GHG INVENTORY REPORT 2024

TOPSIL GLOBAL WAFERS A/S

INVENTORY PERIOD
2024.01.01 ~ 2024.12.31

PUBLICATION DATE
08.05.25

EXTERNAL VERIFICATION DATE
14.03.25

TOPSIL

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

This Greenhouse Gas (GHG) Report presents the Scope 1 and 2 emissions and a limited assessment of scope 3 emissions inventory for Topsil Global Wafers (hereinafter referred to as Topsil) from January 1, 2024 – December 31, 2024, prepared in line with the GHG Protocol and ISO 14064-1:2018 (Edition 2, 2018 – reviewed and confirmed in 2024 and remains current). Exceptions to this will be marked clearly in the report.

This report outlines Topsils strategy, targets, and performance in emissions reduction and climate adaptation, ensuring reliable data through strong processes and controls. The inventory is subject to third-party verification, with assurance details provided separately.

Topsil is dedicated to transparency and accountability in its environmental impact, why this report, to the best of the business's ability, compiles GHG information in accordance with the principles of transparency, accuracy, comparability, consistency, and completeness actively committing to international protocols, agreements, and sustainability plans. This includes a data-driven approach to collecting, calculating, and presenting CO_2 emissions, ensuring accurate and reliable climate reporting.

1.1 Description of the reporting organisation

Topsil is a Danish subsidiary of Global Wafers Co., Ltd., Taiwan, the world's third-largest wafer manufacturer. Topsil is a global leader in Float Zone (FZ) technology and Denmark's largest semiconductor company.

Topsils' core activity is manufacturing of ultrapure Float Zone silicon in the form of ingots used in advanced and energy-efficient electrical components. The components are used in various sectors such as infrastructure or energy, for production machinery, wind turbines, electric or hybrid vehicles and high-speed trains - primarily for the highest voltage segments in the electricity market.

The organization has multiple suppliers worldwide, and raw material suppliers are often located in the EU and the US, while consumables are sourced locally whenever possible. The organization's upstream and downstream operations rely on air freight due to high demand for FZ ingots and expectations for short lead time. Although FZ ingots contribute to the global movement towards green electricity, Topsil recognizes that its operations have a direct impact on the environment, which emphasizes the importance of actively working with improving environmental performance. By maintaining a continuous focus on managing, monitoring and enhancing environmental performance, the organisation demonstrates strong leadership and upholds a formal environmental management system certified to the internationally recognized ISO 14001 standard.

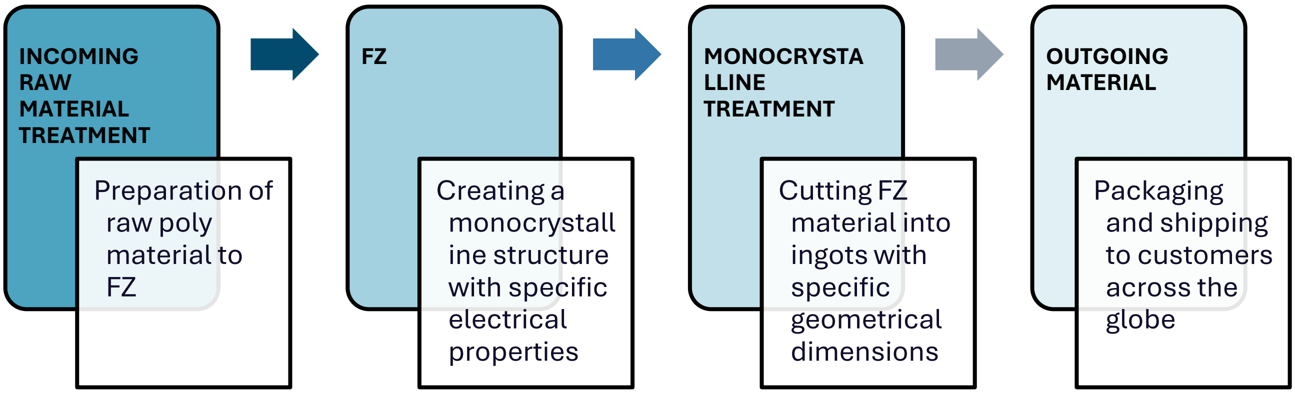
As part of the Global Wafers group, Topsils contributes to the consolidated greenhouse gas inventory and aligns with the group's sustainability strategy and policies. This includes commitments to energy efficiency, renewable energy, carbon initiatives, circular economy practices, and a green supply chain while ensuring regulatory compliance.

1.2 Production Process and Energy Use

While Topsils production process is relatively simple, the FZ (Float Zone) process requires specialized technical expertise. Production begins with incoming inspection and preparation of raw materials. All materials are checked and processed to meet the strict cleanroom requirements before entering the FZ production area.

The FZ process is the core production step, where electrical properties are developed using specialized FZ pullers. This process is highly energy-intensive, accounting for approximately 50% of the company's total energy consumption. As a result, it is classified as a Significant Energy Unit (SEU) in Topsils Energy Management System, meaning half of Category 2 emissions originate from this single process step. The output of the FZ process is a long crystal with a cone and tail end, which are considered waste material at this stage.

In the final stages, the FZ pulls are cut into ingots, which are cylindrical mono crystals free of voids, vacancies, or other defects. These ingots undergo grinding and measurement before being packed and shipped to customers worldwide.



1.3 GHG Management Policy and Reduction Strategy

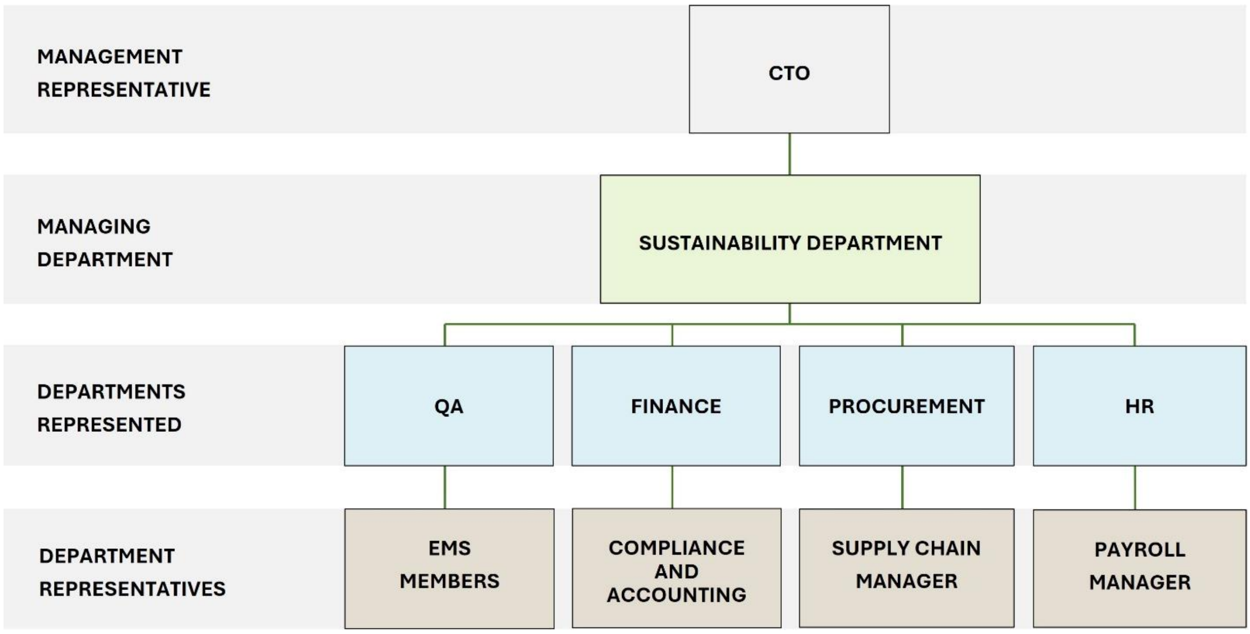
At Topsil, we recognize that our activities impact both our organization and our stakeholders. Therefore, we continuously strive to minimize negative environmental impacts by integrating environmental, energy, and safety considerations into our operations while actively seeking opportunities for positive influence. This includes both developing products that support global green power conversion and engaging with our local community to drive sustainability efforts.

Our commitment to GHG reduction is guided by a strategic and methodical approach, prioritizing actions where they will have the greatest impact. By systematically mapping and implementing reduction initiatives, we ensure meaningful progress.

1.4 GHG Management Committee and its responsibilities

Topsil takes a cross-functional approach to GHG accounting and Environmental Management System (EMS) activities. To ensure a comprehensive strategy, a GHG Committee has been established to oversee all aspects of GHG reporting. The committee includes representatives from multiple departments, bringing diverse perspectives to the process.

Topsils environmental commitments are guided by the IATF approach, emphasizing risk assessment, continuous improvement, and customer focus. In a GHG context, the customer is the environment, and satisfaction is achieved by meeting environmental requirements and contributing to the global effort to fulfill the Paris Agreement.



The Sustainability department initiates the GHG reporting process at the beginning of each year. They oversee the overall strategy and delegate data collection tasks to specialized task forces, ensuring efficient and accurate reporting. These task forces consist of representatives from QA, Finance, Procurement and HR, each responsible for gathering relevant data within their domain.

The Management Representative holds ultimate responsibility for the GHG Management System, making sure that the managing department ensures progress and keeps represented departments involved and on track and addressing any challenges that arise during the process. Additionally, the EMS (Environmental Management System) members conduct the internal verification of the GHG report, ensuring its accuracy and compliance before finalization.

1.5 Inventory Period

The GHG inventory period covered in this report is from 2024. 01. 01 to 2023. 12. 31. The report works in a yearly cycle and follows the calendar year.

1.6 Purpose

Topsil reports GHG emissions in compliance with the Greenhouse Gas Inventory and Registration Guidelines of ISO 14064-1:2018, reaffirming our commitment to effective greenhouse gas management.

1.7 Intended Use and Intended Users

The primary users of the GHG inventory are the Global Wafers Group and other relevant stakeholders, including the organization's customers and employees. Additionally, the supply chain is considered an intended user, as the organization aims to leverage GHG inventory results to identify and promote improvement opportunities for suppliers.

The report will be accessible to all stakeholders. Initially, it will be shared internally, with the possibility of using it—either in full or in part—for external communication at a later stage.

1.8 Operating Procedures for GHG Inventory

Topsil has established and maintains a documented procedure for GHG Management, ensuring a structured approach that encompasses responsibilities, scope, review, data selection, data handling, and risk assessment. This framework serves as a vital tool in completing the Plan-Do-Check-Act (P-D-C-A) cycle, which is essential for maintaining a reliable and transparent inventory system.

Given the organization's ISO 14001 and ISO 50001 certifications, a significant portion of data selection and data handling is integrated within the existing Environmental and Energy management systems. Additionally, supplier-related information is managed internally by the GHG management group.

1.9 Record Keeping

GHG inventory-related records, including purchase documents, invoices, meter reading records, and other relevant data, will be maintained as documented information in accordance with the organization's internal procedure for document control and retention. The minimum retention period is 10 years, though this may vary based on specific customer requirements.

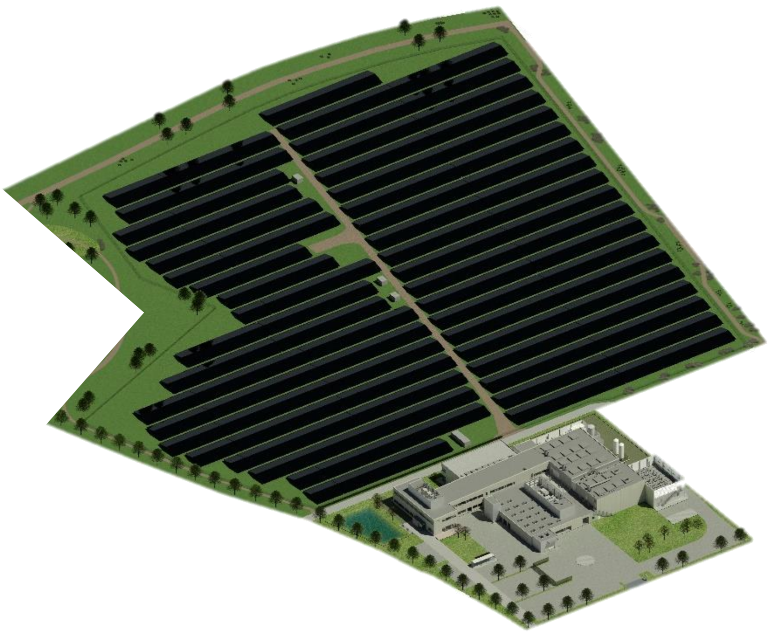
TOPSIL

CHAPTER 2 ORGANISATIONAL BOUNDARIES

The organizational boundaries have been determined based on the Operational Control approach, covering the facility located in Frederikssund, Denmark. Within this site, the identified emission source is electricity consumption, while no GHG sinks or reservoirs have been observed.

In 2024, a solar park was constructed to supply electricity to the Frederikssund facility, with operations set to begin in January 2025. While the GHG reduction benefits of the solar park will not be reflected in this reporting period, the CO_2e related financial expenses have been accounted for, as they fall within the investment year. This initiative aligns with the organization's commitment to reducing its carbon footprint and enhancing energy sustainability in future reporting periods.

The following illustration provides a visual representation of the site. The first image depicts the Frederikssund facility as it appeared in 2023, before the construction of the solar park. The second image, from 2024, includes the newly established solar park, which will begin supplying electricity to the facility starting in January 2025.



CHAPTER 3 REPORTING BOUNDARIES

The following emissions are reported in this GHG inventory:

- Direct GHG emissions (CO_2, CH_4, N_2O) from mobile sources. (Category 1 and scope 1 in GHG Protocol Methodology)
- Indirect GHG emissions from purchased energy consumed by the facilities are included in the reporting scope. (Category 2 and scope 2 in GHG Protocol Methodology)
- Indirect GHG emissions from the value chain, corresponding to Scope 3 under the GHG Protocol Methodology and ISO 14064-1:2018. (Categories 3-6). Scope 3 is assessed using a limited cradle-to-gate approach, which includes transportation to other Global Wafer sites.

This approach has been chosen because Topsil acknowledges its supplier responsibility while also recognizing that many raw material suppliers have limited influence and insight into downstream processes leading to their final product. Given the organization's current knowledge, it is not feasible to comprehensively map or validate data for all Scope 3 categories.

3.1 Significance of emissions

To determine and justify the selected emission sources and data and ensure that all relevant aspects of the GHG inventory system are covered and properly represented, a significance assessment has been conducted. All emissions are reported as CO_2e in the final inventory (see Chapter 4).

- Only CO_2 emissions have identified as significant
- CH_4 and N_2O emissions have only been evaluated for transportation and deemed insignificant based on base year data
- The general significance criteria used in this report is 5%

The significance criterion is based on a process approach, which considers the following factors:

1. Regulatory or sector-specific requirements
2. Available data
   2.1. Quality of available activity data
3. Available emission factors
   3.1. Quality of available emission factors
4. Capability to monitor and reduce GHG emissions within organisational boundaries
5. Employee Involvement
6. Risk assessment based on knowledge gathered by Topsil
7. Supplier involvement and development
8. Scope 3 limitations (cradle-to-gate approach)

Based on these considerations, the company assesses the significance of indirect emission sources. The results of this assessment are presented in the remainder of Chapter 4

3.1.1 Category 1: Direct GHG Emissions

Direct GHG emissions originate from sources owned or controlled by the reporting entity, including transportation fuels. Topsil operates a limited number of company cars, while all other on-site energy sources rely solely on electricity. Emissions from the biodiesel component in B7 diesel are not accounted for in CO_2 calculations due to EU standards, which consider biogenic CO_2 emissions as carbon-neutral (ICCT - comprehensive carbon accounting for identification of sustainable biomass feedstocks) However, CH_4 and N_2O emissions from combustion are fully included in GHG inventories.

3.1.2 Category 2: Indirect GHG-emissions from imported energy

Topsils production relies exclusively on electricity, which is sourced from the Danish power grid. In 2024, there was no on-site electricity generation. The Danish government annually provides data on GHG emissions from the national grid, reported in terms of CO_2, CH_4, and N_2O. No Renewable Energy Certificates (RECs) were purchased during the inventory period.

3.1.3 Category 3: Indirect GHG emissions from transportation

Four subcategories have been identified as sources of indirect emissions associated with transportation in order differentiate and identify sources in the most correct way:

(1) Downstream transportation
(2) Business travel
(3) Upstream transportation
(4) Employee commuting

All mapped transportation relies on data from transport suppliers and as such is only given in CO2e even though it is known that engine combustion produces CO2, CH4 and N2O.

3.1.3.1 Category 3: Upstream Transportation

Upstream is not included in the inventory. This means that the uncertainty of transportations subcategory has increased. It is estimated by the organisation to be lower than the emissions from downstream transportation.

This is due to the fact, that the organisation utilises a high-impact transportation mode for downstream. This high-impact transportation mode is not utilised in the upstream and as such, the method should have a lower impact (if known) than downstream transportation. At current state it is not possible for the organisation to get valid data for any upstream transportation.

3.1.3.2 Category 3: Downstream transportation

Topsil ships several tons of products each month to customers and other Global Wafer sites. Throughout the year, different transportation suppliers are used, though most shipments are delivered via air freight. For this inventory period, two transportation suppliers have been identified.

The organization relies on GHG emissions reports provided by its suppliers. Since the last inventory period, both suppliers have improved their data management and calculation methods. As a result, they can now report not only CO_2 emissions but also account for other GHGs, expressed in CO_2-equivalents (CO_2e).

The downstream transportation emissions are calculated based on both Well-to-Wheel (WtW) and Tank-to-Wheel (TtW) methodologies. However, the organization prioritizes WtW reporting, as it provides a more comprehensive view of GHG emissions across the entire transportation supply chain. The transport suppliers utilize EcoTransIT World for emissions calculations, including emission factors and assumptions. The EcoTransIT World methodology handbook is publicly available on the EcoTransIT World website for reference.

3.1.3.3 Category 3: Employee Commuting

Employee commuting is based on a survey designed to represent the organization. Different vehicle types are considered, with GHG emissions attributed to exhaust gases from combustion engines (CO_2, N_2O, CH_4) and electricity use (CO_2). The biofuel content in biodiesel has been accounted for by applying the emission factor for diesel B7. Participation in the survey was voluntary and open to all employees.

3.1.3.4 Category 3: Business travel

The organization conducts a limited number of business trips annually, primarily for supplier and customer visits. According to Global Wafers company policy, business travel is minimized as much as possible and restricted to nearby local destinations, with no overseas trips. Emissions are reported solely as CO_2 and are based entirely on supplier data, calculated using BEIS/DEFRA methodology. Since most business travel is by air, and aircraft GHG calculations are complex, supplier-provided estimates are used. Emissions from journeys to and from visits to suppliers in Denmark are not accounted for.

3.1.4 Category 4: Indirect GHG-emissions from products used by an organisation

When finding sources of indirect GHG emissions from products, focus has been on sources – which in practice will often be our suppliers, with the highest GHG emissions. The GHG Management committee has conducted the analysis of significance. The analysis takes the following parameters into account:

(1) The product/service delivered
(2) The level of ESG knowledge
(3) The level of importance to Topsil
(4) Other relevant subjects such as maturity of the supplier

Based on this analysis, the GHG management have identified several relevant sources and suppliers that are able to provide data for supplied products, goods and services.
Three subcategories have been identified as sources of indirect emissions associated with indirect GHG emissions in order differentiate and identify sources in the most correct way.

3.1.4.1 Indirect GHG-emissions from goods purchased by an organization.

Indirect GHG-emissions from goods purchased by an organization.

a) Emissions from purchased goods: Emissions associated with extraction, transportation, manufacturing and processing of raw materials and products.
   - Raw material supplier 1
   - Raw material supplier 2
   - Raw material supplier 3
   - Gas supplier 1
   - Packaging material supplier 1
   - Plastic material supplier 1
   - Office materials supplier
   - IT Supplier 1
   - IT Supplier 2

b) Emissions from capital goods: Emissions from manufacturing, transport, and final disposal of long-term assets acquired by the organization.
   - Renewable energy infrastructure supplier

3.1.4.2 Indirect GHG-emissions from services used by an organization.

a) Emissions from services:
   - Cleanroom service provider
   - IT service provider
   - Waste handler 1
   - Waste hander 2

The analysis looks at all suppliers in scope 3 that is identifiable in the different subcategories (purchased goods and services, capital goods, fuel and energy related activities, waste generated during operations etc.).

3.1.4.3 Category 4 emission sources explained

3.1.4.3.1 Emissions from purchased goods - Raw supplier 1 and 2

Three raw material suppliers are identified for the inventory period. “Raw supplier 1” and “raw supplier 2” were included in last two year’s GHG inventory (reporting period: 2022 and 2023) and accounted for approximately 90% of all emissions. Materials from “Raw supplier 3” has been used for development trials and has provided CO_2e data, allowing for a more detailed assessment.

The main driver of high emissions is a specific step in the production process with energy requirements similar to the FZ process. The energy input for this step varies by supplier and may come from electricity, coal, diesel, or gasoline, depending on geological and political conditions.

“Raw supplier 2” utilizes “Together for sustainability” (TfS) PFC Guideline methodology and ISO14067:2018 when determining the GHG emissions related to raw material production and “raw supplier 3” follows ISO14067:2018 and ISO1467:2018 ensuring standardized emission reporting. “Raw Supplier 1” has ceased production, meaning the last reported quantities—also used in last year’s inventory—are applied in this report to maintain consistency in emissions assessment.

3.1.4.3.2 Emissions from purchased goods - Gas supplier 1

Topsils' production processes require various gases, some of which can have a significant impact on GHG emissions, as outlined in IPCC guidelines. The GHG Management Committee has identified "gas supplier 1" as a likely significant contributor to the overall GHG inventory.

The CO_2e emissions from the gasses are sourced from the supplier and calculated according to European Industrial Gases Association methodology for determining a product's carbon footprint which is significant due to the energy-intensive production and processing required for separation and purification.

3.1.4.3.3 Emissions from purchased goods - Packaging material supplier 1

Packaging materials used for safe transportation are single-use products made from cardboard, foils, tins, pallets, and other materials. Research from external institutions suggests that packaging materials can be a notable source of emissions, which is why they have been included in this year's GHG inventory to assess their overall impact.
However, the methodology used to calculate CO_2e emissions for these materials is not currently known.

3.1.4.3.4 Emissions from purchased goods - Plastic material supplier 1

Plastic material is used in a sub-process to protect materials from contamination. The plastic supplier provides oil based materials, which contribute to the overall carbon footprint of the production process.

Data on material consumption and electricity usage for all four product types is available for 2024, but CO_2e data on products is not available yet.

3.1.4.3.5 Emissions from purchased goods - Office material supplier - limited assessment

In 2024, office supply providers were included in the emissions inventory after an assessment of their increased availability of ESG data. Although previously overlooked, office supplies are a recurring part of operations and contribute to indirect emissions.
However, the overall assessment of purchased goods and services remains limited due to data availability and reliability gaps.

These limitations emphasize the need for improved supplier engagement and greater data transparency in future reporting efforts. As more suppliers meet the necessary reporting and sustainability requirements, Topsil is progressively expanding its GHG inventory to cover a wider range of purchased goods and services.

By incorporating office supplies into the 2024 emissions inventory, the report better reflects Topsils overall environmental impact, aligning with its broader sustainability objectives.

3.1.4.3.6 Emissions from purchased goods - IT supplier 1-2

As a company in constant growth and development, the demand for expanding and upgrading IT equipment is substantial. Additionally, cybersecurity requirements make a reliable IT infrastructure essential. IT equipment depends on various minerals, some of which are rare and difficult to extract. The recovery of these minerals from electronic waste remains a challenge, making IT products a notable contributor to the GHG inventory, though on a limited scale.

For this reporting period, it has not been possible to include all IT purchases, so the inventory is limited to laptops and monitors. Emission factors differ by product, and the precise calculation methodology remains unknown.

3.1.4.3.7 Emissions from capital goods - Renewable energy infrastructure supplier 1

It is crucial to account for the emissions footprint of the solar park in its establishment year, even though it will not be operational until January 1, 2025. This approach ensures transparency in emissions reporting and provides a more accurate reflection of the project's full lifecycle impact.

While including these emissions in 2024 might temporarily skew the emissions profile, it is necessary to align with best practices in GHG accounting. Capturing the initial investment footprint allows for a clear understanding of the short-term increase in emissions due to materials, transportation, and construction. This also ensures that the subsequent GHG reductions in 2025 and beyond can be accurately tracked and compared against this baseline.

The reported footprint reflects the embodied carbon impact of the solar park's establishment before it begins offsetting electricity-related emissions. However, it is important to note that the current picture is not fully comprehensive, as not all components of the park are included in the calculation. Nonetheless, this marks an important first step toward understanding and managing the full climate impact of the installation.

3.1.4.3.8 Emissions from services - Cleanroom service provider

Topsil operates under cleanroom restrictions, requiring externally provided services to maintain the necessary conditions. These services can have a significant environmental impact, particularly with chemicals, water consumption and energy use. Until further investigations confirm otherwise, “Cleanroom service provider” are considered a notable source of emissions. “Cleanroom service provider” have calculated emissions using factors from Energinet and ADEME.

3.1.4.3.9 Emissions from services – IT Service provider

The IT service provider is responsible for managing the disposal of IT equipment, prioritizing maximum reuse and recycling to reduce environmental impact. Efforts focus on extending device lifecycles, recovering valuable materials, and ensuring that non-reusable components are processed through responsible recycling methods in compliance with sustainability standards and waste regulations.

Using an independent calculation framework, the report from the “IT service provider” quantifies the climate impact of reusing IT equipment compared to producing new equivalents. This information supports Topsil in aligning with their climate goals and sustainability ambitions promoting responsible IT asset management.

The data shows the avoided climate impact achieved by reusing IT equipment instead of producing and transporting new devices.in this report, the climate impact results are presented in greater detail.

3.1.4.3.10 Emissions from services - Waste handler 1 and 2

Waste management is a crucial factor in assessing the environmental impact of production facilities. Since all sites generate significant amounts of waste, it is essential to account for waste handling—including disposal and treatment methods—in emissions reporting. This aligns with local regulations, political directives, and potential ISO 14001 certification requirements.

The inclusion of this category ensures a comprehensive evaluation of emissions linked to waste treatment. "Waste handler 1" has provided emissions data for waste acid, though the exact calculation method remains unknown. Meanwhile, "waste handler 2" covers approximately 50% of managed waste emissions, but some fractions are not yet included in their calculation tool" Klimakompasset", limiting the precision of the calculations.

By incorporating waste-related emissions, this report highlights the environmental benefits of recycling, demonstrating how it contributes to negative net emissions through waste diversion, reduced resource extraction, and lower overall CO_2 emissions.

3.1.5 Category 5: Indirect GHG-emissions associated with the use of products from the organisation

Includes the processing of sold products, the use of sold products, the final processing sold products, downstream leased assets, franchises, investments, and so on.
As Topsil Global Wafers delivers a raw material product it is not possible to completely know the indirect emissions associated with usage of the product. It is known that other Global Wafer sites do further processing on the products sold and transform them into wafers.

All Global Wafer sites strive towards having a GHG inventory, so any processing of FZ ingots will be a part of their inventory. It is also known that many end customers focus on/are currently creating GHG inventories, but the progress and content of their inventories are currently unknown. It is something the entire supply chain must develop with each other's help, to truly cover the cradle to end of life treatment, but the system is not yet mature enough to give provide data valid GHG emissions.
Topsil Global Wafers is not part of a franchise or any investment, so they are out of scope.

3.1.6 Category 6: Indirect GHG-emissions from other sources

This inventory does not include the amount of greenhouse gas removal and greenhouse gas emissions from other indirect emission sources.
It has not been possible for the organisation to identify other sources which could contribute to indirect GHG emissions.

CHAPTER 4 QUANTIFIED GHG INVENTORY OF EMISSIONS

4.1 Review and adjusting of base year

The base year for GHG reporting is established as 2021.
The reporting year 2021 was the first year in which emissions data was collected within the organization's operational control, ensuring compliance with the requirements outlined of ISO 14064-1. In 2021 only scope 1 and scope 2 emissions were analyzed. Scope 3 emissions were introduced in the 2022 reporting year, but only as a limited assessment.

In the 2023 reporting year, the base year was reviewed and adjusted due to a calculation error in Scope 2, imported energy. The energy emission factor was corrected from 135 g CO_2/kWh to 206 g CO_2/kWh, as revised by Energinet. This adjustment was made to reflect the impact of certificate trading, ensuring that the factor aligns with the corrected national energy mix and represents Danish electricity production for 2021, as published by Energinet. Additionally, CH_4 (methane) and N_2O (nitrous oxide) that were previously not accounted for in Scope 2 calculations were included, following the GWP100 values from IPCC AR6, enabling consistent comparisons across reporting periods.

In the latest energy emission factor revised by Energinet representing the corrected national energy mix for 2021, published in 2023, adjusts the energy emission factor from 206 g CO_2/kWh to 207 g CO_2/kWh. It is estimated that the increase in 2021 data is insignificant and that a base year adjustment is not required. This is because the adjusted factor does not result in a variation exceeding ±5% in the organization’s published GHG inventory.

Base year will be adjusted when:

1. Major changes at the factory will directly impact scope 2
2. Better quantification of scope 3 emission data.
   (Data must be relevant, complete, consistent, accurate and transparent)
3. Major changes in the supply chain that will significantly impact scope 3
4. Calculation errors have a major impact on the GHG inventory

4.2 Expanded Scope 2 reporting: Location-based and market-based methods

Starting this year, Topsil is required by the Global Wafers Group to report Scope 2 emissions using both location-based and market-based methods in accordance with ISO 14064-1. This dual approach ensures greater transparency, aligns with SBTi requirements, and provides a clearer picture of the company’s energy-related emissions.

4.2.1 Location-Based Method (Previously used for SBTi reporting)

Emissions are calculated based on the average emission intensity of the local power grid where energy is sourced. This method does not account for renewable energy initiatives, such as Renewable Energy Credits (RECs) or direct green power purchases.

4.2.2 Market-Based Method (Now included for SBTi reporting)

Reflects the specific energy sources purchased by the company rather than the grid average. Factors in green energy procurement instruments, such as RECs, direct contracts, and the residual mix.

By implementing both methods, Topsil can demonstrate the impact of its renewable energy investments, ensuring more accurate reporting and supporting its RE100 and net-zero goals.

The base year settings (**year 2021**) calculated using location-based energy emission factor:

CATEGORIES	**LOCATION-BASED**
Scope 1, Direct GHG emissions	19,80 tons CO_2e
Scope 2, Indirect GHG emissions from imported energy	1095,41 tons CO_2e

4.3 Types of Greenhouse Gases

According to greenhouse gases defined in ISO 14064, Kyoto Protocol, and Greenhouse Gas Reduction and Management Act, the inventory greenhouse gases include CO2, CH4, N2O, HFCs, PFCs, SF6, NF3. Note that not all categories emit all greenhouse gases, thus the inventory will be based on quantifiable emissions.

4.4 Greenhouse Gas Emissions Calculations

4.4.1 Emission Source Identification

The emission source items identified within the boundary are listed in the table below:

<table>
<tr><th>CATEGORY</th><th>SUBCATEGORY</th><th>IDENTIFIER</th><th colspan="2">EMISSION FACTOR</th><th>SOURCE</th></tr>
<tr><td rowspan="2">1. Direct emissions</td><td rowspan="2">Mobile</td><td rowspan="2">Company owned vehicles</td><td rowspan="2" colspan="2">*</td><td>https://theicct.org/sites/default/files/publications/Global-LCA-passenger-cars-jul2021_0.pdf</td></tr>
<tr><td>European Environmental Agency, 2023*</td></tr>
<tr><td rowspan="4">2. Indirect emission from imported energy</td><td rowspan="4">Electricity</td><td rowspan="4">EMS-data collection</td><td>Location-based energy emissions factor</td><td>Market-based energy emissions factor</td><td>https://ens.dk/analyser-og-statistik/noegletal-om-energiforbrug-og-forsyning</td></tr>
<tr><td>138 gCO2e/kWh</td><td>489 gCO2e/kWh</td><td>https://energinet.dk/eldeklaration/</td></tr>
<tr><td>0,3 g CH_4/kwh</td><td>0,3 g CH_4/kwh</td><td rowspan="2">https://ens.dk/analyser-og-statistik/noegletal-om-energiforbrug-og-forsyning</td></tr>
<tr><td>0,005 g N_2O/kwh</td><td>0,005 g N_2O/kwh</td></tr>
</table>

3. Indirect emission from transportation	Downstream		Transport supplier 1	3,514 x 10^{-6} t/tkm (0,000003514 t/tkm)	Dataset from the supplier included tCO_2e emissions and other relevant data, enabling Topsil to calculate emission factors. Supplier data is ISO14083 and GLEC-compliant
			Transport supplier 2	–	Report from supplier, based on EN 16258 And Product Lifecycle Accounting and Reporting Standard, ISO14083 and GLEC-compliant
	Commuting by employees		Vehicles, employee owned, public owned	*	European Environmental Agency, 2023*
	Business trips		Business trip supplier 1	–	Report from supplier, based on BEIS/DEFRA
4. Indirect emission from products used by the organisation	Indirect GHG-emissions from goods purchased by an organization.	a) Purchased goods	Raw supplier 1	127 $kgCO_2e/kg$	Inventory report year 2022, method unknown
			Raw supplier 2	74,2 $kgCO_2e/kg$	ISO14067:2018 Together for sustainability (TfS) PFC Guideline
			Raw supplier 3	156,09 kgCO2e/kg	ISO 14064-3:2019 + ISO1467:2018
			Gas supplier 1	-	https://www.eiga.eu/uploads/documents/DOC167.pdf
			Packaging material supplier 1	0,204 – 32,749 kg CO_2/unit	Report from supplier, dependent on item ID, method unknown
			Plastic material supplier 1	6,1 kg CO_2 / roll	Raw data from supplier - calculations by Topsil
			Office material supplier 1	–	Raw data from supplier - calculations by Topsil
			IT Supplier 1	627-187 kg CO2e/product	Data from supplier based on ICT LCA White paper in accordance with GHG Protocol Product Standard
			IT Supplier 2	296-668 kg CO2e/product	Data from supplier based on ICT LCA White paper in accordance with GHG Protocol Product Standard
		b) Capital goods	Renewable energy infrastructure supplier 1	The factors used for the calculation are presented in section 4.4.4.5.6.	EPD-document published by EPD-Noway Datasheet and contract documents from supplier - Calculations by Topsil
	Indirect GHG-emissions from services used by	a) Waste generated in	Cleanroom service provider	0,141 kg CO_2/ delivered CO_2	Report from supplier - emission factors from ADEME and Energinet
			IT Service provider	1,8 kCO2e - 31,6 kCO2e	Data from supplier based on ICT LCA White paper in accordance with GHG Protocol Product Standard

	an organization	operations	Waste handler 1	-	Report from supplier, factor and method unknown
			Waste handler 2	Emission factors related to waste categories	https://assets.eu.ctfassets.net/vhb8aakerf77/2X8iCzgLyORBZLnNbGTAoS/a85812a0d4d1ad0d91df7be11ae47118/MASTER_Udvidet_Vejledning_Klimakompasset_2023_FINAL.pdf
5. Indirect emission associated with usage of product	Processing of sold product		Silicon wafers	N.A	Covered by other Global Wafer sites GHG reports. See Global Wafers webpage

*Some of the subcategories require several emissions factors to properly calculate them. A summary of them can be found below:

- **Petrol density**: 0,75 [kg/l] source is: 1.A.3.b.i-iv Road Transportation 2023 p. 56, table 3-28 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Diesel density:** 0,84 [kg/l] source: is 1.A.3.b.i-iv Road Transportation 2023 p. 56, table 3-28 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Petrol** (bulk emission factor for Passenger Cars)**:** 3,17 [kg CO_2/kg fuel] source: is 1.A.3.b.i Road Transportation 2023 p. 135, table A1 0-7 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Diesel** (bulk emission factor for Passenger Cars)**:** 3,18 [kg CO_2/kg fuel] source: is 1.A.3.b.i Road Transportation 2023 p. 135, table A1 0-7 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Motorcycle** (bulk emission factor for Passenger Cars)**:** 3,16 [kg/kg] source: is 1.A.3.b.i-iv Road Transportation 2023 p. 135, table A1 0-7 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Buses**: N/A [kg/kg] source is: 1.A.3.b.iii Road Transportation 2023 p. 135, Table A1 0-7 (EMEP/EEA air pollutant emission inventory guidebook 2023, updated 2024, published by European Environment Agency)

- **Diesel B7 ICTT WTW:** 0.98 (WTT) [kg CO_{2e}/kg] + 2.44 (TTW) [kg CO_{2e}] = 3.42 [kg CO_{2e}/kg] source is: ICTT White Paper, p. 71, Table A.9.

- **CH_4 emissions factor for gasoline:** 0,000057 [kg/km] source is: IPCC chapter 3, Mobile combustion, p. 3.24, table 3.2.5 Gasoline, Euro 4, Urban, Cold

- **CH_4 emissions factor for diesel:** 0 [kg/km] source is: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 3, Mobile combustion, p. 3.24, table 3.2.5 Gasoline, Euro 4, Urban, Cold

- **N_2O emissions factor for diesel**: 0,000015 [kg/km] source is: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 3, Mobile combustion, p. 3.24, table 3.2.5 Gasoline, Euro 4, Urban, Cold

- **N_2O IPCC Gasoline:** 0,000006 [kg/km] source is: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 3, Mobile combustion, p. 3.24, table 3.2.5 Gasoline, Euro 4, Urban, Cold

- **CH_4 – GWP100**: 27,9 source is:

7SM, p.16, table 7.SM.7 The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material

- **N_2O – GWP100:** 273 source is:
  7SM, p.16, table 7.SM.7 The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material

** 0,069 kWh/km (for hver passager) =14,149km/kWh

4.4.2 Selection and management of emission factors

Greenhouse gas emissions are primarily calculated using site-specific emission factors from national sources, such as electricity production data. When national data is unavailable, regional or global factors are applied. For general emissions factors, such as those for gasoline combustion or GWP values for greenhouse gases, IPCC AR6 or other regional sources are preferred, as these values remain consistent regardless of location.

4.4.3 Calculation instructions

All calculations are conducted using SI units, with appropriate unit conversions to express results in tCO_2e or $kgCO_2e$, ensuring consistency across the reporting framework.

During calculation SI-units are considered and the conversion between them to end up with either a tCO2e or kgCO2e.

The calculation of GHG emissions follows the carbon emission coefficient method, which is based on the equation:

$$E = A \times EF \times GWP$$

where: E = emissions, A = activity rate/consumption rate, EF = emission factor, and GWP is global warming potential value.

To ensure accuracy, the organization applies GWP values from the IPCC 2021 AR6 report, using the following factors:

- CO_2: 1
- CH_4: 27.9
- N_2O: 273

These values are derived from the Supplementary Material to "The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity" (page 16, 7SM).

When available Topsil, relies on supplier-reported emissions, particularly for transportation (Category 3) and for purchased goods and services (Category 4). This ensures a more accurate and consistent assessment of the emissions associated with these activities.

4.4.4 Methodology for calculation of emissions from categories 1-4

4.4.4.1 Category 1: Direct emission by company owned vehicles

The organisation has a few company-owned vehicles utilised by the top management. The organisation implemented a semi-automatic calculation methodology for all vehicles either owned by the organisation or by the employees.

4.4.4.2 Category 2: Imported energy electricity, methodology for calculation of emissions

All production activities rely on energy imported from the public electrical grid. As Topsil does not purchase Renewable Energy Certificates (RECs), emissions are calculated twice, one using a location-based electricity factor and one using a market-based factor. (see 4.2)

Electricity consumption is measured monthly as part of the Environmental Management System, and this data serves as the basis for emissions calculations, following the standard calculation methodology, see section 4.4.3
Starting in 2025, Topsil will begin receiving electricity from its solar park, which has been supplying energy to the grid since January 1, 2025.

4.4.4.3 Category 3: Employee Commuting, methodology for calculation of emission

The organisation implemented an automatic calculation based on input from employees. As soon as data is filled in, a macro ensures that all information is collected in a new spreadsheet. A calculation sheet was developed, calculation emissions on inputs from employees and relevant emission factors.

When data has been gathered the result is calculated for the entire organization by multiplying the result with the average number of employees for 2024.

4.4.4.4 Category 3: Downstream transportation, methodology for calculation of emission

Transport supplier 1 provided a detailed dataset covering all flights conducted during the relevant reporting period. This dataset included the following key information:

- Each individual flight
- Transported cargo weight (tons)
- Total transport distance (kilometers)
- CO_2e emissions for both Well-to-Wheel (WtW) and Tank-to-Wheel (TtW)

The supplier's emissions data were calculated using EcoTransIT World, a recognized tool for estimating transport-related greenhouse gas emissions. This tool considers various factors such as aircraft type, fuel consumption, emission factors, and route details to provide an accurate estimate of the total environmental impact of transportation.
To determine an average emission factor for the transport operations, Topsil calculated CO_2e WtW (g/tonne-km) based on the supplier's data. The method is outlined below:

The transport work in tonne-km is calculated by multiplying the total cargo weight by the total transport distance:

Tonne-kilometers (tkm) = Cargo moved (t) × Total distance (km)

To determine the average Well-to-Wheel (WtW) CO_2e emissions per tonne-kilometer for the given transportation data.

$$\text{Average } CO_2\text{e WtW}(t/tkm) = \frac{Total\ CO_2e\ emissions\ (t)}{Total\ tonne\text{-}kilometers\ \ (tkm)}$$

4.4.4.5 Category 4: Indirect emission from purchased products used by the organisation, methodology for calculation of emissions

Based on the table presented in section 4.4.1, not all suppliers will handover information on how data is achieved or if the data is complete and valid. In those cases, no further calculations take place.

However, some suppliers have given more details which triggers calculations for Topsil. The general triggers can be summed up to be:

- When data from supplier do not match the activity data
- Supplier data is based on per purchased item
- The data is not collected through suppliers

The following sections will contain the methodology when calculations by Topsil is triggered.

As outlined in the table in section 4.4.1 not all suppliers provide details on data sources, completeness, or validity. When such information is lacking, no further calculations are performed.

However, in cases where suppliers provide detailed data, Topsil may conduct additional calculations. This is triggered when:

- Supplier data does not align with activity data
- Emissions data is provided per purchased item
- Data is not sourced directly from suppliers

The following sections outline the methodology used when Topsil performs its own calculations.

4.4.4.5.1 Raw material suppliers 1-3

Raw material suppliers are assessed based on Topsils activity data. Since the company purchases more raw materials than it consumes annually, calculations are required to accurately reflect the selected inventory period. These calculations consider each supplier's activity and their proportional contribution. See section 4.4.1 for details.

4.4.4.5.2 Gas supplier 1

The gaseous emissions have a Global Warming Potential (GWP) of 0 as they are noble gases. The supplier's emission factor calculations are based on AR5 GWP values, rather than the updated AR6 values. The methodology used follows EIGA's "Methodology to Establish a Product Carbon Footprint (Doc 167/20)."

For electricity-related emissions, the supplier relies on IEA data, which includes CO_2 emissions but does not account for other greenhouse gases.

4.4.4.5.3 Packaging material supplier 1

This supplier has provided CO_2 per item identification and the purchase amount. As such the methodology is slightly modified to be:

$$E = D*PA* GWP$$

where: E = emissions, D= data provided by supplier by each item, PA = Purchase amount for each item, and GWP is global warming potential value.

4.4.4.5.4 Plastic material supplier 1

Unlike previous years, data on material consumption and electricity usage for all four product types is available for 2024. This allows for a more precise emission calculation facilitated by Topsil. Calculations are based on yearly consumption, accounting for a 10% buffer.

The CO_2e emissions for materials used have been calculated using emission factor sources considered reliable while emissions from electricity consumption have been determined using the country specific government's 2024 conversion factors. This approach ensures consistency in emissions reporting while acknowledging data limitations in the current assessment.

4.4.4.5.5 Office material supplier 1

The assessment of purchased goods and services remains limited due to gaps in data availability and reliability. The CO_2e data used in this inventory is based on supplier-reported values from orders placed in 2024, but only 48% of the purchased product types have an associated CO_2e value. Of those, just 46% are sourced from suppliers or recognized climate databases, meaning that out of 776 product types, only 126 + 46 have a valid CO_2e reference.

Furthermore, the methodology behind CO_2e calculations provided by various suppliers is unknown, adding additional uncertainty to the assessment.

4.4.4.5.6 IT supplier 1 and 2

Unlike the 2023 inventory, IT suppliers now present CO_2 emissions for both Scope 2 and Scope 3, providing a clearer picture of the full product impact when considering the entire value chain. This transparency highlights how much more emissions are associated with a product when upstream and downstream activities are included.

The purchases are spread across four product categories, with a total of 125 products purchased, compared to 94 last year. This increase in procurement explains the rise in emissions associated with IT equipment.

The supplier applies the methodology from the ICT LCA White Paper, used in Rejoose, which follows the GHG Protocol Product Standard for calculating emissions from ICT products and services.

According to the GHG Protocol Product Standard the supplier uses 100-year GWP values and applies the IPCC Sixth Assessment Report (AR6).
The supplier uses the standard method for calculating GHG emissions:

$$GHG\ Impact\ (kg\ CO_2e)\ =\ Activity\ Data\ (unit)\ \times\ Emission\ Factor$$

Calculations are made using measured or estimated power usage profiles, multiplied by appropriate country-specific emission factors that reflect the full lifecycle of electricity production, including generation, transmission, and upstream emissions. Both location-based and market-based emission factors are supported. Transport emissions are also considered, using either fuel consumption or distance-based models. Assurance of data quality and methodology is required, either through third-party verification or internal expert review, depending on the product's context

4.4.4.5.7 Renewable energy infrastructure supplier 1

The solar modules installed in our solar park have been assessed for their environmental impact using data from an Environmental Product Declaration (EPD) published by EPD-Norge (Registration number: NEPD-4908-4258-EN), which provides essential lifecycle emissions information. In addition to the EPD, the specific capacity used for the project has been determined based on the technical specifications outlined in the project proposal, supplier offer, and contract documents, which also confirm the exact number of modules purchased.

The Global Warming Potential (GWP) for these modules is specified as 0.449 kg CO_2e per Wp (watt-peak) in the EPD on page 11. The GWP total is the sum of all listed results in kg CO_2e per Wp related to the six presented life cycle phases:

A1-A3 (Production Phase): 0.4061 kg CO_2e/Wp
A4 (Transport): 0.0248 kg CO_2e/Wp
A5 (Installation): 0.00163 kg CO_2e/Wp
C2 (Transport for End-of-Life): 0.0354 kg CO_2e/Wp
C3 (Processing of Waste): 0.0188 kg CO_2e/Wp
C4 (Final Disposal): 0.0470 kg CO_2e/Wp

This value serves as the basis for estimating the total CO_2e emissions associated with the modules.
To calculate emissions per module, the following input values were used:

$$= Wp\ per\ module \times GWP\ per\ Wp\ CO_2e\ per\ module\ (kg)$$

To convert this into tons of CO_2e, the value was divided by 1000 to convert kilograms to tons and then multiplied by the total number of modules purchased to determine the overall emissions for the solar park.

The EPD provides emissions data for solar modules but does not account for the full carbon footprint of the entire solar park. Key limitations include:

- Mounting System – Steel structures contribute significant emissions, but no LCA data is included.

- Inverters – Electronics and cooling systems have embedded carbon that is not assessed.
- Electrical Infrastructure – Cables, transformers, and grid connections are missing from the emissions calculation.
- Land Preparation & Construction – Site clearing, foundations, and installation activities are not covered.
- Operations & Maintenance – Energy use, cleaning, and repairs over the system's lifetime are excluded.

The subcontractors of the supplier currently do not have available data on the CO_2e emissions associated with the services they have provided. This limited scope means the EPD underestimates the park's total emissions. A fuller assessment requires LCA data for all supporting components, installation, and operational impacts.

4.4.4.5.8 Cleanroom service provider

Topsil operates under cleanroom restrictions, requiring externally provided services to maintain the necessary conditions. These services can have a significant environmental impact, particularly through chemical use, water consumption, and energy use. Additionally, rental and cleaning of cleanroom garments contribute to emissions due to the water, energy, and chemicals used in the washing process.

Until further investigations confirm otherwise, these services are considered notable emission sources. Emissions have been calculated using factors from Energinet and ADEME for accuracy.

4.4.4.5.9 IT Service provider

This report focuses exclusively on the climate impact associated with refurbishment and reuse compared to purchasing new equipment, following a 'Cradle-to-Gate' approach.

The documentation and calculation methodology follow the GHG Protocol guidelines, ensuring a standardized and reliable approach. For further insights, see the energy and environmental documentation software Rejoose's webpage.

4.4.4.5.10 Waste handler 1 and 2

"Waste Handler 1" has provided emissions data for waste acid, though the specific calculation methodology remains unclear. Topsil has met with the supplier to discuss waste handling procedures and has reviewed the calculation sheet used for emissions estimates. This sheet, developed by an external company, was last revised in 2020, introducing significant uncertainty regarding its accuracy and relevance.

As of April 2024, CO_2 reporting provided by "waste handler 2" is based on "Klimakompasset", meaning emissions calculations include a broader range of waste types and treatment methods beyond just recyclables. Emissions factors can be either positive (indicating an environmental burden) or negative (representing avoided emissions).

"Waste handler 2" accounted for 63% of the total waste in 2024 compared to just 10% last in 2023, s while the data is not yet fully comprehensive, it represents a substantial improvement over the previous reporting year. "Waste handler 2" provides CO_2e data covering 55,94% of the total managed waste equal to waste in 15 out of 21 waste categories. Four waste fractions are not yet available in" Klimakompasset", and two fractions currently cannot be fully calculated due to limitations in the emission factor methodology.
Since these emissions (including or excluding the avoided emissions) fall outside the reporting scope only the total quantities (tons) are reported.

49.95% of the waste has been recycled, while 50.05% has been incinerated for energy recovery. Recycling leads to significantly higher avoided emissions than incineration, as it reduces the need for virgin raw materials and lowers emissions from extraction and production. In contrast, incineration generates energy but results in fewer avoided emissions.

Due to the high share of recycled materials, net emissions are negative, highlighting the environmental benefits of reduced resource extraction and lower overall CO_2 emissions.
However, any avoided emissions from recycling should not be included or deducted from the Scope 3 inventory but may instead be reported separately from Scope 1, Scope 2, and Scope 3 emissions. (The GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard, page 79.)

4.5 Greenhouse Gas Emissions for the reporting period 2024

The total GHG emissions for 2024 amount to 33854,5 tons of CO_2e, using location-based energy emissions factor and with 36285,1 using the market-based energy emissions factor.
The emissions for each category detailed in the table below. All values are presented to one decimal place.

CATEGORY	SUBCATEGORY	IDENTIFIER	EMISSION (TCO2E)		PERCENTAGE (%) (LOCATION-BASED ENERGY EMISSIONS FACTOR	PERCENTAGE (%) MARKET-BASED ENERGY EMISSIONS FACTOR
1. Direct emissions	Mobile	Company owned vehicles	1,9		0,005	0,0046
2. Indirect emission from imported energy	Electricity	EMS-data collection	**Location-based energy emissions factor**	**Market-based energy emissions factor**		
			1048,5	3479,1	2,73	8,52
3. Indirect emission from transportation	Downstream	Transport supplier 1	1.650,2		4,3	4,04
		Transport supplier 2	6,2		0,02	0,02
	Commuting by employees	Vehicles, employee owned, public owned	182,9		0,5	0,45
	Business trips	Business trip supplier 1	77,0		0,2	0,19

<table>
<tr><td rowspan="15">4. Indirect emission from products used by the organisation</td><td rowspan="11">Indirect GHG-emissions from goods purchased by an organization.</td><td rowspan="10">a) Purchased goods</td><td>Raw supplier 1</td><td colspan="2">20226,0</td><td>52,7</td><td>49,52</td></tr>
<tr><td>Raw supplier 2</td><td colspan="2">9866,0</td><td>25,7</td><td>24,16</td></tr>
<tr><td>Raw supplier 3</td><td colspan="2">322,0</td><td>0,8</td><td>0,79</td></tr>
<tr><td>Gas supplier 1</td><td colspan="2">361,0</td><td>0,9</td><td>0,88</td></tr>
<tr><td>Packaging material supplier 1</td><td colspan="2">34,0</td><td>0,1</td><td>0,08</td></tr>
<tr><td>Plastic material supplier 1</td><td colspan="2">11,3</td><td>0,029</td><td>0,03</td></tr>
<tr><td>Office material supplier 1</td><td colspan="2">2,5</td><td>0,007</td><td>0,01</td></tr>
<tr><td>IT Supplier 1</td><td colspan="2">11,5</td><td>0,030</td><td>0,03</td></tr>
<tr><td>IT Supplier 2</td><td colspan="2">13,3</td><td>0,035</td><td>0,03</td></tr>
<tr><td>b) Capital goods</td><td>Renewable energy infrastructure supplier 1</td><td colspan="2">4577,5</td><td>11,9</td><td>11,21</td></tr>
<tr><td rowspan="4">Indirect GHG-emissions from services used by an organization</td><td rowspan="4">a) Waste generated in operations</td><td>Cleanroom service provider</td><td colspan="2">0,2</td><td>0,001</td><td>0,00</td></tr>
<tr><td>IT Service provider</td><td colspan="2">0,0</td><td>0,0</td><td>0,00</td></tr>
<tr><td>Waste handler 1</td><td colspan="2">21,0</td><td>0,1</td><td>0,05</td></tr>
<tr><td>Waste handler 2</td><td colspan="2">0,0</td><td>0,0</td><td>0,00</td></tr>
<tr><td colspan="4" rowspan="2">5. Total</td><td>Location-based</td><td>Market-based</td><td>Location-based</td><td>Market-based</td></tr>
<tr><td>38413,6</td><td>40844,26</td><td>100,0</td><td>100,0</td></tr>
</table>

4.5.1 Direct GHG emissions (Category 1)

It is well established that CO_2, CH_4, and N_2O emissions are associated with combustion engines running on gasoline or diesel. However, the company-owned vehicles registered in 2024 are primarily electric, meaning emissions are calculated using the national electricity factor, as outlined in Category 2. While this factor only includes CO_2, the Electricity Declaration allows for the inclusion of CH_4 and N_2O emissions.

Although Scope 1 emissions remain below 5% and are considered insignificant, omitting them entirely would compromise the completeness of the inventory. Additionally, ISO 14064-1 requires that all emission scopes are represented in the reporting.

4.5.2 Indirect GHG emissions from imported energy (Category 2)

Topsils energy mix consists of renewable sources such as hydropower, wind, and solar, alongside biomass, natural gas, nuclear power, oil, and coal. The company classifies wind, solar, and hydropower as true renewable energy sources, while biomass, natural gas, and nuclear power are considered greener alternatives, despite differing political classifications in Denmark.

Although Scope 2 includes all on-site energy consumption for production, its overall contribution to the GHG inventory is minimal, accounting for less than 5% of total emissions (see section 4.5). Consequently, while efforts to reduce Scope 2 emissions can enhance the company’s sustainability profile, making it more attractive to investors, customers, and employees, the most significant climate impact lies in Scope 3 emissions.

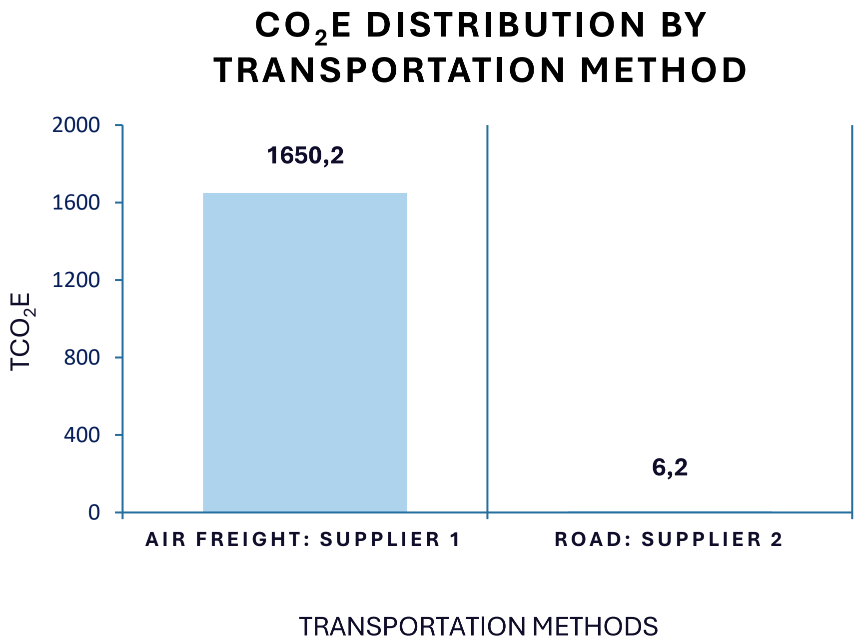
This does not imply that Topsil should neglect internal emission reductions but rather that mitigation strategies should primarily focus on Scope 3. For details on reduction initiatives, see Chapter 5.

4.5.3 Indirect GHG emissions from category 3 - 6

A notable observation is the variation in emissions between different suppliers and their respective categories - transportation and purchased goods & services.

The most significant contributors are "raw supplier 1 and 2", accounting for more than 85% of total emissions. This aligns with Topsils expectations, as raw material production is highly energy intensive. Considering political, geological, and energy composition factors, these results appear credible. Additionally, raw material suppliers' strategic policies play a key role in influencing emissions levels.

For transport suppliers, the mode of transport (air or road) is the primary determinant of emissions, with the distribution outlined below:



All transport emissions are reported exclusively in tCO_2e, as it has not been possible to extract other GHG emissions from the provided report. Additionally, there is insufficient data for Topsil to independently calculate emissions beyond CO_2e.

Regarding other categories, none can be classified as significant, as the majority contribute less than 5% to the overall GHG inventory.

4.5.3.1 Subcategory: Commuting by employees

Topsil conducted an employee survey to gather information on how employees commute to work. The answering rate is appr. 22% and represent Topsils employees.
When looking at the other emission gasses from vehicles the distribution is as below:

	tCO_2	tCH_4	tN_2O	Total tCO_2e
Equivalent Emissions	180*	2	1	183
Percentage (%)	99%	<1%	1%	100%

*Note that it is simplified to no decimals.

Based on the results, employee commuting has a low impact on overall GHG emissions, with minimal contributions from other exhaust gases. The organization's average commuting CO_2 emissions are lower than the municipal average (source: Movia Trafik). This is likely due to a high number of local employees, with many commuting less than 10 km per day.

When evaluating N_2O and CH_4 emissions in relation to the total GHG inventory their environmental impact is negligible.

Currently, employee commuting emissions do not meet the significance threshold of 5%. However, with the global rise in electric vehicle (EV) adoption, driven by sustainability policies such as the Paris Agreement and CSRD, an increase in EV usage among employees is anticipated. Consequently, the significance of this category may change in future assessments.

4.5.4 Emissions from biomass combustion

In accordance with the requirements of ISO 14064-1:2018 (paragraph 9.3.1), biomass combustion and its associated emissions must be quantified.
Topsil does not have any biomass combustion within its reporting boundaries.

Type of GHG emission	tons/year
CO_2 Emissions from Biomass Combustion	0
CH_4 Emissions from Biomass Combustion	0
N_2O Emissions from Biomass Combustion	0
Total Emissions	0

As the facility was constructed with a fully electric energy supply, there is no reliance on alternative fuel sources. Consequently, Scope 1, Category 1 includes only company vehicles as direct emission sources.

4.6 Uncertainty assessment

All GHG inventories have inherent limitations in accurately representing the ‘true’ emissions inventory. It is the responsibility of the GHG Management Committee to assess how well the inventory reflects reality. This is done through an uncertainty assessment, where uncertainties are identified, quantified, and described. By understanding these uncertainties, Topsil can optimize resource allocation, reduce uncertainty, and implement effective mitigation measures to enhance decision-making.

The GHG inventory system is based on measurement systems, which consist of various inputs such as measurement tools, personnel, environmental conditions, and methodologies. Each of these elements introduces uncertainty into the final calculation.
For example, when calculating road transport emissions, factors such as vehicle type, load, location (e.g., urban or rural), driver behaviour, engine type, route, and weather conditions all influence the actual CO_2e emissions per trip. Since not all variables can be precisely known, uncertainties arise at each input level.

Additionally, many GHG emissions calculations rely on estimations, such as fuel consumption estimates based on national averages. While statistical analysis suggests that an average can reasonably represent emissions, it is always within a limited confidence level. Typically, a 95% confidence interval is used to express how well the calculated value represents the 'true' emissions.

There are two primary approaches to conducting an uncertainty assessment:

1) Scientific Approach (Statistical Calculation with 95% Confidence Interval)
- Requires that all input data and their uncertainties are fully known.
- Uses statistical methods to quantify the reliability of emissions calculations.
- Provides a numerical confidence interval for reported values.

2) Expert-Based Risk Assessment
- Conducted by competent experts with specialized knowledge of emissions inventories.
- Does not rely on statistical calculations but instead applies expert judgment to assess uncertainties.
- Incorporates qualitative and experience-based evaluation of measurement reliability.

Both approaches contribute to improving the accuracy, reliability, and transparency of the GHG inventory while enabling better risk management and decision-making.

4.7 Data quality assessment

Ensuring high-quality data and assessing uncertainty is crucial for maintaining the credibility and accuracy of the GHG inventory. When empirical data is incomplete or does not fully capture all sources of uncertainty, a statistical approach is not feasible. In such cases, a data quality assessment conducted by subject matter experts becomes essential.

Due to the nature of the current inventory data and the varying methodologies used by suppliers, it is not possible to apply statistical tools to determine uncertainty, as many of its underlying causes cannot be fully identified or mapped. Instead, the organization will use an expert-based evaluation, aligning with the methodologies outlined in IPCC:2006 Volume 1, Chapter 3, Sections 3.2.1.3 and 3.2.2.3, which detail best practices for expert-driven uncertainty assessments.

The GHG Management Committee at Topsil will oversee the data quality assessment, leveraging its expertise in:

(1) Measurability and precision of collected data
    a. Includes calibration of measurement tools and gauges.
(2) Direct measurements controlled by the organisation
(3) Direct or indirect measurements provided by suppliers
(4) Emission factors applied
    a. National factors are prioritized as the most reliable.
    b. IPCC factors, which align with national factors, are also considered.
    c. Alternative factors or methodologies for determining emission factors, which may require additional validation by the GHG Management Committee.
1) Calculation methodologies
    a. Includes assessment of suppliers' calculation methods and the validity of data provided.
(5) Self-Estimation of GHG Impact data based on estimates from suppliers or internal assessments.
(6) Trustworthiness of supplier data
    a. Evaluates whether supplier feedback appears reasonable.
    b. Considers factors such as the relationship with the supplier, as well as political, geographical, and external influence

The GHG Management Committee assesses all subcategories (4.5) and assigns them a classification score based on data quality:

CLASSIFICATION	**DESCRIPTION**
4 (A - Best possible data)	Data is trustworthy, reliable, measurable
3 (B - Acceptable data level)	Data is collected indirectly but remains usable.
2 (C - Slightly less acceptable data level)	Not possible to get the necessary information to make a reasonable judgement on data quality
1 (D - Unreliable data)	Lack of understanding of how the data was obtained, making it invalid for the subcategory.

Using this classification system, the GHG Management Committee reviews and discusses the data, assesses associated risks, and determines the final data quality evaluation for all identified subcategories in the inventory.

4.7.1 Weighted data quality assessment based on supplier contributions

By converting the data quality scores from categorical values (A-D) to numerical values (1-4), it becomes possible to conduct a weighted data quality assessment that reflects the relative impact of each supplier's emissions. This approach enables a more granular and quantitative evaluation of data reliability across different emission sources.

The previous classification system (A-D) was qualitative and did not allow for direct calculations.
By converting A =4, B = 3, C = 2, and D = 1, we can now use mathematical methods to analyze and compare data quality.

Since different suppliers contribute varying amounts to the total emissions, their data quality should be weighed accordingly. A supplier that contributes 50% of total emissions but has a poor data quality score (e.g., 2 or 3) has a much greater impact on overall data reliability than a supplier contributing only 1% of emissions.
This means that simply averaging data quality scores would not accurately reflect the overall data reliability. Calculation method for weighted data quality score:

$$\text{Weighted Score} = \sum \text{Total Emissions} \sum (\text{Supplier Emissions} \times \text{Data Quality Score})$$

This formula ensures that suppliers with high emissions, but low data quality pull down the overall score, making it a more accurate representation of where the greatest uncertainties lie.

CATEGORY	SUBCATEGORY		IDENTIFIER	DATA QUALITY SCORE - CATEGORIAL VALUE	DATA QUALITY SCORE - NUMERIC VALUE
1. Direct emissions	Mobile		Company owned vehicles	B	3
2. Indirect emission from imported energy	Electricity		EMS-data collection	A	4
3. Indirect emission from transportation	Downstream		Transport supplier 1	C	2
			Transport supplier 2	C	2
	Commuting by employees		Vehicles, employee owned, public owned	D	1
	Business trips		Business trip supplier 1	C	2
4. Indirect emission from products used by the organisation	Indirect GHG-emissions from goods purchased by an organization.	a) Purchased goods	Raw supplier 1	C	2
			Raw supplier 2	B	3
			Raw supplier 3	B	3
			Gas supplier 1	C	2
			Packaging material supplier 1	D	1
			Plastic material supplier 1	C	2
			Office material supplier 1	D	1
			IT Supplier 1	D	1
			IT Supplier 2	D	1
		b) Capital goods	Renewable energy infrastructure supplier 1	D	1
	Indirect GHG-emissions from services used by an organization	a) Waste generated in operations	Cleanroom service provider	C	2
			IT Service provider	C	2
			Waste handler 1	D	1
			Waste handler 2	C	2
5. Total				B-C	1,9

4.7.2 Key weighted suppliers and data quality impact

The largest contributors to total emissions and data reliability are:

- Raw Supplier 1 (44.1%) – Largest emissions source, but low data quality (2), making it a priority for improvement.
- Raw Supplier 2 (21.5%) – Second-largest source, with better data quality (3).
- Customer 2 (15.3%) – High data quality (4), setting a strong reporting standard.
- Customer 1 (10.9%) – Moderate data quality (3).
- EMS Data Collection (2.3%) – Reliable data (4), ensuring strong Scope 2 reporting.

4.8 Data quality and transparency in the supply chain

The majority of the collected data falls into categories B and C which converted to numerical values as a weighted data quality score based on 1-4 scale is 2.36. This means that the overall data quality assessment leans towards moderate reliability, but there are still significant areas with lower data quality that could be improved. Focus will be on data transparency with “raw suppliers 1 & 2”, encourage other suppliers to align reporting standards, and maintain high Scope 2 data quality. Prioritizing high-emission, low-quality sources will enhance overall data reliability in future inventories.

Greater transparency in the supply chain is necessary to ensure that data is relevant, complete, consistent, accurate, and transparent (ISO 14064-1:2018). Until full transparency is achieved, significant uncertainties in data quality cannot be reliably mapped using a statistical approach.

However, the Corporate Sustainability Reporting Directive (CSRD), which is being implemented within the EU, is expected to enhance data availability and quality. Since Topsil and many of its key suppliers are EU-based, compliance with CSRD requirements will help address existing data gaps and improve future reporting accuracy.

While the omnibus approach and the delayed requirements of the CSRD still act as drivers for action, the real impetus will increasingly come from businesses’ own ambitions and their growing awareness of how critical it is to improve sustainability practices. Companies will realize that improving performance is not only necessary to comply with regulations but also to retain or increase their market share in a rapidly evolving business environment.

Meanwhile, certain data categories fall under Topsils direct control, ensuring better traceability and reliability. These are described below:

4.8.1 Uncertainties in Employee Transportation Data

The data collection method is based on an internal survey/questionnaire, achieving a 100% response rate for company-owned vehicles, while approximately 22% of the rest of the organization participated. The employee commuting data is based on self-reported estimates, such as:

- Fuel consumption (L/100 km)
- Distance travelled to work

These estimates introduce inaccuracies due to memory recall errors and reliance on individual assumptions. A significant source of uncertainty this year is the low response rate, with only 22% of employees submitting answers. This is likely due to the limited time available for employees to respond, making it a key area for improvement in future reporting.

To reduce uncertainties and enhance data quality, the survey should be conducted earlier in the next inventory period, giving employees more time to provide accurate responses. It has been observed that office personnel find it easier to respond to the form compared to production staff, which may have impacted participation rates.

Additionally, refining the calculation file to further automate data handling and minimize manual corrections will help ensure a more reliable dataset.

4.8.2 Data quality for imported energy emissions (Scope 2) is very high.

Calculations are based on the national grid average provided by Energinet for location-based energy emission factors and electricity declarations for market-based energy emission factors.
Collected data is cross-referenced with electricity bills and other verified sources to ensure consistency.

As a result, imported energy emissions receive a high reliability score in the data quality assessment, whereas employee transportation emissions include some uncertainties due to self-reported data limitations.

4.9 Comparison with selected base year

To track Topsils environmental impact over time, the organisation continuously compares its emissions to the selected base year (2021) and monitors increases or decreases in tCO_2e. Since the base year inventory only contains data for Scope 1 and Scope 2 emissions, the comparison remains valid only for these categories.

Emission category	Reporting period 2021 (Base Year) tCO_2e	Reporting Period 2022 tCO_2e	Reporting period 2023 tCO_2e	**Reporting period 2024 tCO_2e – location-based energy emissions factor**	GHG reduction tCo_2e	**Reporting period 2024 tCO_2e – market-based energy emissions factor**
Scope 1, Category 1, Company Cars	19,8	13	3	**2**	2023: -16,8 2024: -17,9	**2**
Scope 2, Category 2, Electricity	1095	1303	1105	**1049**	2023: 10 2024: -46,9	**3479**
Total CO2e	1115	1316	1108	**1050**	2023: -7,2 2024: -64,8	**3481**

4.9.1 Scope 1: Reduction in company car emissions

Comparing 2021 to 2024, Scope 1 emissions have decreased by 17.9 tCO_2e, primarily due to fleet electrification and optimized vehicle usage. Company car emissions dropped from 19.8 tCO_2e in 2021 to just 2 tCO_2e in 2024, highlighting the impact of targeted mitigation strategies.

4.9.2 Scope 2 Electricity emissions – location vs. market-based methods

The Scope 2 electricity emissions trend shows markedly different results depending on whether the location-based or market-based emissions factor is used:

Location-Based Approach:

- 2024 emissions: 1049 tCO_2e
- Change from 2023: A reduction of 46.9 tCO_2e, primarily driven by energy efficiency improvements and the continued decarbonization of the national grid.

Market-Based Approach:

- 2024 emissions: 3479 tCO_2e
- Change from 2023: A significantly higher figure, due to reliance on electricity from the residual market mix, which has become more fossil-fuel intensive (see section (5.1.7).

This discrepancy is rooted in the way each method defines emissions:
The location-based method uses the average emissions intensity of the national grid, while the market-based method considers the specific electricity contracts and origin of the electricity a company purchases. In Denmark, a large portion of green electricity origin certificates (GO certificates) are sold to buyers abroad. As a result, even though a company may consume power from renewable sources, it is counted as fossil-based in market-based calculations unless it retains or purchases the certificates.

Thus, the high market-based emissions reflect the fact that Topsil Global Wafers does not currently hold green electricity certificates or a contractual green energy agreement for 2024. This highlights the importance of developing a renewable energy procurement strategy — including the acquisition of origin guarantees — to reduce Scope 2 emissions under the market-based method going forward.

4.9.3 Total CO_2e Trends and Considerations

Total CO_2e (Location-Based, 2024): 1050 tCO_2e → 64.8 tCO_2e reduction from 2023
Total CO_2e (Market-Based, 2024): 3481 tCO_2e → Significantly higher due to reliance on the residual electricity mix and lack of renewable energy contracts.
While the location-based figures confirm that Topsil is making tangible progress through energy efficiency and grid developments, the market-based emissions demonstrate a need for stronger strategic alignment with renewable energy sourcing. Addressing this gap will be essential for aligning with international reporting standards and future emissions reduction targets.

CHAPTER 5 GHG REDUCTION TARGETS AND MITIGATION ACTIONS

Topsil continuously strive towards exploring options and solutions that can mitigate or eliminate our GHG emissions from the inventory. As such the organisation works with mitigations activities that can be split up into three different sections.

1) Internal mitigation activities
2) Working with suppliers for scope 3 reductions
3) Expectations and collaboration with our customers

5.1 Internal mitigation activities

To reduce Scope 1 (direct emissions) and Scope 2 (indirect emissions from purchased energy), Topsil independently and Topsil as a part of Global Wafers can implement the following mitigation strategies:

5.1.1 Electrification of company fleet

Continue replacing combustion-engine vehicles with electric vehicles (EVs).
Expand on-site EV charging infrastructure, particularly when powered by renewable energy (e.g., the new solar park).

5.1.2 Optimization of production process – energy efficiency in fz process

The FZ process is the largest consumer of electricity within production and, therefore, the biggest contributor to Scope 2 GHG emissions. Optimizing this process is a key focus area for improving energy efficiency and reducing emissions.

5.1.3 Global Wafers RE100, SBTi and net zero ambitions

In 2021, Global Wafers set a clear sustainability goal by committing to achieving net-zero emissions in accordance with the Science Based Targets initiative (SBTi) by 2040 across its global operations. Global Wafers joined the RE100 initiative in 2024, pledging to transition to 100% renewable energy.

Topsil aims to achieve RE100 by 2025 through the construction of a solar park adjacent to the factory.

5.1.4 The solar park

One of the major projects in 2024 has been the establishment of the solar park, solar park with an estimated capacity of 10.2 MW, expected to generate 9,500,000 kWh per year, which will be reflected in next year's inventory report.
The project began in 2022, with the contract signed in 2023. Construction started in April 2024 and was completed by the end of 2024, with the solar park officially put into operation in January 2025.

The full impact of this initiative on reducing kg CO_2e per kg product will become evident once the solar park becomes operational. The park is expected to cover at least 100% of Topsils projected electricity consumption, ensuring RE100 certification for the coming years. Over time, as electricity demand increases, additional capacity may be required. This could be achieved through expanding the solar park, integrating wind turbines, or another alternative renewable energy source to ensure consistent energy coverage, regardless of weather variability.

As part of the solar park project, 6,500 native forest plants were planted to enhance biodiversity in the area. Beyond improving the local ecological conditions, these plantings also contribute to carbon sequestration, storing CO_2 both in the soil and within the trees themselves.

This carbon sink has not been included in this year's GHG inventory calculations, as it was assumed to provide a very small contribution in the short term. However, it could be an interesting area for future analysis, particularly through a projection of the trees' long-term CO_2 uptake. Such an assessment would help quantify their potential role in offsetting emissions and strengthening the sustainability impact of the solar park.

5.1.5 ISO 50001 requirements

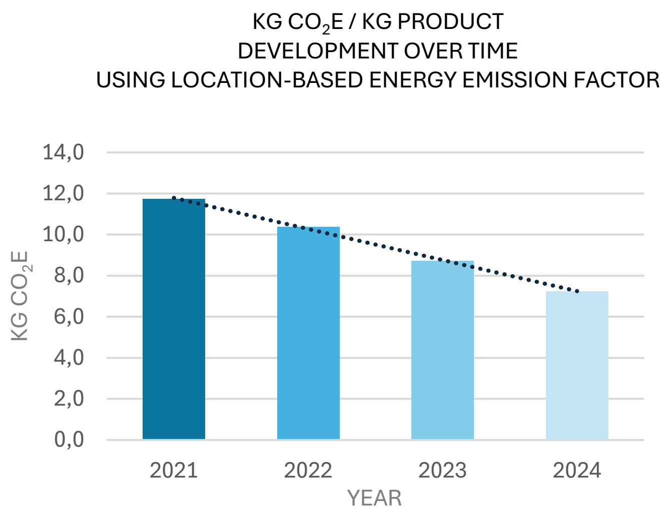
As part of Topsil Global Wafers' ISO 50001 certification, the company is required to implement energy optimization and reduction plans. These efforts are managed by the Energy Management System (EnMS) team to ensure continuous improvements in energy efficiency.

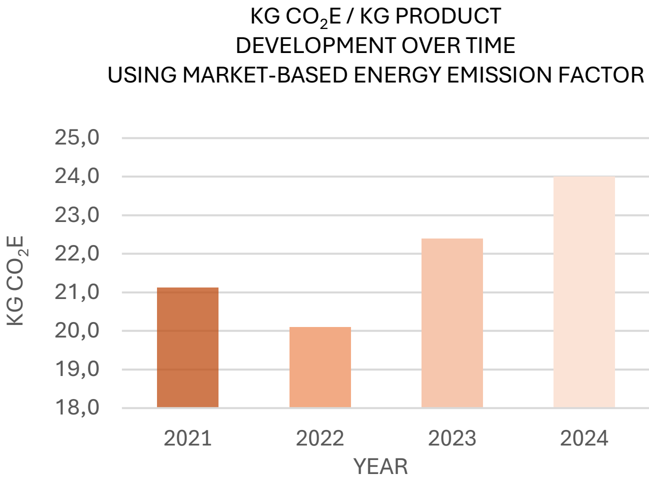
- The primary focus is on optimizing the high-energy-consuming FZ process
- New energy-saving projects may emerge throughout 2025.
- An internal KPI for power consumption rate has been established, targeting a minimum 2% reduction per year.

This aligns with Global Wafers' Environmental Management System (EMS) objectives, which include:

- Energy efficiency improvements
- Absolute GHG emission reductions (Scope 1 & Scope 2).

Topsil have tracked these internal mitigation activities since 2021 and have currently reduced the impact per kg produced by appr. 38% using location-based energy emission factors.





5.1.6 Continuing the downward trend

The downward trend in kg CO_2e per kg product observed in the 2023 inventory suggested that reaching 7.0 kg CO_2e/kg product in 2024 was achievable with continued reduction efforts. The actual 2024 value of 7.2 kg CO_2e/kg product shows that the target was nearly met, reflecting the positive impact of ongoing initiatives while also leaving room for further improvements.

Although market conditions declined in the second half of 2024, this trend has since reversed, signalling potential fluctuations in production and emissions. To ensure continued progress, further reduction efforts must remain aligned with the company's mission, vision, and sustainability policies, with top management driving the initiatives forward.

5.1.7 Explanation for the Increase in market-based CO_2 emissions per kWh (2021-2024)

The market-based CO_2 emissions per kilowatt-hour (kWh) have steadily increased from 378 g CO_2e/kWh in 2021 to 500 g CO_2e/kWh in 2024, despite grid decarbonization efforts. This trend is mainly a result of changes in the residual energy mix and how market-based emissions are calculated under international accounting standards, including the impact of Denmark's export of green electricity certificates (GO certificates).

1. Shift in the Residual Energy Mix
Market-based calculations are based on the residual mix — the electricity left after renewable energy with associated certificates has been sold. In Denmark, a large share of origin guarantees (GO certificates) from renewable sources is sold to buyers abroad. As a result, even if the electricity physically consumed may come from renewable sources, it is counted as fossil-based unless green contracts or certificates are retained by the company.
This has led to a less "green" residual mix, reflected in the market-based emission factor.

2. Increased Fossil Fuel Use in the Residual Mix

- Coal use increased from 31.62% in 2021 to 44.34% in 2023, heavily impacting the CO_2 intensity.
- Natural gas rose from 21.47% to 29.21% in the same period.
- Oil also increased from 3.94% to 5.63%, contributing further to fossil-based emissions.

3. Decrease in Low-Carbon Sources

- Nuclear power, which is virtually carbon-neutral, fell sharply from 30.87% (2021) to 8.39% (2023).
- Biomass and biogas dropped from 1.28% to just 0.11% between 2022 and 2023.
- Wind power declined from 6.66% to 4.57%, while solar rose only slightly (to 4.81%), not enough to counterbalance fossil fuel growth.

4. Implication for Scope 2 Market-Based Emissions
This explains why the market-based emissions factor has increased by over 30% from 2021 to 2024, despite efforts in efficiency and electrification. For companies not holding green energy contracts or certificates, the market-based CO_2 emissions appear much higher than location-based emissions, highlighting a gap between physical consumption and contractual claims.

Although Topsil has already made progress in electrifying its vehicle fleet and increasing energy efficiency, the absence of a green electricity contract in 2024 contributes to significantly higher market-based emissions.

This underscores the importance of securing renewable energy through direct power purchase agreements or by retaining origin guarantees, especially in preparation for future CSRD-aligned reporting.
When the company's solar park becomes operational in January 2025, it is expected to cover 100% of the factory's energy needs, substantially lowering market-based emissions — particularly if the organization retains the associated green certificates.

5.2 Supply chain management

As observed in Section 4.5 the major contributors to the GHG inventory are found in Scope 3 emissions. This highlights the necessity of working closely with the supply chain to achieve meaningful emissions reductions.

5.2.1 Green procurement and supplier development

The most effective approach is to develop suppliers through green procurement and gap analysis. Some of this work will be managed directly through supplier handling at Topsil, but most of the responsibility will lie with the EMS GW Group (Environmental Group in Global Wafers).

By leveraging the Global Wafers network, it becomes possible to:

- Encourage suppliers to enhance their sustainability efforts.
- Dedicate more resources to supply chain emissions reductions.
- Set higher environmental standards for key suppliers.

5.2.2 Focus on high impacts suppliers

The Global Wafers Group's primary focus is on polymer suppliers, as they represent the largest share of GHG emissions within the supply chain. This strategic focus ensures that GHG reduction efforts have maximum impact.

Key tools and standards for supplier development may include:

- Science-Based Targets Initiative (SBTi)
- ISO 14064-1 requirements
- Other corporate sustainability frameworks

By starting with these high-impact suppliers, it is expected that their kg CO_2e/kg raw material will gradually decrease—mirroring the reduction strategies implemented by Topsil Global Wafers. Once a robust system is in place, it is anticipated that suppliers will achieve a minimum reduction of 2% per year

5.2.3 Challenges and external factors

It is important to note that supplier development is also influenced by external factors, such as:

- National policies and regulations
- Geological constraints
- Technological limitations
- Financial constraints

5.2.4 Contract with new waste handler

Although the methodology used by “waste handler 2” in 2024 is significantly more transparent and refined compared to 2023, and the majority of waste types have been accounted for in this year’s inventory, a new waste handler has been contracted and will take over from April 2025.

At the same time, the organization has developed a method that has significantly reduced the amount of dust from production, from 2023 to 2024 the amount is decreased from approximately 50 ton to 35 ton.

Furthermore, starting in early 2025, a new wastewater handling system is developed and installed with the purpose of collecting and reusing the dust left when the water is drained off. An agreement has been made with a processor, drying the sludge and recycling the dust by mixing it into concrete.

5.2.5 Enhanced data collection from suppliers

Efforts to improve emissions transparency across purchased goods and services are ongoing, with several key suppliers working on CO_2 data collection systems that align with recognized methodologies.

Catering Supplier

Topsil is currently in the process of obtaining CO_2 footprint data from its lunch provider, which is developing a system based on acknowledged methodologies. While the system is nearing completion, the underlying database is not yet fully developed, meaning that it could not be incorporated into this year's inventory report. However, it is expected that future reporting will benefit from this improved data transparency.

Coffee Supplier
Although coffee accounts for a negligible fraction of total emissions, it remains a notoriously environmentally impactful product. Beyond CO_2 emissions related to processing and transportation, coffee production is linked to biodiversity loss, poor labor conditions, pesticide use, and deforestation. Given these broader sustainability concerns, gaining better insight into the supplier's CO_2 footprint will be relevant for future assessments.

Suppliers of Corporate Gifts, Merchandise, and Workwear
Similarly, Topsils gifts, merchandise, and workwear suppliers are actively engaged in the complex process of collecting CO_2 data for their products. This requires them to gather emissions data from their own suppliers, making it a lengthy but essential effort to improve supply chain transparency.

As data systems mature, they will provide a more detailed and accurate picture of Scope 3 emissions from purchased goods and services, strengthening supplier collaboration as a key strategy for achieving comprehensive and lasting GHG reductions across the value chain.

5.3 Expectations and collaborations with customers

An increasing number of Topsil' customers and stakeholders are prioritizing GHG management and its related frameworks. As a result, customer expectations for a structured GHG Management System are steadily rising, particularly among European customers preparing for CSRD compliance.

The primary customer requirements focus on:

- Emissions inventory mapping
- Assessing environmental impact

To meet these expectations, Topsil Global Wafers has implemented ISO 14001, ISO 50001, ISO 45001, and ISO 14064-1 management systems and is continuously developing measurable KPIs to track and improve performance.

As time progresses, new regulations take effect, and the market evolves, it is expected that customer requirements will expand to cover all aspects of ESG. This will, in turn, place greater demands on both our emissions inventory and our management, knowledge, and data collection within the broader "Environment," "Social," and "Governance" categories.

5.4 Customer driven emissions – the role of transportation

Despite ongoing efforts to reduce emissions, a significant portion remains customer-dependent, particularly in downstream transportation. Air freight is currently the dominant mode of transport, driven by short lead-time requirements and frequent late orders or order changes, making it the only viable option and significantly increasing GHG emissions (see Section 5.4.3 for transport distribution).

A key strategy for reducing transportation emissions involves improving customer forecasting. More stable and predictable demand would enable a transition to longer, lower-emission shipping methods, such as sea freight. However, this shift remains challenging due to:

- High demand for FZ material, which exceeds production capacity.
- Customer expectations for immediate delivery.

Exploring shipping alternatives could significantly lower emissions, but it would require customer commitment to longer delivery times and a greater focus on accurate forecasting.

A critical component of future strategy is to engage customers in discussions on how to reduce the CO_2 footprint of the products they receive by adjusting logistics procedures. Since Topsils products fall under customers' Scope 3 emissions, their need for transparency and deeper supply chain insight is growing. Strengthening collaboration and aligning expectations will be essential for achieving more sustainable logistics solutions.

5.5 Integration with financial and sustainability reporting

If the Omnibus package is implemented, Topsil will not be required to report under the EU Corporate Sustainability Reporting Directive (CSRD) this year. However, Topsil Global Wafers remains committed to the Science Based Targets initiative (SBTi) and will continue to prioritize transparent, science-based emissions reduction as part of its sustainability strategy.

Regardless of potential regulatory adjustments, Topsil Global Wafers views the CSRD framework, ESRS standards, and the EU Taxonomy as valuable tools for structured ESG management. By working with double materiality assessments to a greater extend, the company ensures a comprehensive understanding of both its financial risks and its sustainability impacts, supporting long-term planning and strategic decision-making.

The company is continuously improving its integration of the GHG inventory into financial and sustainability reporting, while also enhancing efforts to assess and report activities under the EU Taxonomy. By increasingly linking emissions data to financial performance and risk management, Topsil is reinforcing accountability, strengthening stakeholder engagement, and embedding sustainability into its core business strategy.

CHAPTER 6 DATA QUALITY MANAGEMENT AND VERIFICATION

6.1 Internal quality assurance and quality control

The internal verification of the GHG inventory data, methods, calculations and results was executed 12-03-2025, and the report was revised after the internal (first party) verification. The internal verification body is the Quality Department at Topsil

6.2 External Verification and statement

This greenhouse gas report has been verified by Bureau Veritas as an independent third-party verification agency on March 14, 2025.

The external verification has been conducted in accordance with ISO 14064-1:2018 and ISO 14064-3:2018 standards. A formal verification statement will be issued based on the agreement between the two parties.

6.3 Final statements

- This report is edited in accordance with the requirements of the ISO14064-1:2018 standard.
- The approval process before publishing this report is implemented in accordance with our company's GHG inventory procedures.
- This report is an internal document, which is only used for internal GHG management, third-party verification, registration, publication, and preservation in accordance with our company's GHG inventory procedures.
- This report is effective after publication and will be valid when it is revised or repealed.
- This report is edited by Kristine Bergstein, Sustainability Manager and member of the GHG Management Committee.
- This report is reviewed and commented on by Nadia Arp, a member of the GHG Management Committee.

CHAPTER 7 REFERENCES

- Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals, 2021.
- 2006 IPCC guidelines for National Greenhouse Gas Inventories.
- 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- IPPC Sixth Assessment Report: Climate Change 2021
- ISO 14064-1:2018 Corporate Value Chain (Scope 3) Accounting and Reporting Standard.
- ICCT Global Vehicle LCA – White Paper 2021
- 2021: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity Supplementary Material

CHAPTER 8 ABBREVIATIONS

- CIP: Carriage and insurance paid to, means that seller (the organisation) is responsible for delivery, delivery cost and insurance of cost
- CSRD: Corporate Sustainability Reporting Directive
- DAP: Delivered at place, means that seller (the organisation) covers cost and risk of transporting the product to the buyer
- EMS: Environmental Management System
- EnMs: Energy Management System
- EURO 4: EU classification of cars and on how much pollution they produce. EURO 4 are cars are after 1/1/2006
- FZ: Float Zone, a process which melts a polycrystalline structure and transforms it to a monocrystal with specific electrical properties
- GHG: Greenhouse gas
- GW: GlobalWafers
- IPCC: Intergovernmental Panel on Climate Change
- KPI: Key performance indicator
- LTA: Long term agreements
- REC: Renewable Energy Certificate
- RE100: Renewable energy 100%
- SBTI: Science based targets Initiative
- SEU: Significant energy use. Defined by ISO 50001:2018
- SI-unit: International system of units
- WtW: Well-to-wheels
- EMS: Environmental Management system