浙江大学国际联合学院（海宁国际校区）校园碳排放核算报告

（2024 年度）

2024 Accounting Report on Carbon Emission for International Campus, Zhejiang University

2025 年 6 月

July 2025

1 浙江大学国际联合学院（海宁国际校区）概况 Introduction of International Campus, Zhejiang University

浙江大学国际联合学院（海宁国际校区）（以下简称国际校区）位于浙江省海宁市，校园占地 1200 亩，总建筑面积 39.93 万平方米。 国际校区于 2016 年 9 月正式开学，截至 2024 年 12 月，国际校区全日制在校学位生共 3119 人，教职员工及服务人员 829 人。

International Campus, Zhejiang University is in Haining City, Zhejiang Province, covering 1200 acres, with a total building area of 399,300m2. It was officially open to students in Sept 2016, and by Dec of 2024, it has 829 faculties & staff, and 3119 full-time students.

2 报告年及统计范围 Report Year and Scope of Statistics

本报告确定 2024 年为报告年。核算周期为 2024 年 1 月至 12 月。

This report is for 2024, from January to December.

3 核算边界 Accounting Boundaries

校园碳排放的核算边界包括组织边界与运营边界。国际校区组织边界与地界范围一致，运营边界是指与国际校区的组织运行有关的碳排放有关的部门、设施的总和，主要包括三类：

范围 1 指在学校地理边界范围内的发生的直接温室气体排放如锅炉燃烧产生的排放；

范围 2 指学校各类教学科研活动消耗的外购电力产生的间接排放；

范围 3 指其它间接温室气体排放，即由学校教学科研活动引起但发生在校园外的其它间接排放，例如物资采购、教职工上下班和出差乘坐交通工具产生的碳排放等。

国际校区温室气体主要排放源识别见表 3-1。因本报告为国际校区首期碳核

算报告，考虑统计方法和手段尚不完备，暂时不将范围 3：其他间接温室气体排放和范围 1 包含的空调、灭火器等的氢氟碳化物的散逸排放列入统计范围。

The accounting of campus carbon emission is based on two boundaries, organizational boundaries, and operational boundaries. The former one is in accordance with the geographical boundaries of the International Campus, and the later one refers to all department and facilities that are related to carbon emission, which mainly has 3 types:

Scope 1：It accounts for direct greenhouse gas (GHG) emissions that happen within the geographical boundaries of the International Campus, such as emissions from boiler combustion.

Scope 2：It accounts for indirect GHG emissions associated with generation of purchased electricity caused by activities such as teaching and academic research.

Scope 3：It accounts for other indirect GHG emissions that are consequences of activities of the International Campus but happen outside the campus, such as purchase, commuting, business travel and so on.

The main sources of GHG emissions from the International Campus are identified in Table 5-1. Since this report is the first round of carbon accounting reports, and considering that the statistical methods and tools are not yet complete, Scope 3: Other indirect GHG emissions and fugitive emissions of HFCs from air conditioners, fire extinguishers, etc., included in Scope 1, are temporarily excluded from the scope of the accounting.

表 3-1 国际校区温室气体主要排放源识别

Identification Form of Emission Sources (Table 3-1)

运营边界 Operational boundaries	排放源类别 Type of Emission Source	主要排放源 Main Emission Source	消耗的能源 Energy Consumed	温室气体 GHG	是否列入本期核算 Accounted
范围 1 ：直接温室气体排放 Scope 1:	固定燃烧源 Stationary combustion sources	锅炉 Boiler	天然气 Natural Gas	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	是 Y

direct GHG emissions	固定燃烧源 Stationary combustion sources	食堂餐厅 Dining Hall	天然气 Natural Gas	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	是 Y
	移动燃烧源 Non-Stationary combustion sources	校车 Shuttle Bus	柴油 Diesel	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	是 Y
	移动燃烧源 Non-Stationary combustion sources	公务车 Business Vehicle	汽油 Petrol	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	是 Y
	散逸排放 Scattered Emission	空调、灭火器 A/C, fire extinguisher	冷媒 Refrigerant	氢氟碳化物（HFCs）	否 N
范围 2 ：间接温室气体排放 Scope 2: indirect GHG emissions	外购电力 Purchased Electricity	照明、空调、动力设施等 Light, A/C and other facilities	电力 Electricity	二氧化碳（CO_2）	是 Y
范围 3 ：其他间接温室气体排放 Scope 3: other indirect GHG emissions	移动燃烧源 Non-Stationary combustion sources	除校车、公务车外的校园内外交通运输车辆 Vehicles apart from shuttle bus and business vehicles	汽油 Petrol	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	否 N
	移动燃烧源 Non-Stationary combustion sources	飞机、火车、巴士、轮船等（师生的商务旅行） Airplane, train, bus and ship (business travel)	汽油、柴油、电力 Petrol, diesel, and electricity	二氧化碳（CO_2） 甲烷（CH_4） 氧化亚氮（N_2O）	否 N

4 能耗活动水平数据统计 Statistics of Energy-consuming Activities

本报告统计范围为全校园建设项目所有楼宇。

All buildings of the International Campus are calculated in this report.

4.1 排放源及能耗活动水平数据统计 Emission Sources and Level of Energy-consuming Activities

表 4-1 国际校区 2024 年主要排放源数据统计

Main Emission Sources of the International Campus in 2024, (Table 4-1)

运营边界 Operational	主要排放源 Main Emission Source	能源类别 Types of Energy	计量单位	报告年消耗量	记录方式 Recorded by

boundaries			Unit	Consumption	
范围 1 ：直接温室气体排放 Scope 1: direct GHG emissions	锅炉 Boiler	天然气 Natural Gas	10k NM^3	15.23	计量表单 Forms
	食堂餐厅 Dining Hall	天然气 Natural Gas	10k NM^3	5.80	计量表单 Forms
	校车、公务车 Shuttle bus, business vehicles	柴油 Diesel	10k L	5.42	车队统计数据 Bus Center
	校车、公务车 Shuttle bus, business vehicles	汽油 Petrol	10k L	1.19	车队统计数据 Bus Center
范围 2： 间接温室气体排放 Scope 2: indirect GHG emissions	照明、空调、动力设施等 Light, A/C and other facilities	电力 Electricity	10k kWh	3098.04	计量表单 Forms

4.2 重点建筑物的主要排放源及能源消耗量 Main Emission Sources and Consumption of Key Buildings

本报告对学校碳排放总量进行核算外，选取报告年度重点监测建筑物进行碳排放核算，旨在对重点建筑物进行细化核算，从而为下一步采取有效的节能降碳措施提供有力依据。

Carbon emissions of the following buildings are calculated in detail to provide a strong data support for more effective low-carbon measures in the future.

表 4-2 国际校区 2024 年典型功能建筑物能耗活动水平数据

Consumptions of Functional Buildings in 2024 (Table 4-2)

序号	建筑名称	建筑功能	建筑面积（m2）	电量（kWh/a）	天然气（m3/a）
1	浙江大学爱丁堡大学联合学院 ZJU-UoE Institute	科研楼建筑 Scientific Research	9027	2388086.10	——
2	观通书院 Guantong College	学生宿舍 Dormitory	29127	2257369.66	——
3	惟学书院 Weixue College	学生宿舍 Dormitory	27408	1827867.60	——
4	学生中心 Student Center	食堂餐厅建筑 Dining Hall Building	12748	1615826.67	34733.39

5	来同书院 Laitong College	学生宿舍 Dormitory	26854	1437043.48	——
6	学术交流中心 Academic Exchange Center	酒店 Hotel	25296	1430081.00	——
7	浙江大学伊利诺伊大学厄巴纳香槟校区联合学院 ZJU-UIUC Institute	科研楼建筑 Scientific Research	11830	1254727.75	——
8	体育馆 Gymnasium	场馆建筑 Sports	14669	1200468.75	4026.98
9	基础实验楼 Laboratory Building	科研楼建筑 Scientific Research	17801	1193257.00	——
10	实验动物中心 Laboratory Animal Center	科研楼建筑 Scientific Research	1698	1129827.20	——
11	商学院 ZIBS	科研楼建筑 Scientific Research	12546	687919.40	——
12	大讲堂 Auditorium	教学建筑 Teaching	11919	528598.10	——
13	北教学楼 A 楼 Learning and Teaching Building North A	教学建筑 Teaching	10440	331554.85	28445.00
14	北教学楼 B 楼 Learning and Teaching Building North B	教学建筑 Teaching	10750	310098.95	29289.63
15	图书馆 Library	图书馆 Library	9840	279474.80	26810.23
16	行政楼 Administration Buliding	行政办公建筑 Administration	7074	261818.30	——
17	教师公寓 Serviced Apartment	教工宿舍 Staff Dormitory	5824	224365.00	——
18	东西讲堂 Lecture Theatre East & West	教学建筑 Teaching	2502	129952.60	——
19	文理楼 Art and Science Building	行政办公建筑 Administration	10648	105889.20	29011.72
20	校医院 Hospital	医院 Hospital	2130	97191.00	——

21	教工俱乐部 Faculty Club	会议厅 Meeting	1405	51767.20	——
22	多功能厅 Multimedia Hall	会议厅 Meeting	2810	44580.80	——

5 校园碳排放（温室气体排放）清单 List of Campus Carbon Emission (Greenhouse Gas Emission)

5.1 校园碳排放（温室气体排放）清单 List of Campus Carbon Emission (Greenhouse Gas Emission)

1. 校园碳排放（温室气体排放）总量 Total Campus Carbon Emissions (Greenhouse Gas Emissions)

2024 年，国际校区全年温室气体的排放量分别为：CO_2 17411.96 吨、CH_4 0.0254 吨、N_2O 0.0117 吨。折算成二氧化碳当量（CO_2e）排放为 17416.08 吨。其中：直接温室气体排放的二氧化碳当量为 618.51 吨，直接温室气体包括食堂餐饮用天然气、教学科研楼冬季供暖消耗的天然气，以及来往杭州各校区班车和公务用车（不包括教职工私家车）排放；间接温室气体排放的二氧化碳当量为 16797.57 吨，间接温室气体排放主要为外购电力。详见表 5-1 至 5-3。

In 2024, the annual greenhouse gas emissions for the international campus were as follows: CO2: 17411.96 tons, CH4: 0.0254 tons, and N2O: 0.0117 tons. When converted to carbon dioxide equivalent (CO2e), the total emissions amount to 17416.08 tons.

This includes: Direct Greenhouse Gas Emissions: (The carbon dioxide equivalent of direct emissions is 618.51tons. Direct greenhouse gases include natural gas used in the canteen for cooking, natural gas consumed for heating in the teaching and research buildings during winter, and emissions from shuttle buses and official vehicles traveling between the Hangzhou campuses (excluding private cars of faculty and staff)) and Indirect Greenhouse Gas Emissions: (The carbon dioxide equivalent of indirect emissions is 16797.57 tons. Indirect greenhouse gas emissions primarily

come from purchased electricity).

See Tables 5-1 to 5-3 for details.

表 5-1 国际校区温室气体排放量

GHG Emission of the International Campus (Table 5-1)

运营边界 Operational boundaries	主要排放源 Main Emission Source	能源类别 Types of Energy	计量单位 Unit	报告年消耗量	CO_2	CH_4	N_2O
范围 1 直接温室气体排放 Scope 1: direct GHG emissions	锅炉 Boiler	天然气 Natural Gas	万 10k NM^3	15.23	318.3070	0.0057	0.0006
	食堂餐厅 Dining Hall	天然气 Natural Gas	万 10k NM^3	5.8	121.2200	0.0022	0.0002
	校车、公务车 Shuttle bus, business vehicles	柴油 Diesel	万 10k L	5.42	147.9660	0.0078	0.0078
	校车、公务车 Shuttle bus, business vehicles	汽油 Petrol	万 10k L	1.19	26.8940	0.0097	0.0031
范围 2 间接温室气体排放 Scope 2: indirect GHG emissions	照明、空调、动力设施等 Light, A/C and other facilities	外购电 Electricity	万 10k kWh	3098.04	16797.57	0.0000	0.0000

表 5-2 国际校区温室气体排放清单（折算成二氧化碳当量，按范围统计）

Table 5-2: International Campus Greenhouse Gas Emissions Inventory (Converted to CO2 Equivalent, Categorized by Scope)

排放类别 Type	范围 1：直接温室气体排放 Scope 1: direct GHG emissions	范围 2：间接温室气体排放 Scope 2: indirect GHG emissions	总排放量 Total Emission
排放量 Emission（t）	618.51	16797.57	17416.08
所占比例 Percentage %	3.55%	96.45%	100%

表 5-3 国际校区温室气体排放清单（分温室气体种类统计）

GHG Emission Inventories (by type of greenhouse gas) (Table 5-3)

温室气体 GHG / 排放量 Emission	CO_2	CH_4	N_2O	总排放量 Total Emission
排放量 Emission（t）	17411.96	0.0254	0.0117	--
增温潜势（GWP）	1	25	298	--
折算为 CO_2e 排放量（t）	17411.96	0.6340	3.4851	17416.08
所占比例 Percentage %	0.99976	0.00004	0.00020	100%

2. 校园碳排放强度 Campus Carbon Emission Intensity

2024 年度，国际校区按学生人数折合的生均碳排放为 5.44tCO_2e/生，按师生总人数折合的人均碳排放 4.41tCO_2e/人，按校园建筑面积折合的单位建筑面积碳排放为 43.61kgCO_2e/m^2，按校园占地面积折合的单位校园面积碳排放为 20.34 kgCO_2e/m^2。见表 5-4。

In 2024, the average carbon emission of the International Campus is 5.44 tCO_2e/student, the carbon emission is 4.41 tCO_2e/person, the carbon emission per unit of building area is 43.61 kgCO_2e/m^2, and the carbon emission per unit of campus area converted by the campus area is 20.34 kgCO2e/m2. See Table 5-4.

表 5-4 国际校区温室气体排放清单（折算成单位量统计）

GHG Emission Inventories (converted to unit volume statistics) Table 5-4

温室气体 GHG / 排放量 Emission	CO_2	CH_4	N_2O	总排放量 Total Emission
CO_2e 排放量 Emission（t）	17411.96	0.6340	3.4851	17416.08
生均碳排放量 Carbon Emission per student（tCO_2e/生 student）	5.44	0.0000	0.0000	5.44
人均碳排放量 Carbon Emission per person （tCO_2e/人 person）	4.41	0.0000	0.0000	4.41

单位建筑面积碳排放量 Carbon Emission per unit building area （$kgCO_2e/m^2$）	43.61	0.0016	0.0087	43.62
单位校园面积碳排放量 Carbon Emission per unit campus area （$kgCO_2e/m^2$）	20.34	0.0007	0.0041	20.35

5.2 重点建筑物温室气体排放清单 Greenhouse Gas Emissions List of Key Buildings

本报告对国际校区校园建筑中用能总量和单位建筑面积碳排放量大的建筑进行碳排放核算，重点核算建筑的面积为 264346 万平方米，占校园建筑面积的 66.20%，碳排放占校园总排放 60.33%。其中单位建筑面积碳排放强度最大的为实验动物中心，为 360.77$kgCO_2e/m^2$ 。见图 5-2 和表 5-5。

This report accounts for the carbon emissions of the buildings with large total energy consumption and carbon emissions per unit of building area in the campus buildings of the International Campus, and the area of the key buildings is 264346 square meters, accounting for 66.2% of the campus building area, and the carbon emissions account for 60.33% of the total campus emissions. The largest carbon emission intensity per unit building area is the Laboratory Animal Center, which is 360.77kgCO2e/m2. See Fig 5-2 and Table 5-5.

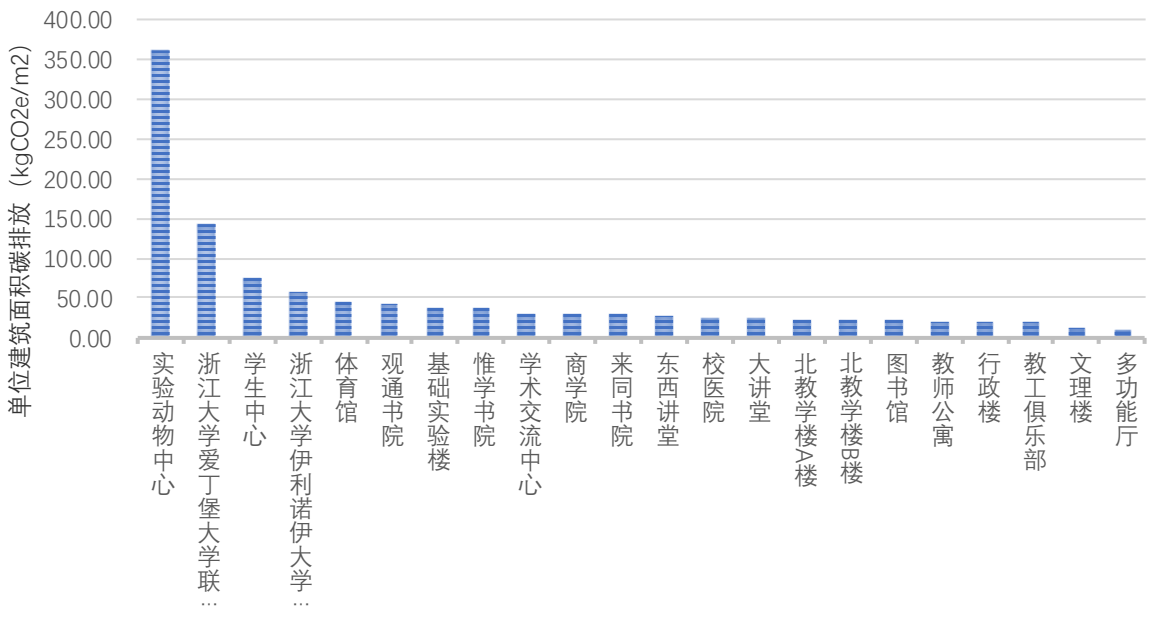

图 5-2 重点监测的建筑物单位面积碳排放

Key Buildings’ Average Carbon Emission (Figure 5-2)

表 5-5 国际校区 2024 年度重点监测建筑物碳排放清单

2024 Carbon Emission List of Key Buildings on International Campus (Table 5-5)

序号 No.	建筑名称 Building	建筑面积 Area（m2）	电量 Electricity（kWh/a）	天然气 Natural Gas（m3/a）	CO2 排放总量（t）	单位建筑面积碳排放 Per Area（kgCO2e/m2）
1	实验动物中心 Laboratory Animal Center	1698	1129827.2		612.59	360.77
2	浙江大学爱丁堡大学联合学院 ZJU-UoE Institute	9027	2388086.1		1294.82	143.44
3	学生中心 Student Center	12748	1615826.67	34733.39	948.69	74.42
4	浙江大学伊利诺伊大学厄巴纳香槟校区联合学院 ZJU-UIUC Institute	11830	1254727.75		680.31	57.51
5	体育馆 Gymnasium	14669	1200468.75	4026.98	659.31	44.95
6	观通书院 Guantong College	29127	2257369.66		1223.95	42.02
7	基础实验楼 Laboratory Building	17801	1193257		646.98	36.35
8	惟学书院 Weixue College	27408	1827867.6		991.07	36.16
9	学术交流中心 Academic Exchange Center	25296	1430081		775.39	30.65
10	商学院 ZIBS	12546	687919.4		372.99	29.73
11	来同书院 Laitong College	26854	1437043.48		779.16	29.01
12	东西讲堂 Lecture Theatre East & West	2502	129952.6		70.46	28.16
13	校医院 Hospital	2130	97191		52.70	24.74
14	大讲堂 Auditorium	11919	528598.1		286.61	24.05

15	北教学楼 A 楼 Learning and Teaching Building North A	10440	331554.85	28445.00	239.22	22.91
16	北教学楼 B 楼 Learning and Teaching Building North B	10750	310098.95	29289.63	229.35	21.33
17	图书馆 Library	9840	279474.8	26810.23	207.56	21.09
18	教师公寓 Serviced Apartment	5824	224365		121.65	20.89
19	行政楼 Administration Building	7074	261818.3		141.96	20.07
20	教工俱乐部 Faculty Club	1405	51767.2		28.07	19.98
21	文理楼 Art and Science Building	10648	105889.2	29011.72	118.05	11.09
22	多功能厅 Multimedia Hall	2810	44580.8		24.17	8.60
	合计 Total	264346	18787765.4	152316.95	10505.06	1107.92

6 附件 Appendix

6.1 排放因子（EF）Emission Factor

温室气体排放因子（EF）是将活动水平数据与温室气体（GHG）排放相关联的因子，即某种单位体积或质量的燃料或物质的温室气体放量。本报告采用的电力排放因子来源于生态环境部、国家统计局发布的《《2021 年电力二氧化碳排放因子》;标煤 CO_2 的排放因子来源为《可再生能源建筑应用示范项目测评导则》；其它排放因子数据基于燃料的热值和《IPCC 国家温室气体排放清单指南 2006》第二卷提供的温室气体缺省排放系数的计算值，其中能源热值来源于《中国能源统计年鉴 2008》第 283 页。

Greenhouse Gas Emission Factors (EF) link activity level data to greenhouse gas (GHG) emissions, indicating the amount of GHG emitted per unit volume or mass of fuel or

substance. The emission factors for electricity used in this report are sourced from the "2021 Electricity Carbon Dioxide Emission Factors" released by the Ministry of Ecology and Environment and the National Bureau of Statistics. The emission factor for standard coal CO2 is sourced from the "Evaluation Guidelines for Renewable Energy Building Application Demonstration Projects". Other emission factor data are based on the fuel's calorific value and the default emission factors provided in the "IPCC Guidelines for National Greenhouse Gas Inventories 2006" Volume 2, with energy calorific values sourced from the "China Energy Statistical Yearbook 2008" page 283.

表 6-1 常用排放因子及相关说明

Common Emission Factors and Related Descriptions (Table 6-1)

类别 Category	排放因子 Emission Factor			来源（或依据） Source
	CO_2	CH_4	N_2O	
电力 Electricity	5.422 tCO_2/（万 kWh）	--	--	生态环境部、国家统计局发布的《《2021 年电力二氧化碳排放因子》P1“表 3 2021 年省级电力平均二氧化碳排放因子”浙江省电力排放因子 "2021 Electricity Carbon Dioxide Emission Factors" released by the Ministry of Ecology and Environment and the National Bureau of Statistics. P1 " Table3 Provincial average carbon dioxide emission factors for electricity in 2021 " Zhejiang Province Electricity Emission Factors
标煤 Standard Coal	2.47 tCO_2/t	--	--	根据《可再生能源建筑应用示范项目测评导则》，标煤 CO_2 的排放因子为 2.47 According to the "Evaluation Guidelines for Renewable Energy Building Application Demonstration Projects," the CO2 emission factor for standard coal is 2.47.
天然气 Natural Gas	20.9 tCO_2/万 m^3	3.73×10^{-4} tCH_4/万 m^3	3.73×10^{-5} tN_2O /万 m^3	《IPCC 国家温室气体排放清单指南 2006》第 3 章的缺省排放因子 The default emission factors in Chapter 3 of the "IPCC Guidelines for National Greenhouse Gas Inventories 2006"

车用汽油 Vehicle Petrol	22.6 tCO_2/万 L	8.16×10^{-3} tCH_4 万 L	2.61×10^{-3} tN_2O /万 L	《IPCC 国家温室气体排放清单指南 2006》第 3 章的缺省排放因子 The default emission factors in Chapter 3 of the "IPCC Guidelines for National Greenhouse Gas Inventories 2006"
车用柴油 Vehicle Diesel	27.3 tCO_2/万 L	1.44×10^{-3} tCH_4/万 L	1.44×10^{-3} tN_2O /万 L	《IPCC 国家温室气体排放清单指南 2006》第 3 章的缺省排放因子 The default emission factors in Chapter 3 of the "IPCC Guidelines for National Greenhouse Gas Inventories 2006"
液化石油汽（固定） LPG (fixed)	17.5 tCO_2/万 L	0.278 tCH_4 万 L	0.0278 tN_2O /万 L	《IPCC 国家温室气体排放清单指南 2006》第 3 章的缺省排放因子 The default emission factors in Chapter 3 of the "IPCC Guidelines for National Greenhouse Gas Inventories 2006"
汽车 Automobile	3.641×10^{-5} tCO_2/km	--	--	2010 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting：Annex 6 Passenger Transport Conversion Tables:22 of 35,Table 6k
火车、动车 Train	3.641×10^{-5} tCO_2/km	--	--	2010 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting：Annex 6 Passenger Transport Conversion Tables:22 of 35,Table 6k
飞机 Airplane	2.052×10^{-4} tCO_2/km	--	--	2010 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting：Annex 6 Passenger Transport Conversion Tables:22 of 35,Table 6l

6.2 全球增温潜势（GWP）Global Warming Potential

全球增温潜势（GWP）：基于充分混合的温室气体辐射特征的一个指数，是指某种温室气体的温室效应与二氧化碳的温室效应的比值，二氧化碳的 GWP 为 1。本次核算用到的 GWP 值，为政府间气候变化委员会（IPCC）于 2007 年编制国家温室气体清单在其报告指南中发布的温室气体在 100 年间的全球增温潜势。

Global Warming Potential (GWP): An index based on the radiative properties of well-mixed greenhouse gases, which measures the relative warming effect of one unit mass of a given greenhouse gas compared to one unit mass of carbon dioxide, which has a GWP of 1. The GWP values used in this calculation are based on the 100-year GWP values published by the Intergovernmental Panel on Climate Change (IPCC) in its 2007 National Greenhouse Gas Inventory Guidelines.

表 6-2 温室气体全球增温潜势

Global Warming Potential (Table 5-2)

温室气体名称 Greenhouse Gas	分子式 Molecular formula	GWP
二氧化碳 Carbon Dioxide	CO_2	1
甲 烷 Methane	CH_4	25
氧化亚氮 Nitrous Oxide	N_2O	298

数据来源：IPCC 第四次评估报告 2007 Data source: IPCC Fourth Assessment Report 2007

6.3 二氧化碳当量（CO_2e）Carbon Dioxide Equivalence

二氧化碳当量（CO_2e）是指与一定质量的某种温室气体辐射强度相当的二氧化碳的量。

全校温室气体排放的二氧化碳当量 $CO_2e = GHG_i \times GWP_i$

其中：GHG_i:第 i 种温室气体的排放量，单位：t

GWP_i: 第 i 种温室气体的全球增温潜势

Carbon dioxide equivalent (CO2e) refers to the amount of carbon dioxide that would have the same radiative forcing as a given mass of another greenhouse gas.

The carbon dioxide equivalent of the total greenhouse gas emissions of the entire campus, CO2e, is calculated as:

$CO_2e = GHG_i \times GWP_i$

where:

GHG_i is the emission of the i^{th} greenhouse gas, in tonnes (t).

GWP_i is the global warming potential of the i^{th} greenhouse gas.