

## University of Cambridge

### Environmental Sustainability Data Assurance Methodology Statement for the 2019/2020 reporting year

The Council of the University of Cambridge are responsible for:

- designing, implementing and maintaining internal controls over information relevant to the preparation of the Selected Information that is free from material misstatement, whether due to fraud or error;
- establishing objective Reporting Criteria for preparing the Selected Information;
- measuring and reporting the Selected Information based on the Reporting Criteria; and
- the content of the Environmental Sustainability Report 2019/20.

#### Introduction

The University of Cambridge published its Environmental Sustainability Vision, Policy and Strategy in 2015

[https://www.environment.admin.cam.ac.uk/files/environmental\\_sustainability\\_vision\\_policy\\_and\\_strategy\\_for\\_web.pdf](https://www.environment.admin.cam.ac.uk/files/environmental_sustainability_vision_policy_and_strategy_for_web.pdf)). This sets out our aims, targets and key implementation mechanisms under nine themes and contains a number of key performance indicators (KPIs). Progress against the ambitions with this policy is reported annually in an Environmental Sustainability Report (<https://www.environment.admin.cam.ac.uk/Annual-Report>).

In July 2019, the University announced a new, ambitious science based target (SBT) for carbon reduction. This commits us to reduce energy-related (scope 1 and 2) carbon emissions to absolute zero by 2048, with a steep 75% decrease on 2015 emissions by 2030. The University has also expressed an aspiration to be ten years ahead of its SBT decarbonisation pathway at all times and to reach zero carbon by 2038 (<https://www.cam.ac.uk/news/university-of-cambridge-adopts-science-based-target-for-carbon-reduction>).

It is important that the University's environmental sustainability data is as accurate as possible to enable us to measure our progress against targets, as well as reduce our negative and enhance our positive environmental impact. This is why we have chosen to gain a public limited assurance opinion of our 2019/20 environmental sustainability data.

#### Scope of reporting

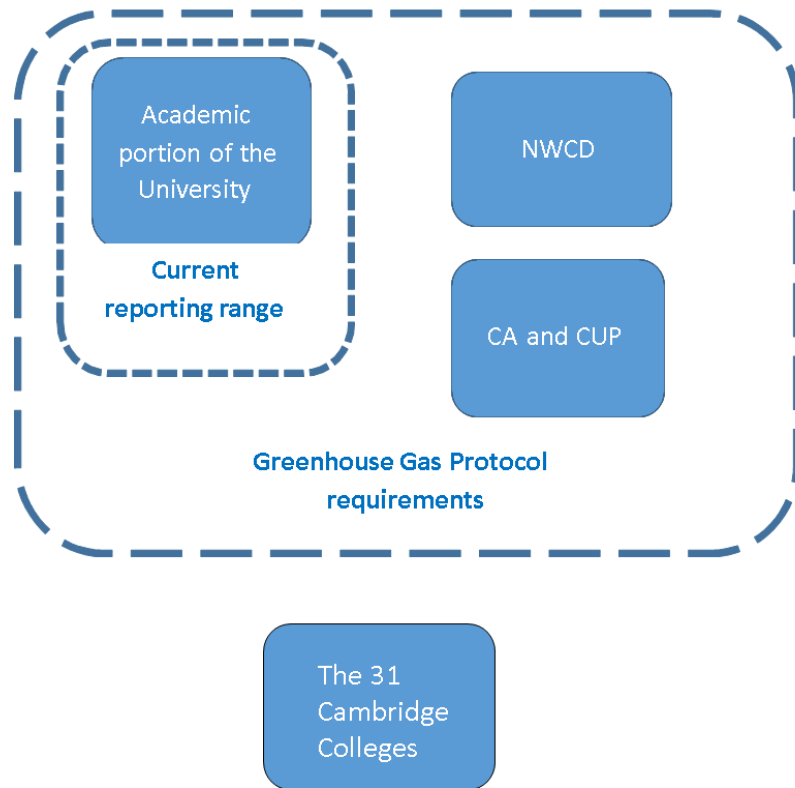
As the table below shows, a number of the key metrics included in our Environmental Sustainability Report refer directly to the University's carbon emissions (scopes 1, 2 and 3). A number of the other metrics (for example, water consumption, waste and staff commuting figures) are used as part of our carbon emissions calculations.

For this reason, for many of our metrics, we have defined the scope of what we include when measuring our progress according to international best practice guidance on carbon emissions reporting ([ghgprotocol.org/corporate-standard](http://ghgprotocol.org/corporate-standard)). 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 what is known as 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 related metrics 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 (Figure 1). In practice, this means that our reported figures do not include the buildings and activities of Cambridge Assessment, Cambridge University Press or the North West Cambridge Development, except for those buildings on the development that provide an academic-related function (such as the Post-Doc Centre). Nor are the University’s commercial property portfolio or rural estate included in our reported figures.

The University owns a number of subsidiary organisations<sup>1</sup> but does not have operational control over all of these. Subsidiaries over which the University does not have operational control are excluded from our metrics. Of the subsidiaries over which the University does have operational control, those based in buildings that form part of the North West Cambridge Development, or are occupied by Cambridge Assessment and Cambridge University Press are currently excluded from our metrics. Some of the University’s subsidiaries are located overseas and we will undertake further work to confirm whether the University has operational control over these.

Under best practice and the Operational Control approach to carbon emissions reporting, our figures *should* include emissions arising from the wider University, including the North West Cambridge Development and buildings occupied by Cambridge Assessment and Cambridge University Press. We are working with representatives from across the wider University to achieve this. For this reason, the scope of our carbon metrics and many of the metrics that are used in our carbon emissions calculations may change over the coming couple of years.



**Figure 1: The University’s current carbon emissions reporting range versus what should be included in the University’s reported figures according to best practice and the Operational Control approach.**

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 metrics.

New University buildings are brought into scope of our reported figures from the date that they are handed over to the University by the building developer. This is the point at which the University gains operational control over the building and assumes responsibility for utilities used in the building.

The table below summarises all of the metrics included in our University’s Environmental Sustainability Report, and for each indicates:

- Whether the metric is one of our Key Performance Indicators (KPI), or data used in our carbon emissions calculations, or both.

- Whether the scope of the metric aligns with the Operational Control approach outlined above.

Where the scope of a specific metric differs to that defined under the Operational Control approach, further information is provided in the section for that metric, below.

<b>Metric</b>	<b>Type of metric</b>	<b>Scope aligns with Operational Control approach?</b>
Energy use (kWh)	Part of our carbon calculations	Yes
Total scope 1 and 2 carbon emissions (energy and fuel use) (tCO <sub>2</sub> e)	KPI The reported KPI is our Location-based emissions figure. We also report our Market-based emissions figure, to take account of the renewable electricity we procure via a Power Purchase Agreement, but this figure is not currently reported as a KPI. See the Energy section for details.	Yes
Carbon emissions from water use (tCO <sub>2</sub> e)	KPI	Yes
Total Scope 1 and 2 carbon emissions per FTE staff and student (tCO <sub>2</sub> e/FTE)	KPI	Yes
Carbon emissions from water use per FTE staff and student (tCO <sub>2</sub> e/FTE)	KPI	Yes

Total Scope 1 and 2 carbon emissions per total income (tCO <sub>2</sub> e/£1000)	KPI	Yes
Carbon emissions from water use per total income (tCO <sub>2</sub> e/£1000)	KPI	Yes
Percentage of energy generated from onsite renewable or low carbon sources (%)	KPI	Yes
Total water consumption (m <sup>3</sup> )	KPI and part of our carbon calculations	Yes
Total water consumption per FTE staff and student (m <sup>3</sup> /FTE)	KPI	Yes
Waste mass generated per FTE staff and student (tonnes/FTE)	KPI	Yes
Waste sent to landfill (tonnes)	KPI and part of our carbon calculations	Yes
Percentage of waste generated that is recycled or composted (construction and non-construction waste) (%)	KPI	Yes
Total scope 3 emissions (tCO <sub>2</sub> e)	Part of our carbon calculations	Yes

The percentage of new buildings that are certified at least BREEAM Excellent or equivalent	KPI	Yes
External awards for sustainable construction/design.	KPI	Yes
Percentage modal split for commuting by staff single occupancy car journey	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff car share	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff bus	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff train	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff cycle	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff walk	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Percentage modal split for commuting by staff motorbike	KPI and part of our carbon calculations	No as this metric is not linked to buildings.

Percentage modal split for commuting by staff other	KPI and part of our carbon calculations	No as this metric is not linked to buildings.
Per capita carbon emissions from flights (tCO <sub>2</sub> e/FTE)	KPI	Yes
Number of awards won by Green Impact teams	KPI	No as this metric is not linked to buildings.
Number of members of the Environment and Energy Coordinator Network	KPI	No as this metric is not linked to buildings.

The University’s reporting year runs from 1<sup>st</sup> August to 31<sup>st</sup> July every year.

**Reporting specifics and methodology**

Normalisation

As detailed in the following sections, a number of our reported metrics are normalised against a series of factors, as a way of contextualizing our performance in specific areas. The normalisation factors that we apply are explained below:

- a) Staff and student numbers  
Several KPIs are specified per FTE (Full Time Equivalent) staff and student.

Staff FTE is defined as the number of direct employees of the University during the reporting period 1 August to 31 July, and the figure is obtained from central University records calculated by the Planning and Resource Allocation Office (PRAO). Staff FTE comprises non-residential staff and residential staff including all academic, research, support, administrative and technical staff. It includes staff employed under a contract of employment and/or for whom the University is liable to pay class 1 NI contributions. It does not however include non-academic atypical staff (such as temporary workers), University of Cambridge Local Examinations Syndicate (UCLES) employees, or contractors. The FTE figure is not reduced for maternity leave or employees on long-term sick leave as they are still employees of the University. One limitation of the staff FTE figure is that HR records can be backdated (and therefore updated and more accurate) after the list has been run and the figure produced.

Data on student numbers is submitted by the University to the Higher Education Statistics Agency (HESA), who conduct validation checks, reformat the data and calculate the student FTE figure. The student FTE figure represents the full-time equivalence of a student on a credit-bearing course of study during the HESA-defined reporting period of 1 August to 31 July. Where a student is studying part-time and will spend less than eight weeks in the UK as part of their course of study, these student numbers are not included in the submission to HESA, on which the FTE calculation is based. In their FTE calculation, HESA exclude the following students on a course of study:

- where any of the course of study is not taught by the University of Cambridge;
- student is dormant for the year;
- student is on sabbatical for the year;
- student is writing-up their thesis, having completed their formal period of study.
- distance learning student;
- student on industrial placement;
- student is studying abroad.

There is a student FTE figure for taught students and a FTE figure for research students. We include both taught and research students in the FTE figures we apply.

b) Per capita emissions

Our KPI on emissions from flights is specified per capita. 'Per capita' is slightly different to FTE staff and students.

Per capita refers to the FTE number of staff employed by the University and the number of research students enrolled at the University, but it excludes the number of undergraduate students enrolled at the University. This is because the vast majority of the University's air travel is carried out by staff and research students. Some undergraduate students take flights for international field trips, but these are minor in terms of spend and distance compared to flights by staff and research students.

c) Total income

Total income is defined as the total teaching and research income of the University's Academic Group. The Academic Group includes the University's academic departments and associated administrative services, and the subsidiary companies of the University, as listed in the University's Annual Report<sup>1</sup>.

The Academic Group excludes Cambridge Assessment, Cambridge University Press and the Cambridge Trusts.

The total income figure is taken from the University's Annual Report, as relevant to our reporting year.

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<sup>1</sup> <https://www.cam.ac.uk/about-the-university/view-and-download-the-annual-report>.



It should be noted that the University does not have operational control over all of the subsidiaries included in the total income figure for the Academic Group. Some of the subsidiaries are located in buildings that are neither owned nor managed by the University. In line with best practice guidance on carbon emissions reporting, therefore, these subsidiaries should be excluded from the income figure we apply for normalisation of our environmental sustainability metrics. In practice, however, it is not feasible to separate out the income from those subsidiaries over which the University does not have operational control.

This means that the total income figure is not directly comparable, in terms of coverage, with our environmental sustainability metrics. However, on analysis, we believe that this is the most appropriate income figure to use for normalisation of our metrics, as it is the income figure that aligns *most closely* with the Operational Control approach.

### **Prior year adjustments**

In the event that errors are found in prior years' data, an assessment will be made as to the extent which this affects the prior year's data, and the amount of work required to rectify it. Should the error be relatively minor (changing the totals of any KPI by less than 1%), or the work required to update the prior data be too extensive, then no change will be made. However future reports will include a note outlining the error identified, and an estimate of the likely effect this has on the prior year(s) totals.

If the error is identified as major (changing any given KPI by more than 1%) and the work to update the data is considered reasonable, a change will be made to the totals and the new figure(s) will be highlighted in future reports as part of a summary of prior years' data, along with a summary of the change made.

### **Carbon**

**Definition:** Carbon represents emissions of carbon dioxide from the University's operational estate and associated activities. Subject to available data, our figures include:

- Scope 1 emissions – those arising directly from our estate and operations as a result of the fuel we consume in our buildings (for example, in gas boilers) and University-owned vehicles.
- Scope 2 emissions – emissions that arise upstream from the University's estate and operations as a result of the electricity and steam that we procure and consume.
- Scope 3 emissions – those that arise either upstream or downstream from the University estate and operations. The Greenhouse Gas Protocol identifies 15 different categories of scope 3 emissions but at present, due to difficulty in obtaining data, we only report on emissions from the waste we produce, the water we consume, staff commuting and business travel undertaken by our staff and students, and our supply chain.

The Greenhouse Gas Protocol covers seven different greenhouse gases in total, the six other than carbon dioxide being methane, sulphur hexafluoride, perfluorocarbons, hydrofluorocarbons, nitrous oxide and nitrogen trifluoride. It is highly probable that some, if not all, of these gases are in use across our estate, for research purposes or, in the case of hydrofluorocarbons, in refrigeration and air cooling units. However, to date we have not been able to collect data on these emissions and they are not included in our reported figures.

**Relevant KPIs:**

- Total scope 1 and 2 emissions (energy and fuel use)
- Carbon emissions from water use
- Total scope 1 and 2 emissions per staff and student
- Carbon emissions from water use per staff and student
- Total scope 1 and 2 emissions per total income
- Carbon emissions from water use per total income
- Per capita carbon emissions from flights

**Unit:** We calculate and report our emissions in tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). The KPIs listed above that relate to emissions normalised by staff and student numbers, or total income, are measured as tCO<sub>2</sub>e/ FTE and tCO<sub>2</sub>e/ £1000, retrospectively.

**Method:** We follow the Greenhouse Gas Protocol Corporate Standard for carbon emissions reporting.

We begin by collecting annual data for the following emissions sources:

Emissions source	Unit of measurement	Source(s) of data
<b>Scope 1</b>		
Natural gas	kWh/ year	See the Energy section below.
Oil		
Biomass		

Diesel and petrol used in University-owned vehicles	litres/year	Departmental fuel account cards and receipts, showing amount of fuel purchased. Further details are provided below.
<b>Scope 2</b>		
Purchased electricity	kWh/year	See the Energy section below.
Purchased heat and steam		
<b>Scope 3</b>		
Water and wastewater	m <sup>3</sup> /year	See the Water section below.
Waste	tonnes/year	See the Waste section below.
Business travel	km travelled/ year	Report on purchased flights, train journeys etc. from the University's preferred supplier for travel services.  Report on expenditure on flights, train journeys, car hire, taxis etc. from the preferred provider of University staff credit cards.  University's financial records, for staff and student expense claims for flights, train journeys, car hire, taxis etc.  Further details are provided below.
Staff commuting	km travelled/ year	The annual staff travel survey – see the section on Staff Commuting, below.
Purchased goods and services	£ expenditure /year	University's financial records. Further details are provided below.

Further information on how we compile our energy, waste, water and staff commuting figures, and use these to calculate our carbon emissions, is provided in the following sections.

In this section, we provide an overview of how we compile our data on fuel used in University vehicles, University business travel, and purchased goods and services.

It should be noted that, for all but one of the emissions sources listed in the table above, 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 Government<sup>2</sup>. The factors published each year are valid for the reporting period 1 August – 31 July; so, for example, the factors published in June 2020 were for the reporting period August 2019 – July 2020. When calculating our emissions, we apply the most recent factors across our data for the entire reporting period.

The only emission source that we do not apply the latest Government factors to is Purchased Goods and Services. As explained below, we estimate our supply chain emissions by using a free tool made available through the Greenhouse Gas Protocol website. The factors applied by this tool date back to 2015/16.

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. The University has two main preferred 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 fueled exclusively using fuel cards and so consumption is captured by the annual fuel card report. After cross-referencing the fuel card reports against the insurance list there will be some vehicles that do not appear in the fuel card reports and so their associated fuel consumption is unaccounted for. The departments that own the vehicles are then contacted individually and asked for missing details or updates on their vehicles that may not be captured in the insurance list and all fuel consumption records.

Returns from departments vary in quality and timeliness. The vast majority of returns will have fuel type and volume, so can simply be added to the totals. Some returns may just be expense claims that need converting to fuel volume using the average from the fuel card report data sets. If fuel type is not identifiable from departmental returns, a judgement call is made based on the type of vehicle. Vans can be assumed to run on diesel and tractors without a registration number can be assumed to use red diesel, for example.

b. Business travel

Business travel is defined as travel undertaken by University staff or students for work or research purposes. It includes domestic and international travel. We include travel via the following modes in our figures:

- Air
- Rail
- Bus and coach

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<sup>2</sup> <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

- Taxi
- Car and van hire
- Privately-owned vehicles
- Ferry.

Air travel makes up the vast majority of the University' expenditure on business travel, followed by rail.

Air travel and rail data are collected from three sources:

- Distance and spend reports on purchased flights and rail journeys from the University's preferred supplier for travel services.
- Report on expenditure using University staff credit cards from the University's preferred supplier for credit card services.
- University's financial records, for staff and student expense claims (Accounts Payable data).

For air and rail travel, two report types are received from the University's preferred travel services supplier; one containing distance information and one containing spend information. The distance report contains journey distances and information that enables correct class and haul type tags to be assigned. It also includes flights that were 'Cancelled' after booking. These must be filtered out before total distances are calculated per class and haul. Appropriate carbon conversion factors can simply be applied to these distance figures.

Flights that were booked using Key Travel but subsequently not taken or were refunded have been found to not necessarily show up in the records. This means that distance figures and therefore carbon emissions estimates from Key Travel are likely to be overestimates.

The University's expenses system records and credit card report do not provide the key information needed to calculate carbon emissions from flights and rail journeys (for example, distance travelled, or class of flight). The reports do itemise spend though, so spend on flights can be estimated and then converted to carbon emissions figures.

To establish a total spend on taken flights from these reports, the University's expenses system records are filtered for travel-related transaction codes and keywords associated with flights. The credit card spend report is filtered primarily using the airline 'Merchant Category Code' (MCC) that is assigned to each transaction.

There are limitations to using spend data from transaction records, particularly with regard to cancelled and refunded journeys. If journeys booked but then not taken are not refunded, they will remain in the spend totals. Any lost deposits will not be 'netted-off' by the refund and some spend will remain in the totals. Also refunds on cancelled flights will need appropriate coding or keywords in descriptors to be picked up by the filters we use. If they don't, the original spend will not be 'netted-off' as the refund won't have been captured, so will be counted in totals when in reality the journeys weren't made. Many of these issues with transaction records should be resolved with the forthcoming improvements to the accounts payable management system and credit card services reporting.

Filtered spend totals (£) from the expenses records and the credit card reports are converted to carbon emissions using the two reports from the University's preferred travel services supplier. Combining the distance and spend information enables the calculation of spend-to-distance conversion ratios which can be applied to spend figures from the University's expenses system records and credit card report.

Carbon conversion factors can then be applied along with further manipulation required to combine the results from these three data streams whilst minimising the risk of double-counting or under-counting. There are some notable limitations to how our air and rail emissions figures are calculated. Currently, three different sources of data must be manipulated independently as none will capture all flights to a high degree of confidence or accuracy. None of the raw data is collected for the purpose of carbon reporting and so flights are recorded in a wide variety of ways and formats, even within one data set. Bespoke coding script has been developed in-house to attempt to extract meaningful spend data attributable to flights or rail from the expenses sourced data set.

For two of the worked datasets, flight data needs converting from spend to carbon emissions. This is done using a conversion factor derived from the third dataset, which has an output of distance travelled. By doing this, we must assume that travel recorded by the preferred travel supplier is representative of the other two data sets. Assumptions include: value-for-money of the flights purchased; the average class travelled and proportion of short-haul to long-haul flights.

For these reasons, our KPI on per capita emissions from flights is reported with a disclaimer of having a large degree of potential error, to reflect the quality of the raw data and the complexity of the calculation methodology.

Finally, it should be noted that each data set contains different date information. Data from the preferred travel supplier does contain 'date travelled'. However, the other two only contain the date that the travel booking was made or paid for, not the date of travel itself. This probably means that, for any given reporting period, some journeys that were taken during the reporting period are excluded from our reported metrics, and conversely that some of the journeys included in our reported metrics were taken outside of the reporting period. This is a consistent issue from year to year, therefore we believe it introduces minimal error to the metrics for any given reporting period.

For business travel by modes of transport other than air or rail, the Accounts Payable spend figures are filtered by transaction code, which divides up travel expenses into taxi, car hire, van hire, etc. Travel spend attributed to generic transaction codes is allocated to the travel mode in the same ratio. Carbon emissions for these journeys are calculated by converting the amount spent (£) into distance travelled (km), using spend-to-distance ratios from such sources as car mileage expense reclaim rates.

c. Purchased goods and services

We have commissioned a study to estimate the University's supply chain emissions using a free tool made available through the Greenhouse Gas Protocol website (<https://quantis-suite.com/Scope-3-Evaluator/>). This tool applies a simplistic economic input-output approach, which converts levels of expenditure on different categories of goods and services into carbon emissions figures. We apply this approach because we currently do not have sufficient data on carbon impact across all of our expenditure areas. The University procures a huge quantity and variety of goods and services and obtaining accurate carbon data across all of these would be a massive task, if not impossible at the current time.

The results from this tool do not provide an accurate measurement of emissions across different parts of the University supply chain, and should be viewed purely as an indication of the order of magnitude of our supply chain emissions. Whilst limited, the results from this tool do highlight that emissions from purchased goods and services dominate the University's carbon emissions, across all scopes. The results also flag the areas of procurement activity that are likely to have the greatest carbon impact and where we need to focus our efforts around data collection and carbon reduction in future.

We have not been able to seek assurance of our figures on emissions from purchased goods and services this year but are working towards obtaining assurance from 2020/21 onwards.

**Assumptions made or limitations of the data:** There are currently some notable limitations to our reported carbon figures:

- a. Scope: Our reported carbon figures currently relate to the estate and operations of the academic portion of the University. Emissions arising from other parts of the wider University, including Cambridge Assessment, Cambridge University Press and the North West Cambridge Development, are not included in our reported figures.
- b. Data gaps: There are some emissions sources that we do not currently report, simply because we do not have access to robust or complete source data. This includes:
  - Fugitive emissions (scope 1): These are emissions that occur as a result of refrigerant leaks from air conditioning/ cooling units across the estate.
  - A number of scope 3 emissions sources, such as some buildings the University owns and leases to other parties (part of the University's commercial property portfolio) and investments.
- c. Estimates: The figures we report for business travel and purchased goods and services (both scope 3) are estimates, based on the data we have access to and methodologies developed. The specific limitations of these figures are set out above.

We have identified various initiatives to improve the accuracy and completeness of our reported emissions figures. For example, we plan to carry out a screening assessment across all 15 categories of scope 3 emissions to determine their magnitude and where we should focus our future data collection efforts; we intend to carry out a materiality assessment of fugitive emissions across our estate; and we are working to expand the scope of our reported emissions

to align with the Operational Control approach. We are prioritising these according to our ability to influence the data collection process, as well as the significance of the emissions source.

The national lockdown triggered in March 2020 by the COVID-19 pandemic affected our ability to collect robust data for some of our carbon emission sources and we have, in these cases, had to apply estimated figures and/or adjust our calculation methodology. Some narrative on the impact that lockdown has had on our carbon data processes for this reporting period is provided in the relevant sections of this document.

## Energy

**Definition:** Energy is defined as the annual consumption of electricity, gas, steam and fuel in buildings over which the University has operational control. Principally these fuels are used either to generate power for use in electrical equipment or to produce heat for space heating, hot water or process heat in support of research activities.

### **Relevant KPIs:**

- Percentage of energy generated from onsite renewable or low carbon sources.

Our energy consumption figures are also used to calculate our scope 1 and 2 carbon emissions figures and KPIs (see above).

**Unit:** Kilowatt hours (kWh)

**Method:** Energy data are primarily collected through metering of the University's electricity and gas supplies, the majority of which are now automated. In addition, we have invested in hundreds of automated sub-meters to provide additional granularity where required. Energy generated on the University's site from renewables (PV) is also metered. However, we are still reliant on manual meter readings for some of our energy supplies – most notably for the University's use of steam at the Addenbrooke's hospital site (Cambridge Biomedical Campus).

Data for biomass and oil consumption are reliant on records of the delivery of these fuels to recipient sites/buildings. Delivery notes are used to validate the invoice information that is fed into the University's energy management software, SystemsLink.

Our energy data is captured and recorded in three formats within SystemsLink, namely:

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

When using SystemsLink to compile our annual energy consumption data, we produce the following data reports:



- Electricity – a best of data report, which gives preference to the different data sets in the order of Invoice data— Profile data—Direct data and a second report which uses the preference order Profile – Invoice –Direct.
- Gas – a non-apportioned report of monthly invoice consumption and cost and a best of data report which uses the preference order Profile – Invoice -Direct.
- All other fuel sources – a consumption report from invoice data is produced.

The different reports produced for electricity and gas are then crosschecked 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 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, to support accurate billing. Using this approach also addresses a nuance in the SystemsLink software, where sometimes 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).

All electricity and gas data is collected as kWh units. For older gas meters, which read in cubic metres (m<sup>3</sup>), conversions into kWh are provided by our supplier within their invoices.

For biomass and oil, delivery notes are generally detailed in metric tonnes and litres respectively, therefore a conversion factor is applied to calculate the respective kWh figure. These conversion factors are sometimes displayed on the invoice for biomass, however in their absence Government-published conversion factors are used to derive the appropriate factor<sup>3</sup>. As deliveries of these fuels is intermittent, total consumption during the reporting period is estimated based on the delivery volumes.

Steam supplies at the hospital site are billed by the NHS Trust, based on their manual meter readings. Consumption is metered in kg, lbs or m<sup>3</sup> steam, and invoiced in lbs following conversion by the supplier. A conversion factor is used to derive the associated kWh figure. The conversion factor is derived from a web-based engineering calculations tool<sup>4</sup>.

The University does not currently have any additional means of data collection for steam, other than the invoices provided to us by the Trust. Data is therefore input into SystemsLink directly from the invoice when it arrives. The 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 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 (see the assumptions section for more on this).

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<sup>3</sup> <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

<sup>4</sup> <https://www.abraxasenergy.com/energy-resources/toolbox/conversion-calculators/power/>

Finally, the figures relating to the consumption of each fuel type are converted in to carbon emissions by applying the relevant carbon conversion factor, and the resulting figures are summed, together with emissions from fuel used in University-owned vehicles (see above), to give our total scope 1 and 2 carbon emissions figures.

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 zero carbon through the provision of Renewable Energy Guarantees Origin (REGO) certificates from the energy provider. The PPA is for the provision of 24,408 MWh of renewable electricity per year. The Greenhouse Gas Protocol allows for organisations to report REGO-backed renewable electricity as zero carbon as part of their reported carbon emissions figures, provided that they:

- Meet certain accounting and reporting requirements, and
- Report *both* their total emissions taking account of their zero carbon procured electricity (the figure known as 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) (this figure is known as the Location-based emissions figure).

We calculate our Market-based emissions figure by setting the carbon intensity of the electricity we have procured through the PPA to zero.

We calculate our Location-based emissions figure by applying the grid-average carbon conversion factor published by the Government to all of our procured electricity, including that procured via the PPA.

#### **Assumptions made or limitations of the data:**

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 (or, in the case of PV, some generation assets). In this circumstance, and in the absence of any other supporting data, the previous year's reported consumption/generation figure will be applied as an estimated figure, following a sense check that consumption in the previous year is broadly comparable with that during the reporting period.

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. The lockdown triggered by COVID-19 has made it impossible to do this across the full reporting period for 2019/20 and this has in particular affected our consumption data for steam. In the absence of sufficient meter readings, the NHS Trust have charged the University for their steam consumption on the basis of estimated invoices (April – June 2020), which are based upon the consumption profiles for the same months in the preceding year (i.e. pre COVID-19). For July 2020, we have applied our own estimate (in the absence of any data or estimate from the NHS Trust), which is based on consumption in July 2019 but adjusted to reflect the level of activity seen in the corresponding buildings, as judged from their electricity consumption.

We aim to take photographs to substantiate manual meter readings, and photographic readings of all visible meters when attending plant rooms and sites, for data verification purposes. However, COVID-19 has also made this impossible to achieve across the full reporting period this year. In particular, we are lacking photographic evidence of some manual readings of our PV meters and for this reason we have not been able to submit our KPI on the percentage of energy generated from onsite renewables for independent assurance this year.

For the first time in our 2019/20 report, we have reported our scope 1 and 2 carbon figures using both the Market-based and Location-based approach. However, we have not been able to seek assurance of our Market-based emissions figure. This is because, although we are confident that our contractual arrangements for the supply of renewable electricity meets the accounting and reporting requirements of the Greenhouse Gas Protocol, we have not been able to provide evidence of this for the entire reporting period. This is because the REGO certificates for the electricity provided to us are provided by the energy provider in two six-monthly reports, one in October/ November and the other in March/April. At the time of calculating our emissions figures and undertaking assurance of our data, we had received one report, covering the period from October 2019 (when we entered the PPA) until the end of March 2020. We had not received the report covering the rest of our reporting period (i.e. April – July 2020).

Over the coming months, we will work to develop sufficient evidence to enable our market-based emissions figure for 2020/21 to become part of our data assurance process.

The Location-based emissions figure that we have reported as our KPI on scope 1 and 2 emissions for 2019/20 has been assured.

## Water

**Definition:** Water is defined as the annual consumption of water as a result of the University's activities in buildings over which the University has operational control.

### **Relevant KPIs:**

- Total water consumption
- Total water consumption per staff and student
- Carbon emissions from water use
- Carbon emissions from water use per staff and student

**Unit:** We report our total water consumption in cubic metres (m<sup>3</sup>). Total consumption per staff and student is measured as m<sup>3</sup>/FTE.

Carbon emissions from water use are measured as tCO<sub>2</sub>e, and emissions from water use per staff and student as tCO<sub>2</sub>e/FTE.

**Method:** Water consumption data is currently reliant on readings taken by the supplier and by the Facilities Management (FM) team in some circumstances. Limited data is available from automated sub-meters in some newer buildings. The University therefore uses billing/invoice

data to record consumption data. Data is input into SystemsLink as with energy above, however there is a higher reliance on invoice data for the purpose of reporting performance.

The water consumption data is used to calculate carbon emissions from water use as follows:

- The amount of water used is converted into emissions by applying the water supply carbon conversion factor from the set published by the government.
- Our carbon figure also needs to take account of the emissions caused by the disposal and treatment of our wastewater. Our wastewater is not metered therefore we estimate it as 90% of the amount of water we have used. This is based on the calculations made by the University's wastewater services provider. We then convert this figure into carbon emissions by applying the water treatment carbon conversion factors.
- We sum both figures to calculate total emissions from water use.

**Assumptions made or limitations of the data:** A lack of automated readings means a higher degree of estimated billing takes place this can either inflate or underestimate the consumption at particular sites.

In the absence of sufficient meter readings or invoices to cover the entire reporting period, an estimate of annual water consumption is made based on the invoice data for the earlier part of the period, the estimate is automatically calculated based on the latest invoice received which is extrapolated through to the end of the period as generated by the Systems-link accrual report. In the minority of cases where this is not possible (due to no invoice data to extrapolate from), manual estimates are applied and the method used to produce these estimates varies upon the circumstances of that particular supply. For example use of invoice data from previous years, or in the case of newer buildings use of sub-meter data within the building.

## Waste

**Definition:** Waste is defined as the approximate annual mass of waste arising as a result of the University's activities, including construction waste produced by contractors. The University's contractors and suppliers of services provide waste mass equivalents for the waste they remove from University premises and projects.

**Scope:** For the most part, the scope of our waste figures aligns with the Operational Control approach. Where it is possible to disaggregate the data, buildings that form part of the University's commercial property portfolio are excluded from the figures. However, in some cases, commercial spaces are integrated within, or share collections with, University buildings or University activities, in which case the waste arising from these spaces is included in the figures.

### **Relevant KPIs:**

- Waste sent to landfill
- Waste mass generated per FTE staff and student
- Percentage of waste generated that is recycled or composted

**Unit:** Metric tonnes, or percentage.

**Method:** Data on waste is collected from a number of internal and external sources. Each year, contractors and suppliers are contacted to request data on waste collected from the University, divided by end destination/treatment method. Figures are collected for construction waste and for operational waste. For construction waste, only 'major' projects (those classed as 'Major' under the University system of governance<sup>5</sup>) are included in the reporting.

Totals are produced for each category as follows:

- Recycled - the annual mass of waste (tonnes) sent for recycling
- Incineration - the annual mass of incinerated waste (tonnes)
- Composting - the annual mass of waste (tonnes) that is composted
- Anaerobic digestion - the annual mass of waste (tonnes) that is sent for anaerobic digestion
- Landfill - the annual mass of waste (tonnes) sent to landfill
- Energy - the annual mass of waste (tonnes) that is used to create energy e.g. used for biomass boilers or combined heat and power. Exclude waste that is incinerated with no energy recovery
- Other - other methods of disposal offsite. This may include mechanical biological treatment and offsite autoclave, as well as 'other reuse', such as refurbishment for re-sale
- Hazardous – waste which is disposed of via specialist hazardous treatment methods.

Using the above data, three KPIs are produced:

- Waste sent to landfill (tonnes). This is the total amount of the 'Landfill' category outlined above, for both operational and construction waste.
- Waste mass generated per FTE staff and student (tonnes/FTE). This is the total of all waste categories excluding hazardous, divided by the total Full Time Equivalent number of staff and students.
- Percentage of waste generated that is recycled or composted (construction and non-construction waste) (%). This is the total sum of the 'recycled' and 'composting' categories as a proportion of the total amount of waste (excluding hazardous waste).

The waste figures are also used to calculate carbon emissions from waste, which forms part of our total scope 3 figure, as follows:

- The waste figures are categorised according to both the type of material (paper/cardboard, plastic, metal, food and green waste etc.) and how the waste is processed (recycled, composted, digested anaerobically, landfill, etc.).
- For each category of material versus processing method (for example, paper/cardboard recycled, paper/cardboard landfill, etc.) the relevant carbon conversion factor is applied.

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<sup>5</sup> For the 2019/20 academic year this was defined as a project with a value over £2m

- It should be noted that the government published carbon conversion factors do not cover certain types of hazardous waste, for example inedible oils, solvents, clinical waste, therefore these waste streams are not included in our carbon figures.

**Assumptions made or limitations of the data:** Data used is provided by the University's contractors and suppliers of services, and while checks are made on this, the accuracy of externally provided data cannot be guaranteed. Some data is provided in volume rather than mass, in which case standard conversion factors (WRAP waste volume to mass conversion factors) are used to convert these to weights using the most appropriate or relevant available factor. End destinations of waste are based on categories reported by suppliers, however no guarantee can be made of the precise definition of end destinations of waste disposal. In some cases, end destination data is not available, in which case a proxy set of factors will be used based on end destinations of waste reported by the same or another contractor for similar waste streams, or a figure from a reputable source (e.g. UK government) will be used. There may be some waste contractors being used at a local (departmental) level on a small scale within the University, data from these are not routinely captured. Some on-site disposal or reuse of waste, for instance small scale composting and mulching, may occur across the University and is not recorded. Waste generated by home workers or those working away from University buildings is not currently estimated or reported on. While the reporting period is from 1 August to 31 July each year, some raw data is provided which accounts for periods which do not align precisely to this reporting window, in which case the data is factored proportionally to take account of the average likely waste produced inside and outside of the reporting period (for instance for 6 in-scope months from a total 12 months of data, the total figure is divided by 2).

## BREEAM

**Definition:** BREEAM Environmental Assessment rating of 'Excellent' or higher achieved during the reporting period. BREEAM is a widely accepted standard for assessing the holistic environmental impact of buildings in terms of health and wellbeing, energy, water, materials, waste, pollution and biodiversity.

The wording of the KPI permits an assessment methodology "equivalent" to BREEAM Excellent. This allows flexibility to trial alternative standards. An alternative may also be appropriate where an unusual building typology is proposed that does not fit neatly within the standardisation imposed by BREEAM. Equivalence in this case shall be subject to approval either by the Local Planning Authority or by the Estates Division Project Quality Team.

**Scope:** The KPI applies to new build projects classed as 'Major' under the University system of governance. This aligns with the capital projects process whereby 'Major Projects' are subject to review by the University Buildings Committee. A 'Major Project' is currently defined by the Planning & Resources Allocations Office as projects greater than £2m (see <https://www.prao.admin.cam.ac.uk/capital-planning>). The list of buildings contained in the latest 'Major Projects Portfolio Report' issued to the Buildings Committee is used to identify new buildings that are subject to the KPI. Building refurbishments and infrastructure projects are also listed in the 'Major Projects Portfolio Report', but are not subject to this KPI.

**Relevant KPIs:**

- The percentage of new buildings that are certified at least BREEAM Excellent or equivalent.

**Unit:** Individual new building classed as a Major Project.

**Method:** Award of the BREEAM Final Certificate (or for an agreed equivalent issue of a final report by a nominated sustainability consultant). The Sustainable Buildings Advisor will maintain a tracker and use this to record the reporting year for each Major Project. The date of the BREEAM Certificate (or for the agreed equivalent the date of the final report) shall determine the reporting year.

**Assumptions made or limitations of the data:** For unusual building functions, or highly constrained sites, 'Excellent' certification may not be possible. In these instances the building will be reported as non-compliant with the KPI, however a commentary may be added where it is appropriate to recognise that best endeavors have been applied in maximising the BREEAM rating, together with an explanation of why certain credits were not achievable.

#### Awards for Sustainable Construction and Design

**Definition:** an award specifically relating to environmental sustainability given by a reputable body external to the University during the reporting year. Awarding bodies might include the RIBA, CIBSE, IStructE, Cambridge Design and Construction Awards, BREEAM, Passivhaus Institute and other similar reputable bodies that use a jury of professionals as part of the awarding process. The award title and awarding body will be recorded for transparency.

**Scope:** Major and minor construction projects, including refurbishments.

**Relevant KPIs:**

- External awards for sustainable construction/design.

**Unit:** Number of awards received.

**Method:** The Sustainability Advisor will maintain a tracker and use this to record if an award has been received and the location of the award (typically a link to the awarding body's website). The date of the award announcement shall determine the reporting year.

**Assumptions made or limitations of the data:** There is no methodological process that guarantees that the University will be aware of all awards made as the decision to enter an award is generally taken by third parties such as designers and contractors.

#### Staff Commuting

**Definition:** The staff commuting mode share is the percentage of respondents travelling by each transport mode during a neutral week in October (Monday-Friday).

**Scope:** Staff employed by the University working on a University site or remotely, and contractors or volunteers based at a University site for two days or more per week. This excludes staff employed by CA, CUP and the Colleges. Staff who were on annual leave during the survey week can still complete the survey and note that they did not travel.

**Relevant KPIs:**

- Percentage modal split for commuting by different modes.

**Unit:** Percent (%).

**Method:** This data is collected through an annual staff travel survey conducted online (via Survey Monkey). The mode share is calculated by calculating respondents' daily travel modes during the week (Monday to Friday), which is the mode the respondent used to travel the greatest distance each day. The weekday travel mode is then calculated by taking the most common daily mode for each respondent.

If there is no clearly identifiable mode (e.g. if someone walks for two days and cycles for two days), the respondent is classed according to the following order: Walk, Cycle, Universal Bus, Bus, Train, Taxi, Car – Driver, Car Share – Driver, Car Share – Passenger, Motorcycle/Scooter, Worked from home.

If a respondent stated that they were not working or working from home, then any miles they have entered are assumed to be errors and not counted.

The mode share is calculated by external consultants following the method described.

Data from the annual staff travel survey are also used to calculate carbon emissions from staff commuting, which forms part of our total scope 3 figure, as follows:

- Data for distance travelled to work is captured by the annual staff travel survey. These figures are then doubled to reflect that commuters return home as well and divided by the number of respondents to the travel survey. These base figures are then multiplied by the number of working days in the reporting year (minus annual leave allocations).
- These figures are then multiplied by the number of staff FTE, to return annual commute distance figures for each travel mode. These distance figures are each converted to carbon by applying the relevant carbon conversion factor, and the results are summed to give total carbon emissions from staff commuting.

**Assumptions made or limitations of the data:** We must assume that the respondents to the travel survey are representative of the whole staff population. Other assumptions include that commuters travel home in the same way that they travel to work and that they use all of an averaged annual leave allowance (different grades and role types receive different annual leave allocations).

For the reporting year 2019/20, commuting was massively impacted by movement restrictions put in place in response to the Covid-19 pandemic. The travel survey for the reporting year



covered a week in October 2019 long before this disruption. It was therefore decided that the travel survey figures were only extrapolated for the reporting year to 20/03/2020, when the Vice Chancellor confirmed the shutting of the University for lockdown. University activity did increase to a degree after this lockdown but we have no reasonable metric to use to estimate commuting distances for this period. The figure for 2019/20 is therefore highly likely to be an underestimate.

### Green Impact

**Definition:** The Green Impact KPI measures the number of Green Impact awards won by teams taking part in the University of Cambridge's Green Impact initiative. Green Impact is an international initiative run by SOS-UK (Students Organising for Sustainability – UK) which supports staff and students in improving the environmental performance of their places of work and study. At the University of Cambridge the scheme is tailored to the specific context of the organisation, including awards aimed at laboratories and the Cambridge Colleges. Awards are available for participants after the end of each academic year, based on the number of sustainability-themed 'actions' that they complete. The KPI measures the number of awards presented at the end of each year, usually in June.

**Scope:** The Green Impact initiative is open to all parts of the University of Cambridge, including those within the Operational Control scope, and those outside of it (including the Colleges, Cambridge Assessment and Cambridge University Press). Individual Green Impact teams each determine their own 'scope', typically depending on the areas that their team represents, and these can include buildings, departments, institutes or laboratories, as well as the Cambridge Colleges.

### **Relevant KPIs:**

- Number of awards won by Green Impact teams

**Unit:** Number of awards.

**Method:** At the end of each Green Impact year, each team receives an audit facilitated by SOS-UK and the University's Sustainability Team, conducted by trained student auditors. During the audit process, each team's evidence is verified to confirm they have achieved a given award level. Once this is confirmed, an award, or awards, for each successful team is ordered from a third-party supplier. The list of winners is published on the Sustainability Team's website.

**Assumptions made or limitations of the data:** In some cases, the number of awards will be different from the number of teams as some teams will enter for two awards (for instance a conventional award and a 'Labs' award), while some teams may not complete their submission or it will not meet the required standards at audit, and therefore will not be presented with an award. 'Special' awards, which are a means of extra recognition for individuals and actions based on a nomination and judging process, are not included in the figures as these awards are separate from the core Green Impact process and are not subject to an audit process.

### Environment and Energy Coordinators

**Definition:** This KPI measures the number of Environment and Energy Coordinators (EECs). Environment and Energy Coordinators are staff volunteers who provide a local focus point for environmental and energy issues in their department or institution. Environment and Energy Coordinators are expected to offer advice and support to staff and students, feedback issues to the Sustainability Team and help with the management of any environmental initiatives or projects in their workplace. EECs are part of a network who share ideas, practices and information from across the University. Regular networking events as well as training are run for the EECs network. A 'role description' is available for EECs.

**Scope:** The EECs network is open to all parts of the University of Cambridge including Cambridge Assessment, Cambridge University Press and the Colleges. EECs can represent any part of the University, including a whole department, institution, or a specific building or buildings. Some larger departments and buildings can have two or more representatives who share the EEC role.

**Relevant KPIs:**

- Number of members of the Environment and Energy Coordinator Network.

**Unit:** Number of individuals.

**Method:** The Sustainability Team maintains a register of Environment and Energy Coordinators. When a new EEC joins the network they receive a short induction, at which point they are then added to the register, as well as relevant mailing lists and online groups. An annual survey is issued ahead of the end of the reporting period (usually in the summer) to confirm whether EECs on the register are still active, what they have achieved as part of their role and what they would like to see improve and/or need further support on. The survey responses are used to update the register. In order to collect the data for this KPI, a sum total of the number of EECs on the register is taken immediately after the end of the reporting period (1 August).

**Assumptions made or limitations of the data:** The Sustainability Team rely on EECs providing information on their status, for instance whether they are leaving the University, and therefore there may be cases where departed EECs display on the register. This will only be rectified once a year following the email and survey process outlined above.