ROOT & BRANCH | Embedding sustainability in *all* that we do

Keele UNIVERSITY

Carbon Accounting, Reporting and Management Code of Practice 2024-2029

1. INTRODUCTION

1.1 Overview

Keele University has a long-standing commitment to being more sustainable, and advancing understanding of sustainability and sustainable development, and has created an updated Environmental and Social Sustainability Framework for the period 2024-2029, setting out our overarching pledges in the context of the planetary crisis and UN Sustainable Development goals. This Code of Practice forms part of a comprehensive suite of enacting documents outlined by the framework, ensuring that Keele University continues to take a holistic approach to sustainability, with the appropriate mechanisms and processes to enable the scale and pace of required action.

1.2 Background

Keele University recognises that climate change is one of the most significant global challenges of our time and that urgent action is needed. The University declared a climate emergency in May 2019 and made a commitment to become carbon neutral by 2030. This ambitious target was set with a keen awareness of the crucial and distinctive role that Higher Education Institutions play in tackling climate change, through taking responsibility for the impacts of operational activities and promoting wider action through education, research and community engagement. Indeed, as an institution borne of, and dedicated to inspiring revolutionary change for societal benefit, Keele University has a

strong allegiance to the Higher Education sector's 'call to action' in the face of global challenges and tangible threats to a fair and equal society;

"What is a university if it isn't the space for new thought, innovation, cross-disciplinary perspectives, campus living labs and student-led solutions to respond to the grand challenges of our day – of which climate change is the grandest (and most menacing) of them all?" (Iain Patton, EAUC).

To this end, Keele University launched its Climate Action Framework Principles in 2021, which outlined a core set of principles to ensure climate action is embedded in strategy and practice across the institution. These Climate Action Framework Principles have been embedded within an updated Environmental and Social Sustainability Framework for the period 2024-2029. Reduction of operational carbon emissions is the key focus for reaching carbon neutrality by 2030 and requires urgent action and planning. Priority actions for delivery are improving quality of data collection, accounting and reporting of the University's carbon emissions, and development of a costed Net Zero Carbon Reduction Plan with an evidence-based carbon trajectory in line with science-based targets. To fulfil these aims, in April 2024, Keele University appointed an external consultancy to prepare a detailed baseline and costed Net Zero Carbon Roadmap for Scope 1 and 2 carbon emissions and principal Scope 3 emissions from procurement and supply chain, staff and student commuting, and business travel. It is intended that this will form the foundation of a tangible net-zero pathway aligned with this code of practice for measurement, monitoring and management of carbon.

1.3 Purpose and scope

Keele University has had a long-standing commitment to measuring and reducing its environmental impact and to leading the way in demonstrating ambition and effective action, and is determined to maintain the highest level of ambition to maximise cross-institutional impetus and focus on reaching carbon neutrality. Achieving net zero carbon will be extremely challenging, particularly given wider macro environmental and sector financial sustainability challenges, and requires a whole institution approach. Keele University has a strong foundation to build upon, including successful delivery of several large-scale projects with significant financial investment to increase energy efficiency, reduce fossil fuel consumption and substantially increase renewable energy generation on-site.

Scope 1 and 2 emissions in 2022/23 totalled 6,661 equivalent tonnes of carbon dioxide (tCO_2e) while Scope 3 emissions from procurement, staff and student commuting, business travel, water and waste and staff housing were estimated to total between 30,000-35,000 tCO2e. This represents a 48

% reduction in Scope 1 and 2 carbon emissions from a 2005 baseline of 13,803 tCO2e. This can be partly attributed to the carbon conversion factor of UK electricity decreasing from 0.48 $kgCO_2e$ per kWh in 2005 to 0.21 $kgCO_2e$ per kWh in 2023 (while that of natural gas has remained steady at around 0.18 $kgCO_2e$ per kWh), however this reduction also reflects a decrease in fossil fuel consumption and is despite an increase in gross internal area of Keele University's estate.

Nonetheless, Keele University recognises the scale of the challenge ahead, and is taking several steps to elucidate and support the required action and investment to achieve our ultimate ambition of carbon neutrality through a pathway of best practice. This Carbon Accounting, Reporting and Management Code of Practice, is intended to cover the 5-year period, 2024-2029, so that plans, policies, strategies and actions related to delivery of carbon neutrality ensure that;

- High levels of ambition are maintained, in line with Keele University commitments, and the necessary focus, action, and governance is instituted
- Carbon accounting and reporting follows the principles of relevance, completeness, consistency, transparency, and accuracy
- All policies and plans related to carbon monitoring and management are aligned with best-practice guidance

as outlined in our Environmental and Social Sustainability Framework.

It lays out Keele University's ambitions and protocol for assessment, accounting, reduction and reporting of greenhouse gas emissions associated with its operations and activities. It is informed by internationally recognised guidance and best practice for greenhouse gas accounting and reporting, target-setting and reduction, and will be reviewed and updated in accordance with emerging guidance and/or legislation.

2. CONTEXT, RATIONALE & DEFINITION OF APPROACH

2.1 Carbon Accounting and Reporting

The terms 'carbon', 'carbon emissions' and 'equivalent carbon emissions' are commonly used as an umbrella term for seven greenhouse gas (GHG) emissions as defined by the Kyoto Protocol. Fulfilling carbon reduction commitments requires mechanisms to measure or estimate them with a good level of confidence. GHG (or carbon) accounting and reporting is the process by which an individual or organisation quantifies and communicates the greenhouse gas emissions generated through their

presence and operations. The central global authority for how to track and report GHG emissions is the Greenhouse Gas Protocol, which was borne of a multi- stakeholder partnership of businesses, governments, non-governmental organisations (NGOs) and others, convened by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It arose in the late 1990s, to meet a recognised need for an international standard for corporate GHG accounting and reporting, and the first edition of The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard was published in 2001, with a revised edition published in 2004.

The Standard covers the accounting and reporting of a company's direct and indirect upstream and downstream greenhouse gases covered by the Kyoto Protocol, and how these are categorised as Scope 1, 2 or 3 (Figure 1). Each greenhouse gas has a different global warming potential (GWP), expressed relative to a GWP value of 1 for carbon dioxide (CO_2), allowing total GHG emissions to be normalised as 'equivalent carbon dioxide emissions' (CO_2e). The Corporate Standard provides requirements and guidance to enable organisations to prepare an inventory of GHG emissions and has various supplements, such as the Corporate Value Chain (Scope 3) Standard | GHG Protocol, complemented by various guidance documents and calculation tools. (All reference documents are listed in the bibliography, which contains principal guidance documents and sources which form the foundation of this Code of Practice.) In alignment with financial accounting and reporting, there are generally accepted principles intended to ensure that the reported information is a true and fair representation: relevance; completeness; consistency; transparency; and accuracy.

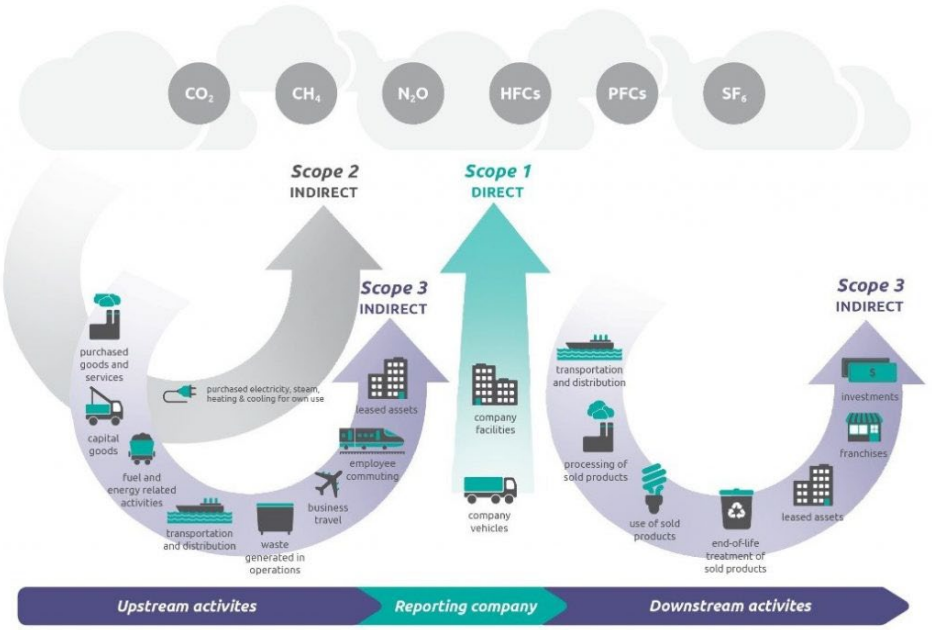

Figure 1.Scope 1, 2 and 3 (upstream and downstream) GHG Categories for Corporate Reporting and Accounting (Source: WBSCD/WRI, 2004; 2011)

The Standardised Carbon Emissions Framework for Further and Higher Education, launched in 2023, was developed by The Alliance for Sustainability Leadership in Education (EAUC) in consultation with the Queens' Platinum Challenge participants and member bodies of the sector such as Universities UK, AUDE, BUFDG, GuildHE and HESA. It is based on the GHG Corporate Accounting and Reporting Standard, and associate standards and guidance, and aims to standardise emissions reporting across the further and higher education sector based on good practice. It provides guidance on inventory boundaries, describes what each category relates to specific to FE/HE institutions and, for most categories, it provides three maturity levels of measurement methodology: advanced level (best-in-class); intermediate level (medium-accuracy); and basic level (lower-accuracy). This enables institutions to start at a basic level and improve calculation methodology, and therefore accuracy, over time.

For completeness of accounting and effective management, it is important to establish boundaries that are comprehensive with respect to direct and indirect emissions. Guidance within The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard and the Standardised Carbon Emissions Framework for Further and Higher Education has been used to define accounting and reporting boundaries, categories and measurement methodologies for Keele University's carbon monitoring and management strategy. Table 1 displays all Scope 1, 2 and 3 emission sources that are applicable to Keele University. While Scope 3 measurement methodology and accuracy is less well established, and collection of relevant data is more complex, than for Scopes 1 and 2, Keele University is committed to working with stakeholders to increase completeness, accuracy and transparency of accounting and reporting in all categories. However, as stated within the Standardised Carbon Emissions Reporting Framework, ease, cost and time implications of achieving more accurate data should be assessed, as it may not be achievable, and carbon reduction activity should be prioritised over improved accuracy.

Table 1. Scope 1, 2 and 3 categories applicable to Keele University

Scope	Category
Scope 1- Direct emissions (on-site)	Natural gas for heating, cooling and ventilation
	Diesel and petrol for fleet vehicles
	Fugitive emissions from refrigeration systems
	Laboratory gases
	Diesel or fuel oil used in generators
Scope 2-Indirect emissions	Purchased electricity
Scope 3-Other indirect emissions	Purchased goods and services
	Capital Goods
	Fuel- and energy-related activities
	Upstream transportation and distribution
	Waste generated in operations (solid waste and wastewater)
	Business Travel
	Employee commuting and remote working
	Upstream leased assets
	Downstream leased assets
	Downstream transportation and distribution (UK/ international student travel)
	Investments

Scope 1 and 2 emissions are dominated by those associated with energy consumption of an organisation's facilities. Keele University has a large campus which contains a mix of academic research and teaching facilities, student accommodation, staff residential properties, and a large Science and Innovation Park. Table 2 shows how emissions from buildings are categorised into Scope 1 & 2 or Scope 3 (upstream or downstream leased assets) emissions based on operational boundaries.

Table 2. Buildings included/ excluded from Keele University scopes of carbon emissions

Assets in boundary for Scope 1 &2	Assets in boundary for Scope 3	Assets outside of boundary
University owned student accommodation	Staff housing (University owned)	Privately-owned housing on campus
University owned and occupied non-residential buildings/ space	Buildings/space rented by University with no or limited operational control	Campus buildings owned by 3rd party
University owned buildings with mix of University use and leased space based on extent of operational control/ proportion of space	Buildings/space leased by University with no or limited operational control	

Keele University has historically reported Scope 1 and 2 emissions, and some Scope 3 emissions

(procurement/supply chain, waste, and water) via the Higher Education Statistics Agency Estates Management Report (HESA EMR), annually, for the reporting period 01 August-31st July. Since 2019/20, the EMR has been optional for Higher Education Institutions in England and Northern Ireland, although most institutions continue to make submissions. The Department for Education (DfE) published its Sustainability and Climate Change strategy in April 2022 in which it refers to the Standardised Carbon Emissions framework;

"We have supported the Queen's Jubilee Challenge for the further and higher education sectors to accelerate a sector-led review. This review will enable all further and higher education settings to report their emissions via a standardised and comparable framework by 2024. From 2025 we will publish targets and institutional progress for the further and higher education sectors."

The legal status as the tertiary education sector's designated data body for England transferred to Jisc (the UK's digital body for tertiary education) following a merger with HESA in October 2022. Jisc is understood to be working with DfE to align EMR more closely with SCEF and establish the value of an improved EMR reporting product going forward (EAUC, 2023) however, as yet, the HESA EMR format remains unchanged.

2.2 Target-setting and Net Zero Pathway

There are many different envisaged transition pathways to global net-zero emissions, with different implications for our climate, nature and society, and Keele University is committed to following and disseminating best practice. We are acutely aware of the scale of challenge in setting a target to achieve net zero carbon emissions by 2030 and, while we are determined to maintain the highest level of ambition, achieving this target will not be prioritised over following a pathway that is "consistent with societal climate and sustainability goals within the biophysical limits of the planet" (SBTi, 2024).

The Institute of Environmental Management and Assessment (IEMA) first published the 'GHG Management Hierarchy' in 2009, to help ensure a focus on avoidance and reduction of carbon emissions at source, as priority actions over offsetting or trading of carbon. It was updated in 2020 (Figure 2) in recognition of the requirement for escalation of action across all hierarchy levels and realisation that the scale of potential carbon savings may not follow a sequential approach through the hierarchy (IEMA, 2020). Nonetheless the order of priority remains unchanged; eliminate, reduce, substitute and compensate.

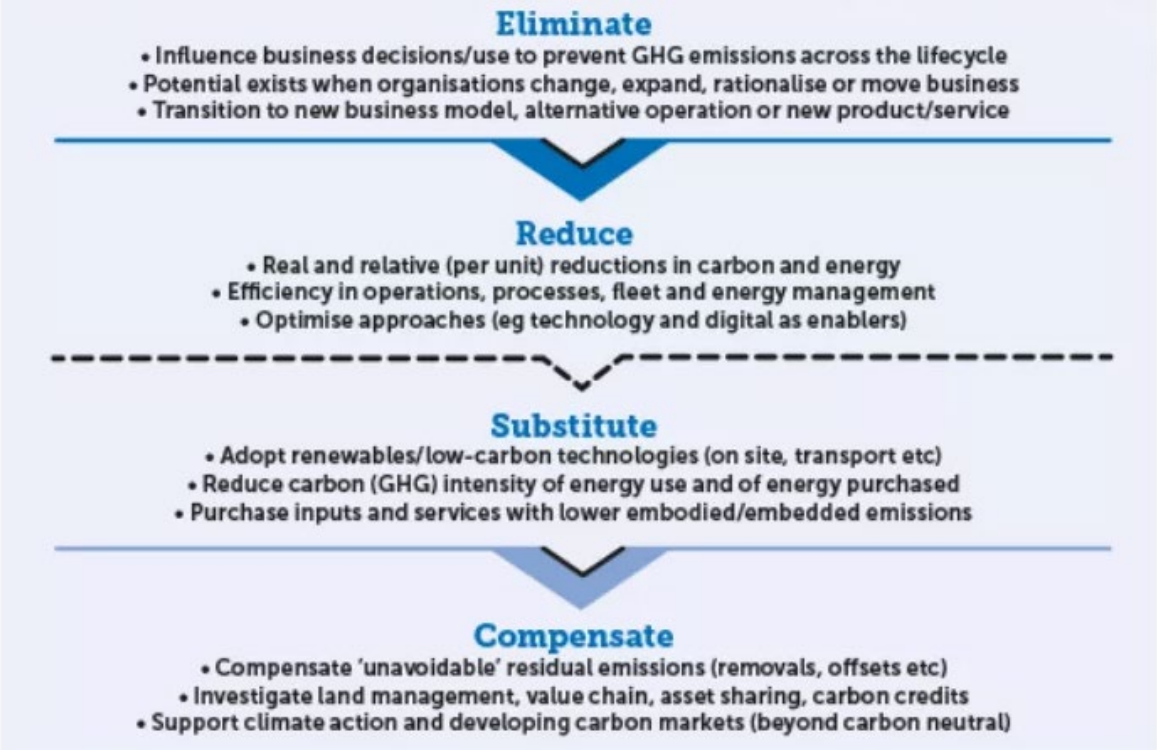

Figure 2. IEMA GHG Management Hierarchy (Source: IEMA, 2020)

The Science Based Targets initiative (SBTi), a collaboration between the Carbon Disclosure Project (CDP), United Nations Global Compact, World Resources Institute (WRI) and World Wide Fund for Nature (WWF), was established in 2015 to help companies in the commercial and industrial sectors to set emission reduction targets aligned with Paris Agreement goals. In 2021 it developed and launched the The Corporate Net-Zero Standard, updated in 2024, which provides the framework and tools for companies to establish targets and pathways aligned with rigorously peer-reviewed scientific findings on requirements for reaching net-zero carbon at a global level by 2050 (SBTi, 2024).

The SBTi Corporate Net-Zero Standard defines net-zero as:

● Reducing scope 1, 2, and 3 emissions to zero or a residual level consistent with reaching net-zero emissions at the global or sector level in eligible 1.5°C-aligned pathways by 2050 at the latest; and

● Permanently neutralising any residual emissions at the net-zero target year and any GHG emissions released into the atmosphere thereafter.

The standard also encourages organisations to go further than their science-based abatement targets to mitigate emissions beyond their value chains (known as “beyond value chain mitigation”),

to contribute to societal net-zero goals, and sets out 4 key elements that make up a net-zero target as depicted in Figure 2:

- Near-term science-based target, “to roughly halve emissions before 2030”
- Long-term science-based target of “more than 90% of emissions before 2050”
- Neutralisation of any residual emissions “to counterbalance the final 10% or more of residual emissions that cannot be eliminated”
- Beyond value chain mitigation (BVCM) to “reduce and remove emissions outside of their value chains in addition to near- and long-term science-based targets”.

SET NET-ZERO SCIENCE-BASED TARGETS

1 **Near-term SBTs**: 5-10 year emission reduction targets in line with 1.5°C pathways.

2 **Long-term SBTs:** Target to reduce emissions to a residual level in line with 1.5°C scenarios by no later than 2050.

NEUTRALIZATION

3 **Neutralization of residual emissions:** GHGs released into the atmosphere when the company has achieved their long-term SBT must be counterbalanced through the permanent removal and storage of carbon from the atmosphere.

Neutralization on the way to net-zero » Near-term investments to **scale carbon removal solutions**

Recommendation 10 - Neutralization milestones: *Companies should disclose information such as planned milestones and near-term investments that demonstrate the integrity of commitments to neutralize unabated emissions at net-zero.*

BEYOND VALUE CHAIN MITIGATION (BVCM)

Recommendation 9 - Beyond value chain climate mitigation: *Companies should take action or make investments outside their own value chains to mitigate GHG emissions in addition to their near-term and long-term science-based targets. For example, a company could provide annual support to projects, programs and solutions providing quantifiable benefits to climate, especially those that generate additional co-benefits for people and nature. Companies should report annually on the nature and scale of those actions.**

* *Please see "Above and Beyond: An SBTi report on the design and implementation of beyond value chain mitigation (BVCM)".*

BVCM Goals

Goal 1: Deliver additional near-term mitigation outcomes to achieve the peaking of global emissions in the mid-20s and the halving of global emissions by 2030.

Goal 2: Drive additional finance into the scale-up of nascent climate solutions and enabling activities to unlock the systemic transformation needed to achieve net-zero by mid-century globally.

BVCM Principles

SCALE: Maximising climate action | **FINANCING NEED**: Focusing on under financed mitigation | **CO-BENEFITS**: Supporting the SDGs | **CLIMATE JUSTICE**: Addressing inequality

Figure 3. Key Elements of the Corporate Net-Zero Standard Pathway (SBTi, 2024)

It is widely agreed that using SBTi methodology to set targets and pathways is best practice for establishing decarbonisation strategies, and several universities have adopted the approach, although SBTi does not have a sector-specific framework and validation of targets for universities and colleges[1]. Keele University is also a signatory of the Race to Zero for Universities and Colleges, which calls on members to meet robust science-aligned criteria.

2.3 Carbon compensation, neutralisation and beyond value chain mitigation

The topic of carbon compensation is complex, and discussions around the underlying principles and technical implications are multi-faceted and often divisive. While there is strong consensus that emissions should be reduced as far as possible before offsetting, and wide agreement that carbon compensation has a necessary role to play in decarbonisation at varying scales, the reputation of 'carbon credits' and the voluntary carbon market in which they are traded, has been marred by inconsistent approaches, lack of regulation, and widespread reports of undelivered promised emissions reductions, and even environmental and social harms (Holder, 2023).

A carbon credit (or offset) represents an avoidance (e.g. through prevention of deforestation), reduction (e.g. by restoration of peatlands) or removal (e.g. by direct air capture or restoration of forests) of one tonne of equivalent carbon emissions, which allows an organisation to compensate for generating the equivalent quantity. Carbon offset projects can be categorised as nature-based, technological-based or a hybrid of the two, and have different implications in terms of cost, risk and permanence. Regulated compliance markets (e.g. UK Emissions Trading Scheme), enable trading of credits which count towards Nationally Determined Contributions and national net zero targets, however for individuals or organisations looking to offset emissions, these are purchased in an unregulated voluntary carbon market. The Voluntary Carbon Markets Integrity Initiative (VCMI) is an international non-profit organisation with "a mission to enable high-integrity voluntary carbon markets" (VCMI, 2024), while the Integrity Council for the Voluntary Carbon Market (ICVCM or Integrity Council) was set up as "a non-profit, independent governance body to set and maintain a global standard for high integrity in the voluntary carbon market" (IVCVM, 2024).

VCMI released a Claims Code of Practice in 2023 to provide clear requirements, recommendations and supporting guidance to organisations on when they can credibly make voluntary use of carbon credits as part of the near-term and long-term net-zero commitments, and how their use should be communicated, while ICVCM launched its Core Carbon Principles and Program-level Assessment

[1]The Alliance for Sustainability Leadership in Education (EAUC) conducted national and international research which showed significant appetite for a university/college-specific SBT methodology and verification framework (EAUC, 2024)

Framework, “setting rigorous thresholds on disclosure and sustainable development for high-integrity carbon credits and establishing a pathway towards even higher ambition”. As representing key stakeholders in the voluntary carbon market, (ICVCM on the supply side and VCMI on the demand side), in 2023, ICVCM and VCMI announced their joint commitment to ensuring investors in the voluntary carbon market “can invest confidently in high-integrity credits as part of comprehensive end-to-end climate strategies” (IVCVM, 2023). Nonetheless, criticism and scepticism of carbon credits and the voluntary carbon market remains (Gabbatiss, 2023; Lakhani, 2024; Delacote *et al.*, 2024). The Carbon Coalition is an EAUC initiative for universities and colleges to purchase carbon credits for offsetting from a portfolio provided by an Appointed Certification Manager (presently Carbon Green Ltd.) based on a scoring mechanism, however there is wide variation in price of available credits within the portfolio.

A ‘leading’ approach has been proposed (SBTi, 2024; UKGBC, 2024) of setting an internal carbon price (ICP) based on the true socioenvironmental cost of emitting a tonne of equivalent carbon emissions (as yet undefined, but believed to be significantly greater than the price of most carbon credits), and using this ICP to establish a fund that is used to go beyond offsetting to achieve Beyond Value Chain Mitigation (BVCM), by investing in projects that support climate mitigation, especially those that generate additional co-benefits for people and nature.

2.4 Keele University’s Overall Approach to Carbon Accounting, Reporting and Management

Guidance on GHG accounting and reporting, including defining boundaries, categorising emissions, and calculation methodology is well-established, particularly for Scopes 1 and 2, and the EAUC Standardised Carbon Emission Reporting Framework provides a clear directive for the Higher Education sector, which adheres to guidance within the GHG Protocol for Corporate Reporting and complementary documents. Keele University will therefore follow this guidance for carbon accounting and reporting, and will report on carbon emissions annually, for the periods 01 August-31st July. Keele University will also continue to submit data via the HESA EMR, which enables benchmarking with the wider sector. In all cases, the UK Government’s GHG conversion factors, which are published by the Department for Energy Security and Net Zero[2] annually, will be used to convert activity data (e.g. litres of fuel, tonnes of waste, distance travelled) into equivalent carbon emissions. While the SERF aims to increase the principles of relevance, completeness, consistency, transparency and accuracy compared with the HESA EMR, these should be broadly similar for Scopes 1 and 2, and Scope 3 categories of procurement/supply chain, waste and water.

[2] Formerly Department of Business, Energy and Industrial Strategy

Setting and validation of targets and pathways for reduction of carbon emissions is less well established for the Higher education sector. The Science Based Target Initiative does not yet provide higher-education sector specific methodology and framework for validation. The BSI PAS 2060: Specification for demonstration of carbon neutrality was last updated in 2014 and is due to be withdrawn in 2025 following publication of "a more credible alternative, BS ISO 14068-1:2023 international standard…setting out strong principles and detailed verifiable requirements on quantification and reduction or removal of GHG emissions". This highlights the complexity of defining and delineating required action in response to the global challenge, and resultant evolving nature of best-practice guidance. BS ISO 14068-1:2023 and the Science Based Target Initiative demonstrates best practice approach to achieving carbon neutrality and will be adopted as the guiding principles of Keele University's net-zero carbon ambitions. A baseline year of 2018-19 will be used for target-setting.

The subject of carbon offsetting is complex and often contentious, as discussed in Section 2.3, however it is an essential element of Keele University's transition to net-zero, particularly in relation to Scope 3 emissions, and we are committed to adopting a best practice of leading approach by developing an offsetting strategy aligned with the Oxford Offsetting Principles , and/or using enhanced Internal Carbon Pricing to target Beyond Value Chain Mitigation.

Irrespective of changes in guidance related to aspects such as renewable energy and carbon offsetting, Keele University will adopt the GHG Management Hierarchy in framing and scoping its approach to carbon management such that elimination and reduction of consumption will be prioritised in all categories, whether energy demand for heating, cooling and powering buildings, staff and student commuting or international business travel. However, as stated within IEMA guidance, transition actions will not be restricted by a fixed sequential approach, and Keele University intends to make strides in all hierarchy action areas in targeting net-zero carbon, in a manner similar to that illustrated in Figure 4; progressing a range of short-term carbon reduction actions and levers for systemic change, while planning medium-to-long-term strategic actions to achieve reductions in line with Science-based targets that can be 'neutralised' through recognised compensations (IEMA, 2020).

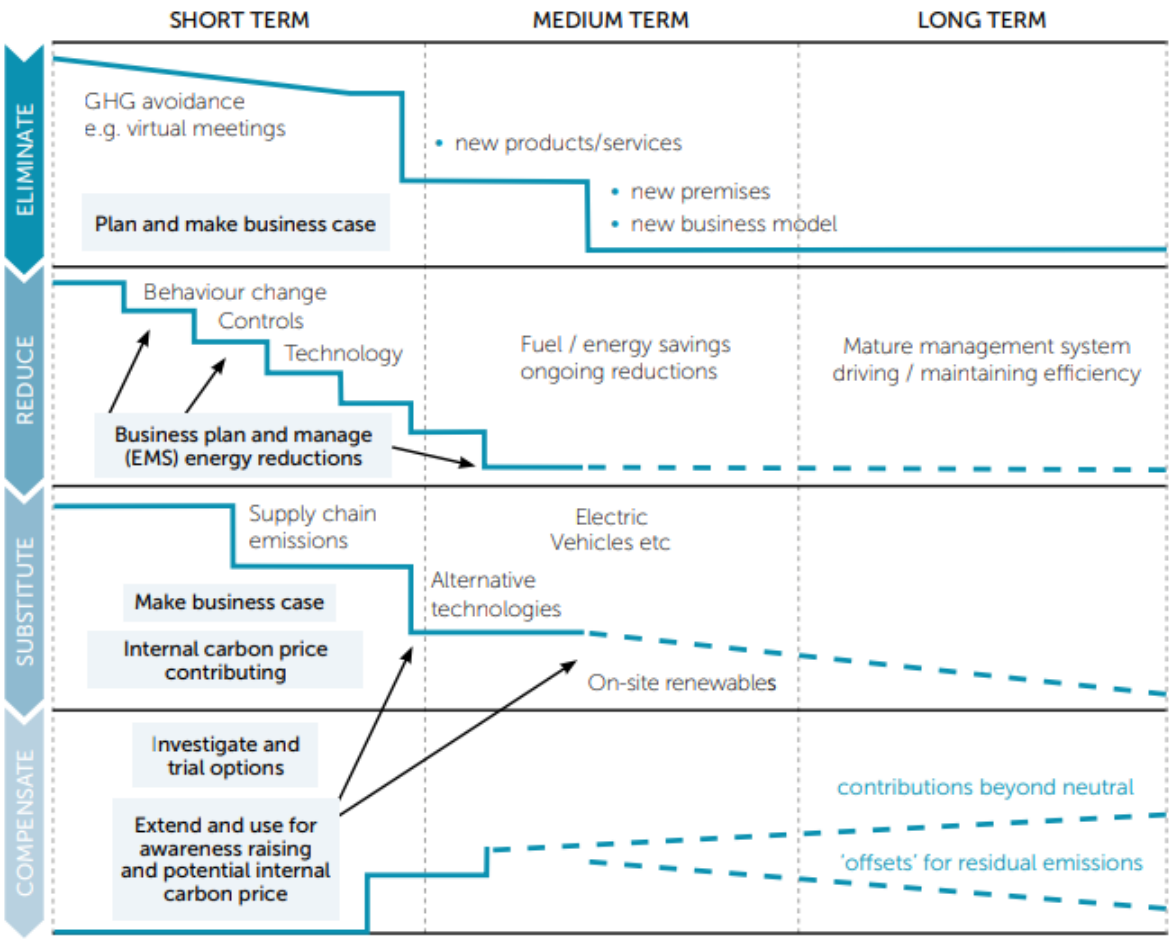

Figure 4. Example of Net-Zero Transition Planning using the IEMA GHG Management Hierarchy (Source: IEMA, 2020)

Due to the relative complexity and immaturity of Scope 3 measurement methodology and accuracy, and lesser ability to implement effective reduction strategies and influence external activity, this overall strategy for carbon monitoring and management will be sub-divided into Scope 1 & 2, and Scope 3. Achievement of targets shall neither be to the detriment of following best practice in line with meeting sustainability goals at national and global scale, nor will reduction efforts be restricted due to immaturity of calculation methodology, and this will enable Keele University to differentiate and invest in optimal points of the net zero journey for these scopes, so that the appropriate focus and action can be applied to all categories, led by robust, scientifically informed guidance.

3. ROLES, RESPONSIBILITIES & GOVERNANCE

Strategic delivery of net zero carbon is overseen by a Net Zero Project Executive Group (NZ PEG)-an executive-led governance structure for the delivery of key institutional priorities and projects,

chaired by a member of the University Executive Committee. The Head of Net Zero Delivery & Sustainability will issue an annual report in line with this Code of Practice, in communication with the relevant departments and directorates. Quarterly updates on Scope 1 and 2 emissions will be issued within reports on energy consumption, cost and carbon emissions, as defined within an Energy Management and Monitoring policy.

Table 3 Members of Keele University Net Zero Project Executive Group

	Job Title
Dr Mark Bacon (Chair)	*Chief Operating Officer*
Prof Mark Ormerod (Institutional Lead for Sustainability)	*Deputy Vice Chancellor and Provost*
Dr Laura Rhodes	*Head of Net Zero Delivery & Sustainability*
Chris Garlick	*Director of Estates and Campus Services*
Paul Hodgkinson	*Director of Planning & Strategic Projects*
Jonathan Cain	*Head of Capital Planning and Programme Delivery*
Abby Swift	*Senior Communications Officer*
Alana Wheat	*Sustainability Engagement Officer*
Prof Zoe Robinson	*Professor of Sustainability in Higher Education*
Naomi Ashenden	*Deputy Director of Estate Services*

4. CODE OF PRACTICE

4.1 Accounting, Reporting & Baseline of Scope 1 & 2 Emissions

Scope 1 and 2 emissions will be calculated, in accordance with Table 4, and reported within an annual publicly available report based on a template provided in Appendix A. Reports will be made available in November proceeding the end of the reporting year. The report will contain a full explanation of source data, calculation methodology and included/excluded buildings. Carbon emissions will be related to a baseline year of 2018/19. Table 4 shows Scope 1 and 2 emissions for this baseline year were approximated to be 7515 tCO_2e (4739 tCO_2e for Scope 1 and 2776 tCO_2e for Scope 2).

Scope 1 and 2 emissions will also continue to be calculated and reported annually via the HESA EMR, in accordance with HESA definitions and data standards. These emissions are not submitted directly by the University but, rather, automatically calculated from input information about energy consumption, using the appropriate conversion factors published by DESNZ. The input values (e.g. kWh of natural gas and grid electricity) should correspond to the building space reported within the EMR return. The HESA EMR does not include data regarding refrigerants or other f-gases. The baseline year used within the HESA EMR is 2005, which is 13,803 tCO_2e for Keele University.

For transparency, the source data used to calculate total annual consumptions and related included/excluded buildings for Scopes 1 and 2, for both the annual report and HESA EMR submission, should be clearly documented in an accessible format, e.g. an Excel workbook, and stored in the Microsoft Team space titled 'VCO-Net Zero'.

Table 4 Scope 1 and 2 category descriptions, baseline totals and details of calculation methodology used

GHG emission Scope/category	Keele University inventory	*Recorded within HESA EMR?*	Baseline year 2018/19 emissions (tCO_2e)	Description of source data and calculation methodology for reporting year	SCEF classification of calculation methodology for reporting year	Notes
Scope 1- Natural gas	Combustion of natural gas in on-site boilers applicable to buildings/space as defined within Table 2, and in teaching/research laboratories	*Yes*	4677	Annual mains gas consumption from TEC customer portal, minus metered annual gas consumption from buildings/space not included in Scope 1 and 2 (as defined within Table 2) multiplied by annually published DESNZ equivalent carbon conversion factor for natural gas ($kgCO_2e$ per kWh (Gross CV)).	Level 3: Best-in-class	Some Scope 3 emissions captured due to lack of separate metering data for some commercial space within main campus. Lab gases not accounted for.
Scope 1- Fleet (owned/operated)	Fuel in University-owned or leased vehicles	*Yes*	28	Annual diesel/petrol consumption calculated from fuel cards kept by Estates & Campus Services, multiplied by relevant DESNZ equivalent carbon conversion factor for vehicles ($kgCO_2e$ per litre)	Level 3: Best-in-class	
Scope 1- Refrigerants, research-based f-gas, volatile organic compounds	Emissions from leakage of refrigerants from air-conditioning applicable to buildings/space as defined within Table 2	*No*	34	F-gas maintenance records kept by Estates & Campus Services, multiplied by relevant DESNZ equivalent carbon conversion factor for relevant refrigerant.	Level 3: Best-in-class	Lab gases not accounted for.
Scope 1- Other fuels	Combustion of fuel in generators applicable to buildings/space as defined within Table 2	*No*	Not reported. Judged as immaterial (0.01-0.05% of Scope 1 and 2 emissions)			
Scope 2- Indirect GHG emissions from electricity consumption	**Purchased electricity for** buildings/space as defined within Table 2	*Yes*	2776	Annual grid electricity consumption from TEC records, minus metered annual electricity consumption from buildings/space not included in Scope 1 and 2 (as defined within Table 2) multiplied by annually published DESNZ equivalent carbon conversion factor for UK grid electricity (kg per kWh). Note	Level 3: Best-in-class	Some Scope 3 emissions captured due to lack of separate metering data for some commercial space within main campus.

				electricity consumption of excluded buildings should be adjusted based on estimation of proportion of electricity provided from LCEG.		
TOTAL SCOPE 1 & 2 EMISSIONS		***7481 tCO_2e***	**7515 tCO_2e**			

4.2 Targets & Pathway to Net Zero for Scope 1 & 2 Emissions

The SBTi Corporate Net Zero tool and near-term tool have been used to define minimum and aspirational 2030 targets for Scope 1 and 2 using the cross-sector absolute reduction method (also known as absolute contraction). The aspirational target is to reach a level consistent with achieving net-zero by 2030, by making a reduction of 90 % compared with the base year of 2019 (a target of 752 tCO_2e for total Scope 1 and 2 emissions). Near-term science-based targets are 5 to 10 year mitigation targets in line with a 1.5 °C pathway[3] to reaching the long-term science-based target (no later than 2050). This target of 3717 tCO_2e represents a 51 % reduction in total Scope 1 and 2 emissions compared with the 2019 base year. Minimum and aspirational targets will be set annually based on planned actions and projected carbon savings.

Table 5. Minimum and Aspirational Targets for Reduction of Scope 1 & 2 Emissions by 2030

	2019 Base Year	**2023 Most recent year**	**2030 minimum target**	**% Absolute Reduction**	**2030 aspirational target**	**% Absolute Reduction**
Scope 1	4,739	5,172	2,550	46		
Scope 2	2,776	1,524	1,168	58		
Scope 1 & 2	**7,515**	**6,696**	**3,717**	**51**	**752**	**90**

Since almost all scope 1 and 2 emissions are associated with energy consumption of buildings, the pathway to net zero will focus on the below priority actions, aligned to the GHG Management Hierarchy;

[3] Since July 2022, the SBTi has required near-term targets covering scope 1 and 2 emissions to be aligned with 1.5°C pathways and scope 3 targets to be aligned with well-below 2°C pathways

1. Reduction of energy demand by deep retrofitting of existing buildings and setting stringent standards of operational energy for any new buildings[1] by focusing on a fabric-first approach.

2. Specification of energy efficient (and non-fossil fuel powered) systems and appliances.

3. Ensuring that energy wastage is detected and remedied by increasing building management system capability and automatic zonal control of HVAC and lighting systems, in addition to encouraging behavioural change.

4. Meeting this reduced overall energy demand by non-fossil fuel sourced energy, ideally by increasing on-site renewable electricity generation and/or by procuring electricity which can be attributed to off-site renewable generation following best practice, or by relying on extensive decarbonisation of UK grid-supplied electricity.

There is a plethora of extensive and detailed guidance relating to each of these action areas, and Keele University will work with specialists to ensure all opportunities are captured to deliver optimal results. In 2024, an external consultancy was appointed to model and evaluate a carbon reduction pathway for the built environment of Keele campus, and it is intended that this will form the basis of a strategy and associated actions to decarbonise the estate. In this way, we will target meeting a 90 % reduction of Scope 1 and 2 emissions and then look to "neutralize" the remaining emissions in line with best practice.

4.3 Accounting, Reporting & Baseline of Scope 3 Emissions

As aforementioned, fulfilling the principles of relevance, accuracy, completeness, consistency and transparency for Scope 3 accounting is much more difficult than for Scopes 1 and 2. Keele University's Scope 3 emissions from procurement and supply chain, waste and water are estimated annually and reported via the HESA EMR. An estimation of Scope 3 emissions for the baseline year of 2018/19 was made but excluded international student travel, emissions from downstream leased assets on the Science and Innovation Park, which are believed to make significant contributions to total Scope 3 emissions. Calculation methodology used for the baseline and level of maturity according to SCEF guidance is shown in Table 5. Even with the exclusion of significant categories, total estimated Scope 3 emissions for the 2018/19 baseline year were 32,296 tCO_2e, exceeding combined Scope 1 and 2 emissions for that year by a factor of 4.5.

Table 6. Scope 1 and 2 category descriptions, baseline totals and details of calculation methodology used

Scope 3 emission category	Keele University inventory	*Recorded within HESA EMR?*	Baseline year 2018/19 emissions (tCO_2e)	Description of source data and calculation methodology for reporting year	SCEF classification of methodology	Notes
Procurement and supply chain	Emissions associated with procurement & supply chain of goods and services purchased for the operation of the University. Emissions associated with water consumption.	Yes	**21,051**	Spend of supply chain converted to CO_2e using HESCET tool with latest conversion factors built in.	Level 1-basic	This is provided as an annual report (Excel workbook format) by NWUPC. Will look to move to Level 2 for 23/24 reporting
Capital Goods	Emissions associated purchase of tangible assets	*Yes*	**(measured within above)**	CAPEX spend converted to CO_2e using the HESCET tool with latest conversion factors built in	Level 1-basic	As per above
Fuel- and energy-related activities	Upstream emissions associated with fuels and energy in Scope 1 & 2 (i.e., emissions associated with getting fuel/energy to point of use including well-to-tank and transmission & distribution)	*No*	**270**	Consumptions of fuels and electricity reported in Scope 1 and 2 multiplied by relevant DESNZ equivalent carbon conversion factors for well-to-tank (WTT) and transmission and distribution.	Level 3: Best-in-class	
Waste generated in operations	Emissions associated with waste disposal and treatment of waste, recycling and wastewater.	*Yes*	**254**	Weight based calculation from tonnage reports (by material/treatment option) provided by waste contractor, and water supply volume (assuming 95 % of incoming water), multiplied by relevant DESNZ equivalent carbon conversion factors	Level 3: Best-in-class	Some waste, e.g. capital project waste, biohazardous and chemical waste not captured. Will look to capture all waste emissions in 23/24 report
Business Travel	Emissions associated with travel and accommodation of staff for business-	*No*	**1354**	Travel spend data collected and spend-based emission factors applied	Level 1-basic	Will look to move to Level 2 for 23/24 reporting

	related activities.			for relevant transport mode		
Employee Commuting	Emissions from staff commuting as well as emissions associated with remote working.	*No*	**9189**	Assumption on staff commuting habits based on national average distance travelled by each transport mode, multiplied by number of staff,	Level 1-basic	Will look to move to Level 2 for 23/24 reporting
Upstream leased assets	Emissions from rented buildings and vehicles	*No*	**Not applicable in base year**			
Downstream transportation and distribution	Emissions from student travel, including daily commuting and travel between home address and University for UK and international students.	*Yes*	**Student commuting accounted for in employee commuting total. Travel between home address (outside of term-time) and University not calculated**			International student travel not accounted for-believed to make a significant contribution. Will be estimated in 23/24 reporting.
Downstream leased assets	Emissions from leased buildings.	*Partially*	**178- from leased staff housing only**	Metered gas and electricity consumption, calculated as per relevant Scope 1 and 2 categories	Level 3: Best-in-class (but incomplete inventory)	Does not include leased buildings on Science and Innovation Park, believed to make a material contribution. Will be estimated in 23/24 reporting.
Investments	Investments, endowments	*No*	**Not calculated**			An emerging area and guidance will be added once available. (EAUC, 2023)
ESTIMATED SCOPE 3 EMISSIONS			**32,296 tCO_2e**			Reflects an estimate of major proportion of emissions but does not include significant contribution from int'l student travel

4.4 Targets and Pathway to Net Zero for Scope 3 Emissions

Using the SBTi tools to set science-based targets for Scope 3 requires that long-term net-zero targets cover at least 90 % of Scope 3 emissions and 67 % for near-term targets. Until recently, it was uncertain whether the higher education sector should include international student travel in Scope 3 emissions, and the recent guidance within the EAUC's Standardised Carbon Emissions Reporting Framework that this should be accounted for means that Keele university can only make near-term targets aligned with a longer-term net-zero 1.5 ^oC pathway at this point. This defines the minimum Scope 3 target reduction for 2030 as 17,375 tCO_2e, representing a 45 % reduction compared with the 2019 base year (Table 7). This minimum reduction target will be re-defined and an aspirational

target set once comprehensive student travel emissions and emissions from leased buildings on the Science and Innovation Park have been estimated in 2025. It should also be noted that procurement/supply chain, capital goods and commuting emissions are presently estimated by a basic calculation methodology, and so improvements in measurement method may mean a significant change in quantification. Annual targets for reduction will be set, but with such considerations in mind.

Table 7 Minimum Target for Reduction of Scope 1 & 2 Emissions by 2030

	2019 Base Year	2023 Most recent year	2030 minimum target*	% Absolute Reduction
Scope 3	**32,296**	**To be calculated**	**17,375**	**46**

*Subject to re-definition

Like for Scope 1 and 2 emissions reduction, the GHG management hierarchy will be used as the basis for targeting this 46 % reduction in Scope 3 emissions. The 2023 EAUC-led report, Accelerating the Tertiary Sector to Net Zero, contains guidance on action pathways and enablers, and various examples from other UK institutions, on tackling emissions associated with procurement and supply chain and travel and transport, which dominate overall emissions. Keele University will develop detailed plans and policies over the next 6 months, related to these and other categories of emissions as detailed in the University's Environmental and Social Sustainability Framework.

4.5 Approach to Carbon Compensation

Presently, Keele University does not have a strategy for carbon compensation, but will look to existing and emerging best practice guidance to establish a plan of action that enables offsetting based on IVCVM Core Carbon Principles and Oxford Offsetting Principles , and additionally targets Beyond Value Chain Mitigation. Updates will be provided within the Annual Carbon Emissions Report (template report shown in Appendix A).

5. RELATED POLICIES, PLANS & CODES OF PRACTICE

This Code of Practice sits within the overarching Environmental and Social Sustainability Framework, which defines a suite of documents covering 15 themes which directly or indirectly influence the University's carbon emissions. Since over 98 % of Scope 1 and 2 emissions are generated from gas and electricity consumption of University-owned buildings, strategies and policies for development of the University campus, energy monitoring and management, energy procurement, and climate risk and resilience, will be implemented by December 2024, based on targeting 90 % reduction. Energy consumption reports will be issued quarterly to track and estimate Scope 1 and 2 carbon

emissions.

Scope 3 emissions are dominated by procurement and supply chain, and travel and transport, and reduction will also be targeted by implementation of policy documents and associated actions. However, essentially all University-related operations and activities have a direct or indirect impact on the University's carbon footprint, as defined by total Scope 1, 2 and 3 emissions, and it is intended that this Code of Practice, and the targets and ambitions stated within, will influence policies and strategic action across the University, to enable a net-zero transition pathway through a consideration of the GHG Management Hierarchy.

6. DOCUMENT CONTROL INFORMATION

Document Name	Carbon Accounting, Reporting and Management Code of Practice 2024-2029
Owner	Head of Net-Zero Delivery & Sustainability
Version Number & Key Amendment	1.0
Equality Analysis Form Submission Date	[Date form submitted]
Approval Date	23 July 2024
Approved By	University Executive Committee
Date of Commencement	23 July 2024
Date of Last Review	23 July 2024
Date for Next Review	23 July 2027
Related University Policy Documents	[List all applicable]
For Office Use – Keywords	

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APPENDIX A: TEMPLATE FOR ANNUAL CARBON REPORT

ROOT & BRANCH | Embedding sustainability in *all* that we do

Keele UNIVERSITY

Keele University Carbon Emissions Annual Report: 01 August 20__ - 31 July 20__

The report should refer to information and guidance within the Carbon Accounting, Reporting and Management Code of Practice 2024-2029 located in Policy Zone

1. INTRODUCTION

This section should contain an overview of previous year's emissions, influential changes and activities during the reporting year, a comment on change in DESNZ annually published conversion factors, and changes in calculation methodology, reporting boundaries, extent of categories accounted for and any associated impact on targets.

Table 8. Buildings included in Keele University Scope 1&2 and Scope 3-leased assets

Assets in boundary for Scope 1 &2	*GIA (m^2)*	*Assets in boundary for Scope 3 leased assets*	*GIA (m^2)*
Full list of buildings and area to be included			
Total GIA (m^2)			

2. REPORTED CARBON EMISSIONS AND RELATION TO TARGETS

2.1 Scope 1 and 2 emissions

This section should document Scope 1 and 2 category emissions and totals for the reporting year, previous year and baseline year, with a description of source data and calculation methodology.

Table 9 Scope 1 and 2 category emissions compared with baseline and previous year emissions, with description of calculation methodology and additional notes on boundaries/measurement

GHG emission Scope/category	Keele University inventory	Baseline year 2018/19 emissions (tCO_2e)	Previous year emissions (tCO_2e)	Reporting year emissions (tCO_2e)	Description of source data and calculation methodology for reporting year	SCEF classification of methodology	Notes
Scope 1- Natural gas	Emissions from combustion of natural gas in on-site boilers applicable to buildings/space as defined within Table 2, and in teaching/research laboratories	4677					
Scope 1- Fleet (owned/operated)	Emissions from fuel used in University-owned or leased vehicles	28					
Scope 1- Refrigerants, research-based f-gas, volatile organic compounds	Emissions from leakage of refrigerants from air-conditioning applicable to buildings/space as defined within Table 2	34					
Scope 1- Other fuels	Emissions from combustion of fuel in generators applicable to buildings/space as defined within Table 2	Not reported. Judged as immaterial (0.01-0.05% of Scope 1 and 2 emissions)					
Scope 2- Indirect GHG emissions from electricity consumption	Emissions from purchased electricity for buildings/space as defined within Table 2	2776					
TOTAL SCOPE 1 & 2 EMISSIONS		**7515 tCO_2e**					Minimum 2030 target= 3717 tCO_2e Aspirational 2030 target=752 tCO_2e

Total Scope 1 and 2 emissions for the reporting year were ___ tCO_2e and are shown in Figure 1 compared with baseline, previous year, and target emissions. It represents a __ % reduction/increase compared with baseline emissions and a __ % reduction/increase compared with previous year emissions. Gross internal building area related to Scope 1 and 2 emissions increase/decreased by __ % compared with baseline emissions and __ % compared with previous year emissions. Total Scope 1 and 2 emissions relative to gross internal floor area are __ /m^2 compared with ___/m^2 last year .

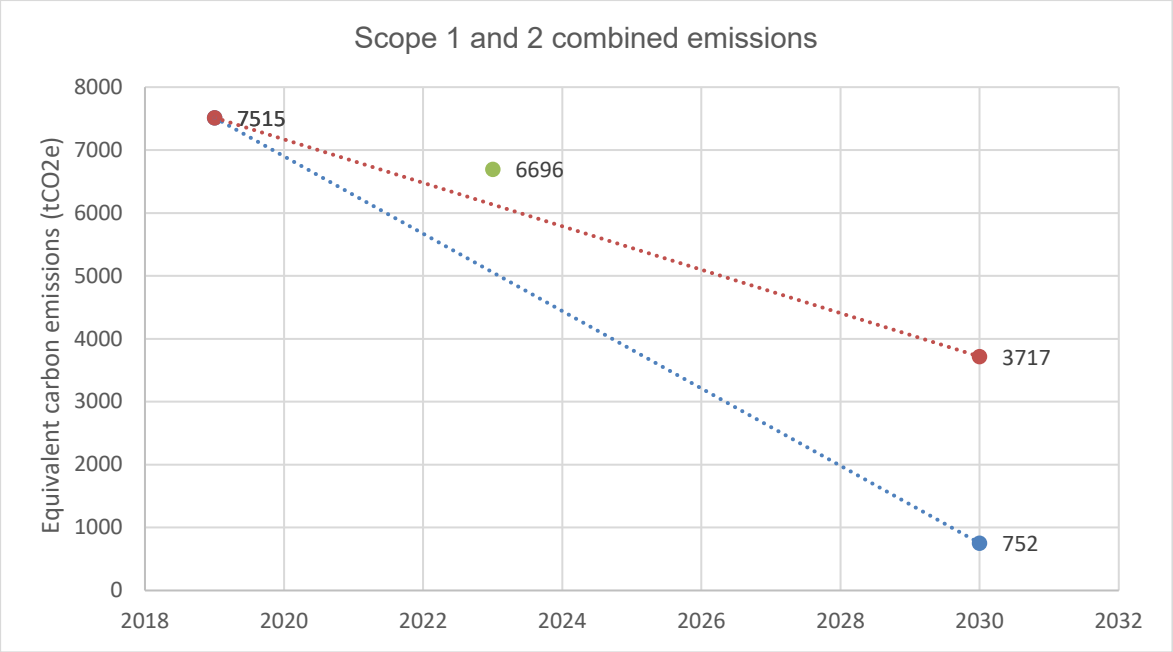

Figure 5. Total Scope 1 and 2 emissions for reporting year in context of baseline year, previous year emissions, and 2030 target emissions

2.2 Scope 3 emissions

This section should document Scope 3 category emissions and totals for the reporting year, previous year and baseline year, with a description of source data and calculation methodology.

Table 10. Scope 3 category emissions compared with baseline and previous year emissions, with description of calculation methodology and additional notes on boundaries/measurement

GHG emission Scope 3 category	Keele University inventory	Baseline year 2018/19 emissions (tCO_2e)	Previous year emissions (tCO_2e)	Reporting year emissions (tCO_2e)	Description of source data and calculation methodology for reporting year	SCEF classification of methodology	Notes
Procurement and supply chain	Emissions associated with procurement & supply chain of goods and services purchased for the operation of the University. Emissions associated with water consumption.	**21,051**					
Capital Goods	Emissions associated purchase of tangible assets	**(measured within above)**					
Fuel- and energy-related activities	Upstream emissions associated with fuels and energy in Scope 1 & 2 (i.e., emissions associated with getting fuel/energy to point of use including well-to-tank and transmission & distribution)	**270**					
Waste generated in operations	Emissions associated with waste disposal and treatment of waste, recycling and wastewater.	**254**					
Business Travel	Emissions associated with travel and accommodation of staff for business-related activities.	**1354**					
Employee Commuting	Emissions from staff commuting as well as emissions associated with remote working.	**9189**					
Upstream leased assets	Emissions from rented buildings and vehicles	**N/A**					
Downstream transportation and distribution	Emissions from student travel, including daily commuting and travel between home address and University for UK and international students.	**N/A**					
Downstream leased assets	Emissions from leased buildings.	**178 (leased staff housing only)**					
Investments	Investments, endowments	**Not calculated**					
TOTAL SCOPE 3 EMISSIONS		**32,296**					Minimum 2030 target= 17,375

Total Scope 3 emissions for the reporting year were ___ tCO_2e and are shown in compared with baseline, previous year, and target emissions. It represents a __ % reduction/increase compared with baseline emissions and a __ % reduction/increase compared with previous year emissions. Total Scope 3 emissions per FTE staff and student were __ compared with ___ last year.

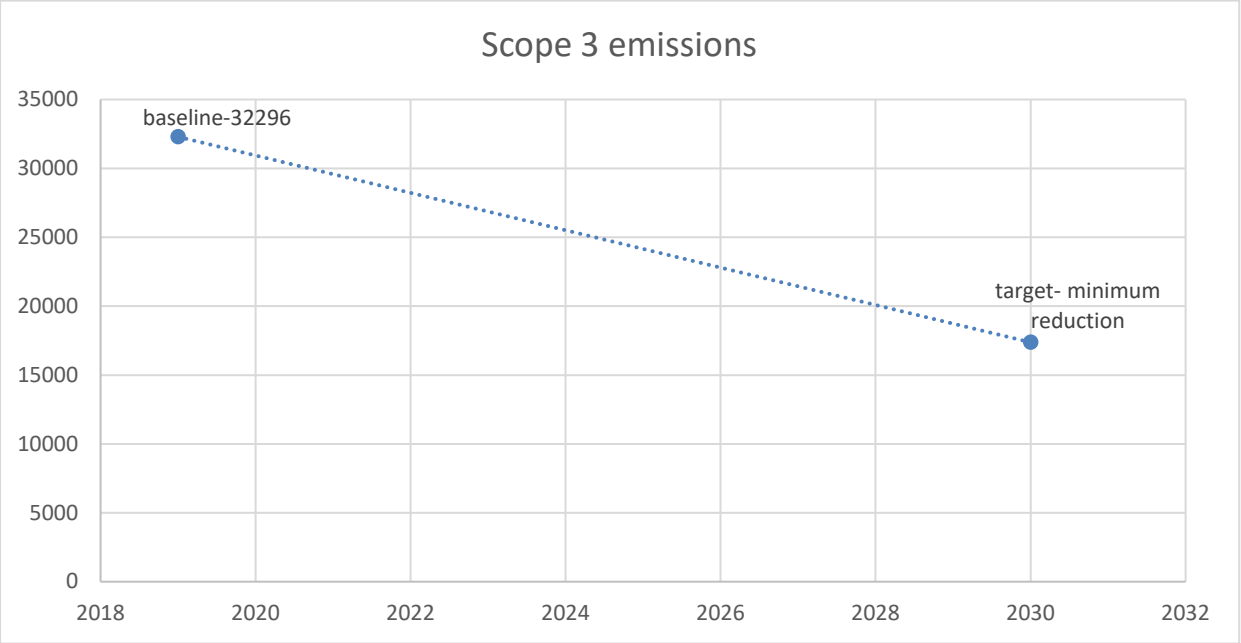

Figure 6. Estimated Scope 3 emissions for reporting year in context of baseline year, previous year emissions, and 2030 target emissions

3. REVIEW OF PROGRESS AND DIRECTION OF TRAVEL

This section should present a commentary on contributory emissions and review of actions taken in reporting year, and related progress, year-on-year and as compared with baseline. It should comment on carbon emissions relative to 2030 targets and annual intermediate target.

4. OUTLOOK AND REDUCTION TARGET FOR NEXT REPORTING YEAR

This section should present an outlook for the next reporting year, risks and opportunities for carbon reduction and planned action with prediction of effect on emissions, in the context of existing targets and an updated annual SMART target.

5. CURRENT STATUS AND OUTLOOK FOR CARBON COMPENSATION.

This section should provide an update on any actions related to carbon offsetting and update on proposed approach to offsetting/compensation.