



CLIMATE EMERGENCY **CARBON REDUCTION PLAN**

July 2022



FOREWORD BY **PROFESSOR SIMON GUY**

The climate emergency is the most significant issue affecting planet Earth, our generation and potentially more dramatically, the generations that will follow us. Unless rapidly and comprehensively addressed, the long-term consequences are disastrous for the ecology of the planet and much of its human and non-human population. It is our collective responsibility to meet this challenge and to address the climate emergency as individuals and as an organisation.

Environmental Sustainability has been at the heart of Lancaster University since its foundation and it is a key part of our strategy to help tackle global environmental challenges, both through our teaching and research, and via the sustainable management of our own campus and operations. In December 2020 we declared a Climate Emergency and we have developed an ambitious goal of carbon net-zero for carbon emissions from electricity and heating by 2030 along with a net-zero commitment from all other emissions by 2035. It is essential that we meet these ambitious targets for managing and reducing our carbon emissions through a practical and effective roadmap which Lancaster University's Climate Emergency Carbon Reduction Plan (CECRP) provides.

There are still uncertainties and complex challenges in front of us, but we believe with ambition, creativity and collaborative effort we can achieve our goals. The University is fully committed to implementing the major carbon reduction projects required and to engaging its research, teaching and professional expertise to meet the challenges which lie ahead.

Professor Simon Guy

Pro-Vice-Chancellor Global (Digital, International, Sustainability)
Lancaster University



INTRODUCTION

Since Lancaster University adopted a Carbon Management Plan (CMP) in 2010 it has successfully reduced its carbon emissions from energy consumption by over 50%, achieving its 2020 carbon reduction target. The University has also made significant progress in understanding its emissions from its travel and procurement activities and reducing these in certain areas.

The overall decrease in carbon emissions is a result of the implementation of a sustained and extensive range of carbon reduction projects, including a large-scale wind turbine, combined heat and power engine, biomass boiler, as well as reductions in carbon emissions from grid electricity and the many energy efficiency projects implemented or designed into new and refurbished buildings. Progress has also been made in reducing carbon emissions from travel through the University Travel Plan and also in certain areas of procurement, such as waste management and water consumption.

With its Declaration of a Climate Emergency, the challenge now for Lancaster University is to reduce its carbon emissions from all emissions sources or 'scopes', comprising energy consumption, transport and procurement to 'net zero'. The carbon reduction targets adopted within the University Declaration of Climate Emergency are science-based, in that they are aligned with the Paris Climate Accords (COP21) goals, and as such are of the scale (and speed) of reductions required to avoid dangerous climate change, through holding global temperature increases to below 2.0°C above pre-industrial temperatures and pursuing a target of limiting the increase to 1.5°C.

Lancaster University is a leading research and teaching institution, in addition to being a major contributor to projects and strategies addressing global warming, climate change adaptation and mitigation. The CECRP recognises this position, incorporating a range of projects from the conventional to the cutting edge. Carbon management and climate change adaptation offers significant research, teaching and engagement opportunities. Given the institutional understanding of this global issue it is essential for Lancaster University to be ambitious with its carbon emission targets and projects implemented in order to achieve them.

The CECRP provides a strategic route map, detailing how the University proposes to reduce its carbon emissions through using a range of policies, projects and initiatives. Other important aspects of the climate emergency and environmental sustainability, including ecological issues, sustainability in teaching and research and embedding environmental thinking and practice into the student experience are to be addressed in a separate University Environmental Sustainability Plan.



CLIMATE EMERGENCY DECLARATION

In recognition of the increasing urgency to respond to global warming and climate change Lancaster University declared a climate emergency; the decision being endorsed by University Council in November 2020.

The Declaration of Climate Emergency commits Lancaster University to two key carbon reduction targets.

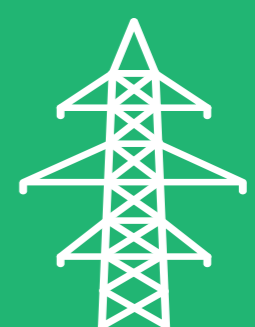
GREENHOUSE GAS EMISSIONS ARE CLASSIFIED INTO THREE PRINCIPAL TYPES OR "SCOPES"

EMISSIONS SCOPES



Scope 1

Energy emissions from natural gas and fuel consumption and refrigerant loss



Scope 2

Energy emissions from imported grid electricity

The term Energy Emissions refers to Scopes 1 & 2 emissions, which are commonly used to categorise a type or source of carbon emissions.

Similarly, the terms Travel emissions and Procurement emissions are used to identify different sources referring to scope 3 emissions.

Scope 3 TRAVEL

Emissions from staff and student daily commuting, business and academics, and international students



Scope 3 PROCUREMENT

Emissions from purchased goods, scientific and IT equipment, professional services and materials, and activities from building construction





CARBON REDUCTION TARGETS

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Carbon reduction targets have been established through the Declaration of Climate Emergency.

'Interim indicators have been established in order to gauge performance in achieving our longer term carbon reduction targets.'

Interim Carbon Reduction Indicators

Scope 1&2 carbon emissions reduced to interim indicator of 6,000tCO₂e p/a by 2025/26

Scope 3 carbon emissions interim indicators of 41,133tCO₂e for 2025/26 and 21,838tCO₂e for 2030/31

OUR CARBON TARGET FOR 2035 IS NET ZERO AND FOR ENERGY WE'LL REACH IT BY 2030



Scope 1&2 carbon emissions to be reduced to 'net zero'
Scope 3 carbon emissions target of 21,838tCO₂e



Scope 3 carbon emissions to be reduced to 'net zero'



Scope 1,2 & 3 emissions not to exceed total carbon budgets

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SDG) CARBON BUDGET

Lancaster University's CECRP is considered to contribute to 10 of the 17 UN Sustainable Development Goals (SDG's).

Comprising an extensive range of diverse projects the CECRP clearly aligns directly to four UN SDG's.



Projects within the CECRP have been identified as indirectly contributing to six UN SDG's.



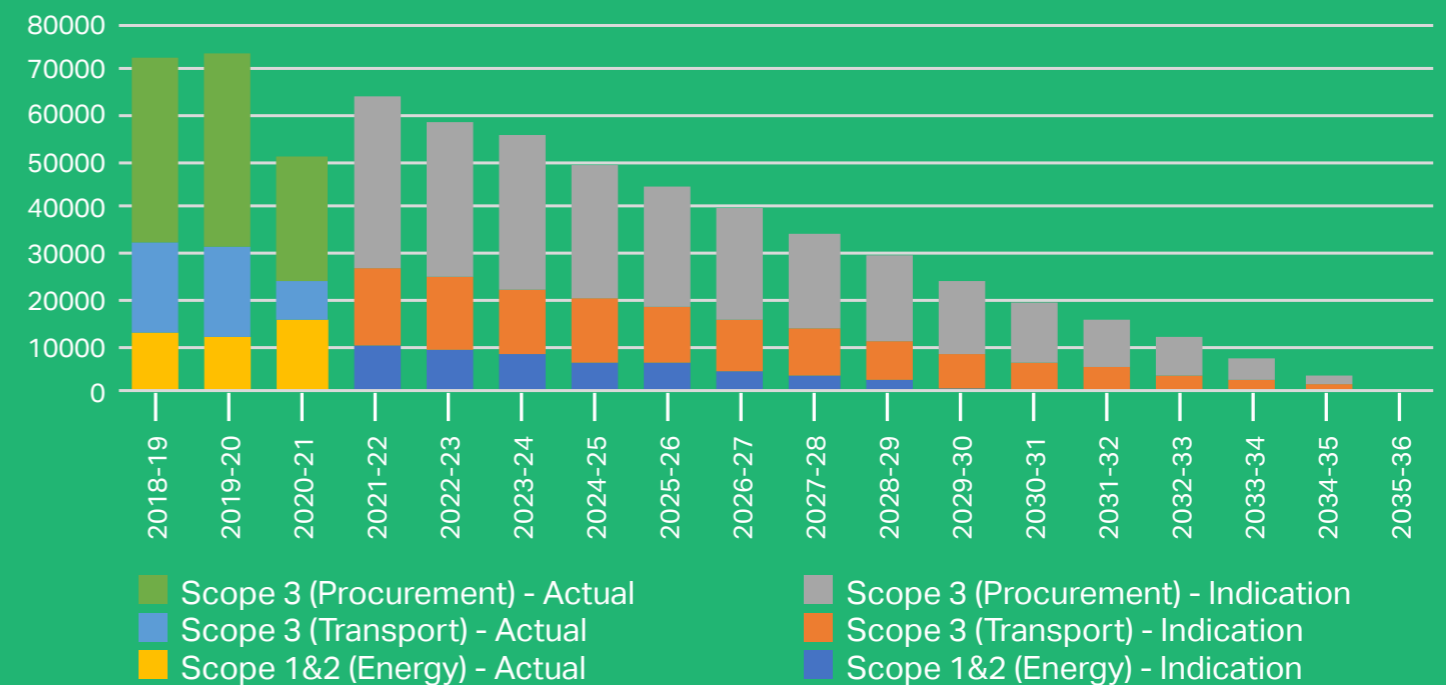
Lancaster University carbon budget represents the total carbon emissions that can be produced by the University between 2020 and 2035 based on a linear pathway in order to achieve the carbon reduction targets detailed in its Declaration of Climate Emergency. Carbon Budgets are already established for the UK as a whole and have been calculated for all local authority areas including Lancaster District.

It is considered unlikely that University carbon emissions will reduce in a consistent and gradual manner, as emissions reductions will actually occur as carbon reduction projects commence, and other factors such as weather and equipment failure will affect emissions.

In practice a more variable reduction pathway is anticipated. The chart below shows existing carbon emissions including emissions baseline year of 2018-19 and projected future emissions in order to achieve carbon reduction targets. The projected emissions profile will change as the carbon reduction contributions and timings of projects are firmed up.

A mechanism for addressing carbon budget overruns will be developed as part of the CECRP in order to ensure the University remains within its overall carbon budgets.

Existing and Projected Carbon Emissions



CARBON REDUCTION KPI's

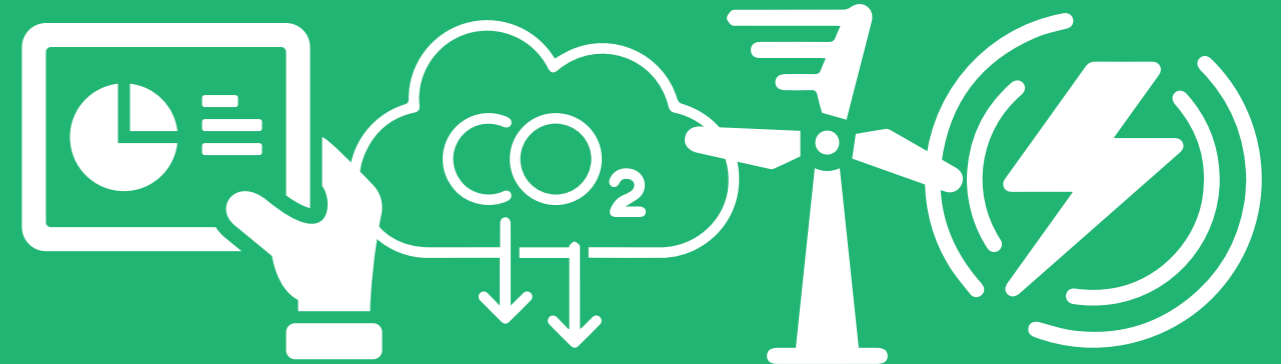
Three Key Performance Indicators (KPI's) relating to scope 1&2 carbon emissions and renewable energy generation have been established and approved by University Council. Grouped under 'Environmental Sustainability KPI 11'.

Energy

Annual emissions as reported to HESA

Annual emissions incorporating site grid electricity supply Carbon Emission Factor (CEF)

Total renewable Energy generated annually onsite (or offsite) as reported to HESA



KPI's for Scope 3 related emissions enable the monitoring of performance in relation to Scope 3 targets. The following KPI's have been proposed (pending approval by University Council) in order to track Scope 3 emissions performance.

Travel

Carbon emissions from staff and student commuting as reported to HESA

Carbon emissions from business and academic travel as reported to HESA

Carbon emissions from other travel

Procurement

Carbon emissions from supply chain as reported to HESA



The Higher Education Statistics Agency (HESA) collects, assures and disseminates a wide range of data about the operations and activities of the Higher Education sector in the UK.

The data HESA collects includes information on environmental performance and carbon emissions. Lancaster University reports environmental information to HESA on an annual basis, which HESA collate and make publicly available.



CARBON FOOTPRINT

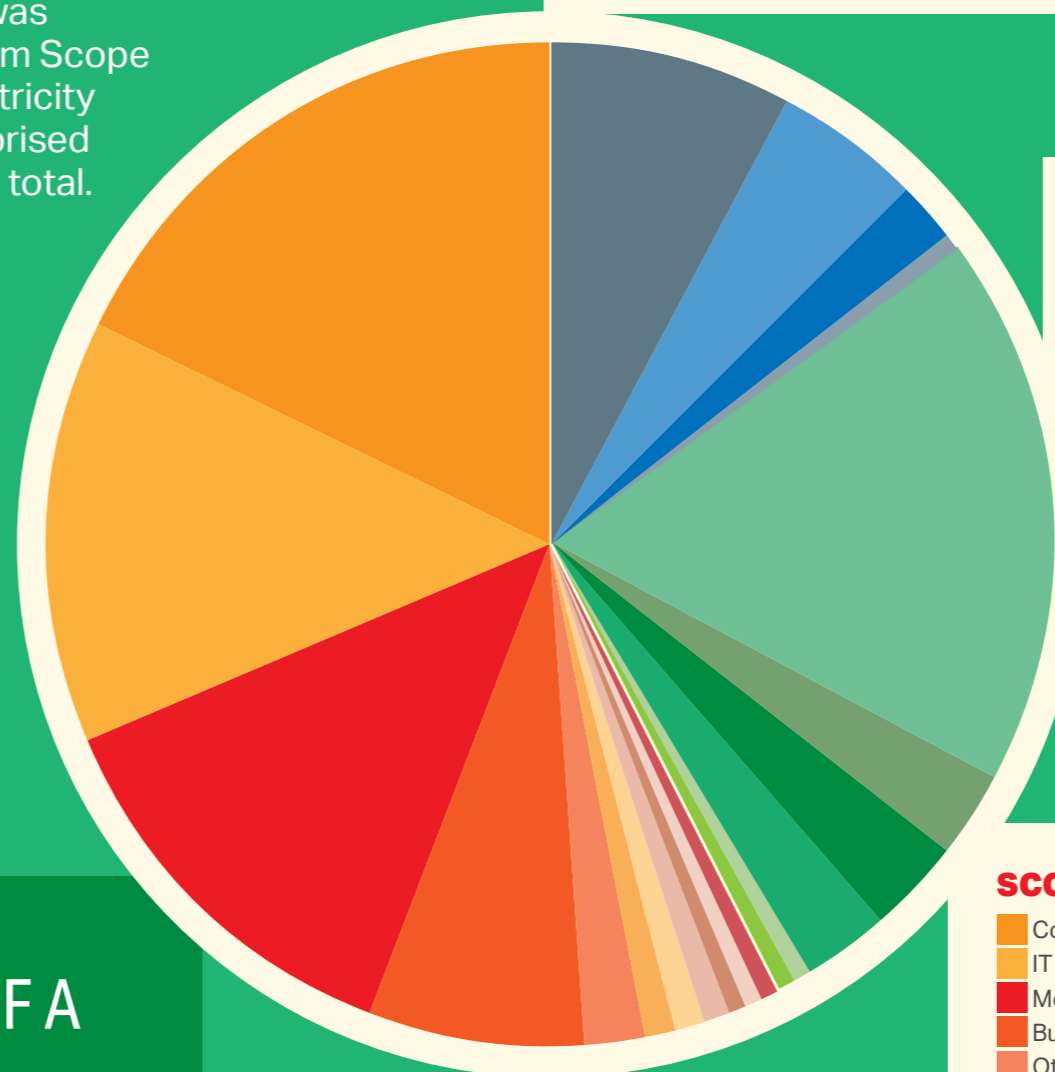
Lancaster University's total carbon footprint from its activities and operations in 2019-20 was 73,437tCO₂e. Emissions from Scope 1 & 2 sources (primarily electricity and gas consumption) comprised 11,689tCO₂e, or 16% of the total.

Of University Scope 3 emissions, those relating to transport comprised 19,850tCO₂e, or 27% of the total, with procurement accounting for 41,898tCO₂e, or 57% of total emissions.

A breakdown of Lancaster University Carbon Footprint is presented in this chart.

WHAT IS THE CARBON COST OF A DEGREE?

The carbon cost of a degree at Lancaster University in 2019-20 was approximately 5.2tCO₂e per full time equivalent student (considering scope 1,2&3 emissions)



SCOPE 1&2

- Gas - Heating - 6,060tCO₂e 8%
- Electricity and Heating from CHP - Gas - 3,913tCO₂e 5%
- Electricity - Grid* - 1,675tCO₂e 2%
- LU Vehicle fleet - 40tCO₂e <1%

16%

SCOPE 3 TRAVEL

- Student B/EoY - International - 12,895tCO₂e 18%
- Student Commuting - 19,67tCO₂e 3%
- Staff Commuting - 2339tCO₂e 3%
- Student B/EoY - UK - 361tCO₂e 3%
- Business & Academic - 2,242tCO₂e <1%
- Grey Fleet - 46tCO₂e <1%

27%

SCOPE 3 PROCUREMENT

- Construction - 13,533tCO₂e 18%
- IT & Comms technology - 10,484tCO₂e 14%
- Medical & Precision Instruments - 9,293tCO₂e 13%
- Business Services - 5,302tCO₂e 7%
- Other Manufactured Products - 1,269tCO₂e 2%
- Paper Products - 526tCO₂e 1%
- Food & Catering - 379tCO₂e 1%
- Waste Treatment, Disposal & Recycling - 219tCO₂e 1%
- Water Supply & Wastewater Treatment - 38tCO₂e <1%
- Fuels, Chemicals & Gases - 58tCO₂e <1%
- Unclassified & Other - 797tCO₂e <1%

57%

SUSTAINABLE ENERGY FOR THE UNIVERSITY ESTATE

An extensive range of projects have been implemented over recent years by the University in order to reduce carbon emissions from energy consumption and improve energy efficiency.



THE COMBINED EFFECT OF THESE INITIATIVES HAS RESULTED IN CARBON EMISSIONS FROM ENERGY CONSUMPTION REDUCING BY OVER 50% SINCE 2005.

Wind Turbine Project

Lancaster University's 2.3MW wind turbine commenced operation in November 2012. In its first full year of operation (2013-14), the wind turbine generated over 5,000MWh of electricity, significantly higher than projected. The turbine produces approximately 15% of the University's annual electricity requirements and has reduced carbon emissions by up to 2,000tCO₂e per annum.



Biomass Boiler Project

The University won £500k grant funding to install the biomass boiler in the Energy Centre. The 0.95MW boiler became operational by December 2012 and reduces carbon emissions by up to 950tCO₂e during a normal heating season. Woodchip is sourced from forests in North West England to supply the boiler.



Combined Heat & Power Engine (CHP)

The CHP engine was operational by February 2012. Running on gas, it generates 2.2MW of heat which is fed into the district heating system and 1.9MW of electricity supplied to the University's electricity network. The CHP can supply 25-40% of the University's annual electricity demand and has, reduced carbon emissions by up to 2,000tCO₂e per annum in some years. Electricity from the CHP is much cheaper than grid electricity.



District Heating Project

Lancaster University's district heating system provides heat to two thirds of the campus buildings. The district heating project has run over the last two summers with extensive works in the energy centre and local plant rooms. Its purpose is to improve the reliability and efficiency of the district heating system through works to maximise the use of the CHP and biomass boiler and significantly upgrading the controllability and efficiency of local plant rooms.



16%

ENERGY EMISSIONS

Gas Consumption Emissions

The principal source of Scope 1&2 emissions at Lancaster University is consumption of gas. The gas being primarily used to operate the boilers in the Energy Centre that provide heating through the district heating system to 2/3 of campus and also in numerous other local heating boilers across campus.

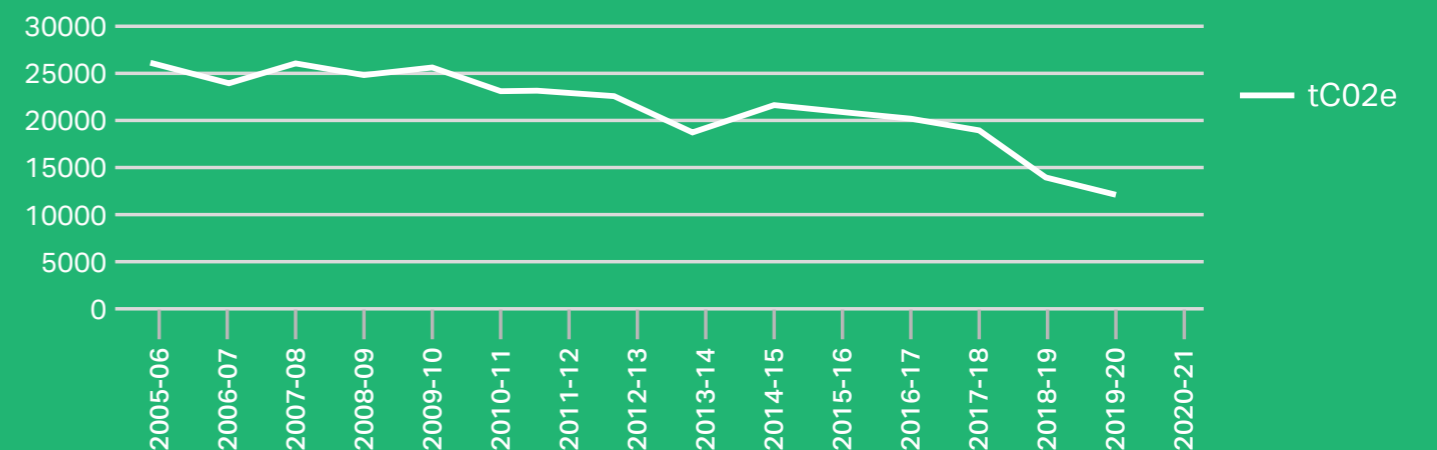
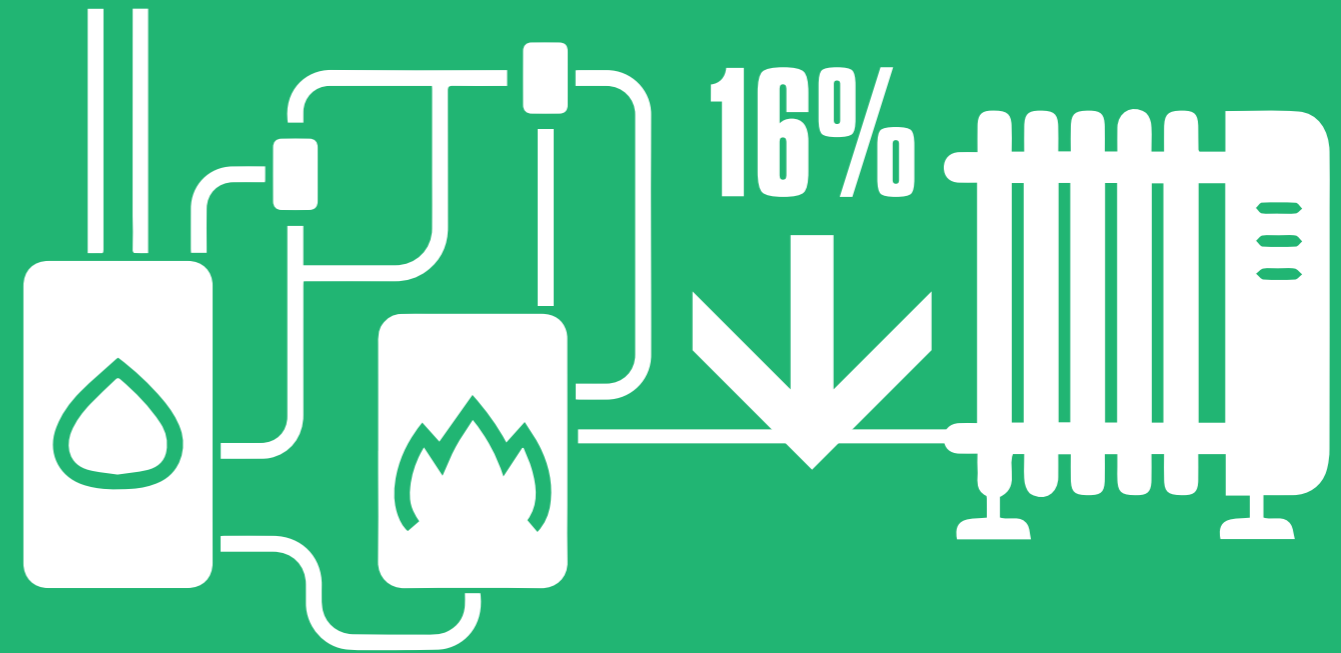
Electricity Consumption Emissions

Emissions from consumption of grid electricity are a more limited source of emissions totalling 1,675tCO₂e, as the University uses a supplier of low carbon grid electricity. Operation of the University vehicle fleet makes a minor contribution to emissions, with much of the fleet now converted to electricity.

SINCE 2005 WE'VE REDUCED OUR SCOPE 1&2 ENERGY RELATED EMISSIONS BY 50%

Summary of Scope 1&2 Carbon Emissions for 2019-20

CO ₂ e Source	tCO ₂ e (2019-20)	% Total of Scope 1,2&3 Emissions
Gas – consumption from heat generation in boilers	6060	8.3
Gas – consumption from heat and electricity generation in CHP	3914	5.3
Grid electricity	1675	2.3
Lancaster University Vehicle Fleet	40	0.1
Total	11689	15.9



27% TRAVEL EMISSIONS

Lancaster University carbon emissions from transport in 2019-20 comprised 27% of total University carbon emissions of 19,850tCO₂e. Transport related carbon emissions stem from six principal transport areas.

Lancaster University Travel related carbon emissions have consistently totalled between 17-20,000tCO₂e p/a over the last eight years, [the time period for which full data is available]. Total University travel related carbon emissions declined from 19,000tCO₂e in 2012-13, to around 17,300tCO₂e in 2015-16. The trend since has been for carbon emissions to increase in 2019-20, when they totalled just under 20,000tCO₂e.

INTERNATIONAL STUDENT TRAVEL REMAINS THE MOST SIGNIFICANT SOURCE OF TRAVEL EMISSIONS

Summary of Scope 3 Procurement Carbon Emissions for 2019-20

CO ₂ e Source	tCO ₂ e (2019-20)	% Total of Scope 1,2 & 3 Emissions
Grey Fleet	46	0.1
Student Daily Commuting	1967	2.7
Staff Daily Commuting	2339	3.2
University Business & Academic Travel	2242	3.1
Student Travel Beginning & end of term/year within UK	361	0.5
Student Travel Beginning & end of year International	12895	17.6
Total	19850	57

Student Air Travel

The most significant source of transport carbon emissions, comprising 18%, or 12,895tCO₂e of total University emissions in 2019-20 is from air travel by international students travelling to and from their country of origin to Lancaster University at the beginning and end of the year. Emissions from this source have increased by approximately 50% between 2012-13 and 2019-20.

Student & Staff Daily Commuting

Emissions from student and staff daily commuting comprise approximately 3% each of total University carbon emissions. This has been a notable success story, with emissions from these sources declining from over 10,000tCO₂e in 2006-07 to below 5,000tCO₂e in 2019-20. The reason for these reductions being primarily travel mode changes driven by the University Travel Plan, improvements in vehicle efficiency, and in 2019-20, reduced commuting due to COVID-19.

Business & Academic Travel

University business and academic travel is also a significant source of travel related carbon emissions, comprising approximately 3% of the total or 2,242tCO₂e in 2019-20. Emissions from this source increased by 20% between 2012-13 [the first year full data was available] and 2018-19 due to increased travel. 2019-20 saw emissions from this source drop by 1/3 due to business & academic travel largely ceasing during COVID-19. Over 90% of the carbon emissions in this category are from air travel, with much of the remainder relating to train journeys.

Student Travel at the beginning and end of year within UK

Student travel at the beginning and end of each term/year within UK comprised 360tCO₂e carbon emissions in 2019-20 and has increased by approximately 50% since full data on this emissions source was available in 2012-13. The principal source of emissions being car travel, and a secondary source train journeys.

University 'Grey fleet' Travel

University 'Grey fleet' travel (travel in private vehicles on University business) resulted in emissions of 46tCO₂e in 2019-20. Emissions were depressed from a more typical 75-80tCO₂e p/a prior to the impact of COVID-19.



TRAVEL EMISSIONS



STUDENT DAILY COMMUTE COMING DOWN



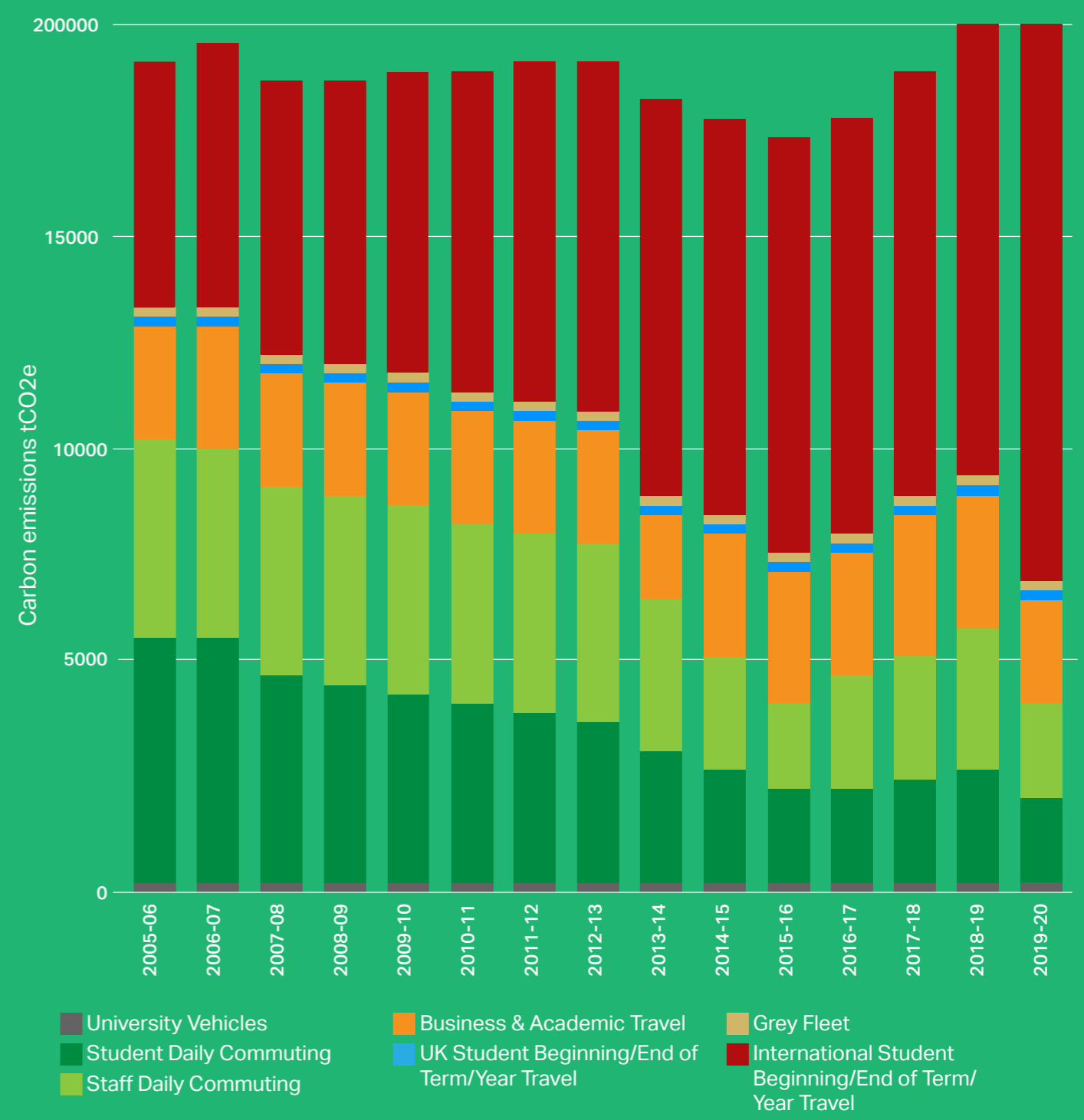
STAFF DAILY COMMUTE COMING DOWN

BUSINESS AND ACADEMIC TRAVEL IS STATIC

INTERNATIONAL STUDENT TRAVEL IS RISING



Scope 3 Travel Carbon Emissions 2005-06 to 2019-20*



*Note: Certain travel emissions are estimated prior to 2012-13.

57% PROCUREMENT EMISSIONS

Carbon emissions from procurement activities are the most significant category of emissions at Lancaster University comprising 57% of total University carbon emissions or 41,898tCO₂e.

Procurement covers thousands of different products and services at Lancaster University with many hundreds of suppliers. Higher Education Sector institutions typically split procurement emissions into 11 principal categories.

Summary of Scope 3 Procurement Carbon Emissions for 2019-20

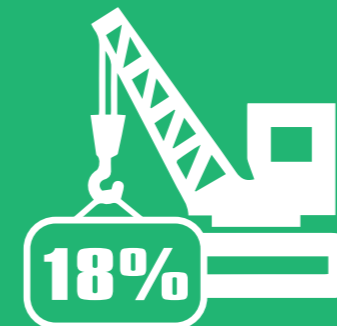
Emissions Source	tCO ₂ e (2019-20)	% Total of Scope 1,2 & 3 Emissions
11 principal categories		
Construction - 13,723tCO ₂ e	13533	18.4
IT & Comms technology - 8,324tCO ₂ e	10484	14.3
Medical & Precision Instruments - 8,689tCO ₂ e	9293	12.7
Business Services - 5,247tCO ₂ e	5302	7.2
Other Manufactured Products - 1,180tCO ₂ e	1269	1.7
Unclassified & Other - 761tCO ₂ e	797	1.1
Paper Products - 512tCO ₂ e	526	0.7
Food & Catering - 370tCO ₂ e	379	0.5
Waste Management, Disposal & Recycling - 219tCO ₂ e	219	0.3
Fuels, Chemicals & Gases - 58tCO ₂ e	58	0.1
Water Supply & Wastewater Treatment - 38tCO ₂ e	38	0.1
Total	41898	57

At Lancaster University over 50% of total carbon emissions are from four procurement categories, the main source of emissions within these categories.



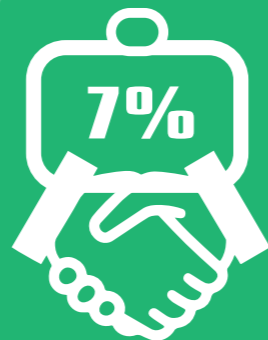
Medical & Precision Instruments

The significant carbon emissions associated with the procurement of 'medical and precision instruments' reflect University spending on specialist scientific and research equipment and machinery, comprising nearly 13% of total University emissions.



Construction

Comprising one third of procurement carbon emissions and 18% of total carbon emissions, construction related emissions reflect the substantial capital building project works ongoing during 2019-20 including LUMS West Pavilion, Library extension and Sports Centre new sports Hall.



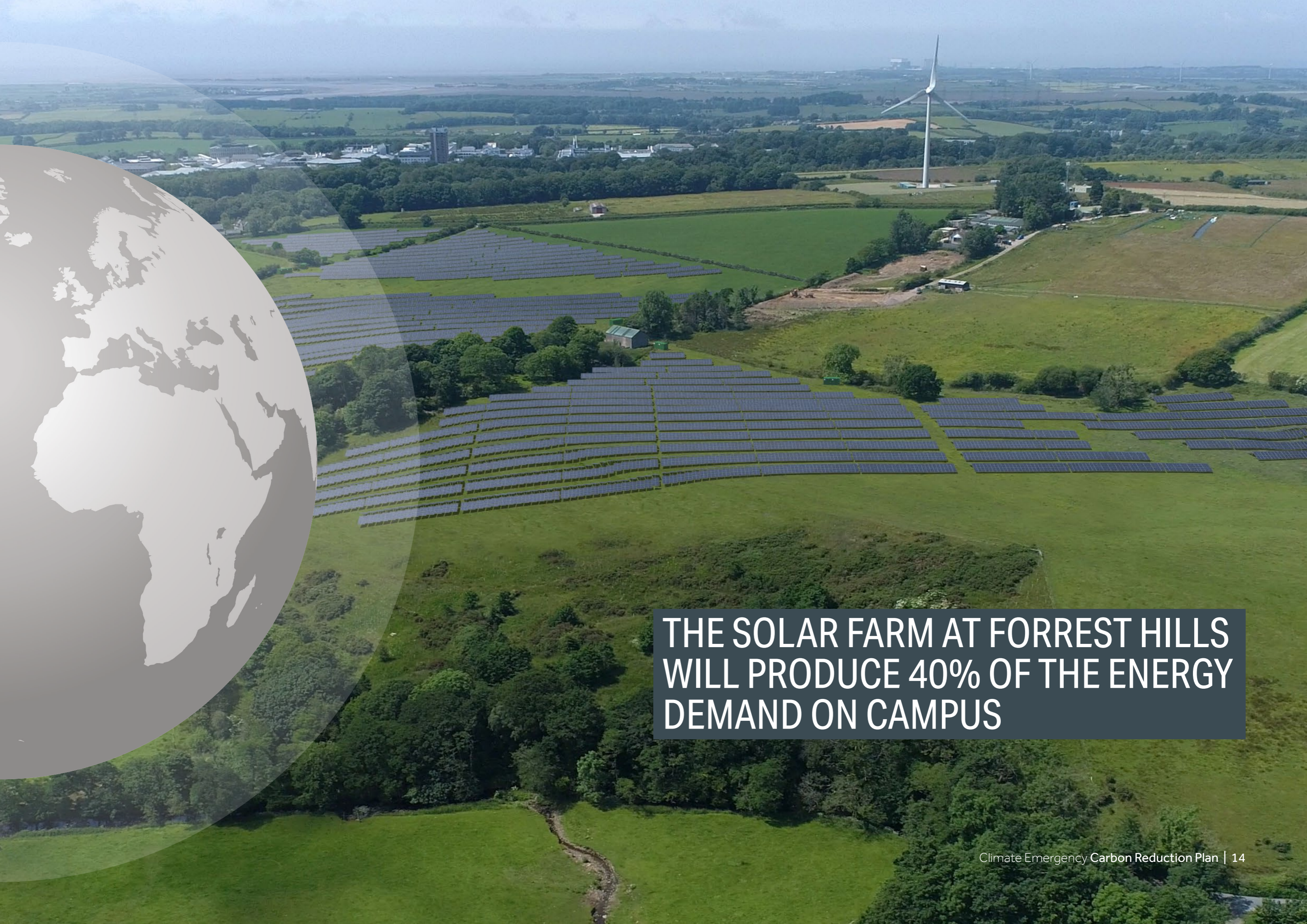
Business Services 7%

Comprising approximately 7% of procurement emissions, 'business services' captures a wide range of services and activities purchased by Lancaster University. Business services includes consultants, accountancy & audit services, a wide range of property, building and control system services, education and laboratory services and IT services.



IT & Comms Technology 14%

Totalling over 25% of procurement related carbon emissions and 14% of total carbon emissions, IT and comms technology includes procurement of hardware such as computers, IT and network equipment and software, software licences, journal licences and photography.



**THE SOLAR FARM AT FORREST HILLS
WILL PRODUCE 40% OF THE ENERGY
DEMAND ON CAMPUS**

TACKLING ENERGY REDUCING THE 16%

Comprehensive plans to reduce carbon emissions from energy consumption and achieve the 2030 'net zero' target for scope 1&2 emissions have been developed and implementation has started.

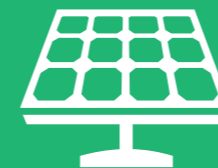


TWO THIRDS OF THE UNIVERSITY VEHICLE FLEET IS ELECTRIC

Electricity and Gas

The University will execute a complete transition to renewable energy generation and consumption through the implementation of the following project elements:

- Development of a large scale on-site solar Photovoltaic (PV) farm to generate renewable electricity for use as electrical power and for heating on campus.
- Extension of the University district heating system to provide low carbon heating to all buildings on campus.
- Replace gas fired boilers via the electrification of heating and installation of large scale heat pumps for the district heating system.
- Targeting localised efficiency measures, building by building, to increase thermal insulation and efficiency and reduce electrical and gas consumption. Projects to extensively install high efficiency lighting, transformers, motors, control systems and other equipment are being identified.
- Development and deployment of further renewable generation and energy storage technologies.



The solar PV farm, district heating extensions and heat pump installation project is projected to reduce carbon emissions by 10,000tCO₂e p/a.

LU Vehicle Fleet

The University will implement the following projects to decarbonise the University Vehicle fleet:

- Continuing implementation of the Facilities vehicle replacement programme, replacing all remaining Facilities petrol/diesel vehicles with electric alternatives and the replacement of specialist grounds vehicles with electric alternatives as they become available.
- Implementation of Faculty vehicle replacement plans and schedules.

Refrigerant Gas Emissions

The University will control refrigerant gas (FGAS) emissions through the following projects:

- Ongoing regular maintenance and servicing of FGAS systems and replacement of residual high GWP (Global Warming Potential) containing systems.

TACKLING TRAVEL REDUCING THE 27%

Carbon reduction projects have been or will be developed for all elements of scope 3 travel emissions, including staff and student daily commuting, University business & academic travel, international and UK student travel at the beginning and end of the year and 'grey fleet' emissions.

The projects are designed to enable the University to meet its Scope 3 'net zero' carbon emissions target for 2035, interim carbon reduction targets for 2025 and 2030 and Scope 3 travel carbon emissions budgets.



Student & Staff Daily Commuting

Whilst the University does not have control over daily commuting related emissions, which comprise 5.9% of total carbon emissions, it can substantially influence travel mode choices and reduce resultant carbon emissions through implementation of appropriate policies, projects and infrastructure.

The University will implement the following projects to facilitate and influence the decarbonising of student and staff daily commuting:

- Development & Implementation of LU Travel Plan (4th Edition) and supporting travel policies with focus on carbon emission reduction and continuing improvements in staff and students using sustainable travel modes.
- Development of initiatives and facilities to enable staff/students to switch to EV vehicles.
- Continue to develop University travel policies and facilities to ease use of public transport and facilitate the introduction of low/zero carbon buses in Lancaster.
- Development and implementation of policies to support and enable homeworking.
- Working in partnership with Lancashire County Council and Lancaster City Council to enable the development of continuous and fully segregated shared use cycle/pedestrian routes between Lancaster City Centre, Lancaster University and other key destinations.
- Implementation of Forest of the Future#2 and other approved carbon offset or capture schemes to offset residual emissions.

University Business & Academic Travel

Business and academic travel comprises 3.1% of total University carbon emissions, and is considered essential to University academic research, development and engagement.

The University will implement the following projects to facilitate and influence the decarbonising of University business and academic travel:

- Reduce physical attendance at events promoting on-line remote attendance where possible.
- Promote low emission travel modes and reduction in the overall number of journeys.
- Development & implementation of a sustainable Business & Academic Travel Policy.
- Establishment of specific targets and an Action Plan for reducing Business and Academic Travel Carbon emissions.
- Development of project to allocate Faculty/Divisional Business and Academic Travel carbon budgets
- Implementation of Forest of the Future#2 and other approved carbon offset or capture schemes to offset residual emissions.



TACKLING PROCUREMENT REDUCING THE 57%

Representing over 50% of total University Carbon Emissions - procurement is Lancaster University's most significant carbon emission source.

Emissions stem from the manufacturing, transport and provision of thousands of products, services and activities that the University purchases so this is a most challenging area in which to reduce carbon emissions, given the limited control and influence the University has over these processes.

**WE HAVE INTRODUCED
POLICY AND GUIDANCE
TO HELP STAFF MAKE
SUSTAINABLE CHOICES**

A three-stage approach is being implemented, and planned to enable the University to achieve its 2035 net-zero target through the development of a Procurement Carbon Reduction Plan. The Procurement Carbon Reduction Plan comprises the following elements.

Carbon Emissions Assessment & Analysis

- Assessment of historic and current annual procurement carbon emissions using HE Supply Chain Emissions Tool and categorization into correct category coding.
- Calculation of Lancaster University *specific* emissions for procurement categories using methodology's developed for particular product categories.
- Assessment of supply chains to better understand the drivers for the areas of expenditure with the biggest impact - Construction, Business Services, medical and precision instruments and IT.
- Identification of product categories which have the most significant carbon emissions and which product categories Lancaster University has the most influence over suppliers on, in order to enable a targeted approach to addressing the most significant emissions sources.
- Working with suppliers to help them understand their carbon impacts and providing carbon impact training and information (carbon dashboards) internally to staff with procurement responsibilities.
- Determination of product category specific carbon reduction targets and product category specific carbon budgets within the overall Procurement carbon budget.
- Integration of product category carbon emissions targets, and carbon budgets into Faculty, Division & Departmental environmental sustainability plans.
- Delivery of training within procurement and Faculties for staff with procurement responsibilities on the carbon impacts of procurement options and procurement Carbon Reduction Plan.
- Monitor and report Procurement performance against Procurement carbon reduction targets and carbon budget on an annual basis.

Developing Product Category Carbon Plans

- Develop specific plans (with carbon emission targets and budgets) for reducing carbon emissions in individual product categories between Procurement and University Faculty, Departments or Divisions responsible for spending in that particular procurement category.

Developing Procurement Residual Emissions Offset Strategy

- Develop a strategy for offsetting or capture of residual carbon emissions relating to the procurement of essential products or services where it is not possible reduce the emissions at source.

PRODUCT CATEGORY SPECIFIC CARBON PLANS

Initiatives and progress in addressing carbon emissions in selected procurement product categories are outlined in this section, together with projects in development for future implementation.



Construction

Comprising up to 20% of total University emissions, construction related emissions are the most significant University carbon emissions source. The level of emissions has been driven by the high level of construction activity on campus over recent years from the University capital development programme. With the capital programme paused for a period during COVID and planned on a smaller scale in future years, substantial reductions in this emission source are anticipated during 2021-22. Facilities construction projects currently utilise the BREEAM methodology to manage environmental impacts from construction projects. However, it is planned to develop an in-house tailored methodology for construction projects that focuses more effectively on the reduction and elimination of carbon emissions during both the design, construction (or refurbishment) and operational lives of the buildings.

The University will implement the following projects to decarbonise University construction projects:

- Minimising the level of build in the University Capital Plan, through refurbishment of existing buildings and facilitation of 'agile working' in order to reduce future campus space requirements.
- Development of a tailored environmental sustainability frameworks [Minimum Standards Specification – MSS] for Projects to replace BREEAM methodology, incorporating criteria to reduce design related, construction and operational carbon emissions from new and refurbished developments.
- Provision of appropriate resources in the University Capital Plan to enable and facilitate the construction or refurbishment of University buildings to meet the requirements of the revised construction MMS.
- Review the use and embedded carbon content of construction material to seek alternative lower carbon, sustainable products.

IT & Comms Technology

Specification of IT and comms technology for procurement is largely driven by ISS. The following initiatives are planned to help meet the 2035 carbon emissions target:

- The University will implement the following projects to facilitate and influence the decarbonisation of IT & Comms technology Procurement:
- Development of a new overarching 'Green IT Plan', with specific focus on controlling and reducing carbon emissions through procurement of appropriate IT technology and software.



Food & Catering

Facilities Food Operations, Retail & Bars and Catering departments have made significant progress in reducing the carbon emissions and wider environmental impacts of food and catering operations at Lancaster.

The University will implement the following projects to decarbonise Food and Catering Services:

- Assessment of Lancaster University specific carbon emissions from Food & Catering operations.
- Development of a Sustainable Food & Catering Plan to establish a revised framework for sustainable food, catering and hospitality operations at Lancaster University, incorporating consideration of carbon emissions.

Paper Products

Significant reductions in paper consumption (and printer consumables) have been achieved in recent years through implementation of centralised management of printing by ISS, which have in turn reduced consumption. Whilst consumption of paper is likely to continue to reduce in the longer term, in order to meet the 2035 carbon emissions target the following initiatives are planned:

The University will implement the following projects to decarbonise Paper Products Procurement:

- Development of an assessment methodology to allow accurate assessment and comparison of paper product vendors carbon emissions.
- Review of carbon emissions from publishing organisations and journal suppliers.
- Procure low/zero carbon paper products where financially tolerable.

Waste Treatment, Disposal & Recycling

Carbon emissions from waste management and recycling have been tracked since 2006-07 and have seen emissions fall from approximately 450tCO₂e in 2006-07 to 275-300tCO₂e in 2017-18.

Whilst a relatively minor source of procurement related carbon emissions, substantial progress has been made in reducing emissions from waste treatment, disposal and recycling through improving reuse, recycling and recovery levels for waste. Waste and recycling targets, including carbon emissions from waste disposal are set in the Facilities Waste & Recycling Plan, which details the initiatives and projects designed to improve recycling and the resultant carbon emissions.

The University will implement the following projects to decarbonise Waste Disposal & Recycling:

- Ongoing procurement of water supply and treatment services of suppliers with the lowest carbon footprint.

Water Supply & Wastewater Treatment

Carbon emissions from this source have fallen significantly over the last 15 years from a peak of over 399tCO₂e p/a as our water supply and waste water treatment contractor, United Utilities has gradually decarbonised their operations.

Whilst the University has limited direct control over carbon emissions from water consumption and wastewater treatment, substantial reductions in carbon emissions have been achieved by the University's primary supplier of water & waste water services, United Utilities. It is anticipated that emissions will continue to reduce as the carbon intensity of electricity used in water supply and treatment reduces further.

The University will decarbonise Water Supply & Treatment through:

- Ongoing procurement of water supply and treatment services of suppliers with the lowest carbon footprint. Ongoing procurement of water supply and treatment services of suppliers with the lowest carbon footprint.



CARBON OFFSETTING AND CARBON CAPTURE

Whilst the projects and initiatives in the CECRP will substantially reduce carbon emissions, completely eliminating emissions from some sources, in particular in relation to certain (Scope 3) travel and procurement sources to meet the 2035 'net zero' target will be virtually impossible. In order to achieve the 'net zero' target it will be necessary to 'offset' or 'capture' such residual emissions.

CARBON OFFSET

This is the reduction or removal of carbon dioxide (or other greenhouse gases) in order to compensate for emissions made elsewhere.

CARBON CAPTURE & STORAGE

The process of capturing carbon dioxide (either at emissions source or from the atmosphere) and either storing it in a underground geological formation, or converting it to a stable (non greenhouse gas) form.



There are a range of potential approaches to carbon offsetting and capture for Lancaster University, which could include:

- Investing in 'commercial' carbon offset ecological improvement, reforestation or renewable energy projects.
- Developing and implementing University managed carbon offset projects through reforestation or ecological improvement.
- Investing in or developing direct carbon capture and storage systems.

Carbon offset and capture is a rapidly evolving area. Its development is being carefully monitored in order to identify the most appropriate options for the University to adopt in order to offset or capture its residual emissions. However the University is already developing or implementing several carbon offset initiatives, including:

- Drafting a carbon offset and capture policy – establishing an overall University approach to this area.
- Implementing a direct carbon offset project through reforestation across the University estate through the Green Lancaster 'Ecowoods' project.
- Development of a larger scale reforestation project (Forest of the Future#2) through the application of an internal carbon charge on business and academic travel (and potentially other travel emissions). The revenue from these schemes being used to fund large-scale regenerative tree planting in the University's locality in order to both offset travel or procurement carbon emissions and create a regionally significant Forest.

The carbon offset and storage projects ultimately adopted will need to be implemented at scale to address the 'difficult to eliminate' residual emissions. In the medium to long term carbon offset projects will be gradually replaced by carbon capture.

CECRP GOVERNANCE, REPORTING & REVIEW



Under the delegated authority of the University's Vice Chancellor, responsibility for the implementation and review of the CECRP rests with the Climate Emergency Group, which will report to the University Executive Board (UEB), Vice Chancellor and Council on the progress in implementing the CECRP. Thematic sub-groups will also be established to develop, implement and monitor the Carbon Reduction Plan elements relating to Scope 1&2 Emissions (Energy), Scope 3 (Travel) and Scope 3 (Procurement). These groups will report to the Climate Emergency Group.

Through the Pro-Vice-Chancellor Global (Digital, International, Sustainability) the Climate Emergency Group makes recommendations to the UEB and the Estates Committee (and hence the Finance & General Purposes Committee and University Council) in relation to the implementation of specific projects, developments and initiatives to ensure the carbon reduction targets within the CECRP can be met and carbon emissions maintained within carbon budgets.

The CECRP and Climate Emergency Group governance structures specifically address carbon reduction aspects of the global climate emergency. It is recognised that other aspects of the climate emergency must also be addressed with equal speed and focus including the ecological emergency, embedding of environmental sustainability thinking into the student experience, teaching and research and broader social practice. These aspects of the climate emergency will be addressed through a new group, the 'Sustainability Group' that will report separately to UEB.

The CECRP is specifically scoped to address Energy, Transport and Procurement related carbon emissions. Other areas or initiatives with substantial carbon emissions are not currently addressed or within the scope of the CECRP. It is essential that these issues are, in due course, considered in terms of their carbon impacts, for example pensions or strategic decisions made by the University. Such issues should have carbon assessments undertaken in future, prior to decisions being made.

The CECRP will be reviewed on a regular basis in respect of performance, projects and scope. Carbon emissions will be closely monitored in order to track progress towards achieving carbon reduction targets and achieving carbon budgets, with reports produced on an annual basis and provided to the Climate Emergency Group, UEB and University Council.



CONCLUSIONS

The impact of carbon emissions on the climate and ecology of Planet Earth and the resultant have become crystal clear since Lancaster University's original CMP was initially published 2010. Lancaster University's response, through the Declaration of the Climate Emergency and adoption of new carbon reduction targets and carbon budgets covering all emission scopes, emphasises the importance the University and the University Community place on this issue.

Leading the way to net zero by 2035

The University is considered both locally and within the Higher Education sector as a leader in carbon reduction and is often viewed as the organisation to follow the example of in carbon reduction; with this document and its supporting projects likely to be considered examples of best practice and to signpost how other sector and local organisations might best approach carbon reduction and behaviour change.

Whilst the CECRP details projects designed to achieve 'net zero' it does not specifically address climate change adaptation plans as such. A range of adaptations will be required by the University and the nature of those will depend on local climate impacts. A separate assessment of environmental risks and potential adaptations required is planned to be undertaken.

This document, the CECRP, demonstrates the progress made to date in reducing carbon emissions and the ambition and commitment to reduce carbon emissions further. The 'net zero' targets adopted by the University are science based and very challenging, but demonstrate the significant steps that are required in order to avoid catastrophic global warming and climate change.

Reference Documents

- Climate Emergency – Background and context
- Carbon measurement methodologies, assumptions and calculations
- Carbon Budget & Offset/Capture Policy
- Alignment with UN Sustainable Development Goals
- Carbon Management Governance Structures
- CECRP Integration with Facilities & University Plans