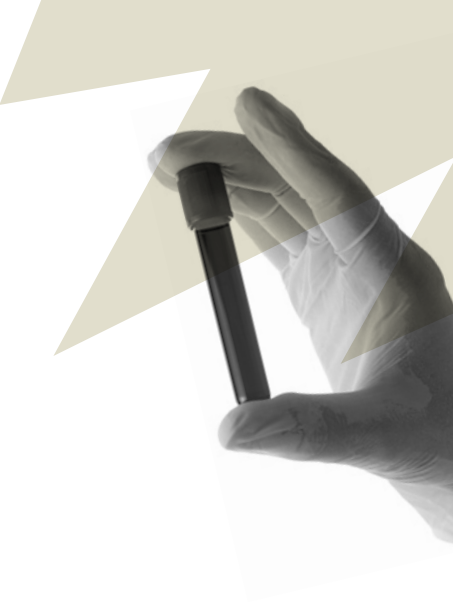
THE ROYAL ANNIVERSARY TRUST



The Platinum Jubilee Challenge

Accelerating the UK Tertiary Education Sector towards Net Zero

A sector-led proposal for action and connected thinking

Inside this report

Acknowledgements

The Royal Anniversary Trust (the Trust) would like to thank the forty-two individual Platinum Jubilee Challenge participants, the Department for Education (DfE), and The Alliance for Sustainability Leadership in Education (EAUC) and their associated working groups as collaborators on this project. We also thank SB+CO for their facilitation and co-writing of this report, and EcoAct for their contribution in developing the carbon footprint model.

In addition, we thank the tertiary education sector's membership organisations, including the Association of Colleges (AoC), Colleges Scotland, Universities UK (UUK), and other stakeholders for their input to the development of this report, and who welcome its findings.

Letter from The Royal Anniversary Trust

Kristina Murrin CBE
CEO, The Royal Anniversary Trust

For over thirty years, the Queen's Anniversary Prizes have been the pinnacle of achievement in the higher and further education sectors. Historically awarded by the late Her Majesty Queen Elizabeth II, they recognise the most innovative and impactful institutions across the UK, with each being recognised in a medal ceremony traditionally held at Buckingham Palace.

To mark the Queen's Jubilee in 2022, the decision was made to launch a challenge to the latest extraordinary winners. What could they achieve if they crossed geographical, subject, and sector boundaries, and worked together on a tough shared issue?

Over the course of the last year, the Platinum Jubilee Challenge (the Challenge) has brought together twenty-one winning institutions to develop a plan to accelerate the tertiary education sector towards Net Zero. Visits, detailed research, an in-depth residential, and many, many hours of teamwork have gone into its creation. We hope it will be an invaluable resource to help the sector accelerate its knowledge and actions.

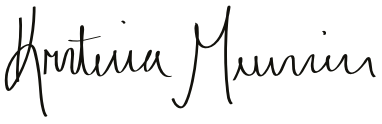
The report is highly ambitious. It fully covers Scopes 1, 2 and 3, and includes a sector-specific Standardised Carbon Emissions Framework (the Reporting Framework) based on the Greenhouse Gas (GHG) Protocol. Great credit goes to the EAUC for their detailed work to develop the framework and guidance for implementation. This was consulted on nationally with the full HE and FE sectors thanks to the support of UUK and AoC. If adopted sector-wide, it will provide consistency, transparency, and data-led decision making.

This report sets out a clear pathway for the sector to reach Net Zero, with recommendations for institutions and the government on how to accelerate progress. This is the most detailed work on Net Zero currently being promoted across the UK public sector. Internationally it is also attracting great interest and is allowing the UK to lead the way in carbon reduction thinking.

Collaboration and partnership have proven to be strong touchstones for both HE and FE participants during the Challenge, and this report is written in that spirit. We thank DfE for their wholehearted support of the Challenge. This initiative supports the 'innovate, test and invest' strategy set out in the DfE's Sustainability and Climate Change Strategy.

While the scale of the global climate emergency can feel daunting, we are also excited by the opportunities it creates. The UK's world-leading tertiary education sector has a vital role to play, not only in leading by example but through its research, training, and expert skills in climate science. We have a great history of innovation, knowledge sharing, and skills training which is needed now more than ever. The government can create the environment for these initiatives to thrive and grow.

The Royal Anniversary Trust would like to thank all the individuals, institutions, and sector bodies that gave their time and expertise so generously over the last year. Above all, we would like to dedicate this report to the memory of Her Majesty Queen Elizabeth II, who supported and championed the UK's universities and colleges throughout her life. We hope progress will now be made towards securing our climate future in her honour.



Kristina Murrin CBE

The Challenge Ambition

Launched by the Trust in 2022, the Challenge was created as a vehicle to help the UK tertiary education sector accelerate its progress towards Net Zero emissions and drive change through climate leadership. This project presents a historic opportunity to build capacity and climate resilience within the higher education (HE) and further education (FE) sectors.

The Challenge acknowledges that the tertiary education sector has a key role to play in responding to the global climate emergency. It is unique in its leadership on climate change and ability to affect widespread change through education, research, and innovation. It can also equip vast parts of our society with the knowledge and behaviours needed to deliver a lower carbon economy and world. Therefore, the substantial investment needed by the sector provides an immense opportunity for the UK's transition to a low-carbon future.

This report was created as an outcome of the Challenge, and has three main objectives:

- Share knowledge, insights, and recommendations with the sector to accelerate its progress towards Net Zero
- Propose a Standardised Carbon Emissions Framework and guidance to bring uniformity to emissions reporting across the sector
- Recommend to the government the policy changes and actions needed to help the sector achieve Net Zero emissions

This report represents the views of its authors ('the participants' – listed on page 6), and not necessarily those of every institution participating in the Challenge.

A MESSAGE FROM THE PARTICIPANTS – 'A UNIQUE SECTOR-LED OPPORTUNITY'

As Challenge participants, we are putting forward a report that reflects the discussion informed by the academic thinking and practical experiences of this group. It outlines the necessary and urgent policies and mechanisms that we feel are needed to progress the sector towards Net Zero emissions. We recognise the important role we play as a sector to accelerate our UK-wide climate emergency response and contribute to a just transition. As global leaders in education, this should lead to reduced emissions, system change, and long-term climate resilience.

The importance of integrating sustainability and Net Zero emissions thinking into each institution's leadership, strategy, and decision-making processes is essential. This requires an understanding of the scale of the challenge at every level, with a clear prioritisation of actions, and effective governance processes. We know that progress can only be accelerated if every institution's expertise is coordinated across its academic and professional functions, to maximise ideas and support implementation.

Our aim is to help the sector to:

- Build organisational accountability through governance and decision-making
- Adopt the Reporting Framework
- Increase funding to accelerate the decarbonisation of estates
- Improve innovation, skills, learning, and research
- Maximise HE and FE partnership and collaboration
- Encourage and kick-start cross-sector knowledge sharing

To support these aims, we propose a set of guiding principles on Net Zero emissions and have identified three Action Pathways where we suggest the sector should focus efforts to reduce emissions. These are across Built Environment, Travel and Transport, and Sustainable Supply Chain, which make up 80% of the sector's overall carbon footprint. We have highlighted Finance and Investment, and Internal Skills and Resources, as two cross-cutting Enablers to help accelerate progress towards Net Zero.

Although the Reporting Framework is not currently mandatory, we believe that its adoption by the sector would go a long way towards helping institutions understand the full scope of their emissions, and where to focus action to reduce them.

Here, we set out a clear and long-term sector-based pathway towards Net Zero emissions to enable a strong response from the government and the sector. Our recommendations and priorities represent the Challenge's collective ambition to promote a more sustainable, secure, and resilient sector for all.

We hope that the government listens to these recommendations, and that they are embraced and acted upon. We also endeavour for this report to become a valuable resource for the sector and all educational institutions to enhance and enable their work.

The Challenge Participants

The Challenge is comprised of the winners of the most recent round of The Queen's Anniversary Prizes. This is the highest national honour given to the tertiary education sector, and represents the most innovative and impactful institutions across HE and FE in England, Northern Ireland (NI), Scotland, and Wales. These twenty-one institutions have taken part in in-person visits, a residential workshop, and working groups over the last year to capture key themes and common challenges faced by the sector in reaching Net Zero.

Representing a cross-section of different campus sizes and types, with contrasting student mixes and geographical locations, their collective contribution to sustainability is significant. Among them are strong examples of climate leadership that demonstrate the integration of nature-based and social impact thinking within Net Zero activity, as well as breakthrough solutions in new sustainable materials and technologies, and experiences of decarbonisation.

The participants represent a wide range of approaches to Net Zero and their commitments vary in scope, boundaries, milestones, and time horizons, and only some institutions have fully costed decarbonisation plans. However, they all face common barriers to achieving emissions reductions. By sharing this breadth of experience with each other throughout the Challenge, the participants were able to bring into focus the cross-sector collaboration opportunities for both HE and FE institutions.

> **"Collaboration and partnership have proven to be strong touchstones for both HE and FE participants during the Challenge, and this report is written in that spirit."**
>
> Kristina Murrin, The Royal Anniversary Trust

The participants

21
15 are HE and 6 are FE institutions

There are
20
urban campuses (of which 7 have a rural hub) and 1 rural campus

15
institutions are in England

4
in Scotland

1
in Northern Ireland

1
in Wales

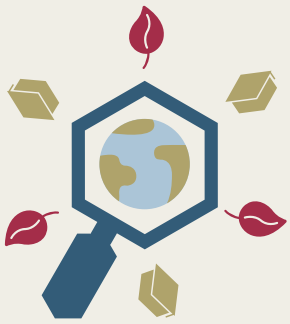
Their combined student population includes

70%
UK students

30%
international students

4
have overseas campuses and 5 hold additional agricultural land

Over
50%
of the participants have a sustainability research institution



University of Aberdeen

Professor Tavis Potts
Personal Chair, Dean for Environmental Sustainability

Fraser Lovie
Policy Adviser, Estates and Facilities

Anglia Ruskin University

Simon Chubb
Head of Sustainability

Felicity Clarke
Institute Manager, Global Sustainability Institute

University of Bradford

Stuart McKinnon-Evans
Sustainability Programme Sponsor

Mark Wrigley
Engineering Team Manager

Chichester College Group

Rob Kay
Director of Estates

Tom Hughes
Senior Academic Lead on the Strategic Development Fund/Net Zero Carbon

Exeter College

Richard Church
Chief Financial Officer

Steve Strang
Director of Estates and IT

University of Glasgow

Professor Jaime Toney
Director, Centre for Sustainable Solutions, Professor in Environmental and Climate Science

Dr Stewart Miller
Sustainability Manager, Associate Director, Centre for Sustainable Solutions

The TEC Partnership

Neil Bainbridge
Vice Principal, Grimsby Institute of Further and Higher Education

Heriot-Watt University

Anna Clark
Sustainability Strategy Co-ordinator

University of Huddersfield

Patrick Flavin
Carbon and Energy Reduction Manager

Professor Jill Johnes
Dean of Huddersfield Business School

Imperial College London

Professor Paul Lickiss
Academic Leader in Sustainability

Rhea Samra
The Grantham Institute for Climate Change

University of Leeds

Lynda Simmons
Interim Director of Sustainability

Dr Shona Smith
Research and Innovation Development Manager, Priestley International Centre for Climate

Professor Piers Forster
Professor of Climate Physics, Director, Priestley Centre

London School of Economics and Political Science

Bob Ward
Policy and Communications Director, Grantham Research Institute

Thea Hamilton
Environmental Manager

London School of Hygiene and Tropical Medicine

Dr Matt Lee
Chief Operating Officer, Member of Executive Team, Chair of the Sustainability Committee and Director of SCIF

John Starmer
Director of Estates, Director of SCIF

The Manchester College

Steven Pickard
Director of Facilities

Niall Wright
Director of Estate Redevelopment

Nottingham Trent University

Helen Puntha
Green Academy Lead

Charmaine Morrell
Head of Sustainability

University of Oxford

Harriet Waters
Head of Environmental Sustainability

Tom Yearley
Deputy Head of Environmental Sustainability

University of Reading

Professor Mark Fellowes
Pro-Vice-Chancellor

Dan Fernbank
Energy & Sustainability Director

South West College (NI)

Dr Barry McCarron
Acting Head of Business Development

Eimear Grugan
Estates and Sustainability Manager

University of Strathclyde

Dr Roddy Yarr
Executive Lead, Sustainability

Dr Tracy Morse
Head of the Centre for Sustainable Development

Swansea University

Dr Justin Searle
SPECIFIC's Building Energy Systems Research Lead

Teifion Maddocks
Sustainability Manager

Warwickshire College Group

Ben Fairhurst
Head of FE Quality and International Programmes

Student Challenge Prize Fund

The Student Challenge Prize Fund was created as part of the Challenge to champion excellence in student innovation that supports the sector's ambition for Net Zero emissions. The aim is to recognise the important role that students play in supporting their institution by encouraging further innovative and creative thinking around carbon reduction. Five student-led on-campus projects were awarded funding and mentoring in 2022. Voted on by the participants of the Challenge, the winners were:

Anglia Ruskin University

Rethinking energy efficiency: A new user-focused approach to energy and building use

London School of Hygiene and Tropical Medicine

Reinventing waste in the MRCG domain (REWIND)

Swansea University

A nature-based solution to increase biodiversity and landscape carbon sequestration on and off campus

University of Leeds

Mini meadows to reduce carbon emissions and increase soil carbon content

Warwickshire College Group

Sustainability and climate change online learning modules for 16-18-year-olds

Find out more about the project outcomes

Go to page 57

Executive Summary

OUR MISSION

The UK's tertiary education sector will be a global leader in accelerating the climate emergency response and leading a just transition for people and the planet.

It will take a systems approach to reducing greenhouse gas emissions, building climate resilience, protecting and enhancing nature, and putting people at the centre.

The sector will use its strength in connecting knowledge and scaling new solutions through partnership and collaboration.

A JOINED-UP APPROACH

The Challenge participants have defined the core principles that should underpin a Net Zero emissions ambition and strategy. These principles are based on climate-related research and good practice, and are reflected in the proposed Reporting Framework. The participants recognise that the inclusion of Scope 3 emissions will be a big step for many in the sector, but this is necessary for everyone to play their part in reaching New Zero.

These principles cannot be decoupled from whole systems thinking that includes the protection and enhancement of nature and biodiversity, the resilience and adaptation of the sector to combat the impacts of climate change today and into the future, and the creation of community and societal benefits through the sector's actions, partnerships, education, and research.

Principles for Net Zero emissions

1

Scopes 1, 2 and 3

Commitments should account for Scopes 1, 2, and 3 emissions as specified by the GHG Protocol[1]. This incorporates direct and indirect emissions, and reflects leading practice and the ability to influence supply chain partners. This approach should be reflected in Climate Action Plans or Net Zero strategies, with goals, actions, and measurement across all three Scopes.

2

Standardised reporting

Standardised reporting, with clear emissions boundaries, is crucial for the sector to demonstrate a unified, transparent, and leading approach to emissions measurement. The Challenge participants were unified in their support of making this reporting mandatory for the sector, across all nations, and supported the concept of peer validation of public sector reporting.

The sector should aim for implementation of the proposed Reporting Framework against Scopes 1, 2 and 3, by 2024. This sector-wide baseline will allow the sector and each institution to identify robust roadmaps to Net Zero emissions by 2050 or sooner, and be an exemplar for others worldwide. The sector should also understand and be aware of global reporting frameworks that enhance the risk management of issues to support increased transparency and goal setting. Read more about the Reporting Framework on page 63.

3

Accelerated decarbonisation

The sector should focus on accelerating decarbonisation and align with climate science, pursuing efforts to limit global temperature increase to 1.5°C above pre-industrial levels. This means rapid progress by 2030 with near-term reduction targets, and further deep decarbonisation across Scopes 1, 2 and 3 to reach Net Zero emissions by 2050.

4

Sector collaboration

The sector should proactively share knowledge and resources between HE and FE institutions to mobilise action towards Net Zero emissions. This would create local two-way partnerships that harness the full impact of the sector's skills, experience, and solutions.

5

External partnership

The scale of the climate challenge requires system-wide partnership, so the tertiary education sector should actively work with local authorities and regional governing bodies, as well as collaborate with the private sector in the UK and beyond to innovate, access finance, and deliver wider benefits.

6

Carbon offsetting

The use of offsetting for carbon removal should be used as a last resort to neutralise residual Scope 1, 2 and 3 emissions that cannot be reduced or avoided. The sector should adopt leading principles on offsetting, focusing on high-quality, verified removal schemes. Read more on offsetting on page 52.

Priorities for the Sector

Built Environment

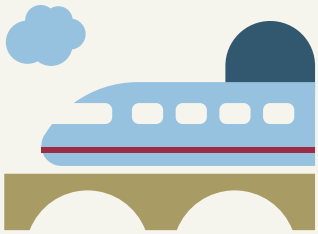
To achieve Net Zero by 2050 or sooner, the sector needs to ensure that every building is Net Zero emissions in operation and climate resilient. The sector should invest in adaptation to protect estates from climate change and remove embodied carbon by embracing sustainable construction standards. To deliver these priorities, the sector needs the right skills and resources for detailed carbon reduction planning and implementation, access to long-term capital investment, and public-private partnerships to implement change at scale.

Read more

Travel and Transport

The sector should reduce non-essential travel, shift mindsets and behaviour towards more 'purposeful travel', and prioritise low-carbon travel. To fully understand the scale of travel, the sector should accurately measure and report against its travel-related Scope 3 emissions and aim to understand the impact of current internationalisation strategies on business and international student travel. Institutions should embrace more sustainable travel planning and policies, and engage students and staff to encourage behaviour change.

Read more



Internal Skills and Resources

The sector should define the key internal skills that are needed for individual institutions to speed up their journey to Net Zero, and the key resources, policies, and standards that should govern implementation. They should span from Built Environment to Travel and Procurement, and involve work with education stakeholders, including the DfE and professional bodies, to encourage the inclusion and accountability of sustainability training into staff onboarding and professional learning and development.

Read more

Sustainable Supply Chain

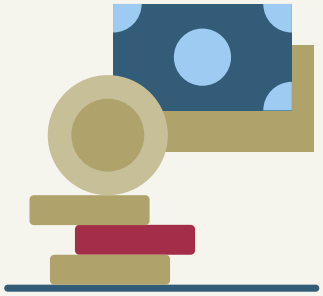
The sector must adopt sustainable procurement standards, policies, and processes to allow procurement teams to effectively reduce emissions across Scope 3. The adoption of an accurate measurement methodology would help to drive more sustainable purchasing decisions. The sector should equip purchasing decision-makers with the carbon skills necessary to influence tenders and contracts, develop case studies to share good practice, and to report progress. At the same time, the sector should support small and medium-size enterprises (SMEs), that are a crucial part of the sector's supply chain.

Read more

Finance and Investment

The sector should take a long-term investment approach to financing sustainability and the decarbonisation of its estates. Working with its stakeholders, including the DfE, it should identify ways of unlocking greater investments from the public, private, and third sectors, including novel sources such as green bonds, to support the delivery of its Net Zero strategies. The sector should also work to understand and mitigate the financed emissions of its own investments.

Read more



Recommendations to Government

Built Environment

1 Establish a UK-wide Decarbonisation Institute for the tertiary education sector to support the implementation of a low-carbon energy transition and Net Zero emissions built environment. It should provide individual institutions with data and insights to back the right solutions, identify system-wide regulatory blockers, and promote collaboration across the wider public and private sectors.

2 Fast-track the transformation of the National Grid to remove barriers that currently hamper the adoption of renewable technologies by the sector. The large education estate has high potential to generate green energy, but needs the right infrastructure and commercial framework in place.

Read more

Travel and Transport

3 Fund the research and development of a simple digital business travel measurement tool and portal, which will allow institutions to accurately and consistently track, measure, and influence their staff and students' business travel.

4 Require all local councils to consult with local universities and large colleges on their sustainable transport plans to adequately represent the needs and impact of the broad education community.

5 Require publicly-funded research bodies, including UK Research & Innovation (UKRI), to ensure transparent principles of sustainable travel and related emissions are mandatory within research-led funding bids.

Read more

Sustainable Supply Chain

6 Make the data from existing carbon reporting requirements e.g., SECR, ESOS, PPN0621, available via a dedicated online portal, for utilisation in measuring detailed supply chain emissions.

7 Incorporate sustainability and carbon reporting modules within the Department for Business, Energy and Industrial Strategy (BEIS) 'Help to Grow' scheme[2] to increase carbon literacy amongst SMEs and support emissions reporting.

Read more

Finance and Investment

8 Extend 0% VAT rate relief to incentivise decarbonisation of the existing tertiary education building stock through low emissions refurbishment and retrofit ahead of new builds, and conduct a review of current restrictions on debt levels through the Office of Students.

9 Ring-fence the proportion of carbon emissions that tertiary education is responsible for from the Public Sector Decarbonisation Scheme (Salix) specifically for the sector, and improve access for the institutions most in need.

10 Create a UK government-backed mechanism for smaller tertiary education institutions to band together to to raise incremental private sector funding for investment in renewables. Investigate what would facilitate a central collective capital raise.

Read more

Internal Skills and Resources

11 Fund and create a sector-led digital 'hub' to share resource materials (e.g., good practice, policy frameworks, case studies) across sector estates and sustainability teams, to accelerate knowledge for those who are responsible for creating and implementing Climate Action Plans and Net Zero strategies.

12 Fund a dedicated regional human resource for FE institutions to kick-start and transfer the skills needed to collect and measure carbon data in order to deliver on the requirement for a Climate Action Plan per institution by 2025.

13 Offer incentives to capture FE leavers and HE graduates with sustainability expertise and skills, to work in the tertiary education sector in order to retain green skills and drive the sector's Net Zero transition.

Read more

Offsetting

14 Regulate and improve transparency on land use and sale for carbon capture schemes, building on current work by The Scottish Land Commission. Commercial schemes must not be allowed to further damage natural habitats, deplete non-marginal agricultural land, or exclude local communities from a project's consultation process or access to the natural landscape.

Read more

Taking action

The Challenge identified three main Action Pathways that represent 80% of the sector's emissions. This report outlines the priorities for the sector in each area and some key recommendations to the government. Two cross-cutting enablers were also identified that will accelerate action across all Pathways.

To underpin this work, the adoption of the Reporting Framework will provide a baseline of sector-wide data to inform decision-making within these areas that can be leveraged by both HE and FE institutions at whichever stage of their Net Zero journey.

Key milestones

Total Carbon Footprint 18.1 $MtCO_2e$

2024 Standardised Carbon Emissions Framework implemented

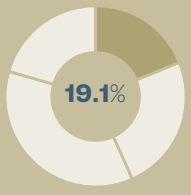
2025 Baseline data and reporting established for whole sector

2030 Reach a ≈50% reduction in emissions across S1, S2, S3

2050 Reach a ≈90+% reduction in emissions across S1, S2, S3

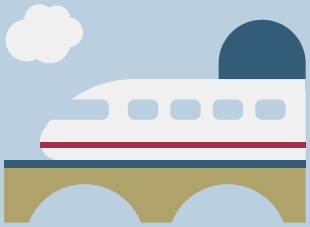
Three Action Pathways to accelerate the UK tertiary education sector towards Net Zero

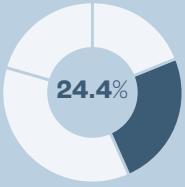
1 The Built Environment



% of total carbon footprint related to heat, power and construction of estates

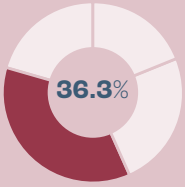
2 Travel and Transport





% of total carbon footprint related to Travel (business and student travel)

3 Sustainable Supply Chain



% of total carbon footprint related to purchased goods and services

Net Zero
UK tertiary education sector

Finance and Investment

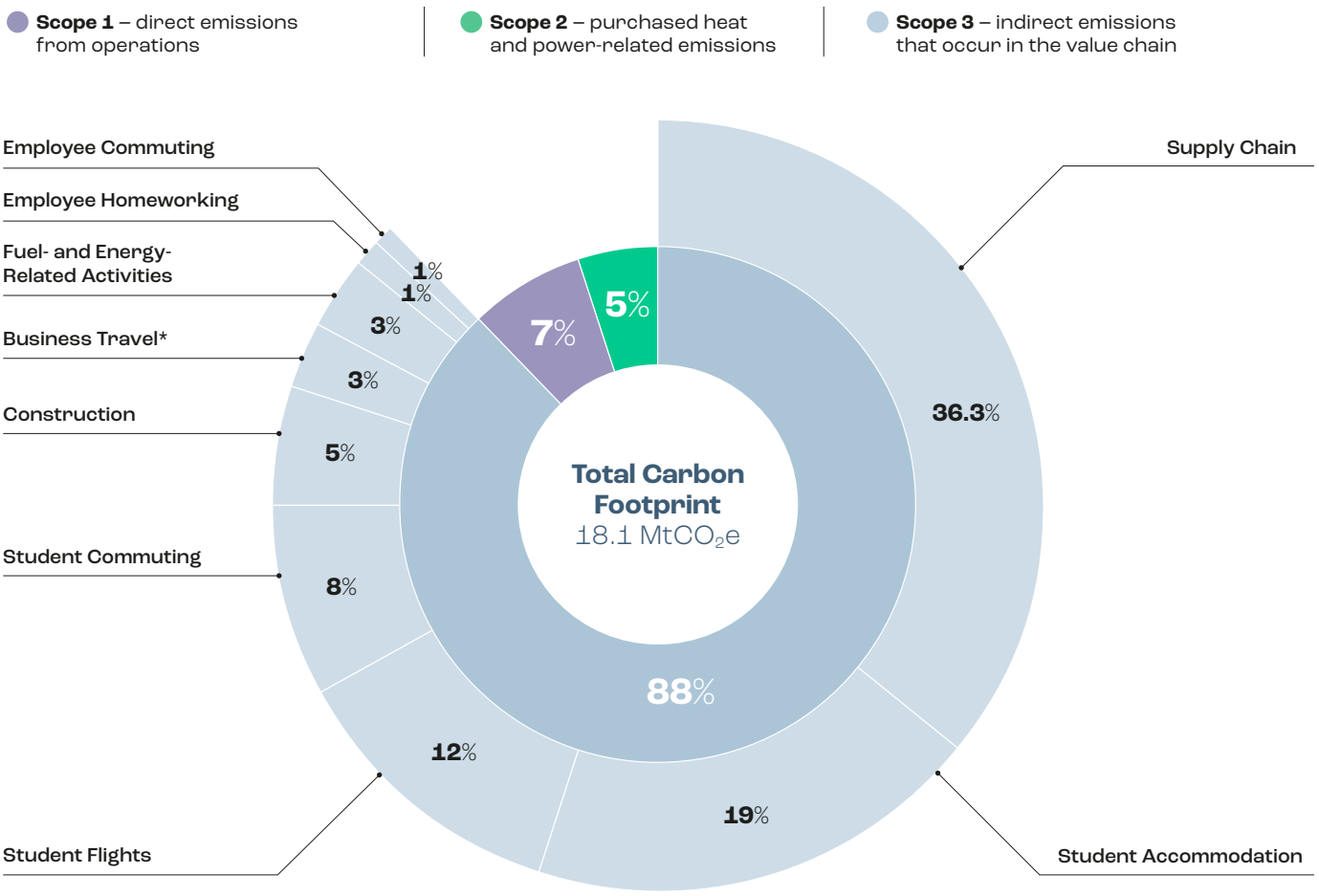
Cross-cutting Enablers

Internal Skills and Resources

Underpinned by a Standardised Carbon Emissions Framework

Carbon Footprint Model

Chart 1: A breakdown of 2020-21 sector-wide emissions across Scope 1, 2, and 3 in $MtCO_2e$, excluding financed emissions



Accurate and comprehensive emissions measurement is essential in managing and reducing organisations' carbon footprints. However, there is currently a lack of comprehensive emissions data for the HE and FE sectors. This is due to fragmented regulation on emissions reporting and differences of approach across devolved nations.

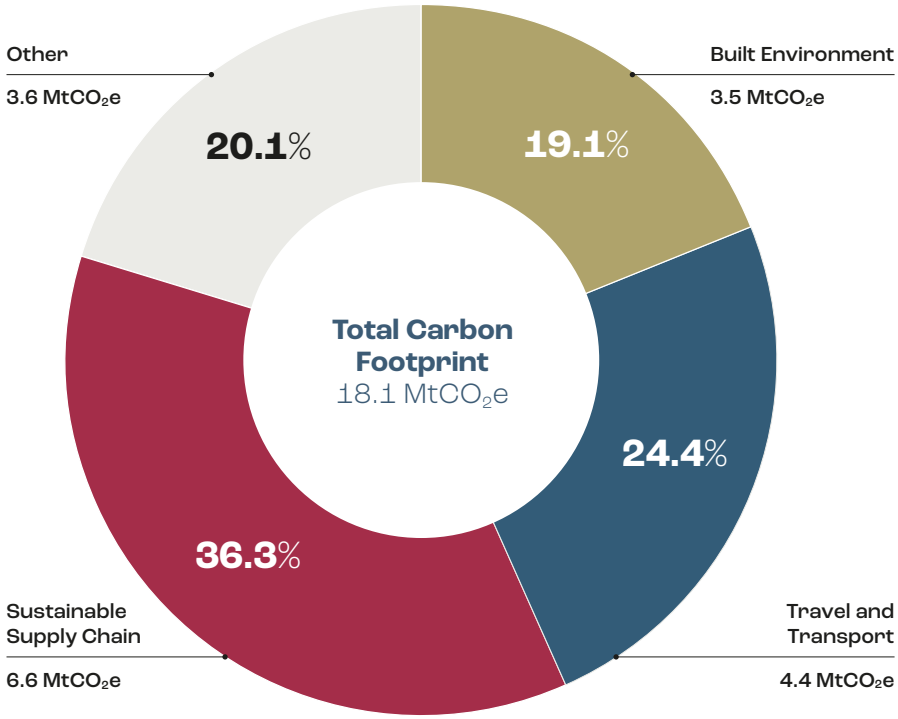
A consistent baseline for individual institutions and the sector is crucial to prioritise action and investment. The aim of the Reporting Framework is to close this gap. As a starting point, the Challenge developed a full sector carbon footprint, based on the categories in the proposed Reporting Framework, using available data and best practice methodology.

The calculation covers 268 HE universities and 269 FE colleges. The list of included institutions was developed based on organisations reporting to the Estates Management Record (EMR)[3], the Education and Skills Funding Agency (ESFA)'s database of college finance records[4], Office for Students' Register[5], and devolved nations' registers of HE and FE institutions.

The footprint was created using reported emissions data from EMR for 2020/2021. Where institutions had not reported data, emissions intensities for individual categories were developed based on total expenditure, student and staff numbers, or internal area, and extrapolated. This was done for both HE and FE institutions. A complete methodology for each emissions category is available in the Appendix, on page 66.

* Business travel emissions were estimated based on 2018/2019 data to avoid the impact of COVID-19.

Chart 2: Emissions sources related to the Action Pathways of Built Environment, Travel and Transport, and Sustainable Supply Chain in 2020-2021



Overview of the sector's emissions

The UK HE and FE sector emissions across Scope 1, 2 & 3 were estimated to be 18.1 $MtCO_2e$. HE institutions contribute to approximately 86% of this and FE 14%. With the presence of international students and the inclusion of student accommodation, emissions per student in HE are significantly higher (6.3 tCO_2e/student) compared to FE (2.0 tCO_2e/student).

With limited data available for FE, most of the results were estimated based on HE. Emissions data and intensity per student will be refined as institutions start reporting according to the proposed Reporting Framework. Similarly, Scope 3 emissions calculation across HE remains less developed compared to Scope 1 and 2 data. Therefore, while the numbers shown provide a helpful starting point and overview of likely significant emissions sources, they should be further refined before making institution-level decisions. This report focuses on three main areas of emissions: Built Environment, Travel and Transport, and Sustainable Supply Chain, which make up 80% of the sector's overall carbon footprint.

A significant source of emissions is the **Built Environment**, where Scopes 1 and 2, the institutions' fuel and electricity, total 2.1 $MtCO_2e$, or 12% of the overall sector footprint. This accounts for 10% and 22% of HE and FE emissions, respectively. Emissions from Scope 1 are estimated to constitute 61%, and Scope 2 39%.

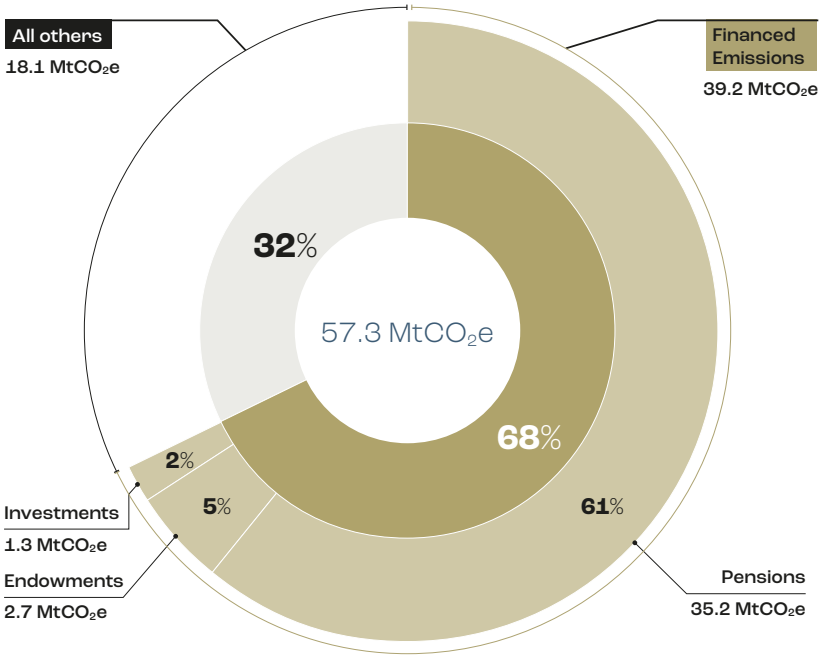
In addition, if the upstream emissions associated with extracting and transporting the fuel and the transmission and distribution of electricity are included, this adds another 0.5 $MtCO_2e$, equivalent to 2.8%. Furthermore, the supply chain emissions from construction projects in 2020/2021 were approximately 4.7%. However, construction emissions are variable and in 2018/2019, construction's contribution to supply chain emissions was nearly 3 times higher. With additional investment required to improve building fabric to meet Net Zero, this level is expected to return in the short-term. In aggregate, the built environment contributes nearly 20% of the sector's total emissions.

Travel, while spread across several sources, is another significant source of emissions. This is due to business travel accounting for 0.6 $MtCO_2e$*, 3% of the sector's emissions, employee (1%) and student (8%) commuting, and international student flights to and from the UK (12%). In total, these emissions represent almost 25% of the sector's footprint. They account for 24% and 26% of HE and FE emissions, respectively.

The **Supply Chain** is another significant source of emissions, accounting for 6.6 $MtCO_2e$, more than 36% of the sector's total footprint. In 2020/2021 this was highly influenced by medical instruments (34% of supply chain emissions), followed by business services (22%) and IT (20%). The contributions are expected to return to pre-COVID-19 proportions, where medical instruments accounted for only 4%, but overall supply chain emissions are expected to remain at the same level.

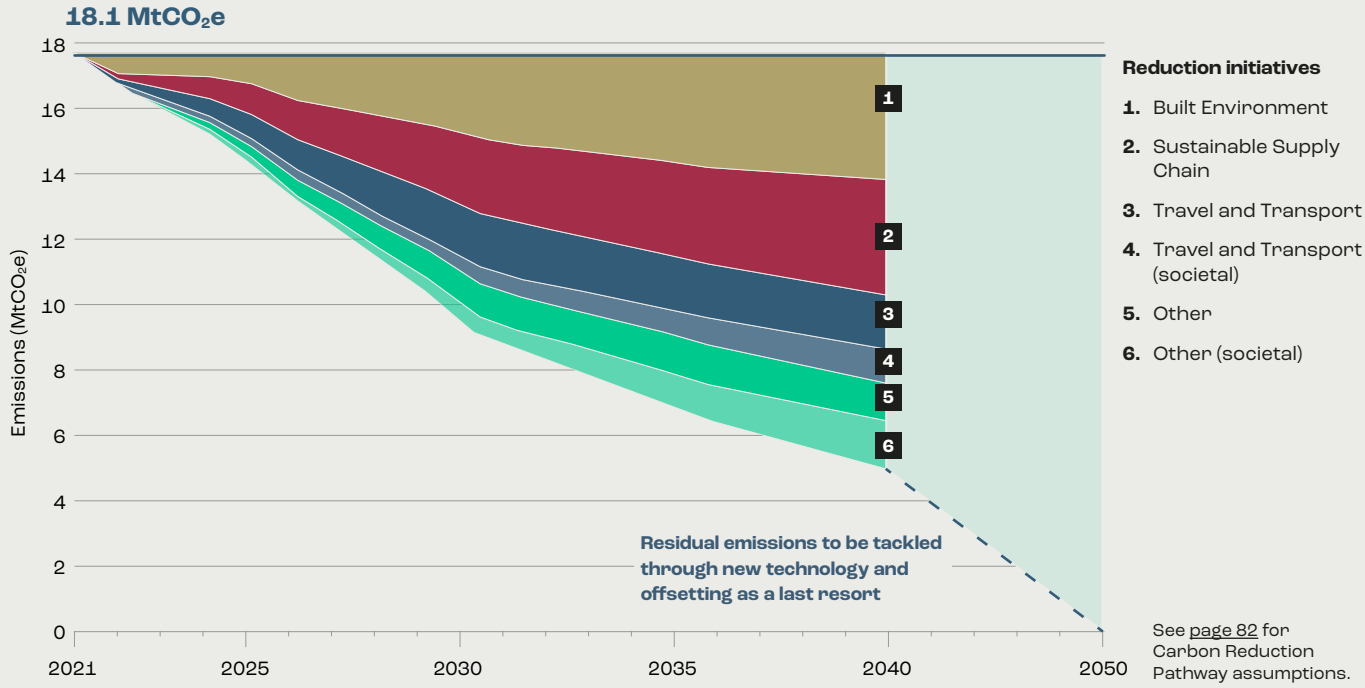
* Business travel emissions were estimated based on 2018/2019 data to avoid the impact of COVID-19.

Chart 3: Scope 3 financed emissions sources in relation to all other emissions sources combined across Scope 1, 2 and 3 in 2020-21



A final source of emissions that generally remains unaddressed by the sector is **Financed Emissions.** With over £46 billion (bn) in endowments, £21 bn in university direct investments, and nearly £110 bn in pension funds (predominantly Universities Superannuation Scheme (USS)), that financed emissions could account for as much as 39.2 $MtCO_2e$, which is more than two times all other emissions sources combined. HE accounts for most of these emissions (95%), with FE's pensions in Local Government Pension Schemes (LGPS) contributing 5%.

Chart 4: High Level Emissions Reduction Pathway*



See page 82 for Carbon Reduction Pathway assumptions.

To help the sector visualise how progress can be made in terms of reducing emissions, and how wider societal change influences the overall carbon footprint, a reduction glidepath model has been created. This glidepath is intended purely as an illustration of how targeted action on emissions reductions across the three Action Pathways can support the sector's Net Zero journey. It also seeks to highlight where further action is likely to be required.

This represents a sector-wide model, which means that it is expected that some institutions will be early adopters, and others will follow the general evolution of the UK's Net Zero path, overall contributing to sectoral Net Zero. The model continues until 2040 to highlight the sector's impetus to decarbonise ahead of the UK's national target of Net Zero in 2050.

OVERVIEW OF EMISSIONS REDUCTIONS

The **Built Environment** is expected to be a key driver of reductions, as Scope 1 and 2 emissions are expected to be close to zero in 2040. This is based on continued energy efficiency measures, use of alternative heating energy sources and electrification, and UK-wide electricity grid decarbonisation[6]. Also, construction emissions are expected to reduce by 67% in 2040 based on UK Green Building Council (UKGBC)'s Whole Life Carbon Roadmap[7]. Overall, the Built Environment is expected to deliver a 22% reduction by 2040.

Supply Chain reductions should deliver another 20% reduction by 2040. This will require extensive effort in leveraging Green IT, engaging professional services providers, and reducing food and materials emissions through volume and emissions intensity reductions.

Travel and Transport changes, including limiting business travel to 33% below pre-pandemic levels, increasing online teaching delivery, increasing student public transport use, and reducing international student flights, can in combination deliver a 9% reduction. In addition to this, societal changes based on the 6th Carbon Budget[8], including reducing aviation emissions and improving private and public transport, will reduce the sector's footprint by 6%.

Student accommodation emissions could be reduced by increasing provision of student Halls of Residence, an overall reduction of 7%. Improvements to residential housing are expected to deliver another 9% reduction.

FURTHER ACTION NEEDED

In total, these improvements reduce the sector's footprint by 72%. It therefore remains for the sector's actors to identify additional reduction opportunities, primarily in the residual emissions sources of supply chain, international student flights, business travel, and student accommodation. As a last resort, carbon offsetting could be used.

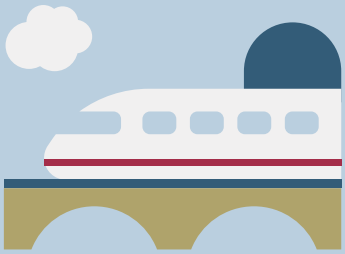
Action Pathways

The Challenge has identified three Action Pathways to accelerate the UK tertiary education sector towards Net Zero:

1 The Built Environment

Read more

2 Travel and Transport



Read more

3 Sustainable Supply Chain

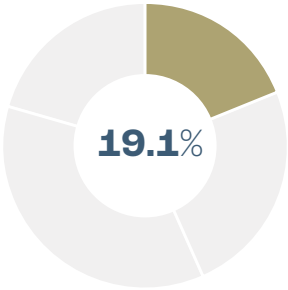
Read more

This section describes how the UK tertiary education sector can work to accelerate progress across three Action Pathways to achieve its Net Zero ambition: the Built Environment, Travel and Transport, and Sustainable Supply Chain. Cutting across all three Pathways are the core Enablers of Finance and Investment, and Skills and Resources. For each of these areas, there is a list of recommendations for government support to create the environment for this acceleration, and where further action is needed from within the sector.

The Reporting Framework will help the sector by giving it a basis of understanding and data to inform decision-making. Ideas and best practice within these areas can be leveraged by both HE and FE institutions at whichever stage of their Net Zero journey.

Action Pathway

1 The Built Environment



Overview

The immediate challenge of decarbonising education estates will entail considerable reduction of the Scope 1 and 2 emissions associated with the energy used for heating and cooling buildings and powering estates. This will require both strategic and technical leadership as institutions grapple with legacy heating systems, changing uses of campuses, increasing costs, emerging technologies, evolving infrastructure, and specific regional strategies.

The sector needs to take a systems-based approach to decarbonising estates, which means developing solutions that also protect and enhance nature, and deliver broader social impacts for staff, students, and local communities.

It must also prioritise the adaptation of estates in response to climate change – tackling energy efficiency and taking a fabric-first approach to refurbishments to achieve climate resilience against rising rising temperatures and extreme weather events leading to droughts or floods.

There is an existing tension for the sector between the cost of decarbonising operations and funding its primary functions of education, training, and research. This is exacerbated by the enormous cost increases in construction in recent years, and the energy crisis. The response requires coordinated leadership and decision-making across strategic, financial, technical, and academic functions, with a decarbonisation strategy fully integrated into policies and governance processes.

Scale of the challenge

- Direct and indirect GHG emissions from buildings account for **23%** of the UK's total emissions[9].
- The education sector (including schools) is the largest commissioner of construction in the country[10] and its buildings consume approximately **22.62 MWh**[11] of energy per year. **56%**[12] of this is used to heat buildings.
- HE and FE institutions in aggregate manage over **40 million m²** of building space.
- Scope 1 and 2 emissions from heat and power across the sector account for an estimated **2.1 $MtCO_2e$**, or **12%** of total sector emissions.
- Upstream emissions associated with extracting and transporting the fuels and the transmission and distribution of electricity add **0.5 $MtCO_2e$, equivalent to 2.8%.**
- Scope 3 emissions associated with embodied carbon in construction are estimated to be **0.8 $MtCO_2e$, or 4.7%** of total sector emissions.

Priorities for decarbonising the Built Environment

- To achieve Net Zero by 2050, the sector needs to ensure that every building is Net Zero emissions in operation by maximising opportunities for energy efficiency and shifting all sources of heat and power to renewable energy.
- Measurement, data, behaviour change, and accountability are key levers to achieve success.
- All buildings need to become climate resilient. This requires investment in adaptation that protects estates, staff, and students from the impacts of climate change.
- The sector needs to remove embodied carbon in new construction and refurbishment projects through sustainable construction standards to reduce indirect emissions from its supply chain.
- To deliver these priorities, the sector needs the right skills and resources for detailed carbon reduction planning and implementation, access to long-term capital investment, and public-private partnerships to implement change at scale.

Key insights

A COMPLEX ENVIRONMENT

Educational buildings and estates are complex and require expert skills and extensive resources to improve energy efficiency or transform at scale.

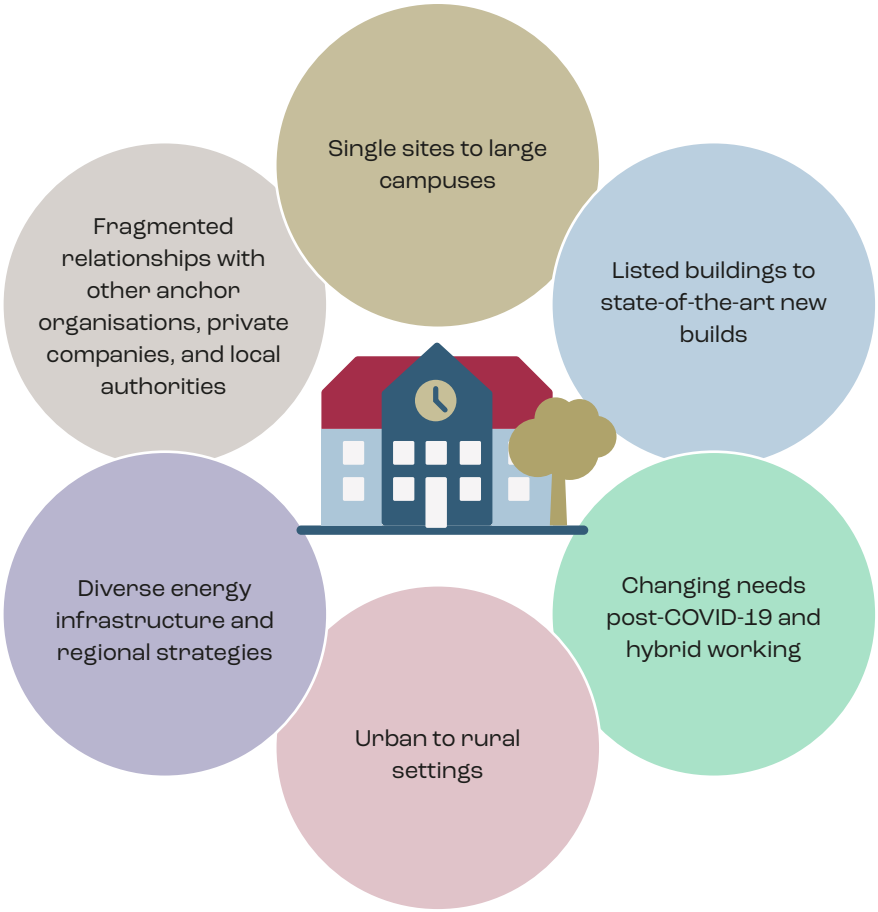
FUNDING AND LEADING THE CHANGE

Access to funding was identified as the biggest challenge to implementing climate plans in the sector. The financial capital needed to make sweeping changes to campus buildings and heating systems runs into the tens and even hundreds of millions of pounds for many institutions. Current financial mechanisms don't always reward environmental building performance, and tend to pitch institutions against one other for narrow windows of funding. Funding bids also require preparation by skilled experts which are hard to secure in-house, leading to a reliance on expensive external consultants. This often means that the least funded institutions are removed from the race for finance before it even begins.

The sector needs to reduce costs through making campuses, facilities, and operations more energy and space-efficient, and less wasteful. As well as the need for more advanced operational management systems, new funding mechanisms are required to help finance sustainable technologies for climate adaptation and balance the risks faced by the sector. The government recently announced the launch of the Energy Efficiency Taskforce (EETF) to drive improvements in energy efficiency and bring down bills in households, businesses, and the public sector. The Challenge hopes that the additional funding package announced from 2025 will be made easily accessible to the sector.

Public-private partnerships were also highlighted by the participants as a way for the sector to share financial risk and deliver solutions for the benefit of the sector and wider society.

Figure 1: Estates characteristics related to the Built Environment



DATA AND MEASUREMENT

Energy data and carbon measurement are crucial for each institution to establish its full carbon footprint and work towards detailed decarbonisation plans for every building. Although many institutions have developed climate plans with a baseline for certain scopes of emissions, the next level of work requires expert skills and resources which are rarely available or affordable.

The digitisation of building management systems is also essential to inform data-led decisions on building use, energy efficiency, and investment. Monitoring technology will also support the management of grid loads and battery storage for renewable energy in the future, as well as potential 'time of use' energy tariffs. The proposed Reporting Framework will support robust reporting of data, but the sector also needs to invest in expert skills and data systems to manage energy effectively.

BUILDING ADAPTATION AND STANDARDS

Prioritising investment in the adaptation of buildings will accelerate reductions in energy use and emissions, and build resilience against climate change. This includes implementing energy-efficient solutions that decrease reliance on energy for cooling or heating, and creating water management plans that anticipate periods of flood or drought.

Building standards and policies for sustainable construction and management are key tools to achieve Net Zero emissions estates. They govern how plans are implemented and protect long-term solutions from the pressures of short-term cost management. These are in various stages of adoption across the sector, and there is an opportunity to share leading practices such as Passivhaus[13], BREEAM[14], and SKA[15] to help raise standards sector-wide, as well as across the construction industry.

PLANNING GUIDELINES

There is a lack of alignment between national and local planning frameworks and the DfE's funding requirements, and the ambitions of the sector. This includes regulation that covers the many listed buildings in the sector, blocking the implementation of energy efficiency solutions such as double glazing, solar PVs, and methods of insulation.

A clearer strategy is needed for aligning planning guidelines with public sector building standards to remove barriers to progress.

The sector also has a role to play in improving collaboration on local climate plans, and sharing knowledge with regional planning authorities and the rest of the public sector.

DECARBONISING ENERGY

The sector must shift to renewable energy and new technologies. While the biggest reductions in Scope 1 and 2 emissions will come from the decarbonisation of the National Grid, many institutions also need to divest from their gas-powered Combined Heat and Power Systems (CHPs) and invest in onsite or locally-generated renewable energy to reduce cost and carbon while securing supply.

Investing in new technologies is challenging, as many remain unproven at scale or have unclear cost models. In some locations, the implementation of onsite renewables is also hindered by the limitations of local grid infrastructure, making it unviable as a solution. The sector needs an agreed approach to reporting onsite renewable energy generation for active Feed-In-Tariff schemes (FITs), as it is not currently clear in the UK where the benefit should be attributed (i.e., to the taxpayer or the institution). The role of REGO-certified (Renewable Energy Guarantees of Origin) electricity also needs careful consideration by the sector due to uncertainty over whether these tariffs actually deliver additional renewable energy production.

Other challenges include a lack of available space for technologies such as ground or air source heat pumps or battery storage in urban campus locations. Local energy networks also inhibit the sharing of power across a complex estate, as they often trigger costs and charges by network providers.

There is no doubt that new regional and national energy strategies are required to accelerate a more progressive infrastructure and drive system solutions through public-private partnerships that help fund the transition from gas to more sustainable energy sources.

Case Study University of Strathclyde

Innovative Technology for Carbon Neutral Heating Networks

The National Manufacturing Institute for Scotland HQ is the University of Strathclyde's first operationally carbon neutral building, located in Renfrewshire's Advanced Manufacturing Innovation District Scotland (AMIDS). The Institute is heated by a new low-carbon, renewable, and circular district energy network.

Using cutting-edge low-carbon technology, the network uses the ambient heat from treated wastewater from a nearby sewage works, which is distributed to buildings connected to the system. Local building heat pumps then raise the ambient heat source to a level which provides heat for each building. A back-up electric boiler provides resilience, and an 800 kWp solar PV rooftop array provides power. The ambient heat network is scalable to 6MW. This process is 90% greener than using traditional gas boilers, so it will enable the District to reduce its carbon emissions by up to 94%, as well as reduce fuel costs and noise pollution.

90%
greener than using traditional gas boilers

This system will contribute to Renfrewshire's goal to be carbon neutral by 2030. As the first network of its kind in Scotland, the University of Strathclyde hopes to inspire the adoption of this technology elsewhere, and position the country as a global leader in this area.

SKILLS AND RESOURCES

Relevant skills and resources are crucial for developing carbon reduction plans and managing these plans on-the-ground. This currently requires multiple external consultants, which is cost-prohibitive for many, and inefficient due to duplicated work across the sector. In the HE sector, there is a skills and funding gap for energy managers, carbon experts, and data analysts. Across both HE and FE, there is a gap in technical skills to manage the implementation of new technologies. There is an urgent need for upskilling and training of sector estates teams, as well as an affordable pipeline of skills for the tertiary education sector.

COLLABORATION AND PARTNERSHIP

Working together was identified as a key enabler for the sector to share knowledge and solutions. The sector has vast expertise and amazing examples of innovation and good practice. Harnessing this through local and national HE and FE networks, and through practical tools and resources, would help the whole sector to move forwards.

External partnerships are also essential for scaling system-wide solutions. The sector needs to collaborate with regional bodies, other public institutions, and private organisations, to share the investment and expertise needed for new low-carbon energy networks and developments. Public-private partnerships also give the sector the opportunity to lead a connected vision for climate neutral districts, integrating nature, active travel, health and wellness, and wider benefits for students, staff, and communities.

Sector Activation

STRATEGY, GOVERNANCE AND LEADERSHIP

- Leading governance processes embed the carbon impact of financial decisions for estates management. If senior leaders implement a 'check and balance' for carbon in financial planning, then sustainability will no longer be seen as a 'nice-to-have'.

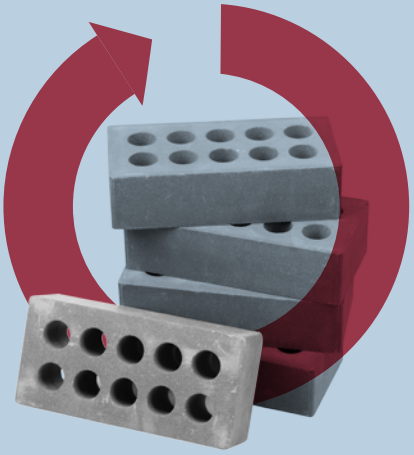
- Good practice in the sector already takes a whole-life carbon approach to buildings using the Royal Institution for Chartered Surveyors (RICS) methodology. This means extending financial decision-making beyond functionality and cost per m^2 to consider the emissions associated with the materials and construction processes, as well as the long-term operational emissions. This approach is vital to deliver a climate neutral built environment for the sector.

Case Study Heriot-Watt University

A Net Zero Community Hub

Heriot-Watt University (HWU) is developing a Net Zero Community Hub, designed as a physical and virtual hub of inspiration, information, and innovation in which to engage and equip communities with the skills and knowledge required to tackle the challenge of reaching Net Zero. It will showcase the university's research and innovation through exhibitions, talks, demonstrations, and workshops, and aims to facilitate collaboration between stakeholders, including local government, the private sector, and community-based groups.

The building is being designed to meet and surpass the Net Zero Public Sector Buildings Standard[16], which charts embodied, operational and whole life carbon. It will showcase and demonstrate sustainable construction technologies, including locally sourced low-carbon and renewable materials and innovations in its construction, such as the K-briq®. This is the world's first 90% recycled brick, developed by Kenoteq, a HWU spin-out company supported by Built Environment – Smarter Transformation Scotland, and Hamilton Waste and Recycling. Therefore, the Net Zero Community Hub itself will serve as a scalable example of collaboration for innovative, sustainable construction.



FURTHER WORK ON STRATEGY, GOVERNANCE, AND LEADERSHIP

- The sector needs to establish good practice guidelines for integrating sustainability aims into policy and governance processes to ensure decision-making and investment criteria for estates projects are managed clearly and consistently across the sector.

FUNDING AND INVESTMENT

- Detailed, costed Carbon Plans are essential to identify priorities and the impact of investment decisions. Leading institutions have developed estate-wide plans that have outlined the total financial cost of decarbonising their campuses. This requires detailed data analysis of current building performance in terms of energy use and emissions, and in some cases the cost and carbon benefits of new technologies. This enables capital funding to be targeted towards the largest areas of emissions and supports the development of competitive funding bids.

- Many in the sector find extensive 'estate-wide' planning impractical or difficult to tackle, and the outcomes are challenging to fund. The alternative is to manage a building-by-building approach that allows for piloting and learning as projects, technologies, and infrastructure develop.

FURTHER WORK ON FUNDING AND INVESTMENT

- A sector-based funding framework that provides practical guidance for alternative financing pathways would help institutions identify the right funding mechanism for decarbonising their estates, and support them on the approach that best aligns with their long-term financial models.

- The sector needs more support and skills sharing on how to access current funding, and a longer-term view of public funding programmes such as Salix. HE and FE also need to work together to attract funding as the sector offers a secure, long-term proposition for investors.

- Developing a long-term business case for the switch from gas to electricity is needed, as this will lead to higher utility bills in the short-term at a time of intense cost pressure.

DECARBONISING BUILDINGS

- Securing the funding and resources for an Energy and Carbon Reduction Plan (ECMP) is an essential first step for all institutions. This will provide the foundation for the development of a Heat Decarbonisation Carbon Plan (HDCP), and all subsequent actions and investment decisions. These steps depend on the work of expert practitioners and close collaboration with institution leaders.

- A total carbon footprint and Net Zero pathway for education estates, in some cases per building, requires robust data monitoring and measurement systems. This will enable effective energy management and inform decisions on energy efficiency, cost savings, and where to prioritise investment. These systems will also help monitor the 'real' savings from projects, which will be far less effective if left unmanaged.

- Building performance data is also an important asset when reviewing occupancy levels and planning space utilisation. Following the pandemic, many institutions have been investing in a review of workspaces to 'right-size' the campus for hybrid working and design flexible workspaces. This directly supports emissions management by avoiding wasted cost and emissions from unoccupied spaces. Involving business functions and academic departments in this process is essential to change working models and behaviours.

- The use of digital 'building twins' is another tool that can help to model different options for technology, refurbishment, or switches in power sources, as well as ongoing performance management. Although this requires expert skills and software, it provides tangible data for financial decision-making.

- Good practice also indicates that adaptation through refurbishment should be prioritised over new builds, and some institutions have set this as a strategic principle. This should include a fabric-first approach to improve a building's energy efficiency through insulation and airtightness, before embarking on new technologies or a replacement new build. The transfer of embodied carbon from demolished buildings into waste, and additional emissions from new construction processes and materials, will increase an institution's carbon footprint. Although sustainable construction processes and circular waste streams are evolving, consideration of the total life cycle of carbon is essential when defining the benefits of refurbishment over new builds.

FURTHER WORK FOR BUILDINGS

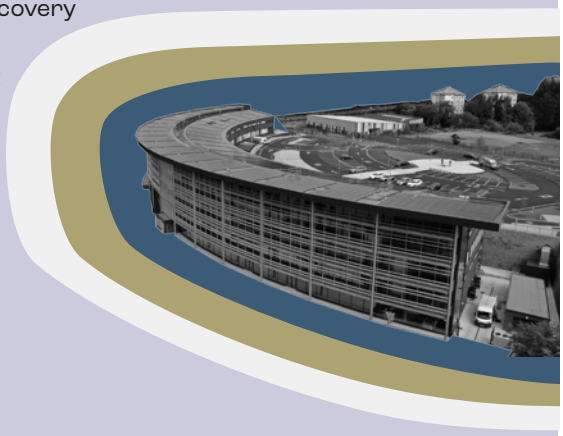
- The sector is a key source of innovation for the built environment and can exert considerable influence through implementing leading standards for sustainable building design and management. The sector should support good practice such as Passivhaus principles, BREEAM and SKA, and develop guidance on how to integrate green design standards at the planning stage of projects so they become a non-negotiable part of every institution's policy.

Case Study South West College

A World-Leading Sustainable Building

South West College's Erne Campus replaced an inefficient, D energy-rated property with an innovative, world-leading building. The Erne Campus is the largest Passivhaus Premium building in the world, the first in the UK, and the first education building worldwide to achieve this rating. There are currently 28 Passivhaus certified educational buildings in the UK[17], including 11 in the tertiary sector.

The Campus includes numerous insulation measures for floor, wall, and roof insulation, the mitigation of over 4 km of thermal bridging, and triple-glazed windows in a curtain wall arrangement. It has an efficient heating system which uses a combination of an air-to-water heat pump and bio-oil CHP. Heating potential is limited to only 228 hours, or 3% of the year above 25°C, using the Passivhaus Planning Package. Linking to this, the ventilation strategy is mixed mode, with a combination of natural and decentralised, and centralised mechanical heat recovery ventilation, which provides filtered air while retaining most of the energy used to heat the building. The building also includes 2,600 m^2 of solar panels and 460 KWh of battery storage for energy production. Conservative estimates suggest that the implementation of these standards will save the college £2 m on heat and energy over 25 years, and facilitate 88% cost savings annually. Now with a world and sector-leading campus, the institution serves as an example of best practice in sustainable building construction.



- Sharing good practice on how to integrate sustainability standards within supplier framework agreements, and selection and monitoring policies, will help raise standards across the sector. These standards should also be aligned across the sector's Procurement Consortia, who are responsible for the appointment of construction and maintenance partners.

- The sector needs to develop a framework for whole life carbon modelling of the built environment to be shared and applied consistently. This will ensure consideration of the whole life carbon impact of a building and prevent new projects from increasing rather than reducing emissions.

- The sector should apply its excellence in construction and energy innovation by using estates to test and trial new solutions as Living Labs. These trials should provide learnings across the sector and help explore opportunities to commercialise solutions.

- Halls of Residence are currently classed as 'temporary accommodation' in general planning rules, and don't adhere to stringent design or planning guidance. The sector should adopt the same sustainable building design and management standards for Halls of Residence as for other estates buildings.

ENERGY TRANSITION

- Onsite renewable energy generation provides a route out of gas and has the potential to deliver both cost and carbon savings, as well as security of supply. It also provides opportunities to trial institution-led innovation, and support research and learning for staff and students. The most common projects are investments in local solar arrays and ground source heat pumps. Some institutions are also exploring the use of water source heat pumps using local rivers or bore holes, or capturing energy from by-products such as sewage. Each institution takes a specific approach depending on land availability, local untapped energy resources, and partnership opportunities.

- There are three key steps when exploring the potential of onsite or local renewable energy generation:

  - Engage the local energy provider to understand the current capacity of local power networks. Additional 'load-bearing' capacity can be restricted, which will limit support for renewable energy projects.

  - Undertake a district-wide feasibility study to identify renewable sources of heat such as ground, water, or sewage.

- Identify partners for collaboration such as local authorities, energy providers, other large public institutions, or private companies.

FURTHER WORK FOR THE ENERGY TRANSITION

- The sector needs to establish and share good practice for the transition away from gas-powered CHP and gas-powered district heating systems to renewable sources of energy, including case studies on the implementation of new technology, the financing model used, and the impact on emissions and ongoing costs.

- Smaller institutions need support to prepare for upcoming legislative and planning changes that will need priority investment, such as changes to Energy Performance Certificates (EPCs) that will require higher building performance from 2027, and a ban on fluorescent lighting from 2023.

- Cooling rather than heating will become a more dominant use of energy in the future, especially for science-based institutions that operate high-intensity laboratories. Sharing best practice on the integration of more sustainable cooling systems will help the sector plan for rising temperatures due to climate change.

- The sector should work together to attract prospective investors in renewable energy schemes. Educational institutions are an attractive prospect for investors in new renewables, providing a stable anchor for energy loads around which to build long-term financial partnerships. In addition, taking a collaborative approach to Power Purchase Agreements (PPAs) that combine the sector's purchasing power will help increase available sources of renewable energy.

SKILLS AND RESOURCES

- HE institutions which are successfully implementing Carbon Plans have senior sustainability leaders with skilled teams and resources to develop, implement, and manage estate-wide projects. This includes specialists in carbon and energy management, data analysis, carbon accounting, waste, and transport. However, these skills are scarce across FE institutions, and the skills needed for the integration of new technologies are scarce across the whole tertiary education sector, tending to be managed by external consultancies.

- In addition to the inhouse skills needed for decarbonising estates, external consultancy skills are also required for Architecture, Mechanical and Electrical Design (M&E), Structural Engineering, Quantity Surveying, and Environmental Certification. Some

Case Study Swansea University

The UK's First Energy Positive Classroom

Swansea University's SPECIFIC Innovation and Knowledge Centre (IKC), in collaboration with partners including Tata Steel, is pioneering Active Buildings® which generate, store, and release their own solar energy. Included in this remit is the Active Classroom®, developed in 2016 as the UK's first energy positive classroom.

Energy is generated via a steel roof with integrated solar cells supplied by SPECIFIC's spin-out company BIPVCo, which can be stored in a battery system able to supply power for two days. The buildings also contain perforated steel cladding to generate further solar heat energy, and an electrically heated floor coating designed by SPECIFIC researchers.

These innovative buildings demonstrate how energy decarbonisation can be integrated into design, creating buildings which generate more energy than they consume. There are already plans for Swansea University's SUNRISE project to construct Active Buildings® in India to support some of the 600,000 villages struggling with electricity supply.

Alongside aiding the green energy transition, by integrating self-sufficient renewable energy generation with storage and smart controls, these buildings could foster a more advanced understanding of energy use. The data collected can be used to forecast future needs and control buildings' energy use and storage accordingly.

institutions have a framework of providers and with the support of an annual budget, can access the relevant skills on a project-by-project basis.

- To help support the skills needed across the sector, EAUC have partnered with SUMS Consulting to provide access to specialist sector-focused consultancy to implement emissions reduction across operations and estates. This will be available to the tertiary education sector in 2023, and the Challenge hopes that this will provide affordable technical skills for the whole sector.

- A new tool is being developed by EAUC, Association of University Directors of Estates (AUDE), British Universities Finance Directors Group (BUFDG), and Energise on behalf of the DfE, to provide a roadmap of actions and associated costs for estates-based carbon reduction in 2023. This will provide accessible data for institutions to model the cost and benefit of implementing certain technologies, materials, or processes for carbon mitigation. The Challenge welcomes this and hopes that it will support the sector to move faster.

FURTHER WORK ON SKILLS AND RESOURCES

- Develop a sector-focused skills framework for estates managers and teams, and a training resource to scale the skills needed for the implementation and management of low-carbon solutions.

- Develop a simple toolkit of energy efficiency actions and funding streams for FE institutions which have no inhouse decarbonisation skills. This would help tackle low-hanging fruit, such as changes to lighting and energy management practices that are directly linked to current funding mechanisms from the government.

- Develop formal local partnerships between HE and FE to encourage collaboration and knowledge sharing, and facilitate a pipeline of skilled engineers and estates practitioners for estates teams.

- Read more about how skills and resources could be scaled in the sector in the standalone 'Internal Skills and Resources' section, page 47.

COLLABORATION AND PARTNERSHIP

- Partnerships between universities, regional authorities, and private companies in Scotland have resulted in climate neutral innovation districts and infrastructure. Ambitious programmes like these demonstrate how combined expertise and investment can accelerate progress and scale up the benefits for all stakeholders.

Case Study Brinsbury College

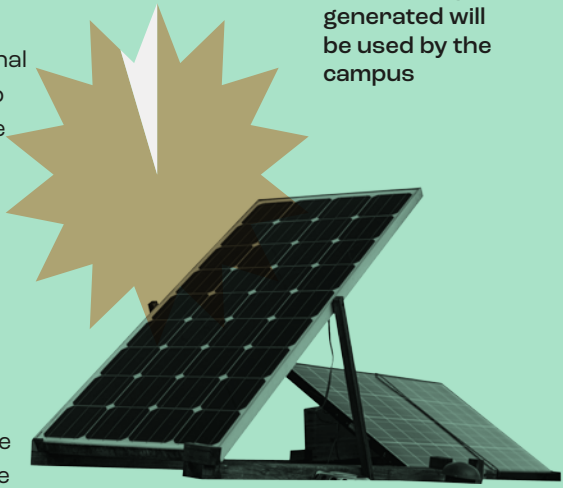
A Mini Solar Farm

Brinsbury College, part of the Chichester College Group, has installed 640 solar panels to create a mini solar farm in an otherwise barren field of very little agricultural use. The equipment will be leased over 25 years via a PPA, meaning that no initial capital outlay was needed from needed from the college. The subsequent estimated savings in electricity charges over the 25-year lease period total approximately £556,000.

The process of setting up the solar farm involved coordinating with local planning officers, the local Environment Agency, and appointing a consultant to ensure that the application for planning permission was submitted correctly. Creating a ground-mounted solar array is a more complex process than traditional solar equipment installation, so extra care was taken to ensure that plans abided with local regulations.

The farm is projected to produce 217,000 kWh per year and reduce the college's emissions by 65,000 $kgCO_2e$ annually. These contributions form part of Chichester College Group's mission to create more sustainable campuses across all of its institutions.

95%
of the energy generated will be used by the campus



- Collaboration across the sector can also unlock access to renewables – in 2019, The Energy Consortium (TEC) worked with 20 universities to develop the first collaborative PPA in the UK, purchasing 20% of their baseload power demand directly from wind farms in Wales and Scotland.

FURTHER WORK ON COLLABORATION AND PARTNERSHIP

- There is a clear disconnect between the HE and FE sectors in terms of sharing skills and experience. Where expert bodies exist, they tend to be exclusively focused on HE, and local partnerships between HE and FE are rare and ad hoc. The sector should look for ways to connect its good practice and experience to fill skills gaps and speed up progress.
- Collaboration on funding bids, such as the application for the Public Sector Decarbonisation scheme and Salix funding, would also be beneficial to support institutions with limited expertise and resources, and to decrease competition.

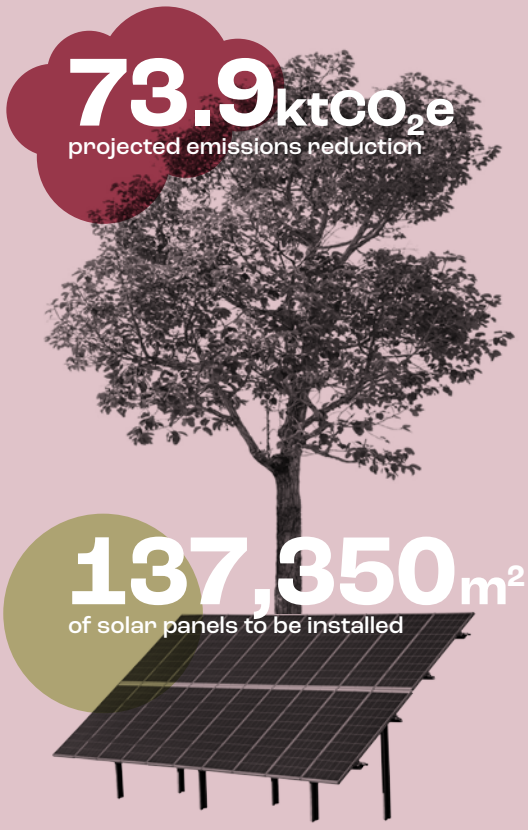
Case Study | University of Strathclyde

Sustainable and Socially Inclusive Communities

The University of Strathclyde has partnered with the Glasgow City Council, alongside other organisations, to deliver a climate neutral and resilient Innovation District. This will include a 100% renewable heat, power, transport, adaptation, and wellbeing plan, which will be both sustainable and socially inclusive for the district's 17,000 residents.

This is projected to achieve 73.9 $ktCO_2e$ emissions reduction, which is an 84% reduction from the current baseline. This will include planting up to 1,200 trees, and building 137,350m^2 of solar panels. The district will also harness power from the River Clyde, which is capable of providing over 2,000 GWh of power annually, of which only 8% would be needed. The innovations will be designed with accessibility and community in mind.

This project is one of 10 within the university's Climate Neutral Districts Vision and Sustainability and Social Impact Plan. The solutions are designed to be scalable and replicable, with the aim to expand them across university and regional local authority districts where the university operates.



Case Study London School of Hygiene and Tropical Medicine

Optimising Energy Use for Long-Term Resilience

300,000kWh
energy saving

As part of its 2030 Net Zero strategy, the London School of Hygiene and Tropical Medicine has plans to improve its estate, optimise its use of space, and build longer-term resilience into its buildings.

The strategy includes a space heating policy, updated engineering standards (for higher energy efficiency and lower carbon costs for technologies being implemented over their life cycle), a continued policy of renewable electricity sourcing, and further research into zero carbon heating technologies. Building innovations will include the installation of solar panels, over 600 efficient low flow taps, more energy-efficient freezers and windows, updated infrastructure, and a new electrical substation.

These plans, facilitated by a £1.2 m grant from the Public Sector Decarbonisation Scheme (Salix funding), are estimated to achieve 300,000 kWh of energy and 66 tCO_2e reduction annually, which will save over £25,000 per year.

Recommendations to Government

Many of the solutions for decarbonising the built environment and enabling the energy transition require a systems-led approach. The Challenge has identified two main areas for the government to support the sector:

1 Establish a UK-wide Decarbonisation Institute for the tertiary education sector to support the implementation of a low-carbon energy transition and Net Zero emissions built environment. It should provide individual institutions with data and insights to back the right solutions, identify system-wide regulatory blockers, and promote collaboration across the wider public and private sectors.

THE WHY

- While Ofgem conducted a review of the energy system in 2021[18], more needs to be done.
- The technical skills required to develop and implement detailed decarbonisation plans in the sector are either limited, fragmented, or inaccessible. Advisory skills are needed to support the development of detailed, costed Carbon Plans for estate buildings and energy sources.
- Centralised expertise is required to identify barriers in regulations, drive policy development, and accelerate best practice in all regions.
- Facilitation of public-private partnerships and funding requires expertise that many institutions do not possess.

THE IMPACT

- Every institution will have a blueprint for decarbonisation, with a clear understanding of the financial investment needed. This will support informed decision-making and prioritisation of emissions reduction.
- The sector and the government will work together to unblock barriers to progress and focus on effective policy development.
- Funding will flow more equitably across the sector and public-private partnerships will fast-track system-wide progress.

2 Fast-track the transformation of the National Grid to remove barriers that currently hamper the adoption of renewable technologies by the sector. The large education estate has high potential to generate green energy but needs the right infrastructure and commercial framework in place.

THE WHY:

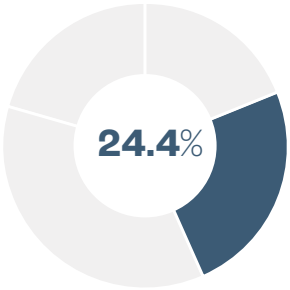
- Many energy providers don't have the infrastructure in place to support local renewable energy generation due to limits in load capacity.
- Institutions with complex estates can't transfer energy across their campuses without incurring additional charges when it moves across meter boundaries.
- National Grid infrastructure inhibits public-private partnerships for district-level energy grids.

THE IMPACT

- The sector will innovate, invest, and collaborate on local renewable energy generation that will increase grid capacity, build local resilience, and provide green power for the sector and local communities.

Action Pathway

2 Travel and Transport



Overview

For the tertiary education sector, travel represents more than carbon emissions – it is about academic practice, cultural exchange, and student independence. The Challenge recognises the importance of these areas, while also acknowledging the significant impact that travel has on the sector's overall Scope 3 emissions. The complexity of the goal to reduce Scope 3 emissions is reflected in the types of travel that the sector is responsible for, including:

- **Business travel** or travel for academic and administrative purposes, research and funding collaborations, conferences, student recruitment, fieldtrips, and any other activities related to the operation of institutions.
- **International and domestic student travel** includes students travelling home at the end of each term or at the beginning and end of the academic year. This is a bigger concern for HE institutions as, according to UUK, international students make up 19.6% of the total university student population[19].
- **Student and staff commuting, including Working from Home (WFH)** is the daily commuting of students and staff, and those who are engaged in hybrid working and learning.

Business travel and international student travel particularly affect many HE institutions which are valuable study destinations for international students and exporters of higher education[20]. However, both HE and FE share common challenges when it comes to commuting, including creating and implementing travel policies, engaging staff and students to affect behaviour change, managing staff wellbeing, and travel planning, all of which is unique to every campus, with no one-size-fits-all solution.

To reach Net Zero, every institution must be able to accurately measure, collect, and report on travel emissions data for Scope 1 and 2, and the areas which sit across several Scope 3 categories (in alignment with the GHG Protocol). These are included in the new proposed Reporting Framework. The adoption of this Framework will facilitate more consistent and transparent travel emissions reporting by the sector.

Scale of the challenge

- GHG emissions from surface transport account for 22% of the UK's total, while aviation emissions account for an additional 7% (in 2018)[21].
- Approximately 40% of daily student travel is done by car, in comparison to nearly 60% of all UK journeys being done by car[22].
- The sector's total travel-related emissions estimated in Scope 3 account for 4.4 tCO_2e, representing 24.4% of total emissions, based on available data:
  - Business travel accounts for 0.5 tCO_2e, or 3.1% of total emissions
  - Student and employee commuting accounts for 1.6 $MtCO_2e$, or 9.1% of total emissions
  - Student flights account for 2.2 tCO_2e, or 12% of total emissions

Priorities for reducing emissions across travel and transport

- The sector should consider more 'purposeful travel' to help institutions and individuals determine when and why it is essential to travel, as well as reducing non-essential travel and prioritising low-carbon travel (i.e., avoiding air travel). The HE sector in particular should look to align its student recruitment and internationalisation strategies with research and business travel priorities.
- The sector should accurately measure and report against its travel-related Scope 3 emissions and account for at least one return journey for every student studying on campus (domestic or international) during the academic year.

- All institutions should create and implement more sustainable travel planning and policies, and engage students and staff to encourage behaviour change.
- The sector should collaborate with local highway authorities and transport providers to create more sustainable travel methods. It is also important that the sector understands trends in travel innovation (e.g., e-scooters), and the policies needed to ensure health and safety standards on campuses.
- HE institutions should consider more accessible and welcoming campuses for international students, for example, keeping Halls of Residence open year-round to make multiple trips home unnecessary.

Key Insights

INTERNATIONALISATION

While UK universities vary in size, as relatively large organisations, they are significant generators of business travel and international travel from students, with many looking to increase student recruitment as part of their internationalisation strategies[23]. At the same time, hosting international students benefits both the HE sector and the economy, with its contribution estimated to be worth £28.8 bn[24] annually.

It is important to acknowledge the tension that this creates between institutions' need to reduce travel for environmental reasons, and the impact that reduction would have on their ability to share knowledge and build connections, compete for research funding, and manage campuses internationally. Striking a balance between the effective reduction of travel and the benefits that internationalisation brings will require behavioural change and a mindset shift across institutional leadership and academics alike. Continued support of such beneficial travel will require aggressively reducing carbon emissions in other travel areas to tackle overall emissions.

UK universities attract students from all over the world. They provide diverse perspectives and are part of the next generation of world changers. As a result, some universities feel that it is their responsibility to compensate for the travel emissions of international students now, to balance their operational impacts with their international education contribution.

Other institutions in the sector have already chosen to offset their current Scope 1 and 2 emissions, and elements of Scope 3, to help scale up credible offsetting solutions and take

Case Study Manchester College

Sustainable and Accessible City Transport

The Manchester College is introducing new sustainable and accessible transport measures to align with the Manchester City Council's (MCC) promotion of active travel across the city. MCC is developing a City Centre Transport Strategy, aiming for 90% of all morning peak trips to the city centre to be made on foot, by bike, or by public transport by 2040. To support this, the college's recently completed City Centre Campus includes only parking spaces for those with accessibility needs across the site and has been strategically positioned near the city's main public transport hubs.

The College's transport measures align with the MCC's strategy objectives while contributing to its own aim of emissions reduction. As the MCC's strategy consultation process is ongoing, the College continues to be actively involved in discussions with the transport engineering team and Transport for Greater Manchester. This includes measures to improve traffic signalling around the college, with the aim of improving pedestrian access to the campus.

responsibility for current emissions. This approach should not diminish ongoing investment in emissions reduction and should be set within on overall Net Zero target and pathway that reduces reliance on offsetting over time.

There is also increased scrutiny from HE funding bodies on the sustainability of grantees, and some bodies such as Wellcome Trust already require travel offsetting, or equivalents, as part of their funding criteria. The Challenge welcomes this increased scrutiny by funders and hopes that they will go much further in considering the policies governing the sustainability of funding awards.

BEHAVIOURAL CHANGE AND POLICY CREATION

Successful creation and implementation of more sustainable travel principles and policies requires wide consultation. It is the experience of the Challenge participants that travel can often be a contentious topic. Therefore, creating a participatory process of building and implementing travel policies that engages leadership, academics, staff, and students is essential. Data and insights can be used to engage and influence all stakeholders to adopt the behavioural changes needed to reduce emissions. The aim should be to help institutions build new social and cultural norms around travel.

GATHERING AND MEASURING TRAVEL DATA

Calculating Scope 3 travel emissions and gathering accurate data can be difficult. Collecting business travel data is time consuming and resource-intensive, often relying on third parties, such as travel booking providers and management companies, or working with purchasing teams and sourcing internal expenses. Student and staff commuting data can be difficult to gather at scale. This is usually done through a travel survey, which can be inaccurate and time-consuming. Surveys also carry a risk of 'built-in bias' by potentially favouring responses from those who typically use sustainable travel methods and are reporting 'good' behaviour over those who may be perceived as having 'bad' behaviour. The geographical spread of individual estate settings can also influence commuting trends, from urban locations with good transport links, to rural settings where commuting is vehicle-based. A standardised way of collecting and reporting travel data, as proposed in the Reporting Framework, would go a long way towards helping the sector focus travel-related actions and efforts.

ALIGNMENT WITH EXTERNAL FUNDING BODIES

Emissions related to business travel are also under scrutiny from funding awards (e.g., grant making bodies such as UKRI and Wellcome Trust) who have travel expectations. This is currently being addressed by some funders, such as Wellcome Trust, which has a grant portfolio of £5.1bn that includes

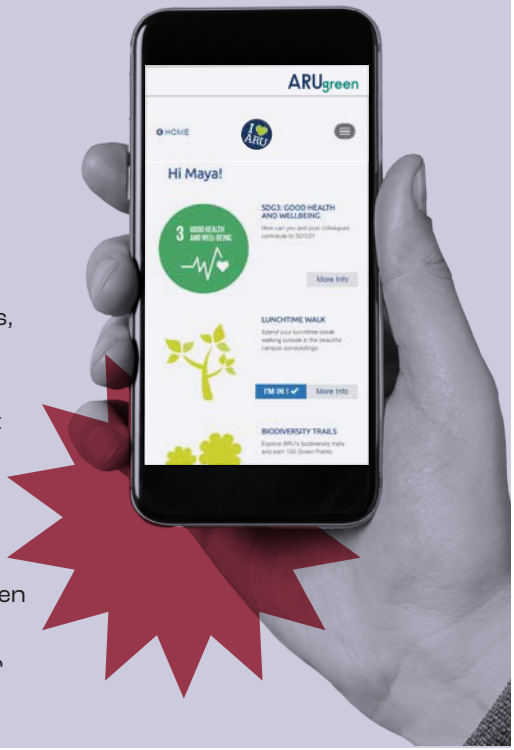
Case Study Anglia Ruskin University

Engaging Students and Staff in Sustainability

Anglia Ruskin University (ARU) has designed an online staff and student sustainability engagement platform called ARUgreen. This uses gamification levers like monthly challenges and rewards to encourage behaviour change around travel, recycling, carbon reduction, and purchasing, alongside health and wellbeing. It also includes bi-monthly webinars, car sharing, and material exchange platforms.

Individuals and teams win vouchers and charity donations through participating in the many events organised as part of ARUgreen. These include photo competitions, insights webinars, cycling challenges, green move-outs, travel surveys, and other quizzes.

In 2020/21, the platform had almost 2,000 participants, logging over 45,000 actions, saving 13,800 disposable cups and bottles, and helping to reduce ARU's scope 3 emissions by 76 tCO_2e. The ARUgreen platform could be replicated across the sector to achieve similar emissions reductions.



76 HE institutions in the UK[25]. The Trust now requires grantees to minimise the amount of travel associated with their funded research where practical, and either offset associated travel emissions, or fund alternative sustainability projects if offsetting goes against the institution's principles.

WORKING FROM HOME (WFH) AND FACE-TO-FACE LEARNING

WFH and hybrid working have become much more common since the COVID-19 pandemic, with an estimated 47% of UK employees – 14 m people – reported to be working from home in April 2020[26]. This is likely to remain common practice, particularly for staff, and presents the opportunity for remote as well as face-to-face learning. This has implications for business travel and commuting, as an increase in WFH would displace carbon emissions to individuals, but would also more broadly impact team working, work-life balance, and mental health, which are beyond the scope of this paper.

Sector Activation

- **Travel Policies:** Many institutions are taking active steps to create more sustainable travel policies, with good practice throughout the sector. The sector should work to collate these as case studies (see 'Internal Skills and Resources' section, page 47) which explore topics such as:
  - restrictions on surface travel by distance or journey duration
  - emissions levy per t of carbon emitted per journey
  - departmental or individual carbon budgets
  - restrictions on class of air travel
- **Prioritisation:** All HE and FE institutions should embed a basic hierarchy of travel considerations into travel principles and policies, including:
  - time and cost justification
  - combining journeys
  - choosing the lowest carbon and practical option for travel
  - giving due consideration to staff circumstances to ensure that policies are well-founded and non-discriminatory
- **Business Travel:** Business travel policies and reporting examples are widely available in the sector, particularly in Scotland where reporting is mandatory. This includes University of Aberdeen's 'Guiding Principles of Sustainable Business Travel'[27] and report, and University of Glasgow's policy for business and student travel[28].
- **Travel requirements and planning:** When considering travel planning, institutions should collaborate with local transport authorities and providers who could help unlock better commuting and active travel routes. Leading practice looks to understand trends in travel innovation (e.g., e-scooters) and their policy implications.

Case Study | Swansea University

Gateway to Net Zero

Swansea University is developing a 'Gateway to Zero' project, in collaboration with private sector companies, local authorities, and other regional businesses, to reduce its Scope 3 emissions. This flagship project would involve creating a renewably powered electrical and hydrogen storage hub for transport on a university site, with charging infrastructure situated in a demo site for future technology (e.g., homes of the future) for the public to view while charging their cars. This first-of-a-kind hub would facilitate a range of research and innovation activities while accelerating and de-risking the adoption of low-emission vehicles. Innovations would include the pilot of H2 buses, which would be pioneered on Swansea's intercampus service which runs every 15 minutes, 24 hours a day.

While the project is currently in the feasibility stage, the university has received considerable industrial collaboration interest. The hub could be used to prove emerging business models for the adoption of Net Zero vehicles, provide chargers with larger scale and capacity, and compare the viability of hydrogen versus electric buses. This project would not only help

Swansea realise its Net Zero ambitions but would showcase the potential of collaborative work to facilitate sustainable transport infrastructure, with opportunities to integrate it into wider Net Zero living plans. The findings from this hub would support further research, and help the sector decarbonise by learning from real-world systems and technologies in use.

- **Offsetting:** Where it aligns with an institution's principles, some in the sector are moving towards offsetting international student travel (see 'Carbon Offsetting' on page 52).

Further Action and Outcomes

- **Business travel measurement:** The sector should place a greater obligation on suppliers to meet a (voluntary/mandatory) standard of consistent and transparent reporting. The sector should collaborate to set detailed standards on third-party travel providers, outlining the data they must measure and provide to allow more granular and accurate measurement of business travel emissions.

- **Student and staff engagement:** The sector should encourage more sustainable travel choices on campus through staff and student engagement. This could include investing in behaviour change research and programmes to understand how to shift mindsets around current travel practices.

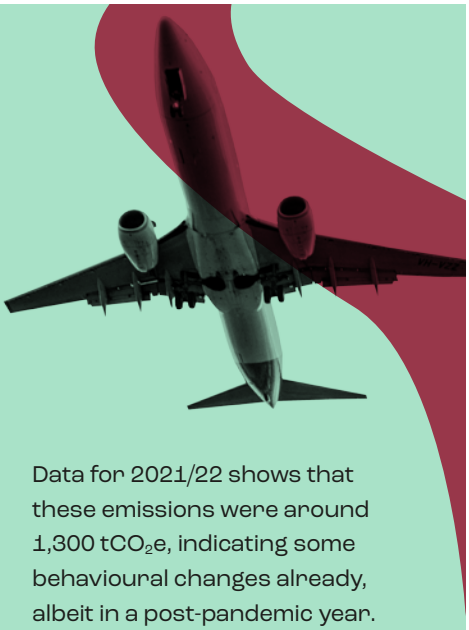
- **Hybrid working and conferences:** Many academic conferences are now held in multi-locations and use technology to provide hybrid experiences. The sector could encourage the further adoption of virtual, rather than physical, activity as the default for most events, and thereby give academics and professional staff the flexibility to participate and build on new ways of working post-pandemic.

- **WFH emissions:** Institutions should leverage emerging standards to capture homeworking emissions and create a more transparent approach to the balance of travel and energy use emissions in a more hybrid-working model. The Reporting Framework includes a WFH methodology based on the EcoAct whitepaper[29] on how to calculate emissions from office equipment, heating, and cooling.

- **Green logistics:** The sector should examine ways to reduce emissions from transport, including EV hubs and bus garages (or other end-of-trip facilities), or a green logistics hub for combining deliveries on campus.

Case Study University of Aberdeen

Business Travel Policy Development



The University of Aberdeen has developed a new approach to staff business travel. A series of Guiding Principles emerged following an extensive consultation, and staff are being encouraged to take actions such as reviewing a Travel Hierarchy (which balances environmental impact, business need, and individual circumstances), and considering travel alternatives such as online attendance. Aberdeen plans to adopt incentivisation measures, such as negotiating discounted travel or subsidising time and costs for the use of public transport.

The new Principles will be incorporated into university culture through a communications plan and by encouraging Line Managers to embed these considerations into travel-related decision making. The university has a 2025 target to reduce business travel emission by 40% from pre-pandemic levels (or 2,500 tCO_2e from a 2018/19 baseline of 4,166 tCO_2e).

Data for 2021/22 shows that these emissions were around 1,300 tCO_2e, indicating some behavioural changes already, albeit in a post-pandemic year. Aberdeen's adoption of business travel guidance and a travel hierarchy could be replicated sector-wide to encourage the behavioural shifts needed to reduce emissions.

Case Study University of Reading

Partnering with the Local Bus Service

The University of Reading has a long-standing partnership with Reading Buses, collaborating on initiatives to increase the use of public transport. For example, Reading staff can purchase discounted bus passes and students can save a third off their bus fare by showing their student card. Other recent initiatives include: the launch of a low-emission gas-powered bus emblazoned with Climate Stripes to highlight the importance of using more sustainable methods of transport; a trial Park and Ride service in partnership with the Royal Berkshire NHS Trust; participation in a Sustainable Travel Day as part of the university's Green Festival 2022; and work with Reading University Students Union to deliver the 360 night bus service on Union nights.

Reading's biennial travel survey in January 2022 revealed that just over 8% of its staff and students use Reading Buses as their main mode of travel to the university. Surprisingly, this number has remained static since January 2020, despite the considerable changes to working patterns since the pandemic. Analysis of previous surveys also showed that bus usage has been steadily increasing since 2012, when the number of people using the bus as their main mode of transport was just under 4%. This has doubled in the last 10 years, highlighting the success of the university's ongoing partnership with Reading Buses, and the value of collaborative transport projects for the tertiary education sector's sustainability ambitions.

Recommendations to Government

3 Fund the research and development of a simple digital business travel measurement tool and portal, which will allow institutions to accurately and consistently track, measure, and influence their staff and students' business travel.

THE WHY

- The Local Transport Plan guidance (2011)[30] references a requirement for local transport authorities to produce a 'Sustainable modes of travel strategy' to meet the requirements of the Education and Inspections Act 2006, but this only applies to children of school age, and lists universities as a 'suggested' consultee only.
- FE and HE institutions have active students and staff who require well planned sustainable travel infrastructure to reduce emissions in the sector from daily commutes.
- Institutions are also left to rely on unvalidated data from private travel management companies, which is often inaccurate.

THE IMPACT

- The research into the barriers that institutions face in calculating business travel emissions to inform the development of a simplified digital portal could solve this challenge and be used by all institutions to provide consistent, accessible data to affect behaviour change.

4 Require all local councils to consult with local universities and large colleges on their sustainable transport plans to adequately represent the needs and impact of the broad education community.

THE WHY

- The Local Transport Plan guidance (2011) already references a requirement for local transport authorities to produce a 'Sustainable modes of travel strategy' to meet the requirements of the Education and Inspections Act 2006, but this only applies to children of school age, and lists universities as a 'suggested' consultee only.

THE IMPACT

- Ensuring this as an explicit objective of Local Transport Plan guidance to universities and colleges would ensure sustainable travel access to centres of tertiary education and increase economic growth and access to skills.
- This would help drive infrastructure change at a regional and local level and encourage collaboration on sustainable travel and transport systems.

5 Require publicly funded research bodies, including UK Research & Innovation (UKRI), to ensure transparent principles of sustainable travel and related emissions are mandatory within research-led funding bids.

THE WHY

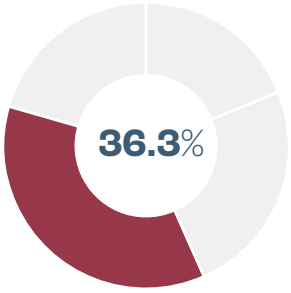
- Currently, no explicit consideration is required of the carbon impact of most research funding bids, including UKRI.

THE IMPACT

- By requiring this, emissions reduction will become a prominent factor in developing funding bids for academic endeavour wherever possible, to reduce the amount of travel required and examining the purpose, mode, and cost of such travel.

Action Pathway

3 Sustainable Supply Chain



Overview

A major part of any institution's Scope 3 carbon emissions sits within its supply chain and is far greater than Scope 1 and 2 emissions combined. In the tertiary education sector, these indirect emissions relate to the procurement of research equipment and teaching materials, IT and data storage, construction, food and catering, and business services. Collectively, the sector wields a large amount of purchasing power. This could be a positive influence and lever to help the sector move towards a more sustainable approach to procurement.

The main challenges that institutions face in this area relate to fragmented purchasing across institutions and devolved spending, and a lack of available supplier data or accurate granular emissions data. This is often compounded by a lack of dedicated resources and specific skills needed in procurement teams to manage more sustainable procurement though policy and frameworks, alongside the calculation and reporting of supply chain emissions.

The importance of being able to accurately measure supply chain emissions is significant. Therefore, the sector should encourage the adoption of a sustainable procurement approach across every institution to calculate, manage, and reduce emissions.

Business travel and international student travel particularly affects many HE institutions which are valuable study destinations for international students and exporters of higher education. However, both HE and FE share common challenges when it comes to commuting, including creating and implementing travel policies, engaging staff and students to affect behaviour change, managing staff wellbeing, and travel planning, all of which is unique to every campus, with no one-size-fits-all solution.

To reach Net Zero, every institution must be able to accurately measure, collect, and report on travel emissions data for Scope 1 and 2, and the areas which sit across several Scope 3 categories (in alignment with the GHG Protocol). These are included in the new proposed Reporting Framework. The adoption of this Framework will facilitate more consistent and transparent travel emissions reporting by the sector.

Scale of the challenge

- Public procurement accounts for approximately 15%[31] of worldwide emissions.
- Emissions from the supply chain (Scope 3) are on average 11.4 times[32] greater than the emissions from an institution's own operations (Scope 1 and 2 combined).
- HE and FE institutions in aggregate spend over £49 bn annually.
- Operational procurement accounts for an estimated 6.6 $MtCO_2$ of Scope 3 emissions across the sector – 36.3% of total emissions.

Priorities for reducing emissions across the sector's supply chain

- Individual institutions should adopt sustainable procurement standards, policies, and processes.
- Procurement teams must be able to accurately measure and gather data to effectively reduce emissions across Scope 3.
- The adoption of an accurate measurement methodology is needed to drive the more sustainable purchasing decisions, in alignment with sector purchasing consortia.
- The sector should ensure that procurement teams are equipped with the carbon accounting skills necessary for reporting, tenders, contracts, and case study development for sharing good practice.
- More support should be focused on SMEs, which are a crucial part of the sector's supply chain, so they can measure and report against their Scope 1 and 2 emissions.

Key Insights

PURCHASED GOOD & SERVICES

The sector's supply chain is very complex due to the diversification and variation of purchasing, meaning that every category represents a small part of an institution's total spend. Purchasing can be highly specialised, including technical specifications related to scientific and medical research, IT, estates, and customised products. The supply chain also has a vast supplier base with no dominant individual or core group of suppliers. Collectively, this reflects the scope of goods and services required for large institutional operations.

Depending on the institution, procurement spend can be devolved to individual schools or faculties, meaning that central teams only undertake a fraction of the total purchasing activity usually defined by contract spend and internal policies. Therefore, central visibility and understanding of this expenditure can hinder influence and control.

While some institutions have embedded sustainability knowledge into procurement teams, there is a general lack of knowledge on how to address the emissions within their Scope 3 carbon footprint.

SMEs AND PURCHASING CONSORTIA

The sector is dependent on suppliers reporting on their Scope 1 and 2 emissions or, in a best-case scenario, using the carbon footprint of the goods supplied to accurately measure supply chain emissions. However, SMEs are often not as developed compared to large corporates in their carbon footprint measurement, reporting and carbon reduction solutions, making it harder for HE and FE institutions to understand where to reduce emissions. This is compounded by the large number of SMEs that make up institutional supplier bases. For larger suppliers who are already calculating their Scope 1 and Scope 2 emissions, the sector should indicate its carbon reduction expectations through supplier policies and upskill their procurement teams so they can communicate their need for emissions data.

No more than 30% of procurement is usually supported by consortia via the use of frameworks. There are several purchasing consortia networks across the UK, but there is no one-size-fits-all approach, nor can consortia independently influence the sector's supply chains. However, alignment with purchasing consortia across regional and national levels will require a more accurate methodology for procurement and supply chain emissions to drive the right actions.

MEASUREMENT THROUGH SPEND-BASED CALCULATIONS

There is often limited understanding within procurement teams of how carbon calculations work and what they represent. The current methodology is based on calculating how much is spent against a common commodity, with no differentiation between products or

Case Study Swansea University

Sustainable LEAF Labs

Swansea University is adopting University College London's LEAF (Laboratory Efficiency Assessment Framework) programme[33] across its laboratories to improve their sustainability and efficiency. LEAF is a laboratory standard accredited to labs taking action to reduce their waste, and carbon emissions, and engage others in sustainability. In addition to providing resources and training, LEAF operates through an online self-assessment tool followed by a lab-based audit, whereby labs are awarded Gold, Silver or Bronze, depending on their level of action.

Swansea has supported the LEAF programme over its lifetime. Since 2019, 31 labs have achieved an award, including 25 Bronze, 5 Silver, and 1 Gold. It has Registrar endorsement to roll LEAF out across all its labs and is currently developing a programme to manage this. In the meantime, Swansea encourages labs to sign-up through collaborating with management and technical teams across faculties, asking existing LEAF labs to advertise the programme, providing resources on their website, and holding regular network meetings to share information on implementation and best practice.

solutions within a category of spend. Not only does this fail to accurately capture emissions from lower carbon solutions, it also drives a rationale that lower spending leads to lower emissions. This works against more sustainable purchasing decisions which are lower carbon but often more expensive in the short term.

A general Scope 3 measurement tool exists within HE, known as the Higher Education Supply Chain Emissions Tool (HESCET)[34], which calculates Scope 3 emissions based on spend. Some consortia have developed a process using the tool to calculate their members' carbon emissions for all institutional spend in a 12-month period. While this is a valuable service for identifying 'hot spots', it forms part of wider reporting, so is generally a lengthy process. Additionally, the data set, which shows spend against relevant goods and services, still requires manual manipulation to further break it down into actionable data. Therefore, despite the existence of the tool, the measurements are not widely used, accurate, or actionable as part of an institution-level reduction pathway. Currently, no similar tool or calculation methodology exists within FE.

SKILLS AND RESOURCES

Finally, many institutions within HE, and particularly FE, lack procurement-specific resources, including the measurement skills and training needed for existing teams, issues with staffing, or a lack of appropriate finance systems, internal processes or policies to help reduce supply chain emissions. Without an accurate measurement tool to help reduce the emissions, it remains a key challenge.

There are procurement 'centres of expertise' and membership bodies which offer support across HE and FE, such as Advanced Procurement for Universities and Colleges (APUC) in Scotland. Consortia also provide their members with advice, support, and frameworks to encourage good practice and offer training. However, additional skills, specifically related to carbon accounting and reporting, are needed to take the sector further (see 'Internal Skills and Resources' on page 47).

Case Study University of Huddersfield

Green Cloud Storage

The University of Huddersfield has implemented a project to utilise Green Cloud Computing services to reduce carbon emissions across its data infrastructure and operations. It is using an 'Infrastructure as a Service' offering to leverage cloud-based data storage and data centre solutions, and Huddersfield is also implementing a 'Cloud First' policy for new software systems and processes.

The university's chosen partner has been certified carbon neutral since 2012, and has a roadmap for its business to be carbon negative by 2030. This move to a greener cloud solution will allow Huddersfield to close one outmoded data centre, and instead focus efforts on improving the other centre, utilising free-cooling and high-efficiency equipment to reduce energy demands in operation.

The first phase of the project, which has included migrating all major systems over to the Cloud, has already led to a 46% reduction in power demand. The university will soon also transition to a Virtual Desktop solution. The use of these new cloud computing systems and processes, designed with sustainability in mind, will also enable further use of updated and more efficient thin computers and laptops, reducing energy demand and ideally extending the useful lifespan of devices.

Sector Activation

- Individual institutions should adopt policies with sustainable criteria for procurement tenders. Creating similar policies and increasing the use of available tools sector-wide would help institutions to effectively manage the procurement of goods and services to reduce their emissions and impact on the natural environment (e.g., waste creation or transport miles). For example:
  - Creating and implementing policies like Nottingham Trent University's[35] Sustainable Procurement Policy, which has set a target for incorporating the criteria with suppliers.
  - Using available guides and tools, such as the Southern Universities Purchasing Consortium's (SUPC)[36] tender, and call-off questions which are category-specific to help institutions investigate suppliers' commitments and plans for managing their own supply chains.
  - Specifically for Welsh public sector organisations, the WRAP 'Sustainable Procurement Hierarchy Guide'[37] can be used to make product purchasing decisions.
- A growing source of emissions for institutions is IT equipment, software, and data storage. Therefore, institutions should adopt sustainable IT policies to create the right balance of onsite versus cloud-based storage. For individuals and faculties, they should work with key IT suppliers to consider lower-carbon and alternatives for IT equipment and cloud-based solutions.
- The sector should use evidence-based assessment tools such as EcoVadis[38] to determine its suppliers' sustainable procurement impact, and engagement tools like the NETpositive[39] Supplier Engagement tool, which allows suppliers to generate their own Sustainability Action Plans. The use of these and similar tools would increase institutions' ability to help their suppliers improve their performance and collect supplier data.
- For institutions with laboratories, they should consider the adoption of University College London's Laboratory Efficiency Assessment Framework (LEAF), a green lab standard designed to improve the sustainability and efficiency of laboratories by helping to identify sources of emissions within each lab and identify areas for improvements[40].
- When designing the construction of buildings, the sector should use the Royal Institute of British Architects (RIBA) Plan of Work[41] Stage 1 to inform the development of the project's procurement strategy. This includes guidance on implementing the seven categories of the Modern Methods of Construction (MMC) framework, providing alternatives to traditional construction methods to improve productivity and efficiency.
- The sector should adopt circular economy principles to reduce waste and bring down costs by limiting the purchase of new equipment, furniture, and materials. This can be done using office furniture exchange platforms such as WARP-IT[42] or the Unigreen Scheme[43].

Further actions and outcomes

- The sector should adopt the Reporting Framework to begin reporting sector-wide across a complete Scope 3 footprint, to move from spend-based data to real supplier data over time.
- Give individual schools, faculties, and departments responsibility for their own carbon footprints by disaggregating this to each decision-making body and providing a thorough explanation of emissions sources. Following this, carbon budgets should be created detailing how much each school and faculty are allowed to emit from their supply chain each year (across all emissions sources).
- The sector should seek to train staff who are involved in purchasing goods and services on behalf of their institution in sustainable procurement skills, as well as support local SMEs to increase carbon literacy.
- The sector should work within its consortia networks to engage with suppliers to advocate for a more sustainable procurement approach to sourcing goods and services (and energy).
- The sector should collaborate across HE and FE to share knowledge, help to close procurement knowledge gaps, and share how to set up rigorous processes.

Case Study University of Oxford

Calculating Scope 3 Emissions

The University of Oxford aims to reach Net Zero across Scope 1, 2, and 3 by 2035. To effectively address Scope 3 emissions, supplier emissions data is needed to produce a baseline from which to progress, so the university conducted a detailed baseline review.

Oxford recognised that existing practice for Scope 3 emissions was not sufficiently detailed or specific enough. Instead, it used two methodologies from the GHG Protocol: splitting inventory and assigning emissions factors by spend category (using secondary data from HESCET or Defra conversion factors), or splitting inventory into categories and contacting suppliers for primary emissions data. The data collected was used to quantify Scope 3 emissions, incorporating emissions factors specific to the university and using life cycle carbon assessments based on environmental product declarations, supplier reports, and HESCET data.

The calculations demonstrated that Oxford's top three supply chain emissions came from scientific and medical equipment, construction, and IT. These were significantly larger than from buildings or energy use. By creating this baseline and finding ways to avoid generic spend based emission factors, Oxford has been able to make tangible commitments to reduce it's emissions. This process could be replicated across the sector as it sets more ambitious carbon reduction targets.

Case Study Nottingham Trent University

Net Zero Carbon Supplier Tool

Nottingham Trent University (NTU), in collaboration with NETpositive Futures, has developed a Net Zero Carbon Supplier Tool. This enables the collation of suppliers' energy data for Scopes 1 and 2 to better calculate NTU's Scope 3 supply chain emissions. Piloted with 40 suppliers across a range of categories, the tool enables NTU to better understand its suppliers' commitments and actions on Net Zero.

Suppliers benefit from engaging with this tool, as they will receive an action plan which guides them towards reducing carbon emissions. Creating these plans will improve market intelligence, enabling NTU to produce reports on Net Zero progress by category or business size, target engagement activity on areas where suppliers are struggling (particularly to support small businesses), and identify good practice. Suppliers can return to the tool to update their progress, fostering a long-term approach to engaging with suppliers working towards Net Zero.

Based on data and feedback from the pilot, NTU plans to share the tool across the sector and expand it to more suppliers. To date, supply chain emissions for the sector have been calculated by spend, so this tool will enable more robust data to be captured and enable more rapid progress on Net Zero ambitions.

Case Study Imperial College London

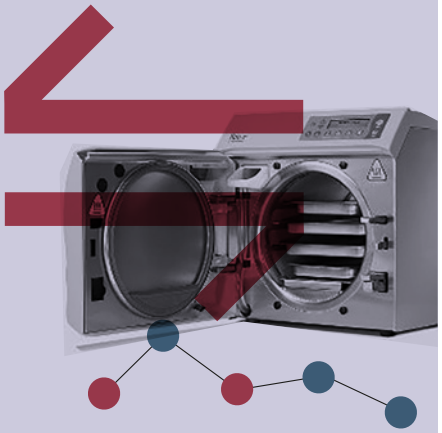
Partnerships for Sustainable Procurement

30%
reduction in the number of autoclaves needed

Imperial College London is working towards more sustainable procurement by engaging with its suppliers to reduce consumption, source environmentally friendly products and services, and use and dispose of them responsibly.

As part of this initiative, Imperial launched a project in 2018-20 to replace its old autoclaves (steam sterilisation equipment). In addition to replacing them with more efficient appliances, the project involved evaluating their use to assess whether need could be reduced. This involved collaboration across university departments, including input at departmental and faculty level, and working with the Purchasing Project and Estates teams. A review included the need for, and associated costs of, electricity, steam, water consumption, maintenance and service contracts, insurance inspections, staff to run the facility, and the autoclaves themselves.

The information collected by this project led to a 30% reduction in the number of autoclaves procured. Imperial was able to maintain its operations while reducing consumption and associated costs. Similar reviews could be carried out across the sector to support more sustainable procurement.



Recommendations to Government

6 Make the data from existing carbon reporting requirements e.g., SECR, ESOS, PPN0621, available via a dedicated online portal*, for utilisation in measuring detailed supply chain emissions.

THE WHY

- Unlocking private companies' emissions data (i.e., the sector's supply chain) would benefit the public and private sectors alike, and help institutions streamline access to SME Scope 1 and Scope 2 data, to help measure their own Scope 3 emissions.

THE IMPACT

- This would be a critical enabler to creating more accurate Scope 3 carbon reduction plans at the institutional level by helping the sector move away from average spend-based carbon accounting.
- This also provides an option for progressive non-regulated companies not covered by SECR to do the same through an 'emissions' directory of companies who can voluntarily upload their information.

7 Incorporate sustainability and carbon reporting modules within the Department for Business, Energy and Industrial Strategy (BEIS) 'Help to Grow' scheme[2] to increase carbon literacy amongst SMEs and support emissions reporting.

THE WHY

- Improving carbon literacy and driving small business 'green growth' offers a huge opportunity for the UK economy as a global leader, and for the sector as its supplier base largely consists of SMEs.

THE IMPACT

- By incorporating sustainability and carbon modules as part of the existing 'Help to Grow' scheme, this could quickly increase carbon literacy and support emissions reporting and reduction amongst the SME sector.

* Such a mechanism was already consulted on as part of the SECR consultation in 2017, however was not implemented within the regulations.

Enablers

Enabler 1: Finance and Investment

As the Action Pathway sections of this report highlight, there is an urgent need to decarbonise universities and college estates across the UK. However, from funding large building retrofits to investing in green skills training, the associated costs are significant.

The Challenge sees the role of finance as a cross-cutting enabler to help the sector finance a viable transition to Net Zero. The answer isn't simple, but by taking an investment-led approach and focusing on maximising government and private sector green finance structures, the sector could both reach its Net Zero ambition and continue to contribute to the UK's economic growth.

Currently, universities in England contribute approximately £95 bn to the UK economy and support more than 815,000 jobs[44], while colleges educate and train 1.7 m students each year[45]. However, according to AUDE, rough estimates indicate that achieving Net Zero for universities will cost many billions of pounds[46]. This indicates a risk that financial constraints will prevent individual Net Zero targets from being reached.

In addition, in November 2022 the Office of National Statistics (ONS) confirmed that FE colleges in England will be reclassified as public sector for accounting purposes. This may have long-term implications for how these colleges are funded and could impact their ability to access funding for decarbonisation, particularly from the private sector.

The DfE should ensure that the re-classification does not make it more difficult for FE to access the funding needed and should ensure the new college financial handbook provides guidance on the options available.

While finance is an enabler, the Challenge also recognises the significant size of Scope 3 emissions that sit in institutions' pensions, endowments, and direct investments. While it is the responsibility of individual institutions to adopt principles of responsible investment, a priority across the sector should be to understand and mitigate the financed emissions of its investments and use this to inform investment decisions[47].

Key Insights

BUILDING SUSTAINABLE INVESTMENT FOR NET ZERO

An individual institution's ability to fund sustainability is dependent on many financial factors. Universities have access to commercial borrowing, investment portfolios, and in some cases, endowments. However, FE colleges, despite being independent self-governing organisations, have always relied heavily on government funding[48]. Within these different environments, both the HE and FE sectors face similar barriers to determining the scale of investment needed, developing a strategy, or deciding where to place investment emphasis, be that sustainability or other education and research priorities.

Building a business case for the decarbonisation of a large estate requires buy-in from institutional leadership and other senior stakeholders. While some institutions are further along than others, many have significant work remaining to determine the cost of decarbonising a mixed estate made up of new builds, refurbished, and listed buildings.

In some cases, institutions lack the resources to bid for the funding needed to make sweeping changes or are met with inertia in decision-making on long-term investment requirements. Many also lack access to the expertise needed to plan and implement their long-term estates adaptation and investment strategies.

SCALING UP ACCESS TO FINANCE

Access to more green finance mechanisms and funding is essential to ensure that the sector can deliver a viable transition to Net Zero.

The Public Sector Decarbonisation Scheme is a powerful funding mechanism and is widely used and supported. However, while public sector institutions are eligible for this scheme, many in FE do not have the skills, capability, or expertise to develop the initial bids, which can make access a challenge. The government's new EETF and its ambition to reduce energy demand from buildings and industry by 15% by 2030, with funding worth £6 bn, would be a welcome addition to the existing funding scheme.

Commercial borrowing will feature in some institutions' funding plans and access to green finance is available from private banking institutions. This suggests that institutions which plan long-term financing for their Net Zero roadmaps can work with commercial lenders, as there is evidently appetite to support such arrangements. Conversely, this suggests that those who cannot meet the requirements of long-term creditworthiness may struggle to use commercial debt, except on an exceptional or case-by-case

basis. Without the other mechanisms such as grant funding, or public sector underwriting, financially weaker organisations will not be able to make a swift transition to Net Zero.

MITIGATING FINANCIAL COSTS AND ENVIRONMENTAL RISK

As demonstrated by the current energy crisis, the rise in energy and utility costs for institutions is increasing. Currently, The Energy Consortium (TEC) has cited that its members are paying approximately 50% more for energy consumed than last year. According to TEC, the sector might expect energy prices to increase by ~250% for energy consumed in twelve months' time, which has implications for universities with large, older estates that are more likely to be presented with immediate challenges, versus those faced with decisions on whether to repair, refit, or replace. This puts considerable strain on current operating costs and available capital for new projects.

This risk also highlights the importance of switching from fossil fuels to a renewable and clean energy source to reduce costs. Environmental risk is increasing, with extreme weather events on the rise. According to U.M. Association Limited (UMAL), the mutual insurance provider specialising in coverage for the HE and FE sectors, climate change will present a range of challenges for HE and FE-owned and third-party infrastructure, affecting business continuity and increasing repair costs[49].

COLLABORATION ACROSS THE SECTOR

The Challenge acknowledges that finance and investment are complex issues, presenting different challenges for every institution. However, it also recognises a strong willingness across both HE and FE to collaborate and create mutually beneficial partnerships, particularly at a regional level, to work together and support one other by sharing knowledge and expertise in finance and funding.

Recommendations to the Sector

- The sector should ensure that each institution has the correct governance processes in place to ensure that financial decisions have sustainability checks and balances built in at all institutions.
- The sector should take a long-term investment approach to financing sustainability and the decarbonisation of its estates. Working with its stakeholders, including the DfE, it should identify ways of unlocking greater investments from the public, private, and third sectors, including novel sources such as green bonds, to support the delivery of its Net Zero strategies.

Case Study The London School of Economics and Political Science

Funding for Green and Social Projects

LSE secured funding of £175 m for green and social projects by issuing its inaugural Sustainable Private Placement[50]. It intends to allocate an amount equal to the net proceeds from the Placement to eligible sustainable projects. The majority of funds will support the development of the Firoz Lalji Global Hub, set to be LSE's first Net Zero carbon building, at Lincoln's Inn Fields in central London. LSE worked with its banking partner NatWest on the transaction and the further development of a Sustainable Finance Framework.

The holistic framework puts sustainability at the heart of the university's financing strategy and considers both environmental and social categories, allowing the university to raise sustainable debt through a variety of debt instruments. The framework aligns with LSE's social purpose and Sustainability Strategic Plan through its funding and financial strategies[51]. S&P Global Ratings issued a Second Party Opinion confirming that the Framework aligns, and sometimes exceeds, the relevant international green and social bond and loan Principles.

The launch of LSE's Private Placement attracted strong interest from long-term UK and US investors and received bids over four and a half times the launch amount, despite considerable market volatility in both credit and rates. It gives LSE the flexibility to issue financial instruments to support its commitment to achieving a broad range of sustainability outcomes.

- Institutions and their funders, including the DfE, should recognise and plan for the significant scale of investment and finance required to achieve Net Zero, and the returns that will result from creating world-leading sustainable facilities and campuses.
- Institutions should ensure that all their investments and finances, including their pension funds and other financial holdings, are aligned with the transition to a zero emissions and climate resilient world.
- A sector-based funding framework should be established to help institutions identify funding mechanisms for decarbonising their estates and guide them on an approach that assesses their appetite for debt and commercial borrowing, possible private-public partnerships, green bonds, use of energy performance contracts, etc.
- The sector should work with the DfE and private stakeholders to address the standardisation of climate finance accounting, in line with the UK Universities Climate Network (UUCN) assessment in its briefing[52], so as 'to enable tracking, comparability and accountability by governments, donors and private investors'. This will make it easier to work across silos and sectors on appraisal protocols, reporting standards, and benchmarking.
- Create a partnership model toolkit to help colleges and universities navigate regional partnerships and working with local authorities and private investors, for example, for local infrastructure and renewable energy projects.
- All tertiary education institutions should work towards compliance with the recent Report from the United Nations' High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, published during COP27[53].

Case Study Exeter College

Showcasing Regional Partnership Models

Exeter City Futures is a local community interest company to help the City of Exeter become carbon neutral by 2030. Since 2019, Exeter College, the University of Exeter and Devon County Council have joined the Exeter City Council and Global City Futures to form a Community Interest Company (CIC).

This network brings together educational institutions, community groups, individuals, and businesses to collectively accelerate the city's Net Zero Exeter 2030 Plan. The college contributes to the organisation's partnership plans as a key network member, while also collaborating with other partners in Exeter regarding sustainability, such as EAUC Further Education Network and linking in through the Salix network.

However, the benefits and impact of such collaborations are highly dependent on the resources invested by each organisation. Additional resources are needed to help more FE institutions 'lean in' to these networks to evolve thinking and allow all parties to make huge strides in sustainability. This regional model offers a valuable opportunity for engagement and learning that could be maximised across FE and HE with the right funding or shared resource.

Case Study University of Leeds

Costing Model for Net Zero Pathway

The University of Leeds developed a Net Zero pathway that is integrated into its Climate Plan. The work began in 2020 and included consultant-led reviews, input from internal and external experts, and the creation of a main oversight group including the Chief Operating Officer, Deputy Vice-Chancellor, the Director of the Priestley International Centre for Climate, Director of the Global Food Institute and the Director of Estates, with support from finance, business and governance teams.

Over 30 different costing models were tested to find the right balance between cost, time, and emissions reduction targets with key inputs from technical staff in estates and energy teams to ensure the plan was deliverable and realistic. From there, existing models were used to estimate the costs of the required interventions, which were divided into decarbonisation categories like retrofitting and renewable energy. After reviewing external cost estimates with university benchmarks, each intervention category was attributed a carbon target and a cost.

The group were able to secure final cost approval by showcasing the flexibility and adaptability of the financial oversight model. A key element of the approach was considering both demand reduction and technological change to move towards the electrification of heat.

Given the scale and interdependent nature of the university estate, this provided enough information to submit a strategic outline business case, which enabled strong support from leadership, allowing for the sign-off of the Net Zero pathway.

Case Study University of Strathclyde

Collaborative Financing for District-wide Innovation

The Climate Neutral Glasgow City Innovation District project aims to integrate 100% renewable heat from the River Clyde and combine power, transport, climate adaptation, and wellbeing solutions that will benefit everyone in the area of the Glasgow City Innovation District.

The work supports the Glasgow Climate Plan and aligns with other existing city plans and climate and social justice policies, using an innovative 'whole systems' approach to build the links between mitigation, adaptation, biodiversity, and social and climate justice.

The vision will inform similar approaches across the city and beyond, and the pioneering work will bring an investment of £500 m in low-carbon and green infrastructure, and skilled jobs. The project is also included in the city and region's £30bn Greenprint Investment prospectus[54].

Recommendations to Government

8 Extend 0% VAT rate relief to incentivise decarbonisation of the existing tertiary education building stock through low emissions refurbishment and retrofit ahead of new builds, and conduct a review of current restrictions on debt levels through the Office of Students.

THE WHY

- The sector often looks to build new infrastructure instead of refurbishing existing stock at a lower carbon cost.

THE IMPACT

- This would incentivise institutions to trial new, innovative technologies that they would need to qualify for VAT relief. The exact criteria of this could be developed alongside heritage bodies.

9 Ring-fence the proportion of carbon emissions that tertiary education is responsible for from the Public Sector Decarbonisation Scheme (Salix) apecifically for the sector, and improve access for the institutions most in need.

THE WHY

- The sector currently represents approximately 35% of the UK public sector building emissions.
- Institutions and their funders, including the DfE, should recognise and plan for the significant scale of investment and finance required to achieve Net Zero, and the returns that will result from creating world-leading sustainable facilities and campuses.

THE IMPACT

- This would help scale the decarbonisation scheme that has already proved to be effective. However, as part of this, research should be carried out to ensure the removal of any administrative burdens currently restricting the sector from applying and benefiting, and ensure fair distribution across the sector.
- This will support the DfE's commitment to work with BEIS to help education institutions access the scheme, and consider how it can better align its application processes and funding windows.

10 Create a UK government-backed mechanism for smaller tertiary education institutions to band together to raise private sector funding for investment in renewables. Investigate what would facilitate a central collective capital raise.

THE WHY

- While many larger universities have specialist investment teams, smaller institutions and many colleges lack this expertise. There is a huge opportunity for public and private finance initiatives to decarbonise the sector, but central coordination and help is needed.

THE IMPACT

- This would increase awareness and understanding of the scale of change and investment required to reach Net Zero emissions in the sector and facilitate greater access to finance.

Enabler 2: Internal Skills and Resources

Starting with the right resources embedded in sustainability, estates and procurement teams are a key enabler to help institutions accelerate their journey to Net Zero. However, resourcing and retaining top sustainability talent is difficult, in part due to the competitive salaries offered in the private sector.

The sector has a responsibility to develop the green skills of its professional and teaching staff to enable each institution's journey to Net Zero. However, there is a gap in green skills across the board in core institutional functions. The sector needs more people with specialist sustainability skills, including energy managers, data analysts, carbon accounting specialists, procurement experts and technical engineers. While the sector is leading in academic thinking on climate change and equipping students with the sustainability knowledge they need for the changing workplace, it is experiencing a shortage of the skills needed to drive change from within.

Key Insights

SUSTAINABILITY EXPERTISE ACROSS INTERNAL TEAMS

Embedding sustainability expertise in leadership and across professional functions is a core enabler to drive change. This includes a co-ordinated understanding across strategic, financial, human resources, and operational teams.

For professional staff in sustainability-related roles, these skills are essential for developing the foundations of Climate Action Plans.

Essential skills, among others, include the ability to measure, analyse, and report on carbon emissions data, build sustainable procurement practices or travel policies, manage large scale sustainable construction projects, or put together funding bids for grant-makers. Although there is a wealth of Continuing Professional Development (CPD) courses courses available to staff on topics from 'Carbon Literacy' to 'Waste Management'[55], dedicated training time is rarely allocated, and people struggle to find time to spend on upskilling.

ADDRESSING THE WAR ON TALENT

One of the core challenges for sustainability teams in colleges and universities is the scarcity of specialist talent, and competition with the private sector that means that roles can go unfilled for months. It is felt by Challenge participants that HE and FE sustainability teams act as a 'conveyor belt of talent' into the private sector, training up team members who then leave to pursue higher-paid corporate roles.

LEADERSHIP AND CROSS-FUNCTIONAL COLLABORATION

Due to the complexity of gathering emissions data across large estates, often with decentralised purchasing and fragmented supply chains, further collaboration between professional services, academic staff, and leadership teams is needed to deliver sustainability plans and facilitate solutions to these challenges.

Recommendations to the Sector

- The sector should define the key internal skills that are needed for individual institutions to speed up their journey to Net Zero, and the key resources, policies, and standards that should govern implementation, from Built Environment, to Travel and Transport.
- The sector should train contractors and ensure there is a pipeline of future green skills for the sector, construction industry and wider society, leveraging partnerships with Institutes of Technology.
- The sector should work with education stakeholders, including the DfE and professional bodies, to encourage the inclusion and accountability of sustainability training into staff onboarding and professional learning and development.
- The sector should create a consortium for the pooling of skills across HE and FE so resources can be shared, and expertise developed.
- The sector should create guidance for working in collaboration with corporate partners to create mutually beneficial carbon or sustainability training programmes or placements for professional staff to accelerate the decarbonisation of the sector. These partnerships would be mutually beneficial and help close the skills gap in the green jobs sector.
- Institutions should aim to build a common language around sustainability to help communicate their strategy to external stakeholders and prospective students, as well as engage current students (e.g., with student groups and through Student Unions) and staff on the topic of sustainability to build climate literacy from within.

Case Study | Association of University Directors of Estates and University of Strathclyde

Climate Solutions Training

Unlocking current sources of knowledge is crucial for the sector. AUDE, the Association of University Directors of Estates, are currently funding a pilot in the Scottish Region for the roll-out of a Climate Solutions Training package. It will be delivered by the University of Strathclyde's Business School and Centre for Sustainable Development on behalf of the Royal Scottish Geographic Society. This will provide specific training for Estates Directors and associated teams on climate and sustainability issues, and inform a national roll-out across the UK.

The training is delivered through a 90-minute online module and will enable users to move through to additional courses which will cover more detailed estates aspects such as legislation.

Building an online Resources Hub for the sector

The Challenge has identified a gap in available good practice resources, specifically for sustainability practitioners or professional service teams. The ambition would be to build a fully accessible Resources Hub of online content including practical tips, guidance, templates, and case studies to address the internal skills gap. The purpose would be to share knowledge and resources across the sector to;

- Build technical knowledge and support core sustainability competencies
- Support carbon managers and estates teams with practical day-to-day tasks
- Provide guidance on how to develop foundation elements of a Climate Action Plan

The Resources Hub could host content such as:

- **Net Zero Strategy and Climate Action Plan development guidance** including guidance and common frameworks for leadership and stakeholder engagement, governance, finance and funding, construction, energy, and communications.
- **Strategy development** for elements such as staff engagement, estates decarbonisation, quick wins, or long-term investment planning.
- **Measurement** guides for Scope 1, 2, and 3 data collection methodologies, in alignment with the proposed Reporting Framework.
- '**How to guides**' for topics such as developing costed Carbon Plans, working with contractors and consultants, collecting and analysing data for reporting, guidance for engaging students to support on frameworks and data, understanding and acting on Scope 3 carbon emissions.
- **Policy templates** for areas such as sustainable travel or procurement policies including principles for engaging suppliers.
- **Case studies** that showcase examples of good practice across multiple sustainability topics to share project learnings, challenges, and opportunities.
- **Discussion boards** that act as collaboration tools where staff initiate conversations and make requests of other institutions.

Case Study Chichester College Group

Skills in Sustainable Industries

Led by Chichester College Group, a consortium of eight college groups, further education colleges, and sixth form colleges across East and West Sussex, and Brighton & Hove, are working together to boost skills training in sustainable industries.

The consortium, managed by FE Sussex, has been awarded a Skills Development Fund of over £7 million (m) as part of the DfE's Strategic Development Fund[56], which has been used to deliver five projects focused on green technology skills growth. A different set of colleges from the consortium will partner to lead and develop each project, including a curriculum focused on alternative energies and hydrogen technology, green technology for land management and production, electric vehicle technology, decarbonisation, and carbon literacy.

This investment in collaboration has taken place over two years, creating a curriculum for the future, and is a leading example of FE's contribution to the education sector's gap in green skills training.

Case Study Warwickshire College Group

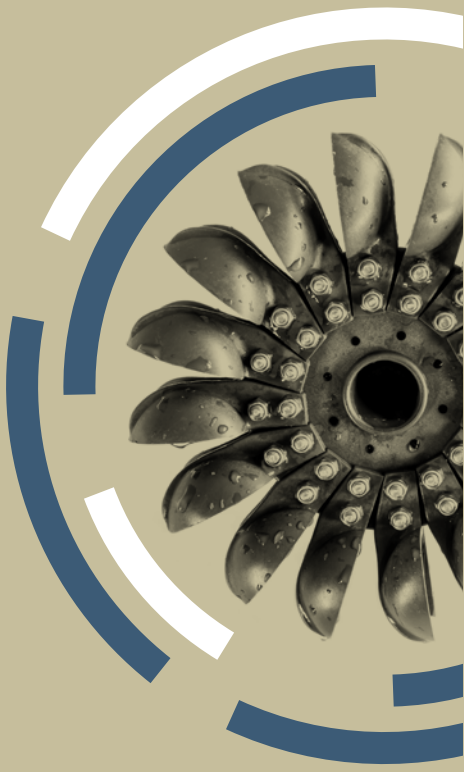
FE's Sustainability Staff Gap

Warwickshire College Group (WCG) has experienced challenges in staff recruitment for jobs supporting its sustainability initiatives. It was unable to hire a lecturer for its Level 2 and 3 Diplomas in Electrical Installation, leading to the temporary suspension of the courses. This affected 169 learners and slowed the flow of qualified electricians joining the workforce to implement low-carbon energy solutions.

This challenge has been felt across FE institutions, with the Association of Colleges' '2021/2 Staff Vacancies' survey[57] demonstrating that the curriculum areas with the highest proportion of persistent vacancies were construction (66%) and engineering (60%). Colleges are unable to offer pay levels that can compete with HE or the private sector, such that college vacancies have reached a critical point. Recruiting staff in these areas is crucial to the achievement of sustainability targets across FE, which is supported by the recommendations to the sector and government in this report.

Case Study Grimsby Institute, The TEC Partnership

Addressing the Renewable Energy Skills Gap



Seven apprentices from the Grimsby Institute have been selected for a pioneering apprenticeship scheme, training them for careers in renewable energy. The 16- to 26-year-olds will pursue a 3-year programme towards the qualification of Level 3 – Maintenance Operation Engineer. The scheme is funded by RES, the world's biggest independent renewable energy company, to support its aim of educating a new generation of renewable energy leaders.

Grimsby is already a hub for renewable energy innovation, as its numerous wind farms make it a key location for the offshore wind industry. Therefore, apprentices can learn from the Institute's cutting-edge training facilities, teaching staff with extensive renewables experience, and specialists from RES' local office.

The launch of this scheme is indicative of the increasing nationwide demand for professionals with skills in renewables, and particularly wind turbine technicians. By investing in these apprentices, RES and the Grimsby Institute demonstrate a viable means of addressing this gap.

Case Study UUCN Working Group

Supporting Access to Green Jobs for Net Zero

The UUCN set up The Climate Education and Skills Group[58] in advance of COP26 to develop a long-term perspective on skills for a Net Zero UK, and actively contribute to HE's role in this journey. The group brings together representatives from the government, the education sector, industry bodies, and civil society organisations, who meet every 6-8 weeks.

In 2020-1, the Group analysed HE and FE education and skills needs, particularly to identify areas for urgent and necessary capacity-building. They highlighted good practice across different UK sectors in the 'Mainstreaming Climate Change Education in UK Higher Education Institutions' briefing paper[59]. This also showcased pathways from education or existing employment to green jobs, such as through the Green Jobs Taskforce.

Moving forward, the Group will continue to provide support and expertise for the UK's Net Zero skills strategy and mobilise collaboration for mainstreaming climate education across HE and FE.

Recommendations to Government

11 Fund and create a sector-led digital 'hub' to share resource materials (e.g., good practice, policy frameworks, case studies) across sector estates and sustainability teams, to accelerate knowledge for those who are responsible for creating and implementing Climate Action Plans and Net Zero strategies.

THE WHY

- As this report demonstrates, there is a plethora of experiences, knowledge, and case studies across the sector. A central place and way to share this information between institutions is necessary.

THE IMPACT

- This would kick-start the sector to build capabilities internally through knowledge sharing and good practice and help accelerate individual institutions' plans.

12 Fund a dedicated regional human resource for FE institutions to kick-start and transfer the skills needed to collect and measure carbon data in order to deliver on the requirement for a Climate Action Plan per institution by 2025.

THE WHY

- Many FE institutions have yet to measure their supply chain data. This is partly due to the lack of a dedicated tool such as HESCET, and a lack of human and technical resources to undertake the measurement.
- Many institutions employ consultants to conduct feasibility studies, create cost models for Net Zero plans, and other tasks required to build Climate Action Plans, which can be cost-prohibitive for smaller institutions.

THE IMPACT

- With additional government funding, even one individual shared between 4-5 regional institutions would reduce duplication and dramatically accelerate impact on reporting and measurement across FE.

13 Offer incentives to capture FE leavers and HE graduates with sustainability expertise and skills, to work in the tertiary education sector in order to retain green skills and drive the sector's Net Zero transition.

THE WHY

- The UK is facing acute green skills shortages across the HE and FE sectors, where they most urgently need to decarbonise. This includes people to manage emissions reduction in energy, built environment, transport, and supply chains.

THE IMPACT

- Retaining green skills in HE and FE will help the sector to compete with the private sector and accelerate progress to Net Zero.

Carbon Offsetting

The role and use of carbon offsets is contentious and hotly debated across the sector. Institutions must guard against offsets being used as an easy way out of the climate crisis or as a replacement for extensive emissions reductions. The sector is committed to limiting global temperature rise to 1.5°C above pre-industrial levels to avoid the worst impacts of climate change. The overall scientific recommendation from the UK's Climate Change Committee (CCC) is that national emissions need to be reduced by 78% by 2035, from a 1990 baseline, to meet the requirements of the Paris Agreement[60].

Verified offsetting schemes have a small role to play in combatting climate change by providing new sources of carbon removals for the GHGs already in our atmosphere and attracting investment for emerging carbon capture projects and technologies. However, they are broadly unregulated and unproven, and do not provide a long-term solution to climate change.

While the hope is for technology to provide carbon capture and storage at scale in the future, there is currently no commercially available solution that can underpin verified carbon offsets. Therefore, nature-based projects dominate the offsetting market and need to be selected carefully to ensure that credible and long-term carbon reduction or removal is proven, and that they do not harm other natural resources or adversely impact local communities.

The Challenge emphasises the need for the sector to apply leading principles when investing in carbon offset credits, including consideration of the impact on water, land use, and biodiversity, and the integration of co-benefits for local communities and wider society. The sector also has an essential role to play in the advancement and evaluation of offsetting through scientific research and learning experiences for staff and students.

While every institution needs to define its own approach to offsetting, it should be viewed as a last resort to neutralise residual Scope 1, 2 and 3 emissions that cannot be reduced or avoided. Investment in offsetting should be focused on high-quality, verified, long-term carbon removal schemes, and contribute to a just climate transition. Where some institutions believe offsetting is the right approach in the short-term, the Challenge would encourage them to consider whether longer-term operational emissions reductions could be achieved by using the investment elsewhere. Assumptions should also be revisited over time as understanding and evidence develops on offsetting, and all efforts should go towards building a credible and resilient offsetting market.

RECOGNISED STANDARDS AND GUIDANCE

The International Carbon Reduction & Offset Alliance (ICROA) provides accreditation for organisations delivering carbon credits for the voluntary carbon market. It aims to define international best practice and ensure the highest standards of environmental integrity. The ICROA's Code of Practice provides 'Essential' criteria for 'offsetting standards'[61] and associated credits, including: Independent verification, Unique, Real, Measurable, Permanent, Additional, and meeting legal requirements regarding the avoidance of environmental and social impacts. The Challenge believes that the ICROA's additional 'Discretionary' criteria should also be mandated for any scheme, ensuring that offsetting projects bring co-benefits to nature and people nature and people and always solicit industry and local stakeholder views.

The UK Climate Change Committee (CCC) recently reported on the role of offsetting and the integrity of the voluntary carbon markets in its 'Voluntary Carbon Markets and Offsetting Report' (October 2022)[62]:

"High-integrity carbon credits purchased by businesses can play a small but important role in supporting the transition to Net Zero. But before growing voluntary carbon markets, Government must put in place stronger guidance, regulation and standards to ensure purchase of carbon credits is not used as a substitute for direct business emissions reduction, and to improve the integrity and transparency of carbon credits. In the absence of these measures, there is a real risk that voluntary carbon markets slow progress towards Net Zero or damage other priorities such as climate adaptation and biodiversity."

The CCC also highlighted that The Integrity Council for Voluntary Carbon Markets (ICVCM) is developing new standards for high-quality carbon credits to provide further criteria and guidance to the market. The Challenge encourages the sector to keep such criteria and guidance under review to reflect good practice.

SECTOR-LED SOLUTIONS

To help the sector access high-quality carbon offsetting projects when the time is right, a new sector-led initiative has been announced. The Carbon Coalition[63], led by the EAUC, provides access to

a pre-screened offsetting portfolio of high-quality projects aligned to specific principles. It is governed by a panel of independent sector experts, and any participating institution must have a Net Zero emissions target and reduction plan in place, and publicly report on progress.

When evaluating the value of carbon offsetting, some institutions have stressed the importance of local projects that also deliver opportunities for learning and benefits for adjacent communities. Although certified offsetting removal schemes are currently limited in the UK, supply is expected to increase in the future and some institutions are already considering developing their own schemes.

There is a sector study underway through the EAUC, called The University and College Land for Carbon Project[64], which aims to establish guidelines for verified offsetting schemes within educational estates and consider whether there is an opportunity for the sector to collaborate and scale these. The outcome will be a set of principles for projects that generate credits for an institution's own Net Zero emissions target, as well as a framework to engage students and staff to maximise knowledge on the use of carbon removals. Any residual credits could also be traded back through the Carbon Coalition for the rest of the sector to purchase.

INSETTING

The Challenge supports the approach and outcomes of localising offsetting projects. Sometimes called 'insetting', this is an alternative way for the sector to invest in interventions to reduce or remove GHG emissions within its value chain while also creating benefits for nature and local communities. These projects also provide accessible opportunities for learning, research, and training which could provide additional income streams for institutions. Examples of insetting include woodland planting and restoration on an institution's own land, or investment in renewable energy generation that also provides power to local residents.

A starting point for decision-making on using carbon offsets

What's the purpose of using offsets versus tackling emissions reduction?	Consider whether the money could be used to reduce your own direct or indirect emissions instead
Is the use of offsets set within a clear emissions reduction pathway and Net Zero target?	Without a long-term plan, you risk avoiding the action needed to reduce your emissions
Are the offsets being used to remove emissions that can't be reduced any further?	Exploring and developing implementation plans for all feasible emissions reductions should be undertaken first and revisited regularly as science and technology develop
Are you adopting leading principles on voluntary offsetting?	Only consider verified schemes and apply leading criteria from the ICROA or independent sector principles
Could insetting within your own value chain be an alternative?	You could deliver additional co-benefits for learning, nature, and local communities by considering local insetting projects instead of remote offsetting
Are the offsets reducing or removing carbon?	Removal projects are those that actually remove existing emissions from the atmosphere, and should be the long-term focus
Does the offset project provide long-term* carbon storage?	Carbon needs to be removed long-term to balance your ongoing emissions, to ensure there's no risk of future leakage
Do the offsetting projects consider all planetary boundaries and have positive benefits?	Ensure that other natural resources such as water and biodiversity are not harmed, and that there are positive social benefits
Have you defined a review loop to keep internal or external knowledge under review?	Offsetting is an unproven mechanism, so an ongoing review of the latest science, technology, and thinking is important

*'Long-term' carbon storage includes mechanisms that provide higher permanence and lower risk of reversal on the timescale of centuries to millennia, such as mineralisation, direct air capture with carbon storage (DACCS), and conventional carbon capture and storage. There are currently very few validated projects using innovative technologies available on the market for carbon storage on this timescale. When selecting nature-based projects, the resilience and longevity of the carbon store must be considered carefully due to the threat of carbon leakage or reversal due to the impact of climate change on the Earth's biosphere and, for example, future repurposing of land or deforestation[65].

Given the significant land ownership by HE and some FE institutions, and their role as anchor institutions within their localities, there is an opportunity to undertake 'own land' insetting projects. Although carbon sequestration may be limited from these activities, resulting carbon credits could be verified and used by institutions to balance against their carbon footprint.

Similarly to offsetting, rigorous standards need to be applied to insetting projects to ensure that the interventions drive down emissions in the long term, respond to local needs, maximise co-benefits, and that care is taken when accounting for associated carbon credits to avoid double counting.

Key challenges for the sector

All institutions face increasing gaps in finance for capital investment projects that address emissions reduction, and some are confronted with the reality that investing in offsets may appear to be the only possible contribution they can make to reduce their impacts in the short term. The Challenge would nevertheless advocate against using offsetting as a short-term solution and encourage institutions to divert this funding to develop feasibility studies or invest in skills or resources that would help reduce carbon emissions over the long term.

UK universities have high emissions associated with student and business travel, and in come cases are using offsetting to compensate for these find out more in the travel and transport section. However, FE colleges have fewer emissions associated with overseas travel, research programmes, or international students, and are therefore not yet turning to offsetting to compensate for their emissions. The costs would only diminish their ability to invest in emissions reduction projects and should not be used as a quick fix to claim 'carbon neutrality'.

Recommendation to Government

The sector is concerned by the accelerated acquisition of land in the UK by private institutions and investors for the implementation of large-scale, commercial forestation and offsetting schemes. This is leading to rising land prices, conversion of non-marginal farmland, and the introduction of monoculture environments that impact biodiversity and provide little benefit or access for local communities. In Scotland, a report by the Scottish Rural College (SRUC) highlighted that land values have risen by as much as 60% in 2021 for forestation purposes, and the Scottish Land Commission (SLC) noted that in agriculture, 40% of farms were purchased by those with non-farming interests[66]. The Scottish Government recently set out interim principles for Responsible Investment in Natural Capital[67] and The Scottish Land Commission (SLC) is currently developing the programme of work that underpins this, including protocols for Natural Capital and Carbon Management[68].

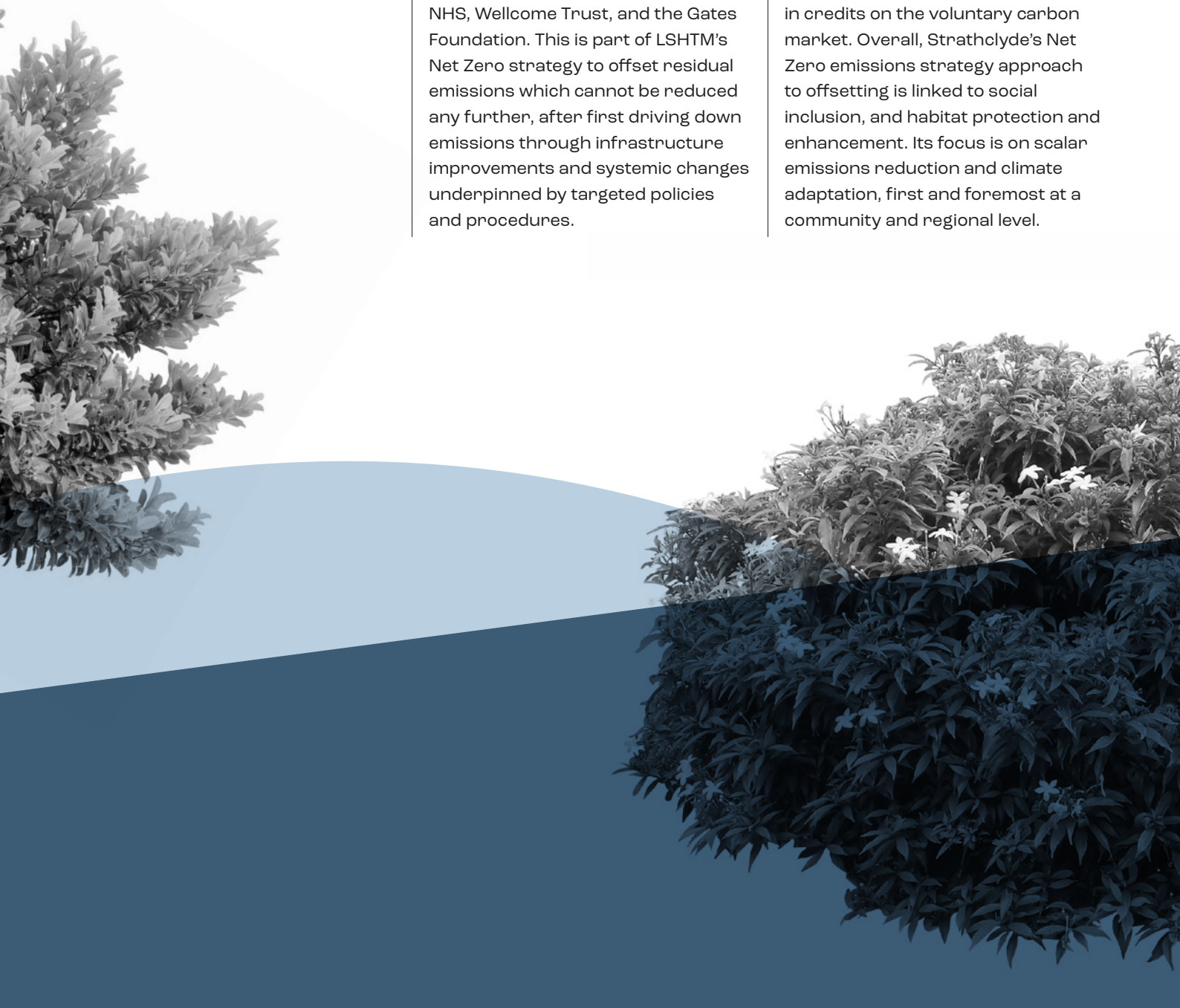
14 Regulate and improve transparency on land use and sale for carbon capture schemes, building on current work by The Scottish Land Commission. Commercial schemes must not be allowed to further damage natural habitats, deplete non-marginal agricultural land, or exclude local communities from a project's consultation process or access to the natural landscape.

Sector approach examples

The Challenge participants take varied approaches to carbon offsetting, which reflects the range of practices across the sector. These examples don't necessarily exemplify the leading principles outlined in this section, as knowledge and available schemes are advancing all the time.

London School of Hygiene and Tropical Medicine is launching Its own Sustainable Climate Impact Fund[69], providing Gold Standard validated offsets through community-based projects linked to its campuses in Uganda and The Gambia. The projects seek to reduce the environmental, social, and economic effects of climate change on rural communities. This includes improving access to basic amenities and fostering economic empowerment for all, especially women and girls. The credits will be used as part of LSHTM's own pathway to Net Zero, and made available to partners such as the NHS, Wellcome Trust, and the Gates Foundation. This is part of LSHTM's Net Zero strategy to offset residual emissions which cannot be reduced any further, after first driving down emissions through infrastructure improvements and systemic changes underpinned by targeted policies and procedures.

University of Strathclyde is part of the Clyde Climate Forest Programme Group[70]. It aims to plant 18 m trees in both urban and rural parts of the Glasgow City region over the next decade to increase canopy coverage, connectivity, and carbon sinks. The project is part of the Glasgow & Clyde Valley (GCV) Green Network Partnership[71] which brings together local authorities and environmental and public health organisations. This is part of the university's approach to invest in renewables, divest from carbon sources, and sequester carbon via programmes like the Clyde Carbon Forest, instead of investing in credits on the voluntary carbon market. Overall, Strathclyde's Net Zero emissions strategy approach to offsetting is linked to social inclusion, and habitat protection and enhancement. Its focus is on scalar emissions reduction and climate adaptation, first and foremost at a community and regional level.



University of Leeds is developing plans for one of the most significant woodland creation projects in the North of England. The Gair Wood programme will transform a 36-hectare site into a mosaic of habitats including 15 hectares of new tree planting and a mix of natural regeneration, scrubland, and open spaces. It will provide research and teaching opportunities including use as a Living Lab, and will also benefit the local community by linking existing public footpaths and providing volunteering opportunities. Over time, the carbon captured by Gair Wood will contribute towards the university's target of reaching Net Zero, balancing residual GHG emissions that are difficult to remove entirely. Beyond the carbon sequestered by Gair Wood, the University of Leeds is developing an institutional approach to guide any use of carbon offsetting, which will only occur once all avenues for emissions reduction have been explored. While the carbon sequestered by Gair Wood will be verified under the Woodland Carbon Code, the primary aims of this project are around research and education, biodiversity gain, and community engagement.

The London School of Economics (LSE) has partnered with Compensate Foundation[72] to use high-quality carbon credits to offset its scope 1 and 2 emissions from 2021 and achieve verified Carbon Neutral operations against the PAS 2060 standard. The associated projects deliver co-benefits, such as protecting biodiversity or creating economic opportunities for local communities in South America, Indonesia, and Africa. In addition, LSE has set an interim Net Zero target for its operations by 2030, and committed to Net Zero across scopes 1, 2 and 3 by 2050.

University of Oxford defined guiding principles for Net Zero aligned carbon offsetting in 2020[73] to support the sector, corporations, and regulators in the development of a high-quality offsetting market. The university's own Environmental Sustainability Strategy[74] sets two ambitious targets for Net Zero carbon and biodiversity net gain by 2035, delaying the use of carbon offsetting, prioritising emissions reduction, and avoiding and reducing biodiversity impacts. It also aims to develop a policy to guide its carbon and biodiversity offsetting activities and will regularly review offsetting opportunities and technologies as the market develops.

The Carbon Coalition[75] is an offsetting initiative managed by EAUC for the education sector. The goal is to provide Carbon Coalition partners with a simple, robust offsetting menu of products that are cost-effective and credible. By utilising the expertise within the education sector, it will provide confidence to institutions in a very complex area. Using the sector's collective purchasing power will also show leadership in driving demand for permanent carbon capture and storage, and advancing the offsetting sector.

The Student Challenge Prize Fund

Over the last few months, the Student Challenge Prize winners have been working in their student groups, overseen by a Student Challenge lead within each institution to bring their project to life. Here are the current outcomes of the five student-led projects.

Anglia Ruskin University

Project

Rethinking energy efficiency: A new user-focused approach to energy and building use

Student Challenge Lead

Felicity Clarke

Students

Kate Baker, Holly Foster, Tom Hambley, Gemma Hardy, Ian Trim

Medical Research Council Unit The Gambia at London School of Hygiene and Tropical Medicine

Project

Reinventing waste in the MRCG domain (REWIND)

Student Challenge Leads

Ola Bankole, John Starmer

Students

Aliyu Nuhu Ahmed, Ana Bonell, Sanusey Camara, Megan Deeney, Ekumah Ouche Favour, Sariba Jammeh, Dam Khan, Salem Ngana

Swansea University

Project

Nature-based solutions to increase biodiversity and landscape carbon sequestration on and off campus

Student Challenge Leads

Teifion Maddocks, Justin Searle

Student

Joseph Pickard

University of Leeds

Project

Mini meadows to reduce carbon emissions and increase soil carbon content, while providing a habitat for flora and fauna

Student Challenge Lead

Thom Cooper, Michael Howroyd, James Wright

Student

Sebastian Stroud

Warwickshire College Group

Project

The development of online learning modules on sustainability and climate change

Student Challenge Lead

Ben Fairhurst

Team

Olga David, Imogen Flower, Edward Holcroft, Talia McKenzie, Matt Smith, Eve Turner, Nadia Studena

Anglia Ruskin University

Rethinking energy efficiency: A new user-focused approach to energy and building use

This project aims to monitor and reduce energy usage across Anglia Ruskin University's campus to produce scalable recommendations for improving energy efficiency. To do this, the project will trial relevant monitoring technologies while also taking into account building use and occupation levels, timetabling, estates information, and thermal comfort data of building users.

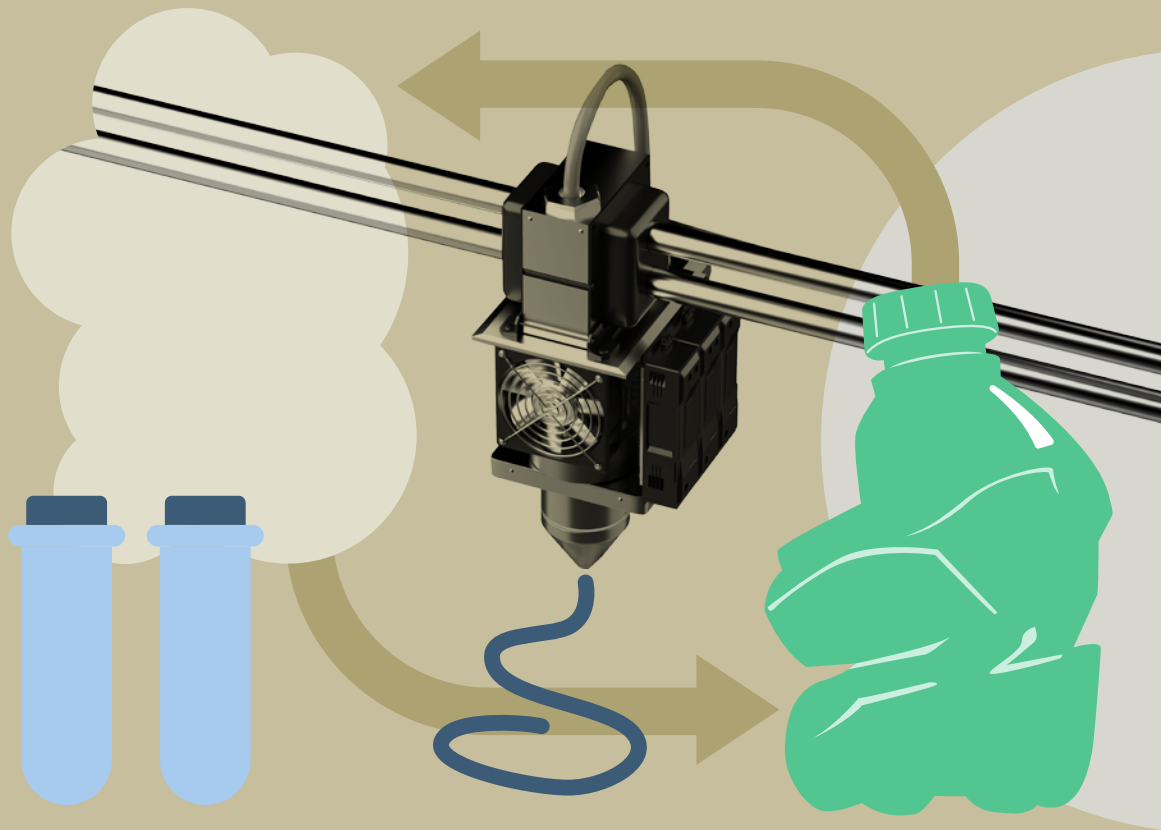
The work will provide opportunities for the taught and research postgraduate community to lead on project planning and delivery, and for undergraduates to contribute to data collection. The team have also been liaising with the team who are delivering the estate's sustainability strategy to understand the campus's operations and to obtain monitoring data. Feedback terminals have been installed, so building users can report on energy use and satisfaction with temperature. This data will be used alongside manual checks of self-reported behaviour data, such as switching off lights. By comparing timetabled and actual room usage, thermal imaging data, heat satisfaction, and building management systems and energy behaviours, a rich stream of data is being collected. This will be integrated with existing practice to provide the information needed to implement greater energy efficiency.

Medical Research Council Unit
The Gambia at London School of Hygiene and Tropical Medicine

Reinventing waste in the MRCG domain (REWIND)

The Medical Research Council Unit, The Gambia (MRCG), at London School of Hygiene and Tropical Medicine's overseas campus, generates a considerable amount of waste. This is currently disposed of in landfill, burned in open fires, or incinerated, constituting an environmental and health hazard.

This project aims to reduce the carbon emissions associated with existing disposal processes by recycling waste instead. This will include recycling plastic waste, such as in-demand laboratory equipment, by shredding it and using a 3D printer to melt it and print new, reusable products. Green waste will be used to produce biogas for cooking in the MRCG restaurant, and the by-product (bioslurry) will be used as manure. Where possible, components of the biogas plant will be constructed with 3D-printed parts from recycled plastic waste. So far, plastic waste has been shredded and stored in preparation for the arrival of equipment, meaning that no incineration or landfill disposal has occurred since August 2022. This is estimated to have saved 12 kg of plastic waste from being incinerated and prevented 10.8 tCO_2e emissions. This project will provide a scalable model for research facilities and health institutions, including sister health sites in the UK.



University of Leeds

Mini meadows to reduce carbon emissions and increase soil carbon content, while providing a habitat for flora and fauna

Through the creation of 'mini meadows', this project aims to alter the university's lawn management to reduce carbon emissions from mowing and increase soil carbon content. These grasslands will provide a habitat for a variety of flora and fauna and provide feeding opportunities for native invertebrates. As soil contains the largest terrestrial carbon pool, its management is critical to the global carbon balance and atmospheric GHG concentration. Grasslands with more plant diversity may be better for carbon storage than species-poor grasslands, as plant diversity increases soil microbial activity and productivity.

The team has identified three on campus locations for meadows, totalling 0.1 hectares, field surveys have taken place, and baseline botanical surveys will continue until April 2023. The team have also collected wildflower seed of local providence to trial different managed regimes. To generate long-term biodiversity data and provide students with training and experience in field skills, the team are working with a BSc Programme Lead to integrate species monitoring into an urban ecology field module. From the start of the project, the team anticipate a drop in carbon output from a reduced mowing regime, and plant and faunal diversity will increase over time as habitats develop.

Swansea University

Nature-based solutions to increase biodiversity and landscape carbon sequestration on and off campus

This project aims to use existing university spaces to create provisions for biodiversity and carbon sequestration on campus and in the local area. It will do this through the production of materials to support wide-scale peatland restoration across the regional landscape, and the creation or improvement of onsite areas for growing native species, such as Sphagnum moss and wildflowers, that can improve habitats rapidly and radically. These will contribute to peatland restoration as they are supplied to blanket mire restoration areas in the South Wales Valleys.

Thanks to involvement from multiple departments and 38 student volunteers, the project is delivering co-benefits through upskilling students and staff. Growing facilities for Sphagnum moss have been built on campus (moss plant plugs in cold frames for future propagation and planting), onsite asset management has been adapted, and some different plant species have been introduced, ethically harvested from nearby land. Wildflower plug plants have been growing, and already planted on campus, and a green roof has been constructed on a recycling compound to further increase biodiversity. This project provides a scalable example of optimising university spaces to increase carbon sequestration capability and native biodiversity.

Warwickshire College Group

The development of online learning modules on sustainability and climate change

Warwickshire College Group is developing online sustainability and climate change learning modules for over 4,000 16–18 year-olds to help them understand how they can contribute positively to a more sustainable society throughout their personal and professional lives. At present, six of the twelve modules have been developed, and will be evaluated and tested by 2,000 students, and eventually form part of their study programme.

Each module will finish with a 'call to action' for participants to join the Group's on campus student 'Green Teams' and apply the information from the course into their everyday lives and future work. Student groups will monitor completion rates, hold focus groups with other students, and support further development of the material. Initial tests with 43 students were positive, with 95% stating that they would be interested in learning more about climate change, and 81% believing that the modules would increase their understanding of sustainability, how it applies to their courses, and the impact it would have on their future careers. Once the modules have been delivered across the Group and feedback received, there are plans to roll them out across other institutions in the UK, through the Group's sustainability certification partner, PlanetMark, who are creating the resources and working with staff and students.

Emissions Reporting

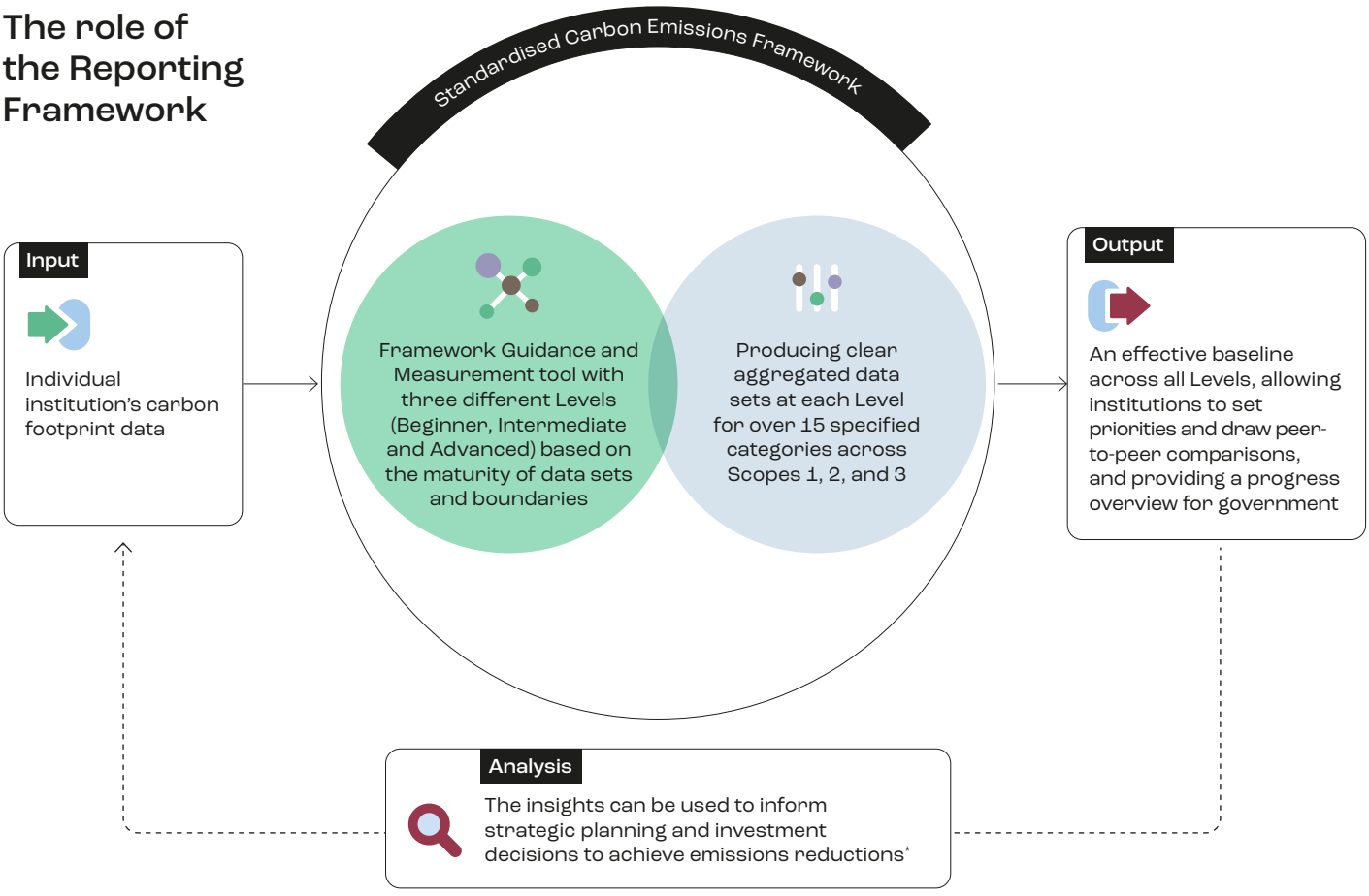
Standardised Carbon Emissions Framework (SCEF) for Further and Higher Education

Currently, there is not an education-based carbon emissions framework and institutions do not have clear direction on what to report and which methods to use. A consistent approach is required for the sector to enable peer-to-peer comparisons as well as transparency for staff and students.
The Reporting Framework is based on the GHG Protocol, so the tertiary education sector can also be compared to other sectors. The collective data could also be used to help the government to identify the areas where institutions need further support to achieve reductions.

The participants encourage all institutions to use the Reporting Framework as part of their Net Zero journey to ensure consistent and transparent emissions reporting against their Net Zero targets.

While the reporting will not initially be mandatory, it is expected to become so, and therefore institutions are encouraged to start reporting as soon as possible so that they are well placed when it does become mandatory. The DfE expect reporting to start in the academic year of 2024-2025, with exact timings to be confirmed. The data collection mechanism will be developed by the DfE within these timelines.

The role of the Reporting Framework



* The DfE, BUFDG and EAUC have also commissioned a complementary project to develop a costing tool which will guide institutions on an estimated cost – both financial and carbon – across a spectrum of carbon reduction activities. This will further support the HE and FE sectors to budget for the actions required to meet their Net Zero targets. This project will be published in March 2023.

EAUC Reporting Framework Development

A key aspect of the Framework development was to use the expertise from within the sector, for the sector. The Framework has been co-created by a working group from the sector with representation from the following institutions:

- Glasgow Caledonian University – Chair
- Keele University
- King's College London
- University of Edinburgh
- University of Lincoln
- University of Nottingham
- University of the West of England
- In-kind support from Avieco

A steering group to oversee the development of the Framework was established and co-chaired by DfE and EAUC. The steering group consisted of key sector bodies to ensure buy-in and ownership of the Framework, and has met monthly throughout its development:

- UUK
- AoC
- BUFDG
- AUDE
- GuildHE
- HESA
- Queen's Platinum Jubilee Challenge Team

The Challenge would like to thank all the institutions and Avieco in the Working Group and the sector bodies in the Steering Group for all their input in this important work for the sector.

The first iteration of the Framework was distributed to the twenty-one participants in the Challenge in June 2022. There was an overwhelming positive response and the group welcomed the standardised approach.

In September, the Framework was distributed for wider sector feedback through key sector bodies' memberships such as Universities UK, Association of Colleges, GuildHE, EAUC, HEPA, BUFDG, AUDE, Colleges Scotland, College Development Network, Colleges Wales (Colegau Cymru), UK University Purchasing Consortia and HESPA. It was also widely shared on social media. EAUC also presented the Framework at various events across the sector. The feedback from the wider sector was used to develop the Framework's final iteration, which has been passed to the DfE in December 2022.

As education is a devolved matter, the DfE are in discussions with the devolved nations with the aim of aligning existing reporting so that there is consistent reporting UK-wide. The mandatory reporting that Scotland and Wales currently have will remain until further notice. DfE are also in discussions with BEIS and any other agencies that currently recommend carbon reporting (e.g., SECR, ESOS), again to align on the requirement for reporting in the future.

The data collection mechanism is under discussion with the DfE, and our preference is for it to be co-ordinated through JISC as the data controller for HE (formerly HESA). The aim is for this reporting to replace the carbon elements of the EMR which universities currently report (in England). The Challenge recommends that the data collection mechanism should be available to both HE and FE. EAUC has provided a high-level overview of the data collection – this is purely a guide and does not have any conversion factors, nor should it be used for data collection other than if an institution wants to use it as a way of representing its data.

Guidance on using the Framework

The methodology guidance outlines the best practices for collecting and measuring data for Scopes 1 and 2, in addition to 15 categories in Scope 3, and provides guidance on how to measure and where to find the data.

There is also a plain English interpretation of the GHG Protocol and how this applies to an education setting, so that institutions do not need a high level of carbon accountancy literacy to complete the reporting.

The Framework has three levels of reporting granularity, and has been developed to help institutions progress from basic reporting and data management to more detailed and granular reporting methodologies.

Basic Level is for institutions at the start of their reporting, which frequently relies on assumptions and easy-to-use calculation tools for the data.

Intermediate Level is for institutions that wish to refine their carbon data and calculation.

Advanced Level is the highest level of carbon reporting with the highest level of accuracy for the data.

Institutions can choose a level of reporting granularity across each reporting area.

Current Reporting for HE and FE

It is a recommendation that the DfE aligns the Framework as the core reporting methodology for the sector and works with HESA to replace the carbon emissions section of the EMR with the Framework. The non-carbon elements of the EMR will also be updated with the sector recommendations that have been led by AUDE. The data collection mechanism could be free to use, and accessible to both HE and FE institutions.

The current requirements for reporting include: SECR, EMR, Welsh and Scottish public reporting.

STREAMLINED ENERGY AND CARBON REPORTING (SECR)

There is no longer mandatory reporting of GHG emissions for the tertiary education sector in England and Northern Ireland. The Education & Skills Funding Agency, however, recommends colleges to disclose emissions in line with the Streamlined Energy and Carbon Reporting (SECR) regulations[76]. These regulations set out reporting on:

- Electricity consumption
- Gas combustion
- Transport emissions covering:
  - Fuel for company/fleet cars for business use
  - Fuel used in personal/hire cars for business use
  - Fuel used in corporation-controlled minibuses

ESTATES MANAGEMENT RECORD (EMR)

For HE, the Higher Education Statistics Agency (HESA) publishes emissions data collected as part of the Estates Management Record (EMR)[77]. The EMR return is optional for HE providers in England and Northern Ireland. Submission is mandatory in Wales and recommended in Scotland[78]. The EMR allows submission of information on emissions from:

- Scope 1 and 2
- Scope 3 for:
  - Business Travel
  - Staff Commuting
  - Student commuting
  - Waste
  - Water
  - Supply Chain

WELSH PUBLIC SECTOR NET ZERO CARBON REPORTING

In 2017, the Welsh Government set the ambition of achieving a carbon neutral public sector by 2030[79]. Following this, a Net Zero carbon roadmap for the public sector was published outlining action to report emissions and progress on targets[80]. The Welsh Public Sector Net Zero Carbon reporting approach[81] provides guidance and requirements for public institutions including the education sector on reporting GHG emissions. The approach will replace and build on the Carbon Reduction Commitment scheme. The reporting requirements include:

- Scope 1 and 2
- Water
- Waste
- Procurement
- Business travel
- Employee commuting

SCOTTISH PUBLIC BODIES CLIMATE CHANGE DUTIES REPORTING

Following the introduction of the Climate Change (Scotland) Act 2009 the Scottish Government introduced in 2015 an Order requiring Public Bodies to submit a report on their climate change duties based on a set template[82]. This includes 44 Scottish Colleges and Universities[83]. This includes reporting on:

- Governance, Management and Strategy
- Emissions, Targets and Projects
- Adaptation
- Procurement
- Validation & Declaration

The Order was amended in 2020 to require further aspects to be reported on including target date for achieving zero direct emissions and targets for reducing indirect emissions. The expectation is that 'Public bodies must consistently, accurately and transparently report all Scope 1 and 2 emissions and all relevant and significant Scope 3 emissions'[84]. Institutions are required to report on:

- Building energy consumption
- Fleet vehicles
- F-gases from labs, air-conditioning systems and heat pumps
- Waste disposal and recycling
- Water supply and treatment
- Transmission and distribution losses from purchased heat & electricity
- Business travel
- Homeworking of staff

THE HIGHER & FURTHER EDUCATION SECTOR WELCOMES THE REPORTING FRAMEWORK

EAUC received 58 institutional responses, with 41 from HE (71%) and 17 from FE (29%). The institutions that provided feedback are:

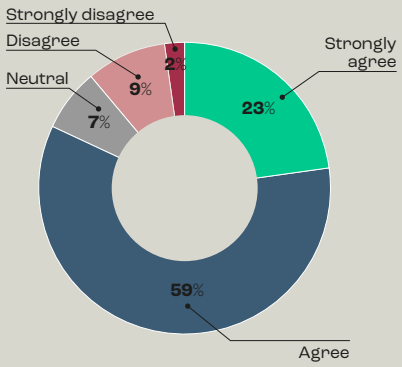
1. Arts University Plymouth
2. Bangor University
3. Basingstoke College of Technology
4. Bath Spa University
5. BHASVIC
6. Boston College
7. Canterbury Christ Church University
8. Cheltenham Ladies' College
9. City, University of London
10. Coleg y Cymoedd
11. College of West Anglia
12. Coventry University
13. Dundee and Angus College
14. Exeter College
15. Forth Valley College
16. Heriot-Watt University
17. Leeds Arts University
18. Leicester College
19. London School of Economics
20. Loughborough University
21. Manchester Metropolitan University
22. Newcastle University
23. Nottingham Trent University
24. Pembrokeshire College
25. Royal Veterinary College
26. SGS College
27. Sheffield Hallam University
28. South Devon College
29. Staffordshire University
30. Swansea University
31. The Open University
32. The Place – Contemporary Dance Trust
33. Trinity College Dublin
34. Ulster University
35. University College London (UCL)
36. University of Aberdeen
37. University of Bath
38. University of Cambridge
39. University of Chester
40. University of Dundee
41. University of Edinburgh
42. University of Exeter
43. University of Glasgow
44. University of Gloucestershire
45. University of Greenwich
46. University of Leicester
47. University of Manchester
48. University of Plymouth
49. University of Reading
50. University of Salford
51. University of Southampton
52. University of St Andrews
53. University of Strathclyde
54. University of Sussex
55. University of Worcester
56. University of York
57. West Lothian College
58. Weston College

Thank you to all the institutions that have provided feedback. A summary of the quantifiable feedback is shown on the next page.

THE 3 REPORTING LEVELS ARE SUFFICIENT (%)

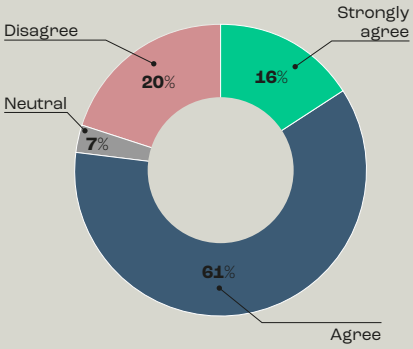
82% of respondents strongly agreed or agreed.

Note: the description of the Levels has now changed from being numerical to be Basic, Intermediate and Advanced following the feedback received.



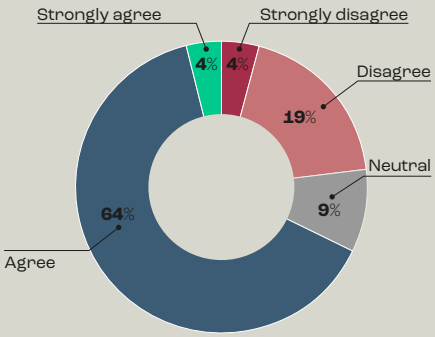
THE PLAIN ENGLISH INTERPRETATION IN THE METHODOLOGY GUIDANCE IS SUFFICIENT (%)

77% of respondents strongly agreed or agreed. This feedback has been taken into account to improve the guidance.



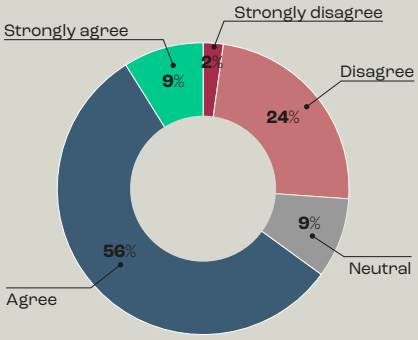
THE PLAIN ENGLISH INTERPRETATION IN THE METHODOLOGY GUIDANCE IS SUFFICIENT (%)

68% of respondents strongly agreed or agreed.



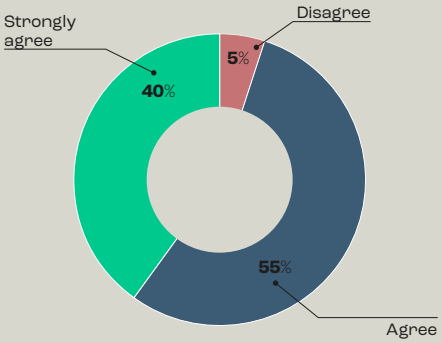
THE METHODOLOGY GUIDANCE IS EASY TO READ AND USER-FRIENDLY (%)

65% of respondents strongly agreed or agreed. This feedback has been taken into account to improve the guidance.



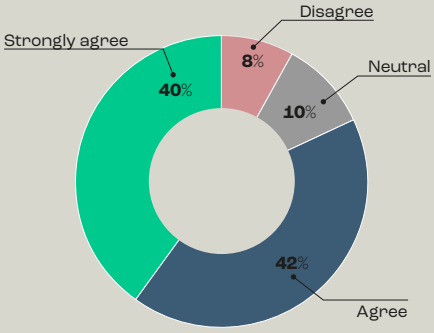
THE STANDARDISED FRAMEWORK FOR THE HE/FE EDUCATION SECTOR IS IMPORTANT TO ENSURE THE NET ZERO READINESS OF INDIVIDUAL INSTITUTIONS (%)

95% of respondents strongly agreed or agreed.



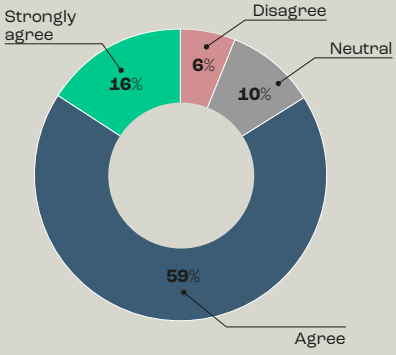
A CONSISTENT AND APPLIED EDUCATION SECTOR FRAMEWORK IS AN ESSENTIAL ELEMENT TO ACHIEVING NET ZERO FOR THE SECTOR (%)

82% of respondents strongly agreed or agreed.



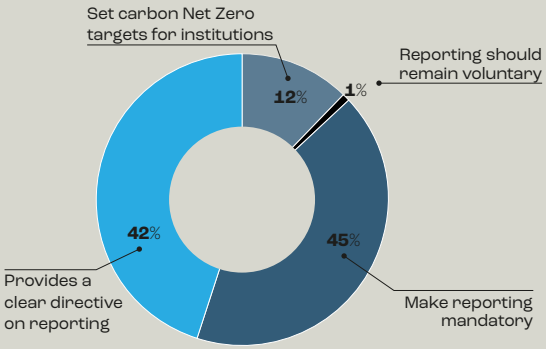
THE STANDARDISED FRAMEWORK REFLECTS A LEADERSHIP APPROACH FOR THE EDUCATION SECTOR ON NET ZERO, BOTH NATIONALLY AND INTERNATIONALLY (%)

84% of respondents strongly agreed or agreed.



THE ROLE OF NATIONAL AND DEVOLVED GOVERNMENTS REGARDING CARBON EMISSIONS REPORTING (%)

It is noted that only 1% of respondents felt that reporting should remain voluntary, however only 45% of respondents actively said that reporting should be mandatory.



About this Report

Contributors

This report was co-created by the participants of the Platinum Jubilee Challenge through a series of working groups and events during 2022. Twenty-one higher and further education institutions, who were awarded Queen's Anniversary Prizes in 2021, nominated two participants from a range of their professional and academic functions. These forty-two participants provided insights, challenges, and experiences from across the sector to develop the content within this report and help others respond to the climate emergency.

THE ROYAL ANNIVERSARY TRUST

The Royal Anniversary Trust was established in 1990 as part of the Jubilee celebrations. The charity's main function is to celebrate the best in UK higher and further educational institutions by awarding Queen's Anniversary Prizes every two years. The awards celebrate excellence, innovation, and public benefit and have been hugely popular, with over 85% of higher education establishments applying every two years.

The Royal Anniversary Trust appointed external partners to develop and facilitate the Challenge process, and to co-author the report with the participants:

SB+CO

Challenge lead

Led by Co-Founder, Penny Baxter, and Senior Sustainability Communications Consultant, Amelda de Segundo

SB+CO are experts in sustainability strategy and engagement and have been working with large businesses and organisations for over twenty years. They developed and led the Challenge programme on behalf of the Royal Anniversary Trust. This included the overall engagement process with the participants and their institutions, the design and facilitation of the main residential event, management of multiple working groups, general research and insight development, and the creation of the final report. They were also responsible for alignment with EAUC on the development of the Reporting Framework and participated in the DfE's associated steering group.

ecoact
an atos company

Technical lead

Led by Senior Sustainability Consultant, Lau Tambjerg

EcoAct, an Atos company, is an international climate consultancy and project developer, helping businesses and organisations succeed in their climate ambitions. They joined the Challenge team alongside SB+CO to provide deep technical knowledge of climate issues and carbon accounting. In addition to supporting the overall programme and working groups, EcoAct worked with EAUC on the development of the Reporting Framework and supporting guidance. EcoAct also developed the overview of the sector's carbon footprint within this report, based on current emissions data and standards.

eauc
The Alliance for Sustainability Leadership in Education

Reporting Framework lead

Led by Fiona Goodwin, CEO (Interim)

EAUC developed the Standardised Carbon Emissions Framework in partnership with a sector working group. Both the EAUC and The Royal Anniversary Trust were supported by funding from the DfE. As well as engaging the twenty-one institutions within the Challenge, wider feedback was also collected from across the sector, working closely with key partners such as UUK, AoC, AUDE, British Universities Finance Directors Group (BUFDG), GuildHE, College Development Network, Colleges Scotland, Colegau Cymru (Colleges Wales), UK University Purchasing Consortia, Higher Education Procurement Association (HEPA), Higher Education Strategic Planners Association (HESPA), Higher Education Statistics Agency (HESA), UK Universities Climate Network (UUCN) and EAUC members.

Glossary

LIST OF ABBREVIATIONS AND TERMINOLOGY

AoC Association of Colleges

APUC Advanced Procurement for Universities and Colleges

AUDE Association of University Directors of Estates

BMS Building Management System

bn Billion

BSc Bachelor of Science

BUFDG British Universities Finance Directors Group

CCC The UK Climate Change Committee

CHP Combined Heat and Power

CO_2 Carbon Dioxide

CO_2e Carbon Dioxide equivalent

COP27 The 2022 United Nations Climate Change Conference or Conference of the Parties of the UNFCCC

COVID-19 Coronavirus Disease-19

CPD Continuing Professional Development

BEIS Department for Business, Energy & Industrial Strategy

BREEAM Building Research Establishment Environmental Assessment Method

bn Billion

DACCS Direct air capture with carbon storage

DfE Department for Education

DfT Department for Transport

EAUC The Alliance for Sustainability Leadership in Education

ECMP Energy and Carbon Reduction Plan

EETF Energy Efficiency Taskforce

EMR Estates Management Record

EPC Energy Performance Certificate

ESOS Energy Savings Opportunity Scheme

ESFA Education and Skills Funding Agency

EV Electric Vehicle

Fabric-first A fabric-first approach to building design involves focusing on the materials used to construct a building before considering further building services systems

FE Further Education

FIT Feed-In-Tariff

GCV Glasgow & Clyde Valley

Green bonds As defined by the International Capital Market Association (ICMA) in *The Green Bond Principles (GBP) 2021*.

Green design As defined by the Royal Institution of Chartered Surveyors in Investing in the webinar: *Investing in Green Buildings*.

Green finance As defined by His Majesty's Treasury and the UK Debt Management Office in *UK Green Financing Programme Allocation Report.*

Green growth As defined by the Organisation for Economic Co-operation and Development (OECD) in *What is green growth and how can it help deliver sustainable development?*

GHG Greenhouse Gas

Green IT As defined by the Department for Environment, Food & Rural Affairs (DEFRA) in *Greening government: ICT and digital services strategy 2020-2025*.

Green jobs As defined by the International Labour Organisation (ILO) in *World Employment and Social Outlook 2018 – Green with jobs report.*

Green lab As defined in the Laboratory Efficiency Assessment Framework (LEAF) in *Make your lab sustainable with LEAF.*

Green logistics As defined by the South East of Scotland Transport Partnership in *Greening Logistics: Sustainable Best Practices.*

Green power Synonymous with 'green energy' as defined by the UK Government in *Green Energy (Definition and Promotion) Act 2009.*

Green skills As defined by the UK government in *Skills for a green economy: A report on the evidence,* in 'Table 1: Summary of skills needs for a green economy'.

Ground source heat pump A pump that transfers heat from the ground and compresses it into a higher temperature, to be used for heating buildings and hot water

HDCP Heat Decarbonisation Carbon Plan

HE Higher Education

HEPA Higher Education Procurement Association

HESA Higher Education Statistics Agency

HESCET Higher Education Supply Chain Emissions Tool

HESPA Higher Education Strategic Planners Association

Glossary

ICROA International Carbon Reduction & Offset Alliance

ICVCM Integrity Council for Voluntary Carbon Markets

IPCC Intergovernmental Panel on Climate Change

IT Information Technology

Jisc The UK's digital body for tertiary education

kg Kilogram

kt Kilotonnes, 1000 tonnes

kWh Kilowatt-hour

kWp Kilowatts peak, the rate at which solar PV systems generate energy when at peak performance

LEAF Laboratory Efficiency Assessment Framework

LGPS Local Government Pension Schemes

Living Lab As defined by the European Network of Living Labs (ENoLL) in *About Us.*

m^2 Metres Squared

M&E Mechanical and Electrical Design

MMC Modern Methods of Construction

m Million

$MtCO_2e$ Million tonnes of Carbon Dioxide equivalent

National Grid The UK's largest electricity transmitter and distributor

NI Northern Ireland

ONS Office of National Statistics

PAS Publicly Available Specification

PBCCD Public Bodies Climate Change Duties

PPA Power Purchase Agreement

PV Photovoltaic, usually in reference to a PV or solar panel

REGO Renewable Energy Guarantees of Origin

RIBA Royal Institute of British Architects

RICS Royal Institution of Chartered Surveyors

Salix Salix Finance is interest-free UK Government funding which can be accessed by the public sector, used to improve energy effiency, and reduce energy bills and carbon emissions.

SECR Streamlined Energy and Carbon Reporting

SKA rating A RICS environmental assessment method, benchmark, and standard for non-domestic fitouts

SLC Scottish Land Commission

SMEs Small and Medium-Size Enterprises

S&P Standard and Poor Global Ratings, an American credit rating agency

SRUC Scottish Rural College

SUPC Southern Universities Purchasing Consortium

t tonnes

TEC The Energy Consortium

UK United Kingdom

UKGBC UK Green Building Council

UKRI UK Research and Innovation

UMAL U.M. Association Limited

USS Universities Superannuation Scheme

UUCN UK Universities Climate Network

UUK Universities UK

Water source heat pump A pump that extracts heat from a body of water and converts it to be used for heating buildings and hot water

WRAP The Waste and Resources Action Programme

WFH Working from Home

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Carbon Footprint Methodology

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Introduction

SB+CO and EcoAct have developed a carbon footprint of the Higher and Further Education sectors for the 2020/2021 academic year.

The purpose of this work was to expand current estimates of the sector's emissions aligning with the Standardised Carbon Emissions boundary. The calculations sought to use the best available data and most recent methodologies to support the identification of emissions reduction levers for the HE and FE sectors.

HE AND FE FOOTPRINT

The results of the sector's carbon footprint are presented in Table 1. This shows emissions by source and contribution across HE and FE. Financed emissions have been excluded from the total and the contribution calculation.

TABLE 1: BREAKDOWN OF EMISSIONS CATEGORIES PER EDUCATION SECTOR

Emission Source	HE Sector		FE Sector		Total	
	$MtCO_2e$	%	$MtCO_2e$	%	$MtCO_2e$	%
Scope 1 and 2	1.5	10%	0.6	22%	2.1	12%
Scope 3: Supply Chain	6.3	40%	1.1	45%	7.4	41%
Scope 3: Fuel- and Energy-Related Activities	0.4	2%	0.1	5%	0.5	3%
Scope 3: Waste and Water	0.01	0%	0.005	0%	0.02	0%
Scope 3: Business Travel	0.5	3%	0.1	3%	0.6	3%
Scope 3: Employee Commuting	0.1	1%	0.05	2%	0.2	1%
Scope 3: Employee Homeworking	0.2	1%	0.1	2%	0.2	1%
Scope 3: Student Commuting	1.0	6%	0.5	18%	1.5	8%
Scope 3: Student Flights	2.2	14%	0.05	2%	2.2	12%
Scope 3: Student Accommodation	3.4	22%	-	-	3.4	19%
Scope 3: Finance	37.6		1.6		39.2	
Total Scope 1, 2 and 3 (excl. Finance)	**15.5**		**2.6**		**18.1**	

Methodology

APPROACH

The initial step of the analysis for measuring the carbon footprint of the HE and FE sectors was to clarify the boundaries of the sectors and determine which institutions are included.

The following inclusion criteria were applied to determine which institutions to analyse for both sectors:

- Institutions that report data to the Higher Education Statistics Agency (HESA), or,
- Institutions included in the Education & Skills Funding Agency database of college finance records, or,
- Institutions in Office for Students' Register and devolved nations' similar registers

DATA AVAILABILITY

Environmental (e.g., grid electricity, Scope 1 and 2 emissions), financial (e.g., total expenditure) and operational data (e.g., gross internal area) for HE institutions was extracted from HESA, which is the official agency for the collection, analysis and dissemination of quantitative information related to HE institutions.

Any missing reporting information was extrapolated using coefficient factors that were created from the reported HESA data. These benchmarks are summarised in Table 3.

Financial and operational data for FE institutions was retrieved from the college accounts published by the Education & Skills Funding Agency[1] and individual institutions' annual reports.

Comprehensive environmental data was not available for FE, and therefore the majority of the calculated emissions for the FE sector have been estimated based on the created benchmarks.

Some of the key statistics of the HE and FE sectors include:

TABLE 2: HE AND FE SECTOR'S KEY OPERATIONAL AND STAFFING INFORMATION

Key statistics	HE Sector	FE Sector	Total
Number of institutions	268	269	537
Gross internal area (m^2)	30,390,796	10,089,490	40,480,285
Expenditure (£m)	41,825	7,676	49,501
Number of students	2,463,004	1,275,239	3,738,243
Number of staff	386,289	129,115	515,404

The following section provides further information on the calculation approaches used for each emissions category as well as the benchmark and assumptions used.

1. Education & Skills Funding Agency (2022) *College accounts academic year 2020 to 2021.* Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1076334/College_accounts_academic_year_2020_to_2021_data_publication_v1.csv/preview

CALCULATION APPROACH

The following section outlines the calculation approach that was applied for each of the relevant emission categories.

Scope 1 and 2

Reported emissions related to Scope 1 and 2 were extracted from HESA. A total of 134 HE institutions reported this information for both their residential and non-residential premises.

A coefficient factor was created based on a weighted average of Scope 1 and 2 emissions over total internal gross area (m^2) of the institutions' reporting data. The coefficient factor was applied to model the Scope 1 and 2 emissions of the remaining institutions by multiplying it with their respective internal gross area.

The same coefficient factor was applied for all the institutions in the FE sector to estimate the sector's respective Scope 1 and 2 emissions, given the lack of comprehensively reported Scope 1 and 2 emissions data.

Scope 3: Supply Chain

Reported Scope 3 supply chain emissions relating to business services, paper products, other manufactured products, manufactured fuels, chemicals and gases, food and catering, construction, information and communication technologies, waste and water, medical and precision instruments, other procurement, and unclassified, were extracted from HESA.

Only 70 HE institutions reported complete supply chain data across all categories.

Coefficient factors were created based on a weighted average of emissions for each of the supply chain emission categories over the institutions' reported total expenditure (£). The coefficient factor was applied to the remaining institutions by multiplying it with their respective expenditure.

The same coefficient factor was applied to all FE institutions to estimate the sector's respective Scope 3 supply chain emissions given the lack of reported Scope 3 supply chain data.

Scope 3: WTT and T&D

Well to Tank (WTT) and Transmission and Distribution (T&D) emissions were calculated for HE and FE's electricity and fuel consumption.

As total Scope 2 emissions are not reported within HESA, an estimate was created based on reported grid electricity consumption (in kWh). The emissions were calculated by applying the DEFRA 2021 conversion factors[2].

WTT and T&D emissions were then obtained using an average coefficient of WTT to Scope 1 emissions, assuming natural gas and total T&D and WTT to Scope 2.

The same coefficients were applied for all the institutions in the HE and FE sectors to estimate the sectors' respective WTT and T&D emissions.

Scope 3: Staff and Student Commuting

Staff and student commuting was calculated using a combination of reported HESA data and information from the UK National Travel Survey[3].

Initially, the percentage modal split for commuting for both staff and students was extracted from HESA. A total of 80 institutions reported on the percentage modal split for employee commuting, while a total of 88 institutions reported the modal split for student commuting.

The modes of transport that were included in the calculation include: Car, Car share, Bus, Train, Cycle, Walk, Motorbike, Other.

Where the percentage of modal split was not reported, the average percentage per region per modal split was used. Given the lack of commuting data for the FE sector, the average percentage modal split per region per mode based on HE was applied for all FE institutions.

Travel data from the UK National Travel Survey was taken from the following datasets:

- Average trip length by main mode, region, and Rural-Urban Classification (NTS9910)
- Average number of trips (trip rates) by purpose and main mode: England, from 2002 (NTS0409a)
- Average number of trips (distance) by purpose and main mode: England, from 2002 (NTS0409b)

2. UK Government (2021) *Greenhouse gas reporting: conversion factors 2021.* Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021
3. Department for Transport (DfT) (2013) *National Travel Survey.* Available at: https://www.gov.uk/government/collections/national-travel-survey-statistics

The calculation for the relevant emissions is as follows:

$$\text{emissions}_i = \sum \text{modal split (\%)} \times EF_i \times \text{Trips per year}_n \times \text{distance per trip}_i$$

Where:

- i is the mode of transport
- n is the institution

The emissions factors used in the calculation were taken from the DEFRA 2021 database[4]. All staff and student commuting emissions include the WTT emissions which have been similarly calculated using the DEFRA 2021 conversion factors.

The number of staff considered in the calculation excludes the percentage of employees that worked from home in the academic year, whose emissions have been calculated separately.

Scope 3: Business Travel

Reported emissions related to business travel were extracted from HESA. A total of 40 HE institutions reported their emissions related to business travel. A coefficient factor was created based on the weighted average of emission over the institutions' reported total expenditure (£).

Due to the impact of COVID-19, business travel emissions were estimated based on 2018/2019.

The coefficient factor was applied to the remaining HE institutions by multiplying it with their respective expenditure.

The same coefficient factor was applied for all the institutions in the FE sector to estimate the sector's respective business travel emissions, given the lack of reported business travel emissions data.

Scope 3: Student Flights

Information regarding the non-UK HE students by HE provider per country of domicile for the academic year of 2020/2021 was provided by HESA.

The distance between the students' country of domicile and the UK was identified. The respective emissions were calculated by applying the DEFRA 2021 conversion factors for business travel[5]. All HE student flight emissions include the WTT emissions which have been similarly calculated using the DEFRA 2021 conversion factors.

It was assumed that 2 return flights per student were taken per year and that travel numbers were not reduced as a consequence of COVID-19.

Information related to the number of international students for the FE sector was not available per institution and per student's country of domicile. As such, an overarching number for international students in FE was estimated from the number of Visa applications and number of Visa extensions for tertiary, FE or other colleges that were found in the Managed Migration Dataset[6] published by the Home Office. From this dataset, the total number of international students for FE amounted to 6,483.

To estimate the relevant emissions for FE, a benchmark coefficient factor was created by taking the weighted average of student flight emissions per international student, expressed at tCO_2e per international HE student.

The weighted average was then multiplied by the percentage of emissions per student region (i.e., Africa, Asia, Australasia, EU, Middle East, North America, Other Europe, South America) from the HE calculation mentioned above.

Further information regarding the assumptions that were made as part of the calculation are outlined in the 'Benchmarks' section on page 82.

Scope 3: Homeworking

Given the implications of COVID-19-related measures implemented regarding employees working from home, the relevant emissions have been calculated using EcoAct's homeworking methodology.

The full detailed methodology is outlined in the EcoAct whitepaper published in 2020[7].

The percentage of employees that worked from home were retrieved from 'Table 3 – Homeworking by Industry Sector in the UK, January to December 2020' from the Office for National Statistics[8].

4. UK Government (2021) *Greenhouse gas reporting: conversion factors 2021.*
5. Ibid.
6. UK Government (2022) *Managed migration datasets.* Available at: https://www.gov.uk/government/statistical-data-sets/managed-migration-datasets
7. EcoAct (2020) *Homeworking emissions whitepaper.* Available at: https://info.eco-act.com/en/homeworking-emissions-whitepaper-2020
8. Office of National Statistics (ONS) (2022) *Homeworking in the UK labour market.* Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/homeworkingintheuklabourmarket

Scope 3: Student Accommodation

Student accommodation was calculated using a combination of reported HESA data and information from the National Energy Efficiency Data-Framework (NEED)[9].

Initially, the percentage split for accommodation by region was extracted from HESA. A total of 170 institutions reported on the student accommodation modal split across various types of arrangements. Where the percentage of split was not reported, the average percentage per region was used. No student accommodation for FE students was included.

NEED data was used to calculate energy (natural gas and electricity) consumption per resident, assuming 1 resident per room across property types. Accommodation was assumed to be the following:

- Not in attendance at the provider: excluded from calculation
- Parental/guardian home: excluded from calculation
- Own residence: estimated based on regional average of gas and electricity consumption for all property types
- Private-sector halls: estimated based on average m^2 per student and kWh per m^2 based on data from HESA. Significant outliers were excluded
- Provider maintained property: assumed already included within reported Scope 1 and 2 data
- Other rented accommodation: estimated based on regional average of gas and electricity consumption for 'Converted flat' and 'Purpose built flat'
- Not known: the respective emissions for electricity and natural gas were calculated by applying the DEFRA 2021 conversion factors[10]

Scope 3: Financed emissions

Financed emissions for HE and FE relate to the emissions resulting from the institutions activities in the real economy that are financed through their pension schemes, endowments, and investments.

Due to the lack of publicly available information related to the financial information of the aforementioned financing activities, a number of assumptions and publicly available benchmark data have been used for the calculation of the relevant emissions.

PENSIONS

Financial data relating to pension contributions have been retrieved from HE institutions' overall pension funds, the Universities Superannuation Schemes (USS), as well as individual universities' self-administered trusts.

The total asset value of all pension schemes amounts to £109,688 m.

To estimate the absolute carbon emissions of the HE sector's pension contribution, the average emissions intensity (tCO_2e/£AUM) of the USS portfolio was calculated at 321 tCO_2e/£m. The USS portfolio consisted of corporate and property investments and sovereign bonds. These figures were retrieved from the USS 2022 TCFD report[11].

The calculated emissions intensity was then multiplied with total asset value in March 2022 based on annual reports to give the absolute carbon emissions for the HE sector.

For FE there are generally two types of pension schemes, a Teachers Pension Scheme (TPS) and a Local Government Pension Scheme (LGPS). TPS is for employed teachers and is an unfunded defined benefit scheme. The scheme for this reason does not have assets and has therefore not been considered in terms of estimating financed emissions.

LGPS is a broad ranging pension scheme for people working in local government or working for other employers that participate in the scheme. To isolate contributions by FE institutions, an average asset value per member was estimated based on LGPS' annual report[12] and multiplied with the number of LGPS members in FE institutions as reported.

9. Department for Business, Energy & Industrial Strategy (BEIS) (2022) *National Energy Efficiency Data-Framework (NEED).* Available at: https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework
10. UK Government (2021) *Greenhouse gas reporting conversion factors 2021.*
11. Universities Superannuation Scheme (USS) (2022) *Universities Superannuation Scheme TCFD Report 2022.* Available at: https://www.uss.co.uk/how-we-invest/responsible-investment
12. LGPS (2022) *LGPS Central Annual Reports and Accounts 2021/22.* Available at: https://www.lgpscentral.co.uk/lgps-central-annual-reports-and-accounts-2021-2/

ENDOWMENTS

Financial information relating to the HE sector's endowment figures was retrieved from HESA.

To estimate the absolute carbon emissions from the HE sector's endowments, the average of the percentage asset allocation breakdown of the Universities of Oxford and Cambridge's endowment funds was used.

Each asset class was mapped to the emissions intensity of unique ETFs based on data obtained from MSCI calculations*.

TABLE 3: ASSET BREAKDOWN OF ENDOWMENT FUNDS

Asset	Oxford	Cambridge
Public equity	39.5%	42.0%
Private equity	38%	20.0%
Credit	11%	3.0%
Fixed interest	5%	14%
Real assets/property	5%	10.0%
Cash	2.60%	0.0%
Absolute return	0%	11%

The average emissions intensity of both endowment funds was estimated as 58.6 tCO_2e/£m.

The estimated emissions intensity was then multiplied by the sum of the HE institutions' income and expenditure reserves.

INVESTMENTS

Financial information relating to HE sector's non-current and current assets was retrieved from HESA.

Absolute carbon emissions were calculated using the estimated average emissions intensity calculated in the endowment section above. The estimated emissions intensity was multiplied by the sum of HE institutions' current and non-current assets.

*Data from MSCI calculations has been obtained through YCharts. YCharts can be accessed at: https://ycharts.com/

13. Oxford University Endowment Management (2022) *The Oxford Endowment Fund.* Available at: https://www.ouem.co.uk/the-oxford-endowment-fund/#
14. University of Cambridge (2021) *Report and Financial Statements 2021.* Available at: https://www.cam.ac.uk/system/files/university_of_cambridge_group_annual_reports_financial_statements_2020-21_0.pdf

Benchmarks

The table below summarises the benchmark coefficient factors that were created for the extrapolation of emissions data.

TABLE 4: BENCHMARK COEFFICIENT FACTORS USED IN CALCULATION

Emission Source	Benchmark	Units
Scope 1 and 2	0.051	tCO_2e/m^2
Non-residential	0.055	tCO_2e/m^2
Residential	0.035	tCO_2e/m^2
Scope 1	0.0311	tCO_2e/m^2
Scope 2	0.0199	tCO_2e/m^2
Scope 3: Supply Chain		
Business services	2.08E-05	$tCO_2e/£$
Paper products	1.07E-06	$tCO_2e/£$
Other manufactured products	3.85E-06	$tCO_2e/£$
Manufactured fuels, chemicals, and gases	2.56E-06	$tCO_2e/£$
Food and catering	1.05E-06	$tCO_2e/£$
Construction	1.14E-05	$tCO_2e/£$
Information and communication technologies	1.95E-05	$tCO_2e/£$
Medical and precision instruments	3.24E-05	$tCO_2e/£$
Other procurement	2.52E-06	$tCO_2e/£$
Unclassified	1.82E-06	$tCO_2e/£$
Scope 3: Business Travel	8.87E-06	$tCO_2e/£$
Scope 3: Student Flights	3.63	tCO_2e/student
Scope 3: Fuel- and Energy-Related Activities		
T&D – UK electricity	0.018	tCO_2e/m^2
WTT – UK electricity (generation)	0.0052	tCO_2e/m^2
WTT – UK electricity (T&D)	0.00046	tCO_2e/m^2
WTT – Natural Gas	0.006	tCO_2e/m^2

Assumptions

Given the lack of environmental and operation data coverage in HESA and other publicly available sources, several assumptions have been made in order to measure and report the emissions for the HE and FE sectors.

SCOPE 1 AND 2

- HE: Assumed that institutions follow a similar energy consumption pattern related to using the same energy sources for all their operations.
- FE: Assumed similar operational function as HE institutions (i.e., activity data relating to Scope 1 and 2 data are the same for both sectors) as well as Scope 1 and 2 emissions having a proportional relationship with internal gross area.

Scope 3: Supply Chain

- Both the HE and FE sector are assumed to have the same Scope 3 supply chain emission categories.

Scope 3: Supply Chain Staff and Student Commuting

- Commuting patterns for both the HE and FE sector related to both employee and staff commuting are assumed to be the same.
- Institutions for both the HE and FE sector are assumed to follow the same commuting pattern (for both employee and student) per region. This assumption was applied in order to extrapolate the percentage modal split for the institutions that did not report this information in HESA.

Scope 3: WTT and T&D

- Assumed that more than 80% of WTT and T&D emissions will come from both the HE and FE institutions' grid electricity and natural gas consumption.

Scope 3: Staff and Student Commuting

- Given the lack of commuting data for the FE sector, it was assumed that each FE institution followed the same percentage modal split per region.
- Due to the lack of commuting information in the National Commuting Survey for Scotland, Northern Ireland and Wales, the respective commuting data for the HE and FE institutions (i.e., total trips per year per mode of transport, total distance travelled per mode of transport) have been assumed to be equal to the average for England.

Scope 3: Business Travel

- Business travel activity for FE is assumed to be the same as HE.

Scope 3: Student Flights

The following assumptions regarding non-UK travel activity were taken into consideration:

- All flight distances have been calculated from the student's country of domicile to London Heathrow Airport.
- All students make 2 return journeys per year.
- All students fly economy class.

SCOPE 3: FINANCES

Pensions

- All university superannuation schemes are assumed to have the same portfolio split between corporate and property and sovereign investments as the USS.

Endowments

- For the HE sector it was assumed that all HE endowments followed the asset allocation of the Universities of Oxford and Cambridge's endowment funds.
- The FE sector is assumed to have no endowments and hence no associated emissions.

Investments

- The emissions intensity (tCO_2e/£m) is the same as the estimated average emissions intensity calculated for Endowments.
- The FE sector is assumed to have no investments and hence no associated emissions.

Uncertainties

As part of the analysis a number of extrapolations using coefficient factors were carried out to model activity and emissions data for both HE and FE institutions. This has assumed that the reported HE emissions data follows a normal distribution. As such, the extrapolations that were carried out carry an inherent uncertainty of estimation.

To depict the uncertainty of the final numbers, the 1st and 3rd quartile of each emissions category have been used. The table below outlines the calculated quartiles for all relevant emissions categories.

For the categories of Commuting, Homeworking, and Financed Emissions, it was not possible to provide this data.

TABLE 5: UNCERTAINTY BY EMISSIONS SOURCE

Emission source	Total	Uncertainty	
	($MtCO_2e$)	1st quartile	3rd quartile
Scope 1 and 2	2.1	-13%	+10%
Scope 3: Supply Chain	7.4	-22%	+2%
Scope 3: Construction	0.8	-22%	+2%
Scope 3: Fuel and Energy-Related Activities	0.5	-13%	+10%
Scope 3: Waste and Water	0.02	-41%	+28%
Scope 3: Business Travel	0.6	-33%	+9%
Scope 3: Student Flights	2.2	-1%	+1%
Scope 3: Student Accommodation	3.4	-27%	+25%

Calculating the Carbon Reduction Pathway

The reduction pathway chart was created based on estimates and targets of how various initiatives can contribute to emissions reductions. In addition, this also recognised that sector pathways were used to contribute to reductions. This intends to visualise how far these initiatives and developments can reduce the sector's footprint and does not represent the participants' view of the future nor commitment to undertaking the included initiatives.

TABLE 6: CARBON REDUCTION PATHWAY ASSUMPTIONS

Action Pathway	Reduction initiative	Description
Built Environment	Energy efficiency in buildings	Assumed there is potential for 10% energy efficiency by 2025/26
	Electrification of heating systems	Targeted 50% electrification of heat by 2030/31
	Alternative energy sources for heat	Remaining heat systems assumed transitioned to alternative fuels by 2040
	Grid decarbonisation	Electricity grid decarbonisation based on CCC's 'Balanced Net Zero pathway'
	Sustainable construction	Estimated construction reductions of ~67% by 2040 based on UKGBC roadmap
Sustainable Supply Chain	Green IT	Estimated green IT can deliver 75% reduction by 2030/31
	Professional services NZ engagement	Assumed professional services engagement can deliver 90% reduction by 2030/31
	Food & materials reductions	Other materials and food targeted reduction of 50% of emissions
Travel and Transport	Business travel reduction less than pre-pandemic	Maintain business travel at 33% less than pre-pandemic levels
	Student commute by public transport	Ensure student commute is done via public transport (90%)
	Increased online courses	Deliver increased amount of course content remotely. Targeted 25% by 2030/31.
	Reduce student flights to 1.5 per year	Reduce frequency with which international students return to 1.5 per year
Travel and Transport (societal)	External improvement – Aviation	External developments based on CCC's 'Balanced Net Zero Pathway'
	External improvement – Surfance transport (cars)	External developments based on CCC's 'Balanced Net Zero Pathway'
	External improvement – Surfance transport (public)	External developments based on CCC's 'Balanced Net Zero Pathway'
Other	Increase provider-maintained Halls of Residence	Shift 30% of students from own/private rental accommodation to Halls of Residence
Other (societal)	External improvement – Residential buildings	External developments based on CCC's 'Balanced Net Zero Pathway'

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