



Carbon Report

2024 / 2025

**UNIVERSITY
OF WARWICK**



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Abbreviations

CHP – Combined Heat and Power. Specifically refers to the gas fired CHP generators used by the University

CSRD – (EU) Corporate Sustainability Reporting Directive

EAUC – Environmental Association for Universities and Colleges

FTE – Full Time Equivalent

GHG – Green House Gas

GWh – Gigawatt Hour

HE – Higher Education

HESCET – Higher Education Supply Chain Emissions Tool

m² – Square metre

m³ – Cubic metre

MWh – Megawatt Hour

PGR – Post-Graduate Researcher

PV - Photovoltaic

REGO – Renewable Energy Guarantee of Origin

SCEF – Standardised Emissions Framework

tCO₂e – Tonnes of Carbon Dioxide Equivalent. (All greenhouse gas emissions combined and expressed in terms of carbon dioxide equivalent)

T&D – Transport and distribution (of grid electricity)

TMC – Travel Management Company

WEEE – Waste Electrical and Electronic Equipment

WFH – Working from Home

WTT – Well to Tank (specifically, the extraction, processing and transport of fuels prior to combustion for energy)

Introduction

The [Way to Sustainable](#), published in 2022, sets out the ambitions of the University to reduce its environmental impact. It describes the changes we will make across the whole institution – including Research, Education, Teaching, Engagement and in our Operations. The strategy includes net zero targets for Scope 1 and 2 Carbon emissions by 2030, and all emissions - Scopes 1, 2, and 3, by 2050.

This report provides an update on carbon emissions, energy and water usage for the University during the 2024/25 reporting year and describes our activities across a range of areas to reduce our environmental impact.

In 2025/26 we will be refreshing our Sustainability Strategy, updating our targets, defining our priorities and describing our plans in greater detail.

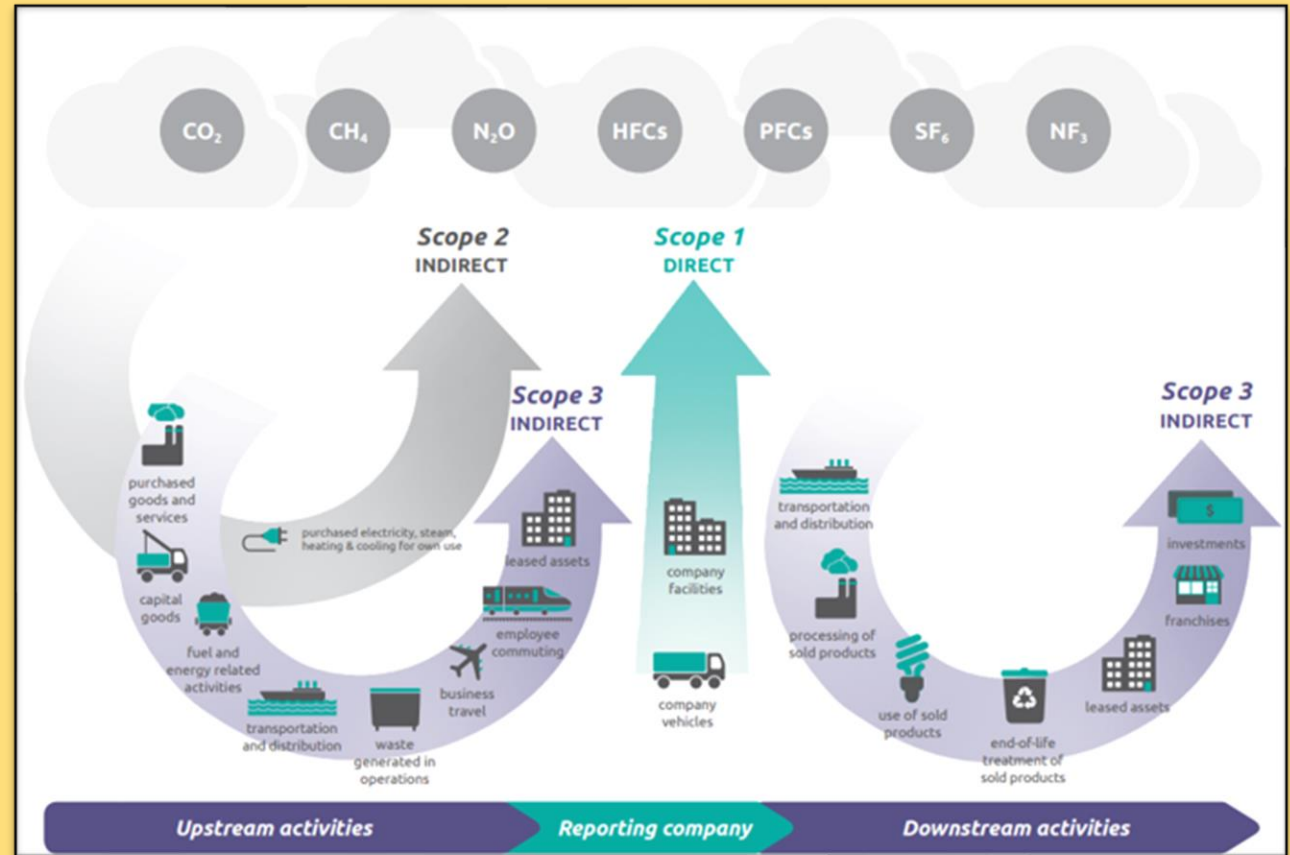
Introduction

Carbon Emission Reporting

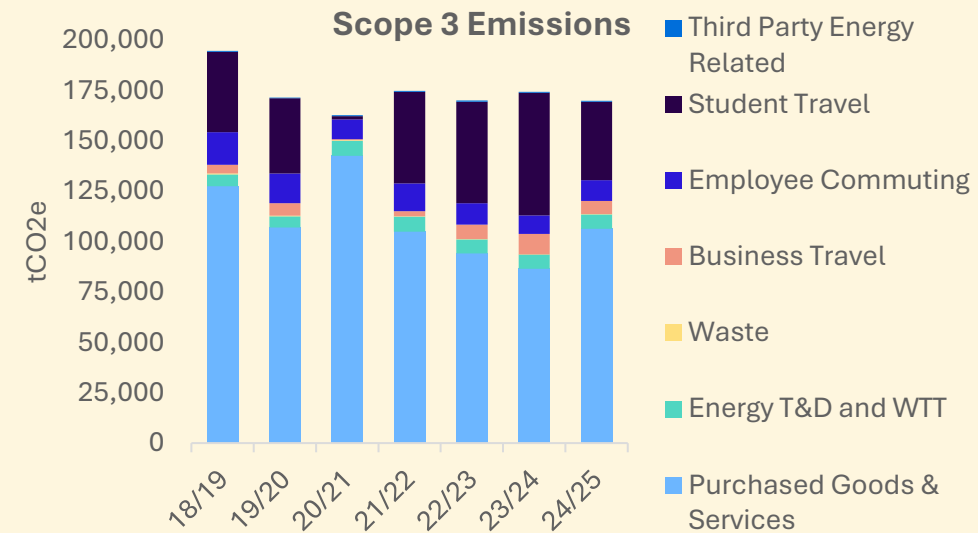
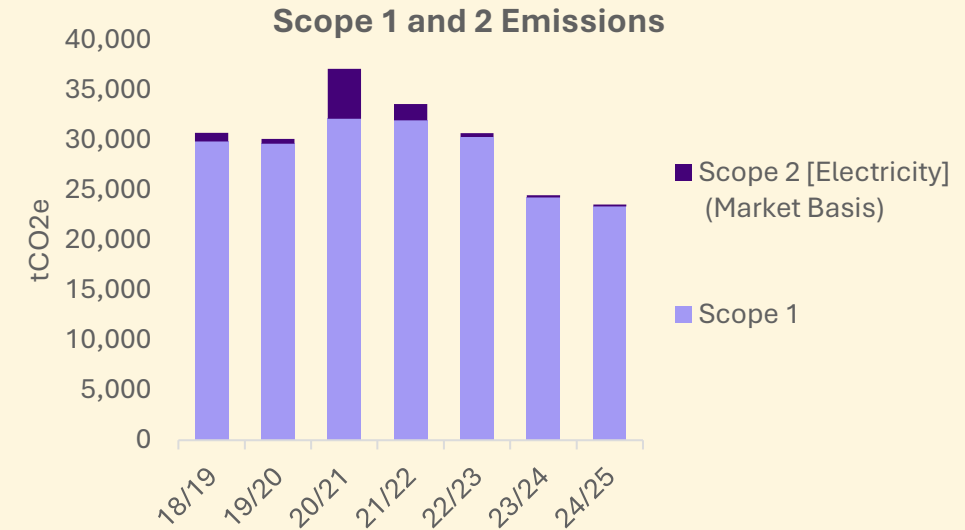
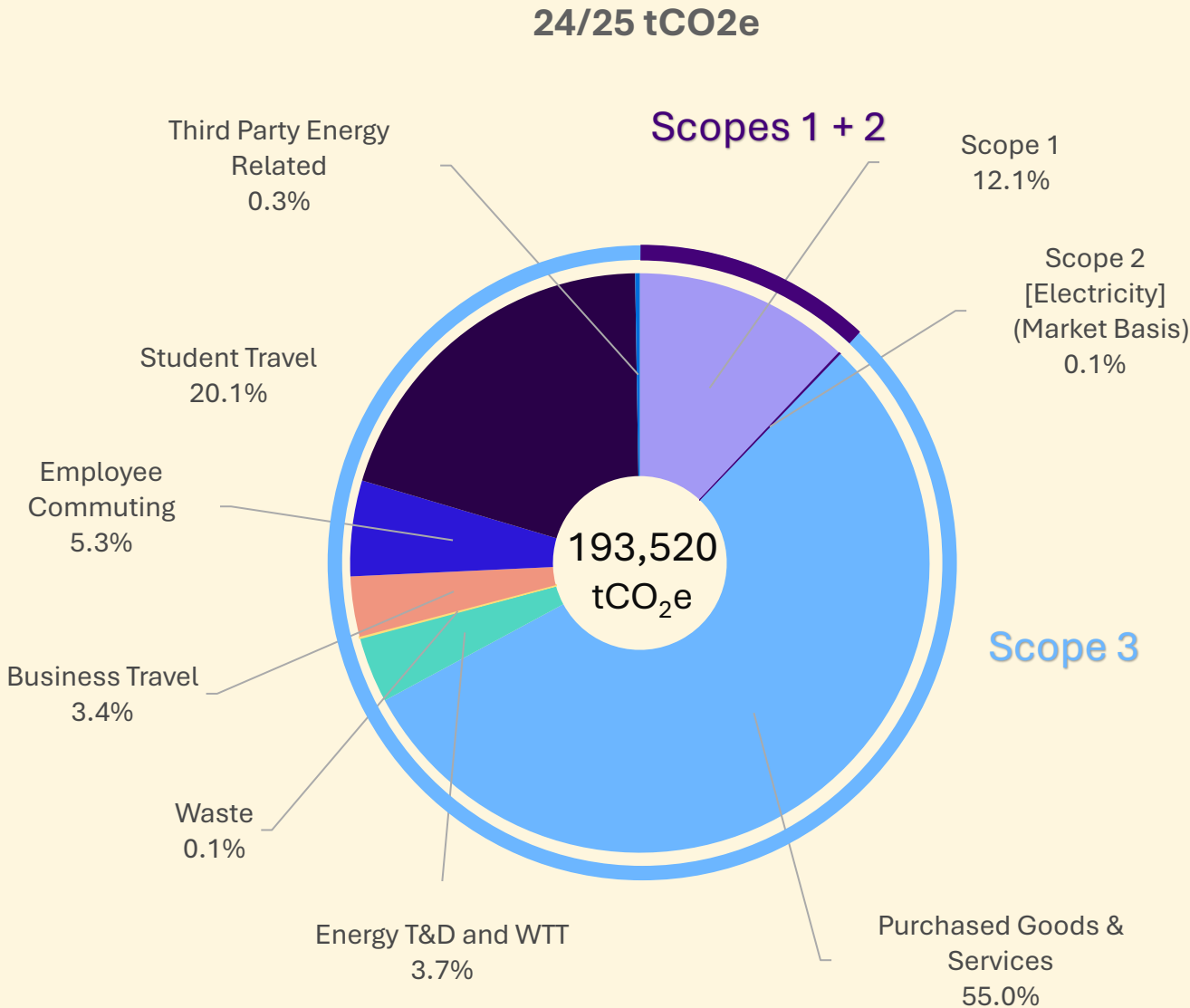
University Carbon emissions disclosure follows guidance from the Greenhouse Gas Protocol, with supplementary guidance from the Environmental Association for Universities and Colleges (EAUC) Standardised Carbon Emissions Framework (SCEF).

The image, taken from the Green House Gas Protocol illustrates how emissions are categorised by Scope.

The EAUC SCEF describes 3 levels of reporting accuracy - advanced, intermediate and basic. Achieving these accuracy levels is dependant on available data and specific emissions factors within each category. An indication of the reporting accuracy for each sub-category of emissions is included in the report based on the EAUC definitions.



Overview



Overview – 18/19 to 24/25



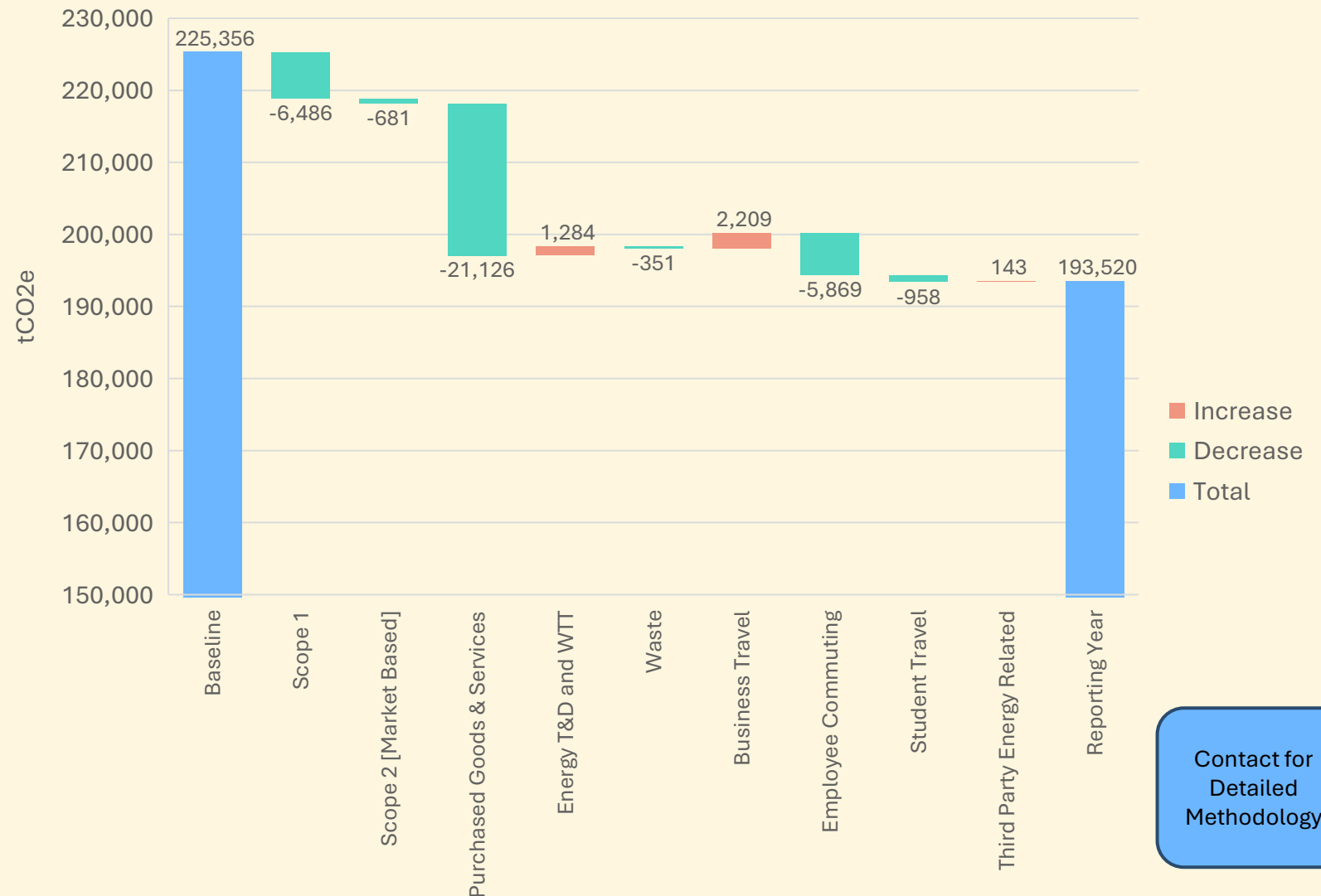
Our baseline for carbon reporting is the 18/19 academic year. Although a complete Scope 1 and 2 data set was available at this time there was some incomplete Scope 3 data.

For certain Scope 3 categories, particularly the *purchased goods and services* category, recommended calculation methodologies have evolved in recent years.

Following the methodologies adopted by the sector, a re-baselining exercise was carried out and our updated estimate for 18/19 carbon emissions across all scopes is 225,356 tCO_{2e}.

We estimate our total emissions for 24/25 as 193,520 tCO_{2e}. These reductions are due to a mix of active interventions, changing University activities, and category emission factor changes amongst other changes. Please refer to the relevant sections within this report for more information on movements within each category.

Total Estimated University Emissions, Scopes 1,2 and 3





Energy Emissions

Scope 1 & 2

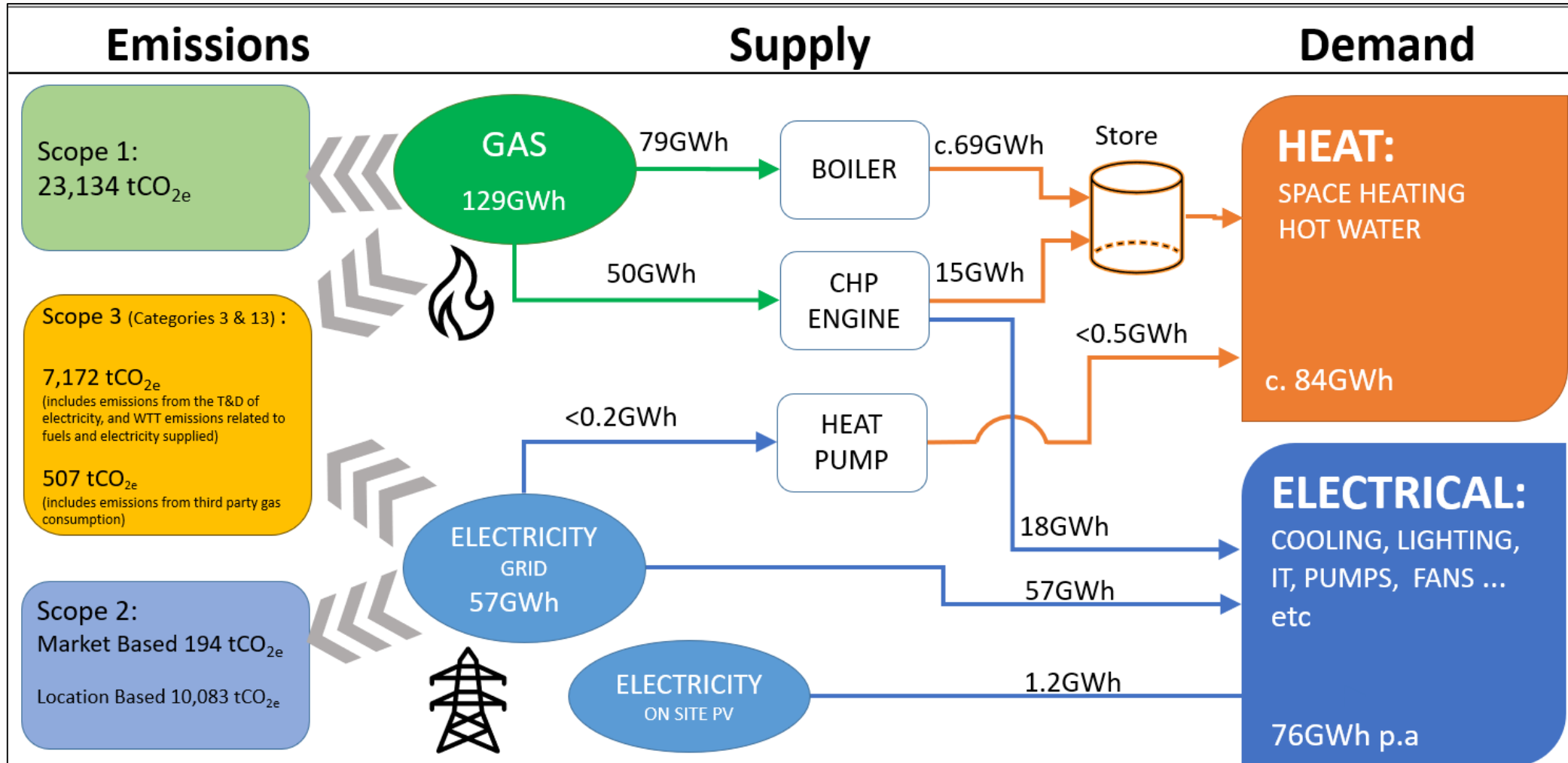
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Energy Supply and Related Emissions Overview



Most of our Scope 1 and 2 emissions arise from our energy use, as illustrated in the graphic below.

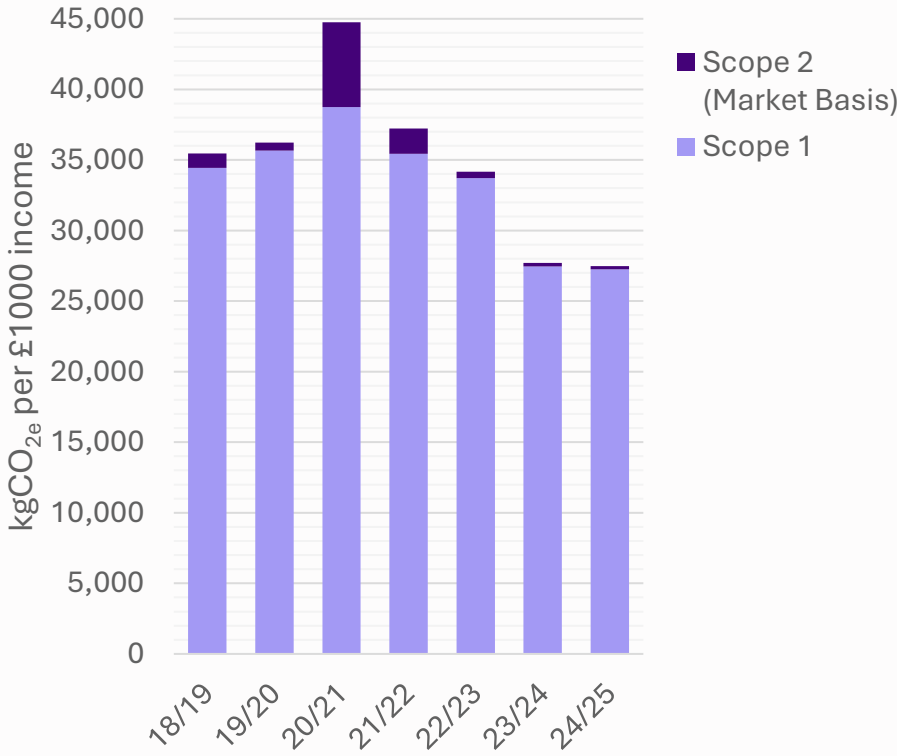
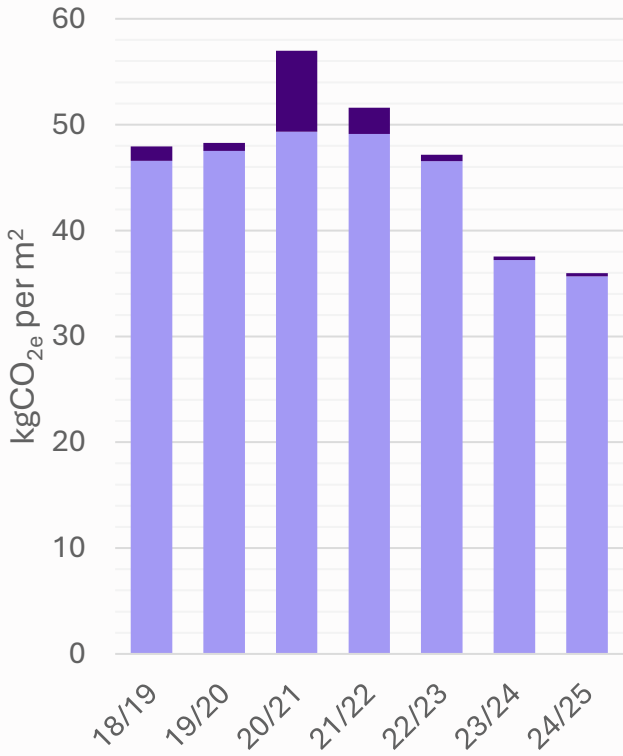
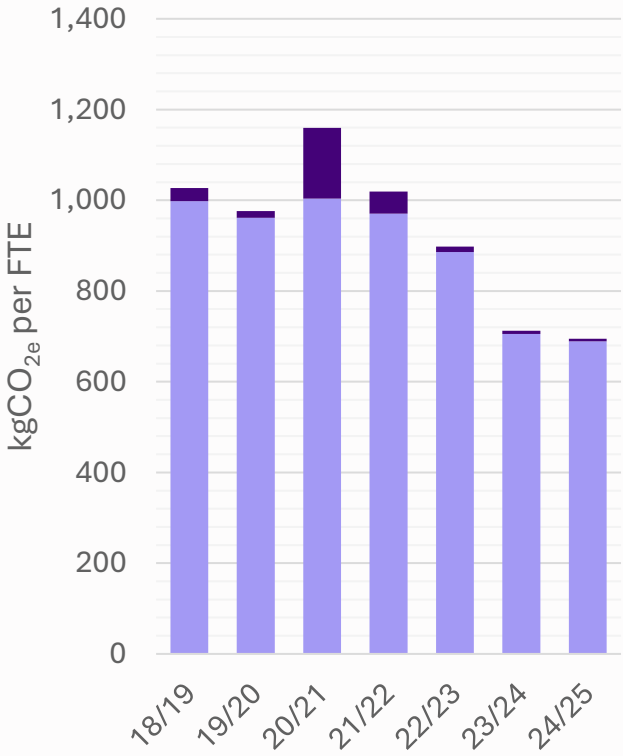


Note: This representation includes a quantity of energy use and emissions from 3rd parties on campus excluded elsewhere in our reporting; a small quantity of Scope 1 emissions (230 tCO_{2e}) come from fleet fuels and fugitive refrigerant gases and are included later.

Scope 1 and 2 Carbon Intensity Ratios



The University is aiming to reduce Scope 1 and 2 emissions against a backdrop of continued growth. The intensity metrics below highlight how our emissions relative to three key factors, per full-time equivalent (FTE), per m² of serviced building floor area, and per £1000 University income, have changed over the years.

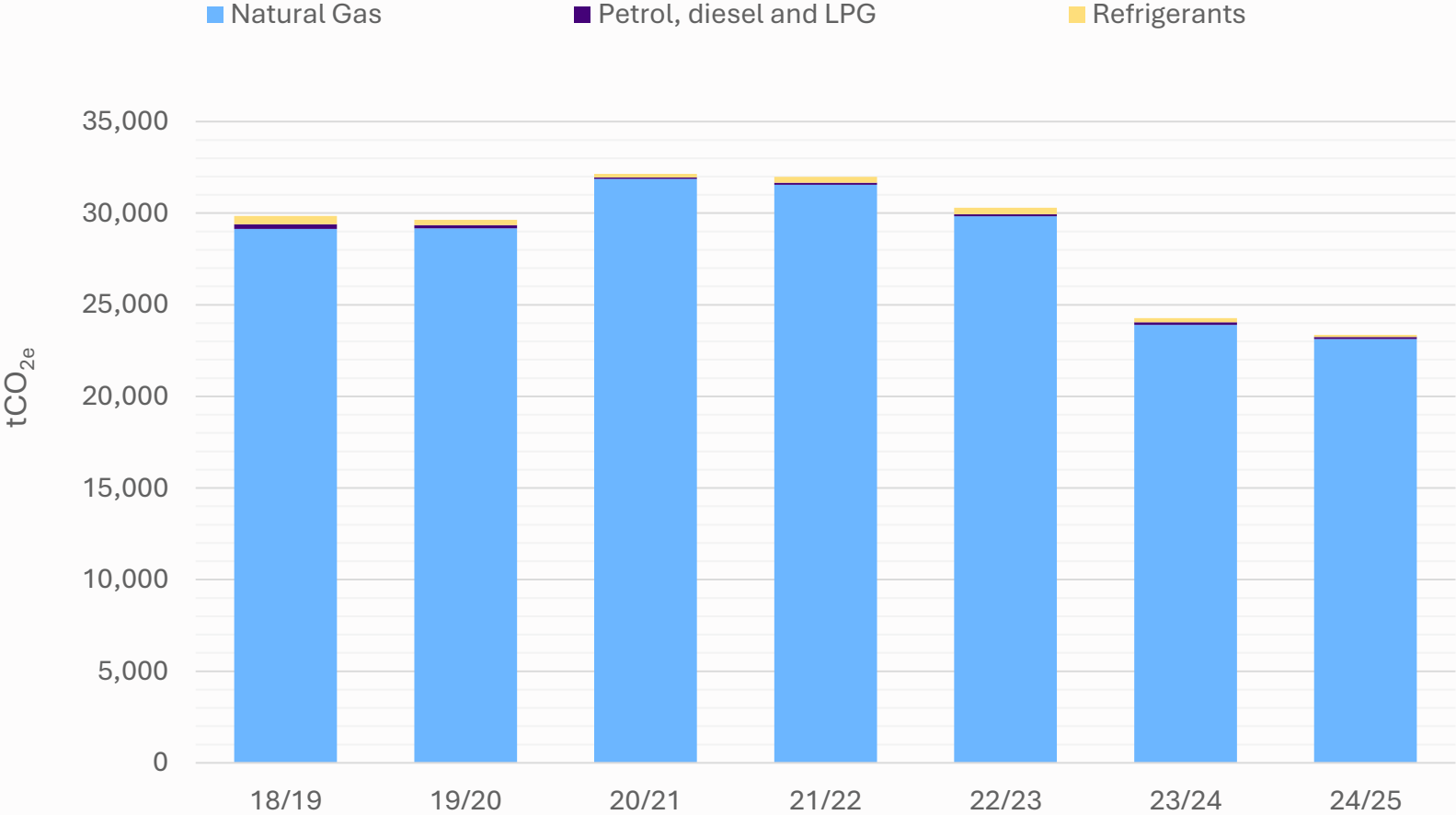
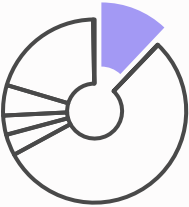


Scope 1: Direct Emissions

In 24/25 our Scope 1 emissions were 23,364 tCO_{2e}, a 21.7% reduction compared to our 18/19 baseline and exceeding our interim 2025 target of 20%.

This reduction represents the combined impact of increased energy efficiency measures, improving operational standards and reduced reliance on gas fired combined heat and power engines.

Emissions attributed to gas supplied to 3rd parties, and for related well-to-tank emissions, are included in Scope 3.



EAUC SCEF Accuracy Rating: **Advanced**

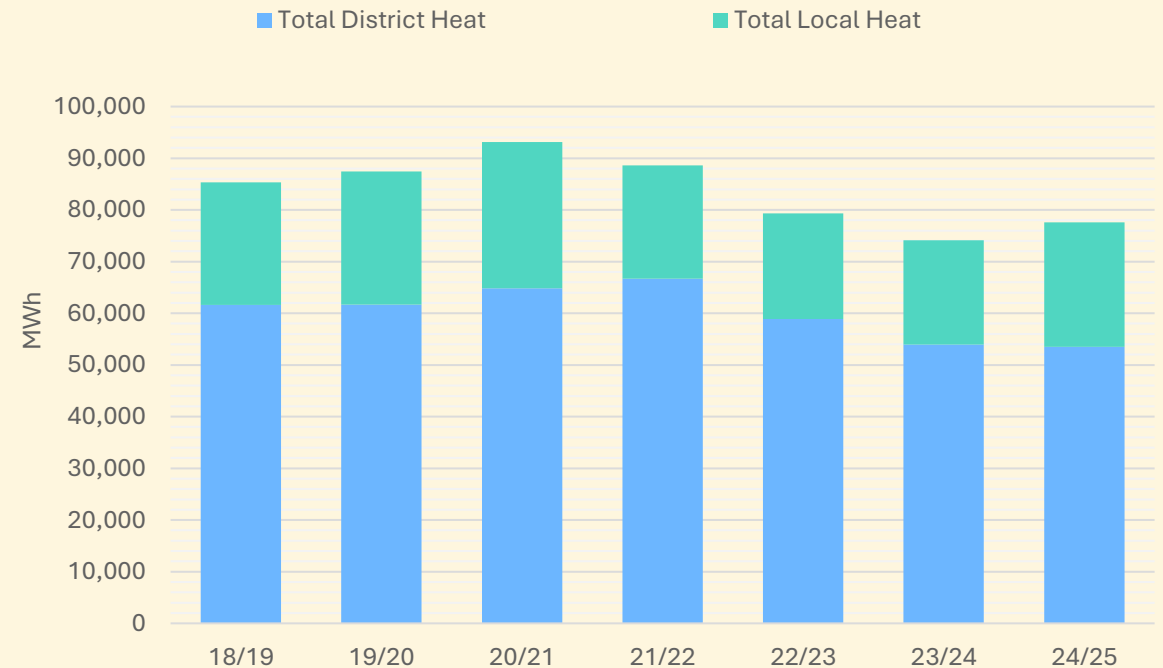
Thermal Energy



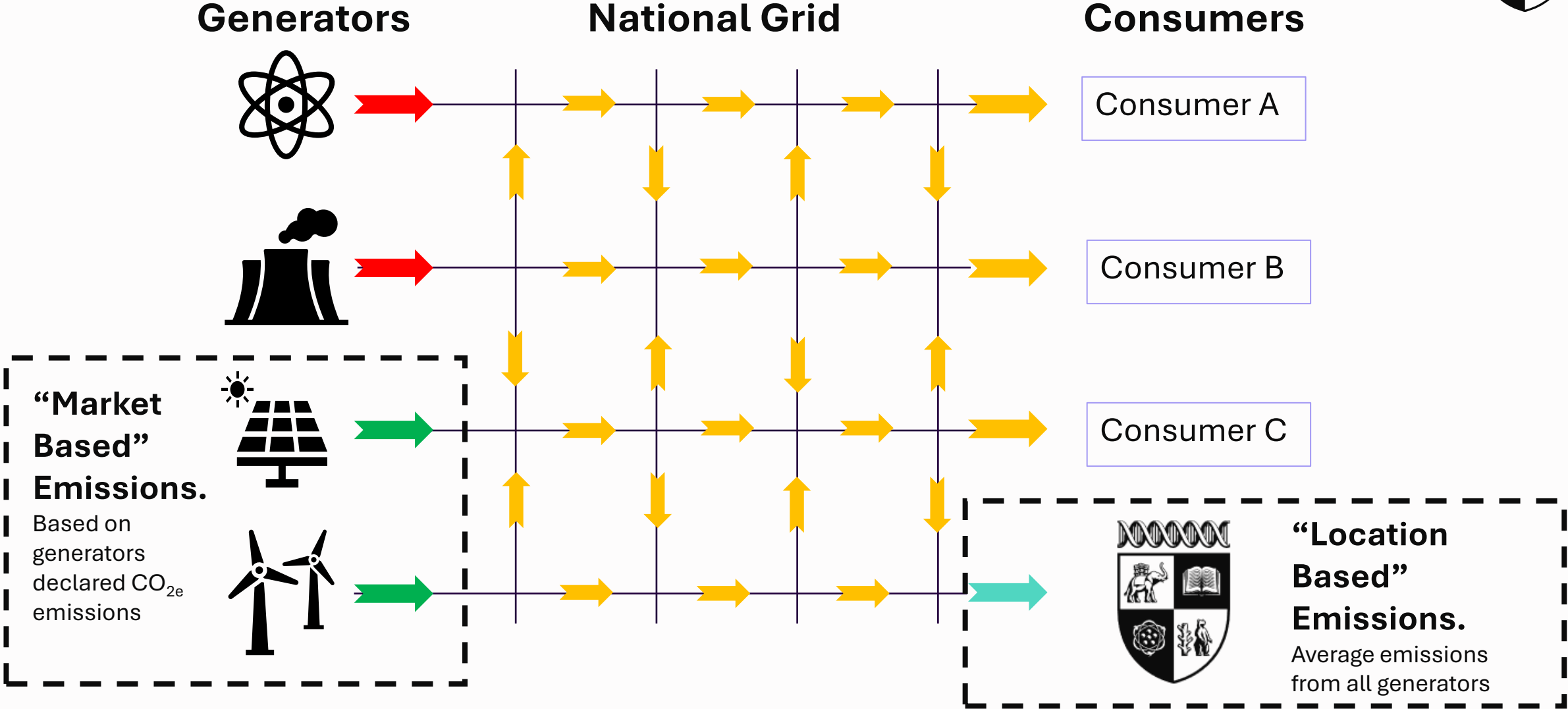
In 24/25, the University had an approximate total thermal demand of 77,600 MWh, a 4.7% increase compared to 23/24. This was due to colder weather – a 5.6% increase in heating degree days on the previous years.

Significant improvements have been made through the implementation of the Energy Policy over recent years through collaboration between teams within Estates and wider University Departments.

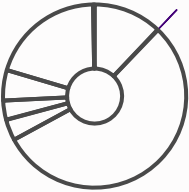
Interventions were also made across campus to reduce heat loss; in 24/25 920 MWh of potential energy wastage was avoided through early intervention. This saving is equivalent to the annual heating of the Faculty of Arts building, or 80 average 2–3-bedroom UK homes for a year, avoiding 170 tonnes of CO_{2e} emissions.



Scope 2 Reporting: Market Based and Location Based Reporting



Scope 2: Indirect Emissions (Market-Based)

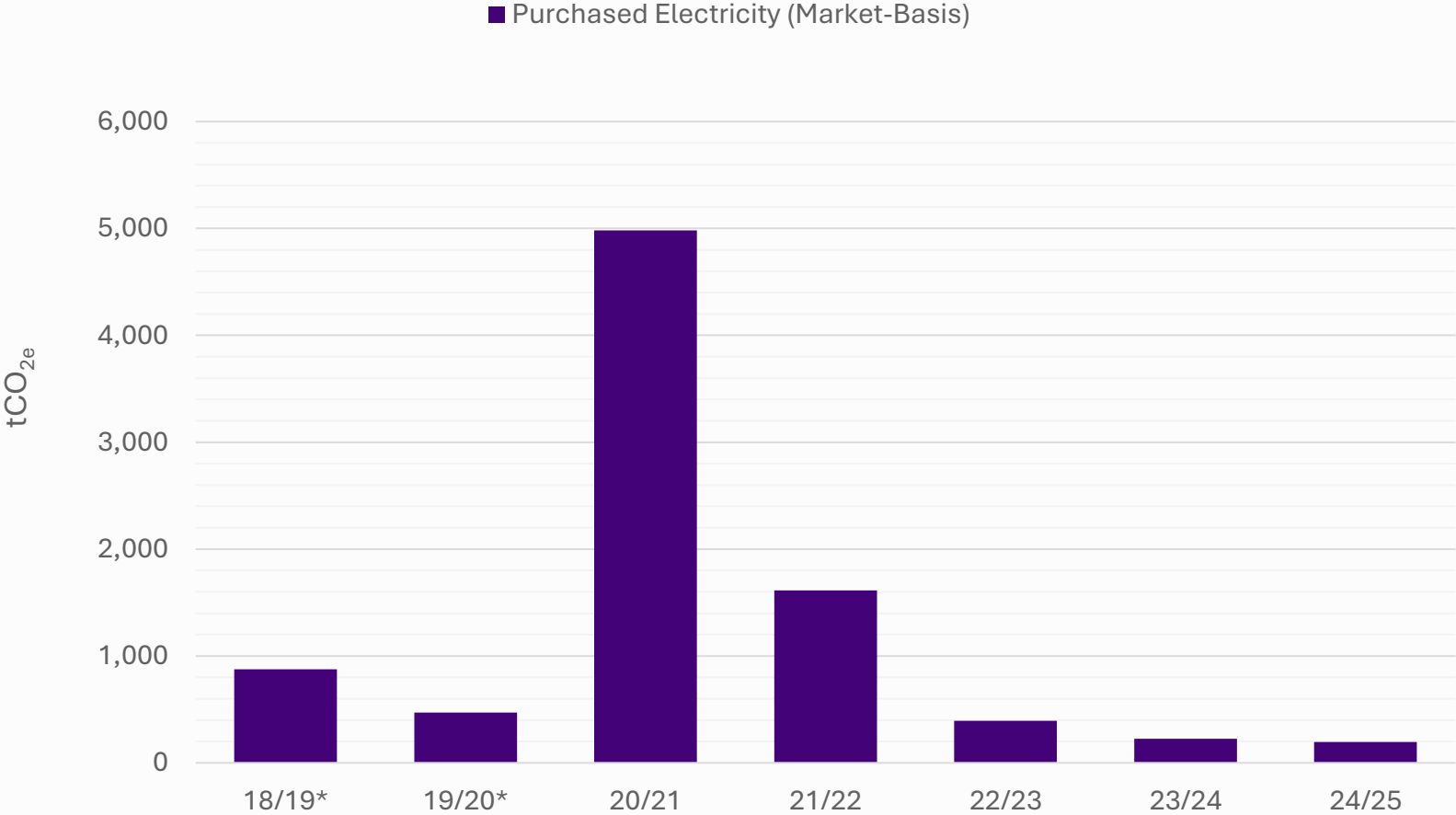


Since October 2021, all directly purchased electricity is sourced from 100% REGO-backed renewable supplies.

This means that market-based emissions from the purchase of electricity remain very low.

**18/19 and 19/20 market-based emissions are reported here from our supplier's fuel-mix disclosure from that period. REGOs were not purchased for this electricity. Since October 2021, the University has only purchased REGO-backed electricity.*

Emissions attributed to grid electricity supplied to 3rd parties, and for related well-to-tank emissions of fuels burned, are included in Scope 3.



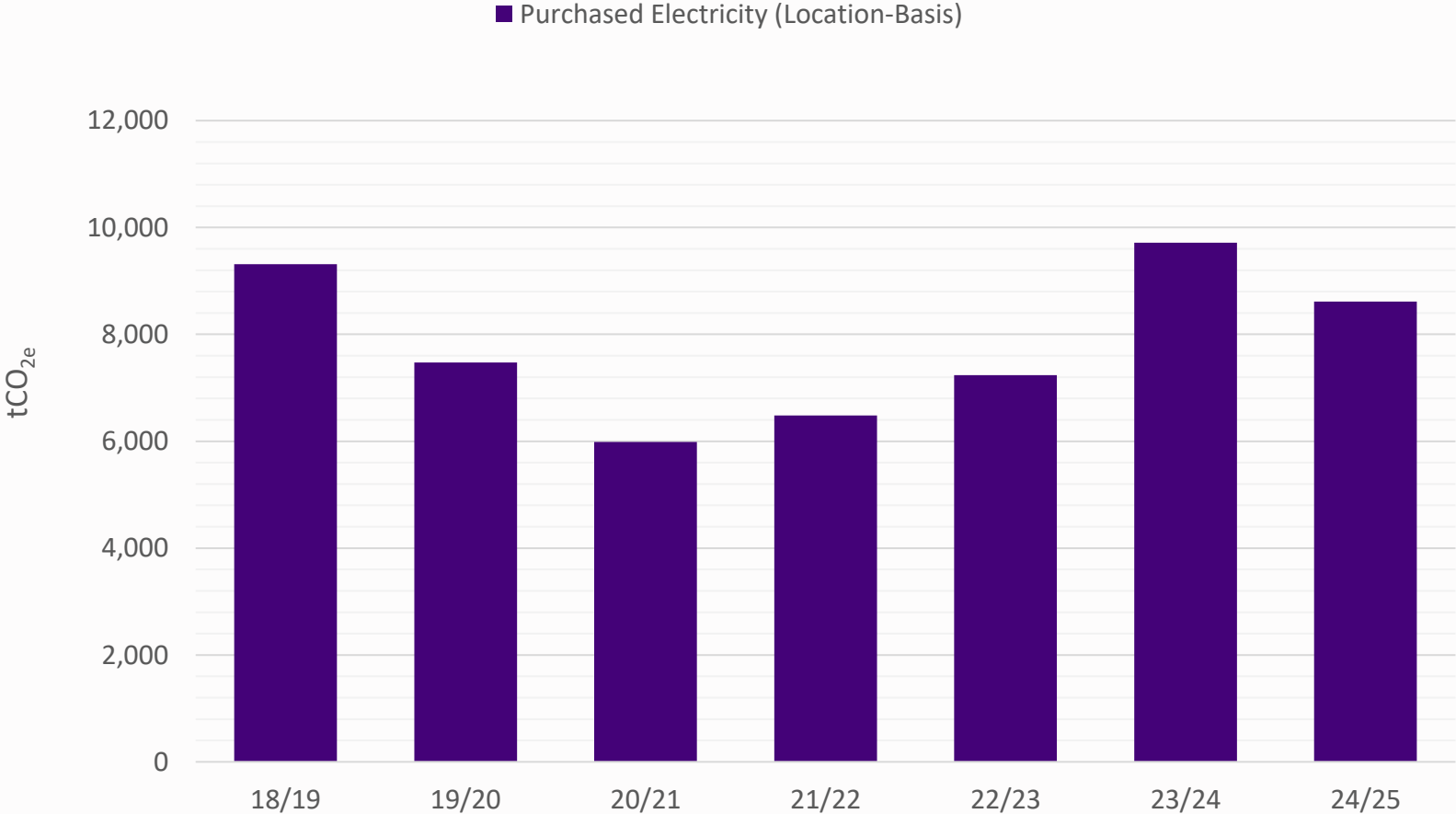
Scope 2: Indirect Emissions (Location-Based)



Our location-based Scope 2 emissions were 8,613 tCO₂e in 24/25, a 11.3% reduction on 23/24, and a 7.5% reduction on our 18/19 baseline.

This reduction is due to a reduction in the carbon factor of UK grid electricity.

Emissions attributed to electricity supplied to 3rd parties, and for related well-to-tank emissions of fuels burned, are included in Scope 3.



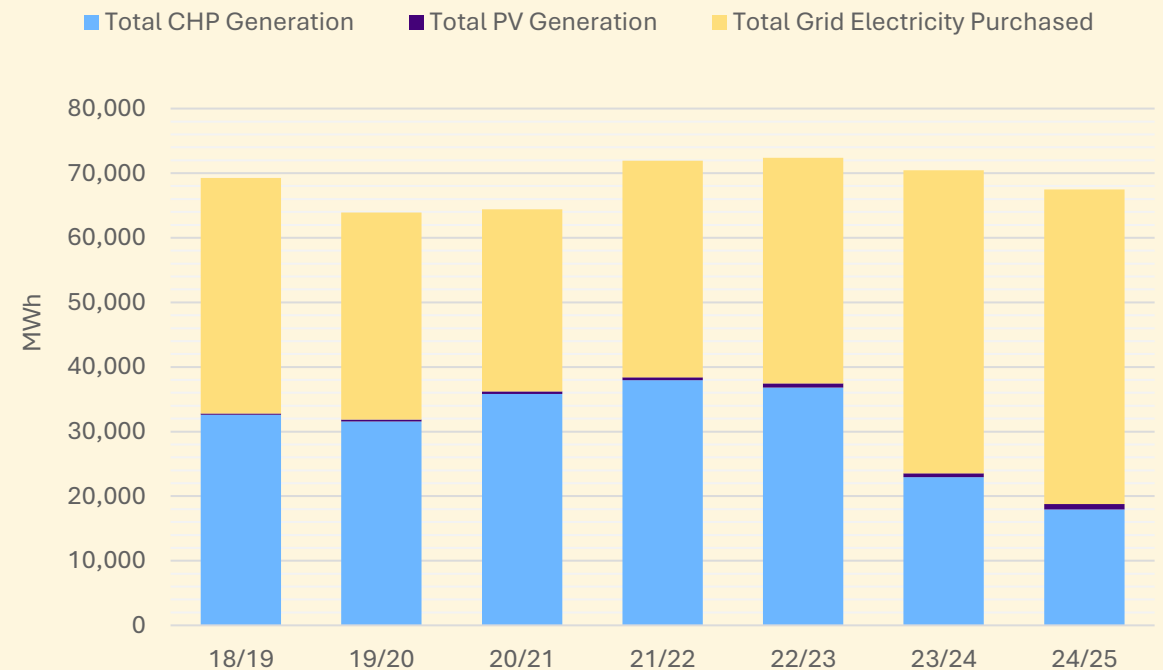
Total Electricity Consumption and Sources



In 24/25, the University generated 28% of its own electricity. This was primarily from gas-fired CHP but supplemented by increasing volumes of solar PV generation.

To reduce carbon emissions, CHP operation has been reduced over recent years and, in 24/25, a further 600kW of peak solar PV capacity was added.

Interventions were also made across campus to reduce electricity wastage with 556 MWh avoided through early intervention. This is equivalent to 206 average 2–3-bedroom UK homes for a year, or the 443 student bedrooms in five blocks of Sherbourne Residences (below).





Indirect Emissions

Scope 3

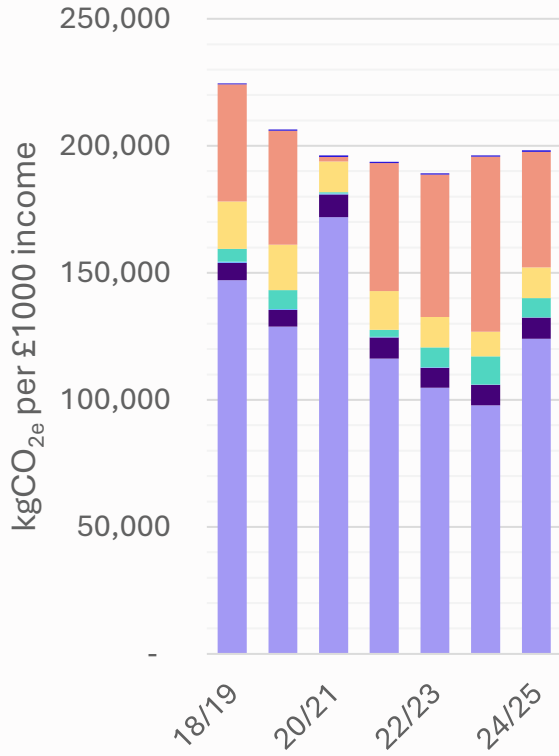
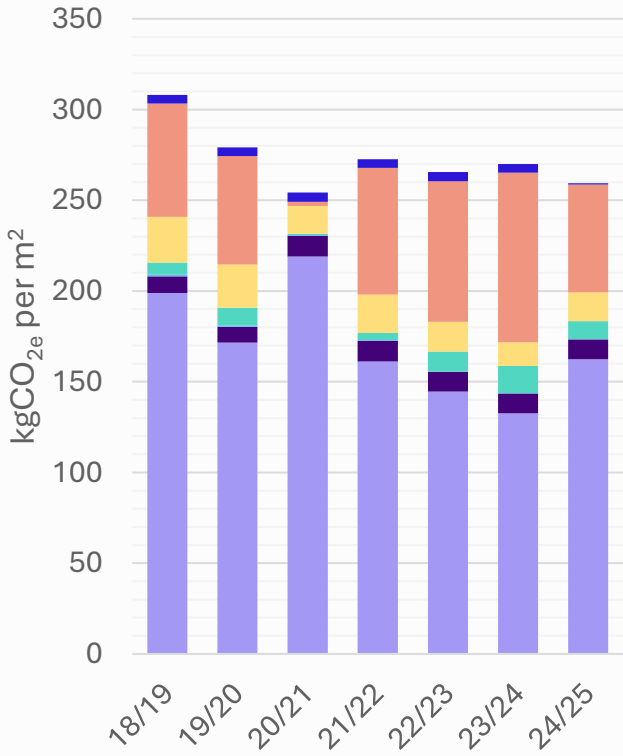
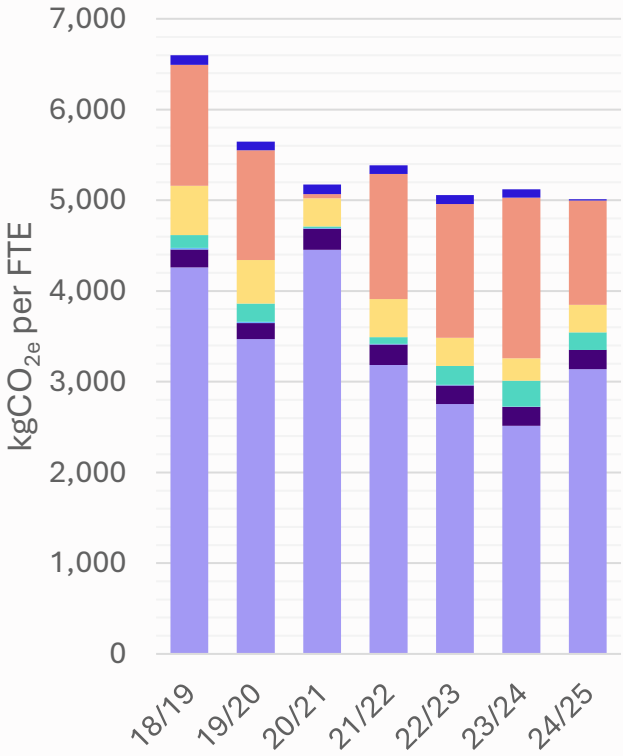
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Scope 3 Carbon Intensity Ratios

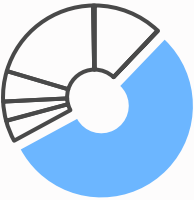


Scope 3 emissions per full-time equivalent (FTE), per m2 of serviced building floor area, and per £1000 University income are shown below, the aim of this reporting is to highlight efficiency improvements over time.



- Third Party Energy-Related Emissions
- Student Travel
- Employee Commuting
- Business Travel
- Waste
- Energy T&D and WTT
- Purchased Goods & Services

Scope 3 Category 1: Purchased Goods, Services and Water



Emissions reported here are calculated exclusively on a *category spend basis* using the HESCET tool. Spend based reporting is low accuracy and reliant on accurate categorisation of expenditure within the financial system.

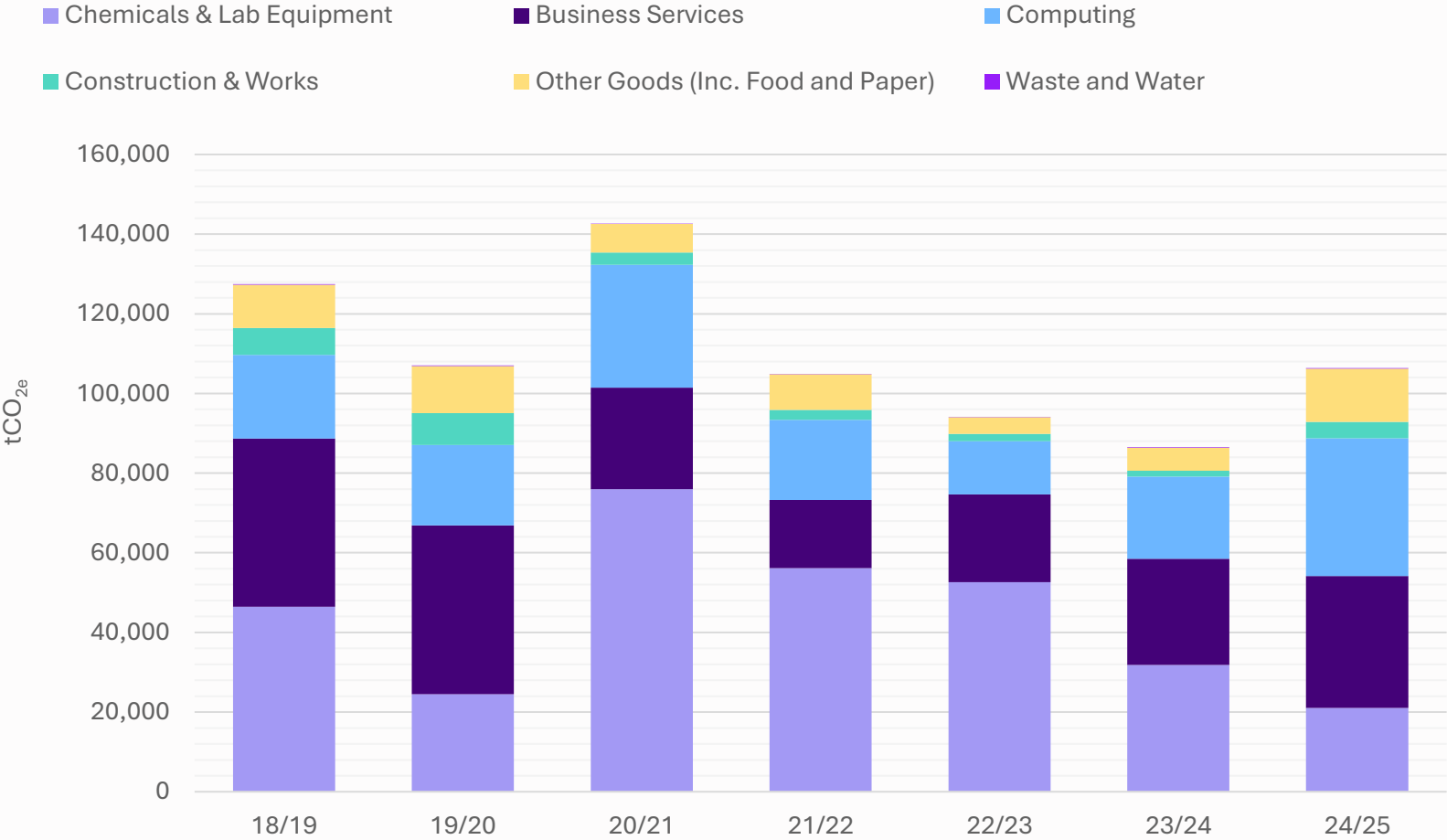
In 24/25, expenditure recorded in the *Chemicals and Lab Equipment* category reduced by 41% from 23/24, leading to a reduction in the calculated emissions.

We do not currently separate capital (Category 2) and transportation (Category 4) from operational spend (Category 1).

Food on Campus

Lab Efficiency

Cloud Based IT Services



EAUC SCEF Accuracy Rating: **Basic**

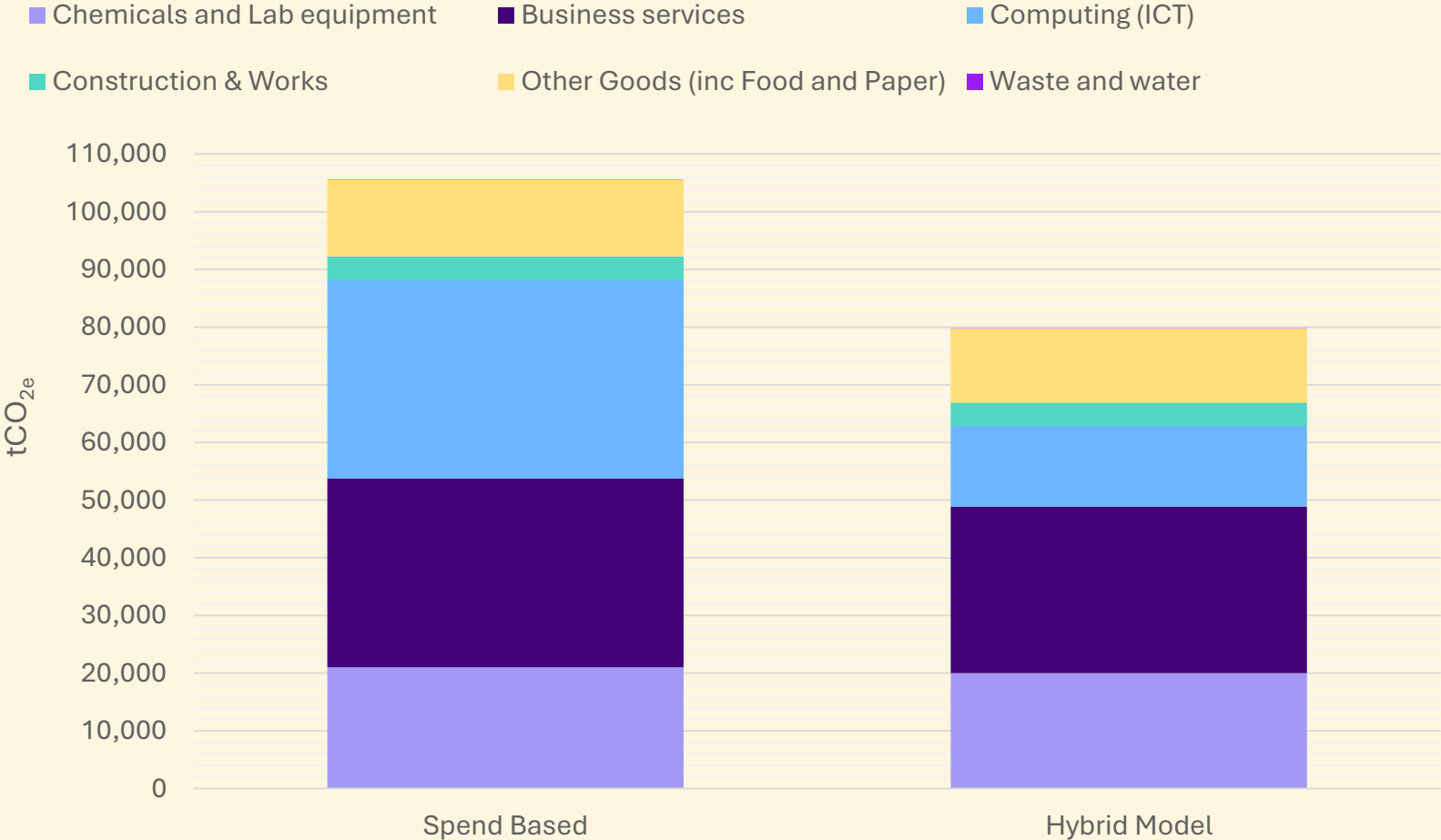
Scope 3 Category 1: Improving the Methodology



The Standardised Carbon Emissions Framework (SCEF) describes three levels of reporting accuracy for Purchased Goods and Services – the least accurate is the spend based model that has been used to date within reporting under the Way to Sustainable.

Warwick is utilising a third-party tool developed with the sector to gather supplier specific data to generate a hybrid model, with an improved level of accuracy.

The charts here show how supplier specific data may influence reportable emissions. One area of particular interest is cloud-based software, where the provided industry calculations are significantly lower than the HESCET mapping assumptions, which are a known area of weakness in the tool due to availability of emission factors.



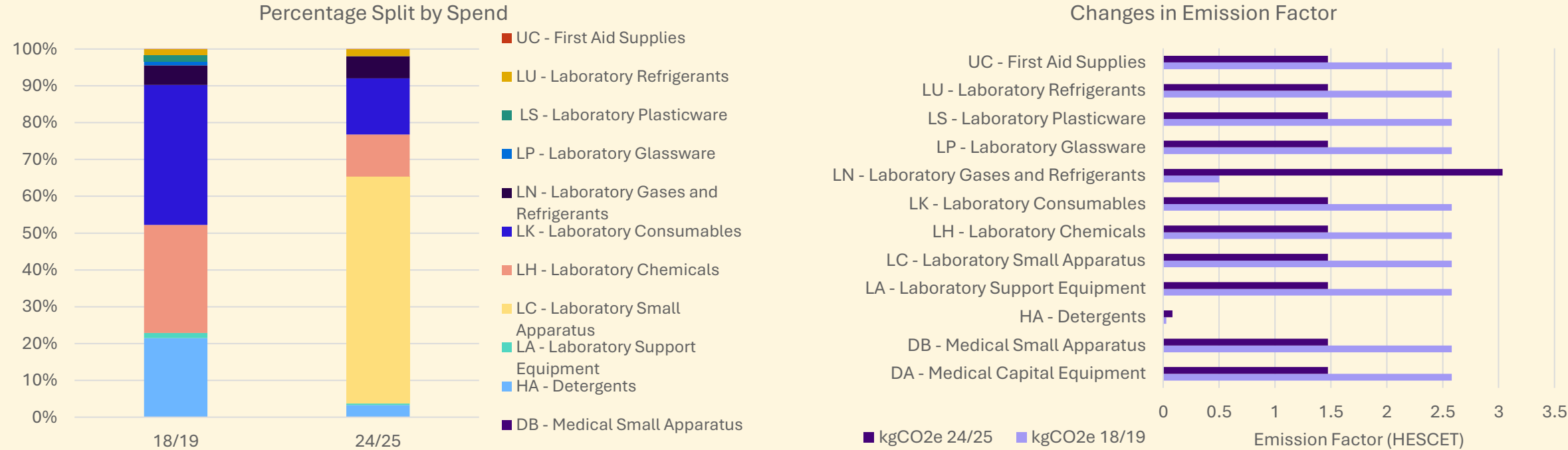
Scope 3 Category 1: Chemicals and Lab Equipment 18/19 – 24/25



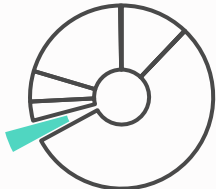
In the Purchased Goods and Services category there have been changes both in carbon emission factors and spend, affecting the calculated carbon emissions.

One spend category where this is particularly true is “Chemicals and Laboratory Equipment”. Since 18/19, the types and proportion of expenditure included in this category (left) have changed dramatically and the overall spend in the category has increased.

However, the DEFRA emission factors that contribute to the overall emission factor for this category (right) have decreased by 43% on average. As a result, despite increased spend assigned to this category, emissions overall have decreased since 18/19.

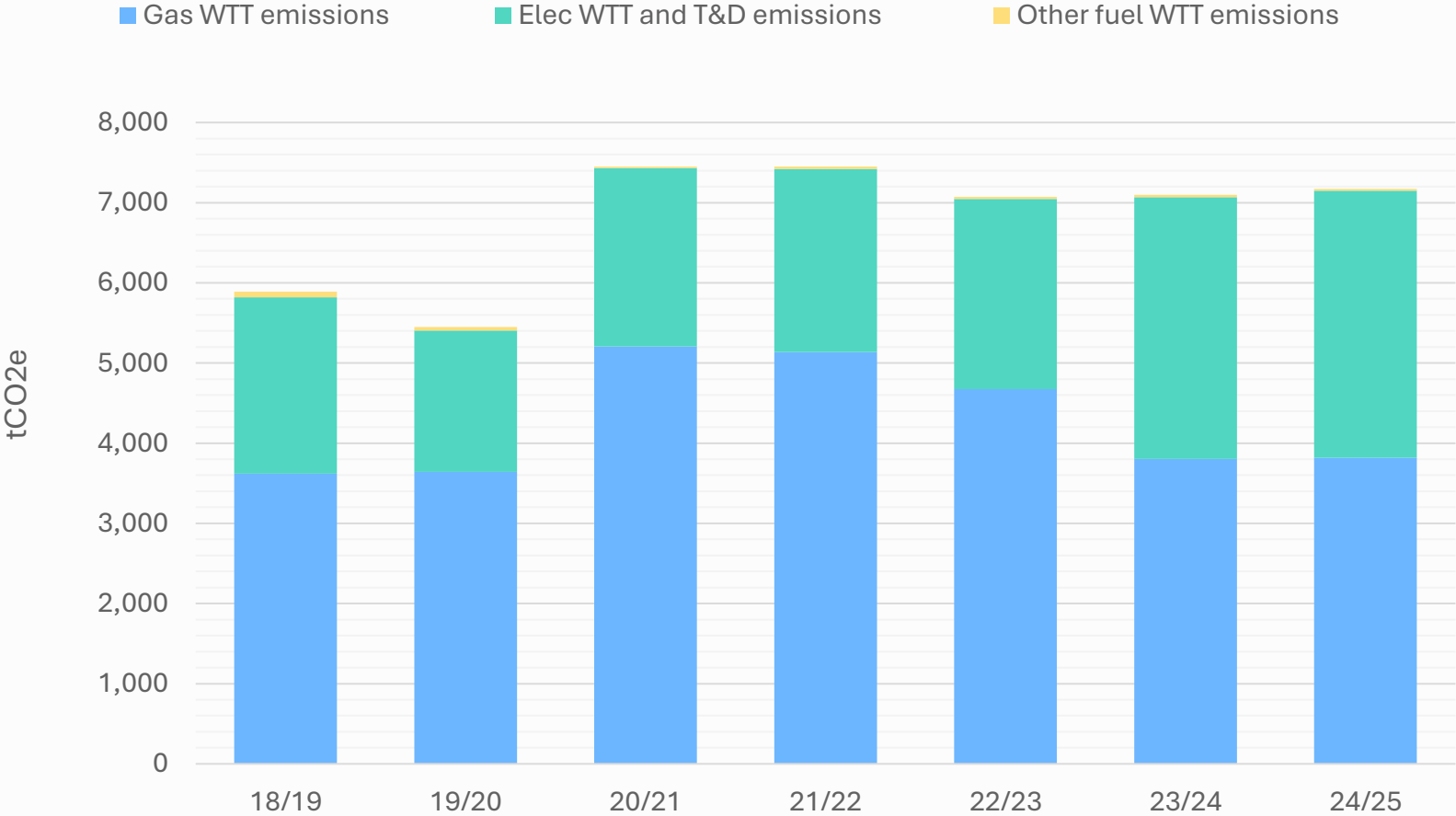


Scope 3 Category 3: Fuel- and Energy-Related Activities Not Included in Scope 1 or 2

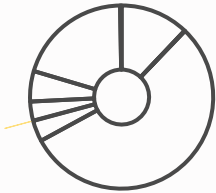


Scope 3 Category 3 emissions arise from the transport and distribution (T&D) emissions associated with our electricity consumption, and well-to-tank (WTT) emissions associated with our natural gas and fleet fuel consumption.

The increase observed between 19/20 and 20/21 is due to a 31% increase in the natural gas WTT emission factor.



Scope 3 Category 5: Waste, including Wastewater



Emissions from wastewater processing represent the largest sub-category of emissions from waste, these have decreased over time due to decarbonisation of wastewater processing.

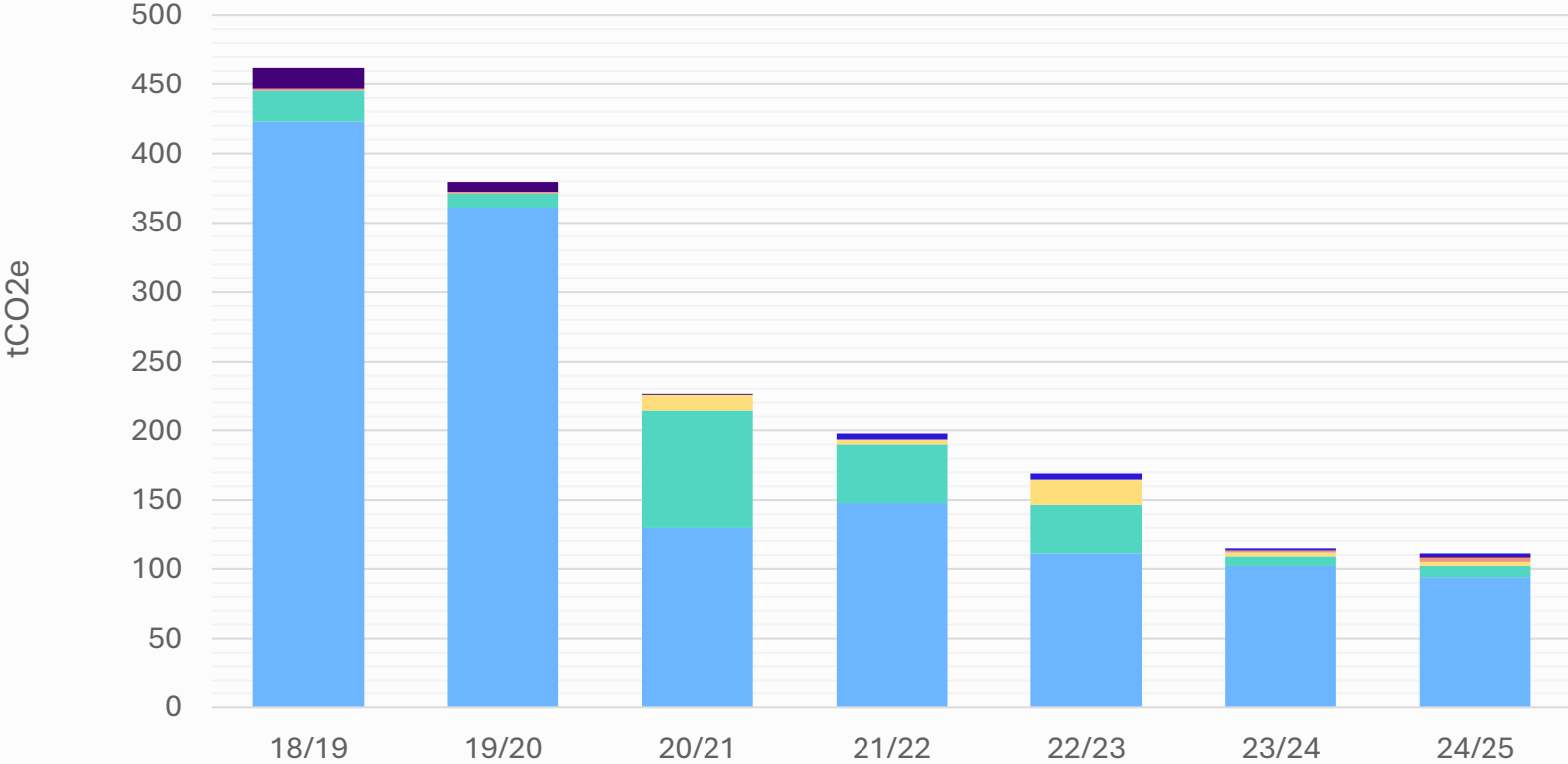
Prior to 23/24, waste figures reported were estimated by the waste contractor.

In 2024, the published emission factor changed from waste disposal to waste removal approach. This had a significant reduction on calculated impact for waste generated on site.

Reuse in Projects

Community Fridge

Waste Water General Recycling Organic Construction & Demolition Electronics (WEEE) Hazardous



EAUC SCEF Accuracy Rating: **Basic**

Scope 3 Category 5: Waste

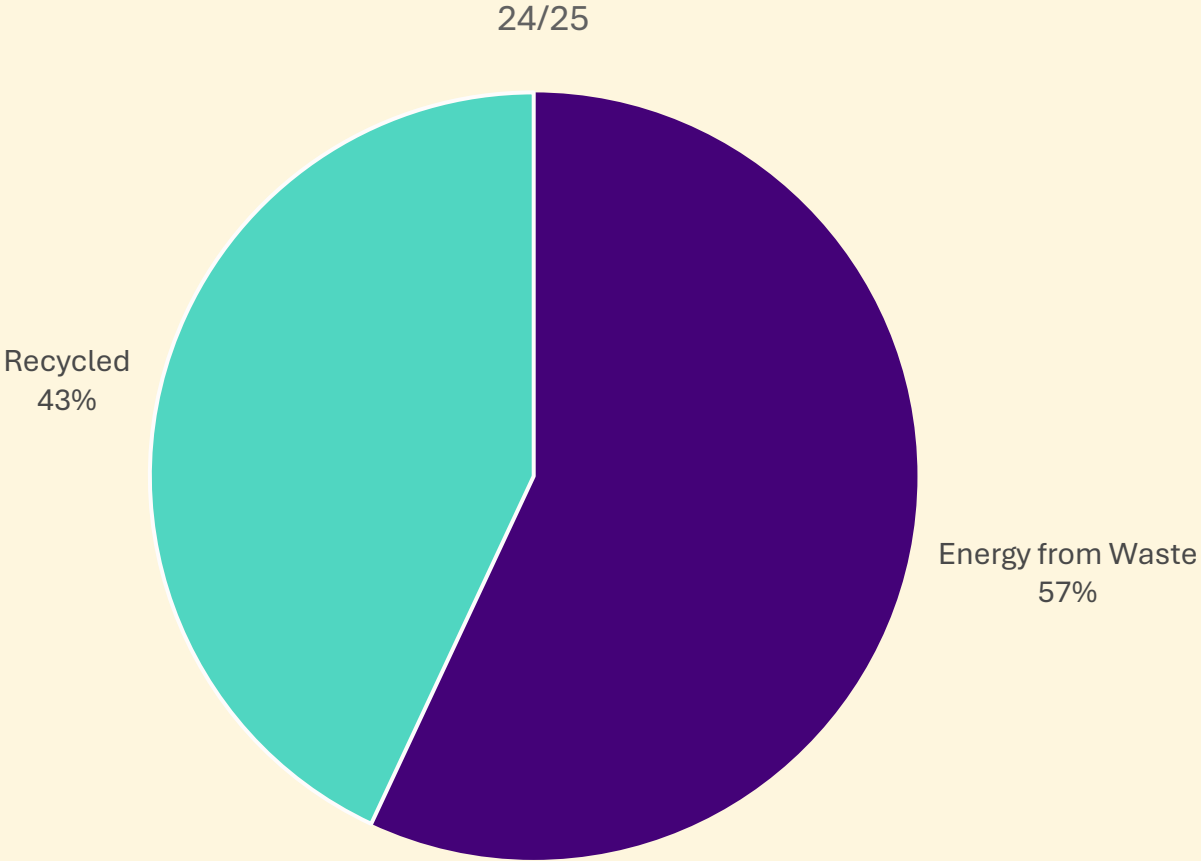


The waste we generate on campus has a low Scope 3 carbon impact, compared to some of our other categories, due to the emissions allocation methodology.

The environmental impact of waste extends beyond the carbon impact, and the Way to Sustainable set a target to reduce waste and increase recycling rates* to 50% by 2025.

Since 23/24 the data sources available for waste have increased in accuracy, the recycling rate for 24/25 is 43% by mass.

**This does not include wastewater or waste generated on construction sites. The waste from construction projects is recorded, over the past twelve months the capital programme has averaged recycling rates above 90%.*



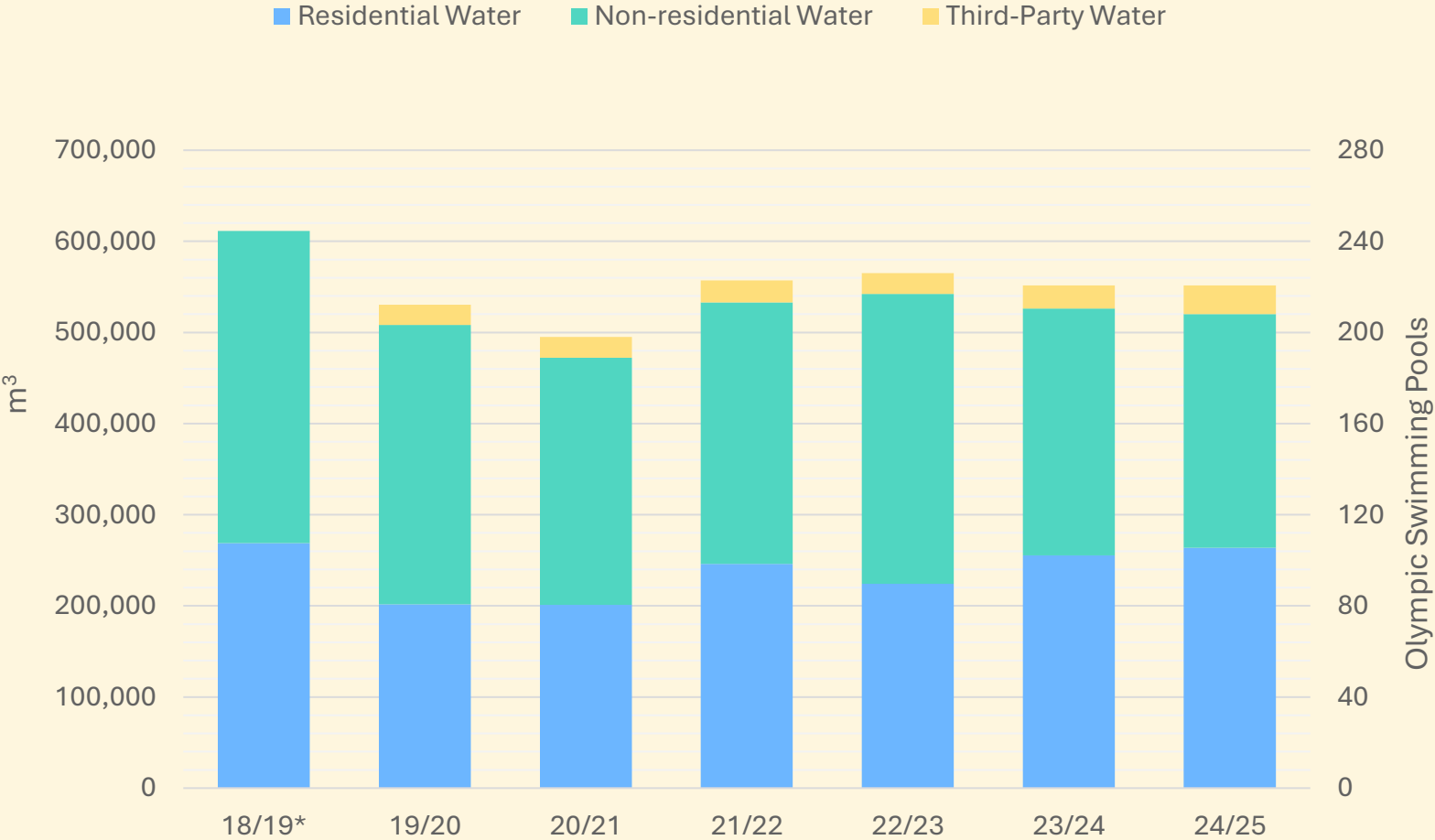
Water Interventions



Water use has a broader environmental impact than the carbon impact of water treatment. In 2025 a drought was declared in the West Midlands, and the University recognises its responsibility to manage water use.

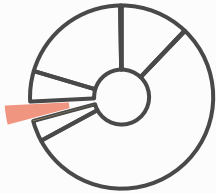
Awareness raising and leak detection are our main interventions. Early leak detection is estimated to have saved around 7.3 million litres of water (7,300 m³) across campus – the equivalent of 3 Olympic sized swimming pools!

The Grounds and Gardens team have started to use Mediterranean species to minimise the watering requirement and are also investigating rainwater harvesting for plant watering.



*18/19 3rd party water usage was not segregated from non-residential water

Scope 3 Category 6: Business Travel, Including Travel to Study



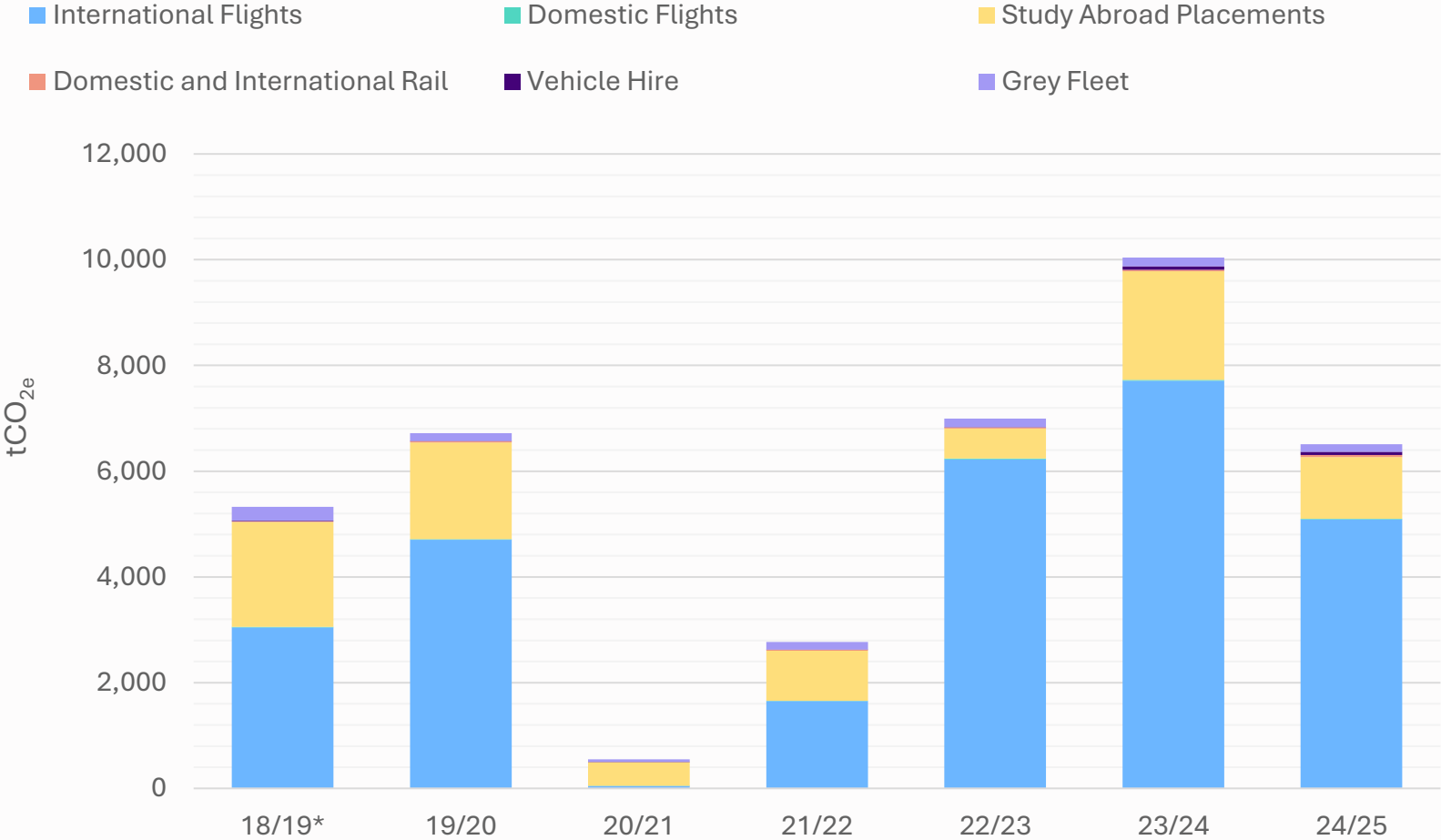
Business travel includes domestic and international travel across all modes.

In 24/25 the average air travel carbon emission factor dropped by 27%, which is substantially responsible for the decrease from 23/24; the recorded travel distances did not significantly change.

Travel relating to study abroad placements are not contracted through a TMC, but emissions are accounted for via location derived calculations.

International flights represent the greatest proportion of emissions.

**18/19 is a partial year of reporting for flights and rail, due to contract changes with the TMC.*



EAUC SCEF Accuracy Rating:
 Business Travel: **Advanced**
 Study Abroad: **Basic**

Scope 3 Category 6: Business Travel

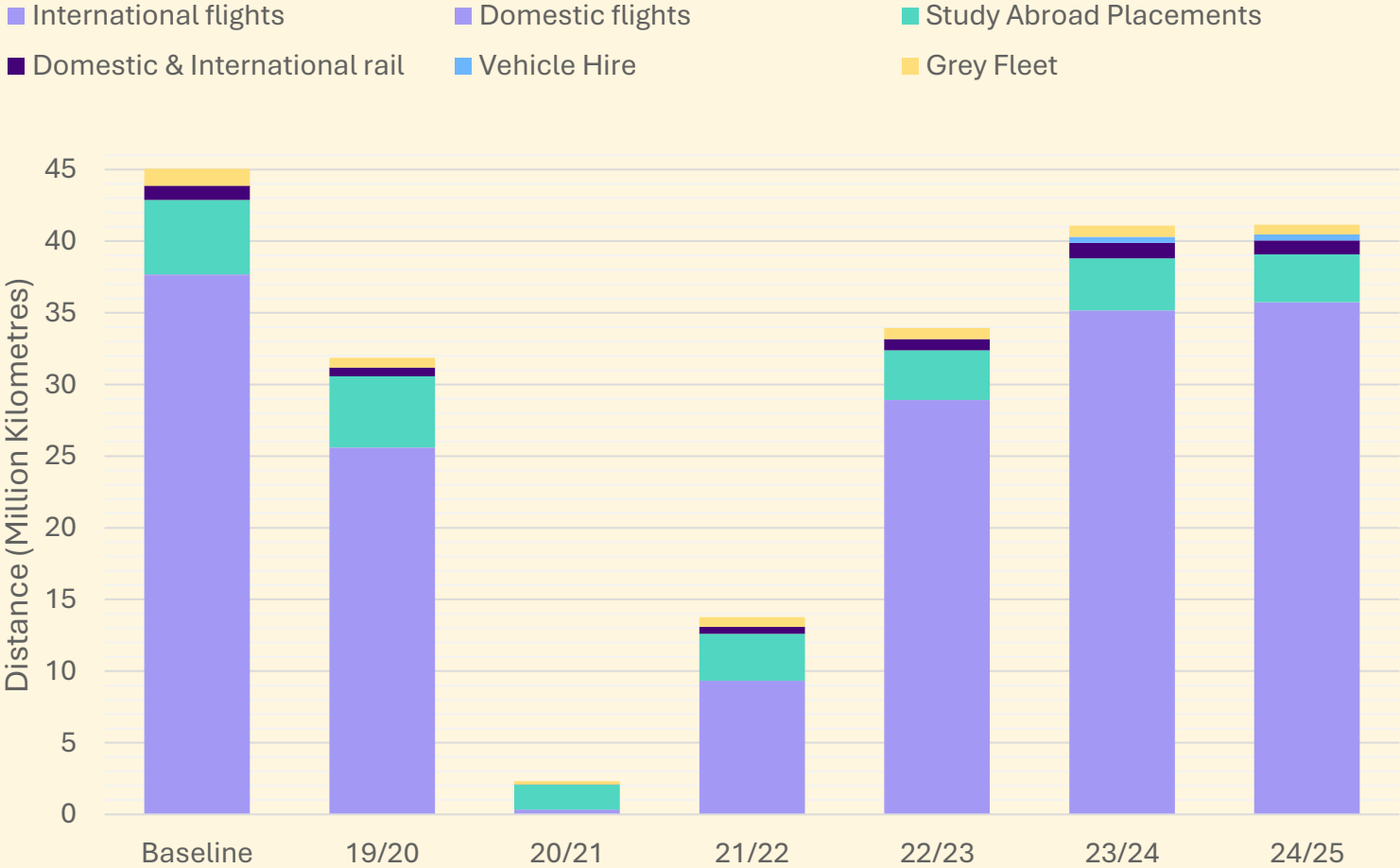


Data in this category is principally obtained from a Travel Management Company and supplemented with vehicle hire and expenses data for staff travel.

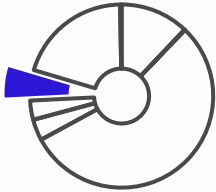
This data was first made available part way through the 18/19 reporting year.

A new “baseline” has been created using a full 12 months of data from the start of this contract.

The baseline will be integrated into carbon reporting in 25/26.



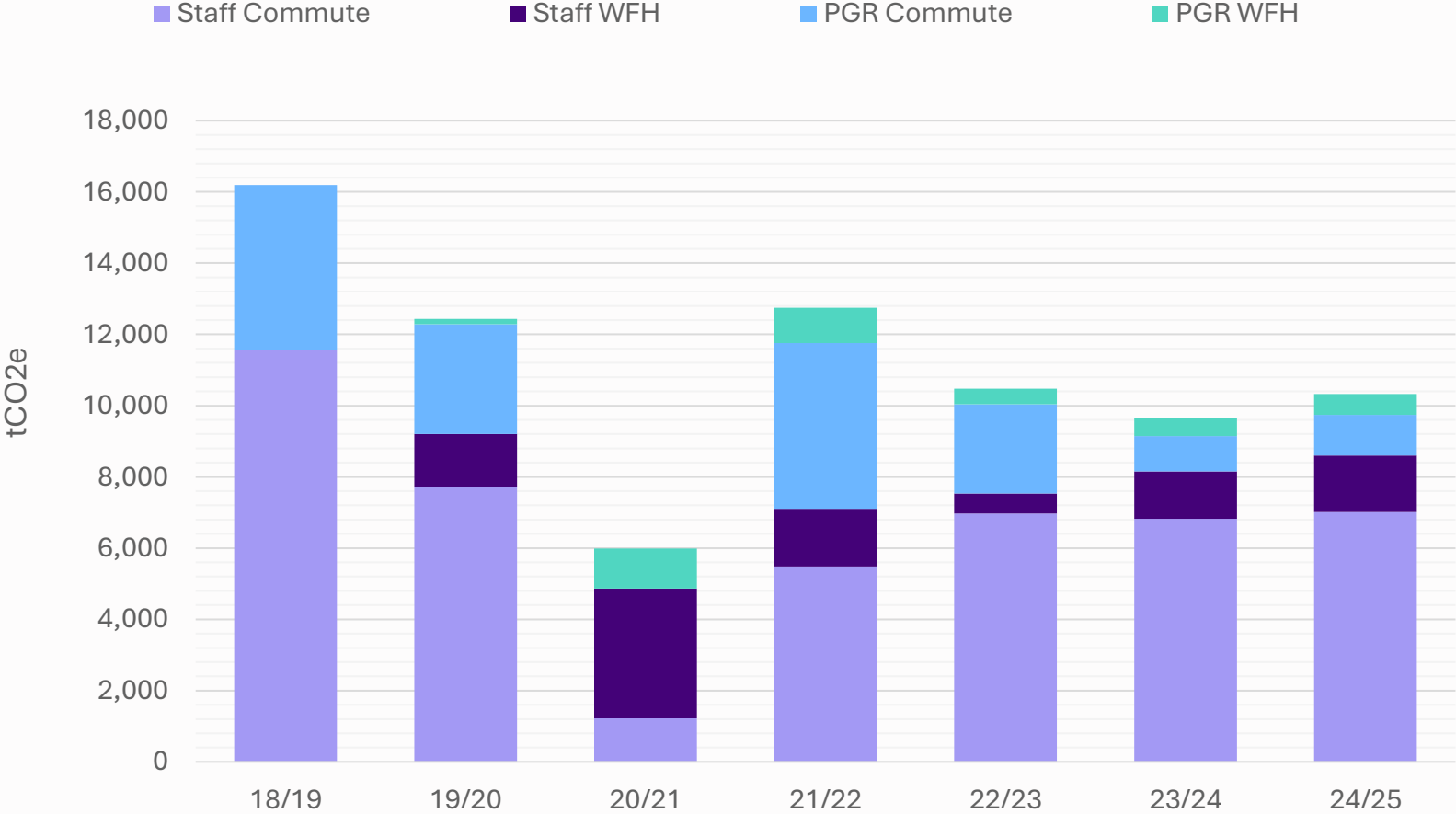
Scope 3 Category 7: Employee Commuting



Emissions for employee commuting comprise both staff and postgraduate research (PGR) staff emissions. Estimates are based on Car Park Automatic Number Plate Recognition (ANPR) data and the results of the transport survey. Staff travel is more carbon intensive than PGR travel, with staff averaging 0.82 tCO_{2e} per person per year, and PGRs averaging 0.45 tCO_{2e} per person per year.

In line with the Greenhouse Gas Protocol and the UK Government's white paper, emissions generated by staff working from home are classified as Scope 3 emissions and reportable alongside commuting emissions.

The accuracy of emissions reported in this category are considered low due to reliance on surveys with relatively low response rates.



Scope 3 Category 9: Student Travel



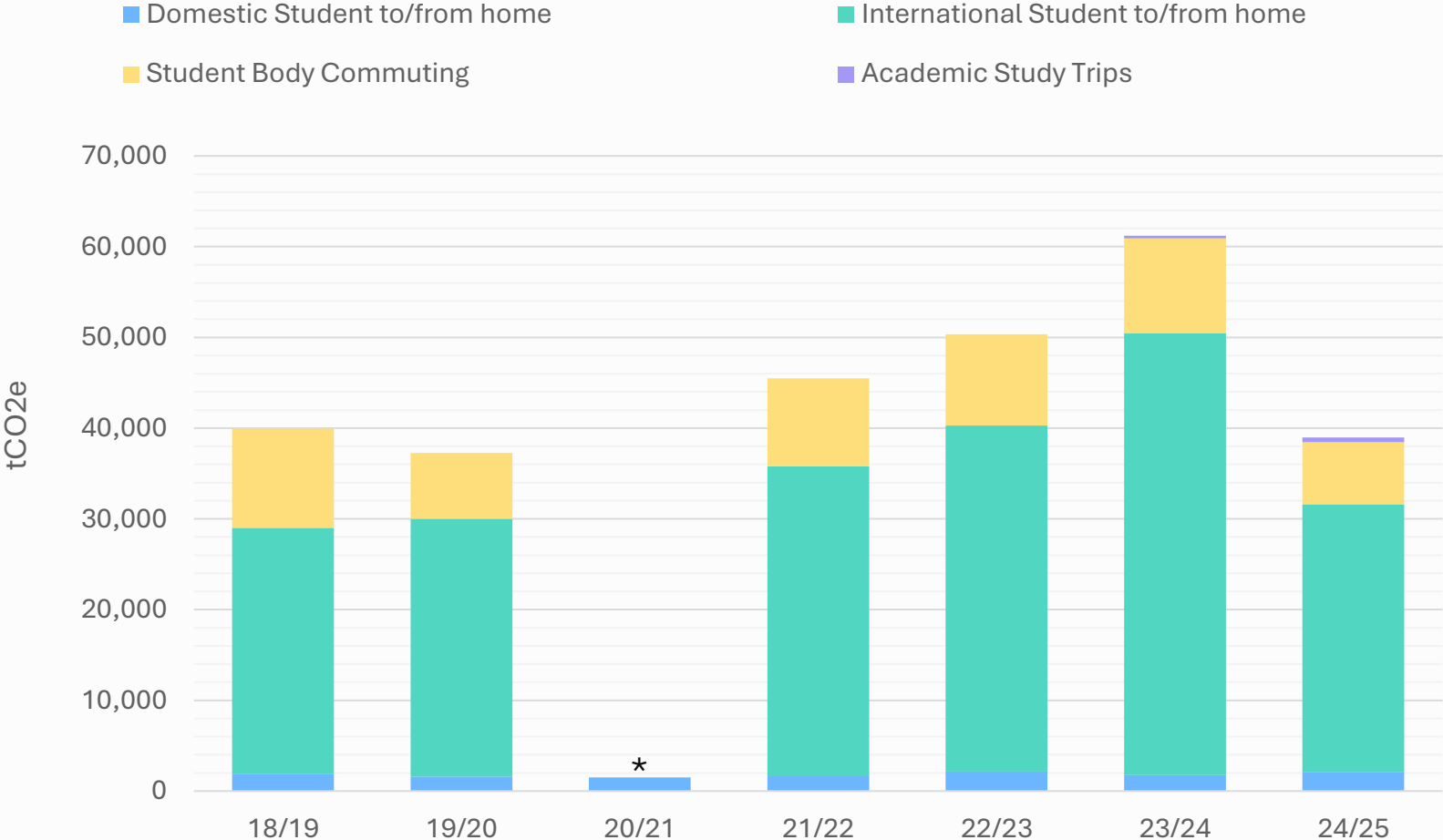
Emissions arising from student travel to University from their permanent residence and term-time commuting is included in this category.

In 24/25 the average air travel carbon emission factor dropped by 27%, which is substantially responsible for the decrease from 23/24.

Assumptions on frequency and methods of travel are made in line with HE guidance which uses distance-based grouping to estimate frequency of travel.

The University does not report student emissions while working from home. Data accuracy in the commuting sub-category is affected by the relatively low response rates to surveys.

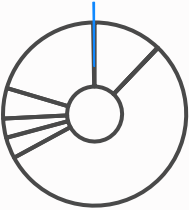
** Due to a lack of available data and travel disruptions through 20/21 the assumptions on travel applied in other years are not considered appropriate. Although Student travel emissions will have been incurred at this time, we have not estimated the values.*



EAUC SCEF Accuracy Rating: **Basic**

Scope 3 Category 13: Downstream Leased Assets

(Third party energy-related emissions)



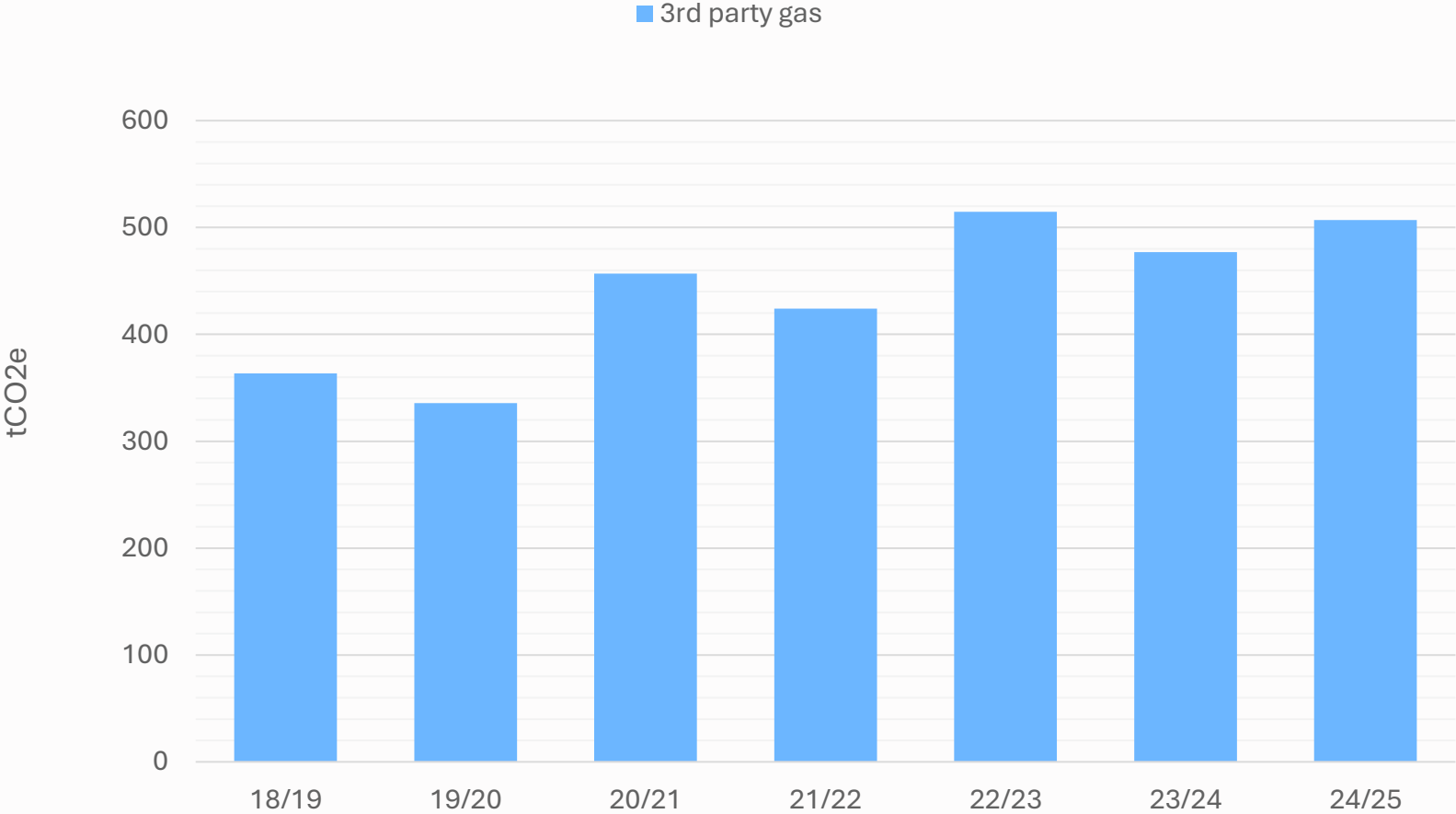
Third parties that lease space on campus, such as food outlets and private companies access energy supplies that pass through the University.

Scope 1 emissions arising from the combustion of this gas are excluded from our Scope 1 emissions but included in our Scope 3 reporting.

These emissions have increased due to increasing gas consumption by 3rd parties on site since 2018/19.

3rd party market-based grid electricity emissions are zero, as all purchased electricity is REGO-backed.

Emissions arising from 3rd party heat and electricity consumption provided from the University's gas-fired energy centres are included within our Scope 1 emissions according to the University role as energy centre owner and operator.





Conclusions

This update records a significant success in the achievement of the interim Scope 1 reduction target. This is due to the combined impact of several workstreams and includes contributions from Staff across the University.

Estimations of Scope 3 emissions show that these represent the greatest proportion of total University emissions, although progress has been made in improving data capture and accuracy of reporting, further work is required across several categories to accurately quantify these. In particular, the Purchased Goods and Services category will require much greater information sharing with supply chain partners to accurately track progress.

The effect of falling emissions factors has been highlighted as having a positive impact in several areas – particularly Location Based Scope 2 emissions, Category 5 – Waste, and Categories 6,7 and 8 where changes in emissions factors for aviation have had a significant impact.

