ASIAN INFRASTRUCTURE
INVESTMENT BANK

AIIB Carbon Footprint Report 2021

Greenhouse Gas Emissions Resulting from AIIB Internal Operations

December 2022

bsi.

Opinion Statement

Greenhouse Gases Emissions Verification
Verification Statement

This is to certify that: Asian Infrastructure Investment Bank
Tianchen East Road
Chaoyang District
Beijing
100033
China

Holds certificate No: CFV 779893
Verification statement

As a result of carrying out verification procedures, it is the opinion of BSI with reasonable assurance that:

- The total Greenhouse Gas Emissions for the year 2021 of Asian Infrastructure Investment Bank is 7,263 tonnes of CO_2e Equivalent, including:
  - Direct GHG emissions: 141 tonnes CO_2e
  - Indirect GHG emissions from imported energy: 6,362 tonnes CO_2e
  - Indirect GHG emissions from transportation: 540 tonnes CO_2e
  - Indirect GHG emissions from products used by organization: 220 tonnes
  - Indirect GHG emissions associated with the use of products from the organization: Not quantified
  - Indirect GHG emissions from other sources: Not quantified
- No material misstatements for the year 2021 Greenhouse Gas Emissions calculation were revealed.
- Data quality was considered acceptable in meeting the principles as set out in ISO 14064-1:2018.

For and on behalf of BSI:

Frank ZHANG, Managing Director, BSI (China)

Original Registration Date: 2022-11-03 Latest Revision Date: 2022-11-03

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LIST OF FIGURES AND TABLES

ABBREVIATIONS

AIIB	—	Asian Infrastructure Investment Bank
AR6	—	IPCC Sixth Assessment Report
BSI	—	British Standards Institution
CH_4	—	methane
CO_2	—	carbon dioxide
CO_2e	—	carbon dioxide equivalent
FAS	—	Facilities and Administration Services Department
GHG	—	greenhouse gas
GWP	—	global warming potentials
HFCs	—	hydrofluorocarbons
ICEM	—	Institutional Carbon Emission Management
MDB	—	multilateral development bank
MRV	—	Monitoring-Reporting-Verification
NF_3	—	nitrogen trifluoride
N_2O	—	nitrous oxide
PFCs	—	perfluorocarbons
SF_6	—	sulfur hexafluoride

EXECUTIVE SUMMARY

The Asian Infrastructure Investment Bank (AIIB or the Bank) aims to lead by example in managing its carbon emissions and disclosing the impact of its internal operations. It analyzed carbon emission impacts associated with its internal operations for the first time in September 2020 (for 2017-2019 emissions) and then again in September 2021 (for 2020 emissions), tracking the carbon footprint from scopes linked with its internal operations. Starting from this report of 2021 activities, AIIB will continuously monitor and verify its carbon emissions on an annual basis and disclose this information to the public.

This report provides a comprehensive analysis of the carbon footprint generated by the internal operations of the Bank's Headquarters in the Chaoyang area of Beijing in 2021. Annual data is prepared for the 12-month period from Jan. 1, 2021 to Dec. 31, 2021. It identifies the sources of greenhouse gases (GHG) and groups them in accordance with ISO 14064-1:2018, which lists six categories of emissions, and which differs somewhat from an earlier categorization that was in line with the Greenhouse Gas Protocol's Scopes 1 through 3.

In 2021, emissions from AIIB's internal operations totaled 7,263 metric tons of carbon dioxide equivalent (CO_2e); 71 percent of that total stems from office electricity consumption and additional 15 percent stems from office heating. In 2021, emissions from business travel accounted for only 7 percent; the sudden and almost complete shutdown of passenger air travel from 2020 until late-2022 due to COVID-19 had a substantial impact on the Bank's carbon footprint. The reduction of business travel, especially international business travel, contributed to the rapid decrease in the Bank's internal carbon emissions in 2021. As China relaxed its COVID policies since December 2022, business travel—especially international travel—is expected to restart in the coming months and emissions from that source will likely again increase in 2023/2024.

This report describes the methodology for selecting and collecting data and computing carbon emissions for all relevant emission categories, using internal and external documentation, interviews from key AIIB personnel and service suppliers, and source data. To ensure the accuracy of the calculations and the findings, GHG data is managed in strict accordance with the ISO14064-1:2018 standard. This document prioritizes open data, the data processing to provide results, and the enhancement of the data's usability and annual maintenance.

This report does not address AIIB's lending or technical support activities for its clients.

CHAPTER 1: GENERAL DETAILS, PURPOSE, AND POLICY

1.1 Introduction

This report includes the Asian Infrastructure Investment Bank's (AIIB or the Bank) complete GHG emissions inventory for 2021. AIIB's reporting procedures and emission categorizations adhere to international regulations and standards. This report conforms to the standards of ISO 14064-1:2018. The information given adheres to the standards established in Part 9.3.1 and (when applicable) Part 9.3.2 of said ISO.

1.2 Purpose of this Report

AIIB aims to (1) follow the best practices of Multilateral Development Banks (MDBs) regarding consistency, comparability, and completeness in the accounting of GHG emissions and (2) align its internal activities with a pathway toward low GHG emissions and with the objectives of the Paris Agreement.

This report:

- relates to AIIB emissions from internal activities. AIIB's portfolio emissions are not included in this report.
- reflects AIIB's initial attempt to report its GHG emissions in compliance with the standards of ISO 14064-1: 2018, as well as its attempts to better understand and eventually enhance its Monitoring-Reporting-Verification (MRV) performance concerning emissions.
- has been prepared in line with the standards of ISO 14064-1: 2018 by the Facilities and Administration Service Department (FAS) of AIIB.
- attempts to use primary data whenever possible, particularly for all major emission sources. In the absence of primary data, a consistent and conservative calculation method is utilized.
- does not include confidential information.

1.3 Introduction to AIIB

By investing in infrastructure and other productive sectors, AIIB aims to encourage sustainable economic development, create wealth, and strengthen infrastructural connections in Asia. Working with other international and bilateral development institutions, AIIB is also tasked with fostering regional cooperation and partnerships to address development concerns. AIIB adapts and innovates continuously to provide its clients with personalized investment solutions that overcome obstacles. They rely on AIIB's resiliency to assist them in achieving their goals even during the most difficult times.

For further information, please visit www.AIIB.org.

1.3.1 Institutional Carbon Management Policies and Strategies

AIIB announced its first Institutional Carbon Emission Management (ICEM) Plan (the Plan) in January 2022 to assist the Bank in achieving carbon neutrality by 2025 and aligning its internal activities with the Paris Alignment. The Plan presents a five-year overview of AIIB's institutional greenhouse gas management strategy (2021-2025). In addition, it identifies steps for the Bank to monitor, verify, and report its institutional carbon footprint, as well as the high-level strategies the Bank might employ to cut and decarbonize institutional energy use.

Figure 1: AIIB's ICEM Plan (2021-2025)

The Plan also sets four decarbonization targets for 2021-2025 as part of AIIB's efforts to curb climate change:

- AIIB will measure and manage its carbon footprint, continuously enhancing the data quality of its institutional carbon footprint wherever possible. AIIB will continue to hone its methods to enhance coverage and transparency and to prepare for disclosure.
- AIIB will publish its institutional GHG emissions resulting from business travel and facilities by the end of 2022.

- In 2023/2024, AIIB will begin purchasing renewable electricity to cut indirect emissions, eventually covering 100 percent of the electrical needs of its offices.
- Prior to 2025, AIIB will offset its remaining greenhouse gas emissions from internal activities.

1.3.2 Institutional Carbon Monitoring-Reporting-Verification

The ICEM Plan established the MRV system for the internal carbon footprint of AIIB. AIIB analyzed carbon emission impacts associated with its internal operations for the first time in September 2020 (for 2017-2019 emissions) and then again in September 2021 (for 2020 emissions), tracking the carbon footprint through scopes linked with its internal operations. Starting with this 2021 report, AIIB will continuously monitor and verify its emissions on an annual basis and disclose this information to the public.

This report provides a comprehensive analysis of the carbon footprint generated by AIIB's internal operations at its Permanent Headquarters in the Chaoyang area of Beijing, China. It was compiled using internal and external documentation, interviews from key AIIB personnel and service suppliers, and source data and data-gathering systems. It describes the methodology for selecting and collecting data and computing carbon emissions for all relevant emission categories. It prioritizes the data source's openness, the data processing to provide results, and the enhancement of its usability and annual maintenance. Notably, this report does not address AIIB's lending or technical support activities for its clients.

Pursuant to AIIB's expansion of its global presence, in July 2022, the Board of Directors approved the establishment of an Interim Operational Hub outside China which is in the process of being set up. The Bank also maintains a backup office in Tianjin, China but it is not currently included due to its modest size and existing challenges to acquiring consistent statistics. Nonetheless, AIIB will undertake additional efforts in the coming reporting years to capture the environmental impact of its subsidiary office(s), and the release will be determined by future capacity.

1.3.3 AIIB Carbon Consultative Group

Utilizing its current knowledge and experience, AIIB established the 'Carbon Consultative Group' in 2021 to address issues connected to resource usage efficiency, waste reduction, and pollution prevention. This committee's primary objective is to (1) identify ways to reduce the Bank's nonportfolio carbon footprint, (2) educate, inspire, and motivate employees to change their behavior both in and out of the workplace, and (3) ultimately empower all Bank employees to live greener lives in a greener working environment. The committee fully uses the Bank's current skills and experience. It addresses resource conservation, waste reduction, and pollution control issues. AIIB has carefully evaluated and adopted key proposals and solutions from the Committee, such as substituting durable and recyclable materials for plastic containers in the canteen and café. Six core members include:

- Xing Zhang, Representative from Strategy, Policy and Budget Department
- Calvin Quek, Representative from Operational Services Department

- Henry Bell, Representative from Corporate Secretary
- Allen Shao, Representative from Information Technology Department
- Zhan Wang, Representative from Facilities and Administration Services Department
- Yuan Lin, Representative from Facilities and Administration Services Department

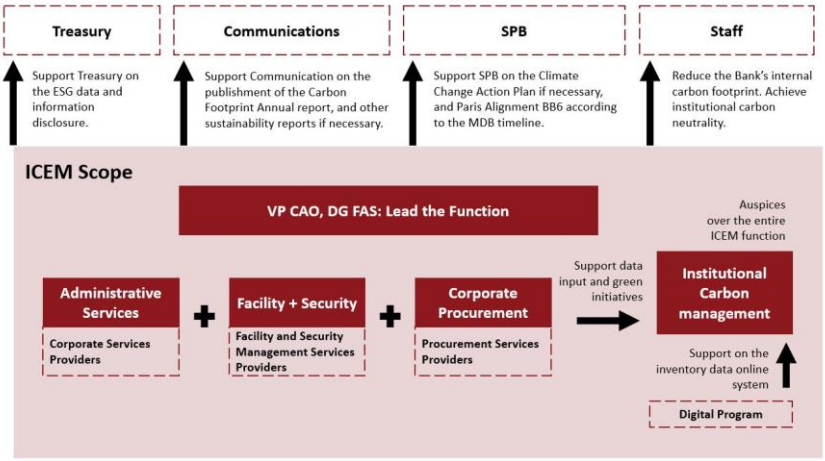
1.4 Persons Responsible

1.4.1 ICEM Governance

ICEM governance is explained by the following:

- AIIB institutional carbon emissions are the subject of the analyses (scope 1, 2,[1] and part of 3[2], including travel, commuting, waste management, water consumption, etc.)
- Staff responsible for ICEM:
  - Vice President and Chief Administration Officer (VPCAO) or Director General, FAS: Leads the function.
  - Institutional Carbon Management Specialist: Supports the entire function.
  - Facility Officer(s) and facility management service providers: responsible for energy and electrical statistics, building energy efficiency measures, etc.
  - Administrative Officer(s) and corporate services providers: responsible for information regarding waste management, water use, vehicle operation, staff commute data, and other green activities.
  - Procurement Officer(s): responsible for procurement data, green procurement programs, etc.

Figure 2: ICEM Governance Structure



[1] United States Environmental Protection Agency Scope 1 and Scope 2 Inventory Guidance: https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance
[2] United States Environmental Protection Agency Scope 3 Inventory Guidance: https://www.epa.gov/climateleadership/scope-3-inventory-guidance

Staff training: ICEM provides regular training to increase awareness of the importance of low carbon emissions and environmental preservation. Specific trainings have been provided by third-party verifiers to data managers (see 1.4.2) for data collecting and maintaining rules.

Document keeping: ICEM documents (UL360) are kept in an electronic format and maintained using a third-party inventory management system that is accessible to both internal and external parties. ICEM documents and management system are examined annually as part of internal and external auditing/verification.

1.4.2 Persons Responsible

AIIB prepared the AIIB Carbon Footprint Report 2021 with significant collaboration among departments of the Bank and service providers.

Overall responsibility lies with

- Dan Yang, Director General of FAS
- Zhan Wang, Manager of the Administrative and Facilities Division

Responsibility for the preparation of the GHG inventory and report:

- Yuan Lin, Senior Institutional Carbon Management Specialist

Data managers:

- Zhang Ying, Administration Officer
- Yechao Zhu, Administration Officer
- Lihai Yin, Senior Facility Management Officer
- Yang Zhang, Head of Security and Emergency
- Li Lv, Senior Corporate Procurement Specialist
- Wanning Zhong, Corporate Procurement Assistant
- Chong An, Digital Program Specialist

1.5 Audience and Dissemination Policy

This report is intended for all AIIB stakeholders interested in AIIB's GHG emissions inventory and the accompanying reporting format, notations, and explanations. It is made available to the public after appropriate third-party verification. In addition, the report communicates:

- AIIB's institutional GHG performance and
- AIIB's institutional resolve to achieve GHG performance improvements.

The intended users of this document are:

- Stakeholders and peers,
- Intergovernmental entities, and
- The general public.

1.6 Reporting Period and Frequency of Reporting

This GHG report covers the calendar year from Jan. 1, 2021 to Dec. 31, 2021. GHG reports are produced annually.

1.7 Reporting Standards, Approach and Verification

1.7.1 Compliance with ISO 14064-1:2018

The GHG report for the year ending on Dec. 31, 2021 has been prepared in accordance with ISO 14064-1:2018.

1.7.2 Audit of GHG Inventory

This report has been verified to reasonable assurance by the British Standards Institution (BSI).

1.8 Declaration Statement by AIIB

AIIB, in its capacity as a “Reporting Organization” for the purposes of this report, therefore, certifies that the inventorying and reporting of GHG emissions have been performed in accordance with ISO 14064-1: 2018. (Specification with Guidance at the Organization Level for Quantification and Reporting of Green House Gas Emissions and Removals).

This report has been verified by a third party, BSI, to a "limited degree of assurance" and that a "Statement of Assurance" from said third party has been included in the report.

AIIB initiated data collection and reporting in a structured format in accordance with ISO 14064-1:2018 requirements.

CHAPTER 2: PRINCIPLES FOLLOWED IN GHG REPORTING

In preparing this report, AIIB followed the following five principles set forth under ISO 14064-1:2018 to ensure that GHG-related information is true and accounted fairly:

- Relevance,
- Completeness,
- Consistency,
- Accuracy, and
- Transparency

Relevant GHG sources and sinks at the Bank were identified and quantified for the purpose of GHG reporting based on the methodology described in the respective chapters of this report. In the event of uncertainty or a lack of data, reasonable assumptions were made based on information accessible on various data platforms to limit the uncertainty and risk associated with GHG accounting.

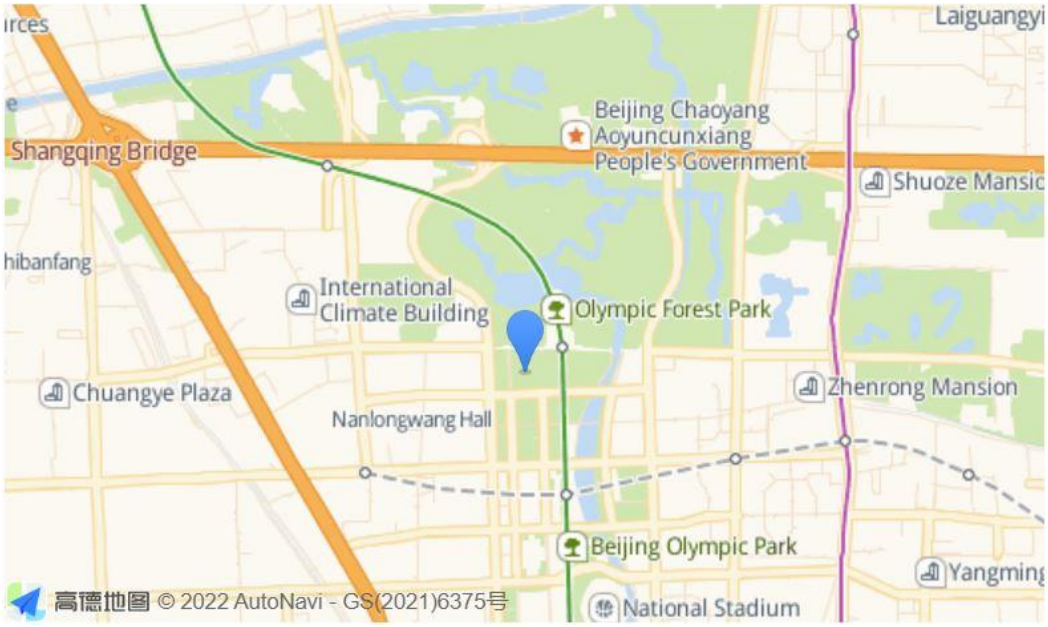
AIIB maintains the records used to collect data for the quantification of greenhouse gas emissions. Collecting sufficient and relevant GHG-related information allows the intended users to make decisions with an acceptable degree of confidence and enable the formulation of a roadmap to reduce internal GHG emissions. This is AIIB's first official attempt to verify and publicly disclose its GHG performance for transparency under the ISO 14064 requirements and to allow for future comparison and benchmarking.

CHAPTER 3: GHG INVENTORY BOUNDARIES

3.1 Geographic Boundaries of the Inventory

AIIB calculates its carbon footprint utilizing the operational control approach. This method considers any emissions over all areas where AIIB has direct physical or operational control, but not necessarily financial control. As such, it encompasses the Bank's Headquarters in the Chaoyang area of Beijing, where its office facilities and administrative functions are located. This report currently does not include any of AIIB's external office(s) due to their small size and the difficulty in gathering reliable data; nevertheless, in the following reporting years, AIIB will make additional efforts to capture the environmental impact of its subsidiary offices worldwide.

Figure 3: AIIB Headquarters Location



Address: AIIB, Tower A, Asia Financial Center, No.1 Tianchen East Road, Chaoyang District, Beijing 100101

Figure 4: AIIB Headquarters

3.2 Reporting Boundary

3.2.1 Emissions Categories and Classification

This report is directed by FAS of AIIB. Reporting boundaries have been established within the AIIB Headquarters, including emissions from facilities and office use in Headquarters, emissions from corporate vehicles in the Headquarters, Bank staff commuting and travel, and emissions from the use of certain products. The boundary does not encompass AIIB investment projects or their associated upstream and downstream emissions.

The sources of GHG emissions have been identified and categorized in accordance with ISO 14064-1:2018. This system classifies emissions into six categories, which differs slightly from Scopes 1 through 3 of the Greenhouse Gas Protocol.

- Category 1 (scope 1): Direct GHG emissions and removals
- Category 2 (scope 2): Indirect GHG emissions from imported energy
- Category 3 (scope 3): Indirect GHG emissions from transportation
- Category 4 (scope 3): Indirect GHG emissions from products used by the organization
- Category 5 (scope 3): Indirect GHG emissions associated with the use of products from the organization
- Category 6 (scope 3): Indirect GHG emissions from other sources

According to the requirements of ISO 14064-1:2018, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

3.2.2 Significance and Materiality

Factors for consideration in assessing significance and materiality include:

- Difficulty in obtaining data
- AIIB's influence on the emission source
- Validity in available quantification and estimation approaches
- Risks/opportunities
- Staff engagement possibilities

AIIB selected inclusions and exclusions in strict accordance with the ISO14064-1:2018 standard. Table 1 shows the significance scores of all identified emission sources within the geographic boundaries of the inventory. All direct and indirect emission sources with significant and medium impact are reported in this document. Those with insignificant impact are not included in this report but are elaborated on in Chapter 3.2.4.

Table 1: Significance Score of Direct and Indirect Emissions Sources, 2021

Subcategory		Emission Sources	Quantitative Method	Emission Factor Availability	Influence	Risk		Opportunity	Sectoral Guidance Availability	Outsourcing	Staff Engagement	Total	Summary
						Possibility	Impact						
Category 1: Direct Greenhouse Gas (GHG) Emissions and Removals													
1.1	Stationary Combustion	Diesel for Emergency Generator	5	5	1	1	1	2	3	1	1	20	Significant
		Natural Gas	5	5	1	1	1	2	3	1	1	20	Significant
1.2	Mobile Combustion	Gasoline for Corporate Fleet	5	5	1	1	1	2	3	1	1	20	Significant
1.3	Industrial Process	Not Identified within the Reporting Scope											
1.4	Fugitive	Release of Refrigerant	5	5	1	1	1	1	3	1	1	19	Medium
		Carbon Dioxide Fire Extinguisher	5	5	1	1	1	1	3	1	1	19	Medium
		Septic-tank	5	5	1	1	1	1	3	1	1	19	Medium
1.5	Land Use, Land Use Change and Forestry	Not Identified within the Reporting Scope											
Category 2: Indirect GHG Emissions from Imported Energy													
2.1	Indirect GHG Emissions from Imported Electricity	Electricity from Grid	5	5	3	1	1	2	3	1	1	22	Significant
2.2	Indirect Emissions from Imported Energy	Hot water	5	5	1	1	1	2	3	1	1	20	Significant
		Heating	5	5	3	1	1	2	3	1	1	22	Significant
Category 3: Indirect GHG Emissions from Transportation													

3.1	Emissions from Upstream Transport and Distribution for Goods	Not Identified within the Reporting Scope											
3.2	Emissions from Downstream Transport and Distribution for Goods	Not identified within the Reporting Scope											
3.3	Emissions from Employee Commuting	Staff Commuting	1	2	2	1	1	1	1	1	3	13	Medium
3.4	Emissions from Client and Visitor Transport	Visitor Transport	1	2	1	1	1	1	1	1	1	10	Insignificant
3.5	Business Travel	Business Travel-Flight	5	5	2	1	1	1	1	1	1	18	Medium
		Business Travel-Train	5	5	2	1	1	1	1	1	1	18	Medium
		Business Travel-Hotel	5	5	2	1	1	1	1	1	1	18	Medium
		Business Travel-Local Transport	1	5	1	1	1	1	1	1	1	13	Insignificant
Category 4: Indirect GHG Emissions from Products Used by the Organization													
4.1	Emissions from Purchased Goods	Cloud Service	5	5	1	1	1	1	1	1	1	17	Medium
		Cold Water	5	5	1	1	1	2	1	1	1	18	Medium
		Other Purchased Goods	2	1	1	1	1	2	1	1		10	Insignificant
4.2	Emissions from Capital Goods	Not Identified within the Reporting Scope											
4.3	Emissions from Disposal of Solid and Liquid	Waste	2	5	2	2	2	1	1	1	3	19	Medium

4.4	Emissions from Use of Assets	Not Identified within the Reporting Scope
Category 5: Indirect GHG Emissions Associated with the Use of Products from the Organization		
5.1	Emissions or Removals from the Use Stage of the Product	Not Identified within the Reporting Scope
5.2	Emissions from Downstream Leased Assets	Not Identified within the Reporting Scope
5.3	Emissions from End-of-life Stage of the Product	Not Identified within the Reporting Scope
5.4	Emissions from Investments	Not Identified within the Reporting Scope
Category 6: Indirect GHG Emissions from Other Sources		
6	Indirect GHG Emissions from Other Sources	Not Identified within the Reporting Scope

3.2.3 Summary of Emissions Source Inclusions

Establishing operational limits for AIIB GHG emissions is mostly influenced by fossil fuel usage in purchased electricity and energy consumption, refrigerant gas consumption in chillers and air conditioning units at the headquarters, staff business travel, etc.

Table 2: Summary of Included Sources of Emissions, 2021

Emission Sources	Category	Data Source	Methodology
Diesel for Emergency Generator	Category 1	Fuel Consumption statistics	Fuel use provided in liters
Gasoline for Corporate Fleet		Fuel consumption statistics	Fuel use provided in liters
Natural Gas		Fuel billing	Fuel use provided in m^3
Release of Refrigerant		Refrigerant billing	Fuel use provided in kg
Carbon Dioxide Fire Extinguisher		Extinguisher quality and capacity	CO_2 refilled in kg
Septic-tank		Total man-days	Assumed by BOD conversion factor, tank depth, etc..
Heating	Category 2	Heating billing	Billing by GJ
Hot Water		Hot water billing	Billing by GJ
Electricity from Grid		Electricity billing	Billing by kWh
Staff Commuting	Category 3	Survey	Staff provided information on their commuting methods
Business Travel – Flight		Provider reports on km	Assumed by the emission factor
Business Travel – Train		Provider reports on km	Assumed by the emission factor
Business Travel – Hotel		Provider reports on total room nights	Assumed by the emission factor
Procurement – Cloud Service	Category 4	Provider reports on emissions	Direct emission reports
Waste Disposal			Assumed by tonnes of different types of waste
		Provider reports on tonnes	
Procurement – Cold Water		Water billing	Billing by m^3

Regarding Categories 3 and 4, AIIB chose staff commuting, business travel (flight, train, hotel), cold water and cloud service procurement, and waste disposal based on their relevance, applicability to AIIB, and availability of raw data.

Emissions derived from biomass have not been identified within the organization boundary and the reporting boundary.

3.2.4 Summary of Emissions Source Exclusions

This report exclusively evaluated emission sources from its internal operations. AIIB's lending or technical support activities for its clients are not addressed by this report. In addition, because this is the first attempt to verify and publicly disclose GHG performance, the difficulty of acquiring data and quantification methods is one of the most influential elements in determining the reporting limit. AIIB's capacity for data management will be continuously enhanced.

The following sources (see Table 3) of emissions have been discovered but are not included in the emissions inventory. The stakeholders and context of the inventory do not deem these sources substantial or material, nor is it possible or viable to calculate them at this time. These emission sources have been identified as insignificant and have been excluded from this report according to Table 1 on the Significance Score of the Direct and Indirect Emission Sources.

There are no Category 6 emissions identified as falling within the reporting boundary.

Table 3: Summary of Excluded Sources of Emissions, 2021

Emission Sources	Category	Data Source	Methodology
Business Travel – local transport, e.g., taxi	Category 3	Note 1	Insignificant source of emissions, according to Table 5
Emissions from client and visitor transport	Category 3	Note 2	Insignificant source of emissions, according to Table 5
Procurement – other goods and services	Category 4	Note 3	Insignificant source of emissions, according to Table 5
Emissions from Investment	Category 5		Insignificant source of emissions, according to Table 5

Notes:

1. AIIB's business travel expense reimbursement system, SAP Concur, can only record reimbursed cab expenditures without distance information. AIIB expects this part of emissions to be below 1 percent of the total emissions. AIIB is not calculating the price of a local cab for this report due to the wide pricing disparity between regions.

2. Visitors to the AIIB Headquarters are responsible for their own transportation reimbursement. AIIB expects this part of emissions to be below 1 percent of the total emissions.
3. In 2021, 221 products and services in 9 subcategories accounted for almost 80 percent of all expenditures (Table 4). Most of these are consultancy services and IT services. This report only examines the emissions associated with cold water consumption and cloud services acquisition.

Table 4: Summary of Expense Share of the Top 80% of Goods and Services Procured by AIIB, 2021

Category	Sub-Category	Expense Share
General Service	Property Management	19.55%
General Service	IT-Implementation	13.31%
General Service	IT Services	12.72%
General Service	IT-Subscription	7.80%
Consulting Firm	Consultancy Services	7.73%
General Service	Outsourced Services	7.40%
Goods	Publications and Subscriptions	5.57%
General Service	Staff Benefits Program-Medical Insurance	4.20%
Consulting Firm	Consulting Services	2.74%
	Total	81.01%

CHAPTER 4: QUANTIFIED GHG INVENTORY OF EMISSIONS

4.1 Consolidated Statement of Greenhouse Gas Emissions

Table 5: Summary of CO_2e Emissions, 2021

Category 1	CO_2e (tonne)
Emergency Generators	13.48
Kitchen Cookers	43.85
Official Vehicles	19.24
Chillers, etc.	0
Carbon Dioxide Fire Extinguishers	0
Septic-tanks	64.28
Total	**140.86**
Category 2	**CO_2e (tonne)**
Municipal Heating	1116.48
Municipal Hot Water Supply	72.52
Electricity for Office Buildings	5173.24
Total	**6362.24**
Category 3	**CO_2e (tonne)**
Staff Commuting (car, tram, metro, etc.)	4.88
Staff Business Travel (High-Speed Rail)	**7.29**
Staff Business Travel (by air)	490.00
Staff Business Accommodation	**37.87**
Total	**540.04**
Category 4	**CO_2e (tonne)**
Cloud Service	22.05
Waste Disposal (food waste, other waste)	191.57
Domestic Water Supply	6.17
Total	**219.79**
Total Emission Category 1-6	**7262.92**

This document does not provide any recommendations or requirements for removal.

4.2 Methodologies for the Collection and Quantification of Data

Although the majority of the data sources are part of FAS's everyday operations, the format and level of detail of the original data vary markedly because AIIB has only just begun to collect fundamental data on carbon emissions from various service providers and sources. In accordance with the ISO 14064-1:2018 standard, the emissions summary consolidates and standardizes emissions data and provides a full explanation of working and estimation.

The overview of emissions sources and their respective data sources is provided in Section 3.2.3. The best available data and computation methods are utilized when estimation is necessary.

The combustion process is defined by the rapid oxidation of substances (i.e., fuels) with the release of thermal energy (i.e. heat). Category 1 activities emit direct GHG such as CO_2, CH_4 and N_2O as well as ambient air pollutions. Emission of these gases from Category 1 sources depend upon fuel characteristics, size along with combustion technology. Emissions also vary with operation and maintenance practices. This guidance only addresses direct emissions of the following types of GHG, i.e., CO_2, CH_4 and N_2O.

This report tries to use regional emission factors instead of international emission factors. It uses the most relevant factor indicated by:

- China Greenhouse Gas Emission Coefficient Library for Product Life Cycle
- GB/T 2589-2020
- Guidelines for the Preparation of Provincial Greenhouse Gas Inventories
- Climate Letter [2022] No. 111, General Office of the Ministry of Ecology and Environment
- Department for Business, Energy & Industrial Strategy (BEIS) – 2021
- IPCC Sixth Assessment Report Global Warming Potentials
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories

4.2.1 Calculation of GHG emission

A fuel-based approach is applied to calculate GHG emissions. The approach typically requires the collection of activity data, in the form of the type and quantity of fuel consumed for combustion purposes. To calculate emissions using fuel type, fuel consumption and emission factor data, the following equations can be applied:

Emission from Diesel Consumption:

Emission (tCO_2e) = consumption (L) * density (kg/L) * emission factor (t/t) /1000
= 5165 (L) * 0.84 (kg/L) * 3.11 (t/t) /1000
= 13.49 (tCO_2e)

For full GHG gases emission factors, sources, and emissions, please see Section G of the Appendix.

Emission from Petrol Consumption:

Emission (tCO_2e) = consumption (L) * density (kg/L) * emission factor (t/t) /1000
= 8454.24 (L) * 0.747 (kg/L) * 3.05 (t/t) /1000
= 19.26 (tCO_2e)

For full GHG gases emission factors, sources, and emissions, please see Section G of the Appendix.

Emission from Natural Gas Consumption:

Emission (tCO_2e) = consumption (L) * density (kg/L) * emission factor (t/t) /1000
= 23872 (m^3) * 0.775 (kg/m^3) / 1000*2.37 (t/m^3)
= 43.85 (tCO_2e)

For full GHG gases emission factors, sources, and emissions, please see Section G of the Appendix.

Emission from Fire Extinguishers:

Emission (t CO_2e) = Quantity of CO_2 gas refilled in 2021 (kg) /1000
= 0 (tCO_2e)

For fire extinguisher information, please see Section G of the Appendix.

Emission from Refrigerant Make Up for Air Conditioners and Refrigerators:

Emission (tCO_2e) = Quantity of refrigerant refilled in 2021 (kg) * GWP /1000
= 0 (tCO_2e)

R104a, R404a and R410a, which are commonly used in refrigeration and air conditioning sectors, are GHGs with Global Warming Potentials (GWP) much higher than that of CO_2. Therefore, the uncontrolled release of these gases into the atmosphere may have significant potential impact on climate change. However, because of two facilities without refrigerant charge information (see Section G of the Appendix), the uncontrolled release of the gases to calculate the emissions cannot be used; instead, the refrigerant refilling quantity was used. For GWP, please see Chapter 4.2.4.

Emission from the Septic Tank:

Emission (tCH_4) = total people * total day * BOD generation (g/per capita per day) BOD transfer factor (tCH_4/tBOD) * coefficient of correction emission (for 4.4m tank) /1000 /1000
= 600 (people) * 200 (day) * 40 (g/per capita per day) * 0.6 * 0.8 /1000 /1000
= 2.30 (tCH_4)

Emission (tCO_2e) = Emission (tCH_4) * CH_4 GWP (tCO_2e/tCH_4)
= 2.30 (tCH_4) * 27.9 (tCO_2e/tCH_4)
= 64.28 (tCO_2e)

Note: depth of septic tank: 4.4m

For septic tank information and factors, please see Section J of the Appendix.

Emission from Electricity Consumption:

Emission (tCO_2e) = consumption (kwh) * emission factor (kg/kwh) /1000
= 8904025.57 (kwh) * 0.581 (kg/kWh) / 1000
= 5173.24 (tCO_2e)
Emission (tCO_2) = Emission (tCO_2e)
= 5173.24 (tCO_2)

Emissions from Heat and Hot Water Consumption

- Hot Water
  Emission (tCO_2e) = consumption (GJ) * emission factor (kg/GJ) /1000
  = 1299 (GJ) * 55.829 (kg/GJ) /1000
  = 72.52 (tCO_2e)

- Heat
  Emission (tCO_2e) = consumption (GJ) * emission factor (kg/GJ) /1000
  = 19998.13 (GJ) * 55.829 (kg/GJ) /1000
  = 1116.48 (tCO_2e)

Note: This report notes how the generation of heat and hot water from natural gas can produce both CO_2 and CH_4. However, the paper Carbon Dioxide Emission Factors of Nature Gas Boilers and Its Uncertainty in Beijing only provides CO_2e emission factors for heat and hot water and there is no other source providing emission factors for all of the GHG gases. Therefore, this report only calculates CO_2e emissions for these two emission sources.

For emission factors and sources, please see Section G of the Appendix.

Emissions from cold water consumption

Emission (tCO_2e) = consumption (m^3) * emission factor (kg/m^3) /1000)
= 29398 (m^3) * 0.21 (kg/m^3) / 1000
= 6.17 (tCO_2e)
Emission (tCO_2) = Emission (tCO_2e)
= 6.17 (tCO_2)

For emission factor and sources, please see Section G of the Appendix.

Emission from Business Travel – Flight and Train

- Flight – Short haul Business class

Emission (tCO_2e) = distance (km) * emission factor (kg/km) /1000
= 170224.84 (km) * 0.12 (kg/km) / 1000
= 20.39 (tCO_2e)

For full GHG gases factors, sources, and emissions, please see Section A of the Appendix.

- Train (high-speed railway)
  Emission (tCO_2e) = distance (km) * emission factor (kg/km) /1000
  = 280487.24 (km) * 0.026 (kg/km) / 1000
  = 7.29 (tCO_2e)
  Emission (tCO_2) = Emission (tCO_2e)
  = 7.29 (tCO_2)

For emission factor and source, please see Section B of the Appendix.

Emission from Business Travel – Hotel

Emission (tCO_2e) = total night * emission factor (kg/per capita per night) /1000
= 860 (nights) * 44.03 (kg/per capita per night) /1000
= 37.87 (tCO_2e)
Emission (tCO_2) = Emission (tCO_2e)
= 37.87 (tCO_2)

For emission factor and source, please see Section C of the Appendix.

Emission from Waste

Emission (tCO_2e) = mass of waste * emission factor (kg/t) /1000
= (61.92 + 54.18) (t) * 1.65 (kg/t) / 1000
= 0.19 (t CO_2e)

Note: This report notes that waste treatment can produce both CO_2 and CH_4. However, China Greenhouse Gas Emission Coefficient Library for Product Life Cycle only provides CO_2e emission factors for waste incineration and cogeneration. There is no other source providing emission factors for all of the GHG gases. Therefore, this report only calculates CO_2e emissions for waste treatment (incineration and cogeneration).

For emission factor and source, please see Section H of the Appendix.

Emission from Commuting

Emission (tCO_2e) = $\sum$ commuting method * emission factor of this method (kg/km) /1000

AIIB designed a five-question survey to understand staff commuting methods. Fifteen percent of AIIB staff participated in the survey, with a total of 82 responses. AIIB staff commuting methods include walking; cycling; e-biking; and riding a taxi, a motor, the bus, private cars, and the subway. See Section F of the Appendix for the full survey results, emission factors for each of the commuting methods and sources, and detailed calculated carbon emission.

Note: This report understands that commuting by bus, private car, subway, motor and taxi can produce CO_2, CH_4 and N_2O. However, China Greenhouse Gas Emission Coefficient Library for Product Life Cycle only provides CO_2e emission factors for each of the commuting methods and there is no other source providing emission factors for all of the GHG gases. Therefore, this report only calculates CO_2e emissions for staff commuting.

Emission from Cloud Service

There are two cloud service providers, Microsoft Azure and AWS. Both can provide AIIB's carbon footprint by using cloud service from them.

Emission (tCO_2e) = Microsoft Azure CO_2e + AWS CO_2e
= 11.35 (tCO_2e) + 10.7 (tCO_2e)
= 22.05 (tCO_2e)

For more information, please see Section I of the Appendix.

4.2.2 Change in Methodologies from Prior Year/Base Year

This report, which represents the calendar year 2021, is the first verified GHG report produced by AIIB; it serves as the baseline for future evaluations. There is no change to the base year calculation in this reporting period.

2021 is the first full operational year following the June 2020 relocation of AIIB's offices to its new, permanent location. AIIB discovered that conditions and emissions vary significantly between its former and current Headquarters. Therefore, 2021 is temporarily regarded as the emission base year, serving as a benchmark for future emission comparisons and preserving data set integrity.

However, AIIB understands that the sudden and almost complete shutdown of passenger air travel from 2020 due to COVID-19 had a substantial impact on the Bank's carbon footprint, therefore 2021 would not be a typical year as a benchmark in the long run. As China has

relaxed its COVID policies since December 2022, business travel especially international travel is expected to restore in the coming months and the emissions from business travel will likely rebound in 2023/2024. AIIB will, on one hand, take steps to encourage employees to use lower-carbon means of transportation, and on the other hand, choose a more appropriate year as the base year in the future. Therefore, recalculation of the base year will be applied where it is necessary to maintain an effective base year comparison. Reasons for this might include the following:

- if the emission factors used change significantly and are relevant to prior years,
- if the total emission changes significantly due to host country's post-covid policies change and/or calculation scope change,
- if a significant estimation method has been changed/improved,
- if a significant data sourcing strategy has been changed/improved,
- if the scope of the inventory is changed (for instance, emissions from other offices included).

4.2.3 GWP Calculation and Source

According to the requirement of ISO 14064-1:2018, seven GHGs include CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3.

Quantities of GHG emissions are given in tones of CO_2e using the GWP from the IPCC Sixth Assessment Report (AR6). The scope of time is 100 years. Sources of direct emissions (Category 1) are expressed as both CO_2e and a thorough breakdown of their GHG emissions, including the GWP value. The most notable greenhouse gases include:

Table 6: GWP Value

CO_2	1
CH_4	27.9
N_2O	273
NF_3	17400
SF_6	25200
R125	3740
R143a	5810
R134a	1350
R152a	164
R32	771
R23	14600
R404a	4728
R407c	1985
R410a	2255.5

4.2.4 Review, Internal Audit and Improvement

This research examines the available data and information as the first comprehensive portrayal of AIIB's emissions. The collection of primary data on all key sources of emissions has been pursued. Where data is absent or incomparable, conservative estimation methods have been deployed, creating an incentive to continuously improve the ratio of source data to estimation methods. In future years, AIIB plans to utilize this section to highlight enhancements to AIIB's framework and methodology for capturing and calculating emissions figures and reduce ambiguity.

AIIB has already established an internal carbon management plan, MRV roadmap, and emission reduction objectives. To implement the plan, and based on the findings of this analysis, it developed the following data management recommendations for 2023:

- Unify the statistical rigor of the activity data as soon as possible to improve the data quality and utilize monitoring data as much as possible, such as fuel consumption purchase records for the corporate fleet, distance for business travel using local taxis, etc.
- Implement more carbon reduction projects and initiate preparations for carbon offsetting while educating and communicating with employees and suppliers.
    - Increase employee training and communication regarding GHG mitigation.
    - Promote carbon reduction among suppliers and build a carbon footprint database for the Bank's acquired goods and services.
    - Promote carbon emission awareness among vendors, suppliers, and service providers.
- Energy consumption, including electricity and heating, accounts for most global emissions. Although AIIB Headquarters are LEED Platinum-certified, there are still opportunities to reduce energy use by implementing further energy conservation measures.
- No disposable products in the Bank.
- Transition from a petrol fleet to electric vehicles.
- Together with waste management service providers, enhance resource recovery in the Bank and avoid landfill disposal.
- Consider purchasing green electricity and utilizing renewable energy as necessary.

Furthermore, to align with Paris Agreement goals, AIIB intends to compensate for its residual emissions beginning in 2024 by purchasing high-quality carbon offset credits, resulting in "carbon neutral" emissions from its internal activities.

4.2.5 Removals and Reductions / Increases

There are no emission cuts to report for the current reporting period

Reduced/increased emissions are irrelevant for this reporting period as the base year.

CHAPTER 5: GHG INVENTORY QUALITY MANAGEMENT

The GHG emission data is derived from raw data supplied by various data sources. To ensure the accuracy of the calculation procedure and the findings, GHG data is managed in strict accordance with the ISO14064-1:2018 standard. The greater the score, from 0 to 10, the higher the data quality. The computed average score according to the standard is 4.95, which corresponds to Level 2. Category 2 emissions from purchased electricity, heating, and hot water have the most accurate statistics. Other categories range from 0.07 to 0.14, indicating substantial room for future improvement.

The specific calculation process is as follows:

Table 7: Inventory Quality Score

Level	Level 1	Level 2	Level 3	Average score	Level
Activity data error level (A1)	Activity data is measured automatically and continuously	Activity data are intermittent measurements	Activity data is self-estimated	4.95	2
Activity data error level (A2)	Use of self-developed emission factors (1) derived from measurement/quality-energy balance; or (2) empirical coefficients for the same process/equipment	Use of (3) manufacturer-provided factors; or (4) regional or national emission factors	Use of (6) international emission factors	Level 1 → 1<= average score < 4 Level 2 → 4 <= average score < 7 Level 3 → 7 <= average score < 10	

Table 8: Inventory Quality Score - Activities

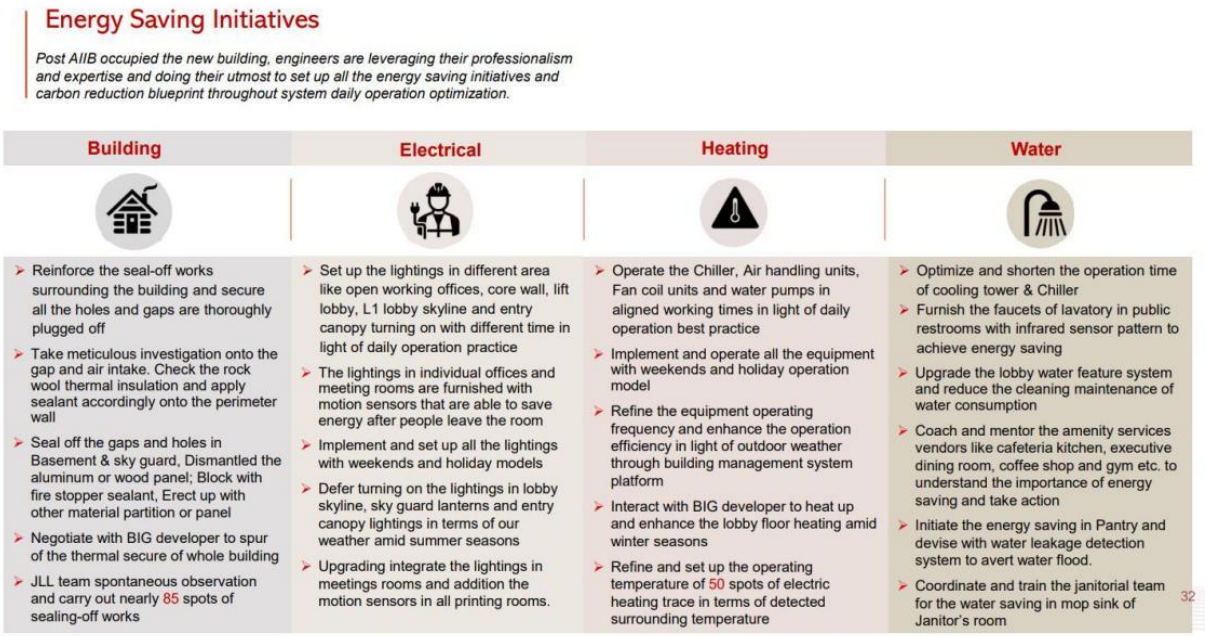
Activity	Fuel	Emission (t)	Percentage (%)	Score
Emergency generators	Diesel	13.48	0.19%	0.00
Kitchen cookers	Natural gas	43.85	0.60%	0.01
Official vehicles	Petrol	19.24	0.26%	0.01
Chillers, etc.	R134a	0.00	2.59%	0.00
Freezers	R404A	0.00	0.00%	0.00
Split air conditioners (30 units)	R32	0.00	0.00%	0.00

Chillers, etc.	R410a	0.00	0.00%	0.00
Carbon dioxide fire extinguishers	CO_2	0.00	0.00%	0.00
Septic tanks	CH_4	64.28	0.89%	0.05
Category 1				**0.07**
Municipal heating	Natural gas	1116.48	15.37%	0.31
Municipal hot water supply	Natural gas	72.52	1%	0.02
Electricity for office buildings	Electricity supply to the grid	5173.24	71.23%	4.27
Category 2				**4.60**
Staff commuting (car, tram, metro, etc.)	Electricity, petrol, diesel, etc.	4.88	0.07%	0.00
Staff Business Travel (High-Speed Rail)	Electricity	7.29	0.10%	0.00
Staff business travel (by air)	Aviation diesel, etc.	490.00	6.75%	0.13
Staff Business Accommodation	Electricity etc.	37.87	0.52%	0.01
Category 3				**0.14**
Waste disposal (food waste, other waste)	CH_4	191.57	2.64%	0.11
Waste disposal (recycling)	CH_4	0.00	0.00%	0.00
Cloud Service	Electricity	22.05	0.30%	0.01
Domestic water supply	Electricity	6.17	0.09%	0.00
Category 4				**0.12**
Total				**4.95**

CHAPTER 6: MITIGATION ACTIVITIES

The permanent headquarters of AIIB is LEED Platinum-certified. Installing lighting occupancy sensors; increasing chilled-water set point; adjusting building-wide heating and cooling set points; shortening operational hours of heating, cooling, and lighting central control systems for the entire building; chiller optimization to reduce energy demands on the facility; etc. are examples of energy-saving initiatives adopted by AIIB.

Figure 5: Energy Saving Initiatives



Source: AIIB Energy Consumption Analysis Report in the Year 2021

Other initiatives include:

1. Technology
   - Purchased GHG emission online management software, maintain GHG related data online from 2022.
   - Made duplex and black-and-white printing the standard for the entire organization.
   - Improved and promoted teleconferencing capabilities wherever possible to reduce travel
2. Reducing Waste
   - Reduce the use of single-use plastics.
   - Eliminated paper cups and free plastic lunchboxes from AIIB catering and vending areas.
   - Staff calendars are made from recycled paper.
3. Improved and promoted teleconferencing capabilities wherever possible to reduce travel
4. Staff tree planting with emission reduction certified

5. Collaboration with the World Wildlife Fund and participated in the annual Earth Hour activity.

APPENDICES

A. Business Travel (Flight)

Summary:

Table 9: Summary of Business Travel Emissions

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	NF_6
Emission (t)	490.00	485.37	0.04	4.58	0	0	0	0

Emission Factors:
Department for Business, Energy & Industrial Strategy (BEIS) - 2021
https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

Table 10: Business Travel CO_2e Emissions, Emission Factors, and Sources, 2021

CO_2e:

	Seat Class	km	CO_2e Emission Factor (kg/km)	Source	2021 Emission (ton)
Short	**Business**	170224.84	0.12	BEIS-Short Haul-Business-CO_2e	20.39
	Economy	80808.30	0.08	BEIS-Short Haul-Economy- CO_2e	6.45
	Premium	2858.12	0.08	BEIS-Short Haul-Average Class- CO_2e	0.23
Mid	**Business**	508805.57	0.22	BEIS-International-Business- CO_2e	109.70
	Economy	160280.73	0.07	BEIS-International-Economy-CO2e	11.92
	Premium	20130.73	0.12	BEIS-International-Premium- CO_2e	2.39
	First	15103.28	0.30	BEIS-International-First-CO_2e	4.49
Long	**Business**	1346259.19	0.23	BEIS-Long Haul-Business- CO_2e	305.21
	Economy	273515.95	0.08	BEIS-Long Haul-Economy- CO_2e	21.38
	Premium	62633.96	0.13	BEIS-Long Haul-	7.83

				Premium- CO_2e	
Total		2640620.67			490.00

Table 11: Business Travel CO_2 Emissions, Emission Factors, and Sources, 2021

CO_2:

	Seat Class	**km**	**CO_2 Emission Factor (kg/km)**	**Source**	**2021 Emission (ton)**
Short	**Business**	170224.84	0.12	BEIS-Short Haul-Business- CO_2	20.19
	Economy	80808.30	0.08	BEIS-Short Haul-Economy- CO_2	6.39
	Premium	2858.12	0.08	BEIS-Short Haul-Average Class- CO_2	0.23
Mid	**Business**	508805.57	0.21	BEIS-International-Business- CO_2	108.67
	Economy	160280.73	0.07	BEIS-International-Economy- CO_2	11.80
	Premium	20130.73	0.12	BEIS-International-Premium- CO_2	2.37
	First	15103.28	0.29	BEIS-International-First- CO_2	4.45
Long	**Business**	1346259.19	0.22	BEIS-Long Haul-Business- CO_2	302.33
	Economy	273515.95	0.08	BEIS-Long Haul-Economy- CO_2	21.18
	Premium	62633.96	0.12	BEIS-Long Haul-Premium- CO_2	7.76
Total		2640620.67			485.37

Table 12: Business Travel CH_4 Emissions, Emission Factors, and Sources, 2021

CH_4:

	Seat Class	**km**	**CH_4 Emission Factor (kg/km)**	**Source**	**2021 Emission (ton)**
Short	**Business**	170224.84	0.00001	BEIS-Short Haul-Business-CH_4	0.001702248
	Economy	80808.30	0.00001	BEIS-Short Haul-Economy-CH_4	0.000808083

	Premium	2858.12	0.00001	BEIS-Short Haul-Average Class-CH_4	2.85812E-05
Mid	**Business**	508805.57	0.00001	BEIS-International-Business-CH_4	0.005088056
	Economy	160280.73	0.000005	BEIS-International-Economy-CH_4	0.000801404
	Premium	20130.73	0.00001	BEIS-International-Premium-CH_4	0.000201307
	First	15103.28	0.00002	BEIS-International-First- CH_4	0.000302066
Long	**Business**	1346259.19	0.00002	BEIS-Long Haul-Business- CH_4	0.026925184
	Economy	273515.95	0.00001	BEIS-Long Haul-Economy-CH_4	0.00273516
	Premium	62633.96	0.00001	BEIS-Long Haul-Premium- CH_4	0.00062634
Total		2640620.67			0.039218428

Table 13: Business Travel N_2O Emissions, Emission Factors, and Sources, 2021

N_2O:

	Seat Class	**km**	**N_2O Emission Factor (kg/km)**	**Emission Factor Source**	**2021 Emission (ton)**
Short	**Business**	170224.84	0.00112	BEIS-Short Haul-Business-N_2O	0.190651824
	Economy	80808.30	0.00075	BEIS-Short Haul-Economy- N_2O	0.060606224
	Premium	2858.12	0.00076	BEIS-Short Haul-Average Class-N_2O	0.002172169
Mid	**Business**	508805.57	0.00202	BEIS-International-Business-N_2O	1.027787258
	Economy	160280.73	0.0007	BEIS-International-Economy-N_2O	0.11219651
	Premium	20130.73	0.00111	BEIS-International-Premium-N_2O	0.022345114
	First	15103.28	0.00279	BEIS-International-First- N_2O	0.042138153
Long	**Business**	1346259.19	0.00212	BEIS-Long Haul-Business- N_2O	2.854069485
	Economy	273515.95	0.00073	BEIS-Long Haul-Economy- N_2O	0.199666645

	Premium	62633.96	0.00117	BEIS-Long Haul-Premium- N_2O	0.073281729
Total		2640620.67			4.58491511

Table 14: Hotel and Train CO_{2e} Emissions, Emission Factors, and Sources, 2021

	Activity	**Unit**	**Emission Factor**	**Unit**	**Emission Factor Source**	**2021 Emission (ton)**	**Unit**
Train	280487.2	km	0.026	kg CO_2e/km	China Greenhouse Gas Emission Coefficient Library for Product Life Cycle	7.292668339	ton
Hotel	860	night	44.03	kg CO_2e/night		37.8658	ton

Data Provider: Ying Zhang

B. Business Travel (Train)

Table 15: Train CO_{2e} Emissions, Emission Factors, and Sources, 2021

Train	**CWT**	**CAS**	**FCM**	**Total**
Original Data	123224.00	77835.00	126084.40	
Unit	mile	km	km	km
km	76567.84	77835.00	126084.40	280487.24
			Emission Factor (kg/per km)	0.026
			Total CO_2e Emission (t)	7.29

Emission Factor Source: China Greenhouse Gas Emission Coefficient Library for Product Life Cycle

Data Provider: Ying Zhang

C. Business Travel (Hotel)

Table 16: Hotel CO_{2e} Emissions, Emission Factors, and Sources, 2021

Hotel	**CWT**	**CAS**	**FCM**	**Total**
Original Data	480.00	276.00	104.00	860.00
Unit	night	night	night	night
			Emission Factor (kg/per capita per night)	44.03

Total CO_2e Emission (t)	37.87

Emission Factor Source: China Greenhouse Gas Emission Coefficient Library for Product Life Cycle

Data Provider: Ying Zhang

D. Refrigerant

Table 17: Refrigerant Consumption and Facilities, 2021

Facility	Quality	Refrigerant	Refrigerant charge	Unit	GWP	2021 Consumption	2021 Emission
Water Chiller	5	R134a	3407	kg	1350	0	0
Water Chiller (networking room)	2	R410a	332	kg	2255.5	0	0
multi-coupled air conditioning unit	22	R410a	176	kg	2255.5	0	0
water source heat pump air conditioning system	29	R410a	38.57	kg	2255.5	0	0
ELV Precision Air conditioner	32	R22	64	kg	0	0	0
Split air conditioner	30	R32	32.25	kg	771	0	0
Parallel freezer	2	R134a	340	g	1350	0	0
Double-door refrigerator	1	R134a	340	g	1350	0	0
Fresh cabinet	1	R134a	340	g	1350	0	0
Drink freezer	1	R134a	80	g	1350	0	0
Double door refrigerator	1	R134a	360	g	1350	0	0
Two-storage temperature refrigerator	1	R404a	398	g	4728	0	0
Double door refrigerator	4	R404a	360	g	4728	0	0
Freezer*	1	R404a	BOHN LOPL042		4728	0	0
Front Office's refrigerator*	1	SD-226Y/HP				0	0

Double door freezer	1	R404a	360	g	4728	0	0
Double door refrigerator	3	R134a	360	g	4728	0	0
Freezer	2	R404a	390	g	4728	0	0
Double door refrigerator	1	R404a	320	g	4728	0	0

*****Two facilities without Refrigerant charge information.
GWP value: IPCC Sixth Assessment Report Global Warming Potentials

Data Provider: Lihai Yin, Lihai Yin, Senior Facility Management Officer

E. Fire Extinguisher

Table 18: Fire Extinguisher Quantity, Capacity and CO_2 Consumption, 2021

Facility	Quantity	Capacity	Unit	Total	Unit	2021 consumption	2021 emission
Dry powder extinguisher	1918	5	kg	9590	kg	0	0
Trolley dry powder fire extinguisher	3	35	kg	105	kg	0	0
CO_2 fire extinguisher	28	7	kg	196	kg	0	0
IG541 gas flooding system (8% CO_2)	228	80	L	18240	L	0	0

Data Provider: Yang Zhang, Head of Security and Emergency

F. Commuting

Table 19: Staff Commuting Survey Results and CO_2e Emissions, 2021

	Private Car	Subway	Cycle	Walk	Taxi	Bus	E-bike	Motor	Total km	Workdays	Single trip emission	2021 total emission	Unit
1	80%	20%							13	200	0.0358	14.32	kg
2		60%			40%				20	200	0.0154	6.16	kg
3	10%	80%			10%				18	200	0.0177	7.08	kg
4				70%	30%				5	200	0.0048	1.92	kg
5	10%	90%							18	200	0.0176	7.04	kg
6		100%							13	160	0.015	4.8	kg
7			100%						5	200	0	0	kg
8		50%	30%	20%					13	200	0.0075	3	kg
9		80%			20%				18	200	0.0152	6.08	kg
10		75%	15%	10%					13	200	0.01125	4.5	kg
11		33%			33%	34%			8	200	0.01329	5.316	kg
12		50%	50%						13	200	0.0075	3	kg
13		50%					50%		13	200	0.01505	6.02	kg
14		90%	10%						20	200	0.0135	5.4	kg
15					5%			95%	13	200	0.0597	23.88	kg
16		40%	40%		20%				20	200	0.0092	3.68	kg
17		60%	20%		20%				13	200	0.0122	4.88	kg
18		80%	20%						13	200	0.012	4.8	kg
19		80%	20%						13	200	0.012	4.8	kg
20	80%	10%			10%				18	200	0.0359	14.36	kg
21		80%			20%				20	200	0.0152	6.08	kg
22		100%							13	200	0.015	6	kg
23			50%		50%				13	160	0.008	2.56	kg
24		90%	10%						13	200	0.0135	5.4	kg
25		10%			90%				20	200	0.0159	6.36	kg
26			33%	33%	34%				5	200	0.00544	2.176	kg
27	100%								13	200	0.041	16.4	kg
28		45%	10%	45%					8	200	0.00675	2.7	kg
29	70%						30%		18	200	0.03323	13.292	kg
30	40%	10%			50%				13	200	0.0259	10.36	kg
31	80%	10%			10%				13	200	0.0359	14.36	kg
32			90%		10%				5	200	0.0016	0.64	kg
33				100%					5	220	0	0	kg
34	40%	20%			40%				18	200	0.0258	10.32	kg
35		20%			80%				13	200	0.0158	6.32	kg
36		100%							13	200	0.015	6	kg
37	100%								18	200	0.041	16.4	kg
38		45%			5%	50%			13	200	0.01205	4.82	kg
39		90%			10%				8	200	0.0151	6.04	kg
40		50%			50%				18	200	0.0155	6.2	kg
41	100%								18	200	0.041	16.4	kg
42	80%	20%							8	200	0.0358	14.32	kg
43					100%				5	200	0.016	6.4	kg
44	100%								18	200	0.041	16.4	kg
45		30%			70%				13	200	0.0157	6.28	kg
46	100%								20	220	0.041	18.04	kg
47		20%	80%						8	200	0.003	1.2	kg
48	80%				20%				20	200	0.036	14.4	kg
49	100%								13	200	0.041	16.4	kg
50				50%	50%				5	200	0.008	3.2	kg
51	50%	50%							8	200	0.028	11.2	kg

52		95%			5%				13	200	0.01505	6.02	kg
53	80%				20%				18	200	0.036	14.4	kg
54		20%			80%				8	200	0.0158	6.32	kg
55			50%		50%				5	200	0.008	3.2	kg
56		80%	20%						8	200	0.012	4.8	kg
57	100%								20	200	0.041	16.4	kg
58		50%					50%		13	200	0.01505	6.02	kg
59	20%	80%							8	200	0.0202	8.08	kg
60		80%			20%				8	200	0.0152	6.08	kg
61			98%		2%				5	200	0.00032	0.128	kg
62		100%							13	200	0.015	6	kg
63		10%	30%		60%				13	200	0.0111	4.44	kg
64		50%			50%				13	200	0.0155	6.2	kg
65		20%			80%				13	80	0.0158	2.528	kg
66	50%	30%	20%						20	200	0.025	10	kg
67	80%		15%		5%				5	200	0.0336	13.44	kg
68		25%	25%		50%				8	200	0.01175	4.7	kg
69	10%	90%							18	200	0.0176	7.04	kg
70		50%			50%				13	200	0.0155	6.2	kg
71	60%	40%							8	200	0.0306	12.24	kg
72		90%			10%				18	200	0.0151	6.04	kg
73	100%								18	200	0.041	16.4	kg
74		33%	34%		33%				8	200	0.01023	4.092	kg
75	100%								20	200	0.041	16.4	kg
76		100%							13	200	0.015	6	kg
77		1%	89%	10%					5	200	0.00015	0.06	kg
78	100%								8	200	0.041	16.4	kg
79		90%			10%				18	200	0.0151	6.04	kg
80		100%							13	200	0.015	6	kg
81	80%	20%							18	200	0.0358	14.32	kg
82	100%								8	200	0.041	16.4	kg
											Total	**650.092**	**kg**
											Total 616 staff	**4.88362**	**t**

Table 20: CO_{2e} Emission Factors of Different Commuting Methods, 2021

Commuting Method	Private Car	Subway	Cycle	Walk	Taxi	Bus	E-bike	Motor
Emission Factor	0.041	0.015	0	0	0.016	0.009	0.0151	0.062
Unit	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km

Emission Factor Source: China Greenhouse Gas Emission Coefficient Library for Product Life Cycle
Survey: https://forms.office.com/Pages/AnalysisPage.aspx?AnalyzerToken=WhwTaLlqCM7rbSkxDRUfbe4qim62Y51A&id=K2XqMcInUk-fgZHOQtSOb0dUDUlGf4VMutKBQgk9cTlUNUw4QVZKR0lKTVNGR0JXQlY0Mzc0SUg4SC4u

G. Energy Consumption

Table 21: Different Energy Sources and Consumption Rates, 2021

Energy	Emission Category	Consumption	Unit
Diesel	1	5165	L
Natural Gas	1	23872	m^3
Gasoline	1	8454.24	L
Hot Water	2	19998.1264	GJ
Heat	2	1299	GJ
Electricity	2	8904025.57	kwh
Cold Water	4	29398	m^3

Emission Factors

Table 22: Gasoline GHGs Emission Factors Calculation Using IPCC 2006 and China Calorific Value, 2021

China Local Gasoline calorific value (GJ/t)	Carbon oxidation rate	Emission factor from IPCC 2006			Emission factor		
		CO_2 (t/GJ)	CH_4 (t/GJ)	N_2O (t/GJ)	CO_2 (t/GJ)	CH_4 (tCH_4/t)	N_2O (tN_2O/t)
43.07	98%	0.0693	0.000025	0.000008	2.9251	0.0011	0.0003
						CO_2e	**3.0467**

Table 23: Diesel GHGs Emission Factors Calculation Using IPCC 2006 and China Calorific Value, 2021

China Diesel calorific value (GJ/t)	Carbon oxidation rate	Emission factor from IPCC 2006			Emission factor		
		CO_2 (t/GJ)	CH_4 (t/GJ)	N_2O (t/GJ)	CO_2 (t/GJ)	CH_4 (tCH_4/t)	N_2O (tN_2O/t)
42.652	98%	0.0741	0.000003	0.0000006	3.0973	0.0001	0.0000
						CO_2e	**3.1076**

Table 24: Natural Gas GHGs Emission Factors Calculation Using IPCC 2006 and China Calorific Value, 2021

China Natural Gas calorific value (GJ/t)	Carbon oxidation rate	Emission factor from IPCC 2006			Emission factor		
		CO_2 (t/GJ)	CH_4 (t/GJ)	N_2O (t/GJ)	CO_2 (t/GJ)	CH_4 (tCH_4/t)	N_2O (tN_2O/t)
42.652	99%	0.0561	0.0000003	0.0000001	2.3688	0.0000	0.0000
						CO_2e	**2.3704**

Emission Factors from IPCC 2006 source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, IPCC, Volume 2: Energy

China Local Energy Calorific Value source: GB/T 2589-2020 General rules for calculation of the comprehensive energy consumption

Table 25: Hot Water, Heat, Electricity and Cold Water CO_2e Emission Factors and Sources, 2021

Energy	Emission Factor	Unit	Source
Hot Water	55.829	CO_2e kg/GJ	Carbon Dioxide Emission Factors of Nature Gas Boilers and Its Uncertainty in Beijing
Heat	55.829	CO_2e kg/GJ	
Electricity	0.581	CO_2e t/mwh	Climate Letter [2022] No. 111, General Office of the Ministry of Ecology and Environment
Cold Water	0.21	CO_2e kg/m^3	China Greenhouse Gas Emission Coefficient Library for Product Life Cycle

Data Provider: Lihai Yin, Senior Facility Management Officer and Yechao Zhu, Administration Officer

H. Waste Management

Table 26: Waste Generation Raw Data, 2021

Refuse classification	2021 quantity	Unit	Waste treatment company	Treatment way
Recycled Waste	15.48	t	Beijing Tianyou Environmental Technology Company	Recycling
Other	61.92	t	Beijing Gaoantun Waste Incineration Co. Ltd.	Incineration and cogeneration
Food Waste	54.18	t	Beijing Gaoantun Waste Incineration Co. Ltd.	Incineration and cogeneration

Data Provider: Yechao Zhu, Administration Officer

I. Cloud Service

AWS: 10.7 tCO_2e
Microsoft Azure: 11.35 tCO_2e

Data Providers:

- Chong An, Digital Program Specialist
- AWS Calculation method - https://aws.amazon.com/blogs/aws/new-customer-carbon-footprint-tool/
- Microsoft Azure Calculation method - https://appsource.microsoft.com/en-us/product/power-bi/coi-sustainability.emissions_impact_dashboard?tab=Overview

J. Septic Tank

Table 27: Septic-Tank Coefficient of Correction, BOD Generation Rate, BOD-CH_4 Conversion Factor, 2021

Tank Depth (m)	Coefficient of correction (for 4.4m tank)[1]	BOD generation (g/per capita per day)[1]	BOD-CH_4 conversion factor (t/t)[1]	People in HQ in 2021 (people)[2]	Total workday (day)[2]	CH_4 GWP[3]
4.4	0.8	40	0.6	600	200	27.9

1. Factor source: Guidelines for the Preparation of Provincial Greenhouse Gas Inventories
2. Including staff, assistants and service providers who physically worked in the Headquarter office in 2021. Both work population and workday are estimated by FAS security of AIIB.

3. GWP value: IPCC Sixth Assessment Report Global Warming Potentials

Data Provider: Yang Zhang, Head of Security and Emergency