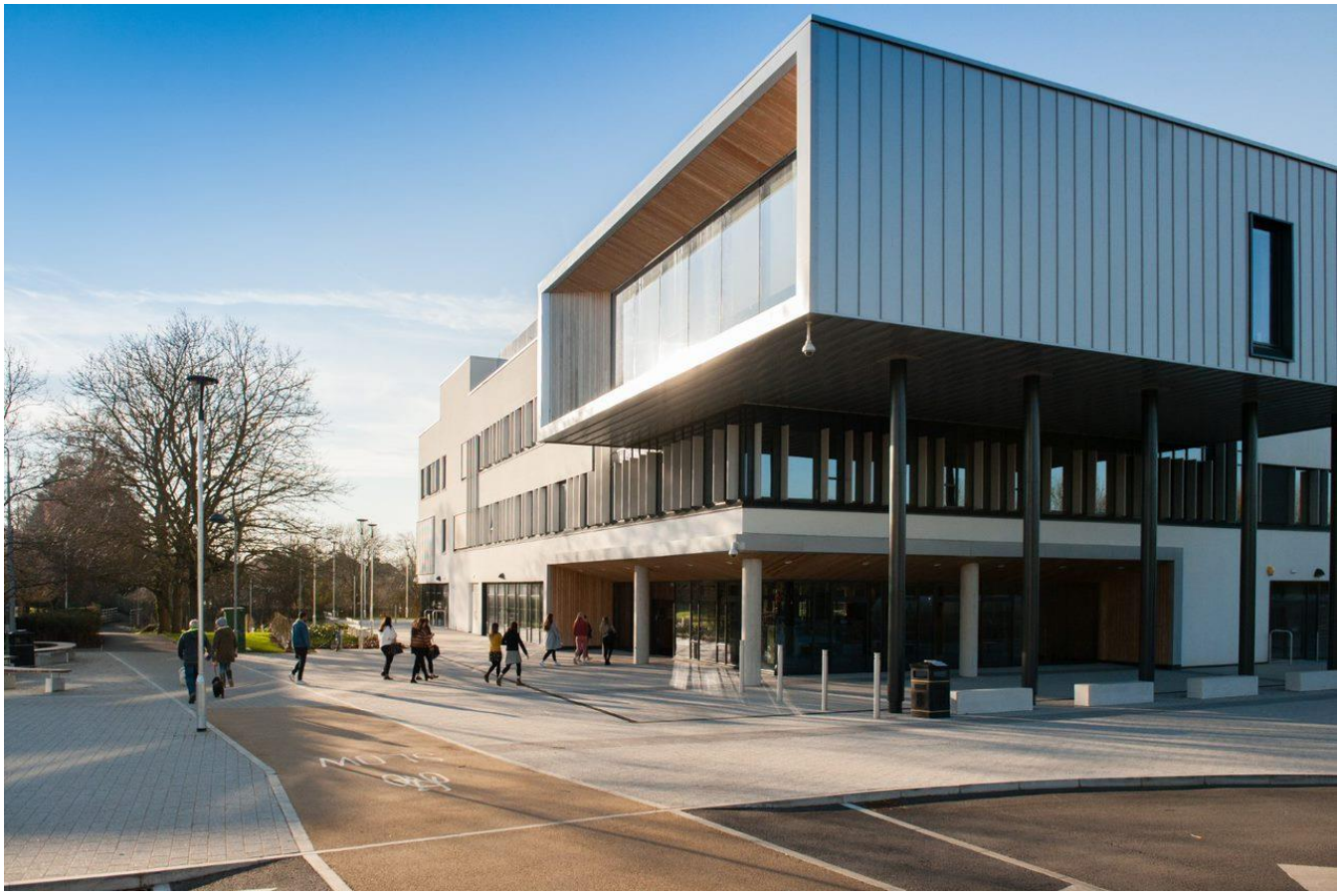
UNIVERSITY OF GLOUCESTERSHIRE

Carbon Net Zero Strategy 2021 – 2030



Version: 1.1

Approval route: University Executive Committee 6 September 2021

Author: Dr Jon Furley
Responsible Senior Manager: Dr Alex Ryan

Contents

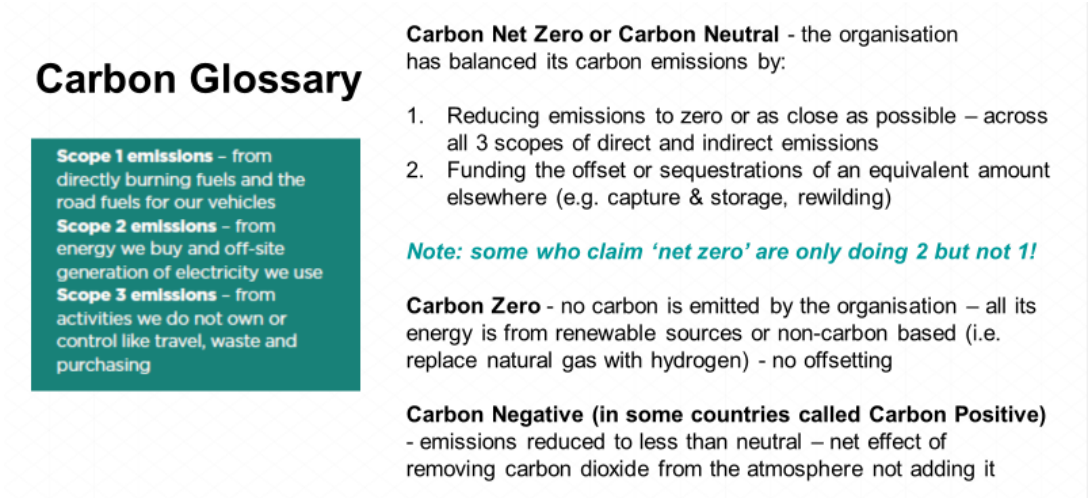
Appendices

1. Executive Summary

1.1 Delivering a Carbon Net Zero Strategy to 2030 is the critical sustainability operational issue in the Strategic Plan 2022-2027, evidencing our commitment to minimising environmental impact in response to accelerating climate change. As a pioneer of sustainability in our sector, our Net Zero goals reflect our intention as an environmentally responsible organisation to pursue further carbon emissions reductions. This public issue is increasingly important to our stakeholders, notably our students (see Appendix 1). The strategy has one core objective:

- ***Deliver net zero carbon emissions by 2030***

1.2 The definition of Net Zero is still open to some variable interpretations and uses in policy. It is important to clarify that 'net zero' carbon does not mean an that an organisation has reached zero emissions. Key terms in relation to net zero and the 3 Scopes of emissions are:



1.3 Net Zero terminology is not well understood and is open to 'greenwashing'. True Net Zero requires an organisation to reduce its emissions from Scope 1, 2 and 3 sources as far as possible, then undertake or invest in carbon projects to compensate its remaining emissions, known as 'offsetting' (see Section 7.3). The route to net zero for the organisation at minimal cost is explained in Sections 3 & 4. The point at which an organisation declares itself as Net Zero is the moment at which emissions have been reduced as far as resources and technology allow and the funding of offsetting will commence against its residual emissions.

1.4 The University's Carbon Strategy 2010-2020 was set for Scopes 1 & 2 emissions only, following the practice instigated by the HE Funding Council for England (HEFCE) when it required HE institutions to develop carbon management plans. Net zero requires an expanded scope and includes the indirect emissions categorised as Scope 3. For UoG the dominant focus in Scope 3 are the emissions associated with travel and purchasing.

1.5 The strategy will baseline against previous carbon performance. In 18-19, a 47% reduction was recorded against the 40% target of the Carbon Strategy 2010-2020, using a 2005 baseline – exceeding target ahead of the strategy completion date. In 19-20 a 63% drop in energy emissions was recorded against the same target, but this effect was unusual due to Covid-19. The strategy will adopt its baseline against 18-19 data rather than the outlier data of 19-20. This baseline will be used

to track progress towards the core objective, measure the impact of projects and show our contribution towards minimising the impact of climate change.

1.6 Projected growth significantly affects our proposed approach to carbon reduction. This strategy is modelled against a 10 year Planning Scenario assumption of 65% growth in student numbers compared to 20-21 figures. This expansion of student numbers and estate could lead to a 44% increase in carbon emissions by 2030 against the 18-19 baseline. The targets and actions of this strategy include this growth in its approach to the ongoing emissions of the University.

1.7 The strategy sets a pathway to achieve an authentic Net Zero postion focused on:

- Development of suitable projects to replace natural gas heating using available funding. This is capital intensive and needs to be funded by external grants such as Salix. The opportunity to use Salix PSDS3 funding for decarbonisation of the City Campus will be explored during the initial stages of this strategy.
- Reducing electricity consumption where possible by implementing LED lighting, enhancing insulation and optimising heating and cooling (including server rooms).
- Selection of appropriate project designs to help manage the emissions associated with estate growth to accommodate rising student/staff numbers.
- Developing (or using) methodologies to more accurately measure the carbon emissions associated with procured goods and services.
- Monitoring travel-related emissions and supporting local projects as well as on-campus actions that enable an increasing volume of students and staff to travel in low carbon modes.
- Working with key suppliers to reduce emissions associated with contracts, by sharing best practices and designing projects and procurement options to cut emissons where possible.
- Accounting for additional emissions whilst developing suitable plans to offset the residual emissions after mitigation through carbon reduction interventions.

1.8 The Net Zero reduction targets by % distributed across emissions scopes will be:

- **Scope 1** **33% reduction**
- **Scope 2** **32% reduction**
- **Scope 3 (travel)** **3% reduction**
- **Scope 3 (procurement)** **34% reduction**

1.9 To ensure success a budget of £1.5M has been approved by the University Executive Committee to deliver suitable projects annually up to 2030 to reduce our carbon emissions as far as possible. By 2030 it is likely that costs of offsetting remaining carbon emissions could range between £700K-£1,660K per annum, which can be reduced by acquiring funding for heat decarbonisation works.

1.10 Given the cross-business nature of the actions needed to deliver this strategy, it will be positioned in the annual Operating Plan, as an institutional KPI of the University's Strategic Plan 2022-2027. It will be included as a KPI in the 10 year Estate Strategy to 2030 and Sustainability Strategy 2022-2027, and included on the Sustainability and Estates internal risk registers.

1.11 The objective to deliver Net Zero by 2030 is set in the UK context and developments specific to the HE sector and may need to be revised in light of future, unforeseen changes in the external environment or the HE Sector. Policy around Net Zero is fundamentally driven by a need for action to minimise climate change impact in line with scientific advice. To ensure the organisation

achieves a minimum for avoidance of further climate change, this strategy will be externally validated to ensure that the principles of Science Based Targets are incorporated. This will confirm that its targets are aligned to deliver sufficient reductions by 2050 (or earlier) against 1990 global emission levels.

2. Context

2.1 Governmental and regulatory

2.1.1 Emissions reduction targets to tackle climate change are an internationally recognised priority. The Paris Agreement clearly sets out the long term global objective to avoid the most dangerous levels of climate change by limiting global warming to below 2°C above pre-industrial levels and aiming to limit this to 1.5°C if possible. The UK is one of 189 countries signed up to the agreement. Following the rise in global youth and civic action on climate change in 2019, further public attention to emissions reduction is expected as the pandemic subsides and the UK hosts the COP26 summit in November 2021. Assumptions informing this strategy in relation to the external context at national, local and sectoral levels are explained below and in Appendix 2.

2.1.2 The EU and its Member States committed to a binding target of a net domestic reduction of at least 55% in greenhouse gas emissions by 2030, compared to 1990 levels. Despite leaving the EU, the UK Government is aiming for the UK to be a leading nation and sees this as an opportunity to develop sales of technologies and services in this field. UK government plans to use the Environment Bill 2021, the UK Industrial Decarbonisation Strategy, the 6th Carbon Budget, the 10 Point Plan for a Green Industrial Revolution and the independent Committee on Climate Change as tools to enable widespread change in government, business and the community, to achieve its goals.

2.1.3 The Environment Bill 2019 sets the UK direction towards Net Zero emissions and supports its Clean Growth aims as part of UK Industrial Strategy. Policies to support the UK in decarbonisation of key industries and services will significantly assist organisations towards this goal. As host of COP26 in 2021, the UK is likely to position this agenda increasingly as key to its future economic ambitions and recovery from the Covid-19 pandemic, with stronger emphasis on the transition to a low carbon/net zero economy. Publicised government plans include initiatives to support further decarbonisation of the electricity supply, research into alternative fuels for heating (e.g. hydrogen) and a ban on the sale of diesel and petrol cars and vans from 2030 and trucks from 2040 (see Appendix 3 for Future Energy Trends). There is also a commitment to public engagement but no clear guidance published on this to date.

2.1.4 Since 19-20 the University has been required to report against the Streamlined Energy and Carbon Reporting Requirements (SECR). The necessary information has been provided within the 2020 Annual Financial Statements and will be required annually. Future legislation to implement a carbon tax for energy use (beyond that of the Climate Change Levy (which taxes energy delivered to non-domestic consumers in the UK) cannot be ruled out.

2.1.5 At the regional level, Gloucestershire County Council, Cheltenham Borough Council and Gloucester City Council have all committed to become net zero or carbon neutral by 2030 and are encouraging local community groups and businesses to make similar commitments. A strategic Climate Change Lead for Gloucestershire has been appointed in 2021, funded by the County, City

and Borough Councils, to lead this wider change. The University's strategy includes its commitment to regional collaboration to optimise its contribution to these goals (see Section 6.5).

2.2 Sector developments

2.2.1 The sector position on the emerging Net Zero agenda is setting an expectation of action by HE institutions to reach this goal by 2030. This is being driven by a combination of:

- Dialogue across institutions and within Universities UK (UUK) in response to the Environment Bill and Climate Commission convened by the Environmental Association of Universities and Colleges (EAUC). Dominant concerns include the efficiency and resilience of campus infrastructure to future academic delivery trends; energy price rises in the light of emerging technology; and alignment withthe need to demonstrate value for money to students.
- Pressure from organisations representing the interests of UK students, notably the NUS charity Students Organising for Sustainability (SOS) whose new Net Zero ranking assesses universities' plans and progress. Its initial 2020 ratings for policies positioned the University in the 2nd tier, scoring 64/100 (badged 'working on it') for progress to date. Publication of this strategy will move the University to the highest tier (badged 'leading the way').
- Continued work by student-led campaigning groups such People & Planet who run the UK universities' sustainability league (which includes dedicated scores on carbon performance) and campaign to drive change in the sector on issues such as fossil fuel divestment.
- Demonstrable ongoing interest in sustainability among students, which is increasingly well documented (see Appendix 1). Student expectations on emissions reduction are expected to continue rising, aligned with attention to sustainability in the wider student experience. The SOS-UK 'Teach the Future' campaign for climate education has taken this momentum forward at all levels of formal education and in 2021 the UK Quality Assurance Agency issued new sustainability education guidelines to be adopted in all HE curriculum benchmarks.

2.2.3 The targets associated with this strategy, their timelines and the activities placed in scope, are aligned to the methodology adopted for the SOS-UK ratings, as the profile of this ranking is expected to grow as SOS-UK assess and publicise the evolving performance of universities on net zero.

2.2.4 The EAUC Climate Commission in 19-20 to support the sector on Net Zero carbon emissions and produced a HE toolkit in 2021 to support institutions, which will be used to inform delivery of this strategy. The use of aspects of the HE Toolkit within the university will be discussed with the senior management group. Adoption of one shared sector position is not anticipated due to the diversity of institutional start-points, estate composition and carbon performance. However, institutions with established track records on sustainability are commonly moving towards net zero plans targeting 2030, in line with the ranking developed by SOS-UK to reflect student expectations. The Vice-Chancellor joined the EAUC Climate Commission and UUK dialogues about its ongoing activities.

2.2.5 The Office for Students (OfS) statement in January 2021 declared its intention to engage with sustainability, following pressure from the National Union of Students on behalf of the UK student body. The OfS states an intent to reposition its responsibilities on sector carbon reporting and review how capital funding could be linked to decarbonisation. The pathway proposed in Section 4 recognises that decarbonisation of heating infrastructure will be difficult for universities to achieve without the ability to draw down external grants or loans. Firm commitments from the OfS Board

are awaited but the statement is viewed as an initial step in the right direction, towards picking up the leadership previously shown by HEFCE on the carbon agenda.

2.2.6 To date there is no internationally accepted standard or methodology covering the measures needed for an organisation to achieve Net Zero. The guidance issued by SOS-UK has been generally accepted as the definition for the FE/HE sector. This strategy therefore aims to reduce as far as practicably possible its emissions from the following activities, using the SOS-UK definition:

- Scope 1 – direct emissions from activities on campus including use of natural gas, fuel used in fleet vehicles and air conditioning leaks.
- Scope 2 – indirect emissions from electricity used on campus, i.e. carbon emitted at power stations its energy is sourced from.
- Scope 3 – water supply and waste water treatment, waste collection and management, business travel, staff commuting, student academic travel (excluding student commute), procurement, endowment investments and agricultural landholdings.

2.2.7 One point of difference where the University intends to be more ambitious and target emissions outside the scope of the SOS-UK ranking concerns the Scope 3 emissions associated with student term time commuting. As these are a direct consequence of the operation of the University and viewed as an important material impact, these will be added to the scope of this strategy.

3. Objectives and Targets

3.1 Internal strategic context

3.1.1 The University has been committed to sustainability as a strategic priority since 2007 and this Carbon Net Zero Strategy forms the critical operational policy associated with its Sustainability Strategy 2022-2027. The strategy will be aligned to the University's Strategic Plan 2022-2027, 10 year Estates Strategy and policies in specific areas such as IT and Procurement (see Section 5).

3.1.2 The University has a positive profile on carbon, seen in external performance assessments:

- People & Planet 2019 league – 1st position againt 154 institutions, scoring 100% for carbon management, 100% for carbon reduction and 37.5% for energy sources.
- Brite Green 2017 sector carbon performance report - positioned the university 24th and in the top 1/3 of institutions having reduced rather than increased their emissions.

Having consolidated that achievement as part of student recruitment campaigns since 2020, the University has reputational as well as budgetary considerations related to its net zero objectives.

3.1.3 The starting position for the strategy is successful delivery of the Carbon Strategy 2010-2020, with a positive emissions reduction trend and having met basic standards for estate developments. Goals set in 2010 were driven by sector reduction targets prescribed by the former HE Funding Council for England. The key achievements have been:

HEADLINE POLICY AIMS	RESULTS AT 2020
Emissions reductions: 40% drop (scope 1 & 2) by 2019/20 against 2005 baseline	**47% delivered by 2018/19** **- target met** (63% in 2019/20 but affected by Covid-19)
Construction projects: minimum expectation = BREEAM Excellent	**Pittville Student Village – achieved** **Oxstalls Business School – achieved**

3.1.4 Its performance record up to 2020 resulted from a range of projects focused on Scope 1 & 2 emissions that reduced carbon emissions and impact at low cost (i.e. the 'low hanging fruit'). In this phase the focus of work was on understanding emissions sources and reducing those associated with Scope 1 and 2, driven through Estates and LTI, mainly through purchase of more efficient plant and equipment. Budgetary pressures meant that no new carbon projects were undertaken through the Carbon Management Plan 2018-2022. The key changes during this phase resulted from:

- Specifications of the Oxstalls campus development and new Business School Growth Hub
- LED lamping projects delivered across 75% of the estate and emitting 60% less carbon
- Updates and repairs to Heating, Ventilation, Air Conditioning (HVAC) and other plant
- IT improvements including moves to MFD printers and solid state hard drives
- Zero waste to landfill status achieved through changes to waste contract and practices
- Development of Pittville Student Village which changed these emissions to Scope 3

3.1.5 The University contributes to climate change directly through emissions from facilities (Scopes 1 & 2) and indirectly through emissions associated with its demand for goods and services and the wider impacts of its activities (Scope 3). Scope 3 emissions are more difficult to reduce, as the organisation has limited direct effect on these (notably suppliers, and staff and student commute). This Carbon Net Zero Strategy requires a step change in cultural and financial approach and a broader remit to include Scope 3, which accounts for 86% of emissions.

3.1.6 Due to the impact of the Covid-19 pandemic in 19-20 the baseline year to track improvements against will be 18-19. Figure 1 below shows the emissions split by source. Overall Scope 3 accounts for 86% of emissions in the baseline year: these emissions split between procured items (54%) and commuting (32%), with a very small contribution from waste arising and water consumption.

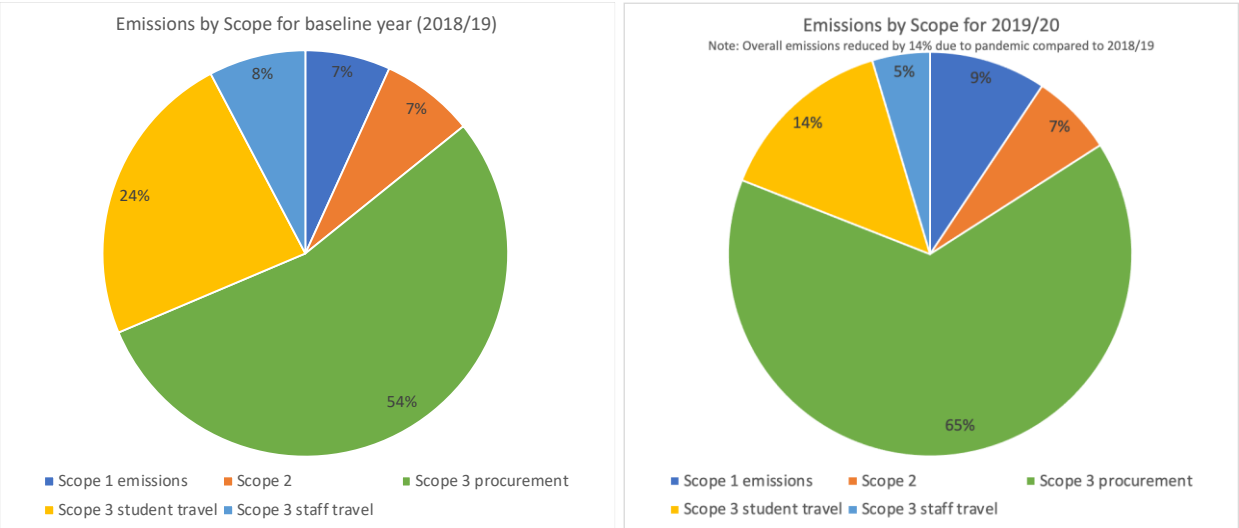


Figure 1 – Carbon emissions for 18-19 (baseline year) and 19-20

3.1.7 Scope 3 travel emissions cannot be directly calculated in the same way as Scope 1 and 2. Sector practices are emergent, with no consistency of scope boundaries and methods of measurement. Confidence in sector data and its comparability is therefore low in places (e.g. many institutions are not measuring travel modes as effectively as UOG has in recent years).

3.1.8 Scope 3 emissions associated with procured goods and services are calculated using a sector tool that examines organisational spend data on set categories. The tool was significantly updated in 2020 and released for use in February 2021. The 18-19 baseline procurement emissions have been recalculated using the new tool to ensure comparative methodology in this strategy period. The tool offers a common methodology for HE but does not reflect the impact of local procurement initiatives. In this strategy the University will work with selected suppliers to measure and reduce their actual (not estimated) emissions and incorporate this data into Scope 3 reporting.

3.2 Overview of objectives and targets

3.2.1 This strategy recognises that Net Zero carbon emissions is an organisation-wide objective that requires commitment from all departments. There will be significant input from Estates, LTI, Finance and Procurement, but the strategy cannot be achieved by these teams in isolation. Its objectives were developed in consultation with the senior managers responsible for activities generating its direct and indirect emissions and the linked policy consequences are outlined in Section 5.

3.2.2 Specific targets proposed for this strategy were discussed at the Sustainability Performance Review in December 2020 and the framework of objectives and targets was discussed and agreed with University Executive Committee in May 2021. The top-level goal and institutional KPI is:

- ***Deliver net zero carbon emissions by 2030***

This means managing and reducing carbon emissions across all Scopes as well as embedding cost effective, carbon-efficient good practices into strategic decisions and operations. Reduction of wider emissions associated with the University will be pursued in partnership with our stakeholders. The top-level goal is subject to external factors and may need to be revised in light of future, unforeseen changes in the external environment or the HE Sector.

3.2.3 This strategy aims to achieve our overall net zero objective through a series of projects focused on different operational aspects (see Section 4.1.3). It also involves working across the organisation to ensure that carbon as well as cost consequences are considered jointly and in long term view for all activities, from construction projects and supplier choices, to education services and field trips.

3.2.4 Based on the above absolute reduction aims and factoring in growth impact, the University's net zero reduction targets as shown below, by % distributed across emissions scopes. These reductions will be achieved through the delivery of interventions outlined in Section 4.1.3.

- **Scope 1** **33% reduction** (assuming delivery of projects 2 and 3)
- **Scope 2** **32% reduction** (assuming delivery of projects 3, 4, 5 and 7)
- **Scope 3 (travel)** **3% reduction** (assuming changes against projects 8 and 9)
- **Scope 3 (procurement)** **34% reduction** (assuming impact from project 10)

3.2.5 These targets against 18-19 performance take account of how projected growth increases the scale of reductions needed. This is shown by emissions scope in Table 1 including the emissions share (% in brackets) for each scope, taken against the 18-19 baseline.

Scope	**18-19 baseline**	**2030 (65% growth scenario)**	
	CO_2 emitted Tonnes (% of baseline)	CO_2 emitted Tonnes	% increase
Scope 1	1,025 (7%)	1,318	29%
Scope 2	1,121 (7%)	1,441	29%
Scope 3 - Staff/student commute	4,730 (31%)	7,812	65%
Scope 3 - Procured services	8,206 (55%)	11,114	35%
Total (all scopes)	**15,082**	**21,685**	**44%**

Table 1 – Impact of UoG growth on CO_2 emissions at 2030 by scope

3.2.6 Figure 2 shows the impact of achieving the reduction targets on the University's overall emissions, factoring in the impact of UK decarbonisation (see Section 4.2.5). In this view, emissions would be approximately 11,700 tonnes at 2030 on the basis of having achieved realistic reductions in all significant areas of activity. The organisation would then be able to declare an authentic Net Zero position, by paying offsetting costs discussed in Section 7 and Appendix 4.

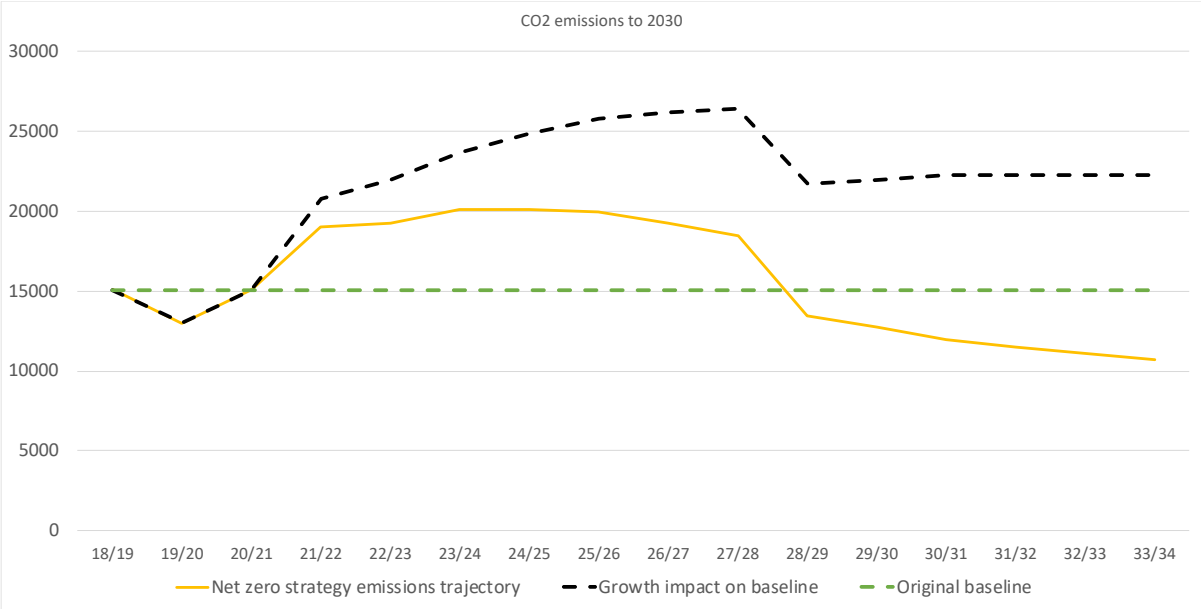


Figure 2 - Impact of strategy on CO_2 emissions

3.2.7 The emissions associated with Scope 2 are derived from our use of electricity and are calculated according to sector guidance using the UK CO_2 Conversions Factors published by HMG. The university purchases all electricity on a renewable energy tariff and other organisations chose to report Scope 2 emissions from energy purchased on a renewable tariff as zero. The discrepancy between reporting methodologies for different sectors will be investigated as part of this strategy.

3.2.8 The 3% emissions reduction target for Scope 3 will require over 7000 Tonnes of CO_2 to be removed from the university's travel related emissions. Although a small % reduction against the 2018/19 baseline, this target requires removal of significant travel emissions due to additional students and staff, associated with planned growth, to achieve an overall 3% reduction.

4. Delivery Path

4.1 Roadmap and Interventions

4.1.1 The path of optimal carbon reductions needs to be balanced with the lowest cost implications. This is not only important for financial reasons, but given the rising public discourse on this agenda and strong campaigns from bodies like SOS-UK. It is expected that students will be increasingly alert to Net Zero plans that rely on high offset spend and fail to deliver maximum absolute reductions.

4.1.2 Figure 3 shows the route for actions, taking the delivery timeframe from the close of the Carbon Strategy 2010-2020, through to 2030. The combination of UoG growth, national change and uncertainties over the precise impact of inventions across a 10-year time span means final reductions are hard to predict. Some projects (see Table 2) once delivered will have an effect on other reduction areas, which means forecast achievements by scope could alter slightly by 2030.

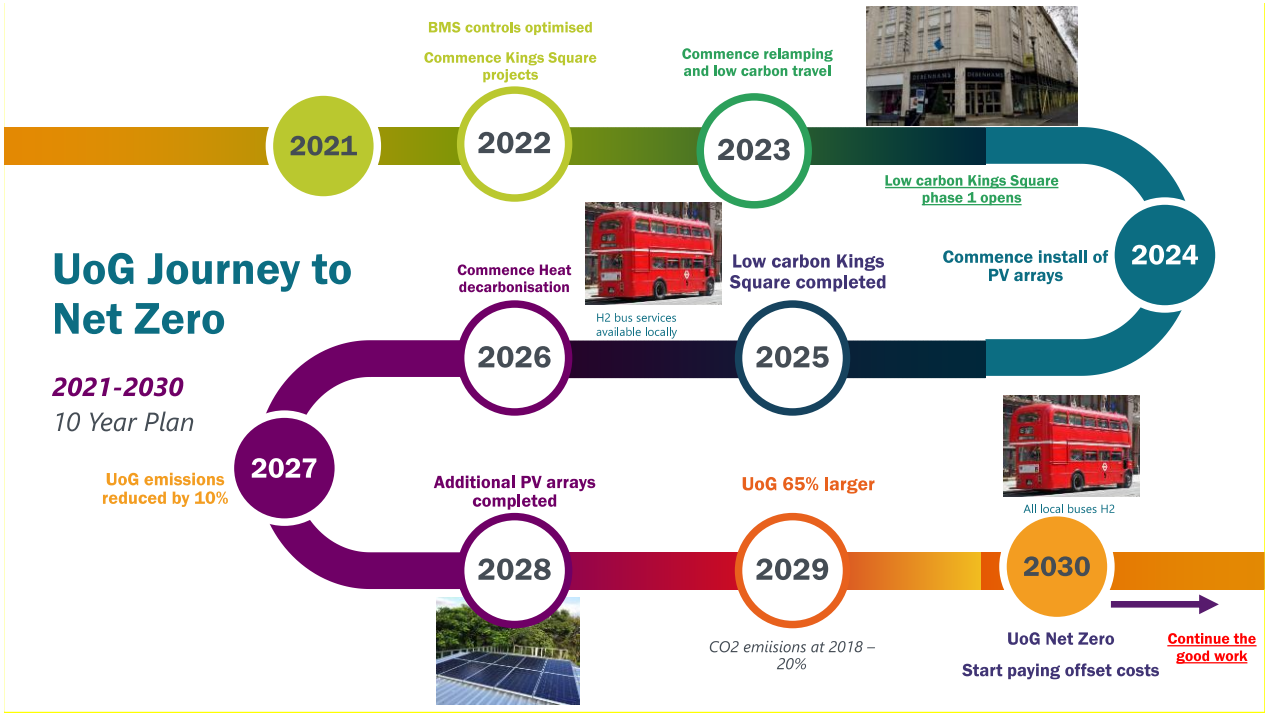


Figure 3 - Intended roadmap with anticipated milestones

4.1.3 Table 2 below shows the proposed projects, the absolute carbon reductions associated with each and the estimated costs (see Appendix 5 for project details, Appendix 6 for possible interventions and Appendix 7 for further insights regarding travel).

	Projects & Interventions	Baseline CO_2 emissions (T)	CO_2 (T) saved	Cost
Scope 1 (direct) gas boilers & fuel - owned vehicles	1. Replace gas heating with electric	1,025	510	£5M
	2. Install only electric heating at City Campus		310	No data yet
	3. Optimise BMS settings (gas)		200	£40K
AIM: 33% drop				
Scope 2 (indirect) emissions from use of electricity	3. Optimise BMS settings (electricity)	1,121	230	costed above
	4. Install final 25% of LED lamps across estate and at City Campus		45	£300K + City Campus
	5. Install PV (3x) at existing sites		35	£400K
	6. Install solar PV at City Campus		Determine available space	
	7. LTI energy efficiency projects – cloud computing, thin client, etc		11	LTI budget
AIM: 32% drop				
Scope 3 (indirect) staff/student commute	8. Support shift from high carbon travel (car use)	4,730	1,130	£600K
	9. Support blended study/work			£0
AIM: 3% drop				
Scope 3 (indirect) procured services	10. Procurement action on tender specifications & supplier selection	8,206	2,700	£200K
AIM: 34% drop				

Table 2 – Proposed reduction actions towards 2030 by scope

4.1.4 Scope 1 and 2 projects save annual expenditure associated with utilities. Gas and electricity prices are likely to rise by at least by inflation over the next 10 years, raising unit prices by 25% (totalling £250K in 2030). Implementing the £40K BMS work (Project 3) is critical to mitigate this.

4.1.5 The £5M listed as Project 1, to replace 80% of gas heating, is capital intensive but saves £10K per annum in offsetting costs. The cost for moving to electric heating is also likely to reduce over the strategy duration or alternate low carbon heating options may become available (hydrogen instead of natural gas). The University has secured a £1.2M grant from the Salix Public Sector Decarbonisation Scheme (PSDS2) to replace gas boilers with air source heat pumps at Oxstalls Halls of Residence, FCH Principal's House and the Chapel at FCH. Further external grants will be sought whenever available to limit future requests for internal capital funding on this work stream.

4.1.6 The ISO 14001 Environmental Management System (EMS) will incorporated the Net Zero objectives and targets, with the Sustainability Operations Manager as EMS lead monitoring progress against these. Annual and periodic reviews will ensure that changes, both positive and negative, can be assessed and mitigation considered, supported by the annual Sustainability Performance Review.

4.1.7 To guide the delivery of this strategy a Net Zero Taskforce will be set up, consisting of service area and user representation selected to influence organisational delivery. This task force will:

- Meet in Semester 1 to prepare an update for the Sustainability Performance Review (SPR) on progress against previous year measures, taking account of updates on projects and student numbers, and to recommend next steps and annual priority actions.

- Meet early Semester 2 to review travel survey data and planning, and to define project requests for the annual Net Zero capital allocation and feedback to other departments on outcomes from the SPR and for service Business Plans or associated policies.

Initially the taskforce will include the following representation:

- Finance and Planning – director
- Estates – director
- Library, Technology and Information Service – director
- Procurement – senior manager
- Sustainability Operations Manager
- Estates – Space Manager
- CMSR – international team
- Academic Schools – representative
- Laboratories - representative
- Students' Union – CEO
- Student body – representative
- Council - representative

4.1.8 Some changes to organisational practices will be required to deliver the net zero plan and the associated cultural shifts within the organisation:

Title	Description	Required for	Owner
Building sub-metering	Utility sub-meters for each building	Tracking energy use and project impact	Estates
Dashboard development	Record of monthly energy use, emissions accessible to teams	Tracking progress against targets, management reports	Sustainability Operations Manager/LTI
Carbon reduction as organisational good practice	All major decisions to consider carbon impact	Project planning, purchasing decisions, Business travel	All Teams
Accurately assess purchasing emissions	HESCET tool uses spend to calculate emissions	Measure actual emissions associated with purchases	LTI/SOM/ Procurement
Business travel emissions	Start to generate records and data on this emissions aspect	Identifying options to cut emissions in this activity	F&P
BMS and energy management	Manage energy use and embed optimised BMS	Avoiding drift from good practice, reducing usage	Estates

Table 3 – Organisational change actions supporting Net Zero

4.1.9 Supporting actions will be integrated into the Sustainability Strategy 2022-2027, including the communications work needed for effective user engagement and PR. Training needs for specific staff may include CPD on carbon and lifecycle costs, plus refresher training on EMS aspects. This helps to develop organisational capacity to make optimal decisions in planning corporate projects, which is critical to net zero success and assists the wider embedding of sustainability.

4.2 Anticipated changes

4.2.1 Several variables will be factored into the delivery roadmap, including the combined effects of technological change and national decarbonisation programmes, as well as maturity and improvement in aspects of strategy such as measurement of Scope 3 and growth of offset markets. In addition, the strategy recognises unknowns related to the legacy of the Covid-19 pandemic and the ongoing evolution of universities in relation to digital transition as it affects core operations.

4.2.2 Some permanent change to work/study patterns is expected following the pandemic and action on low carbon travel is needed to mitigate the impact of 65% growth in student numbers. From 18-19 to 19-20 the overall emissions drop was c.14% (including Scope 3) with travel emissions decreasing by almost 50% (from reductions seen in both commute and inter-campus journeys). Although these changes generated positive outcomes for CO_2 emissions and climate change, further monitoring will be needed to gauge where the patterns of activity and emissions are short term adjustments to meet an immediate need or longer term changes .

4.2.3 Delivering the Gloucester City Campus project with environmental measures to mitigate this emissions impact will be critical to the strategy and priority actions are listed in Table 2 above. There is a risk that associated costs escalate and projects (both refurbishment and Net Zero) are delayed due to funding reasons. If student growth were to still occur, our carbon emissions at 2030 may require us to delay declaring ourselves in a position to become net zero.

4.2.4 Influencing internal buying operations as well as external suppliers is important in reduction efforts and will need to be enshrined in procurement policy and with training to buyers to work towards targets. The focus will be on standardising supplier coding practices for analysis via the HESCET Scope 3 Tool and reaching more cost and carbon efficient outcomes via detailed analysis of proposed services and goods. Maturity of practices among key suppliers organisations is anticipated to be supportive in the organisation's ability to reduce supply chain emissions during the strategy.

4.2.5 The UK journey towards a net zero economy will contribute to emissions reductions for UoG. This national change is estimated to generate 33% reduction overall for UoG. The Net Zero actions identified would add to this reduction and other opportunities are likely to arise in the next 10 years. The following assumptions informed development of the proposed targets (see Appendix 2):

- National grid emissions reduce by 40% by 2030 compared to 2020, impact commencing 2021
- Natural gas will not decarbonise before 2035
- Local bus services will be 100% electric vehicles by 2030, impact commencing 2025
- 20% of cars will be electric vehicles by 2030, impact commencing 2022
- Supply chain will be 40% decarbonised by 2030 compared to 2018, impact commencing 2022

5. Policy Alignments

5.1 Various internal policies and stakeholders are critical elements in delivery of this strategy. The key internal policy connections and their consequences are outlined below in relation to the University's Strategic Plan and its sub-strategies relating to Estates, LTI, Finance and Sustainability.

5.2 University Strategic Plan 2022-2027 – the core objective of the strategy will be an institutional KPI enshrined in the corporate strategy and its annual Operating Plan, aiming to:

- ***Deliver net zero carbon emissions by 2030***

This commitment recognises the potential for changes in the course of this long term strategy, but assumes the basic viability of the current set of proposed targets, resourcing and actions.

5.3 Estates Strategy - to ensure that the strategy becomes embedded across the organisation, the Estates Strategy and annual Business Plans will reflect the relevant projects in Table 2 plus the following objectives:

- Replace plant with low carbon options at end of life (ensuring funds available)
- Ensure effective use of BMS to manage plant and equipment optimally
- Maximise use of natural cooling options in high heat areas such as data centres
- Reduce consumption of electricity, gas and water as far as possible to reduce resource use, cost and emissions
- Improved building insulation and double glazing
- Installation of 'smart campus' technologies to use sensors to control energy use linked to occupation levels
- Improve energy metering across the estate to measure efficiency for each building
- Develop links with maintenance and construction contractors to share best practices
- Consider on-site renewable generation and storage options for building projects
- Align bus service, car parking options and associated subsidies and charges to ensure travel options support and encourage adoption of low carbon travel modes.

5.4 LTI Strategy - to ensure that the strategy becomes embedded across the organisation, the LTI Strategy will reflect the following objectives:

- Use of cloud based services to reduce site based servers and cooling requirements
- Move to thin client computing to reduce embedded carbon in devices
- Consider and monitor carbon impact (embedded, operational and outsourced) of projects
- Reduce cooling requirements by reducing data centres, installing low heat devices and arranging equipment to maximise natural cooling
- Continuing development of online meetings and blended learning solutions (technologies and spaces) that also minimise commute and intercampus travel
- Reflecting carbon impact in the ongoing application of digital transition strategy.

5.5 Procurement Strategy - to ensure that the strategy becomes embedded across the organisation, the Procurement Strategy will reflect the following objectives:

- Whole life emissions assessment of products and services as part of selection process for major projects
- Develop specific mechanism to ensure carbon emissions are considered in all projects and tenders above £500k
- Track carbon emissions for top 10 suppliers directly via annual report from supplier
- Share best practices for carbon reduction across common suppliers
- Contract review processes to include energy efficiency and carbon emissions improvements implemented during contract period prior to renewal of any contract

5.6 Sustainability Strategy - to ensure that the strategy becomes embedded across the organisation, the Sustainability Strategy will reflect the following objectives:

- Net Zero objectives embedded into the operation of the EMS and its externally audited objectives and targets
- Prioritisation of operational sustainability resource to ensure delivery of Net Zero projects including City Campus
- Defined focus on Net Zero carbon within the annual sustainability communications and engagement plan
- Specific actions integrated into annual Live Smart student engagement programme to support low carbon travel

5.7 Catering services changed significantly in response to commercial factors, changes in campus attendance patterns and the Covid-19 pandemic. Although not a major direct contributor to the Net Zero targets, this major contract plays a significant role in reinforcing cultural changes and good practices that connect carbon reduction with related sustainability agendas, including:

- Increasing the % offering of vegan/vegetarian food and 'low carbon' proteins
- Minimising food waste generated in refectories
- Minimising use of plastics and disposables in catering services
- Minimise food miles through selection of suppliers from local area.

6. Engagement and Collaboration

6.1 The Carbon Net Zero Strategy is systemic in its scope and relationships with actors and settings inside and outside the organisation. To progress its actions requires effective engagement and collaboration with diverse stakeholders, including students, sector bodies, local government, community groups, national programmes and internationally (e.g. delivery partners overseas).

6.2 Leaders and managers of teams and services across the University can steer the strategy through the adoption of good practice and supporting cultural change, including:

- Considering life cycle carbon and cost impacts in strategic decision making on building and refurbishment, procurement of products and services, energy using products such as IT and indirect emissions from services such as product logistics and contractor travel.
- Encouraging team members to consider low carbon travel options where possible for all journeys including business travel and commuting, and working proactively with students and course teams to develop options for lower carbon field trips and study visits.
- Ensuring key staff who are on site outside routine hours (e.g. cleaning, security, student support areas) are provided suitable training to enable them to assist in saving energy by ensuring all unnecessary lights and equipment are switched off.
- Supporting the Net zero taskforce, generating ideas and examples of ways to increase energy efficiency, and sharing data on changes and progress in their own services and buildings, as well as local decisions and purchasing outcomes.

6.3 All staff and students, as the key user groups of the University's facilities, can personally help to drive this strategy by taking deliberate action to:

- Understand the link between the learning and working environment, carbon emissions and climate change, and the aspects of their activity with high carbon impact.
- Travel by lowest carbon mode where possible, recognising the contribution that all journeys make to climate change, including commuting, scholarly exchanges and field trips.
- Identify opportunities for education and application on low carbon issues, when devising curriculum projects, professional experience opportunities and research initiatives.

6.4 The Live Smart programme provides a vehicle used to communicate progress and projects to the student body and seek involvement and ideas from them. Communications content will be shared across key channels operated centrally and through the Students' Union. Student and staff survey questions and focused emissions data will be used to develop opportunities to close the gap between survey results (which show understanding of the need for change) and willingness of individuals to take personal action to deliver that change (recognising there are cases where a lower carbon travel mode is not possible).

6.5 The University is already active in informing and supporting regional decarbonisation initiatives and will continue to accelerate its efforts to collaborate locally to ensure that its operational and academic contributions to decarbonisation are optimised, including:

- Involvement with the LEP Energy Group and local travel organisations such as the Wales and Borders Travel Forum, as well as the CheltenhamZero Partnership launched by Cheltenham Borough Council and similar approaches initiated by Gloucester City Council
- Collaboration with the Gloucestershire Climate Change Lead to support change across local councils, major organisations, community groups and interested parties, including active support to continue involving students of the University in the Youth Panel driving the Gloucestershire energy strategy to support regional Net Zero goals.
- Collaboration with this role and through our existing partners and networks in the UN Regional Centre of Expertise in sustainability education, RCE Severn, to broker connections and partnerships, including education and training opportunities as well as research.
- Dedicated work with existing key networks and organisations such as the Local Nature Partnership, Gloucestershire Wildlife Trust and Cheltenham Education Partnership, to support regional capacity development and identification of opportunities.
- Interaction with the local business community, both in the commercial and industrial sectors, to explore solutions that reduce reliance on fossil fuels, explore services and investment models, such as asset share/ownership and optimisation and utility purchasing, that reduce emissions and initial investment required.

6.6 The University will continue to work within the HE/FE sector to further develop methodologies and practices supporting Net Zero, including the accurate evaluation of Scope 3 procurement emissions and to build consensus with regard to scope boundaries in sector Net Zero policies.

7. Financing and Budget

7.1 Funding allocation

7.1.1 The Net Zero Strategy and associated carbon emissions reduction projects has been incorporated into annual financial planning, with £1.5M spend agreed over the next 9 years. To

ensure this spend can be tracked a separate budget line has been created for Net Zero funding, enabling multi-year spend to ensure momentum against a long term strategy.

7.1.2 The budget is shown in Table 4. An appraisal of possible environmental standards to be pursued will be carried out with the project manager and will include an assessment of emissions reductions to support net zero.

Academic Year	**Annual budget – total £1.5M**
21/22, 22/23, 23/24	£200,000 per annum
24/25 to 29/30	£150,000 per annum
Total to 2030	**£1,500,000**

Table 4 – estimated carbon budget by year

7.1.3 Throughout the duration of this strategy opportunities will be pursued to fund carbon infrastructure works using government funded schemes and to develop approaches to private external funding such as shared asset ownership schemes.

7.1.4 The annual internal development opportunities fund may be an avenue to support future quick turn key projects, but is unlikely to be suitable for plant replacement as the timescales for implementation to completion are too long. This funding could be used for additional low carbon travel initiatives such as cycle storage and cycle changing areas.

7.2 Financial benefits

7.2.1 Table 5 below shows cost savings that can be achieved through the recommended pathway*:*

	Cost at 18-19	**Potential saving at 18-19 prices**
Scope 1 - Annual cost of gas	£200K	£40K
Scope 2 - Annual cost of electricity	£646K	£32K
2030 offsetting costs avoided		£238K
Total savings		**£310K**

Table 5 – cost savings associated with proposed pathway

7.2.2 The impact of net zero objectives on the costs of goods and services from our supply chain is hard to predict. Suppliers need to balance the investment needed to reduce their emissions against cost savings for energy consumption. The combination effects from the global pandemic, increased home working, reduced office space requirements, globalisation and net zero make long term cost estimates unreliable. However this strategy will focus on whole life cycle cost analysis over the duration of contracts and product lifetimes to deliver overall best value.

7.3 Carbon offsetting and taxes

7.3.1 Carbon offsetting is part of this Net Zero strategy, recognising that most public sector organisations cannot become zero carbon in a cost-effective manner using current technologies (see Appendix 4 for more on offsetting principles).

7.3.2 Figure 4 below shows the impact of this strategy in reducing potential future offsetting costs, including costs avoided by implementing the associated actions:

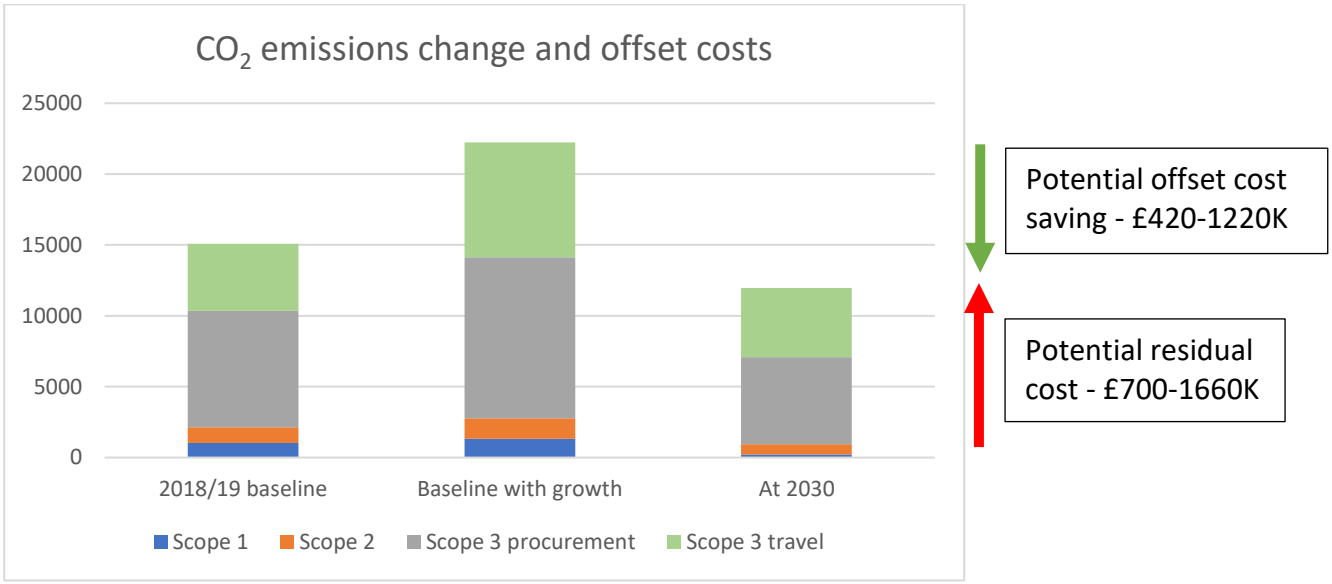


Figure 4 – Residual and avoided offsetting costs

7.3.3 Carbon taxation is in place for use of electricity and gas via the Climate Change Levy (CCL) at approximately £20/Tonne of carbon emitted. For 19-20 the CCL cost for the organisation was £55K. UK government is reported to be considering how carbon taxation could help drive the journey to Net Zero, however no details are available yet.

7.3.4 Any further carbon taxation would need to balance UK business profitability and avoid double taxation (i.e. a system similar to the 'polluter pays' principles in the Producer Responsibility Waste Packaging Regulations). It seems likely that a UK carbon taxation scheme would be based on the current CCL price per tonne (£20), with annual increases, applied to activities that emit carbon – gas use, electricity use, fuel used for business travel including delivery of goods and services.

8. Governance and Monitoring

8.1 Oversight and KPIs

8.1.1 Responsibility for delivery of this strategy will lie with the Vice Chancellor as the Carbon Net Zero Strategy requires an overarching institutional KPI to deliver its core objective by 2030.

8.1.2 The strategy is led by the Sustainability Operations Manager and the Director of Sustainability has formal responsibility for delivery through the Sustainability Strategy, providing joint oversight for progress on targets, evaluated using the ISO 14001 EMS and Sustainability Performance Review.

8.1.3 Senior management responsibility extends to key departmental heads of service (Estates, LTI, Procurement, Planning) to anchor its commitments within their own Business Plans and strategies.

8.2 Data management

8.2.1 A central dashboard is being developed with support from LTI and the Estates team, which can help to track and communicate carbon emissions across the organisation. The data will be

updated monthly and include gas, electricity and water consumption and associated carbon emissions. Travel and procurement emissions will be updated annually by the strategy lead.

8.2.1 Utility bills from that past 5 years have been analysed to enable a full understanding of energy and water use. Utility consumption is being tracked on a monthly basis by the Sustainability Operations Manager to ensure that carbon emissions are understood, given the lack of energy management capability in the organisation and lack of data as previously collected by the Estates team and recorded for submission of the Estates Management Record.

8.3 Reporting and Audit

8.3.1 Progress will be reviewed on an annual basis as part of the annual Sustainability Performance Review. This review, informed by the Net Zero taskforce, will consider:

- Strategy implementation of priorities and decisions required to achieve objectives
- Annual carbon reductions achieved against all scopes, and progress against targets
- Review of strategic decisions and changes in the organisation affecting progression
- Review and/or reprioritisation of projects to transfer into service business plans
- Identification of barriers to implementation and opportunities for funding
- Evaluation of approaches and communication of progress with key stakeholders.

8.3.2 In addition carbon performance of the University is now a required part of the Annual Financial Statements due to the SECR, provided by the Sustainability Operations Manager. Our carbon performance, and the information provided by SECR, is occasionally audited as part of the Finance and Planning audit process.

8.3.3 Public reporting of carbon emissions reduction and wider energy management developments will continue to be included in the Annual Sustainability Report.

8.3.4 The international Science Based Targets Initiative (SBTI) assists organisations to determine how much reduction they need to deliver, by calculating reduction targets against 1990 global emission levels, designed to minimise climate change. As the SBTI does not cover educational organisations during the initial phases of this strategy work will be undertaken with suitable consultants to review our data to ensure the targets meet the expectation of Science Based Targets.

8.3.5 External assessments of our Sustainability performance, including carbon net zero, are conducted as part of the People and Planet Sustainability League and the SOS-UK Carbon Targets ranking.

8.3.6 The UoG Environmental Management System will be used to manage and track the performance of this strategy. This management system includes regular internal audits of carbon performance and also requires annual external reviews and recertification audits every 3 years conducted by BSi.

Appendix 1 – Students and carbon

This snapshot from sector literature, survey data and industry reports marks the level of concern around climate and environmental issues among students, which has risen and stayed high in recent years despite the Covid-19 pandemic. This has driven increased expectation of urgent action:

- 64% of people worldwide view climate change as a global emergency
- 53% of Brits think UK government is not investing enough in tackling climate change

Levels of interest and concern are even more pronounced among younger people:

- 91% of students are fairly or very concerned about climate change, compared to just 80% of the wider public
- 55% of Millennials and Gen Z worry about the climate on a weekly basis and 95% of young leaders think business is not doing enough
- 68% of students want government to prioritise the climate in recovery after Covid 19

Young people aren't just concerned for global issues, they hold optimism and want to lead change.

- 91% of young leaders think 'climate take back' is possible
- Over half of Gen Z are relentlessly committed to making sure change happens
- Personal responsibility, consumer behaviour and life choices seen as key to change

Although there is extensive evidence of a level of concern amongst students, and a generalised commitment in principle to wanting to take action on climate change, there appears to be a gap between the desire for change and action by individuals to reduce their personal carbon footprint, for example in choice of travel mode.

Sustainability is increasingly factoring in people's career choices:

- 78% of UK adults want to play a part in reaching the UK's net zero carbon goal and 57% want to work for an organisation that helps the UK get there (Aldersgate Group 2020)
- Among Millennials and Gen Z this commitment is stronger with 'green growth' now recognised as a top way to attract and retain young talent (GFirstLEP 2019)

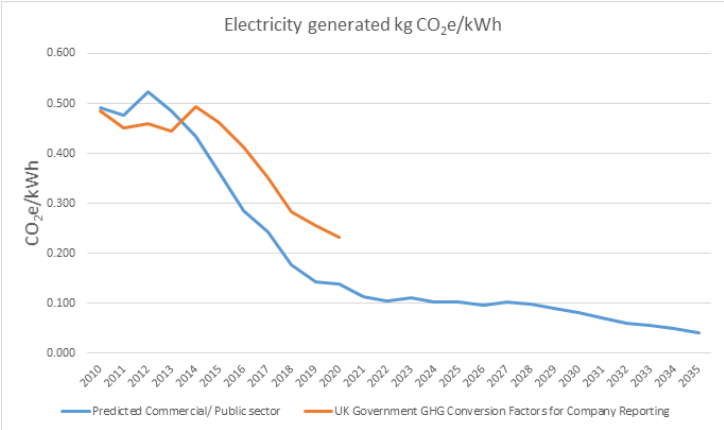
The global market for low carbon goods is set to be worth £1 trillion a year as early as 2030, requiring those entering the workplace in all roles and sectors to have sustainability skills. The current labour force has sizeable gaps in this area e.g. 89% of finance staff, 74% of product development staff and 82% of procurement staff, were not fully capable of contributing to their organisations' environment and sustainability agendas.

In conclusion - sustainability is strong and rising among young people, with the need for all HE disciplines (including those with less obvious links to sustainability) to play a role in preparing the future workforce. This has been recognised by the release of new guidance from QAA/AHE on ESD in 2021, coupled with a push for all QAA benchmark statements to reflect this in future.

Appendix 2 - UK decarbonisation assumptions

This strategy for emissions reduction cannot operate independently of the emissions reductions that result of either UK government strategies or cultural changes. These include the following:

- National grid CO_2 emissions will reduce by 40% by 2030 compared to 2020, impact commencing 2021 - this assumption based on graph below from BEIS:



- Natural gas will not decarbonise before 2035 - pilot scale hydrogen gas supply systems are being tested but UK wide systems, if viable, will not be available before 2035. Infrastructure for reducing gas emissions by introducing 20% hydrogen into gas supply is being considered.

- Local bus services will be 100% electric vehicles by 2030, impact commencing 2025 - the Confederation for Passenger Transport (the trade body for bus and coach operators) has set a target for all buses to be ultra-low or zero emission by 2025 (2023 in some urban areas). The assumption allows an extra 5 years for this target to be fully embedded.

- 20% of cars will be electric vehicles by 2030, impact commencing 2022 - according to the International Energy Agency Global Electric Vehicle Outlook 2020, 2.6% of global car sales in 2019 were electric, with electric vehicles representing 1% of all vehicles globally. This report predicts that global electric vehicle stock will increase by a factor of 15 by 2030.

- The supply chain will be 40% decarbonised by 2030 compared to 2018, impact commencing 2022 - national changes will bring about 30% reduction in carbon emissions. UK government is encouraging businesses to undertake decarbonisation actions and it seems reasonable to assume that this would lead to an overall reduction of 40% for most UoG suppliers.

Appendix 3 – Future energy trends

The utility sector within the UK is focused on delivering supply with minimal climate change impacts. Over the next 10 years likely changes that will help to reduce UoG emissions are:

- Decarbonisation of electricity generation via increased solar and wind power will halve grid carbon emissions by 2035 and approach a 95% reduction by 2050.

- Local energy storage (large batteries) will be developed to store weather dependent energy (solar and wind) for later use.

- Knowing the next 10 years offers little opportunity to decarbonise natural gas, the following changes are being investigated:

    - In the medium term adding 20% hydrogen to natural gas to reduce emissions.
    - In the long term 100% hydrogen gas may be a suitable replacement.

Over the same timescale the market will see significant change resulting in:

- Price increases for electricity due to required investment in renewable generation (30% increase by 2030).

- Price increases for gas as reduced demand decreases the economy of scale (100% increase by 2030).

- Demand for electricity increasing due to the move from gas for heating and increased electric vehicles, which could lead to interruptions in supply and further price increases.

The risk of market volatility and price increases, coupled with the risk of climate change and possible carbon taxing, requires a strategy to reduce our energy consumption as far as possible, with a focus on low carbon electricity supply and a reduction in gas use.

This strategy recognises that the national grid energy supply (electricity and gas) will continue to generate carbon emissions. Natural gas will always have emissions associated with its use, which will only reduce as commercially viable methods of mixing hydrogen with natural gas emerge.

Emissions associated with electricity supply will continue to decrease for the next 20 years as more renewable generation comes online, potentially leading to 90% decrease in emissions by 2050. However it is unlikely that UK supply will become zero emissions due to the strategic risk of being entirely reliant on solar and wind power (demand may exceed supply during cloudy, calm weather).

Appendix 4 – Carbon offsetting

Carbon offsetting involves undertaking projects to remove CO_2 (e.g. tree planting) or investing in projects run by third parties to reduce CO_2 emitted elsewhere by the same amount (e.g. renewable energy generation, sequestering carbon in building materials, etc).

The principle seems simple but application is complex, as these need to be long term solutions that would not occur without this investment. There needs to be a net gain (i.e. not planting 1000 trees on arable land in area A, whilst 1000 trees are cut down in area B to replace that arable land).

At present offsetting projects cover a wide range of activities with a similar range of costs. The market is currently unregulated and most organisations are therefore electing to purchase their offsetting requirements from accredited schemes that meet set standards. As this market matures, commercial pressures will result in most schemes being accredited, with likely increase in average pricing that reflects the accreditation and their proper management.

The tertiary sector has recognised that offsetting will become a significant cost for HE and FE organisations, requiring care when considering offsetting projects to avoid greenwashing. The EAUC has set up a group to develop offsetting options for the sector, aiming to offer a range of options for HE/FE to purchase and use a group approach to achieve the best price for these. This strategy assumes that UoG will join this scheme to ensure a cost effective, assured offsetting mechanism.

A few universities have made commitments to become net zero before 2030, either across all scopes or focusing only on scopes 1 & 2. It is unlikely that they will have been able to make significant reductions on their emissions and they will therefore be offsetting significantly (with significant costs). This approach does not align to the principles of net zero and may be seen as "greenwashing" by other parties, notably students who may also have value for money concerns related to an organisational spend of their perceived fee income against such costly initiatives.

By 2030 greater standardisation and maturity in the economy and practice of carbon offsetting should yield clarity or resolution on the following:

- How electricity from renewable sources should be offset (if at all)
- How procurement offsetting works through the supply chain (i.e. if suppliers offset their emissions, does the contracting organisation also offset these (double counting)

The cost of offsetting varies widely at present, between simple tree planting schemes (£15/Tonne) to complex pilot schemes involving carbon capture (£800/Tonne). The average cost is around £50/Tonne for a certified scheme. The average cost will increase over coming years as space available for tree planting becomes scarce and is expected to be close to £80/Tonne by 2030.

Appendix 5 – Project implementation details

Shows principal projects, when needed, identified owners, indicative costs and carbon impact:

Project	**Heat decarbonisation**		
Description	Replace 77 gas boilers with low carbon option (electric air source heat pumps). NOTE; boilers will need replacing over this timescale anyway		
Timescale	2021-30	Owner	Estates
Carbon impact (H/M/L)	H	Cost (H/M/L)	H

Project	**LED lighting**		
Description	Replace remaining fluorescent tube with LED lamps. Approx 75% of campus complete at 2020.		
Timescale	2021-24	Owner	Estates
Carbon impact (H/M/L)	M	Cost (H/M/L)	M

Project	**BMS optimisation**		
Description	Check set points, sensors and systems for all HVAC and plant connected to BMS and ensure all optimised (i.e. on/off times, thermostat settings)		
Timescale	2021	Owner	Estates
Carbon impact (H/M/L)	H	Cost (H/M/L)	L

Project	**Net zero approach to construction**		
Description	Develop approach to minimise initial CO2 emissions from construction phase and ongoing use of building		
Timescale	2021-24	Owner	Estates
Carbon impact (H/M/L)	H	Cost (H/M/L)	L

Project	**Low carbon travel**		
Description	Support adoption by installation of EV charging points, secure, covered cycle/scooter/motorbike storage, changing/storage areas and showers		
Timescale	2021-24	Owner	Estates
Carbon impact (H/M/L)	M	Cost (H/M/L)	L

Project	**Low carbon procurement**		
Description	For top 20 suppliers engage business to assess true carbon cost of service (not estimate based on spend). Identify best practices and select supplier based on cost, quality, delivery AND carbon emissions.		
Timescale	2021-24	Owner	Procurement
Carbon impact (H/M/L)	M	Cost (H/M/L)	L

Project	**Low carbon computing**		
Description	Move to cloud computing – reduces on site data centres and associated cooling, reduces energy used by personal devices as all storage is remote, reduces carbon built in to device		
Timescale	2021-24	Owner	LTI
Carbon impact (H/M/L)	L	Cost (H/M/L)	L

Project	**Net zero and carbon offsetting costing**		
Description	Develop UoG approach to carbon offsetting. Project to explore optimum offsetting options and ensure budget available by 2030		
Timescale	2021-29	Owner	Finance & Sustainability
Carbon impact (H/M/L)	L	Cost (H/M/L)	L

Appendix 6 – Interventions on emissions sources

Scope 1

UoG Scope 1 emissions derive from 3 sources;

- Emissions from natural gas for heating and cooking are the main Scope 1 focus area.
- Fuel for campus vehicles and emergency generators – electric vehicles will reduce emissions.
- Refrigerant gas emissions from HVAC systems.

Interventions needed

Typically boilers are replaced every 12-15 years and a number will be due replacement before 2030. Replacing gas boilers with electric heating is expensive and requires significant planning.

Scope 2

Although the university purchases electricity on a renewable tariff, sector guidance for emissions calculations requires organisations to use the average carbon emissions for the UK network.

Determining efficiency of buildings, plant and equipment is a challenge as the metering network is not mature, with buildings of differing age and design sharing common meters.

UoG has photovoltaic cells on rooftops at Oxstalls and Park. The largest and most efficient (at the Oxstalls Business School) generates approximately 1% of our overall annual consumption.

Interventions needed

This strategy will explore;

- Optimising plant efficiency via the Building Management System (BMS). Providing sufficient resource to manage the BMS will help ensure that consumption is kept as low as possible
- Increased use of on site renewable energy generation, most likely photovoltaic cells, to decrease emissions and reduce our reliance on volatile electricity prices..
- Improving building metering to enable better analysis of building and plant efficiency.
- Using smart technology to align heating, cooling and lighting to room use and occupancy.
- Greater use of efficient computing technologies eg. cloud servers and thin client computing.

Scope 3 – Procurement

Procurement emissions are calculated from average UK carbon emissions per £ spend across set categories. This does not recognise individual supplier performance, location, etc. nor allow for selection of suppliers based on their emissions.

Interventions needed

- Develop methodology to directly assess the carbon emissions of suppliers.
- Use carbon emissions as part of supplier selection process - selecting suppliers with lower emissions, or considering alternate means to deliver service or need for service.

Appendix 7 – Travel survey insights

The University has used a new annual travel survey since 2017 to determine Scope 3 emissions from staff and students in their commute to campus and travel between campuses. Recent surveys have included additional questions to improve data accuracy and this, plus the strong response rates achieved annually since 2017, gives a reliable multi-year picture of its travel emissions.

Facilities to support low carbon travel have costs estimated in Table 2, but identifying the right interventions to achieve shifts to lower carbon modes needs careful survey analysis and strong communications and engagement with staff and students. The insights below arising in the travel survey data support the actions proposed to help move to lower carbon travel modes.

The 19-20 travel survey provided an indication of the potential impact of home working/study on commute patterns and carbon emissions. The survey data suggest that 50% of students who commute by car could use an alternate low carbon mode (public transport, cycle, walk).

The Net Zero proposals estimate 13% decrease in student commute and 35% reduction in staff commute, including the effects of blended learning/working. This aligns with assumptions adopted by Estates for office space planning, which assume 30% reduction in space needed due to remote working, as well as the recent flexible working survey findings.

The overall impact of home working/study will be beneficial for the organisation. Average commute is 15 miles and initial reports indicate that home working emits less carbon than commutes over 6 miles. Survey responses from students show focus areas for improvements:

19-20 student travel survey comments	**Count from 1483 survey responses**	**Percentage of comments**
What would most support you in walking to your main study location?		
Clear walking maps and directions	22	22.9%
Security and personal safety advice	12	12.5%
What would most support you in cycling to your main study location?		
More secure cycle parking	16	20.8%
More showering and changing facilities	14	18.2%
Pool or hire bikes	11	14.3%
What would most support you in using public transport to get to your main study location?		
Discounted season tickets	95	43.6%
Real time bus information displayed on campus	54	24.8%
What would most support you in using an E-scooter or E-bike to get to your main study location?		
Discounted E-scooter rental charges	38	65.5%