Cambridge Judge Business School

CARBON AUDIT REPORT 2024

In collaboration with Engie Impact

UNIVERSITY OF CAMBRIDGE
Judge Business School

Contents

GHG emissions summary

The following tables summarise the high-level Greenhouse Gas (GHG) emissions for Cambridge Judge Business School in their 2023 calendar year. Table 1 presents the relevant GHG emissions relating to Cambridge Judge Business School's operations (Scope 1 and 2) and value chain (Scope 3), according to the GHG Protocol and in the format required for external reporting.

Scope	2023 [mtCO2e]	%
Scope 1	396	4%
Scope 2 (LB)	247	3%
Scope 2 (MB)	0	0%
Scope 3	8,470	96%
Total	8,866	

Table 1

Introduction and background

Cambridge Judge Business School is the business school of the University of Cambridge that is providing management education. It is named after Sir Paul Judge, a founding benefactor of the Business School. Cambridge Judge Business School is a department of the University of Cambridge School of Technology administrative group. Cambridge Judge offers a suite of courses and programmes, including a PhD programme, master's programmes, and programmes for entrepreneurs, are designed by leading business minds and informed by the latest academic and professional research.

To support this ambition, ENGIE Impact was commissioned in 2024 to support Cambridge Judge Business School in the development of its first carbon footprint assessment.

GHG protocol methodology

Approach

There are three distinct phases in compiling a comprehensive GHG emissions inventory:

- Boundary setting

- Data collection

- Emission calculations

This section sets out how these 3 phases have been applied and integrated into the GHG inventory for Cambridge Judge Business School. For a high-level overview of the methodology taken to compile the GHG inventory, refer to Appendix 1.

Boundary setting

Temporal boundary

For standard carbon accounting procedures, a GHG emissions inventory is compiled for a 12-month period, usually aligning with dates for a calendar or financial year. For Cambridge Judge Business School,

the financial/academic year is used, and therefore the agreed 12-month period for the emissions inventory for 2023 was 1st August to 31st July.

Organisational control

In accordance with the GHG Protocol, calculations in this GHG emissions inventory are based on the principle of operational control. This approach accounts only for emissions from sites under Cambridge Judge Business School's operational control, meaning at sites for which the company can introduce and direct operating policies. For the year 2023, it is understood that Cambridge Judge Business School maintained operational control over several buildings on the campus including its main building (The Addenbrooke's Building and Simon Sainsbury Centre) as well as 4 buildings on Trumpington Street, Keynes House and partial use of 16 Mill Lane building.

Organisational boundaries

Following the principle of organisational control, the 2023 GHG emissions inventories for Cambridge Judge Business School included its main building (The Addenbrooke's Building and Simon Sainsbury Centre) as well as 4 buildings on Trumpington Street, Keynes House and partial use of 16 Mill Lane building.

Operational boundary

A GHG Emissions inventory quantifies the Greenhouse Gas (GHG) emissions generated by a company's activities. This considers all 6 of the Kyoto Protocol greenhouse gases with a unit of output of tonnes of carbon dioxide equivalent (tCO_2e). A unit of 'CO_2e' allows different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO_2. It is calculated by multiplying the mass of emissions from each GHG by their respective 100-year global warming potential (GWP), as shown in Table 2.

Table 2: Kyoto Protocol GHGs and their related GWPs.

Greenhouse gas	Global warming potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	27
Nitrous Oxide (N_2O)	273
Hydrofluorocarbons (HFCs)	1 – 14,600
Perfluorocarbons (PFCs)	7,380 – 12,400
Sulfur hexafluoride (SF_6)	24,300

Table 2

To measure Cambridge Judge Business School's Scope 1, 2, and 3 GHG emissions, this report aligns with the definitions as outlined by the GHG Protocol. These are detailed below:

- Scope 1 ("Direct Emissions"): Emissions from greenhouse gas sources owned or controlled by the organisation.

- Scope 2 ("Indirect Energy Emissions"): Emissions from the generation of imported electricity, heat, and steam consumed by the organisation.

- Scope 3 ("Other Indirect Emissions"): Emissions from all other activities in the value chain (upstream and downstream) of an organisation. There are 15 categories in total, including purchased goods and services, fuel and energy related activities, business travel, and employee commuting.

From discussions with Cambridge Judge Business School's Facilities Project Manager, a materiality assessment of the Business School's buildings and value chain assessed the following activities that generate GHG emissions (see Table 3). This assessment was substantiated by a desktop study of Cambridge Judge Business School's buildings within the operational control boundary.

Scope 1: Direct GHG Emissions

Activity	Description of emission source at Cambridge Judge Business School	Included/excluded
Purchased gas	Onsite combustion of natural gas for hot water and space heating.	Relevant - Included
Company owned vehicles	Combustion of fuels in owned company cars, employee shuttle buses, and barges, and long-term leased trucks.	Not relevant – Excluded
Space cooling	Fugitive emissions from refrigerant gases within A/C and other cooling units.	Relevant - Included

Scope 2: Indirect Energy GHG Emissions

Activity	Description of emission source at Cambridge Judge Business School	Included/excluded
Purchased electricity	Combustion of fossil fuels in the centralised electricity generation system.	Relevant - Included
Purchased heat and steam	Combustion of fossil fuels in decentralised energy systems.	Not relevant – Excluded
Onsite Generation	Generation of electricity from solar PV installed on site.	Relevant - Included

Scope 3: Indirect Other GHG Emissions

Activity	Description of emission source at Cambridge Judge Business School	Included/excluded
Purchased goods and services	Upstream manufacturing emissions from purchased input materials including IOP, lime, and ferro-alloys).	Relevant - Included
Capital goods	Extraction, production, and transportation of purchased or acquired capital goods.	Not relevant – Excluded
Fuel and energy related activities	Extraction, production, and transportation of purchased or acquired fuels and energy.	Relevant - Included

ENGIE

Upstream transportation and distribution	Transportation and distribution of purchased input materials in vehicles not owned or controlled by Cambridge Judge Business School.	Not relevant – Excluded
Waste generated in operations	Disposal and treatment of generated waste. Supply and treatment of water.	Relevant - not included
Business travel	Air, land and sea transportation of employees and students for business-related activities.	Relevant - Included
Employee commuting	Transportation of employees between their homes and Cambridge Judge campus in vehicles not owned or operated by the reporting company.	Relevant - Included
Upstream Leased assets	Operation of assets leased by the reporting company in the reporting year and not included in Scope 1 and Scope 2.	Relevant - not included
Downstream transportation and distribution	Road and sea transportation and distribution of steel products sold by Cambridge Judge Business School between ICAD 1 and the end consumer.	Not relevant – Excluded
Processing of sold products	Further manufacturing of billets sold by downstream companies.	Not relevant – Excluded
Use of sold products	End use of goods and services sold by the reporting company in the reporting year.	Not relevant – Excluded
End-of-life treatment of sold products	Waste disposal and treatment of steel products sold by Cambridge Judge Business School at the end of their life.	Not relevant – Excluded
Downstream leased assets	Operation of assets owned by the reporting company and leased to other entities in the reporting year.	Not relevant – Excluded
Franchises	Operation of franchises in the reporting year.	Not relevant – Excluded
Investments	Operation of investments in the reporting year.	Not relevant – Excluded

Data collection

Process

The ENGIE Impact team prepared and sent data collection questionnaires to the Facilities Project Manager and Senior Business Insight Analyst at Cambridge Judge Business School. They both identified the relevant internal stakeholders to respond, and collected this data directly, before sending back to the ENGIE Impact team. Subsequent data requests were issued if missing or erroneous data was identified.

This data was then validated and input into a bespoke data collection & calculation spreadsheet that modelled the various emissions sources, with a focus on data inputs relating to the impacts of faculty, staff and students. Weekly data validation meetings were held between the ENGIE Impact team, the Facilities Project Manager and Senior Business Insight Analyst to ensure that the data was understood and integrated correctly into the data collection spreadsheet.

The data collection and calculation spreadsheet will be presented alongside this report for Cambridge Judge Business School to conduct GHG Emission Inventories for following years. This will be presented in a format whereby the Cambridge Judge team can view the 2023 data inputs and input data for a second year.

Data quality

'Activity data' can be collected in two ways: 'Primary data' relates to activity data originating directly from activities occurring at Cambridge Judge Business School; 'Secondary data' relates to activity data originating outside of Cambridge Judge's activities (for example, an 'industry average'). Primary data is the priority when compiling a GHG inventory as it is the most accurate, whereas secondary data should only be used when primary data is unavailable.

Emissions calculations

Activity data was validated and cross checked with Cambridge Judge team for any outliers. Emissions were then calculated in a bespoke Excel spreadsheet using GHG emission conversion factors sourced from various internationally recognised databases and sources (see below). These represent the GHG emissions associated with one unit of specific activity data. The following sources of emission factors were used to compile Cambridge Judge Business School's GHG emission inventory.

The UK Government Conversion Factors for greenhouse gas (GHG) reporting (DESNZ) GHG Conversion Factors[1] were used as a basis for calculating emissions from purchased gas, company owned vehicles, space cooling activities, fuel and energy related activities, upstream transportation and distribution, business travel, employee commuting, and downstream transportation and distribution. The DESNZ emission factors used are updated annually and are not geography specific, so are applicable to operations internationally.

The US Environmental Protection Agency (USEPA) Emission Factor Database[2] was used as a basis for calculating emissions from spend based purchased goods and services data. This is through the US Environmentally-Extended Input-Output (USEEIO) Models. The USEEIO emission factors are updated every year and include the carbon dioxide, methane, and nitrous oxide emissions.

---

[1] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

Appendix 1 – Scope 1 and 2 collection and calculation methodology

Category	Item	Data collection description	Emission calculation description	Comments
Scope 1 – Purchased gas	Natural gas consumption	Total annual natural gas consumption provided in kWh by Cambridge Judge Business School. Areas which were not under operational control were accounted floor based on the floor area and therefore not included in the calculations.	Natural gas multiplied by emission factors found in DESNZ 2023 conversion factors.	
Scope 1 – Space cooling	Refrigerant gases	No actual data was available therefore, floor area was used in an estimation tool which combines floor area with the estimated top up amount for a similar building (school). The source for this is ICF: Accounting Tool to Support Federal Reporting of Hydrofluorocarbon Emissions. Areas which were not under operational control were accounted floor based on the floor area and therefore not included in the calculations.	Top up value multiplied by specific global warming potential of each f-gas found in DESNZ Database (see section 3.4).	For better data accuracy, measure actual top up value for each f-gas.
Scope 2 – Purchased electricity	Electricity consumption	Total annual electricity usage was provided for each building in kWh by Cambridge Judge Business School. Areas which were not under operational control were accounted floor based on the floor area and therefore not included in the calculations. On site generation through solar PV has been included within the calculations.	Location-based electricity consumption multiplied by emission factors found in the DESNZ 2023 conversion factor database. Market – based electricity emissions Cambridge Judge are covered by a EDF zero carbon tariff (https://www.edfenergy.com/fuel-mix) for 80% of the energy procured and the residual 20% is covered by Market A PPA (Scottish windfarms)	

Appendix 2 – Scope 3 collection and calculation methodology

Category[3]	Item	Data collection description	Emission calculation description	Comments
Category 1: Purchased goods and services	Purchased goods and services	Annual procurement of goods and services (category 1) from Cambridge Judge Business Schools general ledger are allocated to the most applicable categories within the detailed commodity database of USEPA's Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities (USEEIO). These goods and services included items such as general office supplies, electronic goods and professional services amongst many more.	Spend data is firstly allocated into the appropriate category within the USEEIO tool. Cradle-to-shelf GHG emissions are estimated by multiplying total annual spend in each relevant commodity category by the emission factor specific to that category (including margins), with adjustment for inflation.	For more accurate data collection, collection of actual data is encouraged from suppliers.
Category 3: Fuel- and energy related activities	Upstream activities from other categories	No data collection was needed as this relates to the upstream (additional) emissions of the following categories: scope 1 (purchased fuels, company owned vehicles), scope 2 (purchased electricity), scope 3 (business travel, employee commuting, upstream transportation and distribution, downstream transportation and distribution).	Activity data multiplied by the following emission factors from the DESNZ Database - Well-to-tank: all named categories - Transmission and distribution losses: purchased electricity - Well-to-tank of transmission and distribution losses: purchased electricity	The data accuracy of this Category is directly proportionate to the data accuracy of all relevant categories.
Category 6: Business travel	Faculty – air, train and hotel	Air and rail travel data for Cambridge Judge Business School is collected through a 'Key Travel' file and organised according to cabin class, mileage per segment (leg) and total miles travelled. Air travel data for all other regions was collected internally, to the best availability,	For the actual data, total distance travelled multiplied corresponding emission factors (including radiative forcing) from the DESNZ Database (see section 3.4).	For better data accuracy, flight class should be assigned for all flights and all modes of travel should

---

[3] Category number refers to the order of Scope 3 categories as presented by the GHG Protocol Value Chain Standard, and therefore can be used as a reference to the guidance document. Categories not included in Appendix 4 (for example Category 1: Purchased Goods & Services) related to activities not relevant to the operations at Cambridge Judge Business School – see Table 4 for the list of included Scope 3 categories.

		and contained total trips, departure cities and arrival cities. Distance was calculated for each trip, using an excel-based tool, and sorted into short, medium, and long-haul flight segments according to DESNZ's classification. The most recent version of DESNZ emission factors is then applied to estimate GHG emissions from air travel, where the 'average passenger' was assumed. Spend data including hotel stays, land, sea and air transport and food & beverages were summarised and categorised. The raw data was based on annual procurement of staff business travel taken from Cambridge Judge Business Schools general ledger and allocated to the most applicable categories within the detailed commodity database of USEPA's Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities (USEEIO).	For the spend data, cradle-to-shelf GHG emissions are estimated by multiplying total annual spend in each relevant commodity category by the emission factor specific to that category (including margins), with adjustment for inflation.	be collected (for example: trains, taxis, cars, boats).
Category 6b: Business travel	Students – air, train and hotel	Student air and rail travel data was calculated using comprehensive data sourced from the Business School's internal systems. The following parameters were considered: - City and country of residence: Data on the students' place of residence was collected to determine the origin of travel. - Number of trips: The total number of trips undertaken by each student to attend their course/programme was recorded. - Attendance at orientation week and diploma ceremony: Information was gathered on whether students attended the orientation week and diploma ceremony, contributing to travel frequency and distance. - School locations: Data on whether students attended a school, and the specific location of the school, was included to assess the travel requirements.	For the actual data, total distance travelled multiplied corresponding emission factors (including radiative forcing) from the DESNZ Database (see section 3.4). It was assumed all students fly economy class except the EMBA students that fly business class.	

		- Project team participation: The location and involvement in project teams were recorded, adding to the understanding of student travel. - Hotel stays: The estimated number of hotel nights during these trips was also factored in, as it influences the overall travel footprint. This data was utilized to accurately calculate the travel emissions associated with student activities, ensuring a comprehensive assessment of their air and rail travel impact. The distances associated with student air and rail travel were calculated using the following methods: - Air travel distance: Distances between the students' locations and the school or event destinations were calculated using the Haversine formula, which determines the shortest distance over the earth's surface between two points, taking into account the curvature of the Earth. - Rail travel distance: Train travel distances were determined through online research, utilizing publicly available sources and databases to accurately estimate the rail distances between relevant locations.	
Category 7: Employee commuting	Employee commuting	Employee commuting was calculated through collecting travel data via an online survey which was circulated to all staff. This survey ensured that distance, frequency of commuting as well as type of transport used to commute was collected. Staff had options of between 1-3 modes of travel which included car (solo or shared), train, bus, walk, bicycle on an average week across the year.	Total distance travelled for all employees multiplied by corresponding emission factor from the DESNZ Database (see Section 3.4).	

11

ENGIE

Cambridge Judge Business School
University of Cambridge
Trumpington Street
Cambridge
CB2 1AG
United Kingdom

T +44(0)1223 339700
enquiries@jbs.cam.ac.uk
www.jbs.cam.ac.uk