



SAIF 上海高级金融学院
Shanghai Advanced Institute of Finance



2023

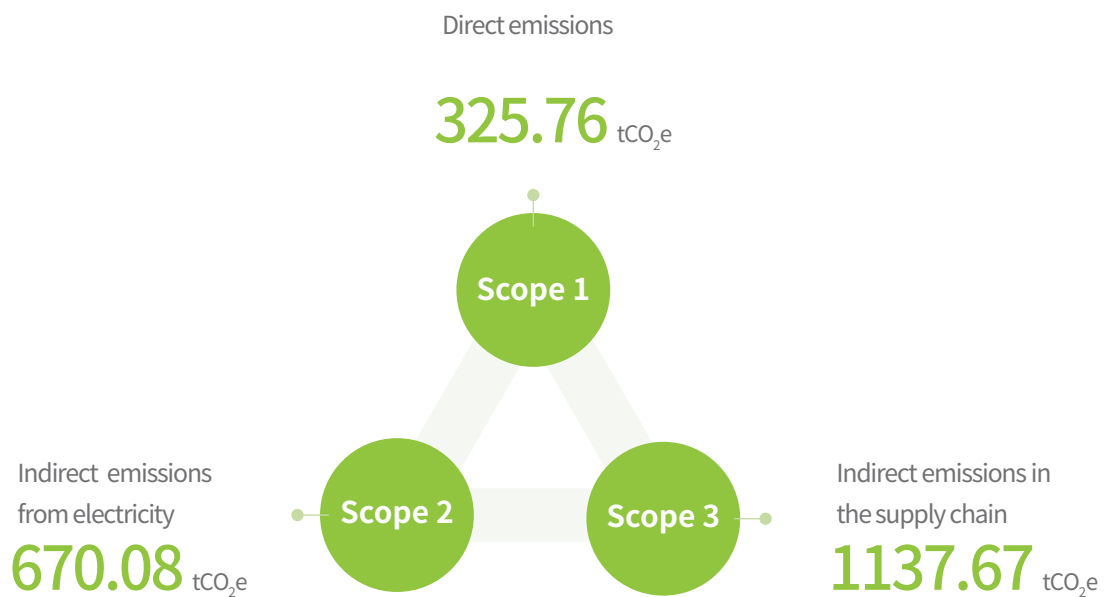
Carbon Inventory
Report

Overview

Amid the mounting challenges posed by climate change, global efforts to mitigate this critical issue have intensified. Widely acknowledged as one of the most pressing challenges of the 21st century, climate change has garnered broad recognition as a global imperative. In September 2020, China outlined its commitment to peak carbon emissions before 2030 and achieve carbon neutrality by 2060, underscoring the nation's proactive stance in addressing climate concerns.

In response to this global imperative, the national call for dual-carbon strategies, and the drive of our social responsibility, Shanghai Advanced Institute of Finance (SAIF) at Shanghai Jiao Tong University has undertaken a pivotal initiative. We have meticulously conducted a comprehensive greenhouse gas inventory report for the year 2023, aligning our efforts with sustainable development strategies and emission reduction targets. Our strategic roadmap entails the implementation of low-carbon development frameworks across our operational spectrum and supply chain, facilitating a systematic reduction in greenhouse gas emissions.

◆ The Greenhouse Gas Emissions of SAIF in 2023



Referencing Standard

SAIF adhered to the *Greenhouse Gas (GHG) Protocol and ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*. For calculating indirect emissions in Scope 3, the *Corporate Value Chain Accounting and Reporting Standard* by the GHG Protocol was employed. These standards ensure a robust and consistent approach to measuring and reporting greenhouse gas emissions, enabling SAIF to effectively track progress and make informed decisions to reduce its carbon footprint.

Carbon Accounting Boundary

Aligning with international standards and conventions, SAIF adopted the operational control approach to define emission activities. The greenhouse gas inventory was meticulously compiled based on emission sources and business activities within the organizational boundaries, encompassing the Shanghai Xuhui SAIF Building, the Beijing Center, and the Greater Bay Area Center. Any changes in organizational boundaries due to expansion or relocation will necessitate revisions to the inventory report.

In accordance with ISO 14064-1:2018, SAIF accounted for seven types of greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), nitrogen trifluoride (NF₃), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

Greenhouse gas emissions were quantified across Scopes 1, 2, and 3 based on the GHG Protocol guidelines. Scope 1 encompasses emissions from organizational activities owned or controlled by the reporting entity, while Scope 2 includes emissions from the consumption of purchased electricity, steam, heat, or cooling. Scope 3 accounts for other indirect emissions occurring in the value chain, covering upstream and downstream emissions not included in Scope 2.

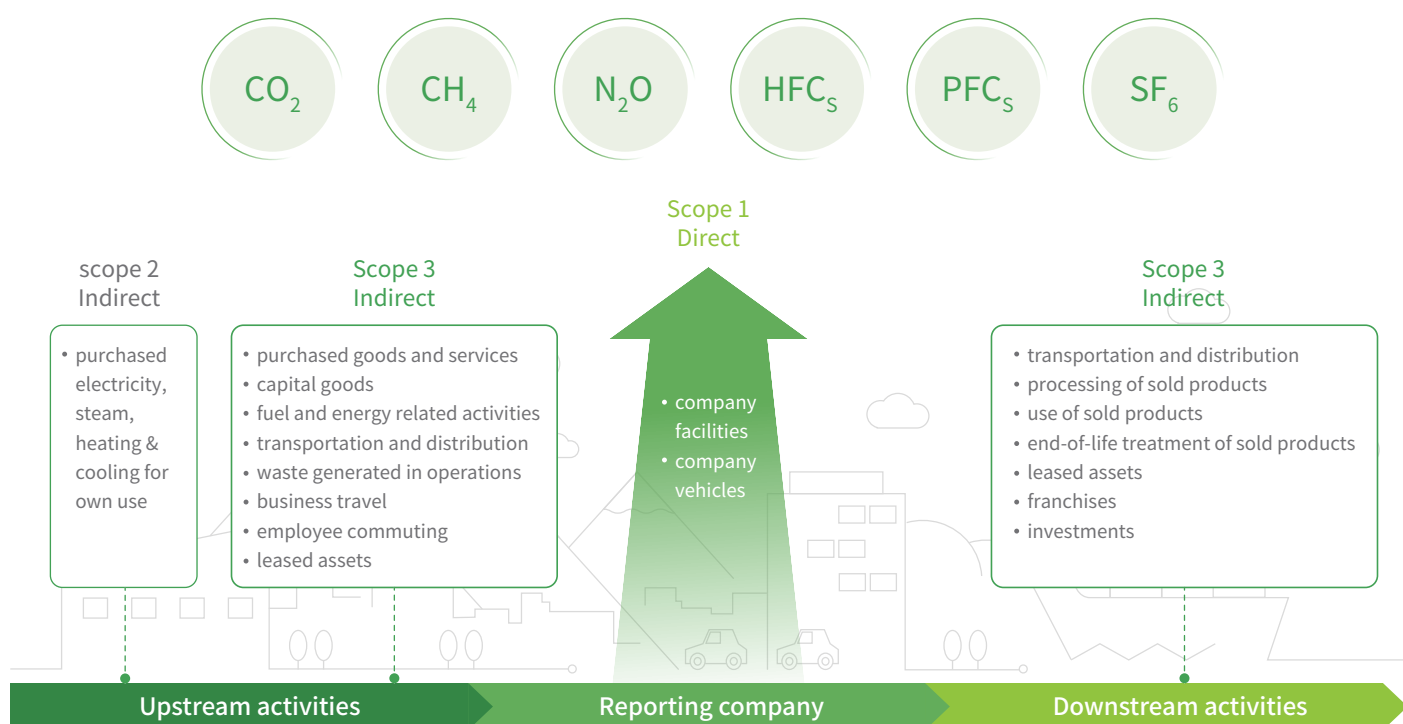


Figure: Overview of GHG Protocol scopes and emissions across the value chain

Emission Categories

SAIF's carbon inventory encompasses Scope 1 (direct emissions), Scope 2 (indirect emissions), and Scope 3 (other indirect emissions). Relevant categories within the organizational boundaries are included. Scope 3 categories are selected based on materiality, business relevance, and data availability. From 2019 to 2022, the Scope 3 carbon inventory solely encompassed the categories of Purchased Goods and Services, Business Travel, and Employee Commuting. In 2023, all relevant Scope 3 categories have been incorporated. Details are as follows:

◆ Table: 2019-2023 Greenhouse Gas Inventory Comparison for SAIF

Scope	Category	2019	2020	2021	2022	2023
Scope 1	Stationary Combustion Emissions	×	×	×	×	×
	Mobile Combustion Emissions	✓	✓	✓	✓	✓
	Process Emissions	×	×	×	×	×
	Fugitive Emissions	✓	✓	✓	✓	✓
Scope 2	Purchased Electricity	✓	✓	✓	✓	✓
	Purchased Heating	×	×	×	×	×
Scope 3	1. Purchased goods and services	✓	✓	✓	✓	✓
	2. Capital goods	○	○	○	○	✓

Scope	Category	2019	2020	2021	2022	2023
Scope 3	3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	○	○	○	○	✓
	4. Upstream transportation and distribution	○	○	○	○	✓
	5. Waste generated in operations	○	○	○	○	✓
	6. Business travel	✓	✓	✓	✓	✓
	7. Employee commuting	✓	✓	✓	✓	✓
	8. Upstream leased assets	×	×	×	×	×
	9. Downstream transportation and distribution	×	×	×	×	×
	10. Processing of sold products	×	×	×	×	×
	11. Use of sold products	×	×	×	×	×
	12. End-of-life treatment of sold products	×	×	×	×	×
	13. Downstream leased assets	×	×	×	×	×
	14. Franchises	×	×	×	×	×
	15. Investments	×	×	×	×	×

Note: ✓ included; ○ not included; × not relevant

Emission Quantification

The primary sources of greenhouse gas (GHG) emissions at SAIF are the operation of office buildings and the daily activities of faculty and staff. After the principal emission sources are identified and data from credible sources are gathered, various calculation methods are employed based on the data quality of different emission categories. Emission data are then converted to carbon dioxide equivalents utilizing appropriate physical or economic emission factors. The methodology employed and the results for GHG accounting in 2023 are detailed below:

◆ Table: Carbon Accounting Methodology and Results for Scope 1, 2, and 3 Emission Categories for SAIF in 2023

Scope	Category	Emissions (tCO ₂ e)	Proportion to Total Emissions	Description
1	Mobile Combustion	6.1074	0.29%	This category consists of a long-term leased vehicle under the operational control of SAIF. Emissions are calculated based on gasoline consumption data from fuel invoices and statistical records, using emission factors from the China Statistical Yearbook and the IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
	Fugitive Emission	319.6498	14.98%	This category includes emissions from refrigerant leakage in air conditioning units. Emissions are calculated based on the amount of R410a refrigerant filled, as documented in air conditioning maintenance records, using the corresponding global warming potential (GWP-100) from the IPCC Sixth Assessment Report (AR6).
2	Purchased Electricity	670.0773	31.41%	This category contains the purchased electricity for the SAIF Building in Shanghai, the Beijing Center, and the Greater Bay Area Center. Emissions are calculated based on the electricity consumption data from monthly electricity bills and the electricity emission factors published by the National Ministry of Ecology and Environment of China.
3	1.Purchased goods and services	24.1421	1.13%	This category involves all purchased goods during the reporting period, mainly categorized as office supplies, household items, and low-value consumables. Emissions in this category are calculated using the average data method, estimating the weight of all purchased goods through research. The lifecycle emission factors from the ecoinvent v3.10 database, the UK Department for Environment, Food and Rural Affairs (DEFRA) 2023 emission factors, and the China Purchasing and Consumption Database (CPCD) are used to convert the emissions into carbon dioxide equivalents.
	2. Capital goods	63.8850	2.99%	This category consists of all newly acquired fixed assets during the reporting period. Emissions in this category are calculated using the expenditure-based approach, directly converting the purchase amount of asset equipment into carbon emissions using the Multi-regional Input-Output (MRIO) emission factors from MioTech.

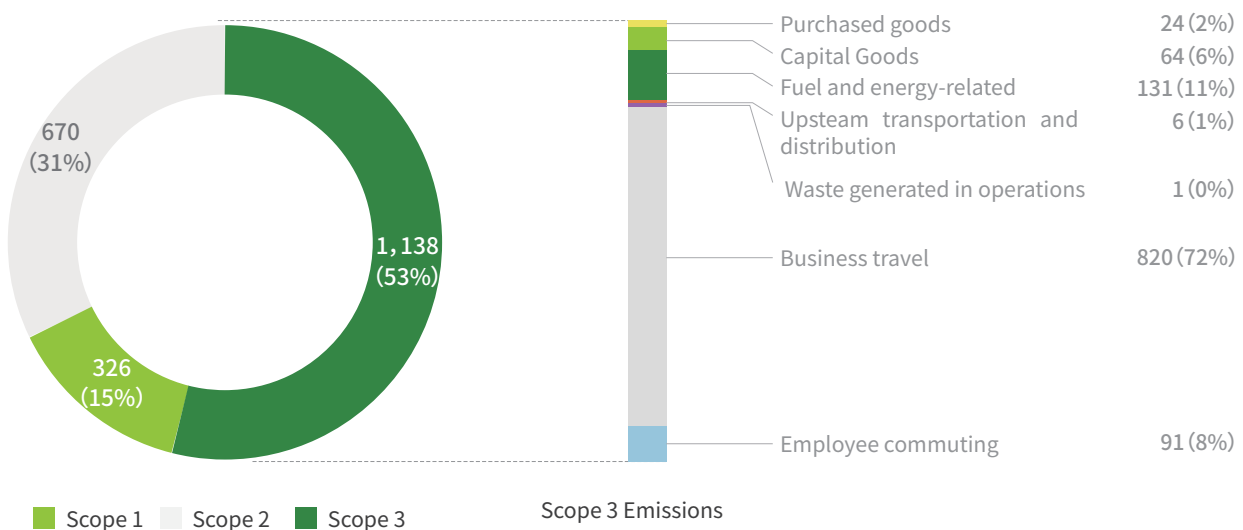
Scope	Category	Emissions (tCO ₂ e)	Proportion to Total Emissions	Description
3	3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	130.7757	6.13%	This category includes upstream emissions from fuel production, electricity generation, and electricity transmission and distribution losses. The emissions are calculated using the average data method, converting the consumption quantities from statistical records and supplier invoices using the emission factors from the ecoinvent v3.10 database.
	4. Upstream transportation and distribution	5.8157	0.27%	This category includes the emissions generated from transporting and distributing all goods and assets during the reporting period. Emissions in this category are calculated using the expenditure-based approach, converting the estimated transportation costs into carbon emissions using the MRIO emission factors from MioTech.
	5. Waste generated in operations	1.4325	0.07%	This category includes all solid waste generated by the Shanghai SAIF Building during the reporting period. Emissions in this category are calculated using the average data method, converting the estimated annual waste weight into carbon emissions using the related waste treatment emission factors from the ecoinvent v3.10 database.
	6. Business travel	820.1374	38.44%	This category includes all transportation and accommodation associated with business travel purposes by SAIF's employees during the reporting period. The emissions in this category are calculated using a combination of the distance-based approach and the expenditure-based method. For air travel, rail travel, and some of the car journeys, emissions are accounted for based on the mileage data provided by suppliers. For the remaining portion, emissions are accounted for based on expenditure amounts.

Scope	Category	Emissions (tCO ₂ e)	Proportion to Total Emissions	Description
3	7.Employee commuting	91.4817	4.29%	This category includes the daily commuting of SAIF's employees during the reporting period. The emissions for this category are calculated using the distance-based method. A survey is conducted to gather information on the daily travel modes and average distances of the employees. The emissions are then converted using the emission factors from the UK Department for Environment, Food and Rural Affairs (DEFRA) 2023 and the "Methodology for Carbon Emission Reduction in Low-carbon Travel in Beijing (Trial Version 2023)".
Total		2133.5046	100.00%	

Results Overview

SAIF's total carbon emissions in 2023 were 2,133.50 tCO₂e. Specifically, Scope 1 direct emissions amounted to 325.76 tCO₂e, while Scope 2 indirect emissions from purchased electricity totaled 670.08 tCO₂e, and Scope 3 other indirect emissions equaled 1,137.67 tCO₂e. Overall, operational carbon emissions (Scopes 1 and 2) accounted for 46.68% of the total, while supply chain emissions (Scope 3) constituted the remaining 53.32%.

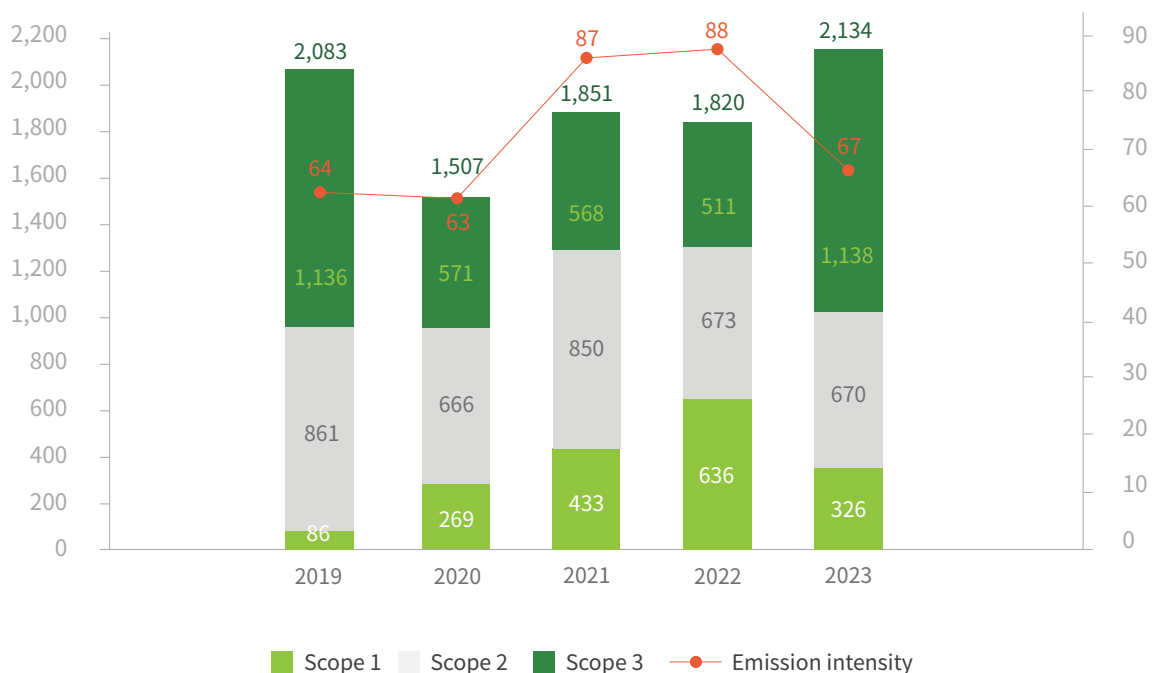
◆ Figure: SAIF's Carbon Emission Distribution in 2023



SAIF maintains a continuous tracking and reporting system for its total greenhouse gas emissions. The graph below illustrates the emissions trend from 2019 to 2023, demonstrating a fluctuating and rebounding pattern primarily attributed to the influence of Covid-19 pandemic control measures. The specific factors contributing to these changes are analyzed as follows:

- **2020:** The pandemic and associated control measures led to reduced offline activities, resulting in decreased electricity consumption and restricted business travel. This led to a significant 27.68% decrease in carbon emissions compared to the previous year.
- **2021:** With the resumption of work and offline activities, there was an increase in electricity consumption for lighting, air conditioning, and equipment, leading to a 22.89% increase in carbon emissions compared to 2020.
- **2022:** Maintenance of air conditioning units caused significant refrigerant emissions, offsetting the pandemic-related reduction in energy consumption. As a result, carbon emissions remained relatively stable compared to 2021.
- **2023:** Operational carbon emissions decreased due to reduced refrigerant filling and adjustments to emission factors for Shanghai's electricity. However, the expansion of Scope 3 emissions accounting led to an overall increase in total carbon emissions, reaching a recent high.

◆ Figure : Carbon Emissions Trends of SAIF from 2019 to 2023 (tCO₂e, kgCO₂e/m²)



Appendix

• The sources of emission factors for this carbon inventory include:

1. "IPCC 2006 Guidelines for National Greenhouse Gas Inventories" published by the Intergovernmental Panel on Climate Change (IPCC).
2. "Methods and Reporting Guidelines for Calculating Greenhouse Gas Emissions of Enterprises" and average carbon emission factors for the power grid, published by the Ministry of Ecology and Environment of China.
3. "Beijing Low Carbon Travel Carbon Emission Reduction Methodology (Trial) 2023 Edition" published by the Beijing Municipal Ecology and Environment Bureau.
4. "UK Government GHG Conversion Factors for Company Reporting 2023."
5. Ecoinvent Database version 3.10
6. China Product Carbon Footprint Database (CDCP) for greenhouse gas emission coefficients throughout the lifecycle of products.
7. MioTech Environmentally-Extended Input-Output (EEIO) Database.

