

University of Cambridge
Environmental Sustainability Data Assurance Methodology Statement
for the 2023/2024 reporting year

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1. Introduction

The University of Cambridge is committed to reducing carbon emissions from its estate. The University's Carbon Reduction Strategy commits to reducing energy-related (scope 1 and 2) carbon emissions from the University's operational estate to absolute zero by 2048, with a steep 75% decrease on 2015 emissions by 2030. Progress against this commitment is reported annually in the University's Reports and Financial Statements and in an Annual Environmental Sustainability Report¹

Selected environmental sustainability metrics included in the University's annual reporting for 2023/24 have been subjected to Independent Limited Assurance. This Methodology Statement sets out the methodology and assumptions we have used to generate these environmental sustainability metrics for the 2023/24 reporting period.

2. Scope of reporting

2.1 Selected environmental sustainability metrics

The two metrics (referred to as 'KPI's in this methodology statement and the University's reporting) subject to Independent Limited Assurance procedures in the 2023/24 reporting period are shown below.

Table 1 – KPIs for the 2023/24 reporting period subject to Independent Limited Assurance procedures

| KPI | Metric |
|-----|--|
| 1 | Total scope 1 and 2 carbon emissions – Location-based (tCO ₂ e) |
| 2 | Total scope 1 and 2 carbon emissions – Market-based (tCO ₂ e) |

2.2 Reporting boundary

The University's reporting year runs from 1st August to 31st July every year.

In reporting against the two carbon KPIs listed above, we have strived to apply and follow international best practice guidance on carbon emissions reporting.² Under this guidance, there are a number of different approaches that an organisation can take to define which operations and activities need to be included when calculating and reporting its carbon emissions. The University has adopted the Operational Control approach, under which the buildings, activities and operations included in our calculations and reporting are ***those over which the University has direct control or significant influence***.

It should be noted that, to date, our reported carbon figures and KPIs refer only to buildings that are occupied by the academic portion of the University – that is, the institutions that are directly involved in delivering the University's teaching and research; and the administrative departments and non-school institutions that support teaching and research. Currently, the buildings and activities of other parts of the wider University are not included in our reported figures. In practice, this means that our reported figures ***do not include***:

- The buildings and activities of Cambridge University Press and Assessment (CUPA). CUPA report separately³ on their carbon and broader sustainability impact.

¹ <https://www.environment.admin.cam.ac.uk/Annual-Report>

² [Corporate Standard | GHG Protocol](#)

³ [Cambridge University Press & Assessment – Cambridge University Press and Assessment Communication on Progress 2022 | UN Global Compact](#)

- The University's commercial estate or rural estate; although buildings that form part of the Eddington⁴ development that provide an academic-related function (such as the Post-Doc Centre) are included in our reported KPIs.

The University owns a number of subsidiary organisations; where these are UK based and within the University's operational control, they are included in our reported KPIs unless they are occupied by Cambridge University Press and Assessment. Subsidiaries over which the University does not have operational control are excluded from our metrics. Some of the University's subsidiaries are located overseas and are excluded from our reporting. We intend to undertake further work to confirm whether these are material emissions sources and should be included in our reporting in future. Based at Eddington are 3 subsidiaries (Portal Estate Management, Core Sustainable Heat Management Limited, Lodge Property Services Ltd) which, in terms of operations and administration, are in scope and included in reporting as they are embedded within buildings over which the University has operational control. Whilst Core Sustainable Heat Management Limited is within scope of our reporting, the Eddington Energy Centre itself is not. This is because the Energy Centre's core purpose is delivery of heat to residential customers at Eddington, who are private residents. Heat that is generated by the Energy Centre and supplied to buildings over which the University has operational control is included in our reporting.

It is important to note that the 31 Cambridge Colleges are each separate legal entities (from the University, and each other) and under the Operational Control Approach are out of scope of the University's reported KPIs.

New University buildings are brought into scope of our reported figures from the date that they are handed over to the University. This is the point at which the University gains operational control over the building and assumes responsibility for utilities used in the building. For example, if the building is acquired and comes under our control two months before the year end, then it will be in scope for those final two months only for that reporting year. The same applies for disposals, in that if we pass on the control of a building to another organisation, that building will only be in scope up until the date the building's control was passed over to the new organisation.

It should be noted that our reported scope 1 and 2 emissions do not currently include emissions that occur as a result of refrigerant leaks from air conditioning/ cooling units across the estate ('F-gases'). These emissions sources are not currently included in our carbon reduction target baseline and remain a known exclusion due to the lack of available data and methodology. Subject to the availability of robust data, we plan to re-baseline our target in future to bring these in scope of our carbon reduction target and future reporting.

Enteric and nitrous oxide emissions from the University Farm are not currently included in the scope 1 emissions disclosed in our reporting. This is due to a lack of available data and methodology at present.

3. Restatement Policy

When necessary, and where information is available, we will restate the prior years' figures using the latest available data to make data as comparable between years as possible. Where restatements have been made for specific KPIs, these will be clearly outlined in our reporting.

Restatements are considered necessary if there is a significant change to an individual KPI, where "significant" is defined as greater than 5% (our materiality threshold).

Restatements may be needed as a result of:

- Structural change: Where we experience a structural change to the scope of our reporting in future periods, we will recalculate the baseline and other data as required, so that we can monitor our performance on a consistent basis.
- Methodology change: Changes in calculation methodology or improvements in the accuracy of emission factors or activity data, which result in a significant impact on the KPI data.

⁴ [Home - Eddington Cambridge \(eddington-cambridge.co.uk\)](https://www.eddington-cambridge.co.uk)

- Corrections: Discovery of significant errors, or a number of cumulative errors, that are collectively significant.

4. Collation of our primary data

Our primary data are those used to calculate our scope 1 and 2 carbon emissions (energy and fuel use) as shown below.

Table 2 – Primary data for reporting against KPIs for the 2023/24 reporting period

| KPI | Metric | Primary data |
|-----|--|---|
| 1 | Total scope 1 and 2 carbon emissions – Location-based (tCO ₂ e) | Building energy use <ul style="list-style-type: none">- Electricity- Gas- Steam and heat- Oil- Biomass Vehicle fuel use <ul style="list-style-type: none">- Petrol- Diesel- LPG |
| 2 | Total scope 1 and 2 carbon emissions – Market-based (tCO ₂ e) | As above, however coming from supply specific carbon factor(s). |

4.1 Building energy use

4.1.1 Data collection

Energy data are primarily collected through metering of the University's electricity and gas supplies, the majority of which are now automated and form the basis of our invoices from suppliers and through supplier invoicing of other energy sources (steam, heat, biomass and oil).

All primary data related to electricity, gas, oil (non-vehicle), heat and steam and biomass is captured and recorded in the University's energy management software, SystemsLink. The data is held in three formats, namely:

- Invoice data (billing records).
- Direct data (manual readings).
- Profile data (automated meter readings).

Data collected in various units based on the metering infrastructure or invoicing method is converted into kilowatt-hours (kWh) within SystemsLink as appropriate using selected conversion factors. Table 3 summarises the units the data is received in and the source of the conversion factors applied.

Table 3- Summary of units energy data is received in and source on conversion factors

| Source | Units received | Conversion source to convert into kWh | Data reported as |
|-------------------------|--------------------------------|--|------------------|
| Electricity | kWh on metering and invoices | None required | kWh |
| Gas | kWh on invoice | Invoice provides conversion (which is recorded by software) | kWh |
| Steam | Volume/ mass in lbs on invoice | Converted to kWh using web based tool ⁵ | kWh |
| Heat (Eddington) | kWh on invoice | None required | kWh |
| Oil | Litres on invoice | Defra published conversion factors applied ⁶ | kWh |
| Biomass | Tonnes on invoice | Conversion factor provide either on invoice or on supplier website | kWh |

The University benefits from the majority of its electricity and gas supplies being installed with Automated Meter Reading (AMR) technology, which is able to send data to SystemsLink on a day+1 basis. We also have invested in hundreds of automated electricity sub-meters to provide additional granularity where practicable.

However, we are still reliant on manual meter readings for some of our electricity and gas supplies and steam supplied at the Cambridge Biomedical Campus (CBC). Oil and biomass consumption data are wholly reliant on the supplier invoices validated by fuel delivery notes.

For our supplies that are not on automated meters, we aim to take or obtain manual meter readings on at least a quarterly basis, and in some cases on a more regular basis where this is possible, consumption is apportioned evenly per day between reads.

Where possible we take photographs to substantiate manual meter readings and request photographic evidence of readings taken by other members of staff of all visible electricity, gas, and steam meters when attending plant rooms and sites, for data verification purposes.

On occasion, where an automated meter stops working properly and this is not spotted or rectified quickly, there may be a gap in the data. Similarly, where manual meter readings cannot be taken regularly, for whatever reason, there may be a gap or absence of data for some supplies. In this circumstance, and in the absence of any other supporting data, the process set out in the estimates section (below) will be followed.

4.1.2 Data process

a) Electricity and gas:

For electricity, a best of data report is run from SystemsLink, which provides two reports which give preference to the different data sets in different orders. The first report gives preference in order

⁵ <https://www.abraxasenergy.com/energy-resources/toolbox/conversion-calculators/power/>

⁶ <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

of; Invoice data – Profile data – Direct data, and the second report uses the preference order; Profile data – Direct data – Invoice data. This is supported by reconciliation against a non-apportioned report of monthly invoice consumption.

For gas, a best of data report is run from SystemsLink, which provides two reports which give preference to the different data sets in different orders. The first report gives preference in order of; Invoice data – Profile data – Direct data, and the second report uses the preference order; Profile data – Direct data – Invoice data. This is supported by reconciliation against a non-apportioned report of monthly invoice consumption.

The different reports produced for electricity and gas are cross-checked to confirm they agree and identify where discrepancies between data types exist and require further investigation. Where there is a discrepancy of over 5% between data types (for example, between the invoice data and the profile data), selection of the data source to be reported is confirmed and a note on the reason for the decision is made. Priority is given to the invoice data because in most cases this is underpinned by automated meter readings which support accurate billing.

Using this approach also addresses the nuance in the SystemsLink software, where on occasion, the absence of an automated meter reading can be misinterpreted as zero consumption (whereas in fact it reflects that we do not have an automated meter on that supply, or that the automated meter has for some reason stopped recording readings).

b) Steam, heat, biomass and oil:

Other fuels are reliant on invoice data only as no other data formats currently exist. For steam and heat, a monthly-apportioned report is run from SystemsLink which spreads the consumption of these fuels across the time period since the last invoice (usually monthly or quarterly). Deliveries of oil and biomass occur as required, meaning there is an inconsistent frequency of delivery and invoicing. For some sites, gaps between deliveries can extend beyond the 12-month reporting period or even be several years. Therefore, a non-apportioned report is run from SystemsLink which assumes all delivered and invoiced fuel is consumed within the month of that delivery.

4.1.3 Estimations and assumptions

Where invoice data based on supplier estimates is being used, these will be accepted unless data to contradict these figures exists (e.g. internal AMR data which is not accessible to the supplier).

Estimates in the case of the Annual Environmental Sustainability Reporting process refer to instances where there is an absence of data from any source.

The following steps will be followed when making estimates:

- For estimates required to complete the reporting period (e.g. the final 1-6 months), the estimate is based on the consumption record in the previous 3 months taking account of any trend in consumption during that period.
- Data gaps of 6 months or greater will be investigated to establish the reasons for the gap. If data for a prior period exists, this will be used to inform an estimate. In the absence of any historical data, a decision will be made to either report 'no data' or apply a suitable benchmark based on the building's current use and floor space.

Steam estimates

With respect to steam, a quarterly invoice typically arrives 8-10 weeks after the end of the billed period. This means that, depending on the time the reporting data is run, the University may have not received the steam billing for April, May and June of the reporting year, and the invoice with data relating to July of the reporting year would not be issued until mid-late November.

For this reason, where necessary we apply estimates based on previously profiled consumption for the last 1-4 months of the reporting period.

As deliveries of these fuels are intermittent, total consumption during the reporting period is estimated based on the delivery volumes.

The University estate's energy supplies are not distributed equally. Some electricity, gas or steam supplies (those on which supplier invoices are based), provide energy to several buildings, for example, just one fiscal electricity supply provides power to the whole of Downing and New Museum sites (circa 30 buildings). In other circumstances, a single building may have more than one electricity or gas supply.

In order to ensure that the University's energy data is aligned to the scope of its operational control (i.e. the building/entities list), each individual building is apportioned energy consumption based the following hierarchy:

1. Collation of total energy demand through fiscal meter associated with a building or group of buildings.
2. Allocation of energy based on additional data from sub-metering for individual buildings or spaces.
3. Allocation based on floor space (GIA) relative to the total area serviced by the main supplies.

This process has been automated within the energy management system through creation of virtual meters which undertake the calculations based on the application of the hierarchy above for each building.

A reconciliation check between the best of data virtual meter report (detailed above) and the main fiscal supplies is undertaken as part of the data collation and checking process.

Virtual meters are in place for all buildings associated with a fiscal supply, if for any reason that building is not within the scope of the University's reporting, any energy apportioned to that building will not be counted towards the University's total figures contributing to the carbon metrics.

4.2 Vehicle fuel use

4.2.1 Data collection and process

a) Diesel and petrol used in University-owned vehicles: To establish fuel use by University-owned vehicles, details of the vehicles and fuel consumption figures are required. An initial vehicle list is established from the University's insurance record. Fuel volume purchased data is principally obtained from reports from the University's two main fuel card providers; we acquire from each a report on the amount of fuel purchased from them by the University during the reporting year.

Many of the vehicles on the insurance list will be fuelled exclusively using fuel cards and so consumption is captured by the annual fuel card report. Cross-referencing the vehicle details within the fuel card reports against the insurance record list will identify vehicles that the University owns but are not fuelled using fuel cards. The departments that own the vehicles are then contacted individually and their fuel purchase records for the prior year are requested. The minimum fields needed are fuel volume purchased (litres), type of fuel and date of purchase.

Once all fuel card reports are received and all additional departments that don't use fuel cards have provided their records, fleet fuel volume totals can then be aggregated

4.2.2 Estimations and assumptions

It must be assumed that the insurance record is complete and up-to-date. It is continually updated by the Insurance Section, within the Finance Division, through the year and where vehicles have been added and removed through the year is recorded.

It is possible for vehicles with a fuel card to be refuelled not using that fuel card. Such a purchase would not be captured by the data collection methodology but is considered negligible. Some returns may just be expense claims that need converting to fuel volume using the average from the fuel card report data sets.

The tailpipe emissions from the fleet fuel purchased occur when vehicles are in use. The collected fuel volume records are date stamped to when the fuel was purchased rather than used. This means that fuel purchased in the previous year may well actually be used within the reporting year but is unaccounted for. Similarly, fuel that is purchased towards the end of the reporting year may not be used until the following reporting year. An assumption must be made that the mismatch at each end of the reporting year balances out.

5. Carbon Conversion

5.1 Carbon conversion factors

Table 4 sets out the factors we apply to convert our energy and fuel data into carbon figures for our scope 1 and 2 KPIs.

Table 4 - Carbon conversion factors and their source

| Emission source | Factor period | Source of factor |
|--|---------------|-----------------------------------|
| Location-based carbon emissions figure (KPI 1) | | |
| Electricity | Calendar year | DEFRA Carbon Factors ⁷ |
| Gas | | |
| Oil | | |
| Biomass | | |
| Fuel: Diesel | | |
| Fuel: Petrol | | |
| Steam & Heat | April-March | CUHT ⁸ |
| Market-based carbon emissions figure (KPI 2) | | |
| Electricity - PPA | April – March | REGO certificates |
| Electricity – EDF tariff | April - March | EDF FMD ⁹ |
| Electricity – Cambridge Biomedical Campus (CBC) supply | April - March | EDF FMD ⁹ |
| Steam & Heat | April-March | CUHT ⁸ |
| Gas | Calendar year | DEFRA Carbon Factors ⁷ |
| Oil | | |
| Biomass | | |
| Fuel: Diesel | | |
| Fuel: Petrol | | |

⁷ Greenhouse gas reporting: conversion factors 2024 [Greenhouse gas reporting: conversion factors 2024 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024)

⁸ Cambridge University Hospital Trust (carbon factor derived from local steam network efficiencies)

⁹ EDF fuel mix disclosure <https://www.edfenergy.com/fuel-mix>

5.2 Carbon conversion methodology for Total scope 1 and 2 carbon emissions – Location-based (tCO₂e)

5.2.1 Methodology

Scope 1

The consumption figures relating to each scope 1 energy source (gas, oil, biomass, liquid fuel) are converted into carbon emissions by applying the relevant carbon conversion factor from UK Government released factors (Table 4), and the resulting figures are summed.

Scope 2

We calculate our Location-based scope 2 emissions figure by applying the grid-average carbon conversion factor published by the UK Government to all of our procured electricity, including that procured via the Power Purchase Agreement (PPA).

Reporting of scope 2 emissions associated with consumption of imported steam and heat from heat networks do not use the government factors. The University has requested a specific carbon factor from our primary supplier of steam (Cambridge University Hospitals Trust), which is based on natural gas burnt by the steam generators and the steam output of the system.

5.2.2 Estimations and assumptions

It should be noted that, for all of the emissions sources listed in the Table 4, we convert the source data (e.g. kWh of energy, km travelled, etc.) into tonnes of carbon dioxide equivalent, using the carbon conversion factors published annually – typically in June or July – by the UK Government. The factors published each year are valid for the following reporting period 1st August – 31st July. When calculating our emissions, we apply the most recent factors across our data for the entire reporting period. For example, we apply factors published in June 2024 to the reporting year August 2023 – July 2024.

5.3 Carbon Conversion methodology for Total scope 1 and 2 carbon emissions – Market-based (tCO₂e)

5.3.1 Methodology

Reporting of scope 1 emissions for natural gas, biomass and oil, and scope 2 emissions associated with consumption of steam, use the same conversion factor as applied in Location-based emissions calculations (Table 4).

The Greenhouse Gas (GHG) Protocol allows for organisations to report scope 2 electricity as zero carbon as part of their reported carbon emissions figures under the Market-based emissions methodology, provided that they:

- Meet certain accounting and reporting requirements, and
- Report both their total emissions taking account of their zero carbon procured electricity (the Market-based emissions figure) and their total emissions as calculated by applying the grid average carbon intensity to all of their consumed electricity (including that procured from zero carbon sources) (the Location-based emissions figure).

Under the Market-based approach the University has 3 distinct sources of electricity:

- Electricity sourced through its Corporate Power Purchase Agreement ('PPA').
- Electricity source from its Zero carbon tariff supplied by EDF.
- Electricity sourced from the Cambridge Biomedical Campus (CBC) private network via Cambridge University Hospital Trust (CUHT).

In selecting the appropriate Market-based carbon factor for these supplies, the University applies the following hierarchy in accordance with Table 6.3 in the GHG Protocol Scope 2 Guidance:

1. Energy attribute certificates or equivalent instruments (unbundled, bundled with electricity, conveyed in a contract for electricity, or delivered by a utility).
2. Contracts for electricity, such as power purchase agreements (PPAs) and contracts from specified sources, where electricity attribute certificates do not exist or are not required for a usage claim.
3. Supplier/Utility emission rates, such as standard product offer or a different product (e.g., a renewable energy product or tariff), and that are disclosed (preferably publicly) according to best available information.
4. Residual mix (subnational or national) that uses energy production data and factors out voluntary purchases.
5. Other grid-average emission factors (subnational or national) – see ‘Location-based method’.

In October 2019, the University entered into a ten-year Power Purchase Agreement (PPA) for the supply of a fixed amount of electricity per year from UK-based wind farms. The supplied electricity is verified as renewable and zero carbon through the provision of Renewable Energy Guarantees of Origin (REGO) certificates from the energy provider. The PPA is for the provision of 24,408 MWh of renewable electricity per year. The Emissions factor applied is therefore zero.

The University’s supplier tariff specific emission factor is applied to remaining consumption purchased through our EDF contract not covered by the PPA. The current tariff is ‘EDF Zero Carbon for Business’, though it does produce nuclear waste which is reported within the University’s Report and Financial Statements and Environmental Sustainability Report as a consequence of using this power source. The carbon conversion factor applied is therefore zero. The University is committed to moving to fully renewable electricity tariffs over time.

Power consumed on some buildings at the Cambridge Biomedical Campus (CBC) are subject to third party supply by Cambridge University Hospital Trust (CUHT). For these recharges, CUHT’s supplier (EDF energy) tariff specific factor has been applied. Buildings supplied by CUHT are identified in the buildings entities list.

5.3.2 Estimations and assumptions

Supplier fuel mix disclosures and associated specific tariff carbon factors are published in July, with reference to the preceding April to March period. Therefore the tariff specific factor used in the 2023/24 reporting process will be a factor derived from the fuel mix disclosure by the supplier for April 2023 - March 2024. The latest published factor is applied to the whole of the University’s reporting year on the basis no other factor is available for the period August 2023 – July 2024.