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Environment and Climate Emergency Working Group White Paper

An Independent Review commissioned by the Vice Chancellor's Executive Group

UNIVERSITY OF EXETER: Environment & Climate Emergency Working Group White Paper

An Independent Review commissioned by the Vice Chancellor's Executive Group

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Executive Summary

The University of Exeter (UoE) declared an Environment & Climate Emergency on 20th May 2019 and in so doing, the Vice Chancellor requested a Working Group, led by Prof Juliet Osborne to make a set of recommendations to VCEG about what declaring a climate emergency should mean to the University of Exeter.

It is essential that the University takes transformative, and fast, action to tackle the declared Environment & Climate Emergency. There is strong evidence of the need to drastically reduce greenhouse gas emissions globally and stop damaging the natural environment. It is a key priority for our students, staff, and communities. Not 'walking the talk' carries a high reputational risk and danger of falling behind in the sector.

The Environment and Climate Emergency Working Group White Paper was developed by a team of over 30 staff and students, including our leading environment and climate experts and over 200 ideas from staff and students. The working group reviewed available data, plans, and scientific evidence. We recommend new targets to reduce UoE carbon emissions and improve the environment. We present a wide range of recommendations to meet these targets, which require change across every aspect of University business: including infrastructure, strategy and culture.

We ask VCEG to approve the emergency actions required to build a prioritized, time-bound costed, plan of action based on the White Paper to meet the recommended new targets to reduce emissions and improve the environment as quickly as possible.

Why the University should take action urgently: The evidence for the environment and climate crisis, and the scientific consensus on the need for rapid and fundamental action is crystal clear, as explained in the IPCC's Global Warming of 1.5°C report, highlighting the considerable risks associated with a 2°C rise is global average temperatures, compared to a 1.5°C rise, and the 2019 reports Ocean and Cryosphere and Climate Change and Land. Additionally, the recent Intergovernmental Panel for Biodiversity and Ecosystem Services report states that around 25% of the world's species are now at threat of extinction due to habitat loss and climate change.
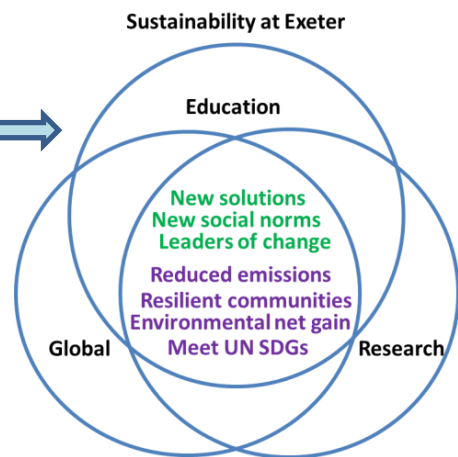
Is it really an emergency? Gilding (2019) states that to act in an 'emergency mode' which is, by definition, disruptive to the status quo, requires two criteria to be satisfied. Firstly, "*that the risk or threat is clear, there is a reasonable likelihood of it occurring, and it will have a large and unacceptable impact if it does*". Secondly, "*That the response necessary to address and reduce the risk to an acceptable level requires an abnormal level of urgency, mobilisation and action…*". Gilding concludes that the scale and level of risk; the scale of change required; and the speed at which it much be delivered clearly make what we are experiencing a Climate Emergency. As such, he argues, we have to shift to an emergency mode of action to address this risk.

This University in particular has a responsibility to take up this challenge and 'walk the talk' for the future of the students we teach. It speaks directly to the University's mission "*to make the exceptional happen by challenging traditional thinking and defying conventional boundaries*." It should thus be embedded into the University's values and principles. A response at appropriate scale is likely to result in **1)** Long term savings with respect to energy use; build quality; reduced and sustainable procurement and waste management in particular; **2)** Additional student recruitment of a generation sensitized to the climate crisis; **3)** Considerable reputational gain amongst staff and students (current and future), businesses and the region; **4)** Ability to steer the sustainability agenda

across the sector via the Russell Group and via funders such as UKRI. The reputational cost of NOT engaging in this properly, quickly and visibly is likely to be considerable.

Where are we now: Despite our educational and research excellence in this field; and considerable work from Professional Services and FXPlus, we are not leading the way. Some policies are well written; but there are gaps in our practice. Direct carbon emissions (scope 1 & 2)[1] for our estate are 14.8k tCO_2e/annum, and are decreasing in line with our current targets; but considerable investment is required to reduce them more quickly. We have far less data available for indirect emissions (scope 3) but they likely account for at least 76k tCO_2e/annum (~ 84%) of our emissions, particularly from all the goods we purchase (procurement 61%), our travel footprint (21%) and some investments (2.4%). The data gap is not unusual for the sector but must be rectified quickly.

Proposed Strategy: The University should aim to be a **sustainability and climate change leader** regionally, nationally and internationally; delivered via transformation in its **operation** and via collaboration in its **educational**, **research, international** and **impact** activities, demonstrating innovation, influence and action.

Sustainability at Exeter

Education

New solutions
New social norms
Leaders of change
Reduced emissions
Resilient communities
Environmental net gain
Meet UN SDGs

Global   Research

Recommended Goals & Targets:

To achieve this we recommend that UoE puts plans and investment in place to meet the following goals & targets:

Goal 1: To be carbon neutral (net zero) for scope 1 and 2 emissions by 2040 via a front-loaded approach to reduce emissions by 75% by 2030 (2005/06 baseline).
Targets: Reduction in scope 1 & 2 of **50%** by **2025**; **75%** by **2030**; **100%** (net carbon zero) by **2040.**

Goal 2: To ensure we have data analytics so that we can reduce scope 3 emissions by 50% by 2030 with a plan to reach net zero by 2050, whilst aiming to respond faster (by 2040).
Targets: Reduction in scope 3 of **50%** by **2030; 100%** by 2050 (stretch target of 2040)
Focus areas: Divestment; Long Haul Travel (↓50% by 2025); Plastics & Paper (↓50%); Recycling (↑to 70% by 2025, ↑to 85% by 2030); Catering emissions (↓50% by 2030). Depends on verifiable data.

Goal 3: To pursue a policy of 'environmental net gain' on our estates, and to use our research and education to deliver environmental net gain within region, country and across the globe.
Requires new ways of collecting and presenting data on our impact.

Goal 4: To be in the top five Universities in national sustainability rankings within sector by 2025, and in the top three Russell Group Universities.

How: The current Sustainability team is not sufficient to meet these targets. It will need investment and a step change from 'Business as Usual' at a scale likely requiring input from the Strategic Delivery Unit. Changes required are technological but also cultural. It will require top level leadership, policy and strategy change; as well as deep individual engagement. We also need to

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[1] **Scope 1** emissions from sources that are owned or controlled (e.g. fuel combustion, company vehicles, fugitive emissions)
Scope 2 emissions linked to purchased electricity, heat & steam.
Scope 3 all other indirect emissions (e.g. purchased goods & services, sold products, transportation (up & down stream) business travel, commuting, waste, investments, leased assets & franchises)

consider those who have yet to be engaged– there is a considerable element of change management to be delivered.

Summary Recommendations:

Our White Paper contains context, and information on other leaders in the sector, and evidence from the data we could gather. We offer over 100 recommendations across 19 themes covering all of University business. Here we summarise some of the essential recommendations into a top 20 (**R1-R20**; illustrated in Appendix 2). They are not in order of priority. Importantly **local travel** and **water** recommendations are also essential and are covered in the white paper.

R1 Data Analytics & Reporting: Immediately improve data capture, analytics, visualisation & reporting of carbon and environmental metrics, particularly for scope 3, to enable setting and meeting of annual targets. Report transparently and demonstrate College accountability for annual progress.

INSTITUTIONAL RESPONSE

R2 Make environmental sustainability one of the **University's core values** and write it meaningfully into **sovereign strategies:** each being made 'climate-compatible' and aligned to UN SDGs.

R3 Governance structure: To ensure sustainability is fully integrated into strategic decisions: create new Environmental Emergency Board, Chaired by a DVC + College Assoc Deans of Sustainability. Strengthen Head of Sustainability role. Ensure students are included to co-create solutions.

R4 Education Strategy: 1) Build the '***Exeter Student Sustainability Portfolio'*** educating every student in all programmes on the topic, **2)** Reduce long haul field courses; offer choice; virtual experiences; justify remaining with tangible environmental outcomes, **3)** Sign SDG Accord.

R5 Research Strategy: 1) Design new '***Sustainable Research Framework***' to steer research practice: may involve environmental justification of research, **2)** Stimulate innovation to find solutions to reduce carbon & maximise environmental benefit, **3)** Re-present UoE env research & structures.

R6 Global Strategy: 1) Have clear 'climate-conscious' strategy and ensure it contributes to lower emissions and finding solutions, **2)** Review & report UoE's environmental footprint resulting from internationalization, **3)** Build new "***climate-compatible global partnerships***" with other Universities to show action.

R7 Set up '***Exeter Climate and Environment* Fund'** to top slice % of international student fees & receive levies for long-haul travel or energy-intensive research. Use for climate crisis action and education to support UoE's drive towards carbon neutrality and environmental net gain.

R8 Regional: Establish a **'*South West Climate Action Network'* (SW-CAN)** to support integrated development of strategy across the region to tackle climate crisis, map our activity, facilitate access to our research and mobilise students to contribute to regional environmental net gain.

R9 Divestment of funds. Divest from direct investment in fossil fuel companies and execute an ethical review of sponsorship of research, education and infrastructure.

INFRASTRUCTURE, ESTATES, DIGITAL

R10 Energy plan: Build business case & plan to be net carbon zero for scope 1&2 (currently >14k tCO$_2$e) by 2040**.** Re-profile spend to bring forward those actions with biggest impact on carbon, especially decarbonizing the gas network. Likely highest investment but with biggest savings.

R11 Buildings and Space: Request Council to take sustainability targets fully into account by making whole life costing decisions when planning investment. Review temporal use of space and optimize space utilization across all campuses: may require shifting cultural norms.

R12 Labs: Monitor carbon & environmental footprint. Massively reduce energy use & improve efficiency. Focus on buying fewer consumables and waste reduction (e.g. plastics).

R13 Digital: Bring forward significant investment in technology for **1)** Step change improvement in video conferencing remote connectivity to reduce travel, **2)** Fast track digital exam system to reduce paper/resource, **3)** Make UoE a pioneering new virtual conference hub.

UNDERPINNING ACTIVITIES AND ENVIRONMENT

R14 Business Travel: Reduce long haul travel carbon footprint by 50% by 2025; and 75% by 2030 using levies and incentives. College & PS depts decide *how* to reduce travel. Review policy to match the best in sector. Establish tools to collate data and monitor travel.

R15 Procurement: The largest part of our carbon footprint (61%) via embedded carbon (>55k tCO_2e). Commission review to address data needs and confirm key areas for change. Start by focusing on **1)** Large tenders to embed circular approach to ensure suppliers meet minimum sustainability requirements, **2)** Audit plastics & paper products and reduce.

R16 Waste and Recycling: New cross-campus plan based on circular approach, and work with region & contractors to innovate. Increase recycling to 70% by 2025 and to 85% by 2030 (Streatham currently 32% compared to Penryn 62%).

R17 Hospitality, Catering & Retail: Radically reduce products and practices with high environmental impact, including the amount of meat served. Increase provision of healthy and sustainable items. Review benefits of local & seasonal produce. Reduce waste: food, packaging, plastics.

R18 Biodiversity: Develop plan to increase **environmental net gain** on estates, within region and globally. Measure it. Plant new student/community woodlands as carbon sinks and for biodiversity, education and community benefits. Designate and protect specific sites on estate.

R19 Behaviour & Culture Change: Enable all staff &students to **change social norms** with mandatory training, environmental footprint tool and incentivisation. Demonstrate top down leadership and support grass roots engagement. Work closely with the Guild and the Student Union.

R20 Communications and Marketing: Ensure transparent communications throughout the journey to create a movement for change. Ensure marketing of education and research spread a clear, substantive and meaningful message about centrality of sustainability to the University.

Of these top 20 recommendations:

- **R1** & **R10-13** will have most effect on direct scope 1&2 emissions.
- **R9** & **R14-R19** will have most effect on indirect scope 3 emissions and environmental net gain.
- **R2-R8** & **R20** will enable the other recommendations. They will change the culture and lead to significant reputational benefits.

Next Steps: The Working Group was set up as a Task and Finish Group to prepare this White Paper.

28 Oct 2019:   VCEG discuss report and consider whether to approve targets and route forward
30 Oct 2019:   VCEG instigate setting up of Environmental Emergency Board (EEB)
11 Nov 2019:   Publish full Working Group White Paper, with comms & engagement plan
Nov 2019:   EEB task Head of Sustainability & SDU to develop a business plan and timeline
Mar 2020:   Environmental Emergency Strategy Board & SDU report on progress to VCEG

Introduction

Method & Approach

The University of Exeter declared an *Environment and Climate Emergency* on 20th May 2019, and in so doing, the VC requested a Working Group, chaired by Prof Juliet Osborne, to make a set of recommendations to VCEG about what declaring an environment and climate emergency should mean to the University of Exeter. The VC asked that the working group bring together leading climate scientists, staff and students to help decide what the University strategy should be, with the understanding that it should be both ambitious and achievable and demonstrate the depth of commitment that the University (**UoE**) has to making the necessary step changes. The working group included 30 staff representing all colleges and Professional Services and FXPlus and students from The Guild and the Student Union (Appendix 1). The working group has completed the following:

- Reviewed UoE's current strategies and plans to minimise carbon emissions, and the data available to monitor this.
- Organised themed discussions with >20 staff experts and gathered >200 ideas from the UoE community on actions that could be taken to make a step change in reducing UoE's environmental impact and carbon emissions (database of ideas available on request).
- Used the evidence and material gathered to write this White Paper which includes a strategy, aligned to suggested new targets, and recommendations for actions to meet these targets.
- **Caveat:** we have not included details on resourcing and investment required and measured benefits because of time and data available. This requires targeted work over several months.

➢ **We ask VCEG to respond to the recommendations in this White Paper, to approve the revised targets, and approve actions required to operationalise and implement the recommendations.**

Why should we change our strategy and take action urgently?

The evidence for the environment and climate crisis, and the scientific consensus on the need for rapid and fundamental action is crystal clear. Under the IPCC sixth assessment cycle three Special Reports have already been released. Global Warming of 1.5°C report highlighted the considerable risks associated with a 2°C rise in global average temperatures, compared to a 1.5°C rise. The 2019 reports on the Ocean and Cryosphere and Climate Change and Land both highlight how all people directly or indirectly depend on these environments for our survival, but all are under intense pressure and degradation. The full IPCC AR6 report is due in 2021/22. Additionally, the recent Intergovernmental Panel for Biodiversity and Ecosystem Services (IPBES) report stated that around 25% of the world's species are now at threat of extinction due to habitat loss and the effects of climate change. The 2019 State of Nature report for the UK suggests that populations of wildlife have plummeted by an average of 60% since 1970, with a quarter of mammals and half of birds assessed to now be at risk of extinction. The implication of the evidence is that UoE needs to put in place measures to rapidly decarbonise its operations to become a net-zero institution whilst also taking positive steps to improve the natural environment in all the places where we have a presence.

Gilding (2019) examines whether the situation can really be described as an "emergency" and in so doing what should be the required response. He states that to act in an emergency mode which is, by definition and intent, disruptive to the status quo, requires two criteria to both be satisfied. Firstly, "*that the risk or threat is clear, there is a reasonable likelihood of it occurring, and it will have a large and unacceptable impact if it does*". Secondly, "*That the response necessary to address and reduce the risk to an acceptable level requires an abnormal level of urgency, mobilisation and action. In other words, a solution cannot be delivered through normal reform processes of policy and market economics*". In examining the evidence Gilding concludes that: the scale and level of risk; the scale or change required; and the speed at which it much be delivered clearly make what we are experiencing a Climate Emergency. As such, he argues, we have to shift to an emergency mode of action to address the risk that climate crisis presents to humanity. The scale of the challenge is

unprecedented, it is a crisis that none of us are insulated from, with impacts already being experienced across the globe. As the VC made clear to his letter to staff (May 2019) the future of our planet and community are at stake. There is also a strong argument that how ever much we respond now, it may be too late to avoid catastrophic change across the world and, whilst mitigating as far as possible, it is also essential to build resilient communities to face the inevitable ([Franzen, 2019](#)). The University could play a key role here, particularly in the region, and across the world by sharing its research on health and well-being in situations of crisis and conflict. But, as a first step, this report focuses mostly on actions to tackle carbon emissions and environmental damage.

This University in particular has a responsibility to take up this challenge, because of our long standing role and reputation within the IPCC reporting process, including 5 authors working within the AR6 cycle; and awards and media coverage for our extensive environmental research. As VC Professor Sir Steve Smith has highlighted, at Exeter we have some of the best teams anywhere in the world working on climate change and the environment. Our scientists and experts in a wide range of subjects are showing leadership and courage presenting the evidence and potential solutions, influencing governments, businesses and communities. It is thus essential that we 'walk the talk' for the future of the students we teach. It speaks directly to the University's mission "*to make the exceptional happen by challenging traditional thinking and defying conventional boundaries*."

Not only should this be embedded more clearly and tangibly in the **University's values** and **principles**, but a response at appropriate scale is likely to result in:

- Long term savings with respect to energy use, build quality, reduced and sustainable procurement and waste management in particular.
- Additional student recruitment for a generation sensitized to the climate crisis.
- Considerable reputational gain amongst students and staff, businesses and the region.
- Ability to steer the sustainability agenda and across the sector via the Russell Group and via funders such as UKRI.
- Improve staff and student wellbeing by being part of an organization actively responding to the emergency, with increased green space, less expectation for travelling and increasing resilience.

Alongside business costs, the increased scrutiny and reputational cost of NOT engaging properly, quickly and visibly are considerable.

It is not just about carbon: The climate crisis discourse and target-setting are primarily based around carbon dioxide emissions and their reduction – which is probably the fastest way to make a difference to increasing temperatures. But humans have a massive impact on the planet beyond this. UoE declared an 'Environment and Climate Emergency' to acknowledge that the footprint we leave is not just related to the climate changing, but it is even more difficult to measure our environmental footprint than our carbon footprint. UoE has a great impact on different aspects of the environment. Some is positive through the impact of our research and education at local, national and global scales although this has not been fully mapped and assessed in terms of the shape and scale of impact. We also have a negative environmental impact, beyond carbon, simply through our everyday business operations. Whilst our current position is yet to be quantified, in this report we present actions that can be taken to reduce other impacts, beyond carbon emissions, such as increasing waste, plastics, water and increased use of land.

The University is in a position to make use of the latest research on how to quantify environmental impact in its broadest sense, and so this is a space where UoE could show real leadership: we present potential approaches here.

1. One way to measure our progress in terms of broad environmental footprint; would be to use the concept of **environmental 'net gain'** i.e. leaving the natural environment in a measurably better state than beforehand (developed and mandated by [Defra](#)). This aligns directly with work done with Cornwall Council and the Local Nature Partnership to develop and design their

Environmental Growth Strategy. It would be an innovative step to attempt an **environmental impact assessment of our research** (regional or global) to match the regional economic impact assessment that we already do.

2. In parallel with this, we should assess how the University aligns to the UN Sustainable Development Goals, more clearly (see University of Manchester report). These SDGs take a holistic approach to balancing environmental, societal and economic goals and signing the SDG Accord would enable this.

3. We should also be using our expertise in circular economy models to reduce resource use and drive down waste production – Exemplar is one UOE project that could help achieve this.

Where are we now?

In truth, our review has highlighted that UoE are not leaders in terms of "walking the talk" with regard to environmental sustainability, despite our educational and research excellence and profile in this field, and considerable work done by different Professional Services (PS) departments and FXPlus. At the broadest level, there is very little attention to the impact of our activities on the planet in our sovereign strategies. There are specific policies in place (and Appendix 3) but in practice, sustainable options across a range of activities are outcompeted by the need to reduce costs and save time in the shorter term (for example in terms of construction, procurement and waste management). There has been considerable recent investment in the Low Carbon Commitment Implementation Plan (LCCIP) which is very positive and yielding results, but there is a need to go further to meet new targets to achieve carbon neutrality as soon as possible.

UoE has not had a Sustainability Manager or Head since Dec 2018, over a key period when the issue of sustainability has risen dramatically in the priority list for students and staff, the public and government. Despite the continued commitment of existing staff involved in operational sustainability across UoE and FX Plus, and their willingness to take on new projects, this has resulted in a gap in continuity of some activities, and some policies not having been reviewed. Datasets on direct emissions are available (reported to HESA) but it was challenging to determine what data sets are available to assess how UoE is performing in terms of indirect 'scope 3' emissions (Box 1). These will be required to ensure progress against ambitious new targets.

Throughout this process the working group did find evidence of very positive activity from particular PS departments and some College departments, with new initiatives being undertaken based on the recent call to address the climate crisis (e.g. Law, Biosciences and Medical School have set their own plans; Geography Penryn carbon footprint tool to reduce academic travel; the Student Union in Cornwall have a proactive 'Green Team' working with the Penryn Sustainability Board (UoE, FXPlus & Falmouth) and Grand Challenges 2019 in Streatham and Penryn produced ideas for UoE's response to the climate emergency). However, such initiatives have not generally been prioritised by senior management across the University. In particular we highlight a gap in academic leadership to work in tandem with PS leadership and student Unions on this so that everyone in the University is engaged in the cultural and technical transformation required [see Governance]. With the appointment of a new Head of Sustainability (from 21 October 2019) this is a crucial time to gather momentum and deliver across the range of themes that are required to transform UoE to a carbon neutral future, whilst maintaining and growing our global reputation and research power.

In terms of the sector, In 2017/18 (using HESA data submission) we should celebrate that UoE performed favourably against other Russell Group institutions in terms of carbon emissions. It ranked 1st for lowest tCO_2e / FTE student; 2nd for carbon reduction achieved and 3rd for lowest tCO_2e/m^2. However, assessing broader environmental policy and practice (not just carbon) in the sector (Appendix 3) suggests UoE is lagging behind in terms of strategy, ambition, level of priority, resource (with a small team of 2.5 staff within Estates), delivery and communications. In terms of sector rankings, we dropped from 18th in the People and Planet Green League to **36th** in **2019** (although methodology not universally accepted by sector), largely due to lack of responsiveness

when the league was being compiled rather than actual lack of action. Regardless of the methodology, or how we dropped in the rankings, this is currently the most reported league in this field and used by students. Without speedy action, we risk being left further behind.

The funding landscape is also re-aligning to address the climate crisis. UKRI have a new Sustainability Board identifying the parameters of a new Sustainable Research Framework, which may result in organisations applying for UKRI funding having to meet particular expectations or commitments in terms of carbon accounting or environmental impact assessments. UoE should be in a position to help create these frameworks and set sector-wide strategies building greater connectivity with the rest of the University sector and the region. Key questions emerging for the sector as a whole are how to decarbonise the gas network in particular, as well as how to measure and manage Scope 3 emissions, and how to engage staff and students in managing their own environmental impact.

UoE carbon emissions to date

Whilst we do not yet have data on UoE overall environmental impact, this section shows UoE's current carbon emissions profile and trajectory from available data, highlighting the scale of change required, and the information that is currently missing from data captured. The estimates of emissions are categorised using the GHG protocol, which uses three "scopes" (Box 1) to delineate direct and indirect sources:
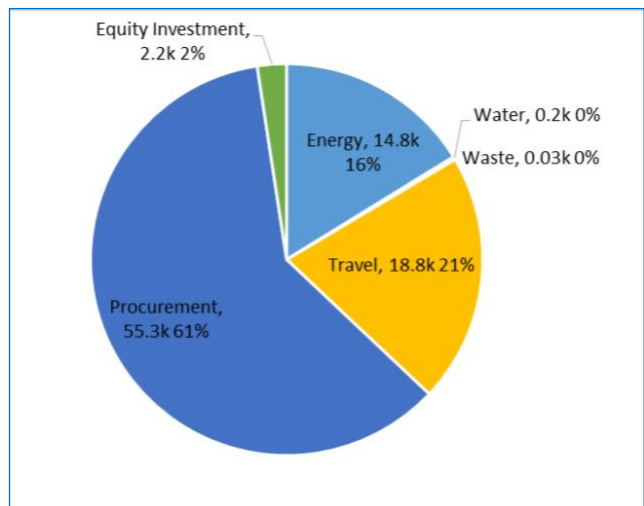

Box 1

Scope 1 emissions occur directly from sources owned or controlled by UoE (fuel, company vehicles).

Scope 2 emissions linked to UoE purchased electricity, heat & steam.

Scope 3 accounts for all other indirect emissions. These occur as a consequence of the activities of UoE, but not within its ownership or control. (e.g. purchased goods & services, sold products, transportation (up & down stream) business travel, commuting, waste, investments, leased assets).

Total carbon emissions for UoE campuses[2] (Figure 1) have been estimated from a variety of data sources. Appendix 4 contains the data, explains data sources, accuracy and assumptions made. The total emissions across all three scopes are estimated to be **91,391 tonnes of Carbon Dioxide Equivalent (tCO₂e).** Note that the emissions profile will change in the future as the University grows, and as definitions and methods of calculation change. We currently only hold good data for scope 1 & 2 direct emissions, representing an estimated **16%** of our total emissions. The indirect emissions associated with the rest of operations (scope 3) include travel, procurement and a proportion of our investments account for **84%.** The

Fig 1: UoE total estimated scope 1,2,3 emissions (tCO2e) For 2018/19(energy); 2017/18(all other)

procurement estimate of emissions is based on money flowing through procurement under different headings and converting this spend into carbon equivalents [although note that this is based on Defra's 2011 methodology] **– these data should be regarded with caution because they are broad and approximate.** We also know that things are missing such as the full footprint of travel (currently
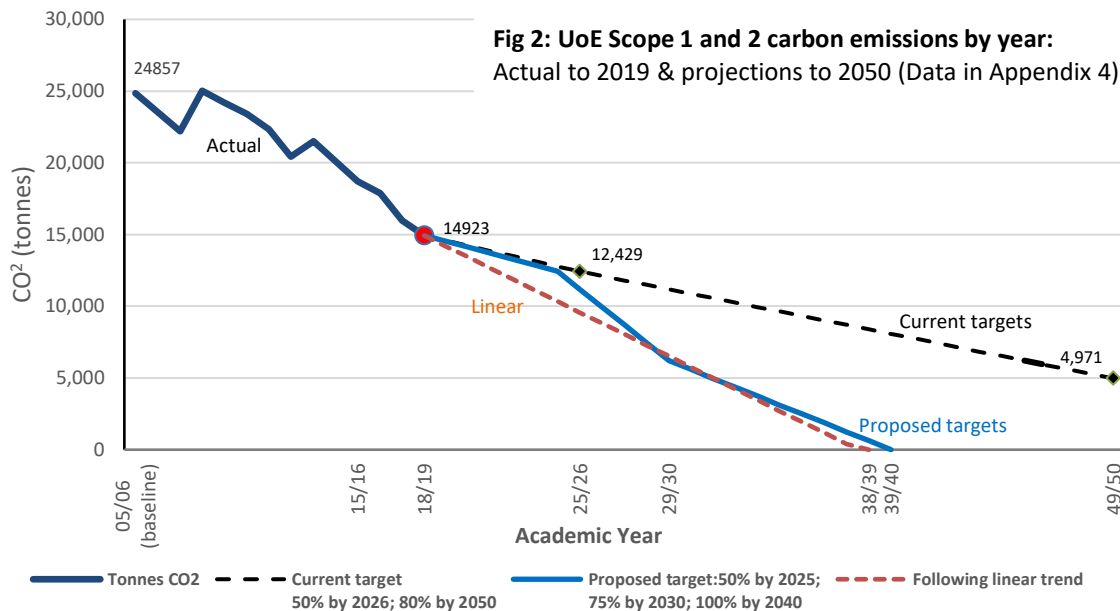
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[2] **Campuses:** Scope 1 & 2: we have accurate data for Streatham and St Lukes Campus. For Penryn, the data for the buildings we own is accurate, for shared buildings we have included an estimate. For Truro campus we do not have access to any data relating to our scope 1 & 2 emissions. Scope 3: Estimates for scope 3 emissions cover all 4 campuses.

does not include international students travelling home which could increase overall emissions by 20k tCO$_2$e – see Travel theme) investment and waste.

Scope 1 & 2 emissions: The UoE Low Carbon Commitment Implementation Plan (LCCIP) is in place to reduce scope 1 & 2 carbon emissions. This has a carbon reduction target (for Scope 1&2 emissions) of **50% by 2026**, compared to 2005/6 baseline. This was approved by Council, in line with the funding profile of the 2016/26 infrastructure strategy in April 2018, with an allocation of £14m up to 2025/26 through the capital infrastructure fund. For the period up to 2020 /21 £1.95m has been allocated and the remaining £12.05m is allocated in years 2021/21 to 2025/26. The LCCIP also includes targets for electricity consumption (reduction per m^2 by 3% year on year compared to 2014-15 baseline); and water (reduction by 3% per year), to meet the University's commitment *"to an 80% reduction in emissions from our operations by 2050."*

To date (2018/19) scope 1 & 2 emissions have been reduced by **40%** from the 2005/06 baseline (Figure 2) and we are on target to reach the 50% reduction by 2026. This trajectory is encouraging and illustrates that with further ambition, and significant resource, it would be feasible to go even faster towards carbon neutral for scope 1 and 2 [see Targets].

Fig 2: UoE Scope 1 and 2 carbon emissions by year: Actual to 2019 & projections to 2050 (Data in Appendix 4)

Scope 3:

From the approximations in Fig 1, this shows that at least 84% of our carbon emissions are indirect, relating in particular to **procurement** (61%), **travel** (21%) and some of our **investments** (2.4%). Discussion with Russell Group Universities has highlighted a sector wide challenge with collecting accurate scope 3 data and several are conducting more work in this area to tackle the climate crisis (Appendix 3). So, whilst very difficult to measure, we contend that the scope 3 emissions should be a specific focus of reductions going forward as they make up such a significant part of the profile. In particular **procurement** and **travel** are priorities for transformation and action. It is likely that the indirect estimate for carbon emissions from waste and investment are vastly under-estimated but it is not currently feasible to rectify that.

Boundaries:

The headline estimates only tell part of the story on the carbon emissions associated with the institution and its operation. How and where we draw the boundaries associated with our carbon impact is a key decision that has to be taken. There are two aspects to this: the **operational boundary** and the **institutional boundary**.

Operational Boundary: The University has to date limited its operational boundary to scope 1 and 2 emissions, which is the current legal requirement for reporting. This is inconsistent with the declaration, what others in the sector are starting to do, and UK framework for working towards a net zero economy by 2050 as set out in the revised UK Climate Change policy 2019. Hence our second proposed goal (below) implies that UoE should bring Scope 3 emissions within its operational boundary to respond properly to the Environment and Climate Emergency.

Institutional Boundary: To date UoE accounts and reports 100% of scope 1&2 greenhouse gas emissions from operations over which it, or one of its subsidiaries, has operational control (owned and operated). UoE has such control if it has full authority to introduce and implement its operating procedures at operation.

Figure 3 uses estimated data to show the emissions associated with our institutional current boundary (Column 1) and wider boundaries associated with UoE operations (Appendix 4). The activities of the institution

Fig 3: Estimated scope 1,2,3 carbon emissions (tCO2e) for different institutional boundary options. Data in Appendix 4
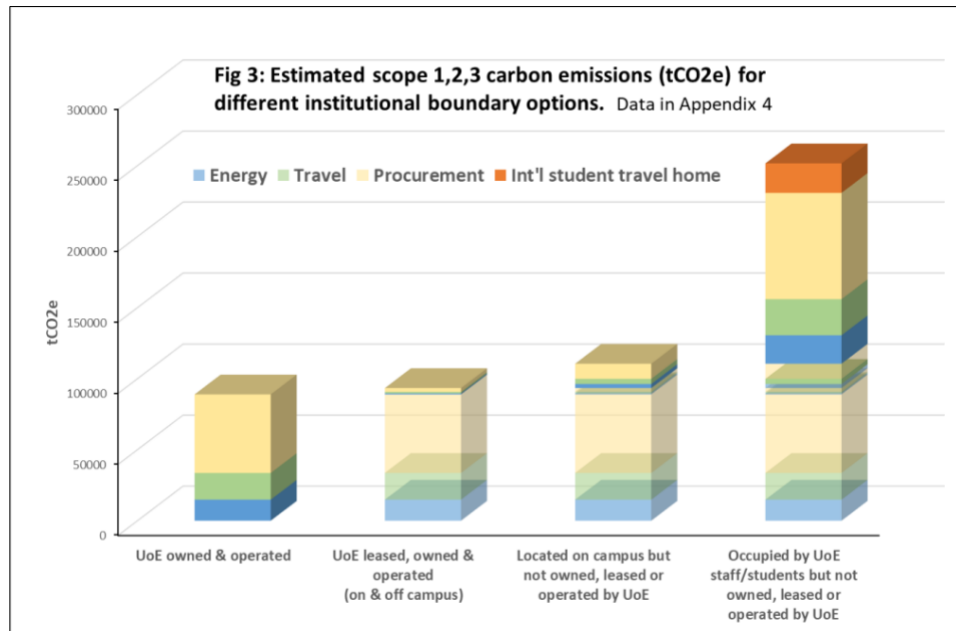
result in considerably more emissions. It can be seen that when all of the different buildings and types of occupancy are taken into account, as well as an estimate for the emissions of international students travelling home (column 4) then estimated emissions for which UoE could be argued to have a responsibility increase of 283%. These estimated numbers should be treated with caution, but it is clear that strategic decisions that UoE takes around student numbers, buildings, etc have knock-on effects for emissions upstream and downstream of what we own and operate. Going forward some of these wider impacts should be included in tracking our journey to carbon neutrality, particularly the emissions associated with buildings that are 'UoE leased, owned & operated (on & off campus)' (column 2) and those that are 'located on campus but not owned, leased or operated by UoE' (column 3).

This Introduction highlights what we know and what we don't know. We know there is an environment and climate crisis requiring a step change from our institution to lead in generating innovative solutions (technical, social and environmental) and reducing emissions. We have started the journey, and we have data on our direct emissions. What we don't know, because the data are not fully captured, is the actual scale of indirect emissions and other environmental impact of the University, which account for the largest part of our footprint. We also have not measured the scale of the positive benefit that our University delivers in terms of education and research that changes how the world responds. But these unknowns should not stop us from moving forward rapidly to put a plan in place to respond to the environment and climate crisis as quickly as possible.

Proposed Strategy and Targets

Recommended Strategy:

The University should aim to be a **sustainability and climate change leader** regionally, nationally and internationally; delivered via transformation in its **operation** and in its **educational**, **research, international** and **impact** activities; demonstrating innovation, influence and action.

Recommended Goals and Targets:

➢ **To achieve this we recommend that UoE puts plans and investment in place to meet the following goals and targets (blue):**

Goal 1: To be carbon neutral (net zero) for scope 1 and 2 emissions by 2040 via a front-loaded approach to reduce emissions by 75% by 2030 (against 2005/06 baseline).
- 50% reduction in scope 1 & 2 by 2025
- 75% reduction in scope 1 & 2 by 2030
- 100% (net carbon zero) in scope 1 & 2 by 2040

Goal 2: To ensure we have data analytics so that we can reduce scope 3 emissions by 50% by 2030 with a plan to reach net zero by 2050, whilst aiming to respond faster (by 2040).
- 50% reduction in scope 3 by 2030
- Plan for 100% reduction in scope 3 by 2050 (with stretch target of 2040 for focus areas)
- This goal depends on verifiable data: see Box 2 for some suggested targets.

Goal 3: To pursue a policy of 'environmental net gain' on our estates, and to use our research and education to deliver environmental net gain within region, country and across the globe.
- This goal requires new ways of collecting and presenting data on our impact

Goal 4: To be in the top five Universities in national sustainability rankings within sector by 2025, and in the top three Russell Group Universities.

Box 2: These suggested scope 3 and environmental targets appear later in the document: [All require verifiable data to baseline and monitor]
- Divest from fossil fuel companies
- Long Haul travel: Reduce carbon emissions by 50% by 2025; by 75% by 2030
- Procurement & Waste: Reduce plastic use by 50%; Reduce paper use by 50%
- Recycling: Increase on all campuses to 70% by 2025; and to 85% by 2030
- Hospitality & catering: reduce scope 3 emissions associated by 50% by 2030.

How:

The current allocation of resources, and size of Sustainability team, are not sufficient to deliver on these targets. This will need investment and a step change from 'Business as Usual' – this is at a scale that requires input from **Strategic Delivery Unit** as it affects every part of the University, and every individual within the organization, as well as our collaborators, partners and stakeholders.

With the required resources (which cannot be specified fully without further work) – there is passion and energy to do this from students and staff at every level. Some aspects require top level leadership, policy and strategy change; but others rely on individual and grass-roots engagement.

The University also needs to consider those who have yet to be engaged. Not all staff and students will agree with new obligations and changes required. The risk is that this could lead to disaffected individuals or teams. This will require positive communications and careful change management.

We report on different areas of business (themes), specifying the current position, evidence gathered and recommendations for each. The Executive Summary has a top 20 represented as a mind map Appendix 2. The full recommendations are grouped into four pillars of change:

1. Data Analytics & Reporting - data and potential KPIs required to meet targets.

2. Institutional Change – covering leadership, governance, recommendations for each sovereign strategy, regional engagement and investment of funds

3. Infrastructure: Estates and Digital– covering energy use, buildings and space, water and digital transformation.

4. Underpinning Activities and Environment – covering key areas of UoE business and activity that underpin everything we do, and result in the largest impact on indirect emissions (scope 3) and the environment, including travel, procurement, waste, hospitality and catering, and biodiversity net gain, concluding with essential role of behavioural change, communications and marketing.

1. Data Analytics and Reporting

We need accurate and accessible data across all of our operations and colleges/services to understand where we are starting from and to monitor and prioritise how to reduce our emissions. A report published by AECOM for the University of Cambridge could potentially be adopted as an example of best practice. They use "Science Based Targets" methodology to model and profile their emissions to set targets and KPIs.

Data Analytics Recommendations:

1. Take immediate steps to improve the accuracy and transparency of UoE's carbon emission data.

- Establish a procedure that captures, analyses and reports all of UoE's scope 1,2 and 3 data from its operation, resourced through the Estates Services with support from all University departments. This will require a data package to report on scope 3 (as well as scope 1 and 2) emissions. For example Greenstone or Team Sigma (used for UoE scope 1&2 already).

- Provide further resource for data analytics (beyond current part time position) under direction of the Head of Sustainability to prioritise data collection, analysis and reporting. And require the procurement, finance and IT teams to support the collection of data from UoE's operation to support the Environment & Climate Emergency response.

- Visibility: Make headline data for scope 1, 2 and 3 public in order to demonstrate transparency, and explain issues around the boundaries of that data. All of other data should remain confidential at this stage until it is better understood.

- Use the Sustainability Leadership Scorecard approach to document UoE progress against targets, which should facilitate a rapid improvement in our rankings in the sector.

2. Re-consider the University 'boundaries' for transparency of carbon footprint.

- Expand the 'operational boundary' to include scope 3 emissions. This will provide an overview of various business linkages and possible opportunities for significant GHG reductions that may exist upstream or downstream of UoE's immediate operations.

- Examine the institutional boundary. In the short term UoE should continue to focus on areas over which it has operational and financial control, but this should be examined going forward to reflect the true impact of our organisation, even if it is currently unclear how to fully address it.

3. Show leadership in tackling the challenge of analysing and reporting a) scope 3 emissions, and b) environmental impact.

- Enable staff and students to use an **environmental footprint tool** to calculate their own carbon emissions [Behaviour Change].
- Take a leading role in the sector, by promoting and leading on the creation of an online network of Universities to share ideas on scope 3 data collection and reporting.
- Research methods for collecting more accurate data on food and drink footprint, lab footprint, and from students and staff on travel, and environmental net gain.

4. **Set annual targets and track KPIs for Colleges/Depts to reach longer term goals of reduced carbon emissions and environmental footprint.**

- Require colleges and services to report reductions in their own carbon emissions annually, using a dashboard approach to benchmark and set their own **annual targets** & **KPIs** (e.g. on travel, procurement, energy, biodiversity). Progress will be reported to the **new Environmental Emergency Board** [see Governance], and onwards to VCEG.

1. Institutional Response

Sustainability goals are not visible in the University's values or sovereign strategies. Although in fact, sustainability is an ideal example of where those strategies can come together to really deliver our mission. Figure 4 demonstrates how we could use the synergy between education, research and global strategies to motivate our staff, students, partners and stakeholders to strive towards researching new solutions, enabling behaviour change and educating students to lead the change on a global stage (green) with outcomes of significant benefit (purple goals). We should seize the opportunity to make these ambitions central to our business.

Fig 4: Sustainability at Exeter

Education

New solutions
New social norms
Leaders of change
Reduced emissions
Resilient communities
Environmental net gain
Meet UN SDGs

Global   Research

➢ **Institutional Recommendation:**
As a priority incorporate environmental sustainability into **University's values** and "*climate proof*" every strategy and policy with targets and goals. Ensure climate and environment are embedded in new strategies as they develop.

2.1 University governance structure, guiding values, and accountability

Aim: To achieve a meaningful and sustained culture change with a University governance structure that better balances economic, environmental and social values in implementing its response to the environment and climate emergency paying particular attention to coherence between sustainability and internationalisation goals.

Currently:

The sustainability governance structure is out of date and unclear on the web and in the Environmental Sustainability Policy. The route by which ideas are fed in, and the means by which action is taken and progress reported against KPIs is not transparent. There must be a clear means by which sustainability is fully integrated into strategic decisions by ensuring responsibility of academics, professional services and student unions at senior level.

Governance Recommendations:

To change the current governance structure to institutionalise a meaningful response to the climate emergency over the long term we recommend the following:

1. **Establish a Deputy VC (Sustainability)**, with responsibility for establishing, implementing and monitoring a sustainability strategy for the University and ensuring coherence across the University. This will ensure that sustainability is directed across both PS and Colleges.
2. **Establish an Associate Dean for Sustainability in each College**, responsible for ensuring that College Executive Groups put plans in place to meet targets to respond to the climate crisis. Sustainability should in this way be integrated into College Business plans via the PRG process.
3. **Establish a Director of Sustainability**, with allocated budget and strengthened team, who is a member of the Professional Services Leadership Team. The current position of Head of Sustainability sits within the Estates department but sustainability goes far beyond the remit of this department. We consider this position needs more authority and autonomy. The Director of Sustainability will support the Associate Deans and DVC Sustainability, as the Director of Research Services supports the ADRs and DVC Research & Impact.
4. The DVC will establish and Chair an **Environmental Emergency Board** (EEB) to make strategic decisions, and oversee the implementation and delivery of strategy. The Director of Sustainability will report to this Board in terms of University progress on the agreed plans and reductions. The ADSs and PS leads will report to the group with respect to college KPIs and progress towards agreed reductions. The DVC will in turn report to VCEG.
5. The [Sustainability Vision and Change Catalyst Group](#) (SVCCG) will act as an **advisory group**, supporting the Director of Sustainability with operational activities and ideas. The current Chair, Stewart Barr will step down, handing over the SVCCG Chair role to the new Head of Sustainability (whilst any new governance structure is put in place). The SVCCG should take this opportunity to refresh its membership to reflect actions required from this report and need for expertise in particular areas. It will remain a mix of academic, PS and student reps.
6. **Train a Sustainability Lead in each Prof Service**, with allocated time, to enable sustained change.
7. **Ensure that all students at all levels are actively involved** in decision-making processes throughout. At the Penryn campus this is working very successfully where representatives on Student Green Team work together with the Sustainability Board (UoE, Falmouth University, FXPlus and the Student Union) enabling connected initiatives and faster change.

The new structure must be guided by the following values:

Leadership: Bold and confident leadership to drive and guide a holistic response to the emergency which complements democratisation (e.g. capital investment group).

Empowerment: Sustainability must be championed by a Director of Sustainability who has responsibility for the full range of sustainability activity beyond Estates, working with the ADSust in colleges and members in each strategic UoE committee with a clear remit for sustainability.

Democratisation: Embed meaningful and impactful employee and stakeholder engagement within the university's governance structure. Managers must clearly identify the decision which can be shaped by engagement exercises, establish processes upstream in decision-making to allow for engagement to shape those decisions, and respond publicly to engagement to ensure collective ownership of the problem.

Candidness: Explicit recognition of the difficulties and tensions between the University's conflicting goals (e.g. between sustainability and global reach) in decision-making and development of a roadmap which clearly and candidly outlines steps to reconcile this tension and if it cannot be resolved, then the position and tensions made clear (e.g. dissenting judgement).

Evidence-based: Committees must include relevant university experts to increase the evidence base for decisions (e.g. ethical investment experts on the investment board, circular economy experts on procurement etc). The process of identifying these people should be open and transparent.

*Values***:** Raise the profile of the social and environmental values embedded in all decisions related to strategy, procurement, waste, investing, estates, data use, education, research, catering, retail and hospitality, communications, regional and public engagement, travel, and internationalisation.

Coherence: Strategy committees need to be linked to ensure that the goals in response to the environment and climate emergency are coherent and embedded in all aspects of UoE governance.

Transparency: Publish regular status reports on the website which map the progress toward set targets and goals.

Equity: Consideration must be given to issues of equity in terms of the relationship between UoE and its external partners, and between VCEG, Council, academic and PS staff and students. For example, we found considerable differences between campuses in how sustainability was managed: there needs to be equity between campuses in terms of policy, investment, resourcing and reporting.

*Tools***:** At Council, and at all levels of University, the case made for spending carbon on projects should be as clear as the case for spending money, and decisions should reflect this. To do this UoE needs to make tools available (e.g. whole life cycle analysis, environmental footprint tool) to enable decision-making and evaluation of trade-offs related to climate costs. In this way VCEG, Council, academic and PS staff and students can calculate and compare alternatives or off-setting options.

2.2 Education in Environment, Climate and Sustainability

The Education theme addresses a broad-ranging set of core concerns: to embed sustainability and climate change into core elements of our curriculum, education operations, the student experience, University reputation and how we prepare students to become change agents as graduates. A critical objective is to make sustainability and climate change an unmissable and core element of the University's brand and to be able to demonstrate this through everyday operations. How we embed sustainability and climate change into our learning and teaching will have a profound impact on how our students can individually and collectively promote social, economic and ecological change as graduates.

Education in Environment, Climate and Sustainability is central to UoE's response to the Emergency both because we urgently need to embed these issues into our learning and teaching practices, but also because UoE is strategically well-placed to become a leader and innovator in this area through its unique combination of world-leading climate and environment scientists and scholars, and its recent investment in pedagogic innovation. In short, we have this opportunity to make UoE a global leader in environment, climate and sustainability education – and to do so with complete conviction.

Currently:

UoE scored 76.5% for 'Education for Sustainable Development' in the 2019 PPGL, well short of the 95.5% scored by the top University in the league (University of Gloucestershire). Despite this, there are clear areas of excellence driven by individual staff and teams, and the SVCCG. For example UoE: **i)** came first in this year's NUS SDG Teach-in, celebrating teaching in relation to the UN's Sustainable Development Goals; **ii)** won a Green Gown Highly Commended award for its careers for sustainability work, encouraging students to use academic skills to work with non-academic organisations on environmental issues; **iii)** is a member of Dissertations for Good, an NUS initiative encouraging student research for environmental sustainability and social justice; **iv)** Climate Change MOOCs have been highly successful, the new MSc in Global Sustainability Solutions has recruited 21 students in its first year demonstrating demand [Suppl S1 and S2 for module & employability audits].

From our investigations, the University's main weaknesses in this field lie in a lack of strategic cohesion and consistent policies that embed sustainability into the curriculum, make UoE a global leader in this field and reduce carbon impacts through education activities. Particular issues include:

- A critical lack of prominent presence in the new Education Strategy which has the opportunity to clarify, outline and provide direction on our approach (SVCCG recommendations submitted to Education Strategy consultation Suppl S3).
- A low profile for education for sustainability in current programmes, with relatively low visibility in our Flexible Combined Honours programme: a real opportunity to develop new pathway.
- A lack of clarity about how students can learn about sustainability, make contributions and be supported to do so through their whole time at the University;
- A need to support and reward academic and PS staff who engage with sustainability education.
- A major gap between our rhetoric around the climate crisis and our practice in terms of education-related travel. For students, this includes overseas field trips by air, alongside staff travel to promote programmes.

Triggered by sensitisation to the climate crisis, there is increased scrutiny and discussion about the carbon footprint of student field courses. We did not have capacity to collate the data and do a full analysis, and note that field course emissions are not fully included in the travel data (Fig 1) because trips are booked in different ways. We took the simplistic approach of estimating the carbon footprint of the most direct flight to the destinations of each field course outside of the UK (total 53 courses) multiplied by the number of students on each (total 1337 students) to get an overall picture of the scale of emissions in 2018 (data available to VCEG on request). Just the flights for these courses cost **2,100 tCO₂e** – which scales at about **2.3%** of the total UoE emissions estimate so deserves consideration (Fig 1). This does not include staff travel, internal travel, or subsistence or any other carbon costs. It also does not capture the potential benefits of the trips. In some cases it can be argued that there is pedagogic value, personal development benefits, and indeed the local community or environment may benefit from these trips. But in many cases the pedagogic and social goals of field trips can be achieved through local, national or European trips using low carbon travel modes. Currently, exotic field trips are also seen as a Unique Selling Point for some of our programmes: although this may well flip with a new generation of climate-savvy students applying to University. Indeed some of our students are already questioning the need to fly long-haul on trips. Note: it is important that Unions are engaged in the discussions, and that field trip recommendations are proportionate to recommendations on staff travel, and other energy intensive activities in the University (e.g. in labs) so students do not consider they are being unfairly penalised.

Education Strategy Recommendations:

1. **Education Strategy:** Environment, Climate and Sustainability needs to be prominent in the Education Strategy to demonstrate senior management endorsement. Revise strategy to:
- Set out a vision for education for sustainability & climate change and the values that underpin it;
- Provide a strategic framework for a core '**Exeter Student Sustainability Portfolio**' for all UoE students, as a duty of the institution to respond to the emergency;
- Outline how disciplines should respond to the emergency in the way they plan curricular and manage their operations, e.g., student travel
- Clarify the support that will be given to staff and students to respond to the emergency.

2. **UoE should sign The Higher Education Sustainability Accord**. "*Leaders of institutions sign to make a corporate commitment*" to work towards the UN's Sustainable Development Goals.

3. **Develop the Exeter Student Sustainability Portfolio:** a cumulatively building set of achievements and activities for students, grounded in a core 5-credit online Sustainability module taken at stage 1 for all students. This would be a joint Guild/Union-University effort and would be designed to become the norm amongst students, increasing carbon literacy and **'sustain'ability'** (learning to know, learning to critique, learning to make change, learning to be and care). This grounding will enable students to identify opportunities for developing their sustainability portfolio over their degree, via different routes: **Academic (**modules, FCH sustainability pathway, low carbon field trips, 'living laboratory', research and dissertations);

Employability (placements and consultancy); **Volunteering** (local activism and supporting communities). Make sure this meets accessibility requirements. Possibly integrate this into academic programmes, so that 5% of a summative degree mark is based on a student's contribution to SDG's. A dedicated **Environment & Climate Emergency Grand Challenge strand** is recommended, potentially following up the best student projects with support from Annual Fund or '***Exeter Climate and Environment Fund***' [described in Global theme].

4. **Field trips and student and staff travel for learning and programme promotion.** With the Students' Guild and Student Union, the University should radically reduce its scope 3 emissions arising from staff and student travel for both field trips and programme marketing. This is critical because such travel has both a relatively high carbon impact and also sends a negative signal about our commitment. It is also likely that if we do not make a major shift in this direction now and show leadership, we will be required to do so through following others. We propose:

5. **Reduce international field courses immediately** by swapping for new short distance, or virtual, field courses to replace current carbon intensive ones. This needs **immediate** attention given the time it takes for new courses to get through programme approval.

- Have a default position of ***no long haul flights for future field courses*** (unless fully justified).

- Justify remaining carbon intensive long haul field trips using a decision tree, for example:
  A: Does the course:
  - bring significant pedagogic gains?
  - positively impact the wider community?
  - embed sustainability content?
  - result in environmental net gain?

  B: Could this course be just as good (or better) in a closer destination e.g. UK/Europe?

  C: Does the location support slow travel?

- Use all field courses as an opportunity to increase **carbon literacy** amongst students. Challenge students to think about the impact of flying and the difficulties faced with offsetting in an attempt to mitigate their flights. Encourage each individual to take responsibility for their own carbon emissions as a result of the course with guidance from module convenors.

- **Offer choice** so no one has to go on a compulsory long-haul field trips

- **Be transparent** in programme marketing and media campaigns about field courses to communicate a thoughtful approach to tackling long-haul travel without diminishing benefits to students - this should help drive a change in culture and expectations from staff and students.

- Provide funds to ensure that rail or other travel options are promoted and become the social norm, alongside exploring how travel itself by low carbon modes can be of pedagogic value.

- Become a market leader in innovating to develop **low carbon online learning experiences**: finding ways to promote programmes online and through virtual learning (such virtual field courses, distance learning and MOOCS in particular which also may attract students to apply as full UoE students), thereby reducing the environmental and wellbeing impacts of staff travel. There is considerable pedagogic and technical expertise to provide valuable pedagogic experiences, without the need to travel. With the right technology, we could offer paid international teaching online in a blended classroom experience with local and distant students. [Digital]

It cannot be over-emphasised how critical such moves are to demonstrate our commitment as a University: we simply cannot perpetuate a culture of high carbon travel and course promotion activities. [See also Travel].

5. **Sustainability in Education Annual Conference:** for sustainability educators, students and learning professionals across the region to share experiences, best practice and learning

opportunities, led by UoE and designed to develop regional community of practice. Jointly run between with the Guild and the Student Union, including student research. Linked to the conference: a jointly-run student-staff online peer reviewed journal showcasing research.

6. **Marketing the University as a key learning centre for sustainability**. If we can deliver the other actions proposed here, then a step change in our marketing is required. It should be bold and cutting edge, attracting more students ambitious to tackle the climate crisis from all directions. We should be promoting what we do and encouraging others to follow.

7. **Staff development:** provide enabling pedagogic resources and training for staff to develop their expertise in sustainability education and practice.

2.3 Research Strategy for Sustainability

The global positive impact that UoE research is having on the environment and carbon emissions is a jewel in the institution's crown: from IPCC authorship, to renewable energy technology, to changing policy on microplastics and marine protected areas, to supporting the health and well-being of rural communities facing the challenges of locally severe climate change (to name but a few). The Lenton Review (2013) demonstrated that there were about 200 staff engaged in sustainability research across all colleges, earning circa £16-20M pa research income which was 30-35% of the UoE total at that time. It highlighted that we have the strongest group of climate researchers in the world, and impressive engagement with the public and private sector (e.g. Met office, SW water) to implement sustainable solutions. In the ensuing 6 years, the volume and reputation of our environmental and climate research has only increased – but the actual shape and scale of it needs revised mapping. On the UoE website, we counted over 25 Institutes, Centres, Hubs and clusters of researchers focussing directly on sustainability and climate research; mostly with a strong inter-disciplinary framing. This is impressive but also confusing. As the Lenton review argued, we need to present our strengths in this area much more clearly, and use the evidence of outcomes to explain why we need global partnerships and the benefit gained from those.

One trade-off to this impressive research portfolio is the environmental "cost" of that research in terms of travel, energy and resource intensive lab work and IT, sponsorship and so forth (covered directly in other themes). So – this is a transitional moment when we will need to justify these research costs against the benefits and outcomes, beyond the economic, in a much clearer way than before. Not only is this expected of us by our community and stakeholders, but it is also likely to become a feature of future research sponsorship to justify the 'carbon cost' of our endeavours.

With regard to research sponsorship, we are likely to come under increasing scrutiny as to whether it is environmentally ethical to accept all available sponsorship from fossil fuel companies, or other funders with known environmental impact; or whether it would be judicious to base such decisions on the topic of the project, and whether the outcomes are likely to have a positive environmental impact (e.g. if the research relates to renewable energy, or mitigation) [see Divestment].

This is also an opportunity to show research leadership into how to solve the paradox of continuing to grow and flourish as an institution whilst cutting our carbon footprint. This is relevant to all organisations and businesses, and not just the University sector. With our combination of experts in ESI, GSI and all colleges, this should enable us to find globally relevant solutions to the challenge.

Research Strategy Recommendations:

1. **Research & Impact Strategy**: Sustainability and Climate Change needs to be prominent in the Research Strategy. We recommend that it is revised to:
- Set out a vision for research for sustainability & climate change and the values that underpin it
- State that all UoE staff are expected to follow the '*Sustainable Research Framework*' (see below)

2. **Re-present all environmental and sustainability research and structures** on website to present cohesive picture: it will improve marketing of UoE sustainability research, and attract students.

3. **Design new '*Sustainable Research Framework*'** to steer research practice: from how to incorporate into grant proposals (providing accessible information on how to cost sustainable options for travel and equipment) to how to manage intensive research, reduce waste, maximise environmental benefit and reduce carbon emissions. This may involve environmental justification of research sponsorship [see Divestment] or of energy intensive research.

4. **Stimulate and pump prime innovation to find environmental solutions:**
- Hold international, virtual summit [see Global theme] to showcase UoE as thought leaders
- Use '*Exeter Climate and Environment Fund*' [Global] to support UoE focussed sustainability ideas.
- Consider pro-bono research/consultancy hub to share our expertise with the region to respond to climate crisis [Regional].
- Create a Climate Crisis research project ideas hub for undergrad and postgrads.
- Increase use of our facilities, estates and community as 'Living labs' for testing ideas.

5. **At college level** *[also see other themes]*
- Build discipline specific plans to work within the Sustainable Research Framework and reduce environmental footprint of research where-ever possible.
- Cost grant applications with sustainable options (travel, equipment, catering)

2.4 Global Strategy and Internationalisation

The University has the ambition to be a globally influential University, and to do this partly by increasing international student numbers and partnerships. A University with a significant global profile is able to achieve greater impact from its teaching and research – and make a difference on the world stage, creating and supporting leaders of change. So, how do we do this in the context of a climate crisis, where there are inherent contradictions in terms of resulting carbon footprint from internationalisation (primarily through frequent long haul travel)? As well as the need to reduce carbon emissions and environmental impact for the sake of the planet, there is increasing public scrutiny of such activity. This is a key challenge for all Universities, both in the UK and across the world that we aim to partner with, so co-created solutions and responses are essential. Indeed we could learn much from the sustainability journies of some of our global partners e.g. UBC.

We contend that the best way for UoE to show leadership will be to tackle the opposing goals (more internationalism vs less international travel) by facing the challenge head on, rather than avoiding it, and **'break the silence'** by endeavouring to ensure our international activity via research and education makes a net contribution towards meeting carbon targets and sustainability goals (SDGs) rather than the opposite, as illustrated in Fig 4. The silence: we could find no mention or acknowledgement of the carbon footprint of internationalisation in the UoE strategy, on the website, or in associated presentations. We have recommended some innovative routes by which the global strategy could start to become compatible with our journey towards carbon neutrality but we do not yet have all the answers. It goes beyond reducing flights, it is by no means straight forward and it needs urgent attention and work. It will involve choices of partners; how to engage them and justifying the benefits of such engagement; including the benefits to and from incoming international students. In itself this challenge could lead to interesting research and outcomes on the costs and benefits of the global agenda; and means by which it can result in environmental net gain.

The benefits of a sustainable strategy for internationalisation will not only be a reduction in emissions and environmental impact and considerable cost saving. But importantly, the University will hold an explicit and transparent position that can be defended against increasing scrutiny, and could indeed be championed as a responsible way of doing business in this crisis.

Global Strategy Recommendations:

See also recommendations for Digital; Business travel; Education field courses.

1. Revise Exeter Global Strategy to embed sustainability and ensure the strategy *contributes* to lowering emissions and creating solutions.

- Set out actions to meet new carbon targets in key areas e.g. reducing long haul travel, employing more locals at remote partner sites to reduce air miles for occasional visits.
- Review the marketing and communications of the strategy so a **full 'climate-conscious' explanation** can be given for **a)** the outbound work being done and **2)** the inbound students being welcomed.

2. Review and document UoE's environmental footprint as a result of the 5 pillars of the Global Strategy. This will require improved data capture and analytics [see Data] but will enable UoE to report against this sovereign strategy in open and transparent fashion.

New initiatives:

3. Top slice a % of international student fees into a new '***Exeter Climate and Environment Fund'*** for climate crisis research, educational projects or infrastructure innovation to tackle emissions, fuelling the University's drive towards carbon neutrality and environmental net gain. (We suggest 5% in first instance; but profiling and a business case would be required to set the level.) If the carbon emissions of international students travelling home is as high as we have estimated at 20k tCO2e, then this would mean this component alone was around 19% of UoE's estimated total emissions (Appendix 4) This fund could also accept contributed levies added to long-haul flights [Travel] and potentially offsetting other activities such as energy and plastic intensive lab work [Labs]. The fund would be managed and distributed by the DVCSustainability and Environmental Emergency Board. The benefits of such an internal fund is that UoE have control over investing it in projects leading to carbon neutrality for UoE and the region e.g. supporting academics and students to do research and conferences via land-based travel; or promoting innovative carbon saving initiatives like planting UoE woodlands [Biodiversity]. It would send a positive message to students and community alike to demonstrate how seriously UoE are taking their responsibilities in this area.

4. Develop "Climate-compatible global partnerships for the 21st century". Start with a developing partnership where both sides have similar visions towards carbon neutrality, for example UBC who are already strong in this area, and imagine what commitments could be drawn into the MoU to show action e.g. co-investing in state-of-the-art virtual meeting facilities, or agreeing to do 90% of partner meetings without travelling. This could then be developed towards all existing and new partnerships going forward to spread best practice. Also consider prioritising European partnerships.

5. Hold an international virtual summit on "*How academia can reach global goals without trashing the climate***".** This will show leadership by 'breaking the silence' on this topic with the sector and funders, and potentially generate new research and pedagogy that can be championed.

2.5 Regional and Public Engagement: SW-CAN: SW Climate Action Network

UoEs engagement with the SW region covers a wide range of strategic and operational activity within Colleges, PS departments and also activities undertaken beyond our campuses and in partnership with others. We consulted broadly on the following topics:

- Civic University
- Community engagement strategy / the University in our community(ies)
- Regional partnerships / economic, development and innovation (and skills) programmes
- Public engagement / engaged teaching and research
- Arts, culture and engagement
- Regional facing collaborative research, contract research & consultancy & research impact
- Student interaction and engagement in the region (unions, societies, placements, projects)
- Regional inclusivity and environmental justice

Whilst UoE's response in this area will likely contribute little in the way of direct or immediate carbon impact on Scope 1, 2 or 3 emissions of UoE, it is critically important in driving cultural and behavioural change both within the University (staff and students) and with the community and supporting long-term wider strategic, multifunctional, business resilience and development priorities, including **i)** Reputation and partnership management (e.g. in terms of student recruitment, regional expectation & global leadership); **ii)** Strategic alignment and integration (Civic University, community engagement, regional engagement strategies alongside alignment with Local Industrial Strategies); **iii)** Income generation and investment in our strengths (e.g. securing and levering further regional investment e.g. Environmental Intelligence Accelerator, , Tevi, and Industrial Strategy); **iv)** Market leadership and position (league tables and relationship with UKRI and Government Departments (MHCLG, Defra, DfID, BEIS etc), REF, TEF and KEF.).

Currently:

There is an inconsistent approach as to how the University responds to requests for help and information on the environment and sustainability from regional partners i.e. local authorities. There is scope to clarify our offer and explore collaborative funding/leverage [Regional Strategy Group paper, Suppl S4].

There needs to be alignment with wider regional carbon/climate emergency targets with UoE (as a business) to meet regional expectations, and sign up to their plans of action. The proposed targets support the regional efforts although do not match them directly: Devon County Council's goal is to be net-zero by 2050 at latest, and Cornwall Council's ambition is to make Cornwall net zero by 2030.

To collaboratively lead a response to climate change in the region we need to demonstrate that we are reducing our own institutional emissions, share lessons learnt, activities & outcomes with regional partners, learn and co-design solutions in partnership. Whilst UoE has world-class expertise in climate and sustainability research this does not mean we're leaders in developing solutions to the challenges we face. We need to co-design solutions across the region and create networks of change, which can scale up to work on solutions with national and global partners. The considerable positive regional engagement already being undertaken (collaborative research projects, £80m of RD&I projects, green consultants, community engagement, student projects and placements etc) is not coherently mapped, made accessible to potential new collaborators or evaluated overtly in terms of its impacts (actual and potential) positive environmental/climate impact. **We evaluate the University regional economic impact but why not our strategic environmental impact?**

Regional Recommendations:

1. Establish a SW Climate Action Network (SW-CAN). The SW-CAN would operate as a One-stop shop for climate relevant Data + Tools + Guidance (knowledge sharing & co-design) + Action Research. It would need funding to establish, with allocated IIB and academic leadership.

- Provide mechanism and funds to enable UoE staff to respond to data and information requests.
- Set up Climate Knowledge Hub online; regionally mapping our existing data, tools and research, including public engagement, student, and arts and culture activities
- Create a data observatory (new and existing data) for regional climate emissions (scope 1-3) and environmental quality, freely accessible to all.
- Appoint Impact Fellows on key themes to co-design solutions with Councils and other actors, turning Climate Emergency declarations into action (secondments, co-funded posts, pro-bono funding from University on regionally significant projects).
- Host staff secondments from partner organisations to work on solutions and vice versa

2. Support integrated development of strategy across the region via the SW-CAN:

- Establish formal partnerships with local authorities and partners (i.e. Exeter City Futures, Exe Community Environment Hub) across South West; signing MOU/collaboration agreements.

- Support Local Economic Partnerships and Local Nature Partnerships in the development of environmental plans and strategies.
- Work collaboratively with councils and other actors who wish to hold **citizen assemblies** as part of their local response to the climate crisis.
- Launch co-designed actions and lever investment. Define applied research gap and opportunities for strategic investment i.e. Climate Change and Health (ECEHH)

3. Mobilise and engage students (UG & PG), through the SW-CAN to contribute to regional solutions and environmental net gain. Work with the Guild and Student Union, and Student Employability, to ensure opportunities for student engagement in regional climate change and net-gain activities are maximised. This will facilitate student project and placement options, and associated activities (i.e. Green Consultants and Grand Challenges) to work with regional businesses and communities supporting regional clean growth and net-gain.

Beneficial outcomes: accelerated emissions reduction across SW; reputational enhancement and resilience to climate change both for UoE and SW region (high quality environment and net zero emissions); regional relationship enhancement and business opportunities. Importantly these actions would establish the south west as the **region of environmental 'net –gain'** - regional USP that aligns with our local environmental and economic strategies and seeks to offer a place-based response to rival the Northern Powerhouse.

2.6 Divestment of Funds

Whilst it is not this group's remit to determine investment policy, we have had many requests to consider this and the UoE Chief Financial Officer provided helpful information on the current policy, and the approach of the investment fund managers. As at Oct 2019, Exeter's endowment fund investment portfolio is valued at around £37m. Good progress has been made in reformulating the UoE investment policy: this includes **1)** the appointment of Rathbone Greenbank Investments (RGI) as our new fund managers who are tracking how our equity investments align with the IPCC recommendations for a 1.5°C/2°C target and are currently developing methodology to monitor how investments across different asset classes and industries align with the government's net zero by 2050 ambition; **2)** Revising policy to avoid investments in the extraction of thermal coal or the operation of oil sand assets; **3)** Investing in renewable energy through: the procurement electricity from renewable generators; a new power purchase agreement with wind farms; a PV installation programme on our buildings; and through the diversifier assets in our investment portfolio.

Whilst this progress should be celebrated, our current investments still have a carbon footprint because we do not exclude oil and gas from our portfolio. RGI report two measures of portfolio-level carbon data. The first is the portfolio carbon footprint, looking at reported scope 1 and 2 emissions of direct equity holdings. As of 17th October 2019 our direct equity holdings have a carbon footprint of **2,180 tCO$_2$e per year** (which count as scope 3 emissions). This is around 2% of total estimated emissions of the University as a whole (Fig 1) and similar to that for field trip travel. It is important to note that the total carbon footprint from our endowment fund will be higher than this because RGI are only currently reporting on direct equity which is 43% or our total portfolio. They don't report on the wider carbon footprint of other asset types because they can be measured in a multitude of different ways and rely on estimates of estimates because of the nature of the different holdings, our ownership share in them, and how they are reported on by the companies involved. The second figure RGI report on is embedded carbon, looking at the potential future emissions associated with the fossil fuel reserves of our energy sector investments. As of July 2019, RGI data shows that we have a potential exposure to a total of **37,339 tCO2e**. These emissions are linked to the limited shareholdings UoE have in oil and gas companies within our portfolio, and they cover the risk associated to the companies extracting all their Proven Reserves of oil and/or gas they hold, based on the percentage shareholding we have in those companies. This exposure to 'embedded carbon' is described as 'small' by RGI – but if UoE aims to reduce to carbon zero by 2040 as proposed, then the

total UoE cumulative carbon budget for scope 1 and 2 is **164k tCO₂e** (assuming a linear reduction from Fig 2). So with an investment exposure of 37,336 tCO₂e this is comparable to **23%** of UoE's cumulative scope 1 and 2 budget.

The arguments are nuanced and the perception of the University values by staff, students and public alike is bound up tightly in the choices of investments it makes. While the University continues to hold investments in fossil fuel companies the significant reputational risk that comes with this will remain (our climate scientists are being openly questioned at conferences about the University's position). We support a view that UoE should not be seeking to generate profit from investments held in fossil fuel companies who generate income from the extraction and use of fossil fuels as this directly conflicts with the global climate efforts and our Declaration of the Environment and Climate Emergency. Divesting would bring UoE in line with the 13 other Russell Group Universities that have committed to fully divest from fossil fuels, putting us in the leading group of institutions; and would importantly reduce our annual overall emissions.

➢ **Divestment Recommendation 1:** The UoE fully divest from all fossil fuels in its endowment fund and update the Investment Policy to that effect. UoE should not invest in companies that get more than 5% of their revenue from fossil fuel extraction. We also recommend that UoE uses its influence to ask those pension funds in which we have interests to work towards divestment, including the £100m of assets within independently run ERBS pension fund and USS.

Also, there is currently a lack of clarity about what approach UoE takes to accepting sponsors for research, education and infrastructure, particularly with regard to the environment and climate risks [Research theme]. As with divestment, there is growing reputational risk and scrutiny; and there are conflicts between the internal policies. In October 2019, updated research from the Climate Accountability Institute, picked up in the mainstream media, showed that just 20 companies, largely the oil majors, are responsible for one third of all carbon dioxide emissions since 1965, despite them knowing the dangers. In addition, projections from Rystad Energy, a leading Norwegian oil data consultancy, suggests that despite the warm words from many big players, most are seeking to increase their production of oil over the next decade, including Shell. This will make it increasingly hard to justify accepting funds from these companies. We support the view in the Reputation Management & Philanthropic Income policy paper (v.28), that the university should *"manage philanthropic income in a transparent, systematic and open fashion. This is because it is the right thing to do, because it protects our University, our colleagues and ourselves from legal action, and because it reflects and defends our reputation in the eyes of our students, staff and stakeholders".* We also understand that income directly from fossil fuel companies makes up only a small part of our current research awards (1.6%), but justification may be warranted.

➢ **Divestment Recommendation 2:** Set up a task and finish group to develop an open and transparent policy for how UoE considers funding and in-kind offers from fossil fuel companies for research, infrastructure and education.

3. Infrastructure: Estates and Digital

3.1 Energy Plan

Energy use and its associated emissions are central to the environment and climate emergency. It includes all direct emissions associated with scope 1 & 2, as well as making up a large component of scope 3 emissions via energy used to grow, make or dispose of items. Any strategy to address our energy use is not just about technological change, but also considerable cultural change across the whole institution. Given some of these issues are picked up in other themes, the main focus of this section is on energy use in our building stock, linking to UoE's existing energy and carbon reduction programme (LCCIP: Low Carbon Commitment Implementation Plan).

Currently:

Energy use across the University's campuses accounts for around **16%** of our direct emissions (Fig 1) (scope 1&2)[3]. Figure 5 shows the difference sources of energy, illustrating that even if all our electricity is from renewable sources, then **43% is still oil or gas**. Figure 6 gives an indicative breakdown of scope 1 & 2 carbon emissions within the University's buildings. Heating of space accounts for ~ 30% of these emissions, whilst cooling and ventilation accounts for ~17%.

Figure 5: UoE carbon emissions from energy use for 2018/19 (tCO2e)

Fig 6: Energy use in buildings, Streatham campus
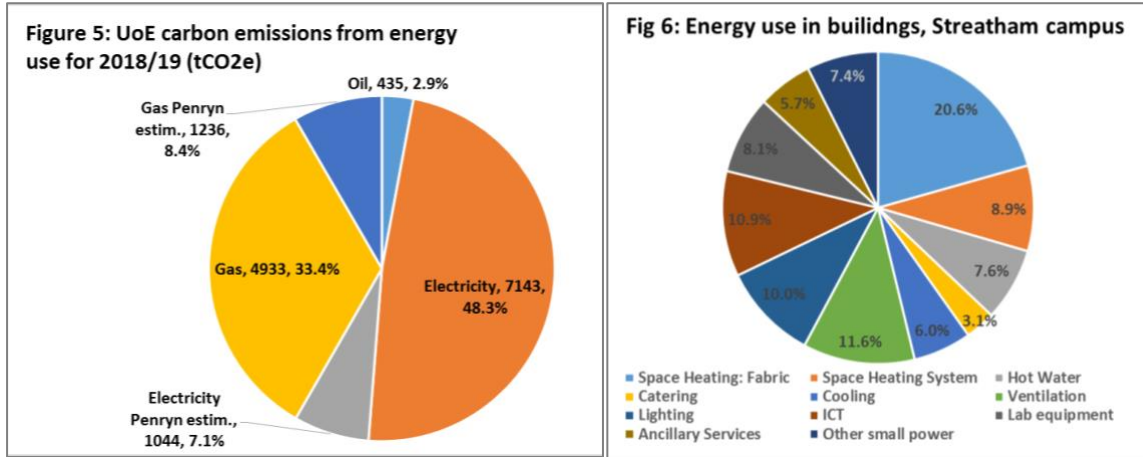
The LCCIP is on target, with the completion of low carbon projects **saving circa £150,000** and **555 tonnes of CO₂e** per year so far. The LCCIP encompasses smart principles and building optimisation to create a campus and buildings that are not just energy and carbon efficient but are able to adapt to changing regulations (such as electricity distribution costs and decarbonisation) in the utilities network and enable future expansion of the University. This provides strong momentum, but the pace of change needs to accelerate to meet the more ambitious targets we propose, and this requires significant investment.

The Russell Group and University sector as a whole need to work in collaboration to ask government for clear regulatory and legislation measures across a range of issues such as decarbonisation of the gas network, robust procurement standards and sustainable transport networks. This is an opportunity for UoE to provide some thought leadership, given our expertise in flexible renewable energy systems, life cycle analysis and sustainable procurement, Innovation will play a part in achieving targets so **we need to be ready and willing to be an early adopter of the emerging technology for the built and digital environment**, whilst appreciating that this may increase exposure to risk. Discussions with other Universities via the Alliance for Sustainability Leadership in Education (EUAC), Russell Group and The Energy Consortium -Education (TEC) show innovation spread across the sector, including UoE. Some examples include Exeter University Clean Energy Power Purchase Agreement and IOT lighting, Keele University Hydrogen heating gas replacement and Bristol University Sustainable Laboratory programme.

Energy Recommendations:

To meet the targets laid out on pg8, **the LCCIP will need to be extended to include additional capital funding and resources over the next 20 years to reach carbon neutrality by 2040.** Firstly, reaching the target of 50% scope 1&2 reductions to 2025 (instead of 2026 which is current target) is possible within the funding already approved, if it was agreed by Council and VCEG to bring spend forward by one year. Plans then need to be developed to 2030 and 2040, with an aim of reducing scope 1&2 emissions to net zero by 2040. A cultural shift is also needed across the whole University

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[3] Data covers Streatham, St Lukes and Penryn (for the latter this includes buildings that are fully owned by Exeter University and 50% of energy use in shared buildings).

from VCEG through to individual staff and students in terms of energy use in a combined socio-technological 'revolution' to achieve net zero.

The recommended targets will require the following actions to be taken:

Short term actions (now – 2025)

1. Bring forward approval for capital expenditure within current LCCIP to achieve revised 50% target by **2025**. This includes completing the LED lighting replacement programme across all campuses (lighting is typically 10% of energy use in a building), and completing Solar PV building mounted programme across all campuses.

The following need extra resource beyond current LCCIP:

2. Develop a Low Energy/Carbon New Build and Refurbishment Strategy

3. Establish a framework for the provision of the Building Optimisation programme

4. Implement sustainable laboratories programme to reduce energy use with labs (SLABS)

5. Undertake feasibility and install additional EV charging infrastructure across all campuses – *[some capital approved but resource needed to further development]*

6. Undertake feasibility and develop programme for conversion of Gas to zero carbon: requiring provision of Ground/Air Source Heat Pumps, Hydrogen systems, Combined Heat and Power and Battery Storage.

7. Develop a budget profile and programme for scope 1&2 net zero carbon from 2040.

8. Set up an **Energy Transitions Advisory Group** of staff and students with expertise in energy transformations (social sciences, engineering, business school etc) to deliver low emissions services across campuses (thermal comfort, lighting, cooking, power, comms etc).

Medium term actions (2025 to 2040)

9. Finalise upgrade to building fabric for existing building stock to increase efficiency (window glazing, insulation etc) during refurbishment

10. Explore opportunities for further renewable energy installations such as PV arrays on car parks.

11. Replace all energy inefficient ventilation and air conditioning systems

12. Introduce new smart grid network including battery storage and develop large scale campus community-wide energy projects such as District heating.

13. Carry out and finalise decarbonisation of the gas network on all campuses through changing gas heating to electric heat pumps or Hydrogen.

14. Finalise provision of offsite renewable energy generation or Power Purchase Agreements to account for remaining carbon not achievable through the efficiency programme.

An initial approximate investigation of the major potential capital required to achieve a net Zero Carbon target for scope 1 & 2 by 2040 is given (Table 1). **Note**: this includes costs that are already approved, so the timeline below (Figure 7) shows the estimated likely investment still required in green of **£72 million**, spread over 20 years. This is an initial indication of the major programme elements and figures should be treated with extreme caution. It does **not** include estimates of the **considerable saving** that will be made in reducing energy usage and improving efficiency, and some of the works would be part of a long term replacement of existing equipment as it comes to its end of life. Further profiling and programme development is required. Regular monitoring is also needed to keep track of changing costs and potential carbon savings, including tracking national policy and action to decarbonise the gas grid and ongoing decarbonisation of electricity grid.

Table 1: Estimated capital required to reach net zero direct emissions by 2040

Net Zero Carbon Initiative	Indicative Capital Cost	Estimated Carbon Saving (tCO2e)	Financial Impact (+) positive (?) unknown	Approximate payback time
Lighting Improvement programme	£5m	891	Reducing electricity use (+)	4 -8 yrs
Solar PV programme on buildings	£5m	800	Offsetting purchase of electricity (+)	5 - 8 yrs
Improve efficiency of current ventilation & air-con	£14m	1,308	Reduced electricity consumption (+)	6 - 12 yrs
Ground / Air Source heat pumps	£40m	3,389	RHI subsidy and reduced fuel costs (+)	8 - 10 yrs
Provision of Hydrogen Generation	£20m	1695	Unknown cost of future Hydrogen (?)	10 yrs +
Provision of Combined Heat & Power and Energy Storage	£15m	1,270	Variable electricity tariffs & maximising use of self-gen electricity on site (+)	~ 10 yrs
Provision for offsite renewable generation /Power Purchase Agreements	£10m	3,137	Offsetting cost of building electricity (+)	8 - 12 yrs
Carbon reduction through engagement plan	TBC	1,481	Reduced electricity and heat use (+)	TBC
Carbon saved through carbon efficient procurement	TBC	840	N/A	TBC
Total	**£109m**	**14,811**		

Fig 7: Approximation of capital required (green £'000) to reach carbon net zero
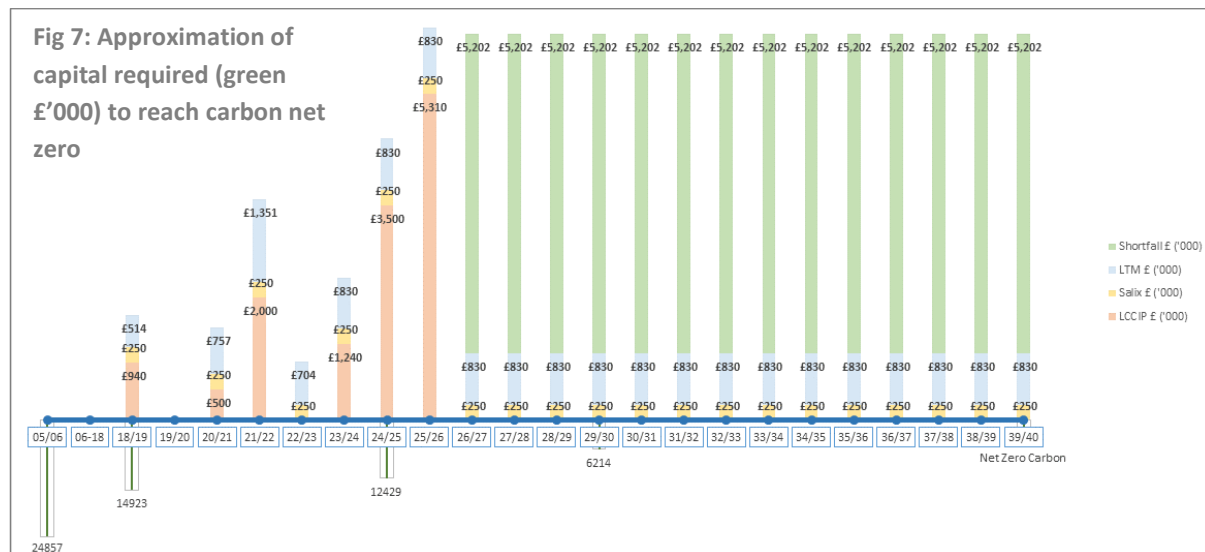
3.2 Buildings and Space

The total UoE Estate comprises 153 Ha and the operation of circa 282,600 m² of building by Gross Internal Area, (GIA) a measure of all internal spaces in our buildings. The buildings take up land and require natural resources to construct and maintain. They contain embedded carbon (in construction and contents) and generate scope 1, 2 and 3 carbon emissions, as well as having environmental impact in terms of water use and waste generation. The GIA is made up of: Streatham 63%, St Luke's 9%, other sites in Exeter 14%, Penryn 14% and Truro <1%. Some of the Penryn spaces are shared with Falmouth and we are renting some spaces in other locations on a small scale. 26% of this GIA figure is 'balance space', which includes circulation space, WCs, plant rooms and similar, and is typical for an HE Estate.

Usable space is divided up into residential (32%), offices (22%), labs (15%), learning & library (16%), sports & social (9%) and other (6%). A significant number of our buildings are inefficient in terms of energy use and space utilisation and fitness for purpose, and the majority of our buildings are well short of BREEAM excellent (our criterion for new build). 17% of this space was built pre-1950's, 30 % 1960-1980, 18% 1980-2000 and 35% post 2000.

Whilst we already have the smallest non-residential space allocation per student in the Russell Group (43% below the Russell Group average), if we can maximise space use efficiency, we can have a smaller associated carbon footprint and use less land and natural resources.

The University is still in a period of growth of research power and student numbers, so inevitably there are increasing demands on existing space and pressure to build new spaces. Our current policy is to construct new buildings to BREEAM excellent as a minimum standard. The BREEAM excellent criteria exclude the unregulated carbon emissions associated with equipment used within the building. It is important that we learn from the running of buildings where UoE have striven for environmental excellence at build stage, but where performance may be different from expected. The ESI building (opened 2013) was built to BREAMM exceptional standard, but has the highest energy usage of all buildings on Penryn campus (annual energy consumption 571kWh/m^2 compared to Peter Lanyon building 91kW/m^2). This is partly because of the way the Combined Heat and Power system is working, but also because of the quantity of energy intensive equipment in the labs. The REEF building (opened 2018) was subject to value engineering during the building phase which resulted in dropping a number of energy saving features: a smaller heat pump was installed supplemented by a gas boiler. By investing in specialist consultants at the planning stage instead, some compromises could have been avoided. Although in this case the building benefits from being used by the renewable energy cluster so the smaller heat pump is in fact adequate (despite the consultant's calculations), the gas boiler has never been needed (so the cost could have been saved), and the building is being used by academics to demonstrate smart grid technology, and innovative solar recharging of boreholes.

The previous theme focussed on large scale infrastructural changes required to reduce energy use (scope 1 & 2). This section focuses on additional significant (often less costly) actions relating to buildings and space to reduce scope 1, 2 and 3 emissions, improve the environment, and also generate long term financial savings. Achieving these actions is a **mass participation exercise with collective responsibility** and will require the entire community to fully participate. Cultural and behavioural norms need to change and action should not be left to Estates and FXPlus to achieve.

Buildings & Space Recommendations:

New Buildings:

1. Design of **Project North Park** to be zero regulated carbon emissions in accordance with CIBSE Guide "Evaluating Operational Energy Performance of Buildings at Design Stage"   TM54.

2. Ensure **whole life costings** are part of the appraisal of new projects and their design.
   - Request Council to take sustainability targets fully into account when planning investment in new buildings and capitalise on savings achieved.
   - Invest in *specialist* consultants earlier in the planning process
   - Beware unseen dangers of value engineering that may result in higher running costs and consequent environmental footprint of new buildings.

3. Review the BREEAM excellent standard for new buildings to ensure it remains relevant or should be increased or switched to an alternative system. For example ensure BREEAM credits in key areas are mandatory. Also look at other bench marking eg LEED

4. Adopt efficiency design codes for laboratories; and procure only highly-efficient equipment such as computers and research equipment (e.g. freezers, autoclaves and fume cupboards).

Current building stock

5. Develop Estate Strategy to address existing building stock rather than build new buildings: could include demolition and redevelopment.

6. Adopt whole life costing for all building works and equipment purchases

7. Monitor and review actual performance of buildings in the years after they are running to capacity, to check if performance matches design predictions, and make adjustments if not.

8. Reduce building temperature set points to 19° from 21° with positive comms campaign to staff and students to avoid extra heaters being used.

9. Form a **Space Strategy Management Group** to manage **space as a strategic asset**
   - Review temporal space use of buildings and desks across all campuses
   - Reduce the number of buildings/spaces that are open, heated and running 24 hours per day
   - Consider Educational programmes with two-year degrees to maximise building use.
   - Shift cultural working norms to increase sharing of offices and hot desking, and adoption of full digital platforms to allow optimum use of available space
   - Stop leaving equipment running on standby or run it at half capacity.

3.3 Labs

Research and teaching in laboratories is at the heart of UoE's growth strategy and ambition for global research power, with internationally high profile research groups, Centres and Institutes. It is one of the most energy intensive activities that we engage in (apart from travel) and potentially has the most environmental impact in terms of waste; plastics; chemical and water use. There is huge scope for reductions and modifications that would reduce energy use, environmental footprint and waste output without compromising delivery of research outputs. Labs cover a total area of ~20,335m^2 at Exeter (15% of usable space) and ~4140m^2 in Penryn. On Exeter campuses there are about 100 x -80 freezers and 4 x -150 freezers; and 206 fume hoods/safety cabinets. There are 61 autoclaves across all campuses. Modifications to lab use should be considered a key priority in reaching the proposed carbon targets for scope 1,2 and 3.

How much difference can we make? We cannot measure the environmental footprint of our labs yet, and sustainability is not embedded in lab practice across UoE and it is not evident on the website. This is despite our own staff (Urbina, Watts & Reardon 2015) highlighting the issue of lab plastic waste in a comment to Nature. They estimated that 280 bioscientists in Exeter were responsible for 267 tonnes of plastic in 2014. An investigation of the savings that could be made by swapping standard pipette racks, used in their thousands, to refillable ones showed potential savings of 33% in terms of money spent, and 66% in terms of waste produced, plastic used and space for storage. Frankly, this change is a 'no-brainer', saving tonnes of carbon and waste and thousands of pounds when scaled up to the University level.

A study of freezers across London colleges [E. James, pers. comm] demonstrated considerable savings in carbon and money by **i) purchasing** the most energy efficient models (use 45% less energy); **ii)** using **energy control devices** (Savawatt controls on 485 units saved £15k & 68kg CO_2/yr);

iii) switching the temperature of -**80° freezers to -70°** (suitable for most samples) can save 1tonne CO_2/yr & 30% energy for each freezer, saving money as well; **iv) Housekeeping:** Regular freezer inspections; defrosting and removal of unneeded samples for more efficient space use.

It is important that the carbon and environmental footprint of lab scientists (via consumables, disposables and energy use) is recognised as just as important as the footprint of staff and students who work in the field and engage in more travel. Most discussion has been around reducing carbon footprint by reducing travel rather than reducing the carbon footprint of lab users. It is important

that future measures to reduce emissions and environmental impact do not just focus on the most visible, as this may lead to some groups being unfairly penalised for their work / studies.

Examples of strong 'Green lab' culture ([Kuntin, 2019](#)) include UC Davis/ Harvard / McGill / UBC; Imperial College and University of Leeds. In terms of UoE, the [ESI lab](#) manager has been leading the way - creating a Green lab guide, a bespoke induction including sustainability; switch off equipment labels; lighting survey; freezer inspections; a campaign for refillable pipette boxes and #labwaste day; and use of benign cleaning chemicals.

Lab Recommendations:

Modifications to lab use should be a key priority in reaching the proposed carbon targets for scope 1,2 & 3. Technical services have provided a full list of actions [Suppl S5] – we list the key ones here.

1. Prioritise data and resource to monitor environmental footprint of lab activities. Audit and set targets for each College to achieve massive reductions in lab energy use, plastic use and waste.

2. Immediately **switch freezers from -80º to -70º** where samples will not be affected and implement 3 monthly inspections to optimise space use and efficiency (NO COST – only savings)

3. Prioritise **reduction of energy use** in labs; by retrofitting e.g. fume hoods, incubators, autoclaves and freezers (requires investment in LCCIP). Only purchase A+++ energy efficient models

4. Establish dedicated sustainability lead within tech services; including in person's PDR objectives.

5. Manage lab supplies to reduce number of deliveries to campus (and costs) by ordering in bulk.

6. **Green Lab Guide** and **sustainability induction & refresh training** for all lab users.

7. Campaign to change lab user culture**.** Clarify individual obligations to:

- Making sustainable procurement choices. Cost sustainable products into grant applications

- Switch off kit; manage freezer space and reduce energy use.

- Only use refillable pipette tip boxes

- Consider levy on carbon cost of plastics and waste, to contribute to '*Exeter Climate and Environment Fund'*. This is in parallel to long haul levies [[Travel](#)] and would recognise that we should not disadvantage one type of researcher over another just because carbon use is less 'visible'.

8. Sign up to the [Laboratory Efficiency Assessment Framework](#) (LEAF) providing a systematic approach to improving sustainability and efficiency in laboratory environments. And achieve '[my green lab' accreditation](#).

The benefits of changing lab culture are that UoE could be leaders in this space. It will result in financial savings (buying less); reduced waste (also saving money) and it will reduce emissions.

The challenges of these changes are that growth of high-tech science means labs are likely to get larger and more complex with more through-put. Also promoting cultural change is difficult and some people may object to changes in their standard practice.

3.4 Water

In economic and environmental terms, the carbon, energy and environmental impacts associated with the use of potable water on campus represents an invisible cost to most campus users. Yet the campus water bill is in the region of £1million/annum and the energy cost of this water provision is likely in the order of ~100,000 kWh/annum. Wastewater treatment costs of a similar magnitude are also "incurred" downstream of the university's water users. Under our current way of thinking, this carbon & environmental cost is viewed as being "outside the boundaries of our university", and

carbon costs are chalked up against the water company's carbon footprint. As pressure on the UK's water resources has increased, technical measures and behaviour change campaigns have begun to drive down per capita consumption of water. The Centre for Water Systems' team propose a coherent approach and roadmap are required for UoE to become a global exemplar in this sphere.

Currently:

There is a current target to reduce water use by 3% per annum, but there is no overall goal. Campus users have little visibility of their water use, and measures to manage water demand have been installed relatively piecemeal (e.g. to meet BREEAM accreditation in new buildings). In Exeter, water usage impacts the environment in a range of ways; from depleting water levels in the River Exe; costs (environmental and financial) associated with treatment and transmission; capital costs associated with upgrade and maintenance; costs associated with pumping and treating wastewater discharges; costs associated with stormwater/wastewater flooding downstream of the campus. Furthermore, virtual water associated with the wider water footprint of UoE can have a global reach (e.g. water used for UoE clothing, catering or in production of aviation fuel used for business travel). We need to minimise our local water needs (and associated carbon footprint); reduce our global water footprint and adapt to the threats of a changing climate. Steps towards achieving this will include; 1) define the current situation; 2) identify opportunities and 3) set out a long term programme towards becoming a leading Water Resilient University.

Water Recommendations: Resources will need to be identified to facilitate the following:

1. Immediate actions taken in the next 12 months:

- Asset survey and Water Audit Report (ongoing, requires resource).
- Identification of best practice technologies and approaches.
- Risk Evaluation and Business Case for including a **Water Resilience Strategy** in Capital Programme, and start to implement.

2. Reduce potable water demand by 50% in 5 years

- Minimise unnecessary water usage (e.g. urinals, high flush Wc's, low water taps & showers
- Maximise alternative water reuse (rain, greywater, groundwater) before potable water

3. Minimise storm water discharge to match greenfield runoff rate. Control rainwater leaving site to demonstrate flood management exemplar

4. Achieve Zero Leakage: Monitor and minimise leakage of water on campus to enable test bed for leakage technologies to be developed (working with SW Water as partners).

5. Embedded real time data collection and visualisation across campus water systems: Share data with key user to drive better behaviour and accountability of water usage

6. Measure and benchmark virtual water footprint: Develop policy to guide more sustainable practices (e.g. procurement etc.) based on evidence

3.5 Digital

There is a digital transformations strategy in place but to enable carbon neutrality to be reached faster than previously targeted, we need to increase the speed at which this happens. We also need to consider the actual carbon impact of our I.T. itself which has not been incorporated into estimates so far.

Digital Recommendations:

Bring forward significant investment in technology & training to:

1. **Make a step change in quality of video conferencing and remote connectivity** across all campuses to reduce travel. Acquire an institutional licence for more efficient remote connectivity (for example ZOOM). Provide training on how to chair virtual meetings and mixed live-and-remote meetings; and raising awareness of how videoconferencing can replace in-person participation in meetings and office hours for commuting staff.

2. **Fast track a transition from paper exams to a digital exam system** for the whole University to reduce massive amounts of paper (exam papers/scripts/feedback). This suggestion was particularly strong from students and the Unions: it will help address 'difficulty of hand-writing' for a digital generation, as well as saving time and possible errors in sorting and sharing scripts.

3. **Pioneer new models of communication such as a new technology hub** that facilitates remote conferencing, with systems geared up to deal with different time zones (24/7 availability and support). UoE could be a hub for all UK participants (academic & business) to virtually attend international conferences.

4. **Visualise carbon and energy use by building on low energy screens** so all are aware of progress and to help change behaviour.

5. **Analyse likely carbon emissions from UoE I.T. and data storage**, and plan how to reduce.

4. Underpinning Activities and Environment

4.1 Travel

Travel (scope 3) appears to account for **at least 21%** of UoE's carbon emissions (Fig 1) but the data available are by no means complete – we used voluntary data for commuting; and mixed sources for booking business travel (Appendix 4). The figure does not include emissions from international students travelling home. So the real figure will be much higher than 18.8k tCO_2e, and will rise as our international student numbers rise. Despite deficiencies in the data available – we comment on both business and local travel.

4.1a Long Haul Business Travel

This covers UoE's long-distance travel (non-commuting) for **University business**, **research** (conferences, field work, visiting collaborators) and **education** (field courses, outbound staff to teach, inbound students to study). Future plans should address all modes of travel, but given time available we focus on **aviation-based travel** as the carbon emissions from flying have by far the largest footprint per unit distance and time. This is not expected to change in the short to medium term. A single return flight from London to Brisbane equates to **5.0 tCO_2e** in economy class and **14.4 tCO_2e in business class[1]** which should be set in the context of estimates that we need to reduce individual carbon budgets to **~2 tCO_2e per annum** (in 2014 in the UK, the annual carbon footprint was **6.5 tCO_2 per capita**.

Our (conservative) estimate of total UoE emissions due to business travel is 9293 tCO_2e which is about 9% of the estimated total carbon emissions for UoE. Approximately 65% of these emissions were from long haul (>6hrs) air travel (for those booked by Key Travel). Note that this estimate only has an approximation for field course travel, and does not include carbon embedded in accommodation and subsistence, International student commuting is not included either.

UoE's current travel policy focuses on *value for money* and does not consider the carbon footprint of travel. Exeter's Sustainable Travel Plan for the Exeter Campuses 2016-2020 is limited to encouraging staff to choose low footprint travel options and investment in video conferencing infrastructure. **Exeter's current strategy lags far behind many other institutions that have in recent years implemented new travel policies or fees** [see Suppl S6]. Examples include Universities that UoE has, or is developing, partnerships with such as UBC and Geneva who have pledged to cut air travel by 30%

by 2030. One oft quoted example is the [Tyndall Centre](#) policy which asks staff to reduce and monitor their travel by following a decision tree to determine whether and how to travel.

Data acquisition is crucial to meeting a reduction in travel emissions, but it is challenging, because no systematic logging of business, research, and education travel exists for UoE. Furthermore, we are not aware of data investigating the distribution of emissions among staff. However, within UoE, voluntary initiatives have been undertaken. For example, the Centre for Geography and Environmental Science (CGES) have implemented a travel tracker aiming to obtain the data we are missing at the institutional level.

Despite paucity of data it seems clear that a reduction in the University's overall emissions can only be achieved by drastically reducing long-distance travel-related emissions from business and student travel. To underline our ambition and withstand scrutiny by the public and students, we suggest that as an institution **we must become, and stay within, the group of research-intensive universities that reduce their aviation-related emissions fastest ('best in class').** Meeting new targets and achieving a leadership role will require fundamental changes in **i)** how we travel, **ii)** whether we travel, and **ii)** where we travel. We also need to **iv)** compensate emissions we cannot avoid. In the long term, these actions will not only reduce our emissions and protect our reputation, but we expect significant overall cost and time savings. Leading the way in reducing emissions from long-distance travel means **partnering with other institutions and funders**. This will allow us to level the playing field and drive more change across the sector. In a first step, we recommend joining groups of institutions searching for strategies jointly, like the [Roundtable of Sustainable Academic Travel](#).

We need to ensure that actions do not disadvantage individuals such as early career researchers, or colleagues with caring responsibilities as non-aviation travel often takes longer, or colleagues with limited budget because non-aviation travel can be costlier. We also need to ensure that it does not give an unfair disadvantage to the field research that UoE does to improve the state of planet compared to research that takes place in labs, but may result in more indirect emissions (via consumables) and waste. However, we expect that as new forms of collaborations and conferences arise in the sector and as conferences move to online formats, reduced travel will benefit those with limited time and/or funds.

Long haul business travel Recommendations:

1. Set targets to reduce long haul travel carbon footprint by **50% by 2025**; and by **75% by 2030** measured at College & P.S Directorate level, and reported annually, holding Colleges accountable for their footprints. Whilst useful to set immediately, delivery against these targets will depend on actions 3 and 4 below. Importantly, Associate Deans of Sustainability, ADIDS and PS Sustainability Leads should decide *how* to cut travel footprint using options such as: ● decision trees (like Tyndall Centre); ● request staff to justify all trips with sign off; ● share individual carbon footprint calculator (Penryn CGES scheme is good example practice); ● set carbon budget per person; ● focus on international interaction/authorship rather than conferencing for staff promotions ; ● focus on frequent flyers: [at UBC 50% of air travel emissions were from 8-11% of faculty staff](#); ● put sustainable travel costings into grant proposals; ● modify field courses [[Education](#)].

2. Modify UoE travel policy; communicate changes clearly; ensure compliance via booking system.

- Business class flights need strong business case
- Consider not reimbursing domestic flights or setting train travel as preferred option for destinations reachable within a chosen time boundary (X hours).
- Be mindful of equity e.g. for those with caring responsibilities, or accessibility requirements.
- Incorporate information on air travel footprint and policy in staff mandatory sustainability training [[Behaviour Change](#)]

3. Collate data and establish travel monitoring scheme across the University to ensure we have correct information on number of trips, length of trips, travel emissions per staff/student, evidence for benefit of travel.

4. In depth review on policy and market-based options of long distance travel considered by competitor institutions [see Suppl S6] and government bodies required by July 2020 to review targets and actions more fully, with implementation by end of 2020.

5. Use *Exeter Climate and Environment Fund* [Global] to reduce long haul travel, and incentivise sustainable travel as follows:

- Use to support/fund sustainable travel choices; especially for students & ECRs; and to support increased environmental benefit from travel, via research and educational opportunities.
- Use to support staff (via a specialist agency?) to book over-land travel e.g. continental rail travel.
- Support Student Unions to record travel footprint (e.g. for sports events) & mitigate impact.
- If long haul flight cannot be avoided - consider **long haul flight 'levy'** which contributes to the Fund – but reduction is MUCH better than 'offsetting' in this way.

Of relevance and already described in other themes:

- **Climate-compatible global partnerships for the 21st century** [Global]
- **Reduce long-haul student field courses** offering more local & digital choice [Education]
- **Invest in digital infrastructure** to enable virtual meetings [Digital]

The overall benefits of reducing long haul travel are carbon reductions; net cost savings; reputational gain from students and public. Better IT infrastructure to improve engagement and participation of students and staff that cannot travel (carers, accessibility, visas) thus addressing equality and diversity concerns; health & well-being benefits from reduced travel demands; UoE more attractive to climate-conscious students. The challenges will be to the global strategy, to ECRS, it will take longer to travel affecting work-life balance; some increased costs for land-based travel; it may affect staff recruitment/retention if aims are communicated poorly.

4.1b Local Travel

This section covers local travel to and from our campuses, including staff and student commuting; local business travel, and other local transport impacts of our operation. The impact that University local transport policy and provision has on individual staff and students makes it an area of high contention; and it crosses the boundaries of institutional and personal responsibility. But it also provides significant opportunities for engagement and individual responsibility, and has acute and visible local impact. Working in collaboration with stakeholders (local authorities, Exeter City Futures, Bus and Rail providers, Co-bikes /Co-cars etc) is crucial in delivering the change required.

The University has two current local 'Travel Plans' (Exeter campuses 2016-2020 and FXPlus Green Travel Plan 2016-2021). Each includes improving public transport provision, improved facilities for cycling and walking, and ongoing review of car parking management, eligibility and charging.

A. **Staff and student commuting data** (scope 3) are voluntarily provided by staff and students, so may not be correct. This needs addressing to provide accurate metrics. Latest commuting data (HESA 2017/18) suggests staff commuting results in 5570 tCO2e and student commuting results in 1842 tCO_2e (see Appendix 4). This does *not* include returning home overseas.

B. **Local business travel** emissions from transportation in vehicles owned or controlled by the University are accounted for in either scope 1 (for fuel use), or scope 2 for electric vehicles. Vehicle mileage data show that over 400,000 miles/year across the fleet of 72 owned or leased vehicles. Carbon emissions estimated at between **100-150 tCO_2e per annum** - only **8 tco2e per annum** are from the electric vehicles (20 in fleet).

C. **Local business travel** (scope 3): emissions from the transportation of employees for business-related activities in vehicles owned/operated by third parties (including buses, trains, taxis, local flights, coaches etc.). Data currently insufficient.

D. **Other local transport impacts of our operation:** emissions associated with activities such as the transportation of goods and services to the University's campuses across its range of operation (catering, building materials, waste disposal etc.). Data currently insufficient.

Local Travel Recommendations: The sustainable travel team suggested a timeline with further recommendations that should be implemented [Suppl S7]. Key actions are here:

1. **Revise Integrated Sustainable transport plans and metrics, in partnership with local authorities and stakeholders**
- Establish improved data capture and analytics to measure impact and progress
- Incorporate revised UoE operational boundary definition of scope 1, 2 and 3 [Data].
- Establish ongoing operational budget and resource for sustainable transport improvements
- Establish revised targets for key local transport metrics; including modal share, transition to electric vehicles, intercampus travel, improving cycle infrastructure, rural bus provision.
- Review flexible working policies, videoconferencing provision etc. to identify opportunities to reduce the demand for local transport for UoE's operations, including inter-campus ops.

2. **Increase investment and incentives for active travel** (walking, bikes) **& shared transport**

- For **active travel**: improve pedestrian access points, more shower, changing and clothes storage facilities; more sheltered and secure cycle storage; spaces for cargo bikes;
- Benefits and further incentives to take up active travel through engagement platform e.g. consider subsidising electric bike purchase.
- Review and invest in **shared mobility solutions** (public transport, minibus) to reduce journey time and cost to staff, students and other campus users.
- Any new or revised investments to be considered as part of the Devon-wide climate emergency working group to share responsibility and ensure best value.

3. **Transform car use and parking policy on campuses**

- Change as much of UoE fleet to electric vehicles as possible as the mileage (400k miles/year) and consequent emissions are high. Include cars used by VCEG to show leadership.
- Increase the proportion of EV-charging spaces available solely to ULEV users in line with (or ahead of) local / government targets will incentivise a shift to ULEV vehicles
- Reduce total number of spaces available to make sustainable modes of travel increasingly appealing; and also has potential to reduce the amount of green space lost on campus.
- Ongoing review of car parking policy, permit eligibility etc

4.2 Procurement

Procurement is about everything the University buys or services contracted, across all areas of business. It underpins everything we do, and every other theme in this report. It is also where key decisions are made to prioritise cost saving over potential environmental gains and carbon reductions – whether this is for large tenders and contracts, or individual purchases made on individual grants. Everything we buy has a carbon cost – and this is difficult to assess because the supply chain is not necessarily transparent. Preferred supplier lists are based on value in most cases.

Our procurement decisions also have implications for the wider region, and can potentially be used to promote local innovation and investment. The power of the University to help transform all sectors into a more circular economy should not be underestimated. This is about reducing use of resources and closing the loop to reduce waste. We have key experts in the field of sustainable procurement (in the Business School) and in carbon life cycle analysis (CEMPS), and projects such as
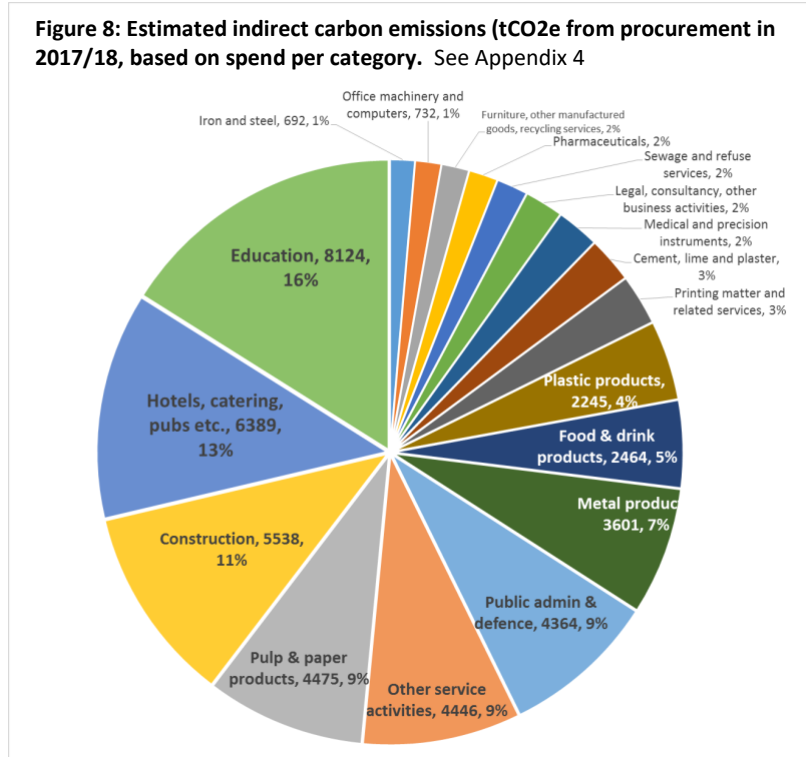
Tevi and Exemplar already working to transform SW supply and waste recovery chains e.g. in plastic and food. As one example, in the last year, via the Tevi project, FXPlus have been working closely with local food suppliers to re-orient their purchase of food and drink for the Penryn campus towards products with a more sustainable supply chain; and lower food miles, to embed a more circular approach with less waste [Hospitality].

Currently:

Of all areas reviewed by the working group – this was the most difficult for which to extract relevant data. As far as we can tell, UoE procurement as a whole has never been prioritised with regard to monitoring reduction and carbon emissions impact.

The only data we could find to illustrate the importance is the report on carbon embedded in our 'spend' from 2017/2018 (Figure 8) but this uses Defra conversion figures from 2011 (Appendix 4) and the categories are so broad that we cannot drill into key areas (e.g. the food and drink category has one carbon conversion factor, when clearly different types of food and drink, and different suppliers of such, have vastly different carbon footprints). These data should only be taken as a broad, simplified illustration.

Given the caveats, they illustrate that:

Figure 8: Estimated indirect carbon emissions (tCO2e from procurement in 2017/18, based on spend per category. See Appendix 4

The majority (61%) of the University's carbon footprint (Fig 1) is likely from procurement - over 55,000 tCO$_2$e of scope 3 emissions.

There is great opportunity to shrink indirect emissions by reducing overall spend (buy far less stuff), and reducing spend on the products considered most environmentally damaging. Not only will this help to meet Goal 1 & 2 (targets for scope 1,2 and 3), but it will also save considerable money by purchasing fewer goods, and reducing the goods that need to be disposed of as waste – thus improving our environmental footprint as well (Goal 3). Fig 8 shows that, according do this very rough calculation, **38%** of the procurement carbon footprint (**24%** of total UoE footprint - Fig 1) is in **plastic products; food and drink; paper; construction** and **hotels/catering/pubs** providing a clear starting point for where substantial savings (carbon & financial) could be made.

The UoE does have a sustainable procurement policy stating that is it "*committed to improving the sustainability of its estate*" defining the process of sustainable procurement "*to meet the needs for goods, services and utilities in a way that achieves value for money on a whole life-cycle basis in terms of generating benefits….to the society and the economy, whilst significantly reducing negative impact on the environment.* The procurement team work to embed this within tenders, but it is not necessarily given great weight in decisions taken on contracts. Whilst tenders (high spend) are targeted, there are thousands of smaller transactions, undertaken directly by departments, that will not have received the same level of support/scrutiny. So there is no means of prioritising the

environmental costs when economics and quality are usually the determining factor for contracts and purchasing. A policy in place does not necessarily change practice. This therefore needs tracking properly and incentivising at every level in every department to make the change. As a member of the working group put it "*Are we prepared to challenge the convenience of our staff and students*". UoE also announced it would become 'Plastic Free' by 2020 but it was difficult to find any policy, plans or targets to achieve this. Other policies around construction, new build and waste are all relevant to this underpinning activity. The procurement team are working with end users and suppliers to join forces to improve economies of scale, reduce the number of deliveries and vehicles coming onto campuses; and work with suppliers to remove and/or reduce plastic packaging.

Other Universities have highlighted that they also need to review data in this area. Some (Manchester, Cambridge, Birmingham) are using the [Government's Sustainable Procurement Flexible Framework](#) to embed social, environmental and economic goals in their purchasing. The framework was published back in 2006 and was used by the Uoe from 2011 to 2013. A recommendation was made to Dual Assurance to discontinue its use owing to the resource required, limited institutional buy in and unproven outcomes.

Procurement Recommendations:

A target of reducing scope 3 emissions by 50% by 2030 means we need to reduce procurement, and/or its carbon footprint by 10% each year for the next 10 years, and to monitor this we need accurate data and monitoring. The challenge is that this transformation cannot be delivered centrally – large tenders can be managed differently, and tools can be put in place to help, but it also needs **substantial cultural change from all individuals purchasing goods**.

1. **Policy:** Update policy to embed a circular approach to procurement management more fully in practice; set criteria for supply chain; consider life cycle value & carbon budget.

2. **Data & measurement:** Ensure datasets are accurate & automated to monitor progress annually to reduce carbon embedded in all University purchases and set up KPIs. This will highlight key areas for action to set a plan for reductions to meet Scope 3 targets [needs resource].

3. **Set clear priorities to determine how to weight sustainability in tendering** and calculate investment needed for examples of sustainable purchasing. Use our experts to provide clear guidance to procurement team on 'what success looks like' and what outcomes are expected from embedding a circular approach to ensure suppliers meet minimum sustainability requirements.

4. Appoint Sustainability Lead within the Procurement team (put in job description/workload).

5. Work with **suppliers** - Consider following [Preston model](#) working with regional bodies and suppliers, to shorten supply chain and embed innovation and social / environmental / economic goals.

6. **Audit and Review key areas of procurement with the aim of setting targets:** e.g.

- Audit of **plastics use** by University**:** policy, purchase, use and waste to enable recommendations for substantial reductions. According to Fig 8, reducing plastics by 50% could save in the order of 1000 tCO_2e indirect emissions.

- Audit of **paper products** by University**:** policy, purchase, use and waste to enable recommendations for substantial reductions. According to Fig 8, reducing paper products by 50% could save 2000 tCO_2e indirect emissions.

7. **Behavioural change:** All Colleges/Depts/P.I.s need to take responsibility for their own buying choices. Request colleges to encourage and support staff to think about sustainability in every purchasing decision. Use data dashboard/KPIs at College level to drive the change. To help individuals make sustainable choices: investigate **i)** if there is a decision tree that can help users

"Is your Purchase essential Y/N....etc"; **ii)** whether "sustainable" suppliers can be tagged on T1 purchasing system; **iii)** whether procurement rules can be put in place on T1 to ensure only the most energy efficient equipment is purchased (e.g. A+++ freezers) **iv**) Incorporate sustainable items into grant applications.

It is essential that this review of procurement aligns with the waste management strategy to ensure a circular approach e.g. aiming for new build tenders to incorporate an ambition of zero waste.

Benefits: Reduction in purchasing – saving money; Reducing waste – saving money; Reduction in scope 3 emissions (not easily reportable) but also scope 1 & 2 if more efficient equipment is purchased. Driving sustainability of suppliers/contracts.

Challenges of this approach: Without audit, we can't document level of reduction. Possible higher costs per item; less choice; difficulty of embedding behavioural change.

4.3 Waste and Recycling

This theme covers all types of waste generated on all of the university's campuses as well as in its supply chain (procurement). We collated information on waste stream data to assess current status of waste management across campuses [see Suppl S8]. UoE generates a vast amount of waste – around **2000 tonnes in 2017/2018** across Exeter and Penryn campuses, consuming the planet's resources, creating GHG emissions (scope 3) as well as causing pollution. It costs UoE around **£400k** annually to manage this waste, and the type of management is affected by suppliers available in the region and routes of disposal. General waste (and contaminated recycling) is sent by current contractors to incinerators in Cornwall and Plymouth. When working properly these produce power for local homes (in Devon and Cornwall) but burning waste also results in emissions. A lot of recyclable material is exported throughout Europe, generating high carbon emissions (which we currently can't quantify). Overall recycling rates differ considerably between campuses for 2018 with Exeter campuses at **34%** and Penryn campus at **62%**. Food waste from these campuses (>60 tonnes at Exeter and over 2000L per week in Penryn) is sent to the anaerobic digester in Plymouth (AD).

There is a UoE [Waste Management Strategy 2016-2021](#) (to reduce waste arisings tonne/M2 by 1% /yr; recycle 45% of waste by the end of 2020; divert 90% of commercial food waste to anaerobic digestion but there was some lack of clarity in data available within UoE and it was not clear how it was being reported to senior university management. Data from 3rd parties and supply chains were not available; and there were no data on carbon emissions associated with waste. There was also little interaction between staff working with waste at different UoE campuses.

On the positives side, successful initiatives have been introduced by Exeter estates team and by FXPlus over the last year, reducing single use plastic cups, bags, straws, bottles (drinks, cleaning products etc), bin bags and packaging by thousands of units in the last year at Exeter and Penryn campuses. The [WARPit](#) initiative also helped avoid 8,617kg of waste, saved 25 tCO$_2$e, and £64,891.

Waste Recommendations:

As with the other themes, dramatic reductions in environmental impact and carbon rely on both central co-ordinated initiatives, and considerable cultural transformation and individuals taking their obligations seriously. The working group members for this theme suggested a timeline with further recommendations that should be implemented [Suppl S8]. The key actions are here.

1. Propose a new cross-campus **UoE strategic plan for waste management based on circular economy principles,** making a significant contribution to carbon reduction targets, and achieve **ISO 14001 re-accreditation.** To do this **setup of an all campus operational working group on waste** immediately to improve coordination between waste teams, design and deliver the plan.

2. Establishing an **online, real-time waste data portal**, providing full transparency to all of the University's waste streams and associated carbon emissions.

3. **Increase recycling rates to 70% by 2025** and to **85% by 2030** (currently Streatham is only 34% compared to Penryn 62%). (Exact targets should be measured against full life cycle analysis and carbon emissions).

4. **Review of all waste management contracts,** working with regional partners to set new vision and targets for regional waste management; introduce new practices to set new goals and innovative waste and recycling solutions (e.g. towards 100% recycling and no waste being sent abroad). The Penryn waste contract renewal forthcoming providing opportunity to set new targets and introduce new practices. Streatham will work with new contractor (Oct 2019) on significant improvements in waste reduction and recycling across the life of the contract.

5. **Stop printing:** Paperless working environments where possible, and paper from 100 % sustainable and verified sources.

6. **Change the culture with training and visibility of waste policies and guides**

- Communicate good news stories on reductions achieved (esp. in waste hotspots)

- Waste amnesty across each dept by building audits with all accumulated waste removed and then education of what to do moving forwards.

- Include waste training in sustainability training programme for all staff and students

- Lab waste awareness campaign.

- Greater visibility of WARPit Scheme and Moving On project (Streatham)

- Focus on reductions in student accommodation: e.g. food waste and preloved items at year end

7. Ensure waste team has time and resource required to implement above strategy and make meaningful reductions in waste, environmental impact and emissions.

See also hospitality theme below for food waste and packaging suggestions

4.4 Hospitality including Catering and Retail

This theme covers a wide range of hospitality services providing food, drink, cleaning and associated services across the campuses:

- Catering - Residential, Event catering, Bars (Exeter guild)
- Events hospitality - Academic/university events, External events
- Housekeeping hospitality - residential, commercial, of estate (not grounds)
- Retail - In-house, 3rd party

Hospitality reaches everyone who visits the university and results in scope 1, 2 and 3 emissions and further environmental impact both in-house and as part of the supply chain. The theme has captured the attention of university members particularly around catering and single use plastic (~50 comments/suggestions to the Working Group). Perceptions of this hospitality have the potential to lead and encourage positive discourse around environmental practice of the university.

The recent IPCC report and FAO have demonstrated that substantial amounts of carbon are embedded in our food and drink; and there is considerable environmental impact in the supply chain from the land where food is grown to the processing, packaging and transport of items (Poore & Nemecek, 2018). We need to shift our consumption to evidentially lower impact and nutritious products (Poore & Nemecek, 2018, Garnett et al 2017; McAuliffe et al 2018; White & Hall, 2017). However, we are also in a strong position to support and encourage exemplary practice. Using our research expertise combined with our role as purchasers we should work with our pioneering local producers in the South West, including farmers to localise supply chains, reducing carbon emissions and the direct environmental cost of the products we buy, as well as providing support to spearhead the return of natural capital to the South West.

Currently:

Hospitality, including catering and retail, is crudely estimated to be responsible for ~15% of our carbon emissions associated with procurement (Fig 8). However, due to the complexity of hospitality services and limited data available, there are no accurate estimates of emissions and environmental impact of different elements of these services. But we know, just from volume that it is likely very large. Fresh Ideas served 34,081 meals (1.25 million food items) and FXPlus served 74,936 meals (0.5 million food items) in the last academic year. Exeter residential student catering supplies 588,800 meals a year. UoE hosted and catered for 5940 events in 2018 with over 0.5 million delegates. In a sample of 21 Streatham menu meal or buffet options, 16 included meat (8 had lamb or beef and 8 were processed meat).

We do not currently have clear and consistent policies and targets relating specifically to climate and environmental priorities across the theme so we are in a position to make big strides in reducing our impact across this high emissions area alongside meeting wider sustainable development goals. Exeter campus services have a [sustainable food policy](#) which provides encouragement for supplying more local, seasonal and better social/environmental practice - there are no targets or policy elements that focus on emissions reduction. FXPlus have a [sustainable food charter](#) that captures priorities for local, seasonal and better social/environmental practice alongside minimising carbon and efficient use of water. There are no policies that capture environment and sustainability across wider hospitality services. In terms of procurement, priorities for hospitality are currently centred on commercial viability. Despite the limited policy drivers, UoE and FXPlus hospitality teams were enthusiastic to give full accounts of their activities (can be provided on request) and have implemented some positive practices to reduce our environmental impact including: **i)** Reducing disposable cups by financially incentivising reusable cups (Exeter) and applying an environment levy to disposables; **ii)** Optimising the regularity of cleaning alongside limiting cleaning products and dosing used by housekeeping; **iii)** Increasing plant-based and vegetarian options on menus, likely driven by consumer demand. However, UoE is currently lagging behind other universities when comparing defined climate emergency policies relating to hospitality [detailed in Suppl S9]. The Universities of Bristol, Newcastle and Manchester have progressive policies to reduce emissions, improve health and reduce environmental impact of food. [Cambridge University state](#) that their recent policies have led to 'a 33% reduction in carbon emissions per kilogram of food purchased' by offering more enticing plant-based meals, reducing meat and food waste.

Hospitality & Catering Recommendations:

Detailed recommendations are provided in Suppl. S10: this is a complex topic, and decisions will affect not only UoE staff and students, but also our visitors and stakeholders in the region.

1. **Set clear, measurable goals for reducing and eliminating products and practices that result in high environmental impact and carbon footprint**; aligning with overall emissions targets. We recommend that a plan is put in place to **reduce hospitality-related scope 1 & 2 emissions by 50% by 2025 and 75% by 2030; and to reduce scope 3 emissions by 50% by 2030 in the first instance**. Many hospitality services are procured from external sources and will have unavoidable emissions associated with them. We expect that there will be a need to mitigate for some of our impact to reduce scope 3 even further. However, faster and bigger reductions from the outset will limit the magnitude of the required mitigation.
2. Make reducing emissions and environmental impact a **core ethical value** of all hospitality activities, including: accommodation, catering, bars, retail, events and 3rd party tenders.
   - Make reducing emissions and environmental impact a core part of everyone's role across hospitality, including waste reduction and management.
   - Improve environmental metric monitoring to enable effective prioritisation.
   - Capture the breadth of hospitality in sustainability policies with ambitious clearly defined targets, including emissions reductions.

- Change the delivery and marketing focus of hospitality services so it is, and celebrates being, environmentally conscious.
- Use cross-departmental capabilities to research and inform the university on best practice.

3. **Improve the provision of healthy and sustainable items** - food and beyond. Act fast where we already have the evidence to support change e.g.
   - Immediately reduce (but don't exclude) meat on menus, ensuring menu replacements have good nutritional value whilst respecting a diversity of dietary requirements and choice. If this is extended to animal products, then estimated potential emissions reduction would be 10-50% (Poore & Nemecek, 2018).
   - Review research into emissions and environmental benefits of local and seasonal products. Use results to guide procurement and celebrate items that meet priorities.

4. **Procure from sustainable sources** and encourage sustainable practices for producers and suppliers e.g.:
   - Use only good/best environmental and welfare practice animal products (including fish).
   - Move towards only sustainably accredited palm oil.
   - Ensure coffee and tea purchased from socially and environmentally responsible sources.
   - Work with regional suppliers to reduce environmental footprint of sourced products.

5. **Reduce hospitality waste** and monitor it:
   - Reduce and re-distribute **food waste** (distribute to people or animals first; AD = last resort)
   - Removal of all single-use, non-recyclable cups, food boxes from campuses, making sure that new materials used are actually being recycled or composted.
   - Stop using disposable/short-life event décor and giveaways

6. **Consult on, and communicate about, changes being made**
   - Share best practice information about healthy sustainable diets across campuses.
   - Use consultation across the university to guide how we meet ambitious targets, i.e. menu replacement options, and respect individual diets and choice.
   - Communicate regarding how and why hospitality practices and catering has changed in response to the emergency declaration. Consider adding carbon costs to menus.

We are in a strong position to radically reduce emissions and environmental impact with limited or no investment across hospitality, alongside sharing a positive story with all our visitors.

4.5 Biodiversity

Proposed Goal 4 is to pursue a policy of 'environmental net gain' on our estates, and to use our research and education to deliver environmental net gain within region, nationally and across the globe. **This should be considered as vital, and as urgent, as reducing carbon emissions**. The most clear demonstration of environmental net gain is biodiversity net gain; although environmental net gain also includes reducing pollution, reducing waste, improving carbon storage and water quality, to name but a few. The concept of environmental net gain has been developing over the last 10 years, particularly for planning and development guidelines, but it is also the aim of the Cornwall environmental growth strategy, and is starting to be used as a means of measuring beneficial actions that genuinely improve the environment from its degraded state. It relies on finding new metrics to measure the condition of habitats to demonstrate improvement.

UoE could certainly be leaders in **biodiversity net gain** and **environmental net gain** approaches. Not only are we developing the metrics, but we are involved in a great number of projects that already achieve this. UoE is having beneficial environmental impact not only on our own estates, but it is central to our research across the world (for example our role in Marine Protected Areas, and reducing plastics pollution); and our work with regional communities and stakeholders (for example the SWEEP project and the Green Infrastructure for Growth project).

Currently:

The total area of the University's estates totals 153 hectares and the UoE Grounds Team and the FXPlus Grounds team both have progressive environmental approach to managing the campuses. The Streatham campus biodiversity strategy is very good, and the 2018 i-Tree inventory report demonstrates that the 10,000 trees on the estate cumulatively remove 2 tonnes of pollutants each year, store 3,200 tonnes of CO_2, divert storm water runoff and help instil a sense of well-being. There is also useful signage to spread awareness of the 'value' of biodiversity on campus.

On the Penryn campus, FXPlus have recently had a new habitat survey completed; they have promoted new wild flower meadows this year, reduce mowing frequency, and each year the students and local community do a Bioblitz on campus.

At all campuses, the teams are moving towards fossil fuel free machinery, increasing composting, and aiming to boost biodiversity where-ever possible. However, the pressures of continual new building, some difficulties with contractors, expectations of 'tidiness' and limited resources means that it is difficult to maintain momentum. To achieve further environmental net gain for UoE as a whole requires PS staff, academic staff and students to drive holistic thinking across the estate and beyond where we have influence in the region.

Biodiversity Recommendations:

1. **Monitoring environmental net gain:**
   - Develop a plan for net gain (biodiversity, environment & wellbeing) for campuses (grounds staff & academics) and a strategy to measure it with students, staff and community.

   - Link with the region to promote environmental net gain via the SW-CAN and using the *Exeter Climate and Environment Fund.* For example add connectivity to the Cornwall Forest

   - Research how to measure and report environmental net gain, across the wide portfolio of environmental, climate and sustainability research and teaching.

2. **Plant 'flagship' student/community woodlands at Streatham & Penryn:** these will not only store carbon over the long term, but will create environmental net gains in terms of biodiversity, flood management and wellbeing benefits. This initiative could be carried out in several ways **i)** on areas unsuitable for building, or **ii)** as a tree nursery to educate in woodland development and provide student and community benefits, or **iii)** plant a tree for every graduate?

3. Ensure campuses have a habitat survey and iTree survey every 5 years. Monitor biodiversity. Use signage to explain benefits of vegetation to emissions.

4. Designate & protect specific biodiversity rich areas of the campuses from development

5. Work with building contractors to improve new plantings; ensure no use of contaminated soil

6. Sustainable management practice: Transition to no fossil fuel/no chemical estate management

7. Invest in and improve campus water courses for water retention and biodiversity

8. Reduce mowing: stop mowing some areas so frequently, managing grass for biodiversity instead

The benefits of these actions are: new carbon sinks; improved environment for all including community & health benefits; saving money (e.g. mowing; chemicals); better water management; composting options (could make money); opportunities for research.

Challenges: A lot of trees are needed to offset large carbon emissions; protected areas could conflict with UoE growth plans; perceptions of untidiness if management is less intense; and may require more hand-weeding if no chemicals are used.

4.7 Behaviour and Culture Change[4]

The University can control Scope 1&2 emissions to provide incentives and deterrents that affect the choices members of staff and students make which affect energy use, but Scope 3 emissions can only be reduced by fundamentally changing individual and collective attitudes and behaviours ranging from use of energy, recycling, paper use, attitudes towards waste, travel, conference culture to food choices. Most of these issues are addressed by the other themes in this White Paper; this theme complements the structural approaches with proposals for the underlying culture change which is needed to **change social norms** and for everyone to make greener choices.

Such behavioural and cultural change in everything staff and students do in their everyday University-related activities needs to take place across the entire institution, with strong visible leadership combined with grassroots engagement with activist staff and students and the whole University community. Evidence from staff surveys suggests low levels of trust in management and resistance to top-down change. This is the culture we have to shift, through role-model leaders and co-creation of solutions with staff and students at grassroots level.

Fig 1 has provisional data but demonstrates a clear imperative to address the individual and collective behaviours that affect travel and procurement, which together make up 82% of the University's Carbon emissions. Within the category of Procurement, the categories that are most obviously affected by individual choices are: Hotels, catering, pubs etc. (13%), pulp, paper products and printing (12%), food and drink (5%) and plastic products (4%). We don't know to what extent behavioural changes rather than structural measures are responsible for our environmental and carbon footprint at present. However, what we know is enough to be able to make strong recommendations about the main areas where changes in our behaviours and patterns of consumption can make a real difference.

Rather than quantify individual targets, we would wish to follow the model of Newcastle University, which conceives of **changes in behaviour as being the *obligation*, or responsibility, of all individuals associated with the institution**. The aim is to cut carbon emissions and improve the environment, delivering Goals 1-4 through an accelerated and rolling programme of actions.

Among the leading institutions in this area are Newcastle University, which aspires to achieve net-zero carbon dioxide emissions by 2040 (matching the recommendation in this document) and EPFL (École Polytechnique Fédérale Lausanne, Switzerland), which is aiming for CO_2 neutrality in 2020. Our recommendations are based on informal exchanges with these institutions, which both seek to win hearts and minds and implement structures that facilitate greener choices and dis-incentivise carbon-intensive alternatives.

Cultural Change Recommendations:

1. **Use multiple strategies to enable all staff and students to take responsibility and action on sustainability**
   - Information package and mandatory training on individual responsibilities regarding the climate and environment emergency, to be included in staff inductions
   - Roll out a **data visibility** campaign which signposts the environmental impact is of everything we do (from toilet flushes via sandwich consumption to paper use and travel). This will help everyone make informed choices that reduce waste and carbon.
   - **Challenge, incentivise and reward** through Above and Beyond criteria, PDR, Students' Green Unit and Green Awards) and the Jump scheme. Departments to set their own targets.

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[4] Working Group thank Prof Julie Sanders, DVC, Newcastle University; Luca Fontana, Project Officer, EPFL sustainability, for informal conversations on this theme.

- Earmark time for Climate Emergency activities in **workloads** (SWARM hours for Climate Emergency champions; facilitate all staff participating in information events and workshops and responding to data and self-assessment requests for 1 day per annum).
- Instigate citizen's assembly-style half-day events across campuses; engage wider community to contribute new idea, co-design solutions, and to encourage people to make new commitments.

2. **Make available an online Environmental Footprint tool** that allows all staff and students to self-assess their current environmental footprint. This tool should enable the collection of the 'soft' data we are currently missing regarding travel arrangements, commuting, food choices, etc. It should also train the user in understanding where their behaviour is having an environmental impact, how big that impact is in comparison with alternative choices, what the alternative choices are and how they may contribute to wellbeing. Make it compulsory within 3 years, after voluntary period to ensure reliable, comparable data gathering every year.

3. **Role model leadership**

- 'Walk the talk' role modelling**:** dissemination of changed behaviours by University's leadership teams (including VCEG) and the impact the changes are having on their carbon footprint (collectives rather than individuals, but the aim is to demonstrate fast and substantial changes in the institutional culture at the very top). This is needed to create a new social norm of what is expected of all UoE staff and students.
- Bridge **top down leadership** with **grass roots engagement** of entire community (students /academic /PS/senior team) across all campuses to co-create solutions.
- Designate specific staff (IPCC authors, PS staff) and students as **sustainability champions** to inspire staff and answer questions. We already have sustainability co-ordinators but it would be useful to explore how these roles could be refreshed and/or align with roles of champions. They will disseminate narratives about how changed behaviour is good for wellbeing, feeding into the Positive Working Environment strategy.

4. **Ensure sustainability activity is recognised & rewarded through existing structures including promotion, recruitment, PDRs.** Change PDP and progression criteria for academic staff (E&R) from international conference participation **to international experience** (include remote conferencing, international networks, co-authored papers, etc.).

4.8 Communications and Marketing

The communication and engagement strategy alongside the behaviour and culture change programme will be critical to the success of the University's response to the environment and climate emergency. To achieve the targets and ambitions set out in the White Paper we will need to mobilise individuals, teams, departments, campuses and leaders across the organisation. This will require a co-ordinated and considered campaign for different audiences.

The campaign will target both internal and external audiences so that we change behaviour, influence stakeholders and demonstrate leadership to establish a global reputation on climate action, the environment and sustainability. The campaign will focus on the practical and substantial action required at an organisational, departmental and individual level based on evidence and science. Students, staff and the wider community are looking to UoE to lead, inform and engage on the biggest challenge of our time so our communications must be clear, honest and ambitious.

UoE already undertake plenty of good work to meet environment and sustainability goals. The Sustainability Team lead this work admirably with a range of events and activities but the profile and communication of this work could be significantly improved. The current perception amongst students and staff is that we are not doing enough as an organisation on the environment and climate emergency with actions not meeting expectations – and expectations are rising. Externally

the perception of the University is much better due in part to the outstanding research and impact of our academics with media coverage each month often ahead of other UK universities apart from Oxford and Cambridge.

The focus over the next couple of years must be to strengthen our reputation as a world leading university on the climate, environment and sustainability recognised by all our priority stakeholders – internally and externally – based on action and tangible evidence.

Communication Recommendation: Establish a comprehensive communication and engagement programme focusing on behaviour change, influencing stakeholders and building a global reputation. The campaign must be appropriately staffed and funded from existing resources with the aim to launch both the campaign and White Paper in November 2019. Campaign objectives:

- To establish UoE as the leading university in UK on the environment, climate and sustainability
- To communicate UoE's targets and actions on the environment and climate emergency
- To create a campaign and movement for change within the university so that we achieve our organisational goals and ambitions
- To establish a network of communicators internally and externally who can help amplify Exeter's work on the environment and climate emergency
- To communicate UoE's outstanding research and teaching on the environment and climate emergency.

Marketing

Whilst marketing has not been reviewed in this report, it is essential that the plan of action and the communications campaign need to go hand in hand with a review of the marketing of all of our education programmes and services to ensure we a spreading a clear, substantive and meaningful message about the centrality of sustainability values to the University's core strategies, teaching programmes and activities.

Appendices & Supplementary Material

Appendix 1: Working Group members and contributors

Appendix 2: Illustrations of Summary Recommendations R1-R20

Appendix 3: Table of Sector policies and practice (also see S6 on travel; and S9 on catering)

Appendix 4: Annotated data file – available on request from climateemergency@exeter.ac.uk

Supplementary material[5] - available on request from climateemergency@exeter.ac.uk.

S1:   Education: Sustainability module audit
S2   Education: SEAS employment audit
S3   Education: SVCCG submission to Education Consultation
S4   Regional Strategy Board – Climate Emergency Update paper
S5   Labs: Priorities
S6   Long Haul Travel: Sector best practice
S7   Local Travel: UoE current practice and Priorities
S8   Waste: UoE current practice and Priorities
S9   Hospitality & Catering: UoE & Sector best practice
S10   Hospitality & Catering: Priorities
S11   Behaviour Change: Priorities

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[5] Ideas from departments; individuals and students on Grand Challenges have been passed to Head of Sustainability as an 'Ideas Tracker' database

Appendix 1: Exeter Environment & Climate Emergency Working Group – Membership

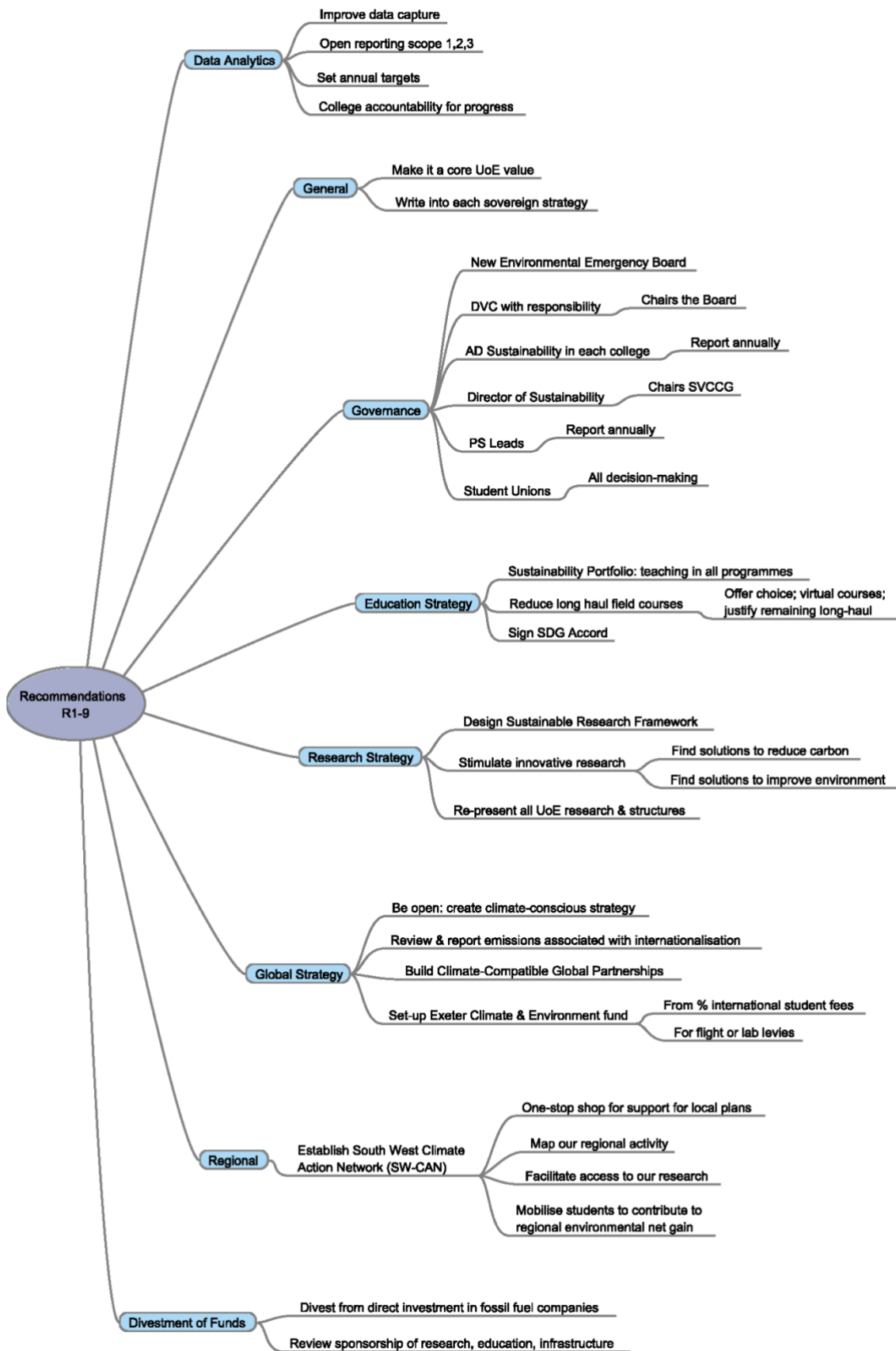| Member	College/Service	University Role
Juliet Osborne (Chair)	ESI - CLES	Professor; Director of the Environment & Sustainability Institute
Richard Hoggett	CLES, Geo	Research Project Manager, Energy Policy Group
Sophia Fraser	GBP	Graduate Business Partner (Intern)
Professional Services		
Hugh McCann	CIOSS	Director of Estates Services
Paul Mucklow	CIOSS	Director of Engineering and Direct Works
Craig Nowell	CIOSS	Director of Campus Infrastructure & Operational Support Services
Andy Seaman	CIOSS	Energy & Sustainable Transport Manager
Peter Fletcher	Finance Services	Procurement, Category Manager
Tony Sanders	FXPlus	Managing Director - FXPlus
Garth Davies	CAMS	Head of Press and Public Affairs
Alex Huke	IIB	Impact and Partnership Development Manager
Andy Richards	Research Services	Global Systems Institute Manager
Academic staff		
Tim Lenton	GSI - CLES	Professor; Director of the Global Systems Institute
Wolfram Moebius	LSI - CEMPS	Research Fellow; Physics & Astronomy
Patrick Devine-Wright	CLES, Geo	Professor in Human Geography
Stewart Barr	CLES, Geo	Professor of Geography; DoE
Peter Cox	CEMPS, Maths	Professor in Climate System Dynamics
Richard Cochrane	CEMPS, Renewables	Associate Professor of Renewable Energy; DoE
Steffen Boehm	Business School	Professor in Organisation and Sustainability
Sarah Hartley	Business School	Senior Lecturer in Management; D-PGR
Pascale Aebischer	HUMS, English	Professor of Shakespeare and Early Modern Performance Studies
Nicola Whyte	HUMS, History	Associate Professor of History
Karyn Morrissey	CMH, ECEHH	Senior Lecturer
Justin Dillon	SSIS, Education	Prof Science and Environmental Education
Séverine Saintier	SSIS, Law	Associate Professor in Commercial Law
Alice Venn	SSIS, Law	Lecturer in Law
Students		
Louise Rutterford	CLES, Bio	PhD student
Sarah Redman	The Student Union	SU President – Student Experience
Joe Rigby	The Student Union	SU President – Exeter
Ellen Monaghan	The Student Union	Undergraduate Geography (Penryn)
Patrick Hoyle	The Guild	Guild President

Appendix 1: Exeter Environment & Climate Emergency Working Group – Contributors

We thank these contributors for sharing their knowledge and ideas for particular sections.
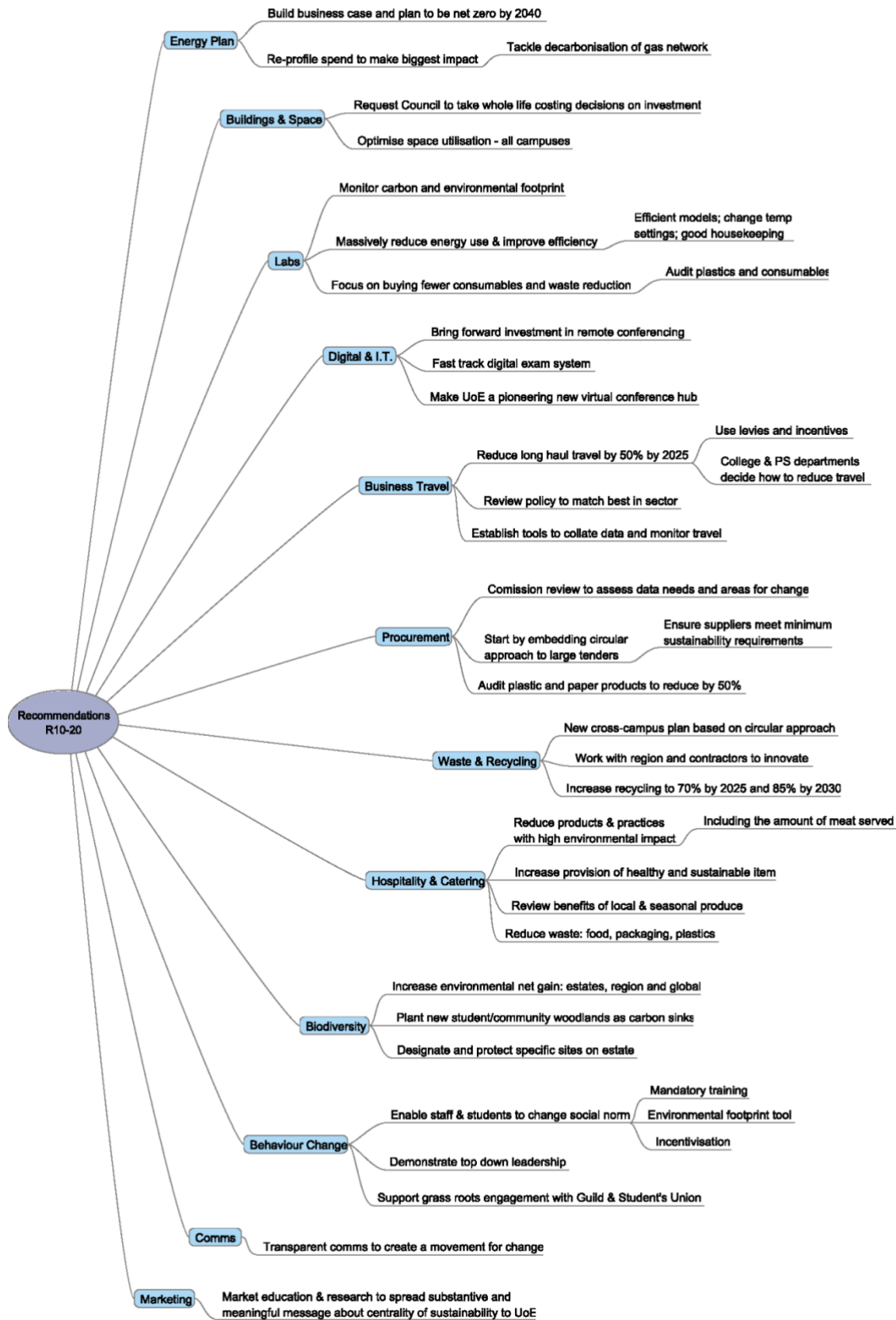Note that advisors have not seen or commented on the white paper, so it may not reflect their views.

Advisor	College/Service	University Role
Professional Services		
Iain Parks	CIOSS	Director of Grounds, Streatham
Giles Maling	CIOSS	Head of Hospitality
Sarah Snow	CIOSS	Acting Director of Commercial Services
Joel Smith	CIOSS	Sustainability Officer
Melissa Summerfield	CIOSS	Carbon Data Coordinator
Neil Sheppard	CIOSS	Head of Facilities Operations - Streatham
Graham Moncur	CIOSS	Facilities Development Manager
Simon Law	CIOSS	Director of Catering and Retail Services
Oliver Lane	FXPlus	Director of Residences and Facilities
Natalie Brown	FXPlus	Head of Facilities Operations
Marja Van Loef	FXPlus	Sustainability Manager
David Lawrence	FXPlus	Energy Manager
Lizzie James	Technical Services	Technical Services Business Partner (CEMPS)
Gail Reeves	Technical Services	Head of Technical Services
Daniela Farina	Technical Services	ESI Lab Manager
Adrian Watson	Technical Services	Technical Services Manager
Alex Morrison	CAMS	Press Officer
Stuart Westhead	Global Partnerships	Assistant Head
Richard Foord	Global Partnerships	Deputy Head
Andrew Connolly	Finance Services	Chief Financial Officer
Donna Fitzgerald	Finance Services	Deputy Director Finance Operations & Procurement
Chris Evans	IIB	Assistant Director – Regional Impact and Innovation
Lindsay Anderson	IIB	Impact and Partnership Development Manager
Victoria Alcock	VC Executive Office	Head of Vice Chancellors Office
Ruth Grimmer	College Operations	Senior College Operations Officer
Sarah Campbell	College Operations	Associate Director of Arts and Culture
Grace Williams	Research Services	Engaged Research Manager
Academic staff		
James Dyke	GSI - CLES	Senior Lecturer in Global Systems
Kelly Moyes	CLES, Bio	Senior Lecturer
Jamie Shutler	CLES, Geo	Associate Professor in Earth Observation
Peter Melville-Shreeve	CEMPS	Research Fellow
David Butler	CEMPS	Professor of Water Engineering
Xiaouyu Yan	CEMPS, Renewables	Senior Lecturer in Energy and Environment
Emma Heady	CEMPS	Student Recruitment and Admissions Coordinator
Tony Norton	Centre for Energy & the Environment	Director
Mickey Howard	Business School	Professor of Supply Management
Kate Hind	Business School	SWEEP Impact Fellow
Sally Faulkner	HUMS, Lang	Professor of Hispanic Studies and Film Studies; ADID
Mark Ferguson	CMH, ECEHH	PhD student
Alice Moseley	SSIS, Politics	Lecturer in Politics
Students		
Nicola Carter	The Guild	Director of Commercial Services
Penny Dinh	The Guild	Guild Vice President – Education
Council		
Sarah Buck	Council	Pro-Chancellor; Independent Lead for Estates and Environmental Sustainability
Glenn Woodcock	Council	Independent Lead for Dual Assurance Sustainability

Appendix 2: Illustration of Summary Recommendations R1 – R9

Appendix 2: Illustration of Summary Recommendations R10 – R20

A mind-map diagram branching from a central node "Recommendations R10-20" into the following categories and sub-items:

Energy Plan
- Build business case and plan to be net zero by 2040
- Re-profile spend to make biggest impact
  - Tackle decarbonisation of gas network

Buildings & Space
- Request Council to take whole life costing decisions on investment
- Optimise space utilisation - all campuses

Labs
- Monitor carbon and environmental footprint
- Massively reduce energy use & improve efficiency
  - Efficient models; change temp settings; good housekeeping
- Focus on buying fewer consumables and waste reduction
  - Audit plastics and consumables

Digital & I.T.
- Bring forward investment in remote conferencing
- Fast track digital exam system
- Make UoE a pioneering new virtual conference hub

Business Travel
- Reduce long haul travel by 50% by 2025
  - Use levies and incentives
  - College & PS departments decide how to reduce travel
- Review policy to match best in sector
- Establish tools to collate data and monitor travel

Procurement
- Comission review to assess data needs and areas for change
- Start by embedding circular approach to large tenders
  - Ensure suppliers meet minimum sustainability requirements
- Audit plastic and paper products to reduce by 50%

Waste & Recycling
- New cross-campus plan based on circular approach
- Work with region and contractors to innovate
- Increase recycling to 70% by 2025 and 85% by 2030

Hospitality & Catering
- Reduce products & practices with high environmental impact
  - Including the amount of meat served
- Increase provision of healthy and sustainable item
- Review benefits of local & seasonal produce
- Reduce waste: food, packaging, plastics

Biodiversity
- Increase environmental net gain: estates, region and global
- Plant new student/community woodlands as carbon sinks
- Designate and protect specific sites on estate

Behaviour Change
- Enable staff & students to change social norm
  - Mandatory training
  - Environmental footprint tool
  - Incentivisation
- Demonstrate top down leadership
- Support grass roots engagement with Guild & Student's Union

Comms
- Transparent comms to create a movement for change

Marketing
- Market education & research to spread substantive and meaningful message about centrality of sustainability to UoE

Appendix 3:   Table of sector policies and practice (part 1)

HE Institution	Key Headlines	Carbon Neutral Scope 1 & 2	Scope 3 Target	Sustainability Lead	Team size	Sustainable Procurement Policy	Sustainable Travel Policy	Sustainable Food Policy
University of Exeter	Declared climate emergency, 20th May 2019.	No net zero target 50% reduction in energy-related carbon emissions by 2026 from a 2005/6 baseline. 80% reduction by 2050.	No current target	Head of Sustainability (Estates)	5	Sustainable Procurement Strategy (outdated)	YES Sustainable Travel Plan for Exeter Campuses	YES Sustainable Food Policy
University of Cambridge	Produced comprehensive vision in 2013 – Environmental Sustainability Vision Oct 2016 Beef & lamb ban cut emissions 11%	Zero Carbon Science Based Target: Energy-related carbon emissions to absolute zero by 2048 (aspiring for 2038), with a steep 75% decrease on 2015 emissions by 2030.	Targets under review – going back to council this academic year once baseline data is improved.	Head of Environment and Energy	18	YES Sustainable Procurement Policy	YES Sustainable Travel Plan	YES Sustainable food policy
University of Manchester	Declared climate emergency July 2019. 1st in Europe and 3rd in world for impact against the UN's SDG's.	Pledged support of the city of Manchester's target of 2038. Reduce by 40% by 2020 from a 2007/08 baseline (2017/18 achieved a 33% reduction).	Non-carbon targets for scope 3 e.g. activities such as commuting and purchasing confirmed from 2015.	University Lead for Env'mental Sustainability (Estates)	10	YES NETpositive Procurement	YES Sustainable Resources Plan The Living Campus Plan	YES Sustainable Food Policy
University of Leeds	Fully divested from significant fossil fuel extractors and set out 7 principles to tackle the climate crisis.	2030 net-zero and further 2050 target of no direct carbon emissions. Reduce by 35% by 2020/21 against 2005/6 baseline.	Total scope 3 emissions to remain static or reduce compared to 2015/16 baseline (excluding procurement emissions).	Director of Facilities Management (Estates)	15	YES Sustainable Procurement	YES Travel Plan 2015-2018	YES Sustainable Food
University of Bristol	First UK University to declare a climate emergency in April 2019.	2030 April 2019 - Reduced by 27% and on way to hitting this target.	Plans to comprehensively measure and begin reduction by 2020/21.	Head of Sustainability (Estates)	18	YES Part of sustainability policy 2017-2023 & Circular Economy Strategy	YES Sustainable Travel 2017-2023	YES Hospitality Services Ethics & Sustainability Food Policy & Procurement Strategy 2017
Newcastle University	Declared climate emergency in April 2019. Became one of the first universities to sign the Emissions Reduction Pledge.	2040 (at the latest). Signed Govt's Emissions Reduction Pledge committing to 30% reduction in Scope 1 and 2 from 2009/10 baseline by 2020/21.	Under review – looking to include specific scope 3 categories in net zero target and improve accounting methodologies.	Deputy Vice-Chancellor	7	YES Sustainable procurement policy & Strategy Level 4 of DEFRA Flexible Framework	YES Travel Plan Update 2015	YES Healthy & Sustainable Food Aims

Appendix 3: Table of sector policies and practice (part 2)

HE Institution	Sustainable Waste Policy	Fossil Fuel Divestment Policy	Travel Target	Meat Target	Waste Target	Align with SDG's	SDG Accord Signed	People & Planet League
University of Exeter	YES Waste Management Strategy	Ethical investment policy but no specific divestment from fossil fuel companies	Calculate CO2 emissions from business travel on 2-yr basis. Convert 25% vehicle fleet to electric by 2020.	NO	Recycle 45% of waste by the end of 2020. Divert 90% of commercial food waste to anaerobic digestion.	NO	NO	36th (2:1)
University of Cambridge	YES Environmental Sustainability Vision	Divestment Working Group Report 2018 Suggests joining the IGCC - adopt position of considered divestment.	Reduce per capita emissions from air business travel by 25% against 2014/15 levels by 2024/25 taking into consideration current under reporting.	Offer no ruminant meat & reduce other meat.	Send zero non-hazardous waste to landfill by 2020. Achieve year-on-year reductions in waste arising per FTE staff and students.	NO	NO	67th (2:2)
University of Manchester	YES Sustainable Resources Plan	Responsible Investment Policy does not specifically reference fossil fuel divestment.	12% reduction in University business travel (based on 2014/15 baseline). Fully electric fleet & charging bays by 2022.	Purchase high-welfare meat and dairy.	Increase recycling segregated at source by 20% by 2022. Increase reuse thro Furniture Reuse Centre and in student residences. Increase recycling of non-hazardous construction materials to 90%.	YES	YES	59th (2:1)
University of Leeds	YES Reuse, Recyclings & Waste	Withdrawn investment from significant extractors (Shell, BP, Total). Support those transitioning to alternative energy sources. Responsible Investment Policy.	Increase proportion of walking, cycling and car sharing for students and staff. Reviewing Scope 3 before travel targets.	NO	Improve recycling rates and reduce contamination of campus waste. Embed circular economy approach into procurement process.	YES	YES	22nd (1st Class)
University of Bristol	YES Circular Economy Strategy 2017-2023 Food Waste 2017	Endowment Investment Policy – "investment focus in non fossil fuel energy providers". Announced divestment in companies that derive more than 5% income from intensive fossil fuel industry.	Achieve 85% (baseline 79% in 2007) and retaining 96% (baseline 96% in 2008) respectively by 2022 for sustainable modes of transport. 5% reduction in carbon from termly travel by 2020.	Reduce the amount of foods from animal origin served.	Reduce waste production by 7%/ FTE by 2025. Reuse 8% and recycle 60% of total 'at source' waste produced by 2022. Reuse 10%; recycle 85% construction and demolition waste by 2022. <1% waste to landfill. Circular economy strategy	YES	YES	11th (1st Class)
Newcastle University	No policy. Waste reduction details on website.	Included in Carbon Management Plan 2019 (CMP). Carbon Advisory Group to facilitate divestment from fossil fuel companies.	Emphasis on improvement and review of travel data. Reduction of business / commuting / out of term travel despite growth with targets to be set after improved robustness of data. (CMP)	NO	Reduce emissions to 1.47 kg CO2e per staff and student FTE by July 2018 – not achieved due to change in waste management, under review. (CMP)	YES	NO	12th (1st Class)