Partnership for Sustainable Textiles

# Assessment of available tools for measuring GHG emissions

## Applicability for companies of the German textile and fashion industry

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# 1 Background

The textile and garment sector accounts for about 6 to 8 % of the global carbon emissions which is equivalent to 1.7 billion tonnes in carbon emissions per year. In the context of the climate emergency, changing policy landscape to promote accountability and increasing consumer awareness, advancing in climate action (SDG13), sustainability and transparency have become top priorities for business actors all along the value chain of the textile and fashion industry. The complexity of value chains in the fashion industry resulting from its global distribution and diverse range of raw materials used, suppliers all around the globe, as well as logistics required to connect manufacturing facilities and consumer markets, makes transparency and traceability also priority for this sector.

To achieve meaningful progress in the reduction of their climate impacts, companies from the fashion industry must intensify their efforts in this field and keep up with global developments. In this changing business environment, the measuring, monitoring and reporting of GHG emissions resulting from the business operations is no longer considered an added value for accessing some niche markets. It is rather a standard requirement for establishing commercial relations and ensuring the long-term economic sustainability of a company.

A systematic approach to climate performance monitoring includes understanding operation emissions, identifying hotspots and improvement opportunities, implementing and reduction measures and finally reporting progress. To support these steps, companies are increasingly seeking partnerships and solutions which can facilitate data management as well as the calculation and generation of quantitative and qualitative indicators for monitoring and reporting purposes. There are also a number of available tools adapted to the activities in different tiers of the fashion industry that can be openly accessed or purchased to support GHG Emissions calculation.

Amid the dynamic and rapid developments in this field, it is difficult to obtain an overview of the variety of available tools, its functionalities, advantages, and potential limitations. In 2020, as part of the activities of the UNFCCC Fashion Industry Charter for Climate Action[1], 15 tools for calculation of GHG emissions were systematically analysed according to several aspects and potential applicability for companies in the fashion industry.

Intended as input for the members of the German Partnership for Sustainable Textiles, GIZ has commissioned Oeko-Institute to summarize the previous findings and deepen into critical aspects of selected tools. This work has been conducted through desk research. Where the tools or required information were not freely accessible, the providers were contacted with questions for clarification and the request to provide a demo version to gain further insights. Experiences with the tools were also gathered, e.g. comments or opinions from other companies using the tools or publications that used the respective tool.

This document summarises relevant aspects of selected tools building on the previous work from the UNFCCC Fashion Charter and complemented by publicly available information[2]. Finally,

[1] Garment sector stakeholders came together in 2018 to commit to climate action through the United Nations Framework Convention on Climate Change (UNFCCC) Fashion Industry Charter for Climate Action. Signatories to the Charter committed to 30 per cent greenhouse gas (GHG) emission reductions by 2030 (from a 2015 baseline) and net-zero emissions by 2050.

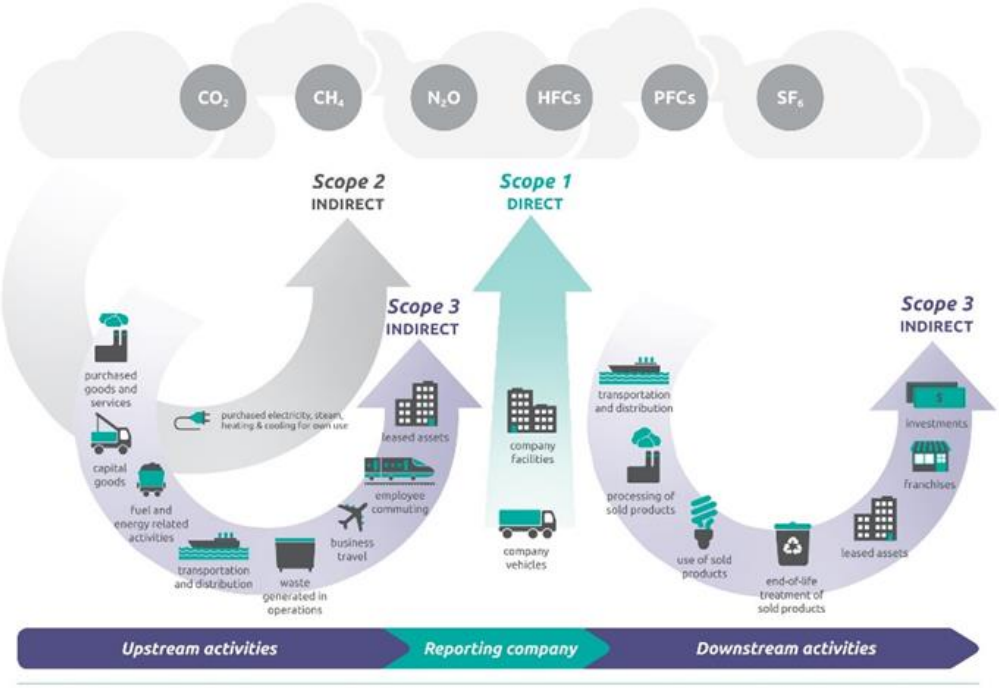
[2] As the specific functionalities of most of the tools could not be directly accessed, the assessment in this report is not conclusive.

further information is provided to guide the companies from the German Partnership for Sustainable Textiles in selecting the appropriate tools considering different levels of their data availability, budget, and progress in measuring their GHG emissions.

## 2 Tools for the calculation of Green House Gas Emissions for the textile and fashion industry

Collecting, measuring and reporting data to account for a company's GHG emissions is an extensive and time-consuming task. Therefore, many companies are seeking available solutions for support and simplifying the calculation of their corporate carbon emissions, which ideally comply and align with the GHG Protocol Methodology (see Figure 2-1).

**Figure 2-1: Overview of emission scopes according to the GHG Protocol**




Source: GHG Protocol

Some available tools are very simple but entail a heavy workload in terms of data collection, aggregation, and preparation. Others, more sophisticated reporting and management tools are offered in the form of Software as a service (SaaS) which provide customised solutions for each need including automated data collection and the generation of different standardised reporting (GRI4, CDP, etc.). Currently, powerful tools are available to provide not only basic calculations of GHG emissions but also analytics and advanced planning features to improve a company's supply chain performance.

Table 2-1 presents a list of the tools originally evaluated by the UNFCCC Fashion Charter in addition to the reasons for its selection or exclusion from this document. Recently launched tools and software solutions which have been included in the process of writing this report are also listed at the bottom.

**Table 2-1: Selection of GHG tools**

| NAME | EVALUATED BY UNFCCC FASHION CHARTER | DESCRIBED IN THIS DOCUMENT | REASON FOR INCLUSION/EXCLUSION |
|---|---|---|---|
| Amfori BEPI calculator | x | Yes | Positively recommended by UNFCCC Fashion Charter assessment |
| CemaSys | x | No | Insufficient information available from UNFCCC Fashion Charter assessment |
| CTIC's carbon reporting tool for China | x | Yes | Positively recommended for the intended audience by UNFCCC Fashion Charter assessment |
| Metrio | x | Yes | Positively recommended by UNFCCC Fashion Charter assessment |
| EcoDesk Horizon | x | Yes | Deemed as promising by the UNFCCC Fashion Charter assessment |
| Enablon GHG Emissions Management Software | x | No | Many limitations described in the Fashion Charter assessment. Not further assessed. |
| IFC Edge tool | x | Yes | Limited applicability described in the Fashion Charter assessment. |
| Mammut/ Quantis tool | x | No | Tool exclusively developed for Mammut and it is not immediately available for use or further licencing. Not further assessed. |
| Quantis Scope 3 Evaluator | x | Yes | Assessed as good for initial screening of Scope 3 emissions. It has been described but not fully assessed. |
| Higg Facility Environmental Module (FEM) | x | Yes | Positively recommended by UNFCCC Fashion Charter assessment. Broadly established in the textile and fashion industry. |
| Higg Brand and Retail Module (BRM) | x | No | Use recommended for performance management but not for not calculations. Does not include GHG calculation functionality. |

| | | | |
|---|---|---|---|
| **Higg Material Sustainability Index (MSI)** | x | Yes | Positively recommended by UNFCCC Fashion Charter assessment. As it does not concern GHG corporate emissions, it has been described but not fully assessed. |
| **Alaska tool from Southpole** | x | No | UNFCCC Fashion Charter Assessment concluded limited applicability |
| **Sphera Environmental Accounting Software** (previously ThinkStep's SoFi tool) | x | Yes | The previous ThinkStep's SoFi tool was positively recommended by the Fashion Charter assessment. |
| **WWF HK- Low Carbon Manufacturing Program (LCMP) Software** | x | Yes | Positively recommended by UNFCCC Fashion Charter assessment |
| **GHG Emissions calculation Tool** | NEW | Yes | Free. Resource from the GHG Protocol. Currently in Beta version. |
| **Ecodesk Scope 1 and 2** | NEW | Yes | Free and easy to use as screening tool for Scopes 1 and 2 |
| **ModInt &bAwear Score** | NEW | Yes | Recently launched (Dec 2021)<br>Replaces the previously available ModInt Ecotool from the Branch organisation for the Dutch textile and clothing industry. Widely used in the Netherlands |
| **ZDHC / Implementation HUB: The Resource Efficiency Module** | NEW | Yes | Based on previous tool from the Carbon Performance Improvement Initiative (CPI2)<br>Tool content has been transferred to the ZDHC Foundation and was re-launched as a module on ZDHC Supplier platform in December 2021. |
| **OEKO-TEX® Impact Calculator** | NEW | Yes | Recently launched (January 2022) |
| **My Climate Tool** | NEW | Yes | Included by recommendation of Climate Change expert group of the Partnership for Sustainable Textiles. |
| **Climate Partner** | NEW | Yes | Included by recommendation of Climate Change expert group of the Partnership for Sustainable Textiles. |

| | | | |
|---|---|---|---|
| Scope3Analyzer | NEW | Yes | Included by recommendation of Climate Change expert group of the Partnership for Sustainable Textiles |

Source: Own Compilation

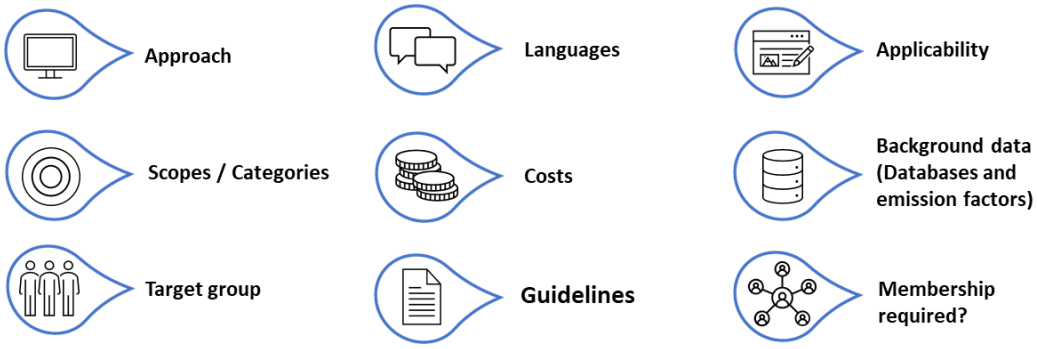
In the following sections, 16 tools are described in detail. The selected tools are clustered according to their link to specific business platforms or sectorial initiatives in section 2.1, customisation features in section 2.2, accessibility and costs in section 2.3, and those which have been especially developed by or for the textile and fashion industry in section 2.4. Moreover, some resources for supporting the estimation of Scope 3 emissions are described in section 2.5.

Along this document the information for each tool will be presented firstly based on the official description of the features and characteristics. This will then be complemented with further remarks regarding methodological aspects such as scopes and types of GHG covered, source and complexity of emission factors as well as use of estimations or primary data for results. Finally, information about typical costs[3] and other aspects related to access to the tools are provided.

Additionally, when available, a snapshot of the tool's interface is presented along with a list of the most relevant advantages and limitations derived from the assessment. Considering the total information collected, specific applicability for the fashion industry is finally recommended and experience reports are listed based on experiences with recognized companies as well as known reputational aspects.

The overview presented in Table 2-2 summarises relevant criteria evaluated for all tools. Along the document, the same criteria will be included in sections describing an individual tool according to the following icons:

**Figure 2-2: Icons used to illustrate the features and characteristics of the tools**




Source: Own compilation

[3] At the time of the assessment.

**Table 2-2: Overview of evaluated criteria for selected GHG Tools**

| NAME | APPROACH | TARGET GROUP | COSTS | APPLICABILITY | GUIDELINES | BACKGROUND DATA |
|---|---|---|---|---|---|---|
| **Amfori's BEPI carbon calculator**<br>Scope 1, 2<br>English<br>Members only | Self-assessment questionnaire | Manufacturers (tiers 1 and 2) and brands | No information | Track supply chain performance. As supply chain mapping from the brand's perspective. Not intended for external reporting. | No information | Ecoinvent database and the International Energy Association |
| **WWF HK- Low Carbon Manufacturing Program (LCMP) Software**<br>Scopes 1, 2, 3<br>Chinese<br>Participation in LCMP required | Web-based database which stores monthly CO2 emissions data of relevant sources. | Manufacturers in the Pearl River Delta Region | €1.482 factory/year in which participation fees are paid. Additional fees for certification and third- party verification | Aggregating, monitoring and reporting GHG emissions | Consistent with GHG Protocol and ISO14064:1 | Emission factors from WWF's technical partners, GHG protocol, and IPCC. |
| **Metrio Sustainability Software**<br>Scopes 1,2, 3<br>English | One stop-shop software for ESG data centralization | Manufacturers, brands, and retailers | Setup costs from €15.000 to 30.000 plus yearly costs depending on the number of users | Reporting but also effective for data analysis | All frameworks, standards, and ratings (GRI, CDP, SDGs, DJSI, MSCI etc.) Accredited by CDP. | Default emission factors taken from the best publicly available, free sources. Possibility to include own individual emission factors |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Sphera's Environmental Accounting Software**<br>Scopes 1, 2, 3<br>English | Software as a Service | Manufacturers, brands, and retailers | No information | Emissions inventory, corporate reporting and GHG reporting required by voluntary and regulatory sustainability programs. | Customisable to all voluntary and regulatory sustainability programs. | Indicators are supported on updated GHG emission factors databases. |
| **EcoDesk Horizon**<br>Scopes 1, 2, 3<br>English | Software-as-a-Service model. Cloud platform for survey-based assessment | Brand retailers and suppliers | Roughly €15.000 to €30.000 | Gather, verify and report data from supply chain sourcing partners | Follows the GHG Protocol methodology | Emission factors primarily sourced from DEFRA. Regional electricity emission factors from national databases. |
| **myclimate smart 3**<br>Scopes 1, 2, 3<br>English, German, French | Web-based platform for standardised carbon footprinting and data management | Manufacturers, brands, and retailers. | Starting from €1.000 | Calculating and reporting GHG emissions according to international standards | Aligned with international standards (GHG Protocol, ISO, CDP, GRI) | Ecoinvent and others (yearly updated). Possibility to include or calculate individual emission factors. |
| **Climate Partner**<br>Scopes 1, 2, 3<br>English, German | Cloud-based software tool for data collection and calculation | Manufacturers, brands, and retailers. | Fees by service package | Calculating and reporting GHG emissions (CCF and PCF) | Follows the GHG Protocol and closely aligned with ISO 14064/PAS 2060 standards | Ecoinvent, DEFRA, GEMIS, Agribalyse, as well as own LCI datasets |

| | | | | | | |
|---|---|---|---|---|---|---|
| **GHG Emissions calculation Tool**<br>Scopes 1, 2, 3 (partially)<br>English | Downloadable Excel tool (beta version) | Manufacturers, brands, and retailers. | Free | Simple calculations with up to 10 facilities | Consistent with GHG Protocol | Default emission factors for fuels and transport from EPA and DEFRA (US and UK based). Regional electricity emission factors from national databases. |
| **Ecodesk Scope 1 and 2**<br>Scopes 1, 2<br>English | Downloadable Excel tool | Manufacturers, brands, and retailers. | Free | Only for screening purposes. Not comprehensive enough for reporting | Consistent with GHG Protocol | Emission factors primarily sourced from DEFRA. Regional electricity emission factors from national databases. |
| **IFC Edge tool**<br>Scopes 1, 2 (but results presented in total CO2e)<br>English | Web-based application | Brands and Retailers | Free | To support the calculation of Scope 3 emissions in categories 8, 13 and 14 (in the absence of better data). | Harmonized GHG methodology* | Data for 144 countries, enabling the incorporation of local information on energy usage and cost. |
| **Scope3Analyzer**<br>Scopes 1 & 2 and upstream Scope 3 categories<br>English, German | Downloadable template for data input and web-based dashboard for results visualisation | Primary aimed at manufacturers. Brands and retailers can also use it.<br>(Focus on SMEs) | Free | To calculate the Corporate Carbon Footprint and track emissions from Scopes 1 and 2 over time. Baseline assessment for supply chain emissions (Scope 3). | Consistent with GHG Protocol and CDP. Recognized by SBT | Emission factors from IPCC 5AR 2014, Ecoinvent, EEA, EXIOBASE, UK Government conversion factors, OECD ICIO, World Bank indicators and BEA. |

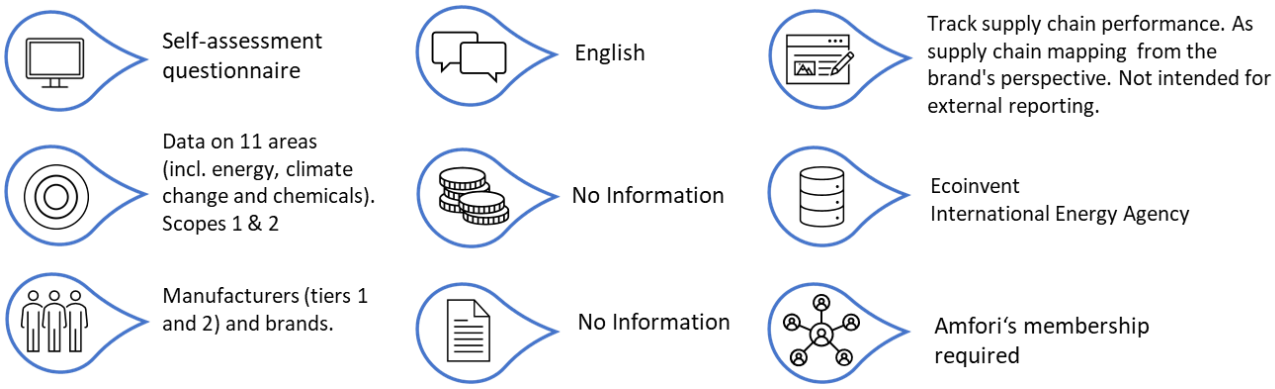
| | | | | | | |
|---|---|---|---|---|---|---|
| **Higg Facility Environmental Module (FEM)**<br>Scopes 1, 2 (Key impact categories such as energy, water, waste, and emissions)<br>English, Chinese | Web-based application | Manufacturers, brands, and retailers. | €178 annually for non-members of Higg | To assess environmental impact of product manufacturing at facilities in tiers 1 to tier 3 | Follows its own methodology (based on GHG Protocol) | EPA 2018, GaBi 2020, IEA 2016, IPCC 5AR |
| **CTIC's Manufacturing Industry Evaluation Information System**<br>Scopes 1, 2<br>Chinese | Web-based application | Manufacturers | Free | Accounting and reporting of GHG from production and business activities of Chinese Textile and garment enterprises. | ISO compliant | Chinese regional conversion factors from Chinese national database, and some IPCC data. |
| **ModInt bAwear Score**<br>Cradle-to-gate (Fibres, Process, type of Product). Results for GWP (total CO2e), water usage, energy consumption and land use<br>English | Web-based application with LCA methodology for products | Brands | Access on the basis of credits (€50 - €300) | To support decision-making at the product design stage. | LCA, ISO 14040 | Ecoinvent and emission factors from technical literature. |

## 2.1 Tools available as part of business platforms and sectorial initiatives

This cluster of tools includes those made available within business platforms or as part of sectorial and industry programs aiming to bring together actors for achieving a common objective. Usually, these tools are just one part of a wider range of support services offered to members upon participation or payment of registration fees. Companies participating in such platforms can benefit from peer collaboration and avoid duplication of efforts in the supply chain. In many cases, a membership allows access to benchmark data based on reporting from other members. In other cases, benefits are also perceived in the form of technical assistance and trainings. Furthermore, a knowledge exchange among members is offered with the aim of promoting progress in implementation of certain goals defined for the given initiative. It is also common that members participating in such platforms are requested to make their own data available to other members in order to facilitate the comparison and further refinement of performance indicators.

### 2.1.1 Amfori's BEPI carbon calculator

**Figure 2-3: Amfori's BEPI carbon calculator: Overview on the features and characteristics**




Source: Own Compilation

The Amfori's BEPI carbon calculator is a tool incorporated into the Amfori BEPI (Business Environmental performance Initiative) online platform[4]. Amfori BEPI was founded in 2013 and provides a comprehensive range of services that enable companies to implement focused environmental improvements in their supply chain. This platform is based on a self-assessment survey covering 11 areas (323 questions) ranging from energy use and greenhouse gases to chemical management. Within this survey, Chapter D includes questions for measuring the company's performance in terms of their climate change impact and provides the $CO_2$ emissions calculator for each manufacturing site, based on the data entered in the self-assessment.

myclimate Foundation supported the development of the Carbon Calculator tool to be integrated into the Amfori BEPI online platform as well as into the supply chain mapping and the reporting tool. This tool is aimed at enabling Amfori BEPI members to accurately measure the carbon emissions of their supply chain.

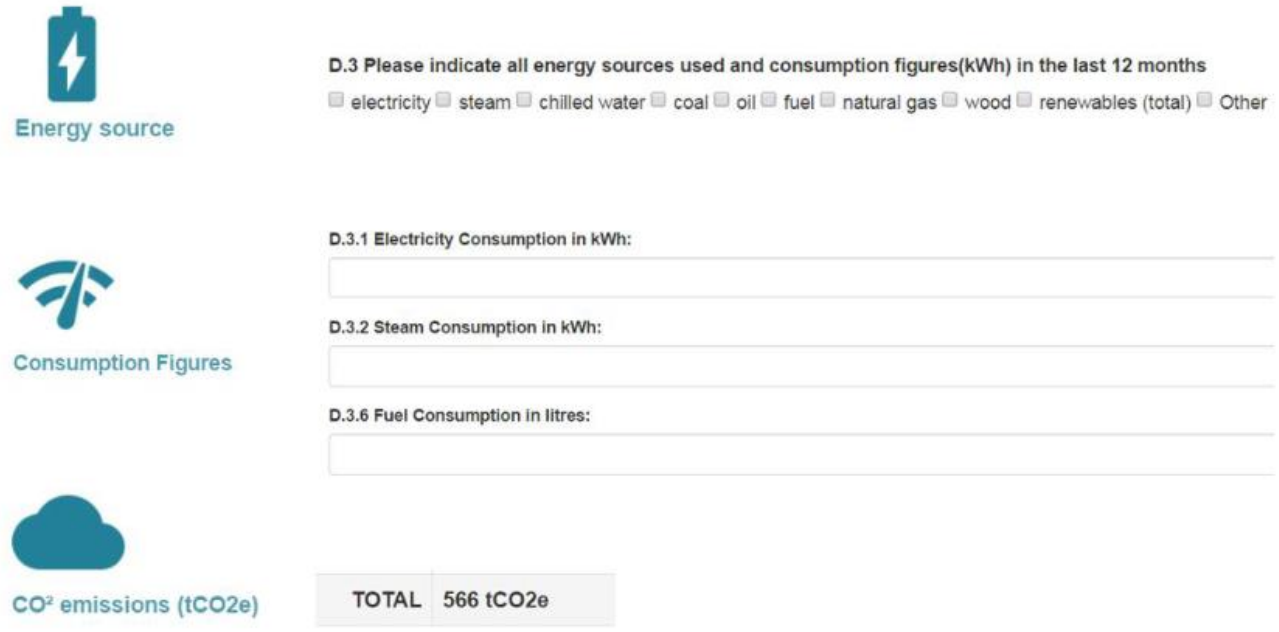
[4] https://www.amfori.org/content/amfori-bepi-platform

The BEPI carbon calculator is intended for providing space for all environment-related supply chain information, allowing companies to easily add their producers and map their supply chain across the world. In addition, this tool shall support communication with facilities; allowing members to request monitoring activities in their supply chain. The results are then available on the platform where both companies and producers can track their performance. Members with a common producer can share the results, thus avoiding duplication of efforts and saving money.

In terms of methodology, the BEPI carbon calculator considers fuel and energy consumption data in the categories "energy use, transport and greenhouse gases". Output 5 provides results in terms of the carbon footprint of each production site equivalent to Scope 1 and 2. The data entry and calculation exclude emissions from logistics and raw materials (relevant to Scope 3). Amfori BEPI is linked to myclimate.com, which uses an LCA approach and emission factors from the Ecoinvent database and the International Energy Association[5].

In terms of applicability for the textile and fashion industry, intended users for the self-assessment are manufacturers. Hence, this tool is either relevant to Scopes 1 and 2 of tiers 1 and 2, or as supply chain mapping (relevant to some Scope 3 categories) from the perspective of the brands. However, no specific customisation options are available for the setup of the textiles value chain. Finally, the tool is not intended for external reporting, thus limiting data compatibility for further corporate sustainability requirements.

**Figure 2-4: Amfori's BEPI carbon calculator: Snapshot of the interface**




Source: Amfori BEPI

[5] More information about the calculation principles behind the myclimate.com Carbon Company calculator available under: https://www.myclimate.org/fileadmin/user_upload/myclimate_-_home/01_Information/01_About_myclimate/10_Downloads/Documents/myclimate-company-calculator.pdf

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Offers more than GHG emissions calculations.<br>· Shared results about environmental performance in user-friendly online platform. Allows requesting data and accessing results of producers.<br>· Linkage between brands and suppliers of the industry. | · Only access to Amfori's members<br>· Not specifically intended for external reporting.<br>· Results from CO2e emissions are not presented in alignment with Scopes of the GHG Protocol but as a total instead. |

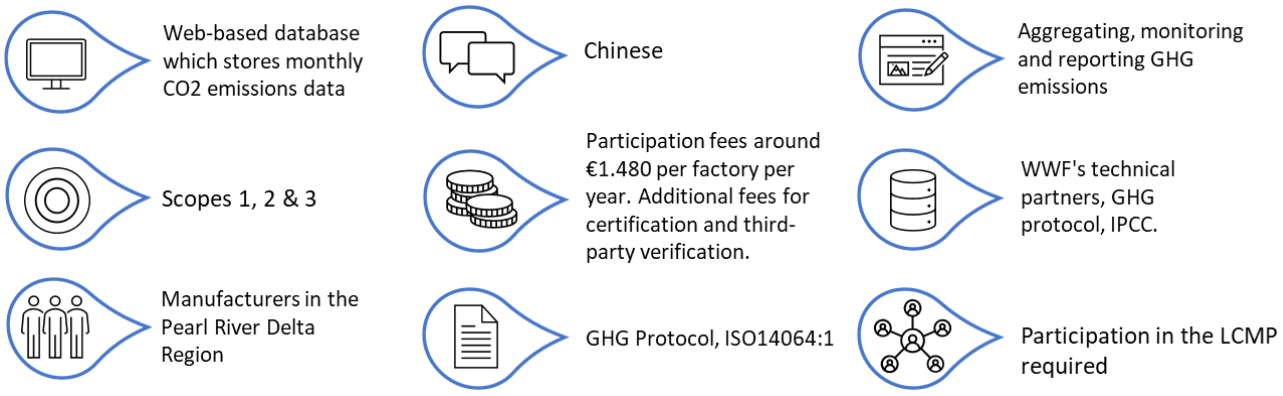
**Recommended applicability for the textiles and fashion industry**

The carbon calculator could be used for own's Scope 1 and 2 Emissions (Self-assessment) and the information in the BEPI Platform to access data about other partners in the supply chain (Scope 3 from a brand's perspective).

Overall, it seems a good tool if a brand wants to map their supply chain and wants to gain a broad picture of its environmental performance which is not limited to solely GHG emissions.

### 2.1.2 WWF HK- Low Carbon manufacturing program (LCMP)Software

**Figure 2-5: WWF HK- Low Carbon manufacturing program (LCMP)Software: Overview on the features and characteristics**




Source: Own compilation

This software was developed and made available in the context of the Low Carbon Manufacturing Programme conducted by WWF Hong Kong. The LCMP software[6] is a software module designed to enable manufacturers to monitor and report carbon emissions periodically. The software module consists of a web-based database in which $CO_2$ emissions data (activity data) of relevant resources are stored monthly. It generates various standardized emissions monitoring reports for the management, for verifiers as well as for the LCMP Project Management Office.

[6] http://lcmp.wwf.org.hk/

In addition, the module provides monthly management information about the company's carbon emissions position and facilitates decision making on all levels within an organization. The software is designed to aggregate and report emissions information on different levels, thus facilitating monitoring and managing emissions for multisite organizations.

Data gathering and results are consistent with key international carbon accounting and reporting standards and initiatives such as the GHG Protocol (WRI, 2007) and ISO14064 (ISO, 2006), enabling manufacturers to report directly according to the Green House Gas Protocol and ISO14064:1. Besides calculating GHG emissions, the software tool also allows companies to identify potential energy saving through GHG management and best-available technologies checklists.

Regarding methodological aspects, the LCMP software utilizes predefined project boundaries and Chinese fuel emission factors in a simple user-friendly online tool. Moreover, reporting outputs are just generated in $CO_2e$, but differentiation according to other GHG seems to be excluded. Built on the GHG Protocol, the software accordingly captures emissions data of the three different scopes and follows an organizational structure frame. While this tool covers all scopes for manufacturers, Scope 3 reporting is optional in the LCMP programme. In addition, the LCMP software has made provision for users to enter carbon offset credits provided that they have bought any (CERs or VERs), which is reflected in the final results.

Currently the tool is mainly focused on companies in the Pearl River Delta Region. The sources of GHG emission factors are from WWF's technical partners, the GHG protocol, and IPCC. The latter are updated whenever the sources are updated. Users can customize these factors if they have specific fuel chemistry-related information. In terms of flexibility, the tool is capable of incorporating additional GHG factors from other regions and additional fuel sources.

Participation fees are HK$ 13,000[7] per year for each factory, and the option of accreditation level certificates is provided for a HK$ 25,000[8] fee per year for each factory. In addition, optional third-party verification is priced between HK$ 15,000 - 45,000[9] depending on the size of the company.

[7] Equivalent to approximately €1.482, ECB reference rate from 28 Feb 2022 (8,751 HKD/EUR)

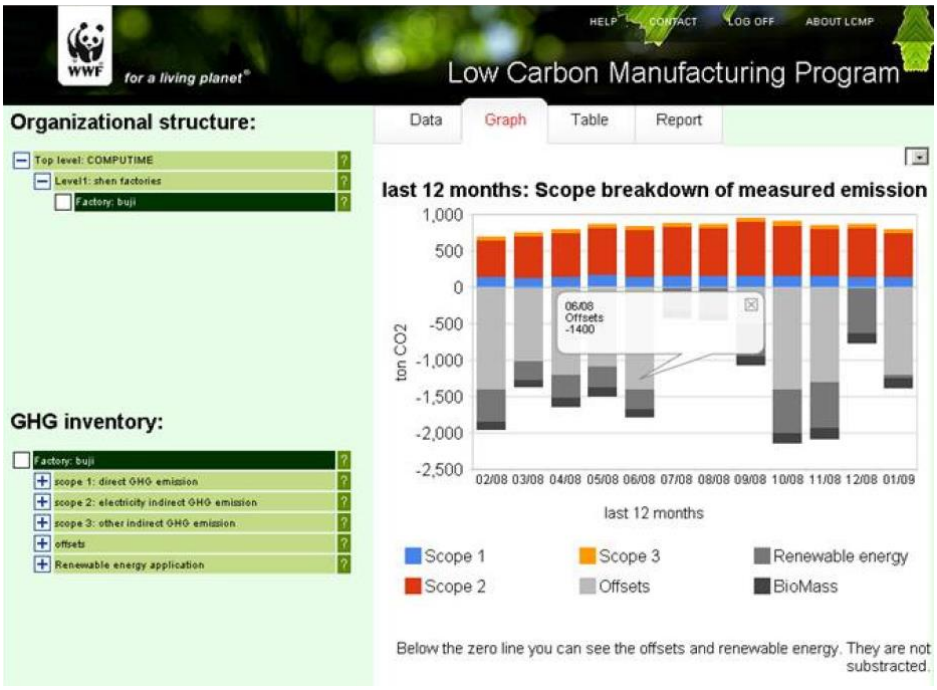
[8] Equivalent to approximately €2.850, ECB reference rate from 28 Feb 2022 (8,751 HKD/EUR)

[9] Equivalent to approximately €1.710- €5.130, ECB reference rate from 28 Feb 2022 (8,751 HKD/EUR)

**Figure 2-6: WWF HK- Low Carbon manufacturing program (LCMP)Software: Snapshot of the interface**


Source: WWF- Hong Kong 2022. https://apps.wwf.org.hk/lcmp/Home

**Figure 2-7: WWF HK- Low Carbon manufacturing program (LCMP)Software: Snapshot of presentation of results**




Source: WWF- Hong Kong 2022. https://apps.wwf.org.hk/lcmp/Home

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Simple and easy-to-use tool<br>· Trainings available (but have not been updated recently). | · As it is was designed for companies in the PRD region only, this tool uses Chinese fuel emission factors which limits its applicability to facilities and operations in that region unless the company can provide own emission factors.<br>· Only available for participants or LCMP Programme (Upon fees payment).<br>· Available documentation and training materials are very old (ca. 2009). |

**Recommended applicability for the textiles and fashion industry**

Tool can be valuable for manufacturers or sites in the Pearl River Delta Region. It is unclear whether brands will get any benefit from it.

**Experience reports and reputational aspects**

*"(...) Some pilot companies already have an ISO system put in place but have no energy / GHG specific guidelines within the system. It is relatively easy for companies with existing ISO systems to incorporate GHG management into the existing systems with guidance from LCMP tools." EnviroInfo (2009)*

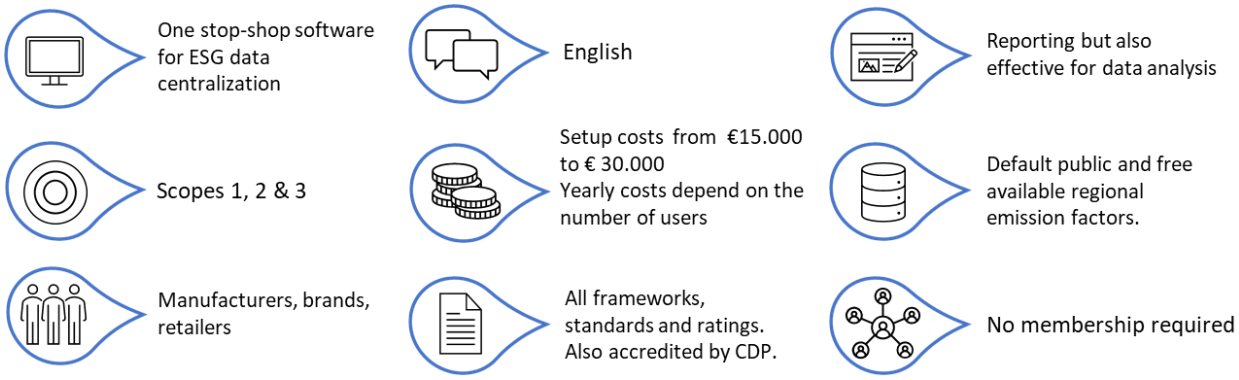
## 2.2 Tailor-made and customisable tools

This cluster of tools consist of tailor-made solutions usually offered in the form of Software as a service (SaaS). Despite representing a significant initial investment (time and costs), this type of tool presents a variety of advantages to big companies. These include the possibility of customising the same solution for implementation in all facilities, among all suppliers and for all operations worldwide including specific emission factors and linking the calculations to existing data management systems.

Tools in this cluster generally allow the user to consolidate data from multiple sources or systems into a single tool, and to further process it for standardized reporting and disclosure purposes. Follow-ups and calculations can be automatised to increase efficiency, thus minimising the effort involved. Besides providing quantitative results, it is common for these tools to include features for data analysis designed to identify hotspots and monitor performance according to standardized frameworks or internal sustainability targets. Finally, SaaS solutions allow for the centralisation of data and files to facilitate reliable verification and the auditing of processes.

### 2.2.1 Metrio Sustainability Software

**Figure 2-8: Metrio Sustainability Software: Overview on the features and characteristics**




Source: Own compilation

Metrio Sustainability Software[10] is a one stop-shop software to centralize, analyse and report ESG data. This software works by collecting relevant quantitative and qualitative data from different facilities and locations of a company, copying them into a "data lake" and performing real-time analysis according to defined key performance indicators for the user. In this sense, Metrio is not only applicable for reporting purposes but can also be efficiently used for data analysis.

In terms of methodology, the GHG calculations performed by this tool cover Scopes 1, 2 and 3. Emissions from purchased electricity can be calculated following either market-based or location- based methodologies. Emission factors are selected for each facility during the setup process. Publicly and free available regional emission factors can be provided as default. However, the client can also upload specific emission factors and update them as needed.

As Metrio is highly customisable, it can be adapted to fit specific needs of companies in the textile and fashion industry. This tool includes an additional supply chain performance module which enables the user to gain a clear understanding of the ESG performance of providers and partners. Additional functionalities include:

Data collection that can be completely automated, however, data can also be entered manually through predefined templates set up with drop-down lists; in addition, it is possible to upload excel files.

A warning function in the case of considerable deviations between new data and previous values; moreover, the history of data modification by the user can be tracked. Customisable user rights allowing to create new users with specific roles and differentiated access to data and modules (data entry, sustainability team, auditor, etc.)

[10] https://www.metrio.net/

Additional communication module directly connected to data and key performance indicators to external and internal communication formats such as report templates and website. Ready-to-use reports can be easily generated by selecting the desired topic as well as indicators and format.

The setup time is about four months (including paperwork). This process starts with an analysis of required, specific needs, and deep scoping for the company. This is followed by configuration and programming and simultaneous setup of API access for data collection. Subsequently, the tool will be customised according to image and branding guidelines of the client. Finally, users will be trained in the use of the tool. The setup costs range between 15,000 and 30,000 €/year. The yearly fees can vary and depend on the number of users (between 15,000 and 50,000 €/year from 5 to 100 users).

**Figure 2-9: Metrio Sustainability Software: Snapshot of the interface**


Source: metrio.net

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Highly customisable to fit industry needs.<br>· Automatization of data collection (API)<br>· Reporting can be based on any framework (GRI, CDP, SDGs, etc.)<br>· User-friendly interface (but data input can be confusing with a simultaneous use of too many tables) | · Not ready to use. Since the tool is tailor-made, it must be considered that longer preparation and time to launch (around 4 months) may be necessary.<br>· High yearly fees and setup fees for SMEs. |

**Recommended applicability for the textiles and fashion industry**

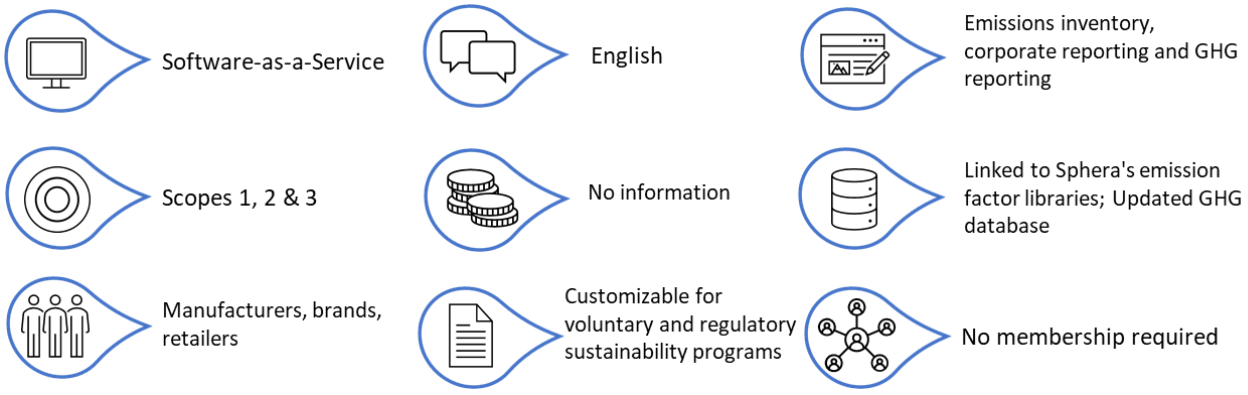
In general, a great data management tool which is mostly intended at reporting and data analysis. Recommended for brand retailers and suppliers. Can be considered to have a good price/performance ratio in terms of solution to the needs of bigger companies. Due to the high costs and setup times, it is an immediate first option for SMEs.

## Experience reports and reputational aspects

- Metrio is a B Corp and, despite its short trajectory, they have already succeeded in winning reliable clients. They offer a supportive, helpful and proactive team.
- "As a small software company, Metrio's platform is very flexible, but it seems less mature and with fewer ready-to-deploy feature modules than with other large companies." (UNFCCC Fashion Charter)
- Experience in supporting companies from the textiles and fashion industry (previous work with Decathlon and Aldo).
- Metrio software is accredited by the Carbon Disclosure Project (for their reporting).

### 2.2.2 Sphera Cloud Corporate Sustainability and Environmental Accounting Software

**Figure 2-10: Sphera Cloud Corporate Sustainability and Environmental Accounting Software : Overview on the features and characteristics**




Source: Own compilation

Sphera's Corporate Sustainability software (formerly SoFi Software) enables companies to report on their sustainability activities using widely accepted industry standards. This reporting and compliance software enables instant data quality checks to facilitate transparent audit trails and voluntary and regulatory compliance reporting. Features for advanced data exchange for automated data, as well as smart and flexible real-time analytic metrics ensure that calculations are precise and up to date.

Sphera's SaaS has an intuitive interface including options for visualising (dynamic charting and personalized dashboards) and functions for sharing reports across users and sites. This tool allows users to insert data directly via custom questionnaires, upload data files or use our automatic integration capabilities.

For the calculation of GHG Emissions, Sphera's software offers automatic compilation of data across company hierarchies or topics. It can, for example, add up to the company's energy consumption from different data sources. Moreover, custom performance indicators to calculate a variety of impacts can be defined. The interface provides multiple methods of data collection

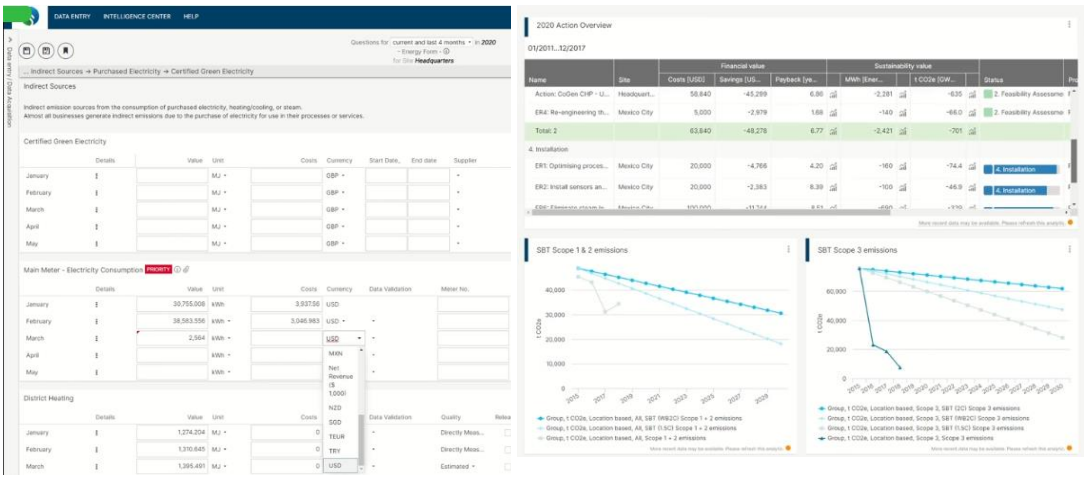
such as entering parameter value data via forms, automated batch processing, or manually importing data via drag and drop, as well as linking it to corporate reporting tools.

As part of Sphera's Environmental Accounting Software, the **Air/GHG Emissions Management**[11] module offers a broad set of data management and calculation functionality to support the rigorous emissions inventory, corporate reporting and greenhouse gas reporting required by today's regulatory programs. This tool could contribute to high transparency for a company's emissions calculation. Furthermore, it helps ensure compliance with a single, traceable corporate system of record for emissions and operations data. This module also allows generating user defined report templates.

As regards methodological aspects, the GHG calculations are linked to other Corporate Sustainability capabilities offered by Sphera, such as Emission Factor Libraries and Performance Management & Improvement. Emission factors are supported on GHG emission factors databases covering different production phases and scope 1,2,3 emissions (with a good level of detail in Scope 3). The calculations are provided based on primary data (entered manually or automatically). If no data or only few data are available, however, the software can estimate results using linked databases.

Considering costs, this tool is affordable only for larger companies, while it could be prohibitive for many others. It is convenient for an individual subscription by companies, which will thus be able to take advantage of the strong customization of the software. However, it remains unclear whether further customisation for companies in the textile and fashion industry will be possible.

**Figure 2-11: Sphera Cloud Corporate Sustainability and Environmental Accounting Software: Snapshot of the interface**




Source: Sphera.com

[11] https://sphera.com/environmental-accounting-software/

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Highly customisable data collection, indicators and reporting options.<br>· Multiple methods of data collection.<br>· Results can be calculated on the basis of data availability (primary data or estimations) | · Costs might limit access for SMEs |

**Recommended applicability for the textiles and fashion industry**

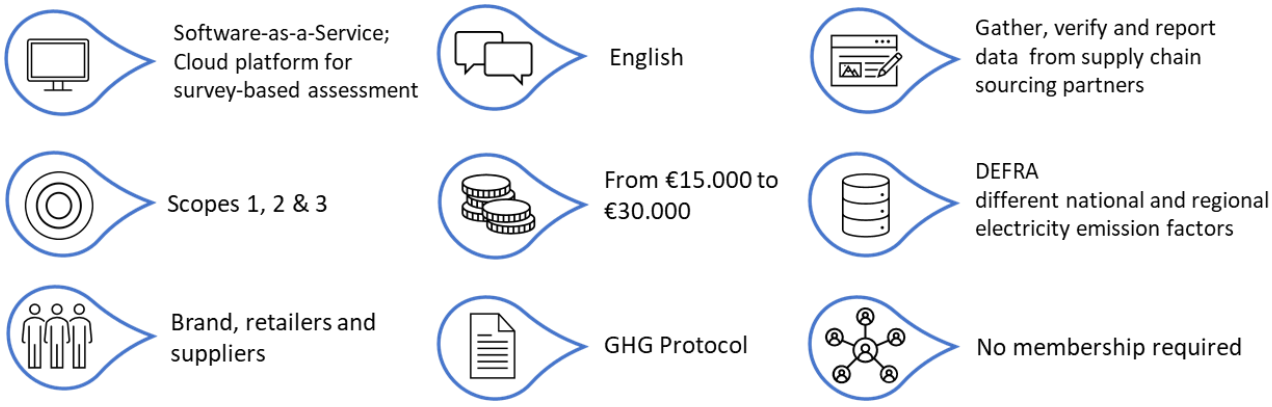
The cost of the tool is possibly only affordable for larger companies, while it could be prohibitive for SMEs. With an individual subscription, the companies will be able to take advantage of the strong customization of the software.

**Experience reports and reputational aspects**

- Sphera's solutions have been prominently recognised by recent awards and benchmarks:
- The Capital Finance International judging panel declared Sphera winner of the 2020 award for Best Corporate Sustainability Software Solutions (Europe).
- Based on interviews with more than 300 EHS executives, the "Verdantix EHS Software Benchmark" selected Sphera as a top Environment, Health Safety & Sustainability (EHS&S) software provider that can help businesses meet their sustainable goals while moving toward a digital future. Sphera's Environmental Accounting solution achieved the highest score in environmental compliance management.

### 2.2.3 Ecodesk Horizon

**Figure 2-12: Ecodesk Horizon: Overview on the features and characteristics**




Source: Own compilation

Ecodesk is a UK based organisation founded in 2010. Ecodesk Horizon[12] is a cloud platform for enterprises to gather, verify and report supply chain source data through an easy-to-use survey

[12] https://www.ecodesk.com/horizon

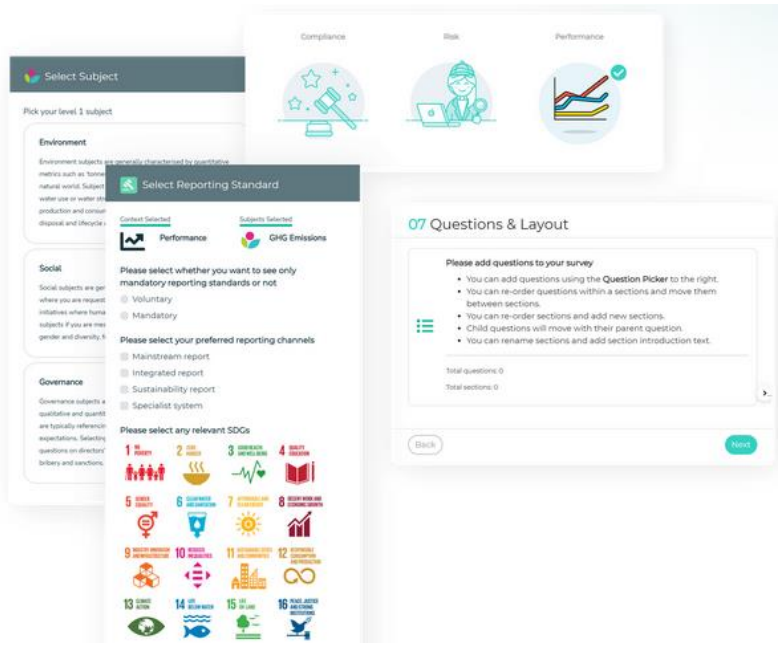
assessment. It uses a Software-as-a-Service model, which is accessible through any web browser. In addition to its ranking functionality, this tool provides detailed analyses on which to base specific actions.

Data is collected directly from suppliers through ad-hoc questionnaires (manufacturing suppliers, logistics, packaging suppliers, etc). The data collected from suppliers go through automatic check-ups through the tool.

The calculations are based on emission factors, following the GHG Protocol Methodology. Emission factors are primarily sourced from DEFRA. All types of GHG and scopes of the GHG protocol are covered (400 indicators out of 1,400 indicators). Clients of Ecodesk Horizon can choose which indicators they want to use and which ones are to be sent to their value chain partners.

Regarding costs, the tool is free for suppliers. The cost for brands depends on the number of questions and the number of suppliers with which a business relationship is to be entered. Rough estimations are €15,000 to €30,000 for the customer (based on 25 questions and 150 suppliers).

**Figure 2-13: Ecodesk Horizon: Snapshot of the interface**




Source: Ecodesk.com

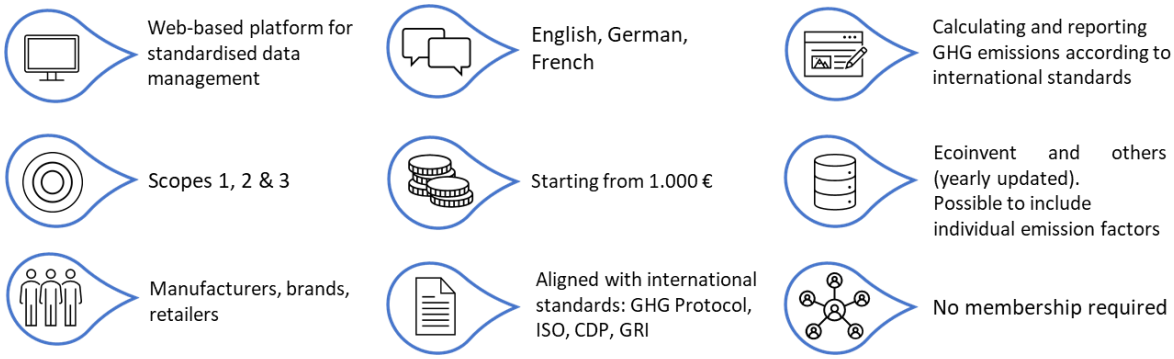
| ADVANTAGES | LIMITATIONS |
|---|---|
| · Flexible tool that can be customised<br>· Very user-friendly and survey-based assessment for value chain partners<br>· Answers from suppliers integrated into a dash-board<br>· Free for suppliers which are requested to enter their data<br>· Cross-check functions to detect anomalous data<br>· Additional feature for reminding suppliers to enter their data | · Price might be high for an SME |

**Recommended applicability for the textiles and fashion industry**

- Good simple approach for collecting supplier data, but some companies may prefer other systems.
- Recommended for monitoring Scope 3 emissions from a brand's perspective.

### 2.2.4 (NEW) myclimate smart 3

**Figure 2-14: myclimate smart 3: Overview on the features and characteristics**




Source: Own compilation

myclimate smart 3[13] is a web-based platform for standardised carbon footprinting and the management of comprehensive sustainability data. This customisable tool simplifies and organises the documentation of sustainability data to support different purposes such as the calculation of Corporate Carbon Footprint (CCF), $CO_2$ and Resource Management up to the supply chain, Sustainability and CSR management. With myclimate smart 3, companies in all tiers of the textile and fashion industry can capture relevant sustainability data, consolidate it throughout the company's structure and assess its environmental impact. myclimate smart 3 is suitable for both SMEs and major international corporations.

[13] https://www.myclimate.org/de/aktiv-werden/firmenkunden/corporate-carbon-footprint/smart-3/

Data collection categories include energy, transport, business travel, employee mobility, office materials, food and waste. Based on these data, greenhouse gas emissions can be evaluated on an annual basis in terms of specific indicators. Additional indicators, for purchased goods or CSR data for instance, can be easily integrated. All inputted data, key indicators and results can be broken down and compared by location or across the company.

In terms of methodology, myclimate smart 3 covers Scopes 1, 2 and 3. The background data in which the calculation of GHG is based are emission factors from Ecoinvent and other relevant databases. The background data basis is updated annually; necessary individual emission factors can be included or even calculated. Companies have the possibility to include specific emission factors or set up additional input fields during the customisation phase or even at a later point. If needed, it is also possible to customize the tool further and generate solutions beyond CCFs, for example, to display the whole value chain in any region.

For the further analysis and processing of data, the web-based platform also offers an opportunity for the depiction and evaluation of interactive graphics as well as for exporting into Microsoft Excel. Moreover, myclimate smart 3 also offers the option of integrating an external audit of the results, which covers all steps leading up to final processing in accordance with established international standards for climate and sustainability reports (GHG Protocol, ISO, CDP, GRI) for which tailored reports can also be generated. myclimate smart 3 is available in German, English and French, the fees for accessing the tool starting from 1.000 EUR.

No interface screenshot available

| ADVANTAGES | LIMITATIONS |
|---|---|
| · user-friendly, multilingual system with interactive dashboard<br>· multiple options for data collection, analysis and reporting<br>· individually configurable system that can be adapted to new requirements at any time<br>· data consolidation and dynamic evaluations on the analysis level of choice, i.e. divisions, countries, locations, etc.<br>· reporting according to international $CO_2$ standards possible: GHG, ISO, CDP and GRI | |

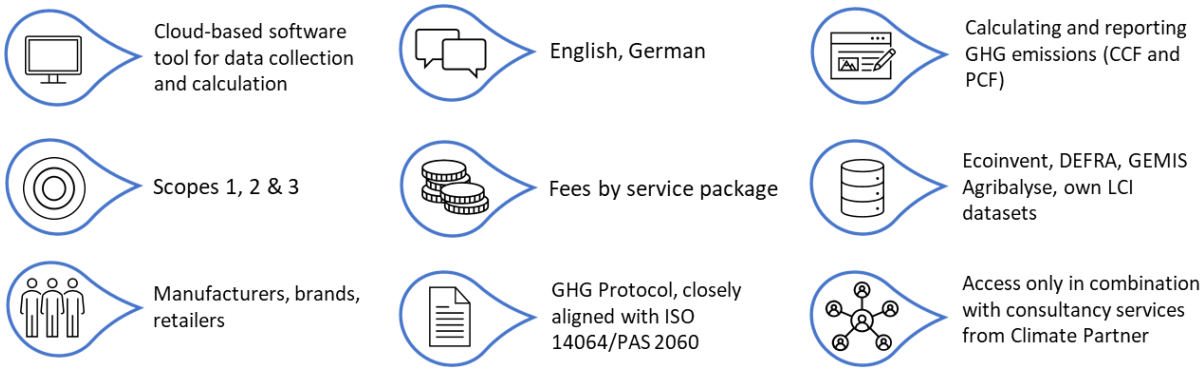
## Recommended applicability for the textiles and fashion industry

## Experience reports and reputational aspects

Myclimate has worked with companies in the Textiles and fashion industry such as Vaude, Exped, Mammut, Oberalp group, Intersport, Odlo, among others.

### 2.2.5 (NEW) ClimatePartner Software Tool

**Figure 2-15: ClimatePartner Software Tool: Overview on the features and characteristics**




Source: Own compilation

ClimatePartner offers a cloud-based software tool for gathering data according to different scopes and categories. This provider offers two different approaches to calculate GHG emissions: The Corporate Carbon Footprint (CCF)[14] and the Product Carbon Footprint (PCF), both available in the same tool. Both approaches are applicable for the fashion industry. Moreover, there are even additional customisation options at the product level which include the calculation of yarn or textiles.

The software tool follows an approach designed to give quick results in a cost-effective manner. It allows users to log in on their own and fill out data while receiving guidance from ClimatePartner during the data collection process. Once joint data collection is finalised, all inputted activity data is translated into carbon emission equivalents. This tool allows for visualisation as to how different facilities and processes impact the company's carbon footprint in real-time.

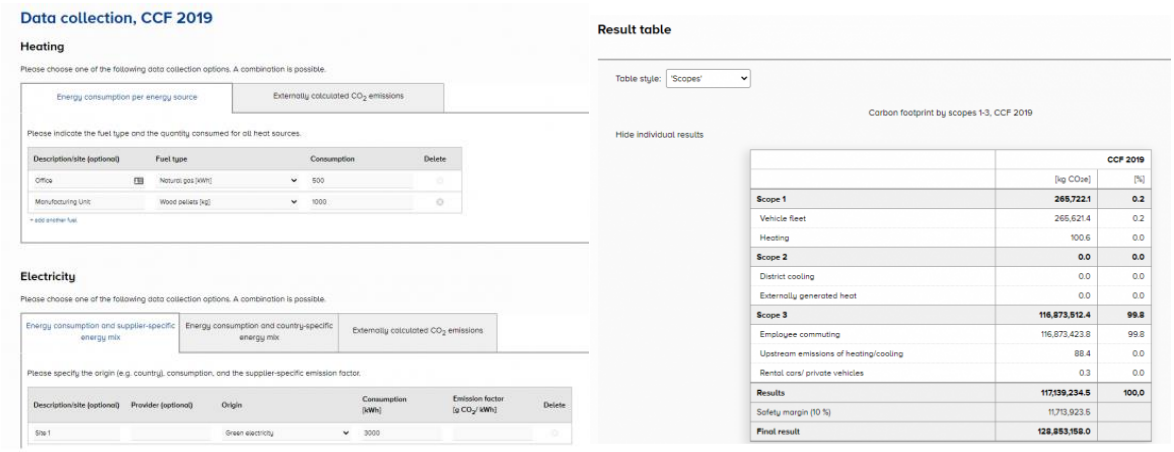
Regarding methodology, the tool follows the GHG protocol (scopes 1 to 3) and is closely aligned with ISO 14064/PAS 2060. As background data for the calculations, ClimatePartner uses a database of thousands of emission factors, compiled from databases such as Ecoinvent, DEFRA, Agribalyse, GEMIS as well as their own LCI datasets. All of them are regularly updated.

ClimatePartner provides the resulting calculated GHG emissions in the form of a tailored report including a breakdown of the corporate footprint, identifying hotspots and a comparison of the carbon footprint in relation to day-to-day items like the equivalent number of t-shirts or flights. In terms of applicability, this tool is suitable for all companies. Product level calculations could be more challenging for a retailer than a producer. However, results can be obtained if primary or secondary data is available.

The GHG calculation tool offered by ClimatePartner is not a standalone tool. Therefore, there are no fixed fees for accessing the tool and this is made available only consultancy services from the provider. For CCF, ClimatePartner charges are based on services packages which depend on the kind and size of the company. For PCF, the fees are determined by the number of products that are to be calculated.

[14] https://www.climatepartner.com/de/leistungen/ccf-corporate-carbon-footprint

**Figure 2-16: ClimatePartner Software Tool: Snapshot of the interface**




Source: ClimatePartner Software Tool

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Easy and automated data entry<br>· Offers customisation options at the product level adapted to the textile industry.<br>· Emissions broken down by scope according to GHG Protocol.<br>· Provides audit-ready results which can be easily exported.<br>· Translates CO2e results into examples to facilitate external communication. | Access to the tool is only available in the context of consultancy services from ClimatePartner. |

## Recommended applicability for the textiles and fashion industry

Calculating and reporting GHG emissions (from CCF and PCF) for brands.

## Experience reports and reputational aspects

Climate partner already works with companies in the (outdoor) fashion industry like Sempatex and Ukuthula. Strong focus on carbon neutrality of specific products or collections.

*"At Ukuthula we work together with ClimatePartner to offer the best quality while reducing the climate impact of our garments within the manufacturing process."* Imanol Ojer, CEO, Ukuthula Sportswear

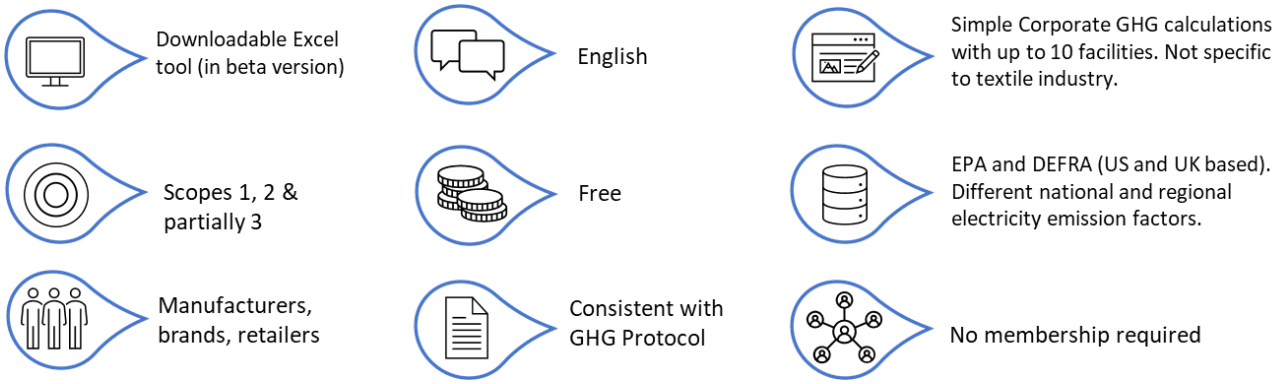
## 2.3 Free and openly accessible calculation tools

The applicability of some of the examined tools focused mostly on calculating emissions within Scope 1 and 2 (direct emissions and electricity-related indirect emissions). The simplest form of calculating tools is available in the form of spreadsheets which help carry out any necessary emissions calculations. Other tools are made available as web-based apps, providing a better user experience and better interface characteristics.

Since these tools are free and publicly available, none of them are customisable or adjusted to the needs of a specific sector. In general, tools in this cluster can be used for screening purposes or in supporting the very first attempts to estimate GHG emissions (in the case of SMEs) when data availability is still in an initial phase, and no other calculation tool has been used. In the case of bigger companies, these tools will most probably not meet the needs nor offer the functionalities for estimating emissions of complex manufacturing processes or many different facilities at a time.

### 2.3.1 (NEW) GHG Protocol emissions calculation tool

**Figure 2-17: GHG Protocol emissions calculation tool: Overview on the features and characteristics**




Source: Own compilation

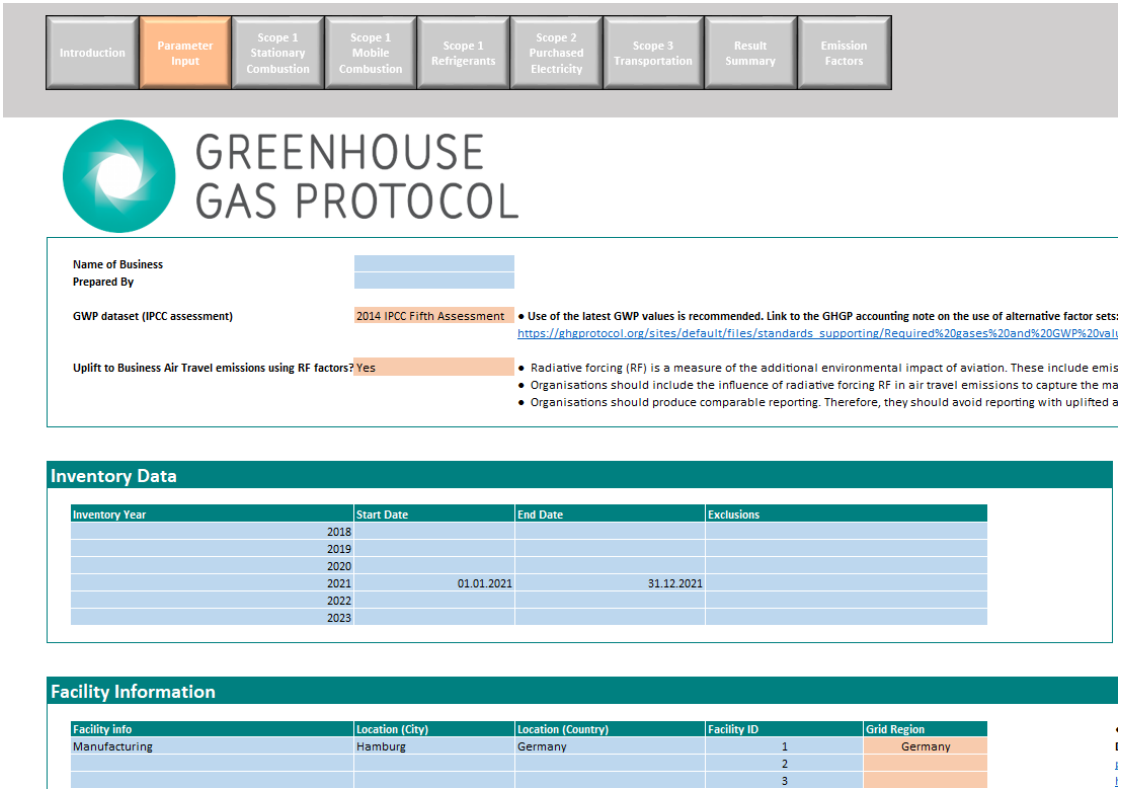
This is a free, Excel-based tool from Greenhouse Gas Protocol and WRI that helps companies estimate their greenhouse gas (GHG) emissions based on the GHG Protocol which is currently on beta version. The tool offers users a step-by-step process to estimate company emissions for specific cross-sectoral emissions sources. Detailed instructions for use and examples of calculations are provided throughout the tool to facilitate its use. Moreover, alternative approaches for determining $CO_2$ and other emissions (e.g., direct measurement, mass balance, etc.) are provided under each scope and emission source.

The GHG Emissions calculation tool does not cover all relevant emission sources within a company's inventory boundary. It is focused on quantifying emission sources from Scope 1 and GHG related to electricity consumption in Scope 2. Besides, this tool offers the possibility for calculating those emissions of Scope 3 related to transportation (upstream transportation and distribution, business travel and employee commuting).

The tool uses default emission factors which vary by country. No separate sets of emission factors are available for EU countries, except for market-based residual electricity mix emission factors. However, this tool allows users to supply custom emission factors (parameters tab), adjust the default global warming potentials and choose whether to use radiative forcing factors for air travel.

Overall, it is a easy-to-use Excel tool that might suit SMEs well in their first attempt of quantifying their GHG inventories. It is probably too basic for bigger companies with more complex data or several facilities. A major limitation is the lack of country specificity for some of the emission sources, given that this tool uses default emission factors for fuels and transport from EPA and DEFRA (US and UK based). While this represents a limitation regarding the accuracy of the results, the quality background data ensures for a reliable first inventory if no other option is available. Eventually, this limitation can be solved by using the option of customisable emission factors.

**Figure 2-18: GHG Protocol emissions calculation tool: Snapshot of the interface**




Source: GHG Protocol and WRI 2022

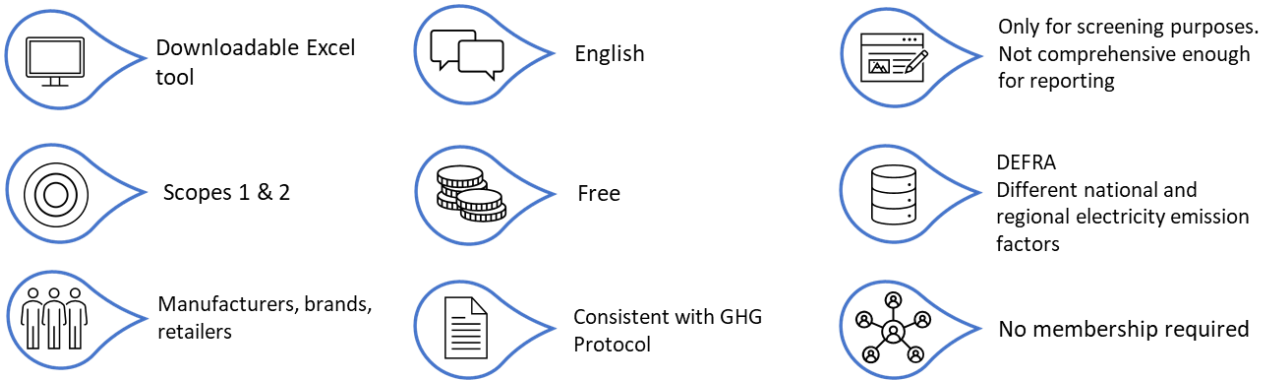
| ADVANTAGES | LIMITATIONS |
|---|---|
| · Free for users<br>· Easy-to-use, downloadable and excel based tool<br>· Aligned with GHG Protocol methodology<br>· Allows users to insert custom emission factors | · Currently only in beta version<br>· Does not cover all relevant emission sources within a company's inventory boundary<br>· Lacks country specificity for Scope 1 emissions |

**Recommended applicability for the textiles and fashion industry**

- Easy-to-use tool which might suit SMEs, particularly if it is there first attempt at calculating GHG emissions
- Likely too simple for large companies with multiple locations or other more complex data needs

### 2.3.2 (NEW) Ecodesk Carbon Calculator Tool

**Figure 2-19: Ecodesk Carbon Calculator Tool: Overview on the features and characteristics**




Source: Own compilation

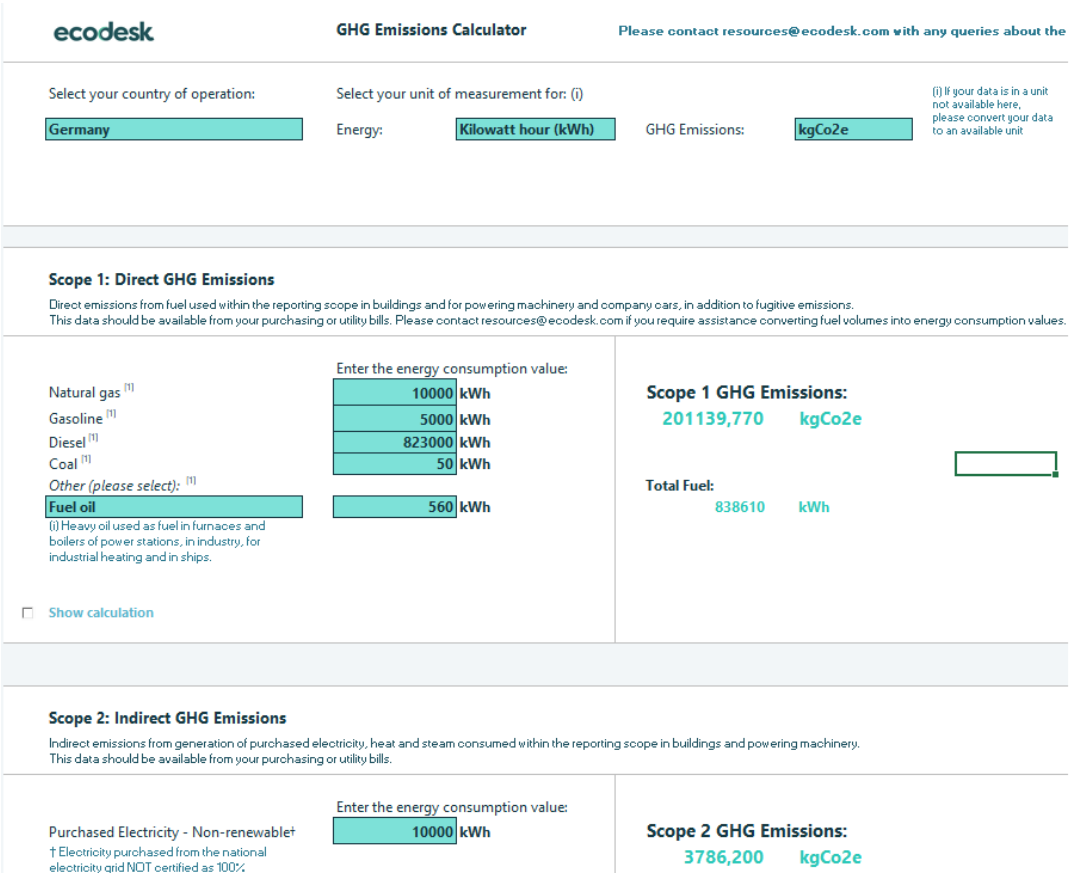
The Ecodesk GHG calculator is a support tool for suppliers to calculate their GHG emissions for surveys conducted on horizon.ecodesk.com. It is available to access on the Ecodesk website[15].

Only Scope 1 and Scope 2 emissions are covered. For Scope 2, it is possible to select the country selection in order to obtain data on the specific emission factors of national electricity markets. The emission factors for this tool are transparently documented (mostly from 2019).

It should be noted that the figures indicated in the tool are only for use within the bounds of their survey, and not for any other purpose. Ecodesk also offers customised software for ESG and supply chain management (see in section 2.2) with further functionalities.

[15] https://www.ecodesk.com/resources

**Figure 2-20: Ecodesk Carbon Calculator Tool: Snapshot of the interface**




Source: Ecodesk.com

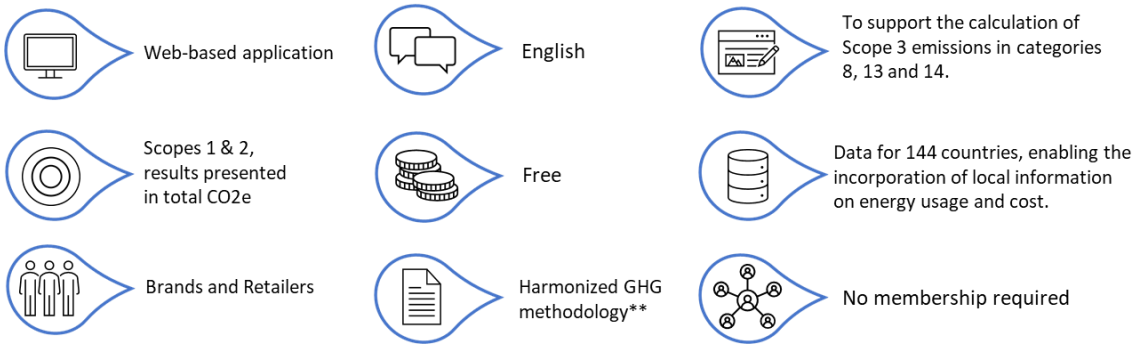
| ADVANTAGES | LIMITATIONS |
|---|---|
| · Free<br>· Excel-based tool<br>· Transparent and documented emission factors | · Results are oversimplified.<br>· Does not consider all possible emission sources in Scope 1 such as fugitive emissions (only fuels included). |

**Recommended applicability for the textiles and fashion industry**

- To be used only as a screening tool for Scope 1 and 2 emissions. Results are not robust and reliable enough for reporting purposes.

### 2.3.3 IFC EDGE tool

**Figure 2-21: IFC EDGE tool: Overview on the features and characteristics**




Source: Own compilation

EDGE – which stands for Excellence in Design for Greater Efficiencies[16] – is an online tool for determining cost-effective ways to build green, sustainable buildings. EDGE has been shown to help planners make energy efficiency savings of over 20% in new buildings. Designed by the International Finance Corporation (IFC), it aims to promote low-carbon development, even in countries where energy efficiency regulations or standards are not yet in place.

The EDGE tool is available as a web-based app, which seeks to promote the investment in green buildings. Users enter their building type (e.g. homes, hospitals, work), city, building data (e.g. number of floors, number of operational hours) to create the base of the building, and can then change factors (such as adding solar tiles) to explore how much energy can be saved. The tool calculates the utility savings and reduced carbon footprint of the user's green building against a base case, how much extra it costs to build, and how long it takes to earn back the investment through operational cost savings resulting from reduced energy demand. It has data for 144 countries, enabling the incorporation of local information on energy usage and cost.

The tool offers modules focused on retail, industrial and office buildings, and it can be used for the estimation or calculation (if primary or more detailed data is available) in the GHG inventory. The tool displays automatic calculations of several indicators based on the default or user entry data. Considering that subcontracting (a factory outsourcing the manufacture of components or products) is a common practice in the textile and fashion industry, this tool could also be a good resource for estimating emissions from selected categories in Scope 3 emissions inventories.

The EDGE tool also includes considerations from building design and materials and HVAC/energy from the grid. An advantage of this tool is that it offers default data for all variables so that estimations can still be provided in the absence of primary data. There is potential to expand the level of details of initial estimations in further iterations if desired.

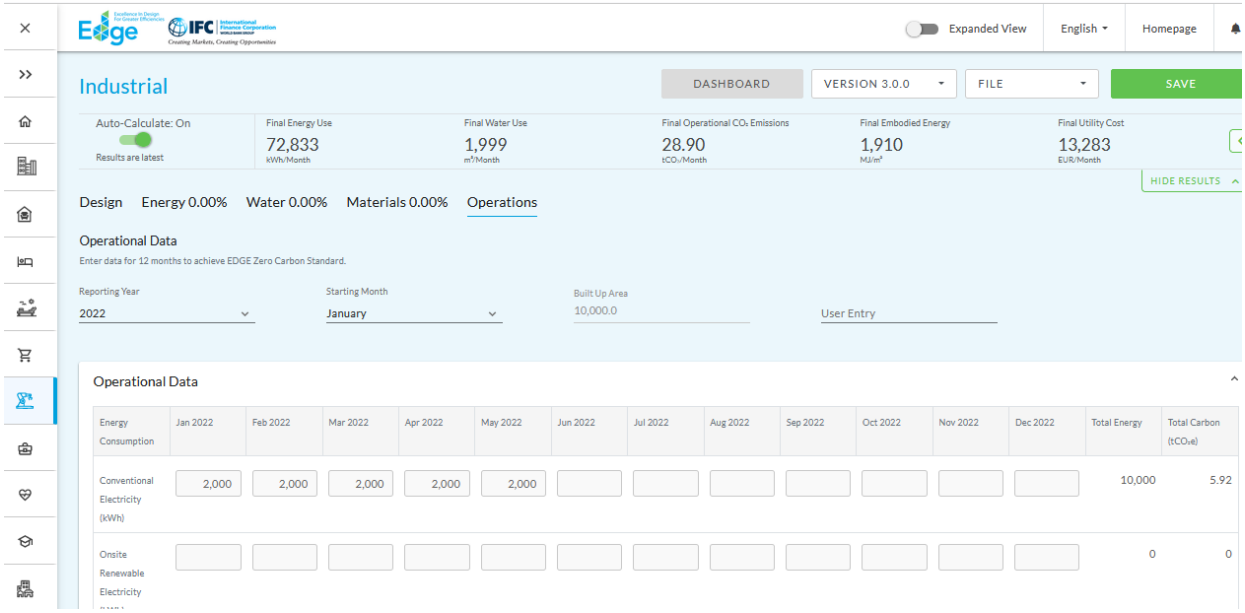
For now, the tool only provides results for total CO2 emissions, which are based on electricity grid emissions and fuels used for cooking and heating. Although emission sources from both Scope 1 and 2 are considered for the site being assessed, the results are not presented per scope. This

[16] https://app.edgebuildings.com/project/allBuildings

observation contradicts previous information claiming that the tool uses a harmonized GHG methodology.

The EDGE tool uses a straightforward interface which delivers a number of outputs from relatively few inputs. The complexity of these outputs largely depends on what is being modelled, but could also become confusing to the user who is interested only in $CO_2e$-related results.

**Figure 2-22: Edge IFC Tool: Snapshot of the interface**




Source: IFC, 2022

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Strong focus on energy efficiency and building materials.<br>· Might prove useful for modelling impacts and emissions in retail/operational space for brands and retailers, especially where data is less available.<br>· Offers default data for estimations in the absence of primary information. | · Results for CO2e are not aligned with scopes in GHG Protocol.<br>· Strong focus on energy efficiency and building materials<br>· Results presented in the form of a variety of indicators which can prove difficult to interpret or directly use for the purpose of GHG inventories or reporting. |

## Recommended applicability for the textiles and fashion industry

Overall, it is a very complete tool with multiple options for data entry and results provided in a variety of specific indicators.

Limited use for manufacturers. Not suitable yet for heavy manufacturing processes. Potentially less of an obvious choice for brands to calculate their Scope 1 and 2 impacts.

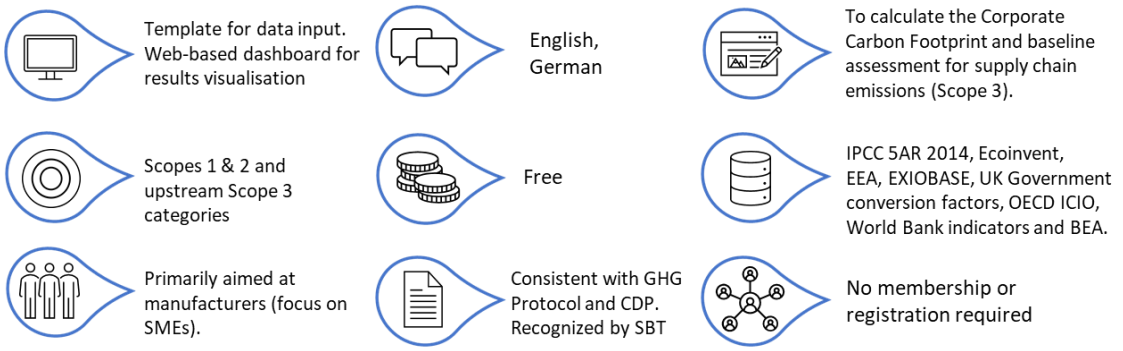
Might be useful in calculating Scope 3 emissions for categories 8, 13 and 14.

## Experience reports and reputational aspects

IFC EDGE tool is used by several multilateral development banks which could be an indicator of methodological reliability.

### 2.3.4 (NEW) Scope3Analyzer

**Figure 2-23: Scope3Analyzer: Overview on the features and characteristics**




Source: Own compilation

Scope3Analyzer[17] is a free tool that allows companies to calculate their emissions along the value chain and which purpose is to offer a low-threshold access with a methodologically correct calculation of the corporate carbon footprint. This tool was developed by Systain GmbH together with the think tank "Industrial Resource Strategies" at the Karlsruhe Institute of Technology (KIT) and the Institute for Industrial Ecology (INEC) of Pforzheim University with funding from the Baden-Württemberg (Germany) Ministry of the Environment. Industrial partners such as Robert Bosch GmbH and the ZEISS Group were involved during the pilot testing of the tool.

The scope3Analyzer enables a simple and comprehensive calculation of the corporate carbon footprint covering Scopes 1, 2 as well as upstream emissions in Scope 3. Downstream emissions in Scope 3 are not covered. The reason is that downstream categories can differ greatly from company to company since these depend on specific business models and specific aspects related to the product's use phase.

Scope3Analyzer uses a downloadable spreadsheet to provide companies with a template for data input in all scopes. This spreadsheet can be uploaded for analysis at a later step. Based on the uploaded data, the tool calculates a company's emissions and presents the results using different visual representations in the web-based dashboard. The dashboards show an overview of emissions including total emissions of Scope 1 (of the own site), Scope 2 (of the own energy purchase) and Scope 3 (of the upstream supply chain). Additionally, an indicator on emissions intensity ($CO_2$ equivalents per euro of sales) is calculated.

A unique feature of this tool is the possibility to gain insights into the distribution of Scope 3 emissions by visualising the results according to different aspects. The dashboard not only differentiates results by Scope 3 category, but also by country of origin of the direct supplier, by

[17] https://scope3analyzer.pulse.cloud/

sector, and by supply chain level: direct supplier (Tier 1) or deeper supply chain (Tier 2-n). These insights enable your company to develop a fact-based climate change strategy that prioritises addressing hot spots of emissions. A summary of the dashboard can be then exported in the form of .pdf, .png and .ppt files to be used directly in selected reports.

In terms of its methodology, the scope3Analyzer can calculate emissions using existing company data (consumption and purchasing data). It should be noted that while emissions from Scopes 1 and 2 are calculated based on specific consumption data (tons, litres, kWh), Scope 3 emissions rely on data about procurement volumes in monetary units. The calculation of Scope 3 upstream greenhouse gas emissions is at the core of the scope3analizer for which a multi-regional input-output (MRIO) model is applied. This model provides aggregated impacts at sector level.

For scope 3, the template for data collection allows users to define names of different upstream categories (products or services) and to enter data on the country of origin and procurement volumes in Euros. As next step, the user is required to assign the individual procurement categories to different sector clusters and sub-sector categories. One of the sector clusters available in the template is "*Textiles, wearing apparel and leather products*". In the sub-categories, a distinction for this cluster can be made between textiles and wearing apparel. However, as this tool is not specifically developed for the textile industry, the options for allocating upstream products and services do not allow to go beyond a broad level of detail. This means, that individual fibre types and cultivation forms (organic, conventional) from the same country of origin cannot be differentiated due to the limitations of the MRIO approach.

For Scopes 1 and 2 as well as selected categories in Scope 3 (3.3 and 3.7.), complementary approaches which combine physical quantity information with LCA-based emission factors are used. Both of these methodologies are recognized and considered compliant with common reporting standards such as the Greenhouse Gas Protocol and CDP and are also accepted by the Science Based Targets Initiative.

As background data, the scope3analyzer uses emission factors from a variety of official sources as well as Systain's own calculations based on public studies. Among them are IPCC (2014), Ecoinvent, European Environmental Agency (EEA), the UK Government Conversion Factors for Company reporting, BP (2021) statistical review of world energy. For Scope 2 emissions, the tool allows the user to indicate consumption data for up to 50 different locations, establishing a link to country-specific emission factors to account for the differences in national electricity mixes. For Scope 1 (energy, heating and mobility), the data input template does not include the possibility of selecting different geographical scopes. This might indicate a limitation in terms of country specificity of the emission factors[18] applied for calculating Scope 1 emissions. The data basis for the input-output model applied in the other upstream categories of Scope 3 include OECD ICIO, the U.S. Bureau of Economic Analysis (BEA), EXIOBASE and development indicators from the World Bank.

Thanks to its easy accessibility, the scope3analyzer is primarily aimed at small and medium-size companies. These companies can use the tool as basis for the first approach to a corporate climate strategy or for answering enquiries from (B2B) customers. Larger companies with no

[18] Country-specific emission factors for fuel combustion are calculated according to the specific composition and calorific values of the energy sources available in each country.

experience in calculating their Scope 3 emissions can also benefit from using this tool for the baseline assessment of their supply chains. Manufacturers are the main target group of the scope3analyzer. However, trade and service companies can also use it. This tool in available in English and German.

Regarding transparency and support information, the website of scope3analyzer includes a FAQs section which provides answers about a variety of topics such as target group, background data, methodology, reliability of results and data protection. The template for data collection contains a section with instructions providing users with background information on the methodology and limitations of the tool. Step-by-step hints for data collection on different categories within the company are also described in the instructions sheet. Furthermore, this section includes specific hints for the preparation and aggregation of Scope 3 data so that it can be properly processed by the scope3analyzer.

**Figure 2-24: Scope3Analyzer: Snapshot of the interface for data collection**

**A | Input form for energy consumption data of your company**

Please enter your energy consumption data and the number of your employees. Please provide all information relevant to your company (consumption) and select the correct unit. Please input the consolidated global consumption across all your business units (locations/countries). It is best to prepare your energy consumption data separately and then enter the final values in this spreadsheet.

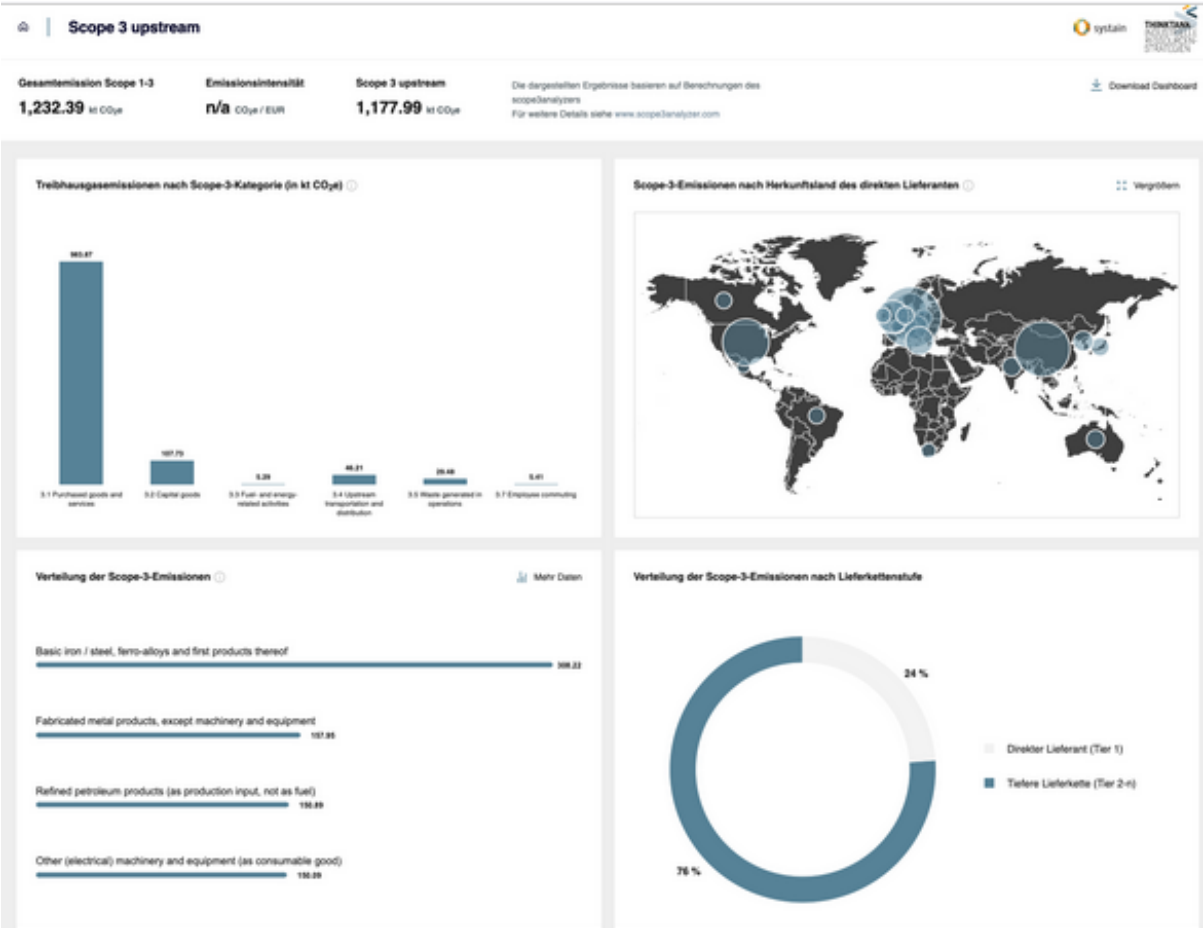
scope³analyzer

This Excel sheet is optimised for printing.

| | | Required information<br>*Please enter quantity and the respective unit of the energy source* | | |
|---|---|---|---|---|
| **Category** | **scope³analyzer** site activity | Consumption | Unit | Effect on emission categories |
| Mobility | Autogas (LPG) | | | Scope 1 + Scope 3.3 |
| Mobility | Diesel fuel | | | Scope 1 + Scope 3.3 |
| Mobility | Petrol | | | Scope 1 + Scope 3.3 |
| Heat | Butane gas | | | Scope 1 + Scope 3.3 |
| Heat | Natural gas | | | Scope 1 + Scope 3.3 |
| Heat | District heating / steam (purchased) | | kWh | Scope 2 + Scope 3.3 |
| Heat | Fuel oil light / heavy | | | Scope 1 + Scope 3.3 |
| Heat | Wood pellets | | | Scope 1 + Scope 3.3 |
| Heat | Propane gas | | | Scope 1 + Scope 3.3 |
| Heat | Hard coal / lignite (industry) | | | Scope 1 + Scope 3.3 |
| Other | Other fossil fuels | | | Scope 1 + Scope 3.3 |
| Employees | Number of employees | | Number of FTE | Scope 3.7 |

Source: Scope3Analyzer, 2022

**Figure 2-25: Scope3Analyzer: Snapshot of the results dashboard**




Source: Scope3Analyzer, 2022

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Free, simple and easy-to-use tool.<br>· Focus on Scope 3 emissions on the basis of economic procurement data.<br>· Results are presented in visually appealing dashboards.<br>· Provides useful insights into the distribution of Scope 3 emissions by category, country, sector and tier in the value chain.<br>· Transparent and complete information about methodology and limitations.<br>· Includes hints for the user on possible data sources, processing, and aggregation during data collection. | · Additional effort for previous data collection and aggregation is required to enter data into the spreadsheet template.<br>· Scope 3 emissions partially covered. The results do not cover downstream categories.<br>· Low level of detail for differentiating input materials specific to the textile industry as part of Scope 3 results.<br>· Lacks country specificity for data on fuel consumption within Scope 1 emissions. |

## Recommended applicability for the textiles and fashion industry

Scope3analyzer is a tool which is especially well suited to determine manufacturers' Corporate Carbon Footprint and which is suitable for use in the baseline assessment for the manufacturers' (upstream) supply chain. The low-threshold and free accessibility of the tool makes it especially applicable for SMEs in the industry.

For Scope 3 reporting purposes, a more specific or more complete calculation of Scope 3 emissions (including downstream categories) is advised.

Due to the limitations of the MRIO approach, the Scope 3 Analyser is suitable for companies that either only have purchasing data available and / or have a wide variety of product groups that goes beyond only textiles.

## Experience reports and reputational aspects

Companies such as Robert Bosch GmbH and the ZEISS Group were involved in the pilot testing of the tool.

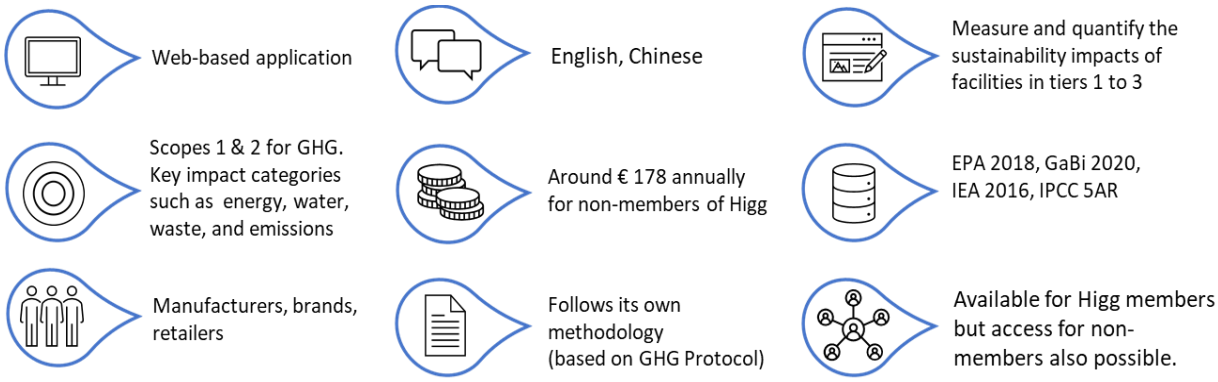
"The Scope3analyzer unfolds its potential the more suppliers a company has and the more difficult it becomes to research individual figures. Above all, however, the data should be collected using the same method and thus be comparable. This is ensured by the method we use." Prof. Mario Schmidt, INEC- Pforzheim University

## 2.4 Tools with special focus on the textile and fashion industry

The tools in this category have been developed responding to the need for solutions suited to calculate GHG emissions based on data and process stages specific to the textile industry. The selected options in this section represent different organisations offering different approaches to the calculation of impacts in this sector. As there are other relevant hotspots identified for the textile value chain, these tools usually collect data on further categories such as energy, water and chemical use along with data relevant to GHG emissions. Among the benefits of using these tools is the consideration on processes and material inputs specific to the manufacturing of textile products. The efforts in data collection and preparation could be significantly reduced by tailoring them to the specific needs of the industry. In addition, some of these tools also calculate their results based on industry-specific databases and representative primary data.

### 2.4.1 Higg Facility Environmental Module (FEM)

**Figure 2-26: Higg Facility Environmental Module (FEM): Overview on the features and characteristics**




Source: Own compilation

The Higg FEM is a tool that measures and quantifies the sustainability impacts of a facility in order to identify strengths and to uncover areas for improvement. This tool standardises how facilities can measure and evaluate their annual environmental performance. It provides a clear picture of the environmental impact that a manufacturer and its facilities are having upon the environment. The Higg FEM is intended for manufacturers, brands, and retailers.

FEM is already used by many suppliers to directly calculate or aggregate their data. It measures key impact categories such as energy, water, waste, and emissions. Facilities complete this module once a year, helping brands measure and compare results year after year. It provides results both for the self-assessment and for the verified modules.

Within the seven categories[19] assessed by the FEM, Energy and Greenhouse Gas Emissions will provide a GHG calculation for both Scope 1 (direct) and Scope 2 (indirect) emissions based on primary data from a company's energy use and on emission factors taken from the best publicly

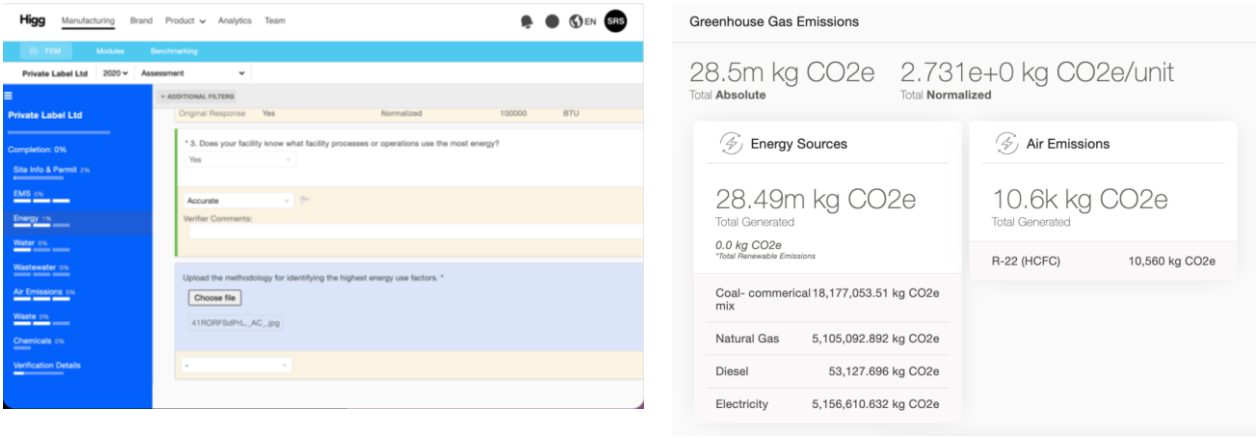
[19] Environmental Management System, Energy/Greenhouse Gas Emissions, Water, Waste, Wastewater, Air Emissions and Chemicals Management

available, free sources. Current emission factors in FEM include EPA 2018 for stationary energy sources, GaBi 2020 and IEA 2016 for purchased electricity and IPCC 5AR for refrigerants.

The calculation methodology of all Higg Tools is very transparent to the user and to the general public. All documentation and guides are publicly available. The GHG emissions calculations in FEM are done in accordance with the GHG Protocol based on the energy use values entered in the Energy section, as well as the refrigerant use listed in the Air section. Electricity emissions are calculated by default by using a location-based, country-level methodology. Users also have the option of using a market-based methodology. It is important to note that FEM only calculates emissions from energy use and refrigerant use while no other direct or indirect GHG source emissions are calculated. Non-renewable and renewable emissions are reported separately. Renewable emissions are only reported at the individual source level and are not included in any subtotals or total calculations. All greenhouse gases[20] are counted in the GHG inventory. However, some individual country-level electricity emission factors may not include some non-carbon emissions due to limited data availability.

Overall, it is a very useful tool for calculating Scope 1 and 2 GHG emissions in manufacturing sites. FEM data is a very useful input to brand/retail GHG emissions calculations. Regarding access, it should be considered that certain costs associated with data processing by Higg Co are involved, amounting to approx. 200 USD (included in SAC memberships; only to be purchased by non-members). A FEM should be purchased annually in order in order to be able to report environmental performance of a calendar year.

**Figure 2-27: Higg Facility Environmental Module (FEM): Snapshot of the interface**




Source: Higg.com

[20] Including carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6), and nitrogen trifluoride (NF3).

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Very user-friendly<br>· Widely used in the textile and fashion industry.<br>· Access to environmental performance data from suppliers and manufacturers in other Tiers.<br>· Results are provided in the form of % and performance scores for facilitating communication with value chain partners.<br>· Access costs are reasonable for non-members and are included in the SAC membership.<br>· Relies on self-assessment and data provided by the facilities. Options and visualisation for verified vs. unverified facilities are provided.<br>· High transparency in documentation and methodology[21]. | · Results not consistent with GHG Protocol<br>· Only energy use and refrigerant use emissions are calculated. No other direct or indirect GHG source emissions are calculated.<br>· Report on GHG emissions calculations presents absolute and normalized results, but not split by scope.<br>· Users must share and post their performance data before being able to access their own results. |

## Recommended applicability for the textiles and fashion industry

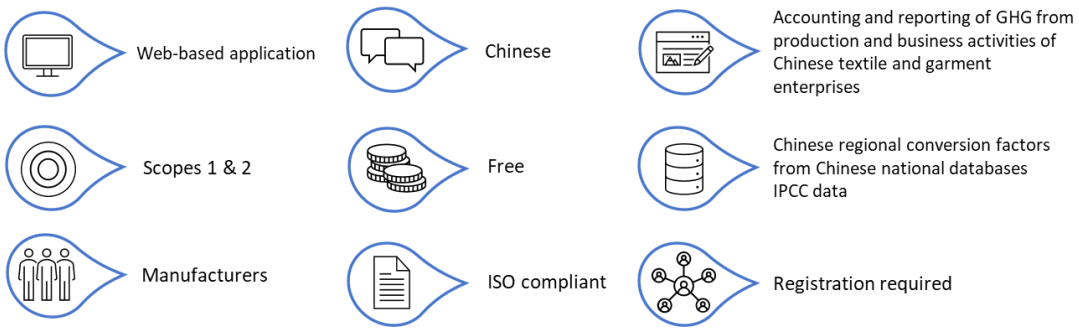
Companies can use the FEM to calculate emissions for tiers 1 and 2, assuming they know the portion of their facility's output. Use recommended for manufacturers and those wanting to directly gather data and calculate GHGs in tier 1 to 3 of the value chain.

## Experience reports and reputational aspects

*"Using the Higg Index enables us to incentivize and reward factories that showcase continuous progress and improvements. We have full visibility into their performance as well as challenges they face. Rather than just receiving updates on a superficial level, our suppliers and brand clients can see progress towards collective goals and be part of that journey together."- Hanna Hallin, H&M Global Sustainability Manager*

### 2.4.2 CTIC's Manufacturing Industry Evaluation Information System

**Figure 2-28: CTIC's Manufacturing Industry Evaluation Information System: Overview on the features and characteristics**




[21] https://howtohigg.org/fem-user-selection/

In order to implement the strategic deployment of green manufacturing-related policies such as "Made in China 2025", "Industrial Green Development Plan (2016-2020)" and "Thirteenth Five-Year Plan for Textile Industry", China's National Textile and Apparel Council (CNTAC) initiated the formulation of the **CTIC's Manufacturing Industry Evaluation Information System** to comprehensively evaluate the green manufacturing level and promote the improvement of the green manufacturing capacity of the textile and garment industry.

The China's Textile Information Center (CTIC), carbon reporting is a management tool for enterprises to account for GHG in the process of production and business activities, set goals and take measures to reduce emissions, thus aiming to create a low-carbon green development brand and enhance the competitiveness of enterprises. Chinese manufacturers are encouraged to use this tool in preparation of participating in the national carbon market and carbon trading, as well as striving for carbon asset appreciation and carbon allowance rights.

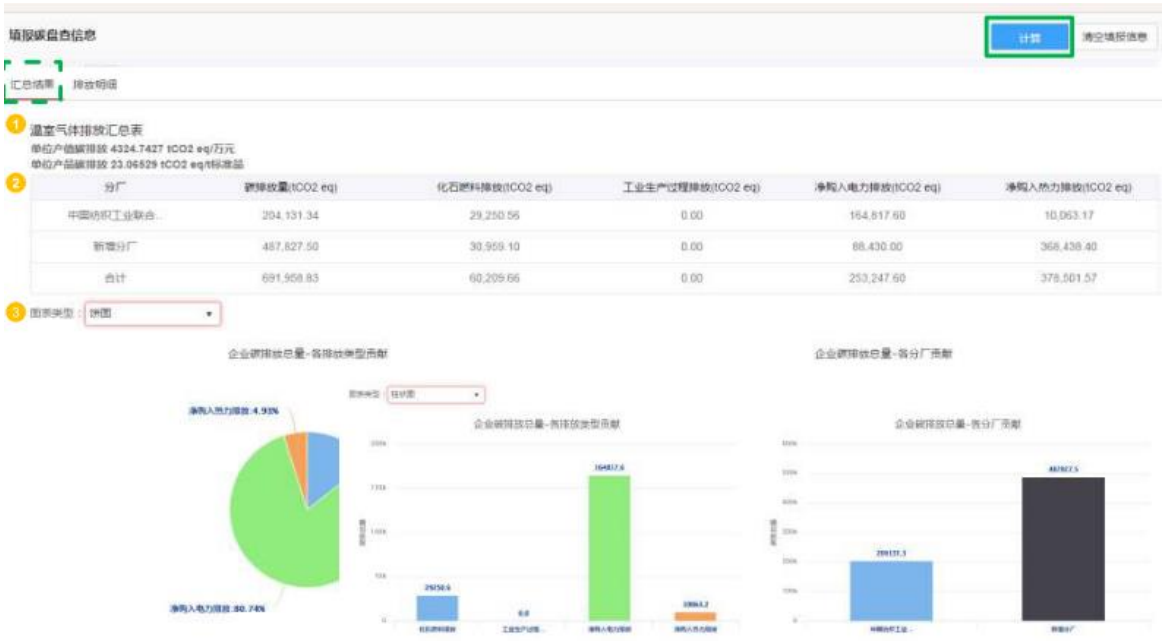
CTIC's Carbon reporting tool is the most frequently used tool for Chinese manufacturers, and it was specifically designed for the textile and fashion industry. This tool is ISO-compliant and uses Chinese-specific regional conversion factors from the Chinese national database, but also includes some IPCC data. All relevant emissions are covered, although no differentiation by type of GHG is provided in the results. Scopes 1 and 2 are the main focus of the tool. There is a complementary supply chain function, but it does not provide for results equivalent to Scope 3.

The results for GHG emissions can be directly calculated for multiple facilities. Different templates for different process types can be selected, but real data must be available as input for the data fields. This tool can also generate GHG estimates based on simple total energy use or break down into processes for those with more sophisticated sub-metering. As it was designed by technical experts, the interface is not user-friendly for manufacturers audience. The interface also displays different tabs for different impact areas and functions beyond site GHG calculation. Further functionalities include result visualisation in graphics or a download as spreadsheets.

In terms of future developments, CNTAC strives to integrate this tool into the LCA system that is also underway. A better detail for Scope 1, 2 and 3 would then be potentially covered. In this process, it must also be considered how chemical management can be integrated and GHG emission factors can be harmonised for different chemicals. Additionally, in the next couple of years, this tool might be integrated into an innovation technology platform created in collaboration with the WWF and HSBC, on which 300 technologies have already been loaded. Based on real data, the platform can model potential savings for sites. A collaboration with the project "Climate Contributer"[22] is also foreseen.

[22] Project that encourages companies to register their green projects for facility management, and track GHG reduction

**Figure 2-29: CTIC's Manufacturing Industry Evaluation Information System: Snapshot of the interface**



Source: China's Textile Industry Federation Social Responsibility Office

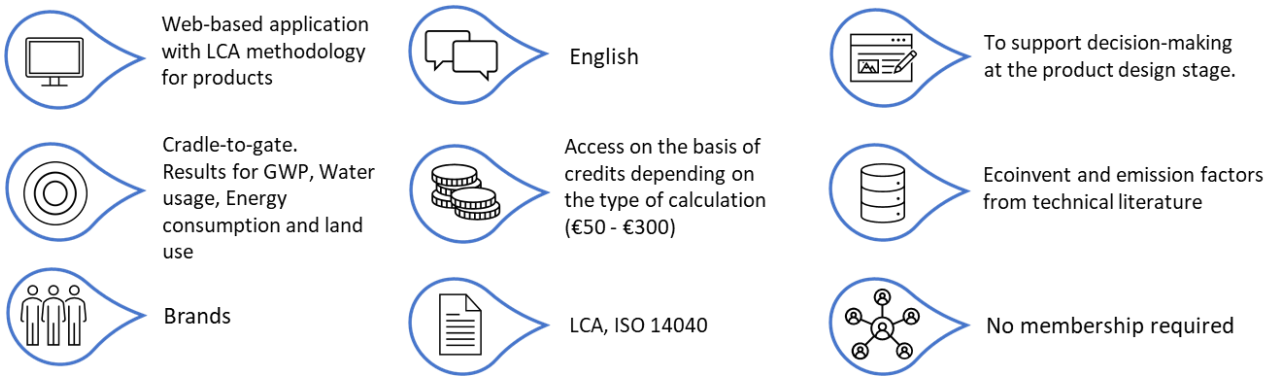
| ADVANTAGES | LIMITATIONS |
|---|---|
| · Major calculation and reporting tool for the fashion industry in China.<br>· Covers good level of detail in Scopes 1 and 2<br>· Free tool. Access upon registration<br>· Basic version can help companies self-report and benchmark against other companies or regions<br>· Promising future developments | · Tool is only available in Chinese<br>· Only Chinese specific regional emission factors. Emission factors for other country energy sources are not in the tool.<br>· Interface is not very user-friendly<br>· Results not differentiated by type of GHG<br>· Tool does not fully calculate Scope 3 emissions |

## Recommended applicability for the textiles and fashion industry

Tool focuses on calculating GHG Scope 1 and 2 emissions for manufacturers. Chinese manufacturers as specifically intended audience. Not applicable for facilities in other regions. Possibly relevant for Chinese companies with overseas facilities and overseas companies with Chinese facilities.

### 2.4.3 (NEW) ModInt bAwear Score

**Figure 2-30: ModInt bAwear Score: Overview on the features and characteristics**




Source: Own compilation

ModInt bAwear Score[23] is a scoring tool for the environmental impact of textiles, processes and products. This tool was launched in December 2021 to provide insight into the ecological footprint of textile products. The impact calculation software can be deployed in the business process in various ways and can make a calculation that fits different needs and different levels of data availability.

bAwear Score combines textile sustainability expertise with state-of-the-art LCA software, so companies in the textile industry can measure, verify and report the footprint of the products they use and produce. This tool has been developed together with SimaPro and is based on more than 35 years of textile expertise. bAwear Score offers three different approaches to calculating product impacts:

- Your Question is a cloud-based and user-friendly application that enables anyone without extensive textile knowledge to quickly assess and compare the environmental impact of more than 80 product types and 30 different materials. Ranging from fashion and workwear to home and interior textiles. All that in less than 5 minutes by following a simple LCA based on a mix of product-specific input and default data[24].This approach is aimed at making decisions about single aspects (e.g. yarn, location of operation, processes, etc) and at understanding the difference between product A and product B for supporting product design and internal planning.

- Your Scenario is an information-as-a-service solution that enables users to create detailed insights into the environmental impact of textile products. Following a complete LCA based on product-specific input from the entire supply chain, this tool helps to transparently communicate and calculate a product's footprint from cradle to gate. This alternative uses a guided online questionnaire (dedicated input forms), to collect required primary data from the producer. If no data are available, data is added from the

[23] https://bawear-score.com/about/
[24] Default data is always in the conservative side from available literature and sources.

proprietary databases. All input data is double-checked and reviewed to ensure completeness and correctness.

- **Your Hotspot** provides specific insight into the hotspots of the supply chain. Calculation results are presented in the form of a personal report with, for example, $CO_2$ footprint or energy consumption of a particular process or part of the supply chain (It will be available in second half of 2022).

Regarding methodology, the bAwear Score calculates the impacts based on the Recipe 2016 method (midpoint). By using a dynamic model, new data sources are added on a regular basis, allowing new innovative materials to be calculated. Results are calculated by sourcing relevant data on fibres, water use, energy consumption, climate impact, chemical consumption and land use from credible sources such as scientific research and external LCA databases such as Ecoinvent. The model covers over 300 data entry options including a variety of fibers, product types and all processes in the textile and fashion supply chain following a cradle-to-gate[25] approach. From material to spinning, weaving/knitting to finishing and confection[26] and finally packaging and transport. It also takes into consideration local energy mixes and the use of renewable energy sources as well as transport modes and distances.

Besides the functionalities linked to the carbon foorprint of a product, bAwear has been working together with Simapro to develop a methodology to integrate the impacts of actual chemicals used in the textile industry into the LCA of bAwear score. This would represent an improvement compared to proxy chemicals commonly used for LCA modelling which might not reliably capture the toxicity impacts.

The access to the bAwear tool works on the basis of credits. The user can purchase credits equivalent to any of the calculation options. The fees range from 50 Euros for YourQuestion to 300 Euros for YourScenario. Even though this tool was jointly developed with the Dutch and Belgium Fashion associations ModInt, a membership is not a requirement to purchase credits and become a user of the tool.

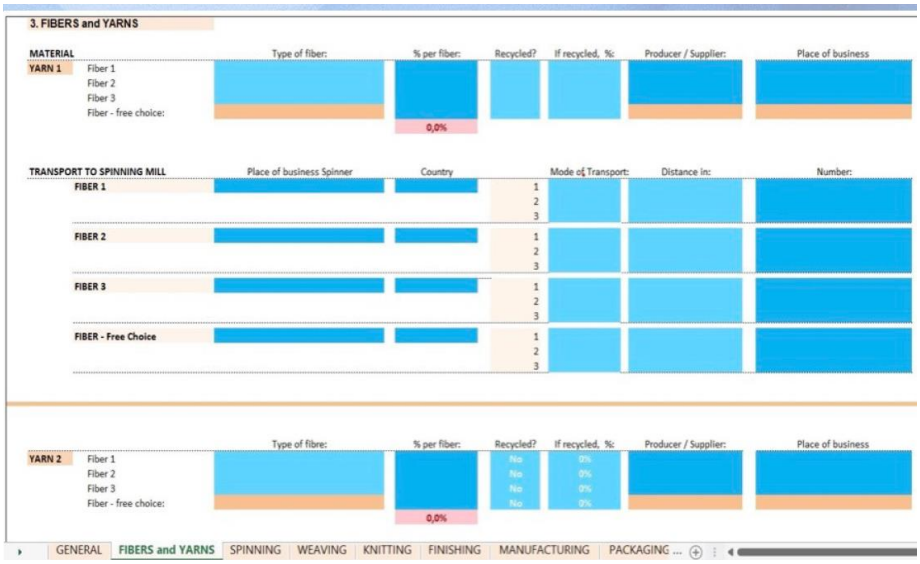
bAwear Score replaces the excel-based ModInt EcoTool[27] previously available for ModInt members.

[25] At the moment, bAwear is working on developing modules for use phase and end-of-life (considering circularity aspects such as recycling and reuse) to expand the scope to cradle-to-grave.

[26] Over 30 different materials to choose from including mix %. Finishing includes 13 different colours at different depth levels which are linked to specific electricity and chemicals requirements.

[27] Developed in 2012 and commissioned by the Dutch Branch organization for the textile and clothing industry MODINT to CE Delft and Alcon Advies BV. This tool was based on PAS 2050 guidelines from 2011.

**Figure 2-31: ModInt bAwear Score: Snapshot of the interface**




Source: ModInt bAwear Score

**Figure 2-32: ModInt bAwear Score: Snapshot of how results are presented**


Source: Modint & bAwear Score 2022. https://modint.nl/english/modint-bawear-score

| ADVANTAGES | LIMITATIONS |
|---|---|
| · Uses a combination of estimations (default data) and primary data for calculations.<br>· Highly customised according to textile and fashion manufacturing processes and materials.<br>· Robust methodological background developed in collaboration with Simapro.<br>· Constantly expanding and working to include new stages such as use phase and different end-of-life options (cradle-to-grave).<br>· Tool in continued expansion. Promising future developments | · Rather a product-level tool than a facility level calculator for GHG emissions.<br>· Results are not provided in alignment with GHG protocol; hence there is no differentiation according to scopes but rather stages of product life cycle (cradle-to-gate). |

| Recommended applicability for the textiles and fashion industry |
|---|
| Uses an LCA approach. Not really suited for calculation or reporting of GHG emissions according to the scopes of the GHG protocol. Eventually further applicability for estimating indicative emissions in selected categories of Scope 3 (e.g. purchased goods and services, use of sold product) can be tested from the perspective of different tiers. |

| Experience reports and reputational aspects |
|---|
| The Dutch and Belgium fashion associations, ModInt and Creamoda, make bAWear score credits available to their members on a regular basis. |

### 2.4.4 (NEW) OEKO-TEX® Impact calculator

**Figure 2-33: OEKO-TEX® Impact calculator: Overview on the features and characteristics**


Source: Own compilation

In 2022, OEKO-TEX® launched the new impact calculator for the textile and leather industry[28]. The goal of the calculator is to enable individual production sites to identify their most significant impacts in terms of $CO_2$ emissions and water consumption and to take action to achieve reduction goals. The calculator also allows production sites to share carbon and water footprint data with different stakeholders, including customers and other value-chain actors. The tool measures the carbon and water footprint of each step in the production process, as well as in total and for each kilogram of material/product. The impacts calculator follows an LCA approach with system boundaries covering emissions in Scopes 1,2 (gate-to-gate) and the option to include some upstream emissions from Scope 3 (cradle-to-gate). The tool does not currently include downstream emissions in Scope 3. However, it is foreseen to include them in the course of a future project (Made in Green).

The OEKO-TEX® impact calculator consists of a dashboard where data entry for different categories is presented. The interface includes a side panel with guiding descriptions for each field, serving the user for orientation regarding the definition or possible data sources for the different entry fields. Minimum data regarding material input and output, electricity, steam, water per facility and per process are needed. GHG sources of on-site processes are automatically calculated.

From a methodological point of view, this impact calculator uses a combination of emission factors from the Ecoinvent[29] and WALDB[30] databases as well as own primary data from SteP client facilities, checked for being representative for the industry. All key data points (hotspots) have been cross-referenced with another source. The workgroup behind the tool also includes Quantis and experts on textile production with many years of experience who review the data.

In the section for data about material inputs, the tool offers different regional emission factors for the most common fibres and their main countries of origin. Additionally, the possibility of choosing "Global" for users who do not have sourcing details is included. At the processing level, the user can select individual processes specific to the textile industry. For electricity consumption, regional markets mixes can be selected, but also personalised energy mixes can be specified for each facility.

In other categories, data about transport distances for each material input can also be included if available. In the category chemicals, only those relevant in terms of GHG emissions are included.

Intended users for the OEKO-TEX® Impact calculator are manufacturing facilities. The tool, however, does not calculate the carbon footprint of an entire company or brand. The results can be used as part of the corporate footprint of a company which owns this facility (part of Scope 1 and Scope 2) or as Scope 3 emissions for a company which purchases the produced goods from the facility. Results are presented in terms of cradle-to-gate and gate-to-gate, but not disaggregated according to the scopes defined by the GHG protocol.

The OEKO-TEX® impact calculator is currently available in Chinese, English, German. Translation into two further languages is planned to increase the outreach of the tool. Although this tool

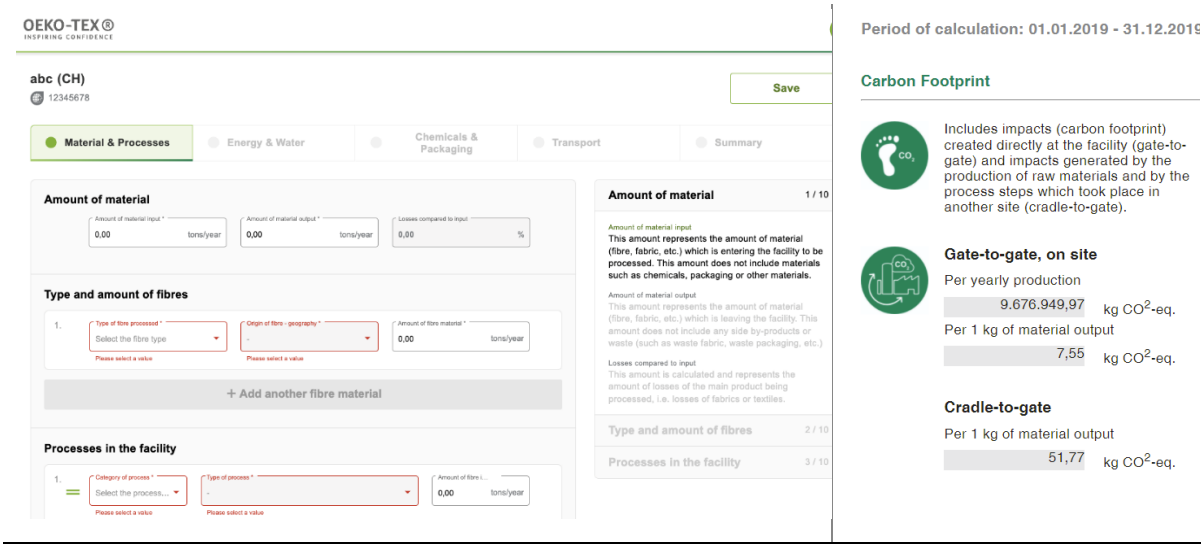
[28] Developed as a standalone tool but currently linked to the STeP by OEKO-TEX® facility certification as a non-mandatory option.

[29] ecoinvent Database https://ecoinvent.org/

[30] World Apparel & Footwear Life Cycle Assessment Database from Quantis. https://quantis-intl.com/metrics/databases/waldb-apparel-footwear/

is currently only available as part of the Environmental performance module of STeP certification, it is foreseen to be made available for market users beyond STeP in the second half of 2022.

**Figure 2-34: OEKO-TEX® Impact calculator: Snapshot of the interface**




Source: OEKO-TEX® 2022

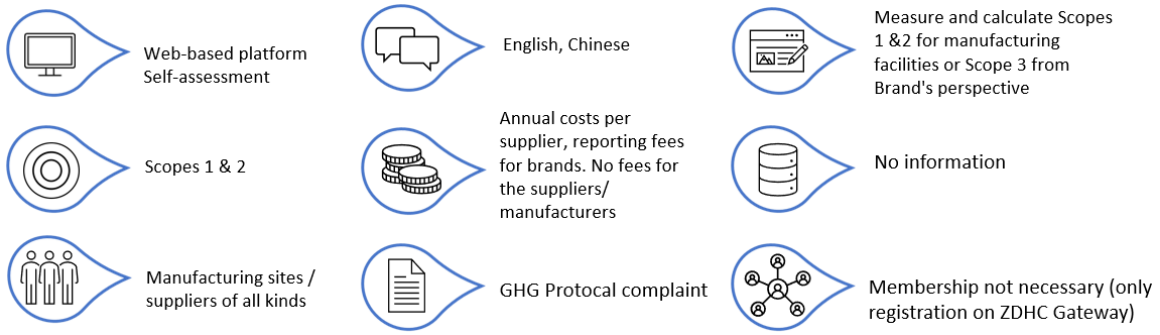
| ADVANTAGES | LIMITATIONS |
|---|---|
| · Includes processes specifically defined for the textile industry, covering several types of processing and manufacturing steps.<br>· User-friendly dashboard and data entry including a side panel with user guide information.<br>· Available in multiple languages which facilitates outreach of the tool along the value chain. | · Results at the facility level, and only represents one part of the corporate footprint of a company or brand.<br>· Calculated GHG emissions are not aligned with GHG Protocol (by scope) but are presented in terms of cradle-to-gate. |

## Recommended applicability for the textiles and fashion industry

This tool can be used by companies to capture emissions from other tiers of the value chain.

### 2.4.5 (NEW) ZDHC Implementation Hub Resource Efficiency Module (REM)

**Figure 2-35: ZDHC Implementation Hub Resource Efficiency Module (REM): Overview on the features and characteristics**




Source: Own compilation

The ZDHC Foundation launched the Resource Efficiency Module (REM) as a tool to help companies reduce the environmental impact of suppliers in their value chains. The new tool is available through the Foundation's partner, the Implementation HUB. It aims to address the large opportunities for environmental improvements in the textile and leather industries which lie within the value chain.

The ZDHC Implementation Hub has proven track record for two of the main features of the platform. The qualitative part comprises a self-evaluation and recommendations for improvement. This part is based on the previously available Carbon Performance Improvement Initiative (CPI2) tool which was transferred to the ZDHC Foundation for its relaunch in 2020. This previous tool was primarily intended for know-how transfer, not as a GHG calculation tool. The refurbished feature in the REM allows the user to prepare a self-assessment about specific reduction measures for facilities and their implementation level. Based on this self-assessment, the tool offers a recommendation list including manuals, templates, info-sheets etc., which is also why it is called "Low Hanging Fruit"

The quantitative feature of the ZDHC implementation HUB is based on a two-year implementation experience in collaboration with a contributing brand. This part comprises detailed consumption data on manufacturing processes. It also allows for calculating the saving potential for single measures implemented by the facility as well as tracking the progress as proof of reason for improved GHG performance.

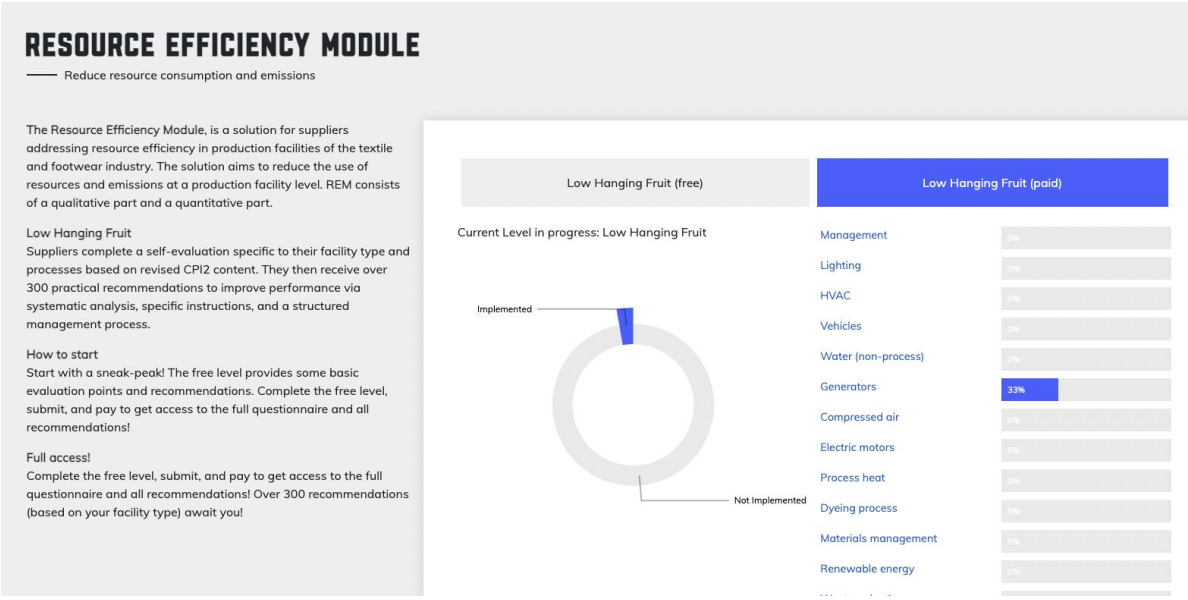
From a methodology perspective, for the quantitative features of the REM, ZDHC seeks third-part approval of background data sources and emission factors for calculations in due frequency, but is based on the GHG Protocol in general. The focus of the REM is the manufacturing site using it and related Scope 1 & Scope 2 emissions only, as the REM does not yet focus on GHG calculations throughout verified supply chain connections and related material flow that would determine the Scope 3 emissions respectively.

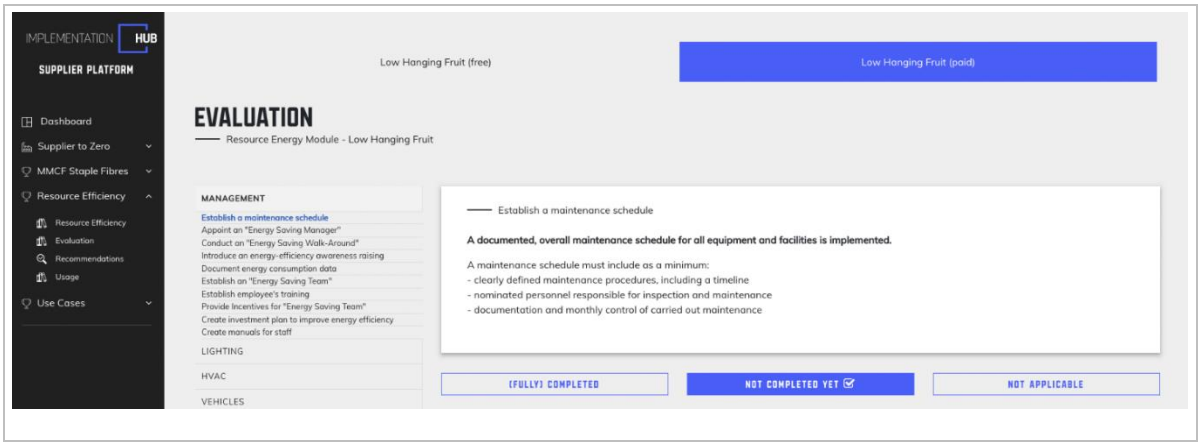
The REM' scope is not limited to any particular factory type. The ZDHC REM is intended for manufacturing sites and suppliers of all kinds, including garment and footwear manufacturers,

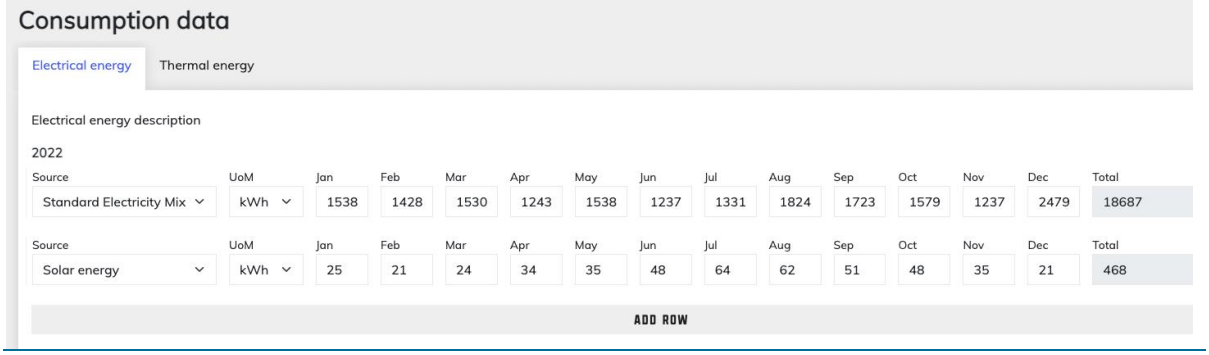
dyehouses, printers or tanneries. However, it does not cover tiers involved with material production, such as fibre and yarn manufacturing. It is recommended for capturing Scope 3 emissions from a brand's perspective. A Brand rolling out the REM to manufacturers of a supply chain will then be able to work with each site's data and is thereby enabled to map the GHG emissions according to the material flow. Each supplier can enter their own data and can invite sub-suppliers or contractors to join and provide information about their facilities. Besides the option of calculating GHG emissions, the ZDHC implementation hub also offers water-related content for wet processing units and a separate solution for addressing sustainable chemical management (Supplier to Zero).

Whereas CPI2 was available in several languages, the REM is currently only available in English and Chinese, as added climate action recommendations and module features were added. The REM will expand according to the need of Brands rolling it out and to the demand from production regions. Learnings from rolling-out the ZDHC chemical programme will be taken into account and there are several REM-related capacity building formats under development in order to increase the manufacturers' engagement and the data quality.

Additional benefits of the ZDHC implementation HUB include links to UNFCCC climate trainings, training academy and third-party expert services. An option to read or publish "use cases" is available for all users. Moreover, suppliers automatically have access to the ZDHC Gateway and the Supplier to Zero foundational level without extra costs.






## ADVANTAGES

- Comprehensive platform offering quantitative and qualitative features.
- A flexible tool that allows for data entry without any experience or expert knowledge
- A qualitative questionnaire provides facilities with a toolkit to reduce resource consumption and emissions
- Results can be calculated on the basis of data availability (primary data or estimations)
- Emissions broken down by scope according to GHG Protocol.
- Covers good level of detail in Scopes 1 and 2 of manufacturers (Scope 3 for brand)

## LIMITATIONS

- No information about background data and emission factors publicly available at this point
- Results at the facility level, not on a process level, and only represent one part of the corporate footprint of a company or brand.
- Module is still in development and will be completely ready only by mid-2022
- Does not consider all possible emission sources in Scope 1 such as fugitive emissions (only fuels included).
- Full access to the module and access to the quantitative part costs Euro 499 / year
- Brand reporting is limited to ZDHC Contributor brands and "Friends of ZDHC"

## Recommended applicability for the textiles and fashion industry

Applicable for calculation of Scope 1 & 2 for a manufacturing facility or Scope 3 from a brand's perspective (by inviting suppliers to join).

Brands can use the tool to monitor CO2 emissions trends from associated factories over the long term.

## 2.5 Further resources for supporting the estimation of Scope 3 Emissions

Calculating Scope 3 emissions is particularly important for the textile and fashion industry because it helps providing insights into the full environmental impact associated with manufacturing and use of their products. Calculating Scope 3 also aims to contribute to identifying the hotspots along the value chain. Indirect emissions, both from upstream and downstream operations, products and services are captured under 15 different categories (Figure 2-2: Icons used to illustrate the features and characteristics of the tools) defined within the Scope 3 corporate accounting and reporting standard of the GHG Protocol.

**Figure 2-36: List of Scope 3 Categories**

| *Upstream or downstream* | *Scope 3 category* |
|---|---|
| **Upstream scope 3 emissions** | **1.** Purchased goods and services<br>**2.** Capital goods<br>**3.** Fuel- and energy-related activities (not included in scope 1 or scope 2)<br>**4.** Upstream transportation and distribution<br>**5.** Waste generated in operations<br>**6.** Business travel<br>**7.** Employee commuting<br>**8.** Upstream leased assets |
| **Downstream scope 3 emissions** | **9.** Downstream transportation and distribution<br>**10.** Processing of sold products<br>**11.** Use of sold products<br>**12.** End-of-life treatment of sold products<br>**13.** Downstream leased assets<br>**14.** Franchises<br>**15.** Investments |

Source: GHG Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting standard

For most brands and retailers, and some suppliers, Scope 3 emissions are more significant and complicated to measure and manage. In fact, many companies in the textile and fashion industry should be able to cover over 80% of their Scope 3 emissions with three categories: purchased goods and services, upstream logistics, and downstream logistics.

However, accounting and reporting indirect emissions in the value chain can be a challenging and overwhelming task for many companies. In many cases, companies require orientation regarding where to start or in which categories they should focus their efforts for detailed data collection. This section briefly describes additional tools and resources that could support the screening and estimation of GHG emissions in some categories of Scope 3.

### 2.5.1 Quantis Scope 3 Evaluator

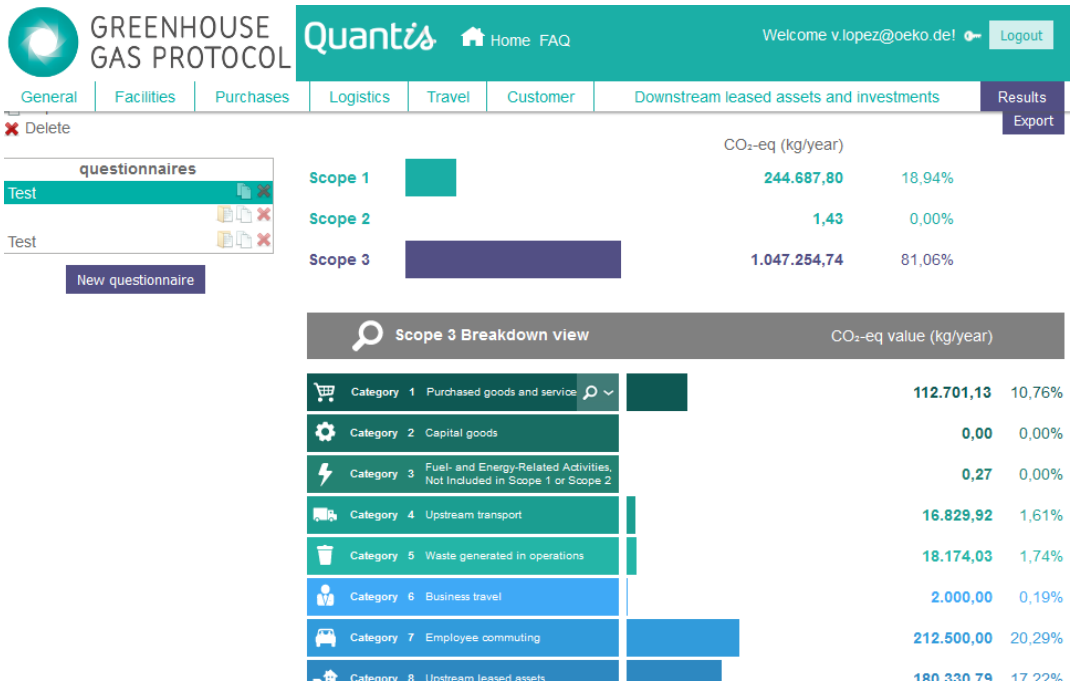
The Quantis Scope 3 evaluator [31] is a 'screening tool' designed to give a rough approximation of the overall Scope 3 footprint. Its calculations follow the GHG Protocol recommendations, meaning the tool can help provide an initial baseline for Scope 3 emissions. It is also a useful tool for companies with few resources or data, especially in terms of identifying the categories in Scope 3 for which it is worth to develop more accurate inventories.

Access to this web-based application is free and open upon registration. It offers a complete overview of the categories in Scope 3 and a detailed view of the results. Since this is a resource for general applicability, it is potentially limited in its adaptability to the textile and fashion industry because of the reliance on world input-output models and relating to the categories on which to focus. Therefore, the results from the Scope 3 evaluator tool are not recommended for reporting purposes or tracking value chain progress.

Despite being developed in collaboration with Quantis as openly available resource for the GHG Protocol website, the background data from this tool appear to be outdated (e.g. drop-down lists for reporting year until 2016). Nevertheless, this tool is mentioned and recommended in the Fashion Charter Playbook as a good resource for an initial approximation.

Considering the above, this resource should be used only as an initial screening tool for Scope 3, as calculations are very simplified and not adapted to the industry specificities. It is recommended that users see the results as a basis for developing a more accurate Scope 3 inventory and for the identification of the category on which to focus their efforts in terms of refining data.

**Figure 2-37: Quantis Scope 3 Evaluator: Snapshot of the interface**




Source: Quantis Scope 3 Evaluator

[31] https://quantis-suite.com/Scope-3-Evaluator/

### 2.5.2 Higg Material Sustainability Index (MSI)

The Higg Materials Sustainability Index (MSI) is the quantitative underpinning of the SAC's Higg Index Product Tools. It is a cradle-to-gate index using a life cycle assessment (LCA) approach to encourage product design teams and the global supply chain of apparel, footwear, and home textile products to engage themselves in environmental sustainability. The Higg MSI was originally developed by Nike after years of research and analysis. In 2012, it was adopted by the SAC and incorporated into The Higg Index. Since then, SAC has been working to mature this index into a tool that may be quite valuable for the whole industry.

The MSI is not a GHG emissions calculation tool but rather a resource for visualisation of material scores. It allows users to create "custom materials" by defining blends and specific processes used during production. Furthermore, it allows for comparing material scores, and the identification of useful sources and methodology information. Following an LCA approach, this tool provides all impacts from resource extraction over cultivation up to finished material ready for assembly. MSI uses Thinkstep Gabi emission factors.

Methodological concerns about the Higg's MSI approach refer to its reliance on weighting and to its allocation of a simple total score, which are not in line with standardised LCA methods. By means of weighting, it is possible to add up all the environmental impact categories and to give a total quantitative value (or single score) for each fibre type. The weighting determines how much importance is attached to impacts such as harmful chemicals, water consumption, land use, biodiversity, use of fossil resources, energy consumption and climate impact. The issues addressed by this approach are seen in the ranking of the various fibres. It has been highlighted that some of the synthetic fibres, for example polyester and polypropylene, show evidence of a high environmental performance. Meanwhile natural fibres such as cotton, wool and silk are down at the bottom end of the ranking. The MSI has also been criticised for lacking differentiation between recycled and virgin fibres.

Despite all of this, there is increasing industry alignment around the Higg tool which is claimed to be the industry-leading value chain measurement methodology. The benefits of MSI lie in the fact of having been specifically developed for use in the industry, and in its single score which simplifies its direct use. The MSI is also recommended by the SBT Apparel guidance as possible secondary data to calculate emissions for the category Purchased Goods and Services in Scope 3 in cases where access to primary data for tiers 3 and 4 is not possible.

In the context of this assessment, the MSI should rather be considered a supporting resource and database for accounting emissions related to selected categories in Scope 3 (depending on the tier's perspective). In addition, manufacturers and brands could, for example, use the average data in the MSI to estimate the emission reductions resulting from changing from virgin to recycled polyester, and to calculate the resulting emissions. Regarding future developments, an upcoming product module might be able to link the MSI to the ongoing EU PEF process.

# 3 Taking a critical view on relevant aspects relating to GHG tools

Applying a more systemic approach to present a more complete picture of the available tools and resources presented in section 2, relevant aspects have been further examined. This section aims to provide a critical perspective on general aspects that might be useful in assessing the reliability and applicability of different tools depending on each company's specific purpose.

### 3.1.1 Organisations behind each tool

The first aspect to consider when further assessing the available tools described in this document, is the type of organisations standing behind each of them. It is important to understand the motivations for developing the tools, the interests that are represented in promoting them and even possible bias. In some cases, partnerships and collaborations with other actors are established in the context of developing the tools. In those cases, it is pertinent to determine if the partnership adds credibility to the tool by bringing, for example, scientific or technical expertise to the process. The organisations behind the tools presented in section 2 could be categorised as follows:

**Business associations** seek to connect several companies in working around a given mission of common interest to its members. This involves joining forces, supporting its members and sharing resources as well as spreading best practices. Such is the case with Amfori, a leading global association for open and sustainable trade which brings together over 2,400 retailers, importers, brands and associations from more than 40 countries. The BEPI platform provides a single point for environmental performance data, helping members to identify environmental hotspots, to compare data and transform information into concrete insights and actions.

By integrating a GHG calculation tool as part of its platform services, business associations are motivated by supporting their members in improving their environmental performance while saving resources and avoiding duplication of efforts. Therefore, tools such as the Amofi's BEPI carbon calculator are largely aimed at comparing data among industry peers. Since the results are intended for internal reporting, these tools do not necessarily include a robust methodological focus or align with existing reporting standards such as the GHG protocol. The calculation methodology of Amofi BEPI's tool, for instance, is based on the Company calculator from myclimate, a consulting company with broad experience in the field of sustainability services. This partnership adds credibility to Amfori's BEPI carbon calculator by backing the data shared in the platform with the methodological robustness from myclimate.

Moreover, in the context of sectorial initiatives, other tools are supported by NGOs. This is the case with the LCMP Software which was developed by WWF Hong Kong with sponsorship from the Green Dragon Fund. In this process, consultants such as the Hong Kong Productivity Council and Azure International Technology & Development (Beijing) were involved and provided technical support.

Other type of organisations which are behind the customisable tools described in section 2.2. are **consulting companies.** Some of these have specialised in ESG and sustainability management services. These organisations are usually very experienced in terms of calculating and reporting GHG emissions. In many cases, the tools developed by these companies resulted from experience

in the field through previous consultancy services and on the recognition of the need for tools which can support companies in this process. Such is the case of myclimate and ClimatePartner, who both are well known for supporting companies in calculating their GHG emissions and providing voluntary $CO_2$ compensation measures. ClimatePartner has over 15 years of experience partnering with over 3,000 clients in industries ranging from food and drink to finance, packaging and manufacturing. myclimate supports companies in the field of $CO_2$ and resource management with advice, analyses, IT tools and labels. Both companies have previous and ongoing collaborations with brands in the textile and fashion industry.

In the case of consulting companies of this type, it is worth mentioning that different services within their portfolios might entail risks regarding the quality and reliability of the GHG calculations. Such risks are linked to potential trade-offs between services for corporate carbon footprint and carbon offsetting which are commonly offered by the same company. This trade-off has gained relevance in the context of growing demand for carbon offsetting services by industry and brands. In attending their clients' interests for claims about "climate neutrality" i.e., selling carbon credits, consulting companies might end up compromising the rigour in the verification of the GHG inventory and further advice on reduction measures.

While the free tool scope3analyzer described in section 2.3 has also been developed by a consulting company, this case differs from the ones mentioned above as it has been developed in the course of a research project funded by the Ministry of Environment, Climate and Energy management of the state of Baden-Württemberg. Even though the German consulting company Systain GmbH is the actor behind the data model and maintenance of the tool, the project was conducted by a consortium which included actors from research, academic and private sectors. The development was scientifically accompanied by Pforzheim University which adds reliability to its methodology.

Another kind of **consulting companies** are those **specialised in software development for ESG data management**. Since these companies are built around their products, their experience in the field might differ as well as their capacity for sector-specific technical support. This group encompasses providers such as Ecodesk, Metrio and Sphera. Although being relatively new, Metrio is a B Corp and has already been engaged with reliable clients also in the textile and fashion industry. Ecodesk, a UK-based company founded in 2010, has a team of data and technology experts with good reputation in the market, collaborating with big pharmaceutical companies such as AstraZeneca. This provider, however, has only cooperated with small companies in the textile sector so far.

Sphera is the leading provider of Environmental, Social and Governance (ESG) performance and risk management software, providing data and consulting services with a focus on Environment, Health, Safety & Sustainability (EHS&S), Operational Risk Management and Product Stewardship. The ESG software solutions from this provider have been prominently recognized in relevant benchmarks[32] which, of course, adds credibility to their services.

[32] Recognised with the 2020 award for the Best Corporate Sustainability Software Solution (Europe) from the The Capital Finance International judging panel as well as the "Verdantix EHS Software Benchmark" as a top Environment, Health Safety & Sustainability (EHS&S) software provider.

**Textile associations and sustainable apparel initiatives** are behind most of the tools described in section 2.4. These organisations are characterised by strong collaboration not only within the industry but also with actors from other sectors such as government, research and civil society. Even though these organisations clearly represent the interests of the textile industry, many of them have sustainability in the core of their mission.

The most prominent of the latter is the Sustainable Apparel coalition (SAC) which is a global, multi-stakeholder non-profit alliance for the fashion industry gathering over 250 leading apparel, footwear and textile brands, retailers, suppliers, service providers, trade associations, non-profits, NGOs, and academic institutions working towards reducing environmental impact and promoting social justice throughout the global value chain. Since the work of the SAC is widely recognised, there is increasing industry alignment with the Higg index tools such as FEM and MSI. The SAC is a member of the Apparel Alliance together with ZDHC and the Apparel Impact Institute.

National textile and fashion associations are also present behind other tools in section 2.4. China's National Textile and Apparel Council (CNTAC) is the organisation which initiated the CTIC's Manufacturing Industry Evaluation Information System. CNTAC comprises of all textile-related industries of the biggest manufacturing market in the world. This tool was developed in collaboration with universities, manufacturing experts and test users for ensuring technical and methodological reliability. Another national textile association behind the described GHG tools is ModInt, the Dutch Branch organization for the textile and clothing industry. This organisation had collaborated with technical experts from CE Delft and Alcon Advies BV to develop the previously available Modint Ecotool for its members. Using the previous experience, ModInt joined bAwear, a start-up company dedicated to the calculation of the environmental impact of textiles, in order to develop and launch the bAwear score. The background model for this tool was built together with SimaPro which is an internationally recognised LCA software provider with a 30-year reputation in industry and academia in more than 80 countries. Behind the scenes, Modint and bAwear also work closely together with Creamoda, the Belgian Fashion Federation.

Further organisations from the industry which have developed GHG tools with a specific focus on the textile industry are those using their extensive technical expertise in other fields of the industry. OEKO-TEX®, for example, is a credible and trustworthy organisation that has been working on standards for the textile industry for 30 years now. At the same time, OEKO-TEX® comprises 17 independent research and test institutes in Europe and Japan who work together to develop test methods and define limit values for the textile and leather industry. For the OEKO-TEX® impact calculator, this technical expertise was combined with the reliability of Quantis, which is an established LCA company that is responsible for the methodology of the impact calculator.

The ZDHC Foundation, which stands behind the Resource Efficiency Module, also oversees the implementation of the Road map to Zero Programme. The mission of this program is to advance towards zero discharge of hazardous chemicals in the textile, leather and footwear value chain to improve the environment and people's wellbeing. Accordingly, ZDHC has had its main focus on chemical management so far. Moreover, ZDHC has not worked in the topic area of GHG Emissions before. Hence, ZDHC is a member of UNFCCC and aims to support GHG reduction via its work on chemicals and improving chemical intensive textile, footwear and leather

manufacturing. However, the previously available CPI2 tool, on which the Resource Efficiency Module is based, brings a strong track record which provides credibility to the organisation in this recent field. ZDHC works with more than 55 international Brands and retailers and more than 5000 manufacturers from mostly tier 2 are using the ZDHC Gateway and the Supplier Platform. Regarding partnerships, the ZDHC Roadmap to Zero Programme collaborates with the German Textile Alliance and the Dutch Agreement on Sustainable Garments and Textile (AGT) and is a member of the Apparel Alliance together with the SAC and the Apparel Impact Institute.

Lastly, the GHG Protocol and all its available resources are the product of a 20-year partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). These organisations collaborate with governments, industry associations, NGOs, and businesses to establish comprehensive global standardised frameworks to measure and manage greenhouse gas (GHG) emissions. Since 1997, the WRI and WBCSD have jointly guided the multistakeholder standard development.

### 3.1.2 Methodological aspects and Compatibility

When comparing the available options, methodological aspects must be examined. The reasons why different tools provide different results can be attributed to the following aspects:

Firstly, there are differences that lie in the system boundaries set for each tool. In general terms, it can be said that most tools focusing on the organisational boundaries intended for the calculation of corporate GHG emissions follow methodologies aligned with the GHG Protocol and results calculated according to Scopes 1, 2 and 3. All tailor-made tools (see 2.2) belong to this category, which is why they perform best in terms of compatibility with international reporting standards such as CDP and GRI.

Many of the other tools included in this assessment do not encompass or only partially cover Scope 3 emissions. The Quantis Scope 3 evaluator is specifically intended for Scope 3, but it is only recommended for initial screening purposes, given that its background data is mostly outdated. In contrast, the scope3analyzer partially covers Scope 3 emissions by focusing on a company's supply chain corresponding to the upstream categories in Scope 3. This recently developed tool uses a simple but reliable input-output economic model to calculate Scope 3 emissions. Therefore, it is also recommended to support the baseline assessment of a company's supply chain.

Tools focused on product level impacts usually apply an LCA approach (ISO 14040) and provide results according to systems boundaries such as cradle-to-gate or gate-to-gate. Calculated GHG emission are presented per lifecycle phase (e.g., materials, processing, use, end-of-life) instead of scope. These tools are applicable for the design phase or as a means of hotspot identification. ModInt & bAwear Score and OEKO-TEX® fall in this group. However, LCA methodologies also offer potential applications for organisational purposes. In this context, the EU has recently submitted proposals for the standardisation of existing LCA procedures with its OEF (Organizational Environmental Footprint)[33]. At the moment, however, these procedures are only applied on a voluntary basis.

Tools which are available in the context of specific sectoral programs or as part of business platforms (WWF-HK and Amofi, Higg FEM) apply their own methodologies which are based on established guidelines, but do not place a strong focus on methodological aspects. The results calculated by using these tools are usually not intended for external reporting but rather for internal use and performance monitoring among peers within the value chain.

### 3.1.3 Transparency and Quality of background data

This section provides general remarks about the extend as to which the background data for GHG emissions calculation tools are disclosed or could be assessed. Evaluating transparency based on openly available information for the individual tools is a difficult task. In cases where this information was not explicit, providers were contacted to request further details and complement the overview.

[33] European Commission (2012). Organisation Environmental Footprint (OEF) Guide. https://ec.europa.eu/environment/eussd/pdf/footprint/OEF%20Guide_final_July%202012_clean%20version.pdf

Background data represent the basis for the calculations of GHG emissions. Therefore, the majority of tool providers disclose the databases and emission factors built in their models, either on the website or in guidance documents on the tool. Common databases such as those provided by IPCC, DEFRA, EPA and the International Energy Association are the most widely used among the evaluated tools. This is because they represent best publicly available and free sources for calculating Scopes 1 and 2 such as stationary combustion, electricity markets, transport and refrigerants. These databases are reliable sources which are prepared and updated by international scientific panels or national and public agencies using established methodologies for calculation.

Other tools disclose the use of databases containing not only data relevant to Scopes 1 and 2, but also more complex datasets linked to input materials such as agricultural inputs, textile fibres, yarns and chemicals or different stages of the textile processing (including aspects such as required infrastructure and by-products as well as waste from operations). Among these databases are Ecoinvent, GaBi or Agribalyse. The use as background data from specific tools could be linked to emissions in all Scopes at the company level as well as at the product level. Moreover, as these databases are developed for LCA applications, they not only provide GHG emissions data (GWP impacts and expressed in $CO_2e$), but also further impacts such as energy, water and land use to name a few.

A third group of databases are those which have been developed by the textile and fashion industry and which are built on primary data from facilities, manufacturers and brands. Their main advantage is the provision of emission factors modelled closer to the operating reality of the textile and fashion industry which could potentially result in higher accuracy for GHG inventories. The WALDB database[34] developed by Quantis could be assigned to this group. The Higg MSI is a single score index and its methodological approach is not comparable to other LCA databases. However, both of these databases are mentioned under this group due to potential uses as secondary data for quantifying selected categories of Scope 3 emissions.

Some tools declare that they are using "own" emission factors built on primary data collected through collaboration with industry actors. On the one hand, the use of this type of emission factors might represent similar advantages to the use of industry specific databases. On the other hand, this might introduce positive or negative bias into the results, as it is not clear whether these emission factors are comparable with others available in commonly used databases. The reason is that self-calculated data could be far from industry averages or even conservative values. Moreover, they might not consider valid assumptions for all types of operations.

In theory, the use and reference to common databases could facilitate the comparison of results. However, all tools rely on a combination of emission factors and except for spreadsheet-based tools, it is generally not possible to track the steps for quantifying individual emission sources once these are integrated into the model. In this regard, it is also important to consider the regularity with which background data are updated in the tools, as this will ensure the validity of results over time. In some cases, GHG calculation tools are developed and launched in the context of a specific project or partnership and the background data are no further revised once the project is finalised.

[34] World Apparel & Footwear Lifecycle Assessment Database (WALDB). Available in https://quantis-intl.com/metrics/databases/waldb-apparel-footwear/

A final aspect related to transparency of the GHG tools is the amount of documentation about the tool available for users and potential clients. Some of the tools such as Higg FEM and WWF-HK LCMP display a higher level of transparency, making available plenty of background documentation, guidelines and trainings openly on their websites. On the lower end of transparency regarding documentation, there are SaaS (Software as a Service) and Cloud-based tools as well as those developed by consulting companies, the reason being that both types of tools are designed for profit purposes, companies being anxious to protect their intellectual property which is the basis of their business model.

While transparency is critical in terms of reliability, this is an issue that can be solved. In the absence of information, most of these providers are willing to provide information on the background data and methodology once this disclosure has been requested by an interested party. Moreover, by working with tailor-made tools for quantifying GHG emissions, the user might gain more insight into and control over the background data and methodology of the calculations. During the customisation and setup process for tailor-made tools, companies like Metrio, Ecodesk, and Sphera usually allow the client to select preferred emission factors and even provide data specific to their operations.

### 3.1.4 Outreach

This aspect refers to the extend as to which individual tools can be used to work with different facilities or partners located in different regions. Given the global distribution intrinsic to the textile and apparel value chains, the potential outreach of a specific tool might be of relevance in terms of selecting the most appropriate solution for one company. A brand, for example, might think about the possibility of purchasing a tool which can also be used to collect and calculate data from suppliers in other regions. In this case, the languages in which a tool is available could determine the decision.

Most tools included in this assessment are available in English. Being the main language of trade and business contexts, this language makes possible cooperation with different facilities around the world and with many supply chain partners. An exception to the use of English as the primary language are the tools specifically developed for Chinese manufacturers and companies in the Pearl River Delta Region (CTI's MIEIS and WWF-HK LCMP) which are available in Chinese. Even though this characteristic facilitates the outreach among companies in their intended target group, it also limits the applicability for actors beyond that region not only due to the language but also due to the regional focus of the emission factors.

Meanwhile, many among the assessed tools have integrated more than one language into their interfaces and some are working on expanding to cover more languages. The OEKO-TEX® Impact calculator, for instance, is available in German, English and Chinese, two more languages being under development. In an effort to facilitate collaboration with SMEs and facilities in regions relevant to textile manufacturing, some companies might consider offering access to their tools in languages such as Vietnamese, Bengali or Tamir to eliminate language barriers with their suppliers.

Besides language, the main limitation for engaging with different tiers in the value chain are the possible costs associated with any effort for environmental improvement. Therefore, companies

aiming to collaborate with other tiers must consider limitations resulting from the costs of their selected GHG calculation tool. In this regard, the use of free, openly available and simple tools might be a very useful preliminary step towards enabling further tiers and SME suppliers with few resources to address quantification of their GHG emissions more readily. Another remarkable strategy is that provided by tools such as the Ecodesk Horizon which assign all costs connected to the tool's use to the brand while allowing free access to all suppliers. This is a good approach to remove barriers by collecting and sharing supply chain information.

## 4 Aspects to be considered in the selection of a tool for quantifying GHG Emissions

Based on the assessment of the different types of tools and functionalities currently available, some general aspects relevant for the selection of a GHG calculation tool have been identified. This section shall be read as a checklist of criteria to consider while weighting the features and characteristics of different tools.

Any company in search of a solution for supporting the calculation of GHG emissions should first consider the following aspects when contacting potential providers:

- ✓ Which are the needs and processes that require support within the company? Think about the complexity of data collection and reporting needs.
- ✓ For which of these processes tools and procedures are already in place and which ones could be replaced by a single solution?
- ✓ Which is the expected timeframe for selecting and setting up the tool? Consider times for negotiation, setup, customisation (if needed), adjustments and trainings.
- ✓ Who will use the tool? It is important to consider the number of possible users (how many departments and facilities are involved). Which department will be required to manage the data and operate the tool?
- ✓ Which key indicators are relevant to the company and the sector?
- ✓ For which framework and reporting standards are the resulting metrics required? Define in which formats
- ✓ Who is the target group for the results and which departments will be interested in accessing data?
- ✓ How much budget is available for a supporting tool?

In assessing the features and characteristics of potential tools, further points should be examined:

- **Organisational structure**: Can the tool be used to support calculation of GHG emissions for all your facilities? Consider geographical scope and differences regarding operations and processes.

- **Data availability at the company level:** Consider existing data management systems and the level of aggregation of data needed to calculate emissions on the different scopes and categories. Is the required data spread in different locations or departments or does it need to be aggregated from different sources before it may be considered as input data for the tool?

- **Emission factors and further data requirements:** Does the tool include regional emission factors covering the location of all facilities for which GHG emissions aim to be measured? In case it does not, and the company has access to these data, is there any possibility for adjusting or customising the emission factors? Does your company require sector-specific data?

- **Update, support and possibilities adjusting to company's needs**. Are pre-defined lists of metrics and indicators sufficient for your company's needs? Are there any plans for changes in the company's organisational boundaries and can the tool adapt to it? Consider new acquisitions, or new facilities, further Scopes and indicators (e.g. in Scope 3) that might be integrated. Are there any plans to join a new voluntary reporting initiative?

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