Quantification and reporting of greenhouse gases emissions at the organizational level in accordance with ISO 14064-1:2019

Reporting Year: 2024

Commissioned by Valland SpA to Eartha Srl

Working Group
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GHG Inventory Report
Piantedo (SO), August 2025

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1. General description of the Organization goals and Inventory objectives

1.1 Statement of the GHG Inventory Report

The Report has been prepared **according to the International Standard 14064-1** (Greenhouse gases – Part 1: Specification with guidance at the Organization level for quantification and reporting of greenhouse gas emissions and removals), prepared by Technical Committee ISO[1]/TC 207 "Environmental management" in collaboration with Technical Committee CEN/SS S26 "Environmental management", and published in August 2019 (EN ISO 14064-1: 2019)[2].

1.2 Report structure and format

The report has been prepared following the principles outlined in the ISO 14064-1 (i.e., relevance, completeness, consistency, accuracy and transparency). The structure and format are those outlined in Chapter 9 (GHG reporting) and Annex F (GHG Inventory structure and organization) of the Standard.

According to the ISO 14064-1, this Report contains **all the mandatory and** (where applicable) **recommended disclosures**, as well as the optional disclosure related to the contractual instruments for greenhouse gases (GHG) attributes (i.e., the "market based" approach description).

Optional disclosures on offsets or other types of carbon credits, as well GHG stored in GHG reservoirs are not included. The Company does not participate in carbon markets, nor does it have carbon reserves which can be used for climate change mitigation activities.

1.3 Description of the reporting Company

Valland SpA has been established in 2006 in Piantedo (Province of Sondrio, Italy), at Via Roccoli No. 252, as a privately held, unlisted Company consisting of a single legal entity. Valland is specialized in the design and manufacturing of **high-quality, custom-made ball, gate and check valves**, delivered worldwide.

According to the Global Industry Classification Standard (GICS)[3], Valland operates within the **"Energy" sector**, and more specifically, within Sub-Industry 10101020 – **Oil&Gas Equipment & Services**. Compared to the previous reporting period, there have been no significant changes in the nature of the Company's activities, products, services, markets, or supply chain characteristics.

Valland is recognized for its **client-centric approach**, combining technical expertise and continuous improvement to achieve high performance. The Company's primary goal is to deliver **best-in-class products**, integrating innovative solutions while ensuring timely and reliable delivery. In 2024, Valland has further strengthened its role as a reliable partner within the sector, supporting clients across upstream exploration, production, subsea systems, transmission networks, and industrial services.

Over the past two decades, Valland has developed a robust and stable network of **local and international suppliers** and strategic partners. This enables effective oversight throughout the entire

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1 International Standard Organization.
2 https://www.iso.org/standard/66453.html
3 https://www.msci.com/indexes/index-resources/gics

procurement and production cycle, supporting the delivery of high-quality, innovative, and timely solutions.

Valland's products are primarily deployed in offshore applications in the **North Sea**, specifically in **Norway and the United Kingdom**. This region represents one of the most strategic and technically demanding markets in the global Oil&Gas industry, as it is characterized by:

- Highly specialized technical requirements.
- Stringent environmental and safety regulations.
- Harsh operating conditions requiring extremely reliable, durable, and safe solutions.

Valland collaborates with major **international operators and top-tier contractors**, supplying high-performance valves for extraction facilities, injection systems, and subsea pipelines. These valves are engineered to withstand high pressures, corrosive environments, and extreme temperatures.

Innovation is a key driver of Valland's operations and sustainability strategy. Since 2016, the Company has actively invested in **Additive Manufacturing (AM) technologies**. Initially launched through targeted collaborations, these efforts have evolved into an internal, ongoing area of R&D across both metal and polymer techniques. These include:

- **Metal AM**: Binder Jetting, Laser Powder Bed Fusion (LPBF), Wire Arc Additive Manufacturing (WAAM).
- **Polymer AM**: Fused Deposition Modeling (FDM, including for composite and high-performance materials), hot-chamber FDM for technopolymers, and photopolymerization of resins.

AM is now used to manufacture valve components and to develop new applications in the broader energy and design sectors. These initiatives are supported by Valland's internal **R&D function**, which combines decades of operational experience with advanced digital tools such as **Finite Element Analysis (FEA)**. The R&D team also conducts safety-focused evaluations, including the preparation of **Safety Integrity Level (SIL)** and **Safety Analysis Reports (SAR)**. These activities are performed in close collaboration with clients and technical stakeholders to ensure tailored, effective, and practical outcomes.

Behind every delivered product there is a network of trusted partners and suppliers who share our commitment to quality and innovation. Over the years, Valland has cultivated strong, long-term relationships across the entire value chain. These connections go beyond formal contracts: they are the key to co-develop solutions, innovate, and ensure timely global delivery. The Company's networks include:

- **Suppliers**, who provide essential raw materials, mechanical components, and AM technologies that drive the innovation.
- **Project partners**, both private Companies and public organizations (e.g., Universities and Research Centres, Research and Consulting Companies, Trade and Industrial Associations, Lombardy Technology Clusters, etc.), who collaborate with Valland to develop advanced materials and AM-based solutions.
- **Distributors**, who ensure that the finished products are delivered globally under optimal condition.
- **Clients**, who rely on the final products and often become long-term collaborators in ongoing projects all over the world.

- **Certification bodies and consultants** who help ensure that Valland meet safety standards and compliance requirements, including the preparation of SIL and SAR.

Finally, it is worth mentioning that during the spring of 2024 Valland has formally established with CTA Group[4] a joint venture named **"Vision2H"**, which is dedicated to developing **green hydrogen solutions** for the global decarbonization. The partnership combines the expertise of Valland in manufacturing industrial valves and AM technologies with CTA Group's worldwide distribution network across chemical, petrochemical, refining and energy sectors. Through this joint venture, Valland has developed a breakthrough 100 kW single-stack Anion Exchange Membrane (AEM) electrolyser, with plans to scale up to MW-level turnkey solutions by the year 2027. The AEM technology operates using pure water or very low-concentration alkaline environments, considerably reducing the use of critical materials, thus lowering the overall environmental footprint.

1.4 Company's policies and strategies for environmental sustainability

At Valland, sustainability is not a separate initiative but it is integral to the daily operations. The **sustainability strategy** proactively addresses economic, environmental, and social impacts, including human rights, across short-, medium-, and long-term horizons, with the aim of preventing negative impacts while generating positive value for the people and the economy.

Sustainability is embedded throughout the Company's business model, operations, supply chains, and partnerships to ensure responsible growth and long-term resilience. The Company's strategic priorities include:

Short term (1-2 years):

- Reducing direct CO_2 emissions across the operations.
- Improving energy efficiency through operational upgrades and optimization.
- Expanding the use of renewable energy, such as photovoltaic systems.
- Strengthening internal sustainability education and employee awareness.
- Investing in workplace well-being and preventive health initiatives.
- Deepening collaboration within regional and national industrial clusters.

Medium-term (3–5 years):

- Scaling up the AM capabilities to progressively reduce material waste.
- Advancing R&D in support of the energy transition, such as hydrogen solutions.
- Expanding lifecycle product design and circular economy practices.
- Enhancing supply chain sustainability and transparency.
- Promoting diversity, equity and inclusion within the workforce.
- Aligning all the key operations with intergovernmental frameworks such as the UN Sustainable Development Goals (UN SDGs) and the European Green Deal.

Long-term (beyond 5 years):

[4] https://www.commercialetubiacciaio.it/

- Become a benchmark in sustainable industrial innovation.
- Influence policy and industry standards through active participation in sustainability forums and knowledge-sharing platforms.
- Maintain a company culture that balances technological excellence with social responsibility.

The Company's sustainability approach is structured around **five core pillars**:

- **Technology-led innovation**: investing in advanced technologies that enhance both the competitiveness and the contribution to sustainability. This includes expanding AM, LPBF, and hydrogen-related solutions.
- **Responsible use of natural resources**: minimizing the environmental footprint by optimizing resource use and integrating renewable energy sources like solar energy.
- **Circular economy practices**: prioritizing lifecycle thinking, designing for durability, reuse, recycling, and responsible end-of-life management of products.
- **People-centric innovation**: people are considered as the driving force of innovation. The Company support continuous learning and skill development while promoting a healthy, safe, and inclusive workplace.
- **Partnerships and collaboration**: cultivating long-term relationships with clients, suppliers, and industry stakeholders. The active participation in clusters enables co-creation, knowledge exchange, and collective progress toward sustainability goals.

The Company focuses on areas where the most impact can be generated:

- **ESG Goal 3** – Good health and well-being
  - Workplace health and safety education and awareness.
  - Team-building activities that foster well-being.
  - Promotion of a balanced work-life culture.
  - Preventive health screenings for employees.
- **ESG Goal 7** – Affordable and clean energy
  - Increasing the share of renewable energy in the Company's consumption mix, such as through photovoltaic installations.
- **ESG Goal 9** – Industry, innovation, and infrastructure
  - Strengthening the R&D Department.
  - Expanding the AM capabilities.
  - Investing in cutting-edge technologies, including LPBF and hydrogen-related solutions.
- **ESG Goal 12** – Responsible consumption and production
  - Reducing waste through prevention, recycling, and reuse.
  - Enhancing resource efficiency both internally and across the supply chain.
- **ESG Goal 13** – Climate action
  - Reducing CO_2 emissions across the internal operations and the supply chain.

- Promoting sustainability education and awareness internally and externally.

Valland's sustainability strategy is closely aligned with societal expectations as defined by international frameworks such as the OECD Guidelines and the **UN Guiding Principles on Business and Human Rights**. By proactively managing environmental, social, and economic impacts, the Company demonstrates a strong commitment to corporate responsibility and ethical conduct.

By integrating human rights considerations, focusing on transparency in the supply chains, and promoting the employee well-being, Valland is deeply aligned with the principles of due diligence and Stakeholders engagement emphasized by these global Standards.

Valland's strategy evolves in response to **macroeconomic, social, and political trends**, including the global push for decarbonization and clean energy, advances in digital and AM technologies, growing regulatory pressure on corporate sustainability disclosures and demand for transparency, inclusiveness, and ethical business conduct from the Stakeholders and society.

1.5 Purpose of the Report in the context of the Company's policies and strategies

Since 2022, Valland SpA has been publishing its annual Sustainability Report. In July 2025, the Company has released its fourth Report, covering the **period from January 1st, 2024, to December 31st, 2024**. This GHG Inventory Report represents a **technical and analytical extension** of the information already disclosed in the Sustainability Report. It offers a comprehensive account of the Company's GHG emissions, following internationally recognized Standards and Protocols. The primary objectives of the current Report are:

- **Support decision-making**: provide actionable insights that enable the Company to measure, monitor, and manage GHG emissions effectively. By quantifying emissions across organizational and operational boundaries, the Report supports the integration of climate-related considerations into business decisions at both operational and strategic levels.
- **Identify hotspots**: map and analyse emission-intensive areas or processes that most contribute to the emissions. This enables the Company to identify priorities for emissions reduction and resource optimization, thereby focusing investments and improvement efforts where they have the highest impact in both the short and medium term.
- **Internal reporting and planning**: assist the internal Stakeholders in preparing environmental reports, define and track science-based emission reduction targets and incorporate GHG performance metrics into strategic business planning and risk management frameworks. This could be the basis to define strategic environmental actions aligned with long-term sustainability goals and commitments.

1.6 Responsibility and reference contacts

The responsibility of producing the GHG Inventory and the corresponding GHG Inventory Report is of the **Sustainability team**, and the reference contacts are the following:

- **Dr. Luca Nonini** – Sustainability Analyst, Eartha Srl; luca.nonini@eartha.it
- **Dr. Alex Giorgini** – R&D Manager, Valland SpA; alex.giorgini@valland.it

1.7 Intended use and intended users

The Report has been produced primarily for **internal use**, aiming to supporting Valland SpA in understanding and managing its GHG emissions, facilitating **informed decision-making**, and advancing **internal sustainability initiatives** focused on emissions reductions. The main users are the top management, the Sustainability and the R&D Teams.

1.8 Dissemination policy

Following the previous paragraph, the Report is intended for internal use only. However, it will also be made publicly available on the **Company's website**. This decision reflects **Valland's commitment to transparency** and forms part of a **broader communication strategy** aimed at informing and actively engaging all the relevant Stakeholders.

1.9 Historical base year and historical base year GHG Inventory

This GHG Inventory Report is the second one prepared by the Company. The comparison between GHG emissions for the years 2023 and 2024 is therefore presented and discussed. As the methodological approach applied for 2024 is the same of that applied for 2023, and as 2023 is the first year for which a GRI[5]-based GHG Inventory has been produced, the **chosen base year is 2023**.

1.10 Reporting period and frequency of reporting

The reporting period is January 1st, 2024 – December 31st, 2024. The reporting frequency is annual.

1.11 Base year and review of the base year

Because of the above, the base year for comparative purposes is 2023. Any future changes in the definition of the base year may be introduced in the future due to structural change in reporting or organizational boundaries (e.g., merger, acquisition or divestiture), shifts in the economic and technological context, change in the calculation methodologies or emission factors values, errors which could substantially influence the results, or obsolescence of the information related to the currently established base year.

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5 The GRI, is, in turn, based on the Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard (Revised Edition, World Business Council For Sustainable Development, WBCSD, and World Resource Institute, WRI 2004, https://ghgprotocol.org/corporate-standard), GHG Protocol – Corporate Value Chain (Scope 3) Accounting and Reporting Standard – Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (WBCSD and WRI, 2011, https://ghgprotocol.org/corporate-value-chain-scope-3-standard), GHG Protocol – Technical Guidance for Calculating Scope 3 Emissions (version 1.0) - Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (WBCSD and WRI, 2013, https://ghgprotocol.org/scope-3-calculation-guidance-2) and GHG Protocol Scope 2 Guidance – an amendment to the GHG Protocol Corporate Accounting and Reporting Standard (WBCSD and WRI, 2015; https://ghgprotocol.org/scope-2-guidance).

1.12 Greenhouse gases included in the Report

GHGs emissions have been computed for (https://www.ipcc-nggip.iges.or.jp/public/2006gl/):

- **Carbon dioxide (CO_2)**.
- **Methane (CH_4)**.
- **Nitrous oxide (N_2O)**.

1.13 Statement on verification and validation

The Company has decided not to verify and validate the GHG Inventory. However, this activity may be considered for future Reports to enhance the credibility and transparency of the disclosed data, as well as to align with best practices and the Stakeholders expectations.

Should Valland decide to undertake a third-party verification process in accordance with ISO 14064-3:2019 (Greenhouse Gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements[6]), the Report may subsequently be shared externally as a certified document.

2. Organizational boundaries

Valland holds **full ownership**, as well as the **operational and financial control**, over all the facilities at its operational headquarters – including factories, offices, and warehouses. As such, the **organizational boundaries are aligned with the physical boundaries** of the headquarters. In case of any future structural changes (e.g., merger, acquisition or divestiture), these boundaries will be reviewed and revised as necessary.

3. Reporting boundaries

3.1 Comparison between ISO 14064-1 and GHG Protocol emissions categories

Table 1 shows the correspondence between the emissions categories defines in the ISO 14064-1 and those defined in the Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard.

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6 https://www.iso.org/standard/66455.html

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Table 1: Correspondence between emissions categories of the ISO 14064-1 and those of the GHG Protocol.

Reference	
ISO 14064-1	**GHG Protocol**
Category 1: Direct GHG emissions	Scope 1: Direct GHG emissions
SC 1.1[a]: Stationary combustion	C 1[b]: Stationary combustion
SC 1.2: Mobile combustion	C 2: Mobile combustion
SC 1.3: Processes	C 3: Processes
SC 1.4: Fugitive	C 4: Fugitive
SC 1.5: Land use, land use change and forestry	*Not available*
Category 2: Indirect GHG emissions from imported energy	Scope 2: Indirect GHG emissions from imported energy
SC 2.1: Imported electricity SC 2.2: imported energy, excluding electricity	C 1: Imported energy (electricity and other carriers)
Category 3: Indirect GHG emissions from transportation	Scope 3: Other GHG emissions
SC 3.1: Upstream transportation and distribution	C 4: Upstream transportation and distribution
SC 3.2: Downstream transportation and distribution	C 9: Downstream transportation and distribution
SC 3.3: Employee commuting	C 7: Employee commuting
SC 3.4: Clients and visitors transport	*Not available*
SC 3.5: Business travels	C 6: Business travels
Category 4: Indirect GHG emissions from used products	Scope 3: Other GHG emissions
SC 4.1: Purchased simple goods	C 1: Purchased good and services; C 3: Upstream fuel and energy related activities
SC 4.2: Purchased capital goods	C 2: Purchased capital goods
SC 4.3: Purchased services	C 1: Purchased good and services
SC 4.4: Treatment of solid and liquid waste	C 5: Waste generated in operations
SC 4.5: Leased assets	C 8: Upstream leased assets
SC 4.6: Purchased services not previously included	C 1: Purchased good and services
Category 5: Indirect GHG emissions associated with the use of products from the Organization	Scope 3: Other GHG emissions
SC 5.1: Use stage of the product	C 10: Processing of sold products; C 11: Use of sold products
SC 5.2: Downstream leased assets	C 13: Downstream leased assets
SC 5.3: End of life stage of products	C 12: End of life treatment of sold products
SC 5.4: Investments	C 15: Investments
Category 6: Indirect GHG emissions from other sources	Scope 3: Other GHG emissions
Not specified	C 14: Franchising

[a]SC: subcategory; [b]C: Category.

3.2 Emissions categories and selection criteria

This chapter includes the description of emissions categories that are considered. When considering whether to include or exclude emission sources, the following **criteria** have been taken into account:

- Activities/processes that are assumed to be quantitatively substantial over the total emissions.
- Ability of the Company to monitor and manage emissions.
- Sources that contribute to the Company's vulnerability to climate-related and reputational risks, or that present clear opportunities for emission reductions.
- Availability and accessibility of data and information.
- Availability, traceability, and validation of documentations supporting the data sources.

Based on internal evaluations, Valland declares that the above criteria have not been used to exclude representative categories or subcategories. The included categories are (**Table 2**):

1. **Category 1**: direct GHG emissions: they occur from GHG sources inside organizational boundaries that are fully owned or controlled by the Organization. The following direct emissions have been considered:
   - From **stationary combustion**: they are the consequence of the direct combustion of any type of fuel (fossil or renewable) burnt in stationary (fixed) equipment, e.g., ovens, boilers, and electricity generators, to generate heat, mechanical work or electricity.
   - From **mobile combustion**: they are the consequence of the direct combustion of any time of fuel (fossil or renewable) burnt in transport equipment, e.g., cars, motorcycles, freight transport vehicles (e.g., trucks, articulated lorries), used for activities/processes directly related to the Company business.

   All the **upstream** (i.e., from cradle to the Company gate) emissions associated with fuels, emissions due to the construction of power plants/vehicles, as well as emissions allocated to fuels transport and any distribution losses are **excluded**.

2. **Category 2**: indirect GHG emissions from **imported energy** (i.e., electricity, heat, steam, cooling energy and compressed air): it refers to the **energy purchased and consumed** by the Company; all the **upstream** (from cradle to the power plant gate) emissions associated with fuels, emissions due to the construction of the power plants, as well as emissions allocated to energy transport and any distribution losses are **excluded**.

3. **Category 3**: indirect GHG emissions from **transportation**: they occur from sources located outside the organizational boundaries and are related to activities/processes not owned and not under the control of the Company. Emissions occurs due to fuel burnt in transport equipment (via land, air, sea, either paid or not paid by the Company and delivered to the first purchasers or other purchasers throughout the supply chain) for the transportation of: (i) simple/capital goods purchased/sold by the Company, and (ii) people (clients and visitors, employee commuting between their home and the workplace, and business travel).

   Emissions associated with: (i) refrigeration gas leaks (e.g., chilled transport, air conditioner), (ii) fuel generation and transportation/distribution and (iii) construction of the transport equipment (vehicle and infrastructure) have not been considered due to the lack of emission factors.

   To avoid double counting with "Category 4: Indirect GHG emissions from used products", only emissions that occur through the latest transport activity from the supplier to the Company gate have been included, whereas all the other ones throughout the supply chain (i.e., among the upstream suppliers) have been excluded.

4. **Category 4**: Indirect GHG emissions from **used products**: they occur from sources located outside the organizational boundaries and associated with **simple goods and services**, as well as **capital goods**[7] purchased by the Company. Simple goods can be both intermediate products used to produce other goods, or finished products used as they are, without any other preliminary transformation process. The emissions are associated to the upstream phases ("cradle to supplier output gate" approach): (i) extraction of raw materials, (ii) agricultural and forestry activities, (iii) materials manufacturing, production and processing,

[7] Goods with extended lifetime (i.e., years, decades) and that are neither transformed nor sold to another Organization or clients (e.g., equipment, machinery, buildings, facilities and vehicles).

(iv) generation of energy carriers consumed through the upstream activities, (v) treatment of waste generated through the upstream activities, (vi) land use and land-use change activities, (vii) transportation of materials and products between the suppliers and (viii) any other activities prior to the acquisition by the reporting Company. This category includes also emissions from:

- **Treatment of solid and liquid waste** produced by the Company (services paid by the Organization to third parties).
- **Upstream activities related to fuel and electricity** (extraction, production, and transportation of fuels used by the Company; extraction, production, and transportation of fuels used to generate electricity, steam, heat and cooling subsequently purchased by the Company; electricity losses due to transmission and distribution processes).

As well as for the organizational boundaries, in case of future structural changes of the Company, the mentioned above selection criteria will be reviewed.

Table 2: List of categories and subcategories of the ISO 14064-1 included/excluded and reasons.

Reference **ISO 14064-1**	Inclusion/exclusion (yes; no)	Reason in case of exclusion
Category 1: Direct GHG emissions		
SC 1.1: Stationary combustion	Yes	
SC 1.2: Mobile combustion	Yes	
SC 1.3: Processes	No	No activities causing emissions are carried out.
SC 1.4: Fugitive	No	No emissions associated to this activity.
SC 1.5: Land use, land use change and forestry	No	No activities causing emissions are carried out.
Category 2: Indirect GHG emissions from imported energy		
SC 2.1: Imported electricity	Yes	
SC 2.2: imported energy, excluding electricity	No	No activities causing emissions are carried out.
Category 3: Indirect GHG emissions from transportation		
SC 3.1: Upstream transportation and distribution	Yes	
SC 3.2: Downstream transportation and distribution	No	Complexity in obtaining the data and accuracy[a].
SC 3.3: Employee commuting	Yes	
SC 3.4: Clients and visitors transport	No	Complexity in obtaining the data and accuracy.
SC 3.5: Business travels	Yes	
Category 4: Indirect GHG emissions from used products		
SC 4.1: Purchased simple goods	Yes	
SC 4.2: Purchased capital goods	Yes	
SC 4.3: Purchased services	Yes	
SC 4.4: Treatment of solid and liquid waste	Yes	
SC 4.5: Leased assets	No	No activities causing emissions are carried out.
SC 4.6: Purchased services not previously included	No	All emissions are already included in SC 4.3.
Category 5: Indirect GHG emissions associated with the use of products from the Organization		
SC 5.1: Use stage of the product	No	Complexity in obtaining the data and accuracy.
SC 5.2: Downstream leased assets	No	No activities causing emissions are carried out.
SC 5.3: End of life stage of products	No	Complexity in obtaining the data and accuracy.
SC 5.4: Investments	No	No activities causing emissions are carried out.
Category 6: Indirect GHG emissions from other sources		
Not specified	No	No activities causing emissions are carried out.

[a] To improve the completeness, accuracy, and transparency of the GHG emissions Inventory, efforts will be made to consider also the categories currently excluded due to both complexity in obtaining the data and level of accuracy.

4. Quantification of emissions: methodological approaches and parameters

4.1 General introduction

The emissions have been calculated using a **model developed by Eartha Srl**. The model has been prepared in the **MS Office Excel 365 environment** (file format .xlsm) and it is based on methodologies aligned with those defined in the "Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard (Revised Edition, WBCSD and WRI, 2004), GHG Protocol – Corporate Value Chain (Scope 3) Accounting and Reporting Standard – Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (WBCSD and WRI, 2011), GHG Protocol – Technical Guidance for Calculating Scope 3 Emissions (version 1.0) – Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (WBCSD and WRI, 2013), and GHG Protocol Scope 2 Guidance – an amendment to the GHG Protocol Corporate Accounting and Reporting Standard (WBCSD and WRI, 2015).

Following the GHG Protocol classification, the model enables the **quantification of the emissions for each category of Scope 1, Scope 2, and Scope 3** over a **default period of 1 year**. The results can be further aggregated into different categories in accordance with the ISO 14064-1. This operation must be performed by the user outside the model as this is not allowed in file.

The model has been developed with the intention of balancing, as much as possible, **accuracy** and the **ease of use**, with the goal of assisting the user in identifying **critical points** (activities/processes characterized by the highest emissions) within the value chain, and for which further data collection and more in-depth analysis may be required.

The model includes a dedicated worksheet for user input data entry, but its structure is not explained in this document as it is not essential for the purposes of the Report.

The results are presented in a separate worksheet. Emissions are reported as both **fossil CO_2eq** and (separately) **biogenic CO_2** (biomass-related emissions) and are provided, within each Scope, in both **absolute terms (t)** and as **fraction (%)** of the total emissions.

Additionally, the model shows the total absolute value as well as the fraction of emissions across the three different Scopes (Scope 1 + Scope 2 + Scope 3; t, %).

For future Inventories, the model includes a feature that enables the storage of the results for all the analysed years in a dedicated worksheet. This functionality allows the Company to systematically archive emissions data, facilitating the development of a **comprehensive "environmental profile"** over a multi-year period. By providing a detailed **historical view of emissions trends** across the value chain, the model supports the development of informed and effective reduction and mitigation strategies.

The following paragraph describes the methodological approach, including literature sources, calculation parameters and any assumptions/simplifications introduced. For the Report, emissions sources have been classified into the categories and subcategories defined in the ISO 14064-1. The description is done only for those included in the Inventory.

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4.2 Methodology

4.2.1 Subcategory 1.1: Stationary combustion

Emissions are calculated by multiplying the amount of fuel consumed (dm^3) by the specific emission factor[8] of the fuel (kg CO_2/dm^3; kg CO_2eq of CH_4/dm^3; kg CO_2eq of N_2O/dm^3) (Department for Environment, Food & Rural Affairs, DEFRA, 2023)[9].

4.2.2 Subcategory 1.2: Mobile combustion

Emissions are calculated considering the volume of fuel consumed (dm^3) (or travelled distance, km) and the corresponding emission factor defined according to the type of vehicle (kg CO_2/mile; kg CH_4/mile; kg N_2O/mile) (GHG Protocol, 2017). This method incorporates the relevant emissions from the vehicle's fuel consumption and the travelled distance, ensuring that the contribution of each transportation method is accounted for in a standardized way.

4.2.3 Subcategory 2.1: Imported electricity

Emissions are estimated by multiplying the amount of energy consumed (kWh) by an emission factor (kg CO_2eq/kWh) that varies according to the purchasing mechanism:

- **Location-based**: a weighted average CO_2eq emission factor is considered, defined according to the composition of the national electricity production "mix"; the emission factor reflects how the electricity is generated in a given area and in a given time period, considering the contribution of all the energy sources (fossil and renewable) (Carbon Footprint Ltd, 2023).
- **Market-based**: CO_2eq emission factor is assumed to be (for an accounting purpose only) equal to 0 kg CO_2eq/kWh, if electricity is produced by a specific supplier from certified renewable sources (tracking system based on the so-called "Guarantees of Origin", GO).
- **Residual-mix**: this is a specific form of the market-based mechanism, which considers certified electricity generated only through non-renewable energy sources. In other words, if a consumer has defined a supply contract with a given supplier to purchase electricity generated only from non-renewable sources, the emission factor is systematically higher than that of the location-based mechanism, as the contribution of all the renewable sources is excluded (Carbon Footprint Ltd, 2023).

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8 It expresses the ratio between the mass of a GHG emitted into the atmosphere from a specific emission source, and a reference unit (e.g., mass, volume, energy, distance).

9 The DEFRA emission factors for CH_4 and N_2O are already expressed as CO_2eq through the corresponding Global Warming Potential (GWP). The GWP expresses the contribution of a gas to the greenhouse effect compared to that of CO_2, which is assumed equal to 1 and taken as reference. The GWP is calculated for a specific period (20, 100, or 500 years). In the model, all the GWP values are related to a period of 100 years and are those defined by the Fifth IPCC Assessment Report (https://ghgprotocol.org/sites/default/files/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf).

4.2.4 Subcategory 3.1: Upstream transportation and distribution

Emissions are computed as the product between the **monetary expenditure (€)** for the storage/warehousing service only and final delivery (i.e., from the last supplier to the Company gates, excluding all the "upstream" activities between suppliers) and the corresponding **"margin of supply chain emission factor"** (kg CO_2eq/€, related to 2023)[10].

Information regarding storage/warehousing methods, type of vehicle used for transportation, mass of goods transported, as well as the travelled distance is not necessary, as the contribution of all these elements is already accounted for into the value of the emission factor (U.S. Environmental Protection Agency, EPA, 2022).

4.2.5 Subcategory 3.3: Employee commuting

Emissions are computed by multiplying the travelled distance (km) by the corresponding emission factor (kg CO_2/km; kg CO_2eq of CH_4/km; kg CO_2eq N_2O/km), defined according to type of vehicle (DEFRA, 2023).

4.2.6 Subcategory 3.5: Business travel

Emissions are quantified based on: (i) type of transport/vehicle used, (ii) number of employees involved and (iii) total travelled distance (per single employee; round trip), applying an emission factor defined according to the type of transport/vehicle (kg CO_2/km; kg CO_2eq of CH_4/km; kg CO_2eq N_2O/km; kg CO_2/passenger · km; kg CO_2eq of CH_4/ passenger · km; kg CO_2eq N_2O/ passenger · km). Optional data such as: (i) destination Country, (ii) number of nights spent in hotels[11] and (iii) number of rooms have also been included to improve the accuracy of the results (DEFRA, 2023).

4.2.7 Subcategory 4.1, 4.2 and 4.3: Purchased simple goods, purchased capital goods and purchased services

Emissions are estimated by multiplying the monetary expenditure (€) by the specific **"supply chain emission factor without margin"** related to the type to which the good/service belongs (EPA, 2022). This emission factors reflects emissions which occur along the supply chain between suppliers and exclude activities involving the last supplier and the transportation and distribution of goods and services up to the Company gates.

Subcategory 4.1 also includes emission related to the **upstream activities for fuels and electricity**:

- Extraction, production, and transportation of fuels used by the Company for direct combustion; emissions are calculated as the product between the volume of fuel (dm^3) and the corresponding emission factor (kg CO_2eq/dm^3) which includes all the "upstream" activities (DEFRA, 2023).

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10 The value of these emission factors have been calculated starting from values expressed as kg CO_2eq/$ (year 2018), considering the ratio €/$ for the 2018, as well as the Italian inflation rate for the period 2018-2023.

11 It is assumed that the employees stay in "3-stars" hotels.

- Extraction, production, and transportation of any fuel used for the generation of the electricity subsequently purchased by the Company under the location-based mechanism: emissions are quantified as the product between the amount of purchased electricity (kWh) and the corresponding emission factor (kg CO_2eq/kWh) that accounts for all the "upstream" activities (International Energy Agency, IEA, 2023).
- Energy losses occurring during the electricity transmission and distribution processes, from the point of production to the Company gate. Emissions are calculated as the product between the amount of energy and an average emission factor related to the Italian conditions (Carbon Footprint Ltd, 2023)[12].

4.2.8 Subcategory 4.4: Treatment of solid and liquid waste

Emissions are calculated as the product between the mass of waste[13] and an emission factor (kg CO_2eq/t) defined according to the type of waste and treatment (DEFRA, 2023). Compared to all the possible types of treatment included in the model (i.e., (i) disposal/purification, (ii) open-loop recycling, (iii) closed-loop recycling[14], (iv) incineration by direct combustion, (v) composting, (vi) landfill and (vii) anaerobic digestion), the following have been considered: (i) open-loop recycling, (ii) landfill and (iii) disposal/purification. If a specific type of waste is not present in the model, the most representative one is used.

4.3 Types of used data

Data used for the calculation are both **primary (from direct measurement)** and **secondary (from estimations)**. For each subcategory, the type of used data and the corresponding source are shown in **Table 3**.

Table 3: Types of data and sources for each subcategory.

Subcategory (SC)	Type of data	Source
SC 1.1 – Stationary combustion	Primary	Company records/bills on fuel consumption (m³) on a monthly, bimonthly, or quarterly basis.
SC 1.2 – Mobile combustion	Primary	Company records/bills by type of vehicle on travelled annual distance (km) or fuel consumption (dm³) for each refuelling operation.
SC 2.1 – Imported electricity	Primary	Company bills on monthly electricity consumption (kWh).
SC 3.1 – Upstream transportation and distribution	Primary	Company records on monetary expenditure (€) for each purchased good.

12 The emission factors available in literature are related to the location-based mechanism; therefore, it is assumed that – given the same Country of origin – the emission factors are also applicable to the market-based (including residual-mix mechanisms).

13 In the model, the waste can be classified as: (i) construction materials, (ii) electrical/electronic devices, (iii) metals, (iv) plastic materials, (v) paper, and (vi) other.

14 In the open-loop recycling, the recycled material is used to produce another type of good, and the material loses its original characteristics. On the contrary, in the closed-loop recycling, the recycled material is used to produce the same type of good and it maintains its original properties.

SC 3.3 – Employee commuting	Primary and secondary	Company records containing municipalities of residence and the number of employees.
SC 3.5 – Business travels	Primary and secondary	Company records containing the destination Country/city (for national travelling), departure and arrival airport, number of involved employees, departure and return date.
SC 4.1 – Purchased simple goods	Primary	Company records on monetary expenditure (€) for each purchased good.
SC 4.2 – Purchased capital goods	Primary	Company records on monetary expenditure (€) for each purchased good.
SC 4.3 – Purchased services	Primary	Company records on monetary expenditure (€) for each purchased service.
SC 4.4 – Treatment of solid and liquid waste	Primary	Company records on waste quantity (kg, dm^3) and treatment type.

4.4 Model characteristics

- **Reproducibility of the results**: the model has been developed in MS Office Excel, a universally accessible program, and uses standard inputs (e.g., mass of fuel, amount of energy, monetary expenditure) with documented assumptions and emission factors. This enhances reproducibility, as other users can replicate results by applying the same inputs data and parameters.
- **Acceptability**: the model aligns with well-established global standards (GHG Protocol, ISO 14064-1) and uses recognized datasets (e.g., DEFRA, EPA, IEA), enhancing its acceptability within corporate and regulatory frameworks, as well as credibility within the sustainability and emissions accounting community. Moreover, its modular design, ease of use, and ability to integrate optional data further support its adoption by a wide range of users.
- **Consistency with the intended use**, balancing both accuracy and ease of use in identifying emission hotspots. Through its modular structure, the model allows for detailed analysis when more specific data is available, while providing broader overviews if input data are limited. This makes the model particularly well-suited for annual reporting, trend analysis, and strategy formulation. This flexible approach can accommodate a range of data availability, making the model a valuable tool for emissions management.
- **Economic proxy approach**: for some subcategories, such as the purchase of goods and services, the model uses economic proxies (e.g., emissions per value of monetary expenditure) rather than direct physical metrics (like the mass of purchased good and the travelled distance). While this approach simplifies data collection, it introduces a higher degree of uncertainty, as there is no guarantee that the monetary expenditure is directly correlated with the emissions intensity of a given good or service. This can be a problem if the upstream activities of the supply chain are not well-understood.
- **Lack of validation**: the model does not incorporate a mechanism to validate its outputs against real-world measurements or site-specific data. Without such validation, the model's predictive accuracy remains uncertain, particularly for emissions sources where on-the-ground data may vary considerably. In the absence of validation, the results should be interpreted with caution, particularly if used to support decision-making or external reporting.

- **Transparency and documentation**: The model is supported by detailed documentation that explains the used methodologies and parameters, required input data, and assumptions. This transparency facilitates user understanding and enables easier review and updates over time.
- **Scalability**: the model is designed to be scalable, allowing adaptation to different Company sizes or industrial sectors while maintaining a modular structure that enables customization according to the specific needs.

4.5 Emission factors: values and literature references

Table 4 reports values and reference of the emissions factors used for the calculations.

Table 4: Emission factors used for the calculations.

Category (C)	Subcategory (SC)	Emission factor		
		Value	Unit of measure	Reference link
C 1: Direct GHG emissions	SC 1.1: Stationary combustion	1. Liquid petroleum gas (LPG) - CO_2: 1.555 - CH_4: 0.001 - N_2O: 0.001	kg CO_2eq of CO_2/dm^3 kg CO_2eq of CH_4/dm^3 kg CO_2eq of N_2O/dm^3	https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023
	SC 1.2: Mobile combustion	1. Car – gasoline: - CO_2: 0.391 - CH_4: $1.5 \cdot 10^{-5}$ - N_2O: $7.9 \cdot 10^{-6}$ 2. Car – diesel: - CO_2: 0.451 - CH_4: $5.0 \cdot 10^{-7}$ - N_2O: $1.0 \cdot 10^{-6}$ 3. Light vehicle – diesel: - CO_2: 0.627 - CH_4: $1.0 \cdot 10^{-6}$ - N_2O: $1.5 \cdot 10^{-6}$	kg CO_2/mile kg CH_4/mile kg N_2O/mile kg CO_2/mile kg CH_4/mile kg N_2O/mile kg CO_2/mile kg CH_4/mile kg N_2O/mile	https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fghgprotocol.org%2Fsites%2Fdefault%2Ffiles%2F2023-05%2FEmission_Factors_from_Cross_Sector_Tools_March_2017%2520%25281%2529.xlsx&wdOrigin=BROWSELINK
C 2: Indirect GHG emissions	SC 2.1: Imported electricity	- CO_2eq: 0.316 - CO_2eq: 0.000	kg CO_2eq/kWh kg CO_2eq/kWh	https://www.carbondi.com/#electricity-factors/?view_363_search=italy&view_363_page=1 Assumption based on the concept of “market-based mechanism”.
C 3: Indirect GHG emissions from transportation	SC 3.1: Upstream transportation and distribution	1. Devices and equipment for cutting tools and machine tool and rolling mills - CO_2eq: 0.029 2. Agricultural, pharmaceutical, industrial and commercial chemical products - CO_2eq: 0.014 3. Computers and related parts, conductors, measurement and communication devices - CO_2eq: 0.010	kg CO_2eq/€	https://catalog.data.gov/dataset/supply-chain-ghg-emission-factors-for-us-commodities-and-industries-v1-1-1

		4. Food products, beverages and tobacco - CO_2eq: 0.016 5. Office supplies - CO_2eq: 0.126 6. Clothing and leather goods - CO_2eq: 0.026 7. Various fabricated metal products - CO_2eq: 0.045 8. Plastic and rubber products - CO_2eq: 0.012 9. Manufactured pipes and fittings - CO_2eq: 0.037 10. Valves and fittings - CO_2eq: 0.036 11. Legal services - CO_2eq: 0.000		
	SC 3.3: Employee commuting	1. Car – Dimensions not available (fuel: not available) - CO_2: 0.1655 - CH_4: 0.0002 - N_2O: 0.0010	kg CO_2eq of CO_2/km kg CO_2eq of CH_4/km kg CO_2eq of N_2O/km	https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023
	SC 3.5: Business travels	1. Short-haul international flight (class: not available) - CO_2: 0.109 - CH_4: $1.1{\cdot}10^{-5}$ - N_2O: $9.2{\cdot}10^{-4}$ 2. Long-haul international flight (class: not available) - CO_2: 0.153 - CH_4: $1.1{\cdot}10^{-5}$ - N_2O: $1.3{\cdot}10^{-3}$ 3. Car – average dimensions (fuel: not available) - CO_2: 0.171 - CH_4: $1.7{\cdot}10^{-4}$ - N_2O: $1.0{\cdot}10^{-3}$ 4. Taxi - CO_2: 0.206 - CH_4: $4.6{\cdot}10^{-6}$ - N_2O: $1.7{\cdot}10^{-3}$	kg CO_2eq of CO_2/passenger·km kg CO_2eq of CH_4/passenger·km kg CO_2eq of N_2O/passenger·km kg CO_2eq of CO_2/passenger·km kg CO_2eq of CH_4/passenger·km kg CO_2eq of N_2O/passenger·km kg CO_2eq of CO_2/km kg CO_2eq of CH_4/km kg CO_2eq of N_2O/ km kg CO_2eq of CO_2/km kg CO_2eq of CH_4/km kg CO_2eq of N_2O/ km	https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023
C 4: Indirect GHG emissions from used products	SC 4.1: Purchased simple goods	1. Clothing and leather goods - CO_2eq: 0.053 2. Office supplies - CO_2eq: 0.224 3. Metallic minerals, dimensional stones and non-metallic minerals - CO_2eq: 1.043 4. Agricultural, pharmaceutical, industrial and commercial chemical products - CO_2eq: 0.420 5. Paper products and paper production plants - CO_2eq: 0.458 6. Primary iron, steel and ferroalloy products - CO_2eq: 1.059	kg CO_2eq/€	https://catalog.data.gov/dataset/supply-chain-ghg-emission-factors-for-us-commodities-and-industries-v1-1-1

		7. Various fabricated metal products - CO_2eq: 0.318 8. Plastic and rubber products - CO_2eq: 0.294 9. Wood products - CO_2eq: 0.219 10. Plumbing fixtures, faucets, valves and other metal fittings - CO_2eq: 0.152 11. Manufactured pipes and fittings - CO_2eq: 0.352 12. Food products, beverages and tobacco - CO_2eq: 0.714 13. Medical supplies, sporting and entertainment goods, fashion items and promotional products - CO_2eq: 0.091		
	SC 4.2: Purchase capital goods	1. Devices and equipment for cutting tools and machine tool and rolling mills - CO_2eq: 0.245 2. Material handling equipment - CO_2eq: 0.271 3. Computers and related parts, conductors, measurement and communication devices - CO_2eq: 0.040 4. Capacitors, resistors, coils, transformers, connectors and other - CO_2eq: 0.146 5. Lights and chandeliers, electrical panels, transformers and household appliances - CO_2eq: 0.177 6. Machinery, excluding computers - CO_2eq: 0.183	kg CO_2eq/€	https://catalog.data.gov/dataset/supply-chain-ghg-emission-factors-for-us-commodities-and-industries-v1-1-1
	SC 4.3: Purchase services	1. Support services for industrial activities - CO_2eq: 0.274 2. Electricity, natural gas, drinking water and wastewater treatment - CO_2eq: 2.847 3. Legal services - CO_2eq: 0.056 4. Professional and technical-scientific services - CO_2eq: 0.136 5. Rental and leasing of non-financial goods, equipment, vehicles and intangible assets - CO_2eq: 0.087 6. Business and corporate management services - CO_2eq: 0.104	kg CO_2eq/€	https://catalog.data.gov/dataset/supply-chain-ghg-emission-factors-for-us-commodities-and-industries-v1-1-1

	SC 4.4: Treatment of solid and liquid waste	1. Washing waters/solutions Disposal/purification - CO_2eq: 0.201 2. Paper and cardboard Open-loop recycling - CO_2eq: 0.000 3. Debris/aggregates Open-loop recycling - CO_2eq: 0.985 4. Metal – mixed-material containers and cans Open-loop recycling - CO_2eq: 21.281 5. Wood products Open-loop recycling - CO_2eq: 0.00 6. Metal waste Open-loop recycling - CO_2eq: 21.281 7. Plastic-average Open-loop recycling - CO_2eq: 21.28 8. Waste from commercial and industrial activities Open-loop recycling - CO_2eq: 0.00 Landfill - CO_2eq: 520.335 9. Small-sized electrical and electronic equipment Open-loop recycling - CO_2eq: 21.281	kg CO_2eq/t	https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

5. Results and discussion

5.1 GHG emissions

The fossil CO_2eq emissions for each category are shown in **Table 5**. For comparison, results are reported for the 2023 and 2024, and in both absolute and relative terms (t and %, respectively).

Table 5: GHG emissions (t; %) for each category: comparison between 2023 and 2024.

Category (C)	Emissions				
	2023		2024		Variation 2024-2023 (t; %)
	t	%	t	%	
C 1 – Direct GHG emissions	469.4	16.2%	772.0	6.8	+ 302.6 (+ 64.5%)
C 2 – Indirect GHG emissions from imported energy	0.0	0.0%	0.0	0.0	0.0 (0.0%)
C 3 – Indirect GHG emissions from transportation	130.1	4.5%	109.5	1.0	- 20.6 (- 15.8%)
C 4 – Indirect GHG emissions from used products	2298.7	79.3%	10507.0	92.3	+ 8208.3 (+ 357.1%)
Total	**2898.1**	**100.0%**	**11388.5**	**100.0%**	+ 8490.4 (+ 293.0%)

Table 6 shows the emissions for **each subcategory**. Results are reported in both absolute and relative terms (t, % of the total of the category and % of the total of the Inventory).

Table 6: GHG emissions (t; %) for each subcategory.

Subcategory (SC)	Category (C)	Emissions		
		t	%	
			Of the category	Of the total
SC 1.1 – Stationary combustion	C 1	760.7	98.5%	6.7%
SC 1.2 – Mobile combustion		11.4	1.5%	0.1%
SC 2.1 – Imported electricity	C 2	0.0	0.0%	0.0%
SC 3.1 – Upstream transportation and distribution	C 3	11.7	10.7%	0.1%
SC 3.3 – Employee commuting		73.0	66.7%	0.6%
SC 3.5 – Business travels		24.8	22.6%	0.2%
SC 4.1 – Purchased simple goods	C4	6038.3	57.5%	53.0%
SC 4.2 – Purchased capital goods		3022.7	28.8%	26.5%
SC 4.3 – Purchased services		1445.2	13.8%	12.7%
SC 4.4 – Treatment of solid and liquid waste		0.7	0.0%	0.0%
Total	**-**	**11388.5**	**-**	**100.0%**

Table 7 shows, for each subcategory, the emissions subdivided – where possible – as **CO_2, CH_4 and N_2O** expressed as CO_2eq through the parameter **GWP** for a time period of **100 years** and equal to 1.0, 28.0 and 265.0 for CO_2, CH_4 and N_2O, respectively (IPCC Fifth Assessment Report, 2014).

Table 7: Emissions of CO_2, CH_4 and N_2O expressed as CO_2eq.

Subcategory (SC)	Category (C)	Emissions			
		CO_2 (kg)	CH_4 (kg)	N_2O (kg)	Total (t)
SC 1.1 – Stationary combustion	C 1	759573.5	662.0	421.3	760.7
SC 1.2 – Mobile combustion		11365.6	0.08	0.06	11.4
SC 2.1 – Imported electricity	C 2	0.0	0.0	0.0	0.0
SC 3.1 – Upstream transportation and distribution	C 3	-	-	-	11.7
SC 3.3 – Employee commuting		72483.8	83.4	428.5	73.0
SC 3.5 – Business travels		21483.1	2.5	178.6	24.8[a]
SC 4.1 – Purchased simple goods	C 4	-	-	-	6038.3
SC 4.2 – Purchased capital goods		-	-	-	3022.7
SC 4.3 – Purchased services		-	-	-	1445.2
SC 4.4 – Treatment of solid and liquid waste		-	-	-	0.7
Total					**11388.5**

[a]The total value is higher than the sum of the individual GHG values because it also includes emissions associated with hotel overnight stays, whereas the emissions of the individual gases refer only to the transportation.

The total GHG emissions are equal to **11388.5 t CO_2eq**, representing a considerable increase of nearly 293.0% compared to 2898.1 t CO_2eq in 2023. This substantial growth is primarily driven by **Category 4 — indirect emissions associated with purchased goods and services** — which accounts for **92.3% of total emissions** in 2024, up from 79.3% in 2023. The increase in Category 4 emissions, from 2298.7 t CO_2eq to 10507.0 t CO_2eq reflects a **considerable expansion of upstream supply chain emissions**, likely due to the increased procurement quantity.

A more detailed analysis at the subcategory level shows that emissions from purchased simple goods (SC 4.1) amount to 6038.3 t CO_2eq, representing **57.5% of Category 4 and 53.0% of the total emissions**. Purchased capital goods (SC 4.2) and purchased services (SC 4.3) contribute for **3022.7 t CO_2eq** and **1445.2 t CO_2eq**, respectively, together accounting for nearly **40% of total emissions**. Emissions related to the treatment of solid and liquid waste (SC 4.4) can be considered negligible.

Direct emissions (Category 1) increase from **469.4 t CO_2eq** in 2023 to **772.0 t CO_2eq** in 2024, though their relative share decreased from 16.2% to 6.8% of total emissions. These direct emissions are almost entirely due to stationary combustion (SC 1.1), which accounts for **760.7 t CO_2eq** (98.5% of Category 1), with mobile combustion (SC 1.2) contributing a minor **11.4 t CO_2eq** (1.5%). The increase in direct emissions reflect an intensified operational activity and thus a higher fossil fuel consumption; however, their decreasing proportional share highlights the increasing dominance of supply chain emissions.

Category 3, related to transportation and distribution, amount to 109.5 t CO_2eq (1.0% of the total emissions). This includes upstream transportation and distribution (SC 3.1) at 11.7 t CO_2eq, employee commuting (SC 3.3) at 73.0 t CO_2eq, and business travel (SC 3.5) at 24.8 t CO_2eq. Employee commuting is the largest contributor within this category, indicating potential for targeted reduction strategies; for this, Valland promote (if possible) remote work, and in the **future compressed workweeks** could also be taken into account to reduce daily travelling. Business travel emissions are manged by prioritizing, whenever possible, **virtual meetings** and setting (when possible) **internal limits on the number of trips**.

The Company profile is marked by a sharp increase largely driven by upstream procurement emissions. While direct emissions and transportation-related emissions have increased and decreased, respectively, their proportion on the total emissions is now lower due to the considerable rise in Category 4. These findings highlight the dominant role of upstream procurement activities in shaping the Company's overall carbon footprint, emphasizing **supplier engagement** and **sustainable procurement** as **critical areas** for future emission reduction efforts.

Emissions from upstream transportation and distribution are considerably lower than those related to employee commuting and business travel. This disparity can be attributed to two main factors. Firstly, business travel emissions are influenced by the substantial number of trips undertaken during the year, while commuting emissions are estimated based on the assumption that each employee travels to the Company using premises by private car every working day of the year. Secondly, emissions from upstream transportation and distribution are calculated using a **"spend-based emission factor"** approach, which does not directly incorporate specific parameters such as the distance travelled, weight of goods transported, or characteristics of the used vehicles.

Although the economic-based approach facilitates a rapid estimation of emissions in the absence of detailed transportation data, it introduces a **considerable degree of uncertainty**. The core assumption behind the spend-based emission factors is that emissions are directly proportional to the monetary expenditure of goods or services. While this assumption may hold in certain cases, it can lead to either underestimation or overestimation of actual emissions. For example, transporting goods over long distances by air or sea typically results in substantially higher emissions compared to short-distance haulage by rail or road. However, such distinctions are not reflected in the spend-based approach, necessitating cautious interpretation of the results.

With regard to emissions associated with purchased goods and services, assuming that reducing procurement volumes is not a viable option, emissions reduction can still be achieved through alternative strategies. These include: (i) optimizing resource use by aligning purchases with actual needs and minimizing waste; (ii) prioritizing the procurement of goods with lower embedded emissions from production and logistics and, when applicable, (iii) choosing products made from recycled or renewable materials, such as FSC-certified wood, recycled plastics or recycled metals. These actions, while not reducing the quantity of goods purchased, can contribute to a considerable reduction in associated upstream emissions.

At the end of 2023-beginning of 2024, the Company has installed a **223 kWp photovoltaic system** on the warehouses roofs (524 modules of 425 Wp each), marking a significant step in reducing the reliance on the grid electricity. The system operates under a **"partial transfer model"**, meaning that the energy which is instantaneously not consumed on-site is fed into the national grid and managed through the Energy Service Magager (Gestore dei Servizi Energetici, GSE) framework. This initiative offsets the increased electricity demand from the grid and enhances the renewable energy share without compromising operations.

In 2024, 42% approximately of the total consumption (i.e., 120 MWh) has been covered by the photovoltaic system, while the remaining 58% has been purchased from a certified supplier that guarantees the exclusive use of renewable energy sources (hydropower, wind, and solar). This procurement mechanism, known as **"market-based"** attributes the origin of the electricity **to specific contractual agreements (one-to-one contracts)**. The electricity consumed is still physically drawn from the national grid – which comprises a "mix" of fossil and renewable sources. The energy consumption in 2024 would have resulted in 55.0 tons of CO_2eq emissions, approximately; however, under the "market-based" approach, these **emissions can be considered offset (albeit at different times and locations) by an equivalent amount of renewable energy generated elsewhere**. As a result, emissions associated to the national grid electricity generation can be considered equal to **0.0 tons of CO_2eq from an accounting perspective only**. All these aspects, combined with the fact that Valland has never purchased natural gas, have enhanced the low-carbon energy profile of the Company and inspires it to continue to be a leader in environmental stewardship.

Compared to 2023, the Company has achieved a reduction in national grid energy use of 37.2%, and of 28.0% in GHG emissions, thanks to the full operation of the photovoltaic system.

Table 8, **Table 9** and **Table 10** show the fraction (%) of monetary expenditures and GHG emissions related to each type of purchased simple good, services and capital good, respectively.

Analysing the relationship between the fraction of monetary expenditure and the fraction of emissions for different types of goods and services is useful, as certain goods or services might represent a small share of expenditures but contribute considerably to emissions, and vice-versa. Identifying such relations can help the Company to focus on those with the **highest emission-to-expenditure ratio**, allowing targeted reductions in areas where the environmental impact outweighs the financial input.

For this specific case, the proportionality is substantially reflected: the goods/services representing the larger fraction of monetary expenditure also represent the larger fraction of emissions, even if with some contrasting situations. For example, for the fabricated metal products, the fraction of emissions is considerably higher than the fraction of monetary expenditure, whereas for plumbing fixtures, faucets, valves and other metal fittings, the situation is the opposite: the fraction of emissions is considerably lower than the fraction of monetary expenditure.

Table 8: Fraction (%) of monetary expenditure and emissions for purchased simple goods[a].

Type of purchased simple good	Fraction (%)	
	Expenditure	Emissions
Various fabricated metal products	67.3%	79.3%
Plumbing fixtures, faucets, valves and other metal fittings	29.5%	16.5%
Plastic and rubber products	1.6%	1.7%
Wood products	1.0%	0.8%
Metallic minerals, dimensional stones and non-metallic minerals	0.3%	1.0%
Agricultural, pharmaceutical, industrial and commercial chemical products	0.2%	0.3%
Primary iron, steel and ferroalloy products	0.1%	0.3%
Clothing and leather goods	0.0%	0.0%
Office supplies	0.0%	0.0%
Food products, beverages and tobacco	0.0%	0.0%
Manufactured pipes and fittings	0.0%	0.0%
Paper products and paper production plants	0.0%	0.0%
Medical supplies, sporting and entertainment goods, fashion items and promotional products	0.0%	0.0%

[a]Upstream activities related to fuels and energy have been excluded.

Table 9: Fraction (%) of monetary expenditure and emissions for purchased services.

Type of purchased service	Fraction (%)	
	Expenditure	Emissions
Support services for construction activities	88.0%	93.6%
Professional and technical-scientific services	11.9%	6.3%
Legal services	0.0%	0.0%
Rental and leasing of non-financial goods, equipment, vehicles and intangible assets	0.0%	0.0%
Business and corporate management services	0.0%	0.0%
Electricity, natural gas, drinking water and wastewater treatment	0.0%	0.0%

Table 10: Fraction (%) of monetary expenditure and emissions for purchased capital goods.

Type of purchased capital good	Fraction (%)	
	Expenditure	Emissions
Machinery, excluding computers	76.4%	79.9%
Capacitors, resistors, coils, transformers, connectors and other	22.9%	19.2%
Devices and equipment for cutting tools and machine tool and rolling mills	0.4%	0.5%
Material handling equipment	0.2%	0.4%
Computers and related parts, conductors, measurement and communication devices	0.1%	0.0%
Lights and chandeliers, electrical panels, transformers and household appliances	0.0%	0.0%

To ensure complete transparency and interpretation, **Figure 1** and **Figure 2** show the comparison of the emissions in accordance with the GHG Protocol for 2023 and 2024. In **Figure 1**, the emissions are aggregated at the Scope level, whereas in **Figure 2** the emissions are subdivided for the Scope 3 categories (§ **Table 1**).

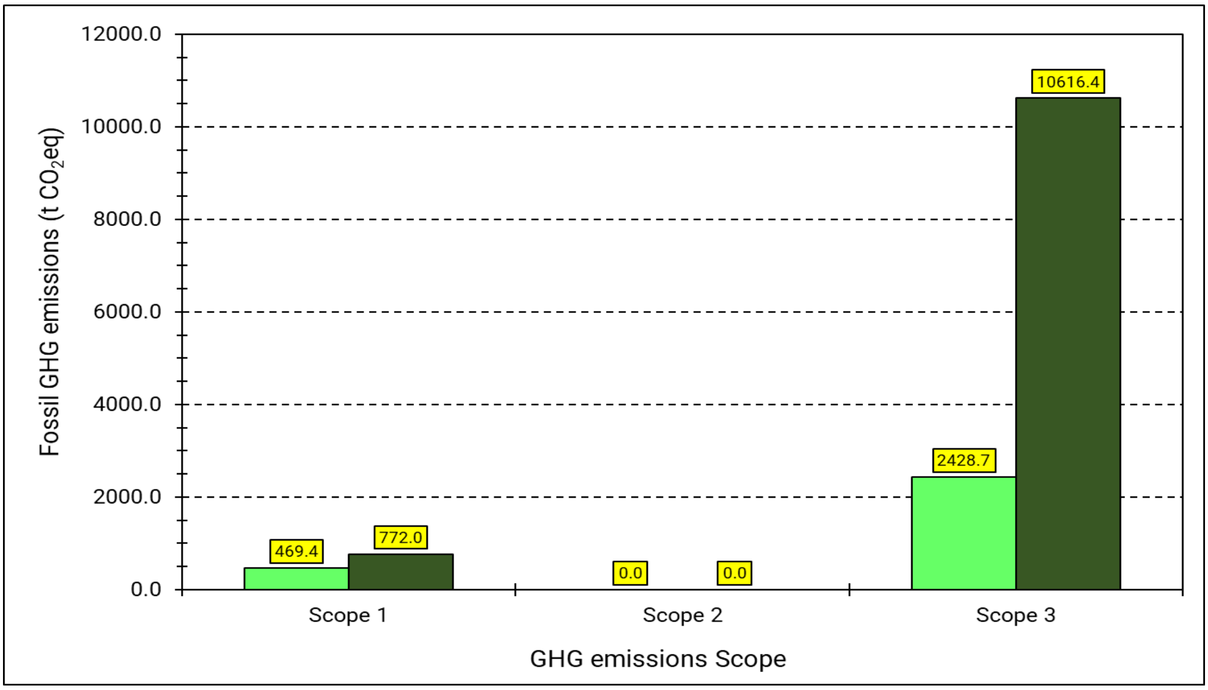

Figure 1: GHG emissions for each Scope: comparison between 2023 (light green) and 2024 (green).

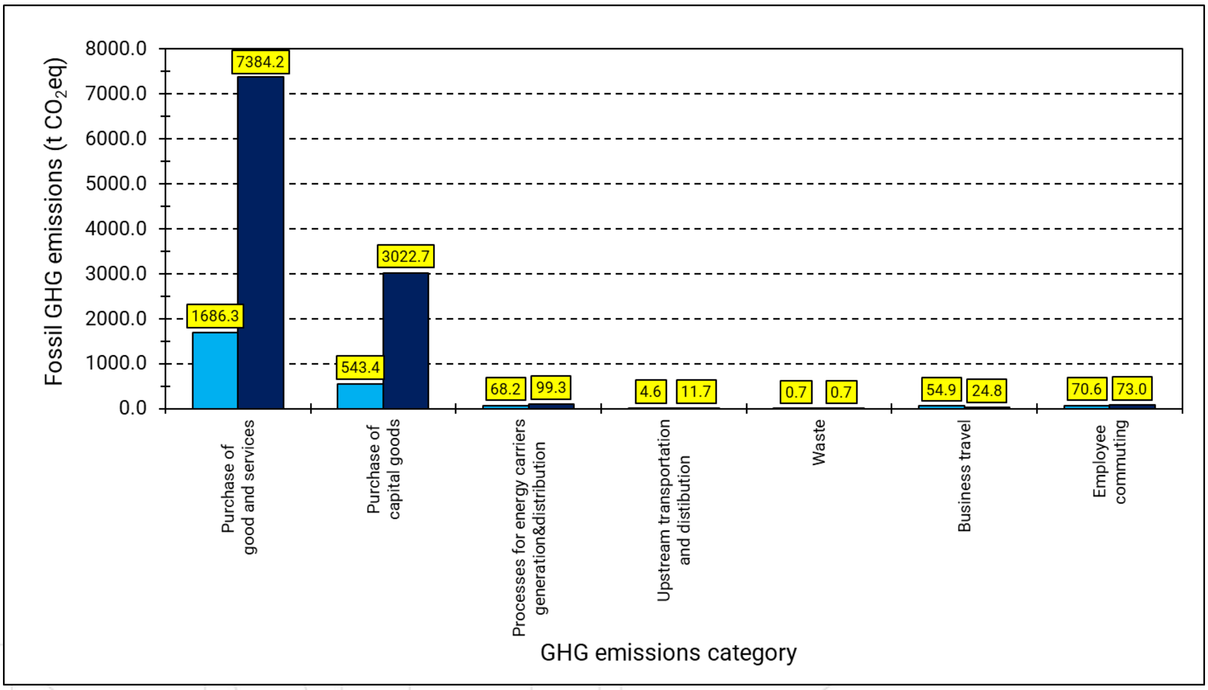

Figure 2: GHG emissions for each Scope 3 category: comparison between 2023 (light blue) and 2024 (blue).

Direct (Scope 1) and indirect (Scope 3) GHG emissions have been equal to 6.8% and 93.2% of the total, respectively, for 2024, and for 16.2% and 83.8% of the total, respectively, for 2023.

5.2 Energy intensity and emissions intensity

During the reporting period, the **total energy consumption** has been equal to **12535427 MJ** (3482063 kWh), including the **purchased electricity**[15] (**699986 MJ**; 174996 kWh), **LPG for heating** the AM warehouse (**11712276 MJ**; 488500 dm^3)[16] as well as **gasoline** (13408 MJ; 452 dm^3)[17] and **diesel fuel** (**109757 MJ**; 2960 dm^3)[18] for the Company vehicles. Compared to 2023, there has been a decrease in electricity consumption and in fuel use for the Company vehicles, but a considerable increase in the consumption of LPG for heating. This has resulted in an overall increase in Valland's energy consumption of approximately 52.8%.

The **energy efficiency** has been evaluated through the **energy intensity**, computed as the ratio between total energy consumption, expressed as **"primary energy"** in **tons of oil equivalent**[19] (toe), and the total monetary expenditure (€) for the purchase of goods, services, and capital goods (most important categories in terms of emissions; upstream fuel and energy activities excluded). For the reporting period, the energy intensity value has been equal to **6.7×10^{-6} toe/€**, -67.7% compared to 2023: while the overall energy consumption (MJ) has increased, the monetary expenditure (€) on goods and services and capital goods has increased more than proportionally (+372.6% in 2024 compared to 2023).

As for the energy use, the **emissions intensity** has been computed as the ratio between the total emissions (Scope 1 + Scope 2 + Scope 3) and the total monetary expenditure (€) for the purchase of goods, services, and capital goods. For 2024 this indicator has been equal to **$2.6 \cdot 10^{-4}$ t CO_2eq/€** (-16.9% compared to 2023). The emission intensity has decreased because the increase in monetary expenditure for the purchase of goods and services and capital goods has been higher than the increase in the corresponding emissions (+372.6% and +292.9%, respectively). In other words, while the total emissions have grown, they have not kept pace with the monetary expenditure increase, suggesting a relative decarbonization in the economic activity: each euro spent now corresponds to fewer emissions compared to the previous year.

5.3 Comparative Analysis of Emission Intensity Against EU Oil&Gas Benchmarks

The Corporate Carbon Footprint of the **major integrated European Oil&Gas Companies** is predominantly dominated by Scope 3 emissions, which account for approximately 90% of the total emissions. These emissions primarily arise from the end-use combustion of the sold energy products (e.g., oil, gas, and petroleum derivatives). In contrast, Scope 1 and Scope 2 emissions represent only 10-20% of the total.

Despite recording substantial profits in recent years, the proportion of investments allocated to low-emission technologies and green initiatives remains limited. The main strategies of the major European Oil&Gas Companies mainly focus on reducing **carbon intensity rather reducing the absolute value of emissions**. This approach could lead to a **misleading interpretation**, because emission intensity might decrease even if the total emissions increase. Furthermore, few operators

15 Self-produce energy through the photovoltaic system has not been included in the calculation as it is renewable, with an environmental impact equal to 0.0 kg CO_2/kWh for the use phase.
16 A lower heating value of LPG derived from literature and equal to 6.66 kWh/dm^3 has been used.
17 A lower heating value of gasoline derived from literature and equal to 8.24 kWh/dm^3 has been used.
18 A lower heating value of diesel derived from literature and equal to 10.30 kWh/dm^3 has been used.
19 Tons of oil equivalent (toe) represent a unit of energy measurement used to compare different energy sources by converting them to a common energy value equivalent to the amount of energy contained in one ton of crude oil. 1 toe = 41.87 GJ = 11.63 MWh.

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set binding targets for Scope 3 emissions, even though these kinds of emissions represent the core of their climate impact.

For **Scope 1 and Scope 2**, ambitious reduction targets exist, with goals ranging from **30% to over 50% by 2030**. However, because Scope 1 and 2 emissions constitute only a minor share of the total, even considerable reductions in these categories have a limited effect on the overall carbon footprint.

Notable differences occur by comparing this situation with that of Valland, in both emission structure and emission intensity (normalized on the revenue). Valland's emission profile for 2024 shows a similar structure: Scope 3 accounts for 92.3% of total emissions (10507.0 t CO_2eq out of 11388.5 t CO_2eq). Its Scope 3 emissions are dominated by Category 4 (purchased goods and services), reflecting emissions embedded in materials, products, and services, which is a typical situation of a manufacturing Company. When looking at emission intensity normalized by economic output, striking differences emerge. **Valland's emission intensity** is **$3.2 \cdot 10^{-4}$ t CO_2eq/€ of revenue** (0.34 kg/€ of revenue) which is **considerably lower** than the range observed for major European Companies, i.e., between $1.8 \cdot 10^{-3}$ and $5.0 \cdot 10^{-3}$ t CO_2eq/€ of revenue (1.8 and 5.0 kg/€ of revenue, respectively). This means that Valland emits **between 5 and 15 times less CO_2eq**. Despite operating at smaller volumes, Valland maintains a low-intensity footprint and a less impactful supply chain per €.

However, reliance on Scope 3 emissions remains a **structural similarity across both Valland and large Companies**, on relative terms, suggesting that an effective mitigation strategy must necessarily **address supply chain emissions** through interventions involving suppliers, procurement criteria, and the selection of lower-impact materials.

6. Inventory quality management

6.1 GHG information management procedure

All information used in the preparation of the GHG Inventory Report is managed in line with the **general principles outlined in ISO 14064-1**, namely relevance, completeness, consistency, accuracy, and transparency. Additionally, the Company's internal criteria for including or excluding specific categories and subcategories (§ 3.2 Emissions categories and selection criteria) are carefully applied. These procedures are designed to support the primary objective of the Inventory: ensuring the quality and reliability of the data. Errors and omissions are **systematically identified** and corrected to maintain consistency.

6.2 Document retention and record keeping

The Company follows a structured approach to ensure the effective collection and storage of all the data required for the GHG Inventory. All the data are handled in full compliance with the Company's internal procedures for GHG information management, particularly those relating to document retention and record keeping. This ensures the **traceability, integrity, and accessibility of information** essential for consistency, verification and long-term maintenance of the Inventory.

6.3 Uncertainty analysis

GHG Inventories are inherently subject to uncertainty, which can broadly be categorized into: (i) **scientific uncertainty** and (ii) **from estimation**. Scientific uncertainty is generally beyond the scope of Company-level inventory efforts, as it arises when the underlying processes driving emissions or removals are not fully understood.

Estimation uncertainty is further subdivided as **model uncertainty** (i.e., linked to the choice and structure of mathematical equations/approaches) and **parameter uncertainty** (i.e., related to the quality and accuracy of input data).

Parameter uncertainty is classified as **systematic** (biases due to faulty methods or equipment) or **statistical** (random errors due to natural variability in measurements). While systematic biases are harder to quantify, they can be identified and mitigated through robust data quality systems. Statistical uncertainty, on the other hand, can be measured through repeated sampling or analysis of empirical data.

For this GHG Report, the **GHG Protocol uncertainty tool**[20] has been applied. The tool is based on the so-called "first order error propagation method", which allows to mathematically combine the uncertainties associated with individual parameters (such as activity data and emission factors) in order to obtain an aggregated uncertainty value for the overall Inventory. The method is based on the following assumptions:

- Errors in each parameter are normally distributed (i.e., Gaussian distribution).
- There are no biases in the estimator function (i.e. the estimated value is the mean value).
- The estimated parameters are not correlated (i.e., all parameters are fully independent).
- Individual uncertainties in each parameter is lower that 60% of the mean.

In the tool, the uncertainty is calculated for both **direct and indirect (i.e., estimated) measured emissions**. Then, the tool provides an aggregated uncertainty value for the total of all the direct and indirect measured emissions, ranking it according to a summary scale based on quantitative confidence intervals, which represents the range of variability within which the real value of emissions is expected to exist. The final result consists of an assessment of the level of accuracy of the results (emissions), as follows (**Table 11**):

Table 11: Level of accuracy of the results.

Level of accuracy	Interval (I) as percentage of mean value
High	-5.0% ≤ I ≤ +5.0%
Good	±5.0% < I ≤ ±15.0%
Fair	±15.0% < I ≤ ±30.0%
Poor	I > 30.0%

For the current Inventory, all the emissions have been estimated (i.e., indirect measurement). The uncertainty has been computed according to:

- Activity data (e.g., quantity of used fuel).

20 https://ghgprotocol.org/sites/default/files/tools/ghg-uncertainty.xlsx

- Uncertainty of the activity data (confidence interval expressed as percentage).
- Emission factors.
- Uncertainty of the emissions factors (confidence interval expressed as percentage).

Overall, the uncertainty value is equal to **± 4.9% (level of accuracy: high)**. This indicates a **strong quality of the data** used and demonstrates that the emissions estimation process has been performed with **methodological rigor**. Moreover, this level of accuracy provides high reliability to the Inventory, making it suitable for sustainability reporting, transparent communication with the Stakeholders and the development of decarbonization strategies based on trustworthy data. Further information on input data and emission factors can be found in **Annex A1**.

7. Mitigation activities

No mitigation activities are actually put in place; purchasing of verified carbon credits from certified offset projects or supporting low-carbon technologies or partnerships that contribute to global emission reductions might be considered in the future.

8. Variations in the methodological approach

Any integrations or improvements to the current version of the model may be introduced for the following years, also according to any change in the reporting boundaries (§ 3. Reporting boundaries).

9. Additional information

There is no additional information to declare.

10. Annexes

10.1 A1: Uncertainty analysis

Table A1.1 shows the data used to estimate the uncertainty for the indirect measured emissions.

	Step 1+2						Step 3					
	A	B	C	D	E	F	G	H	I	J	K	L
	Activity Data	Unit used to measure Activity Data	Uncertainty of activity data (a) (Confidence interval expressed in ± percent)	GHG emission factor	Unit of GHG emission factor	Uncertainty of emission factor (Confidence interval expressed in ± percent)	CO2 emissions (kg)	CO_2 emissions in metric tonnes	Uncertainty of calculated emissions	Certainty Ranking	Auxiliary Variable 1	Auxiliary Variable 2
							A * D	G/1000			(H*I)	K^2
Source description												
S C 1.1: Stationary combustion	488500.0	dm^3	+/- 0.0%	1.5570	kg $CO2eq/dm^3$	+/- 5.0%	760594.5	760.6	+/- 5.0%	High	38.0	1446.3
S C 1.2: Mobile combustion	7483.0	km	+/- 0.0%	0.2463	kg CO2eq/km	+/- 5.0%	1843.0	1.8	+/- 5.0%	High	0.1	0.0
S C 1.2: Mobile combustion	17986.0	km	+/- 0.0%	0.2821	kg CO2eq/km	+/- 5.0%	5074.2	5.1	+/- 5.0%	High	0.3	0.1
S C 1.2: Mobile combustion	1679.5	dm^3	+/- 0.0%	2.6832	kg $CO2eq/dm^3$	+/- 5.0%	4506.4	4.5	+/- 5.0%	High	0.2	0.1
S C 2.1: Imported electricity	174996.0	kWh	+/- 0.0%	0.0000	kg CO2eq/kWh	+/- 0.0%	0.0	0.0	+/- 0.0%	High	0.0	0.0
SC 3.1: Upstream transportation and distribution	1755.0	€	+/- 0.0%	0.0295	kg CO2eq/€	+/- 10.0%	51.8	0.1	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	1788.1	€	+/- 0.0%	0.0142	kg CO2eq/€	+/- 10.0%	25.5	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	75.7	€	+/- 0.0%	0.0102	kg CO2eq/€	+/- 10.0%	0.8	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	270.9	€	+/- 0.0%	0.0163	kg CO2eq/€	+/- 10.0%	4.4	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	13.1	€	+/- 0.0%	0.1261	kg CO2eq/€	+/- 10.0%	1.6	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	48.0	€	+/- 0.0%	0.0264	kg CO2eq/€	+/- 10.0%	1.3	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	254059.4	€	+/- 0.0%	0.0448	kg CO2eq/€	+/- 10.0%	11371.2	11.4	+/- 10.0%	Good	1.1	1.3
SC 3.1: Upstream transportation and distribution	390.3	€	+/- 0.0%	0.0122	kg CO2eq/€	+/- 10.0%	4.8	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	480.0	€	+/- 0.0%	0.0366	kg CO2eq/€	+/- 10.0%	17.6	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	5874.3	€	+/- 0.0%	0.0356	kg CO2eq/€	+/- 10.0%	209.1	0.2	+/- 10.0%	Good	0.0	0.0
SC 3.1: Upstream transportation and distribution	120.0	€	+/- 0.0%	0.0000	kg CO2eq/€	+/- 10.0%	0.0	0.0	+/- 10.0%	Good	0.0	0.0
SC 3.3: Employee commuting	438048.0	km	+/- 15.0%	0.1666	kg CO2eq/km	+/- 5.0%	72995.7	73.0	+/- 15.8%	Fair	11.5	133.2
SC 3.5: Business travels	8870.0	km	+/- 10.0%	0.1725	kg CO2eq/km	+/- 5.0%	1529.7	1.5	+/- 11.2%	Good	0.2	0.0
SC 3.5: Business travels	2305.0	km	+/- 10.0%	0.2081	kg CO2eq/km	+/- 5.0%	479.6	0.5	+/- 11.2%	Good	0.1	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	174996.0	kWh	+/- 0.0%	0.0499	kg CO2eq/kWh	+/- 10.0%	8726.7	8.7	+/- 10.0%	Good	0.9	0.8
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	488500.0	dm^3	+/- 0.0%	0.1855	kg $CO2eq/dm^3$	+/- 10.0%	90621.6	90.6	+/- 10.0%	Good	9.1	82.1
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	4780.2	€	+/- 0.0%	0.2238	kg CO2eq/€	+/- 10.0%	1069.8	1.1	+/- 10.0%	Good	0.1	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	669808.4	€	+/- 0.0%	0.1363	kg CO2eq/€	+/- 10.0%	91300.5	91.3	+/- 10.0%	Good	9.1	83.4
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	14785180.2	€	+/- 0.0%	0.3184	kg CO2eq/€	+/- 10.0%	4707481.7	4707.5	+/- 10.0%	Good	470.7	221603.8
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	4945686.6	€	+/- 0.0%	0.2736	kg CO2eq/€	+/- 10.0%	1353307.7	1353.3	+/- 10.0%	Good	135.3	18314.4
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	107.0	€	+/- 0.0%	2.8472	kg CO2eq/€	+/- 10.0%	304.5	0.3	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	351512.1	€	+/- 0.0%	0.2940	kg CO2eq/€	+/- 10.0%	103337.0	103.3	+/- 10.0%	Good	10.3	106.8
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	15450.0	€	+/- 0.0%	1.0589	kg CO2eq/€	+/- 10.0%	16360.5	16.4	+/- 10.0%	Good	1.6	2.7
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	41385.8	€	+/- 0.0%	0.4201	kg CO2eq/€	+/- 10.0%	17386.8	17.4	+/- 10.0%	Good	1.7	3.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	2392.1	€	+/- 0.0%	0.0559	kg CO2eq/€	+/- 10.0%	133.8	0.1	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	6483287.9	€	+/- 0.0%	0.1516	kg CO2eq/€	+/- 10.0%	982650.9	982.7	+/- 10.0%	Good	98.3	9656.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	56387.7	€	+/- 0.0%	1.0427	kg CO2eq/€	+/- 10.0%	58793.0	58.8	+/- 10.0%	Good	5.9	34.6
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	220613.9	€	+/- 0.0%	0.2187	kg CO2eq/€	+/- 10.0%	48249.1	48.2	+/- 10.0%	Good	4.8	23.3
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	7907.8	€	+/- 0.0%	0.0529	kg CO2eq/€	+/- 10.0%	418.3	0.4	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	869.2	€	+/- 0.0%	0.4578	kg CO2eq/€	+/- 10.0%	397.9	0.4	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	200.0	€	+/- 0.0%	0.1038	kg CO2eq/€	+/- 10.0%	20.8	0.0	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	275.0	€	+/- 0.0%	0.0905	kg CO2eq/€	+/- 10.0%	24.9	0.0	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	1720.7	€	+/- 0.0%	0.0875	kg CO2eq/€	+/- 10.0%	150.5	0.2	+/- 10.0%	Good	0.0	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	3060.0	€	+/- 0.0%	0.7141	kg CO2eq/€	+/- 10.0%	2185.1	2.2	+/- 10.0%	Good	0.2	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	1873.7	€	+/- 0.0%	0.3520	kg CO2eq/€	+/- 10.0%	659.5	0.7	+/- 10.0%	Good	0.1	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	13194789.1	€	+/- 0.0%	0.1831	kg CO2eq/€	+/- 10.0%	2415976.1	2416.0	+/- 10.0%	Good	241.6	58369.4
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	3958853.3	€	+/- 0.0%	0.1465	kg CO2eq/€	+/- 10.0%	579895.3	579.9	+/- 10.0%	Good	58.0	3362.8
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	39846.7	€	+/- 0.0%	0.2706	kg CO2eq/€	+/- 10.0%	10781.8	10.8	+/- 10.0%	Good	1.1	1.2
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	18882.3	€	+/- 0.0%	0.0397	kg CO2eq/€	+/- 10.0%	749.1	0.7	+/- 10.0%	Good	0.1	0.0
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	61035.5	€	+/- 0.0%	0.2452	kg CO2eq/€	+/- 10.0%	14963.0	15.0	+/- 10.0%	Good	1.5	2.2
SC 4.1, 4.2 and 4.3: Purchased goods and services and capital goods	1691.3	€	+/- 0.0%	0.1770	kg CO2eq/€	+/- 10.0%	299.4	0.3	+/- 10.0%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	12.0	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	255.4	0.3	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	3.5	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	75.1	0.1	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.2	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	4.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	520.3347	kg CO2eq/t	+/- 10.0%	52.0	0.1	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	520.3347	kg CO2eq/t	+/- 10.0%	67.6	0.1	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	520.3347	kg CO2eq/t	+/- 10.0%	26.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.3	t	+/- 10.0%	520.3347	kg CO2eq/t	+/- 10.0%	156.1	0.2	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	0.1	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.5	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	10.6	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.5	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.4	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.7	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	14.9	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	25.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.9849	kg CO2eq/t	+/- 10.0%	0.1	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.8	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.2	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	1.7	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.3	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.2	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.2	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	4.3	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	1.5	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.3	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	1.0	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	21.3	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	1.3	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	26.6	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.7	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	15.5	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.3	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.1	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	2.6	t	+/- 10.0%	0.2013	kg CO2eq/t	+/- 10.0%	0.5	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.0	t	+/- 10.0%	21.2808	kg CO2eq/t	+/- 10.0%	0.6	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	0.1	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	1.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
SC 4.4: Disposal of solid and liquid waste	30.0	t	+/- 10.0%	0.0000	kg CO2eq/t	+/- 10.0%	0.0	0.0	+/- 14.1%	Good	0.0	0.0
Note: For individual uncertainties greater than 60%, the results of the tool are not valid					Sum CO_2 emissions (M):		11365689.2	11365.7				
					Step 4: Cumulated Uncertainty:		$\pm u = \pm \frac{\sqrt{\sum_{i=1}^{n}(H_i * I_i)^2}}{M}$		+/- 4.9%	High		

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