1495 UNIVERSITY OF ABERDEEN

Net Zero 2040 Strategy

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Authors

Primary	Roederer Rose Lyne – Net Zero & Emissions Manager
Contributors	Net Zero Strategies and Targets Working Group: • **Chair:** Tavis Potts - Dean for Environmental Sustainability • **Deputy Chair:** Fraser Lovie – Head of Sustainability • Alex Stuart – Sustainable Development Officer • Astley Hastings – Personal Chair – Biological Sciences • Brian Henderson – Director of Digital & Information Services • Chris Osbeck – Facilities Manager – Transport & Waste • Clare Bond – Personal Chair - Geology and Geophysics • Helane Gannicliffe – Head of Procurement • Josefine Bjorkvist – Early Years Researcher • Mark White – Chief Financial Officer • Richard Law – Solution Architect - DIS • Tristan Wolfe – Energy Manager

Version History

Version	Date	Authors	Reviewers	Notes
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Version 1	28/08/2024	Roederer Rose Lyne – Net Zero & Emissions Manager & Net Zero Working Group	Sustainable Development Committee	
Version 1.1	17/09/2024	Roederer Rose Lyne – Net Zero & Emissions Manager	Fraser Lovie – Head of Sustainability Karl Leydecker - Senior Vice-Principal	Updates to reflect changes to NZ boundaries, the inclusion of a foreword, and minor content feedback.
Version 1.2	05/11/2024	Roederer Rose Lyne – Net Zero & Emissions Manager	Karl Leydecker - Senior Vice-Principal Fraser Lovie – Head of Sustainability	Updates to reflect feedback from SMT & FRC
Version 1.3	05/12/2024	Roederer Rose Lyne – Net Zero & Emissions Manager	Karl Leydecker - Senior Vice-Principal Fraser Lovie – Head of Sustainability	Minor updates and new graphics

Executive Summary

Amidst the escalating climate and nature emergencies facing the globe, this Net Zero Strategy is the University of Aberdeen's first comprehensive effort to capture the breadth and depth of action likely to be required to deliver on its own Net-Zero commitments and to contribute to national climate change targets.

There is now little doubt that human activities have greatly increased the concentrations of greenhouse gases (GHGs) in the atmosphere, resulting in rising global temperatures, severe flooding, extensive biodiversity and nature losses, and increasingly extreme weather patterns.

Greenhouse gas emissions are generated from every aspect of modern life. Whether it is the energy used to heat and light our buildings, the fuel used to support global travel and trade, or the emissions embodied in the production and procurement of the goods and services we rely on, climate damaging emissions are generated in most activities.

The Greenhouse Gas Protocol has set the following definitions for each of the three emissions reporting scopes which have been adopted globally as standard reporting practice:

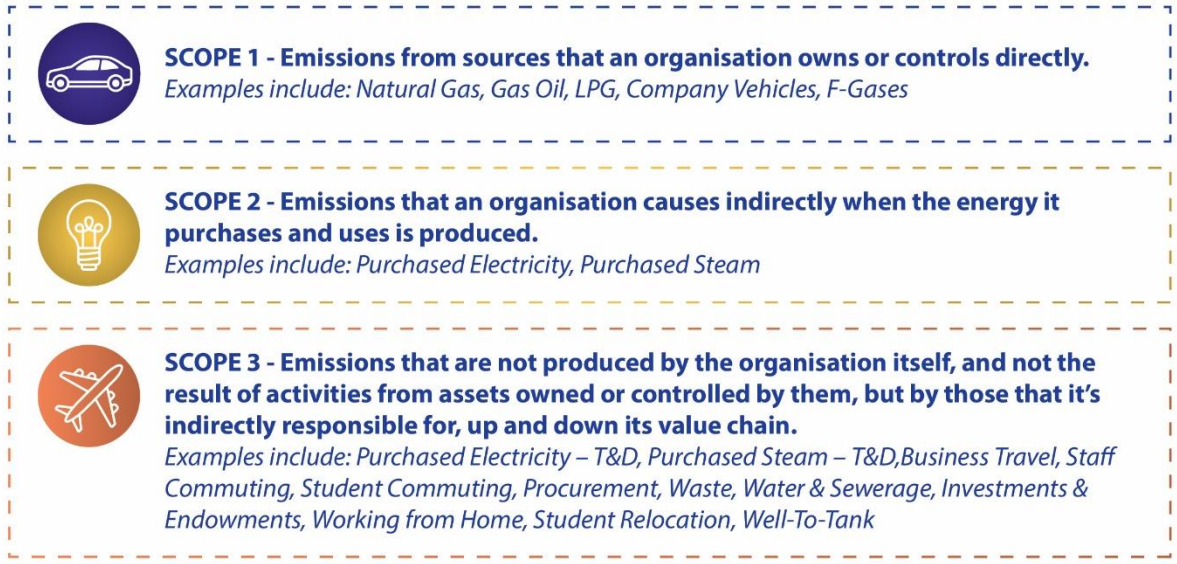

Figure i: Reporting Scope Definitions

As a consequence, significant and widespread changes in how our society lives and works are needed to mitigate the unfolding climate disaster. A fundamental rethinking of established norms is necessary if we are to have any prospect of complying with the aims of the Paris Climate Agreement of 2015 that the world needs to limit projected global temperature increases to well below 2°C (and ideally below 1.5°C). In 2023, the planet breached the globally significant 1.5°C threshold for the first time according to the EU's Copernicus Climate Change Service.

With the effects of climate change becoming increasingly impactful, Scotland has sought to establish itself as a leader in tackling these issues head on. In 2009, through the Climate Change (Scotland) Act, it became one of the first countries to pass into legislation targets for

the reduction of emissions and to set a Net Zero target of 2045, and in 2019 was in the vanguard of nations declaring a global climate emergency. Despite the decision in 2024 to abandon interim 2030 targets, the national ambition for emissions reduction by 2040 remains. Public bodies in Scotland, including universities, have been required to report on their progress in managing and reducing emissions under the Public Bodies Climate Change Duty (PBCCD) since 2016.

These commitments provide the national framework within which we as a University are required to develop our own Net Zero strategy, articulating how we will reduce our emissions as far as possible before tackling any remaining emissions through offsetting or other sequestration activities.

In developing our Aberdeen 2040 strategy in 2019/2020, we took the opportunity to establish sustainability as one of four core themes and to make a high-level commitment to Net Zero, aiming to become Net Zero before 2040. This strategy expands on that high-level commitment and articulates and anticipates the targets, pathways, and other changes likely to be necessary to make that commitment a reality.

Our strategy envisages the absolute elimination of Scope 1 & Scope 2 emissions before 2040. In recognition of the complexities of tackling Scope 3 emissions, we have established a target consistent with the Science Based Target framework's definition of Net Zero that envisages a reduction of 55% by 2040, with a longer-term target of 90% by 2050. All targets are assessed against our 2015/2016 PBCCD baseline. This differential approach acknowledges that the discussion around how best to track, manage and reduce Scope 3 emissions is still evolving.

Figure ii: Scope-by-Scope Emissions Reductions Targets

While it is acknowledged that the journey to Net Zero is unlikely to track a linear reduction model, annual guideline reductions for each scope have also been established, in addition to 5-year targets:

Target	Scope 1	Scope 2	Scope 3
Annual	6.25%	6.25%	3.44%
5-year	31%	31%	17%
10-year	62.5%	62.5%	34%
15-year	94%	94%	52%

Table i: Interim Emissions Reduction Targets by Scope

This strategy has been developed with a whole University approach at its core. This approach requires institutions to recognise that sustainability, and Net Zero in particular, need to be seen as the responsibility of the entire community – with every student, staff member, academic School, and Professional Services Directorate having a crucial role to play in reducing emissions.

A critical part of this strategy has been the development of decarbonisation pathways (see Section 6.2) which reflect on the actions necessary to reduce or eliminate emissions associated with eleven key emissions themes.

The pathways themselves have been developed and aligned with the UN's Sustainable Development Goals (SDGs) and will assist the University in recognising the breadth of activity required to support delivery of Net Zero.

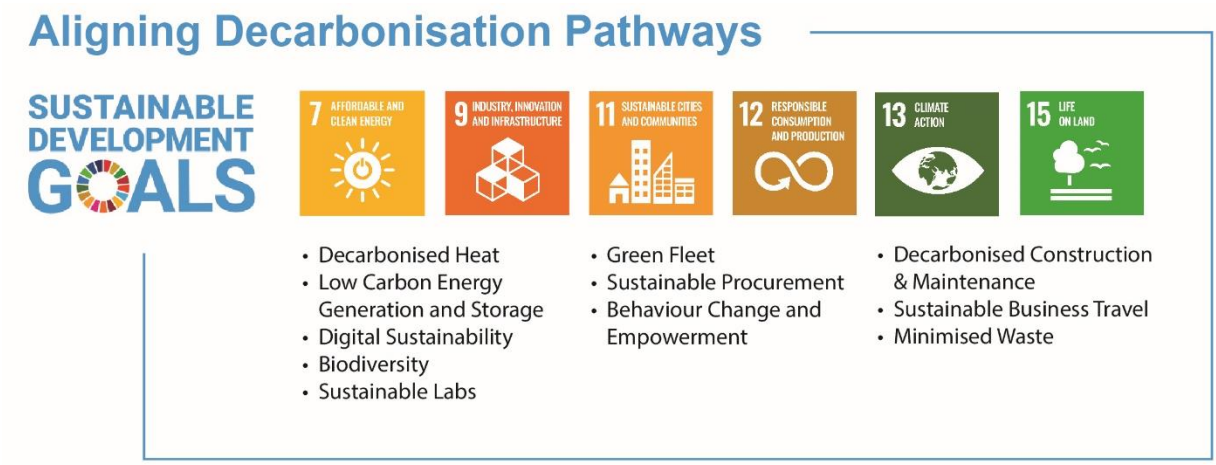

Figure iii: Aligning Decarbonisation Pathways with the SDGs

Achieving Net Zero will require significant investment in both staff and the University's estate. Utilising the sector's "Cost of Net Zero" calculation tool suggests that headline direct investment costs for the University could be in excess of £100 million.

With sector finances under significant strain, alternative funding models will have to be explored and funding identified from a variety of sources, including from Scottish- and UK-backed green loans and grants, as well as investigating opportunities for long-term private investment and partnerships to facilitate energy decarbonisation and to work with us to implement the infrastructure changes required to achieve Net Zero.

The intention is that this strategy will be reviewed annually, with targets and pathways adjusted to reflect the dynamic nature of Net Zero.

Particular attention will be paid to the rapidly evolving discussions around Scope 3 emissions. While Scope 1 and 2 emissions are more predictable and the methodologies for dealing with them better established, the management and treatment of Scope 3 emissions is subject to rapid and ongoing re-evaluation. Future iterations of this document will aim to keep track of and reflect those changes.

Foreword

Since 1495, the University of Aberdeen has been open to all and dedicated to the pursuit of truth in the service of others.

We still aspire to serve that original purpose. It defines our actions and underpins our ethos. We achieve our purpose through excellence in our core activities of education and research, which transform the world around us. Our commitment to Net Zero now forms part of that purpose. Our Aberdeen 2040 strategy established a high-level commitment to be Net Zero before 2040. This strategy articulates, for the first time, the anticipated scale of that task, the types of actions necessary, and the changes we will necessarily see in all aspects of University life.

As a public body in Scotland, we have a statutory duty to take a lead role in the national response to the global climate and nature emergencies. Alongside the contribution we make as a centre for world-class research and education, we recognise that the University's operations must also play a part in the national Net Zero journey, reducing and eliminating, wherever we can, the greenhouse gas emissions associated with how we operate.

This strategy outlines a series of decarbonisation pathways that will mean profound changes in how we conduct all aspects of our operations. Every member of our community, staff or student, has a part to play in that. Embracing and addressing the sustainability challenges we face cannot be optional; it must be at the heart of everything we do, it must inform every decision we take, and it will become integral to every individual's role.

The Net Zero Strategy itself is but a first step on a long and complex journey. We do not yet have all the answers. We may not even have all the questions. But the strategy provides us with a comprehensive baseline from which to start the process and to guide our actions. It will continue to evolve as our understanding of the issues improves and as our efforts to deliver change mature. We do not underestimate the scale of this challenge. The sheer scale of strategic investment required alone demands that innovative and creative solutions are explored and robustly scrutinised.

We will take this endeavour forward openly and transparently. Through our statutory duty to report as a public body, to our own commitment to reporting and sharing emissions data publicly, we will ensure we communicate our progress on the journey with stakeholders and public alike.

This strategy has been supported and endorsed by the University Court of the University of Aberdeen and we welcome the opportunity to share it with you.

George Boyne ***Julie Ashworth***

Principal & Vice-Chancellor ***Senior Governor***

Development Methodology

An initial outline framework Net Zero Strategy was drafted in 2022/2023, indicating that the purpose of the final document would be to move beyond the high-level pledge contained in Aberdeen 2040, by providing detail around targets, pathways, and the actions necessary to enable the University to achieve the commitment set out in Aberdeen 2040 i.e., to achieve Net Zero before 2040.

The initial draft was issued to the Sustainable Development Committee (SDC) for review, and endorsement was given for further work to be undertaken to develop the strategy. As part of this, SDC approved the establishment of a Working Group with representatives from various academic and professional service areas to support this.

Through the Net Zero Strategies and Targets Working Group, the initial draft document has evolved to include decarbonisation pathways, targets, and reflections on the journey to Net Zero, with the document aiming to provide a clear and comprehensive strategy for the institution.

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1. Introduction

In February 2020, the University launched its Aberdeen 2040 strategy. This high-level framework outlined 20 headline commitments around the themes of Inclusive, Interdisciplinary, International and Sustainable for the University to pursue over the next 20 years.

Among those 20 commitments, four relate directly to environmental sustainability and frame the University's sustainability ambition for the period to 2040:

- Encourage everyone within our community to work and live sustainably, recognising the importance of our time, energy and resilience.
- Educate all our students and staff to be leaders in protecting the environment.
- Excel in research that addresses the climate emergency, enables energy transition and the preservation of biodiversity.
- Achieve net zero carbon emissions before 2040.

Notably, Net Zero is at the heart of the Aberdeen 2040 strategy, setting a target of achieving Net Zero emissions before 2040. While Aberdeen 2040 did not detail how this would be done, there was recognition that it would require significant changes in how the University operates.

Throughout this document our greenhouse gas emissions are articulated in terms of carbon dioxide equivalent emissions i.e., CO_2e and quantified in tonnes or kilogrammes i.e. tCO_2e or $kgCO_2e$.

In simple terms, Net Zero means achieving a balance between the carbon dioxide we emit as part of our operations, and that which we eventually must remove from the atmosphere after making every effort to reduce emissions to the lowest level possible.

Achieving this is a significant undertaking, both financially and operationally. A whole institution approach, with strong leadership being supported with input, collaboration, and adaptation from all Schools and Directorates at the University is necessary. Our energy use, procurement, waste and travel practices will all have to change to become more conscious of the emissions impact of these activities, while the consequences of operating in a rapidly changing and increasingly globalised and highly competitive Higher Education sector will also need to be reflected.

Since 2016, the University has made significant progress in reducing its greenhouse gas emissions. This has seen positive improvements achieved as a result of energy saving projects, engagement and behavioural programmes, changes in how we operate our buildings, and improvements in areas such as how we dispose of waste and manage the travel we undertake.

This Net Zero Strategy provides the following:

- Reflections on the successes and challenges of previous emissions reduction efforts to ensure lessons learned are captured and best practice is brought forward.
- Updated emissions reporting and Net Zero boundaries to reflect current best practice.

- An updated emissions baseline to reflect Net Zero boundary.
- A series of strategies and targets which will guide the University's journey to Net Zero.

The journey to Net Zero will be an adaptive process where we learn and implement changes. As such, this strategy and the associated targets will be regularly reviewed to ensure it stays in line with best practice and remains on track to meet the University's ambitions.

2. The Climate Emergency and Net Zero

Since the start of the Industrial Revolution in the mid-18th century, human activities have greatly increased the concentrations of greenhouse gases (GHGs) in the atmosphere. Due to these activities, measured atmospheric concentrations of CO_2 are significantly higher than pre-industrial levels.

The scientific consensus is clear that actions carried out by humans, notably the extraction and burning of fossil fuels, are responsible for the current Climate Emergency. [1] This anthropogenic release of CO_2 into the atmosphere, in addition to other GHGs such as methane, contributes to the current exaggerated warming of the planet via the so-called 'enhanced greenhouse effect'.

In 2022 the IPCC noted that 'global net anthropogenic GHG emissions were 59±6.6 $GtCO_2e$ in 2019, about 12% (6.5 $GtCO_2e$) higher than in 2010 and 54% (21 $GtCO_2e$) higher than in 1990 [1]. While the rate of growth slowed in the past decade, it has continued to rise overall. The IPCC notes that emissions trajectories would make it likely that warming will exceed 1.5°C during the 21st century and limiting warming to below 2°C would rely on a rapid acceleration of mitigation efforts after 2030. 2023 saw the first sustained breaching of the 1.5°C threshold according to the EU's Copernicus Climate Change Service.

In an institutional context the term Net Zero means achieving a balance between the carbon we emit into the atmosphere, and the carbon we remove from it. This balance – or Net Zero – will happen only when the amount of carbon we add to the atmosphere is no more than the amount removed, with every effort made to reduce emissions at source.

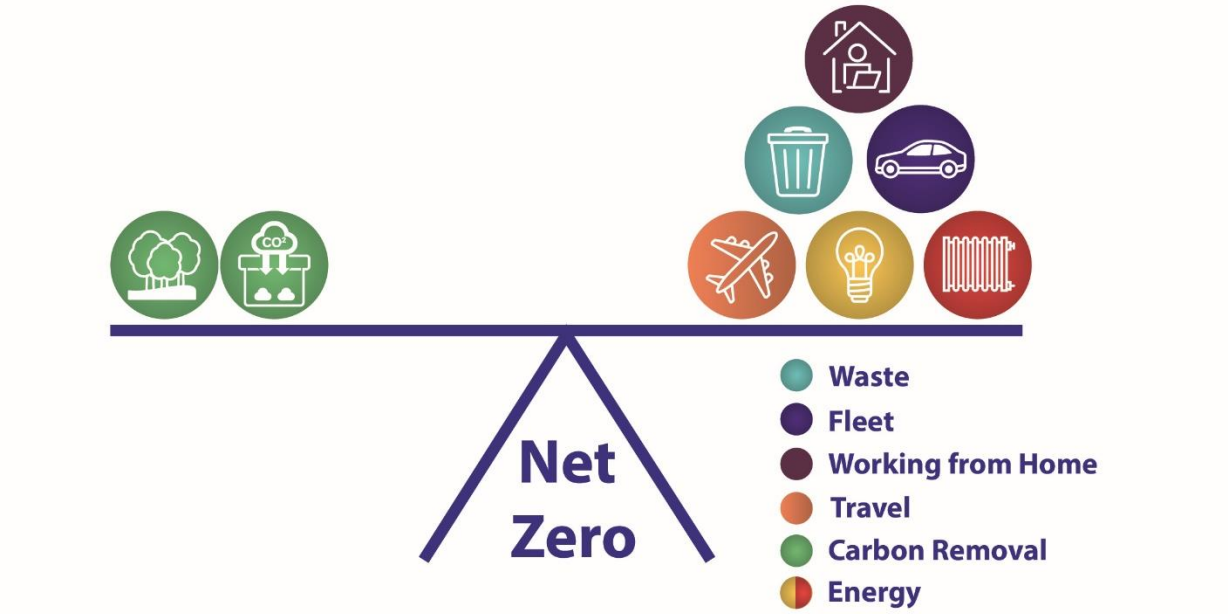


Figure 2-1: Net Zero Balance

It is important to note that the concept of Net Zero differs from that of "absolute zero". Absolute zero refers to the effective elimination of emissions, resulting in no discernible emissions being generated and no use of carbon offsets.

3. The University's Carbon Journey to Date

The University of Aberdeen has long had a focus on sustainability in its research and operations. This strategy forms a continuation of previous work undertaken to reduce the impact of operations, drawing on previous activities and building on current reporting requirements and the expectation that public bodies will take a lead in the national decarbonisation journey.

3.1. Historic Carbon Reduction Efforts

The University has completed two 5-year Carbon Management Plans (CMPs). These had the ambition of reducing the volume of emissions produced from a basket of operational activities defined in line with best practice at the time of their development. The most recently completed CMP was the 2016/2021 plan which had a target reduction of 20% from a 2015/2016 emissions baseline.

The Greenhouse Gas Protocol has set the following definitions for each of the three emissions reporting scopes which have been adopted globally as standard reporting practice:

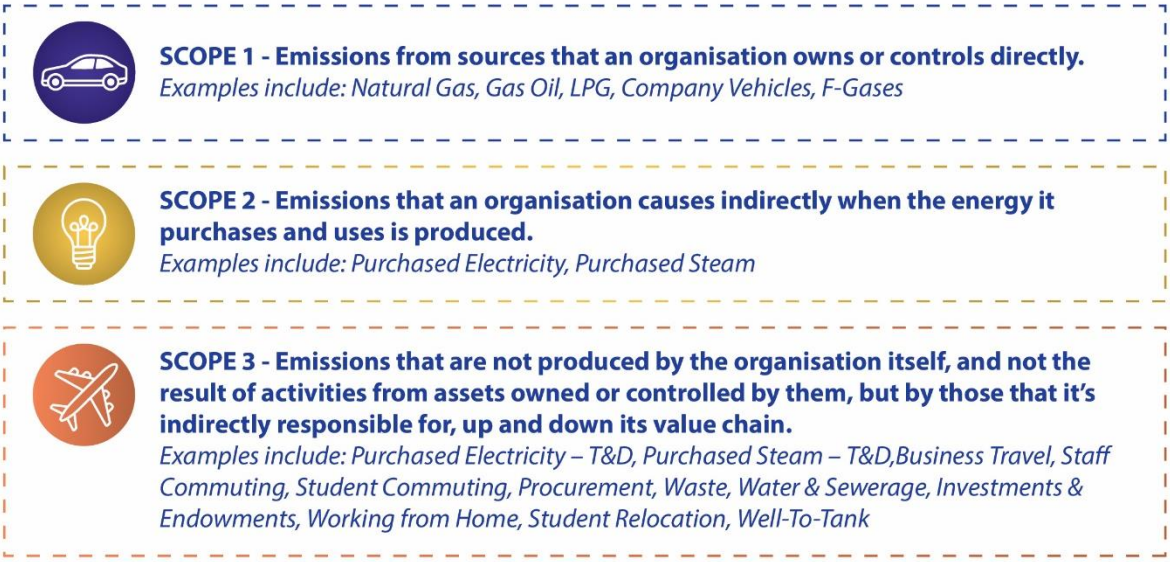


Figure 3-1: Reporting Scope Definitions

The reporting scope boundaries for the 2016/2021 CMP covered the three types (or Scopes) of emissions. Scope 1 and 2 emissions categories are well understood and have remained consistent over time. These include the direct and indirect energy we use to heat and light our campuses. However, the range of categories of so-called Scope 3 (or indirect) emissions that we included in our reporting during this period was limited by the availability of robust data, though it still reflected sector best practice. At that time our reporting boundaries looked like this:

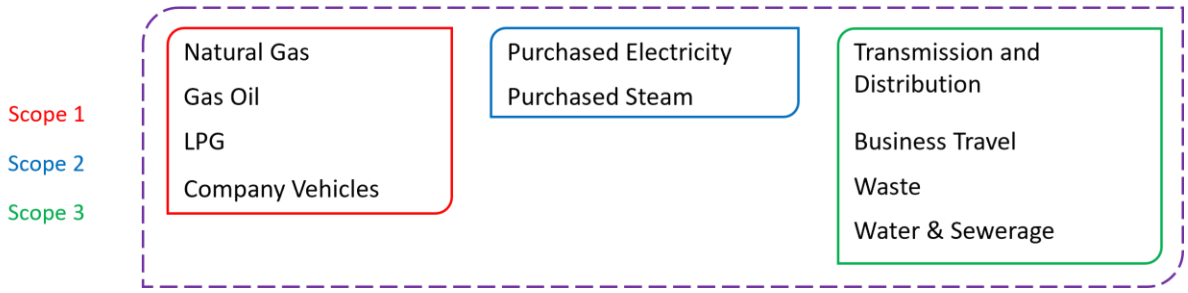


Figure 3-2: 2016/2021 Carbon Management Plan Emissions Boundaries

The need for a more complete picture of Scope 3 emissions means that the above reporting boundaries are no longer considered best practice as they exclude significant indirect emissions sources such as procurement, staff and student daily commuting, working-from-home, and student relocation travel. This is covered in Section 4.

During and following the development of the 2016/2021 CMP, a register of over 160 potential emissions reduction projects was established. This was developed to provide an indicative list of initiatives to pursue and was assessed using a consistent emissions savings calculation and reporting methodology that allowed for the prioritisation of projects in line with funding allocation.

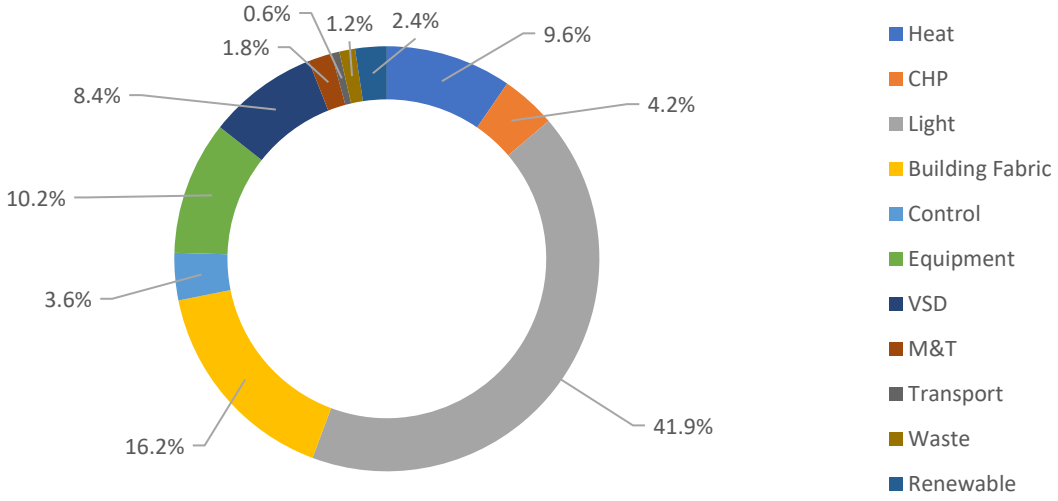


Figure 3-3: 2016/2021 Carbon Management Plan Projects

Each year, progress towards the 5-year target of a 20% reduction was measured and reported; with a list of completed projects maintained.

By the end of the 2016/2021 CMP, the University's carbon emissions had been reduced by 46% (i.e., by 14,500 tCO_2e). Scopes 1, 2 and 3 had reduced by 23%, 52% and 85% respectively, despite increases in the University's owned/occupied floor area. Through the implementation of behavioural campaigns, monitoring and targeting (M&T) regimes, and the completion of 108 projects, the University met the 20% target by 2017/2018.

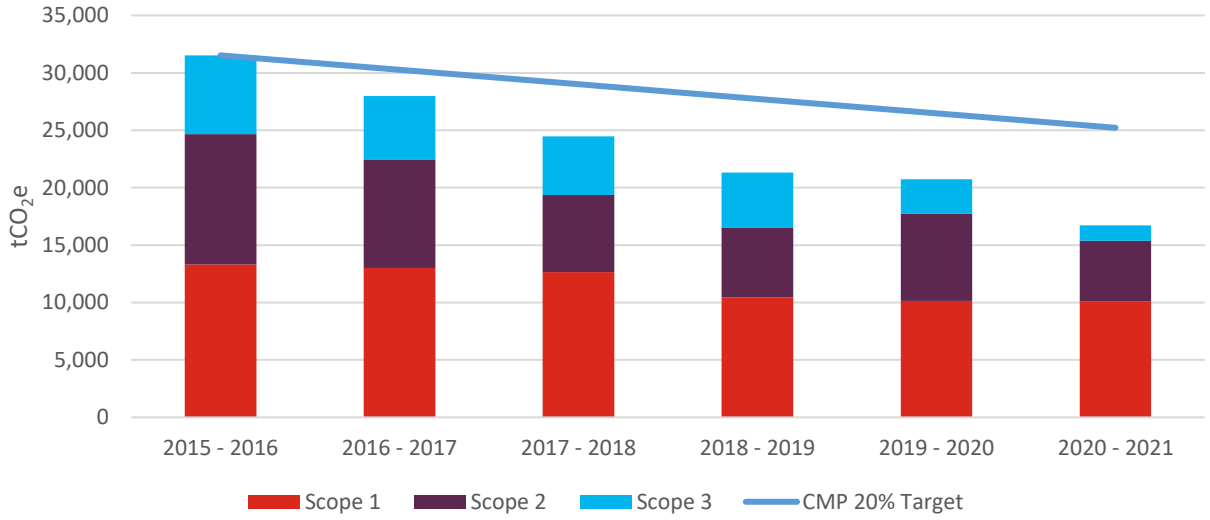


Figure 3-4: Progress Towards 2016/2021 Carbon Management Plan Target

It should be noted that not all of this was down to the University's actions, with a number of external factors contributing to substantial reductions in the University's carbon footprint. These included:

- The grid electricity conversion factor dropped significantly over this period. As a result, around 3,375 tCO_2e of the 5,225 tCO_2e grid electricity emissions reduction can be linked to the decarbonisation of electricity generation.
- A correction in the reporting methodology for emissions from purchased steam was necessary, with kg being reported instead of kWh. This resulted in a reduction in steam emissions of c.30%.
- COVID-19 also meant that the University moved to remote teaching/working for the bulk of 2020 and 2021, which resulted in building energy demands reducing.
- COVID-19 also skewed business travel data, notably during the two years in which travel restrictions limited scope for domestic or international travel.

Following the completion of the 2016/2021 CMP, the University continued its carbon reduction efforts, with further reductions in energy and business travel related emissions.

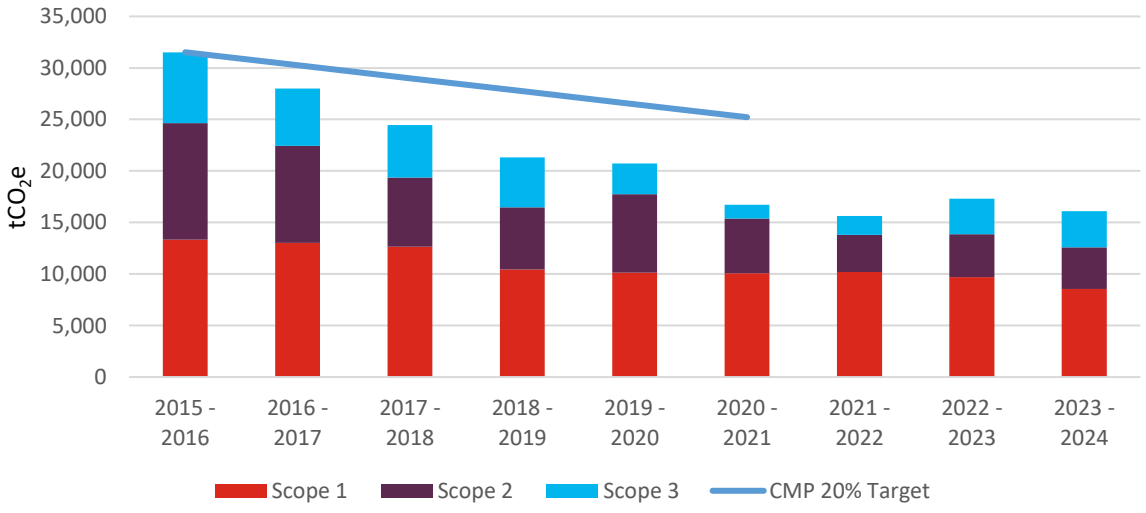


Figure 3-5: Progress Following 2016/2021 CMP

3.1.1. Lessons Learned

Following the completion of the 2016/2021 CMP, a number of lessons learned can be drawn and used to inform the development and operation of the Net Zero Strategy:

- The Project Register, categorising projects by cost, emissions impact, and complexity, was a vital tool for tracking potential projects and to inform the allocation of available funding.
- Providing some funding for staff-identified projects had good engagement and resulted in a number of projects being funded and producing savings.
- An overall lack of funding limited progress. The Project Register identified over £7.3M worth of potential projects. A total of c.£1.75M funding was provided over the course of the CMP.
- The consistency of funding was limited, and confirmation of annual funding levels was typically only confirmed after the start of the academic year, limiting the ability to plan and fund projects with longer time scales.
- Financial savings from energy use reductions were not recycled into the available project funding pot (as happens at some institutions). This limited the ability to fund and implement larger projects with greater impact potential. An internal 'recycling fund' could help to ensure the longevity and stability of funding.[1]
- The identification of projects was largely through internal expertise with limited input from external partners who could potentially have identified (and undertaken) additional projects and/or developed new funding sources.
- Staff resourcing levels and capacity issues limited the delivery of more technically complex projects.

3.1.2. Practices to be Brought Forward

Many of the procedures adopted and implemented as part of the 2016/2021 CMP were found to be successful and as such will be utilised in the delivery of the Net Zero Strategy. These include:

- Maintaining a live project register for all Net Zero related projects.
- Ensuring a consistent prioritisation and evaluation framework is applied to every project.
- Undertaking an annual project identification exercise which involves various departments/teams from across the University.
- Annually reviewing the existing list of projects to ensure it remains consistent as other institutional strategies evolve.
- Annual reporting of progress to include analysis of the following factors:
    - Changes to emission factors.
    - Changes to owned/operated floor area.
    - Changes to student and staff numbers.
    - Analysis of correlation levels between external temperatures and building heat consumption (i.e., degree day analysis).

[1] Similar to what is currently offered by SALIX: https://www.salixfinance.co.uk/recycling-fund/scotland-recycling-fund

Based on the lessons learned detailed at Section 3.1, the following practices are likely to enhance the ability to deliver Net Zero by mitigating some of the challenges observed in implementing the 2016/2021 CMP:

- Identification of external funding to supplement internal funding, including partnerships with external organisations.
- Post-project analysis and review to provide a robust basis for future funding applications.
- Development of appropriate training for operations staff on Net Zero and how they can help deliver it.
- Recruitment of additional Sustainability and/or Projects staff to support delivery of the expected volume of annual projects.
- Bringing in consultants to assist with specialist or non-typical projects.
- Consideration of a strategic delivery partner to assist in the long-term delivery of complex Net Zero projects.
- Setting up a Net Zero Delivery Programme Board.
- Ensuring there is continuous buy-in from committees/senior management to keep Net Zero strategy at the centre of our University strategy.
- Establishment of a 're-investment fund' to reinvest financial savings made from efficiencies projects into fresh projects should be considered.
- Development of a robust methodology for the prioritisation of identified projects.
- Integration of Net Zero projects as part of the main project programme across Estates & Facilities.

3.2. Public Bodies Climate Change Reporting Framework

The Climate Change (Scotland) Act 2009 introduced targets and legislation to reduce Scotland's emissions by at least 80% by 2050. The Act placed certain duties on public bodies, as "major players", relating to climate change.

In 2015, the Scottish Government introduced an Order requiring all 150 Public Bodies to submit an annual report to Sustainable Scotland Network (SSN). These reports detail compliance with the climate change duties and oblige all Scottish colleges and universities to report to the Scottish Government through the Public Bodies Climate Change Duties (PBCCD) framework annually.

PBCCD reporting was designed to achieve the following:

- Improve the quality of climate change data.
- Standardise reporting methodology across the public sector.
- Encourage transparency.
- Guide future Scottish Government strategic reporting, support, and policymaking.
- Improve engagement with leadership.

Reporting was initially voluntary before the Government made it compulsory in 2015 for all public bodies. The PBCCD framework formalised and standardised a series of sector-specific arrangements that had seen universities, colleges and local authorities independently agree climate change commitments and the introduction of voluntary carbon reduction plans and reporting. [2]

In 2020, the Climate Change (Duties of Public Bodies: Reporting Requirements) Amendment Order enhanced the standard of reporting by requiring that, by November 2022, public bodies were required to provide the following in their statutory annual climate change reports [3]:

- Where applicable, the body's target date for achieving zero direct emissions of greenhouse gases, or such other targets that demonstrate how the body is contributing to Scotland achieving its emissions reduction targets.
- Where applicable, targets for reducing indirect emissions of greenhouse gases.
- How the body will align its spending plans and use of resources to contribute to reducing emissions and delivering its emissions reduction targets.
- How the body will publish, or otherwise make available, its progress to achieving its emissions reduction targets.
- Where applicable, what contribution the body has made to helping deliver Scotland's Climate Change Adaptation Programme.

The University has reported under the PBCCD framework every year since its introduction and has engaged proactively as the framework has evolved, including contributing to the development of best practice reporting methodologies e.g., through the initial development of the sector's first standardised methodology and tool for the calculation of student relocation travel emissions.

4. Net Zero Baseline

To provide a consistent reporting baseline for our Net Zero journey, the University's operations from 2015/2016 have been selected. This was the baseline year for our 2016-2021 Carbon Management Plan and has served as the basis for all our reporting under the Public Bodies Climate Change Duty.

Taking into account the most recent guidance for public bodies and reflecting the most recent interpretation of which categories of Scope 3 emissions should be deemed within the scope of the Net Zero strategies of those bodies, we have established our initial reporting and responsibility boundaries (detailed below) and applied these to our 2015/2016 baseline year. The resultant emissions baseline for this strategy is therefore:

32,949 tCO_2e

This differs from our overall carbon footprint, which includes ALL categories of Scope 3 emissions, including those over which we have limited direct control. This section aims to clarify what is and is not including within our Net Zero baseline.

4.1. Emissions Boundaries

Since the introduction of our 2016/2021 Carbon Management Plan, there has been a concerted effort across the public sector to understand the full range of emissions for which public bodies have some degree of direct or indirect control. Best practice guidance has evolved substantially, and several new emissions sources have been identified. As measurement and tracking methodologies for these new sources have evolved, guidance has been adjusted to mandate their inclusion in the reporting produced by public bodies.

This has resulted in F-gases being added to Scope 1 and the following new emissions categories being included under Scope 3:

- Procurement/supply chain
- Working from home/hybrid working
- Hotel accommodation
- Staff and student commuting
- Student relocation
- Well-to-tank

The inclusion of these emissions, applied retroactively where possible, increase the notional 2015/2016 baseline from 31,520 tCO_2e to 99,607 tCO_2e. This reflects the inclusion of significant categories of emissions, notably procurement and student relocation.

However, there is a distinction between the emission sources that the University must monitor, report and seek to influence, and those that the University has a mandated responsibility to include as a formal part of its Net Zero commitment.

As highlighted in Figure 4-1, all Scope 1 & 2 emissions are included in the Net Zero commitment boundary as are five categories of Scope 3 emissions. This reflects our interpretation of current public bodies guidance, with the remaining Scope 3 emissions

sources deemed beyond the immediate focus of this strategy and more appropriately the responsibility of individuals or organisations outside the Institution.

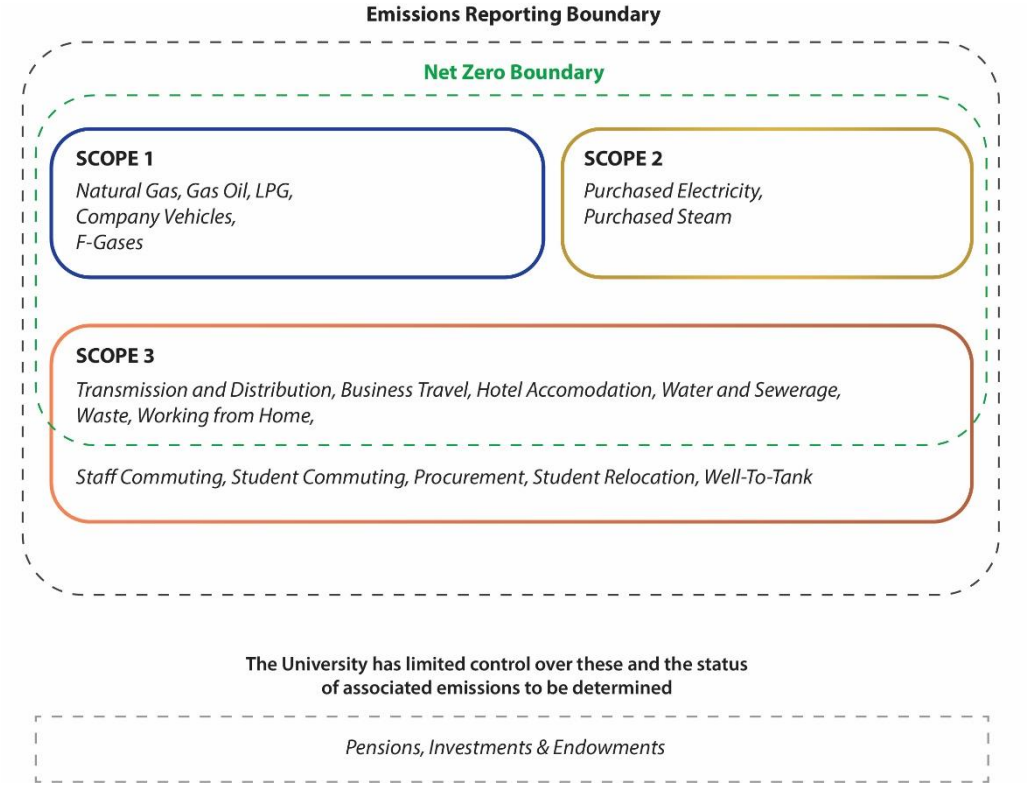


Figure 4-1: Emissions Reporting and Net Zero Boundaries

The remaining Scope 3 sources currently excluded from the Net Zero boundary will still be actively monitored and annually reported. We are also expected to make every effort to positively influence these sources, targeting reductions where we can influence them e.g., through behaviour change programmes, changes to policy and procedures, and through the selection of more climate friendly options, such as amending procurement choices.

Should future governmental or sector guidance change to require the inclusion of any of these sources, the Net Zero baseline will be updated to reflect this.

4.2. Analysis of Baseline Year

Adopting the current guidance on emissions sources, the reporting baseline for emissions deemed to be within the remit of our Net Zero commitment, and calculated using 2015/2016 data, is 31,533 tCO_2e. This figure is explained in more detail below.

4.2.1. Scope Summaries

The emissions split by Scope is detailed below in Table 4-1. Scope 1 accounts for 40.5% of the emissions baseline, Scope 2 for 34.4%, and Scope 3 for 25.1%.

Scope	Total tCO_2e
1	13,345.25
2	11,318.85
3	8,284.84

Table 4-1: 2015/2016 Baseline Analysis - Scope Split

Figure 4-2: 2015/2016 Baseline Analysis - Scope Split

As the University operates a gas-fired electricity generating source (i.e., the Combined Heat and Power (CHP) engine) as well as two large gas-fired heat centres that provide the majority of heat for the Old Aberdeen and Hillhead sites, Scope 1 emissions were the largest source in our baseline year.

As an institution with a significant campus footprint, including office space, teaching accommodation and research facilities, the electricity demand of the estate contributes significantly to the Scope 2 emissions total. As well as purchased electricity, this category also includes steam consumption (for heat) purchased from the NHS and consumed exclusively at the Foresterhill medical campus. As at our baseline year, Scope 2 emissions were the second largest source of emissions.

Finally, while covering a range of emissions categories (see Figure 4-2 above) Scope 3 emissions accounted for the smallest proportion of the Net Zero baseline. Note that in 2015/2016 we did not track data on working from home and as such these emissions do not appear in our reporting until later.

4.2.2. High Level Emission Source Summary

Underneath these headline figures, the University tracks data against over 50 separate emissions sources, aggregating these for ease of reporting and presentation. Understanding how each of these sources contribute to the overall total helps to provide context for target setting, policy development, allocation of funding, and the implementation of projects.

At a category level, our emissions are reported under the following headings:

Emission Source	Total tCO_2e
Scope 1 – Fleet Fuels	43.99
Scope 1 – Natural Gas	13,050.68
Scope 1 – Fuels	237.62
Scope 1 – F-Gases	12.95
Scope 2 – Grid Electricity	8,373.48
Scope 2 – Steam	2,945.37
Scope 3 – Transmission & Distribution	757.38
Scope 3 – Water	154.11
Scope 3 – Business Travel	5,703.58
Scope 3 - Hotel Stays	1,415.83

Scope 3 – Waste	253.95
Scope 3 – Working from Home	0[2]
Total	**32,948.94**

Table 4-2: 2015/2016 Baseline Analysis - High Level Emission Source Summary

4.2.2.1. Direct Energy Use

The University operates a natural gas fired Combined Heat and Power (CHP) engine that generates around 60% of the electricity and meets around 30% of the heat demand on the Kings College Campus[3]. Gas boilers make up the balance of the heat demand in Old Aberdeen, while natural gas fired boilers heat our Hillhead Student Village. Our Scope 1 emissions are largely from these operations.

4.2.2.2. Indirect Energy Use

Grid electricity consumption is the largest component of Scope 2 emissions, with the emissions reporting impact of this source heavily influenced by the level of renewable energy generation in the grid. This causal link has seen the emissions associated with electricity use reduce substantially from our baseline year and at a rate that outstrips any reduction in consumption, reflecting the significant decarbonisation of the grid in recent years (particularly in Scotland). We can and have impacted this number by, for example, improving energy efficiency, installing onsite renewables, and effective monitoring and targeting.

Steam is consumed exclusively at the Foresterhill campus and is supplied to us by the NHS through a CHP supplied district heating scheme. While the University has limited control over how the NHS-supplied steam is generated, the NHS's Net Zero ambitions align with the University's targets, and we will work collaboratively with the NHS to explore a shared approach to achieving Net Zero at Foresterhill.

4.2.2.3. Business Travel

As an institution with global influence and relationships, business travel is a core part of the University's operations. These emissions are incurred as part of the travel undertaken on University business and are predominantly a result of air travel (which routinely accounts for over 85% of these emissions).

4.2.2.1. Hotel Accommodation

Similarly to business travel, the impact of staff and students travelling to and temporary residing in different cities and countries for research, recruitment, and collaboration activities has a significant impact on the University's emissions profile. The scale of the impact varies depending on the country and its typical energy consumption and infrastructure.

[2] Working from homes not monitored or calculated before the COVID-19 pandemic

[3] Also known as the "Old Aberdeen Campus"

4.2.2.2. Transmission and Distribution

A technical category of emissions that are calculated to represent the emissions from energy loss that occur during the passage of grid electricity and purchased steam from a generator to the end user. These transmission and distribution (T&D) emissions are deemed Scope 3. Efforts made to reduce electricity and steam consumption will have a positive impact on this emissions source.

4.2.2.1. Home Working

Working from sector, or hybrid working practices were not routinely tracked by the University during the 2015/2016 baseline year and as such we have not data for that year. Indeed, these emissions were nor incorporated into the PBCCD reporting exercise until 2020/2021 i.e., as a direct result of the COVID-19 pandemic and associated lockdown. Post COVID-19, the University has embraced hybrid working practices for its staff and the associated emissions are now routinely captured as part of our annual emissions monitoring and reporting.

As an integral part of the day-to-day conduct of our business, and with a robust methodology in place for their calculation, these emissions are deemed to be within the remit of our Net Zero commitment.

4.2.2.2. Other Sources

The following emissions sources are considered de minimis (< 2%) but are still tracked and reported in the University's emissions profile:

- F-gases
- Fuel use (fleet vehicles/equipment)
- Non-natural gas heating fuel use
- Water and sewerage
- Waste disposal

A detailed breakdown of all emissions per source can be found in **Appendix A**.

4.2.1. Excluded Emissions Source Summary

As indicated above, current reporting guidance provides us with a framework for deciding which emissions should and should not be included in the University's Net Zero boundary.

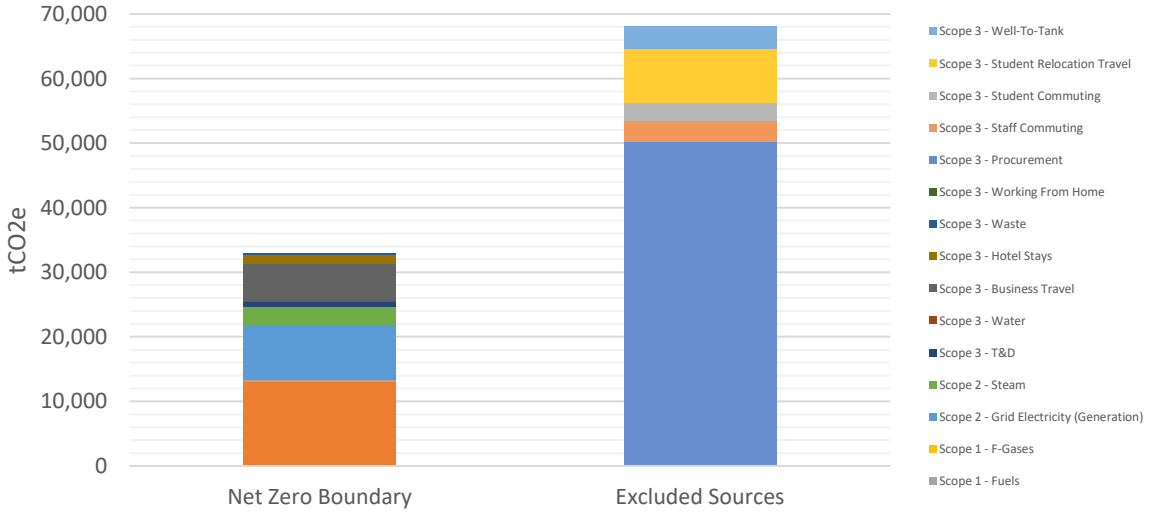


Figure 4-3: Volume of Emissions in Net Zero Boundary vs Excluded Emissions

The table below illustrates the scale and extent of Scope 3 emissions categories not currently required to be included within that boundary but which we are still required to track, monitor, report and seek to positively influence as part of our "whole institution" approach to sustainability.

The paragraphs below provide some commentary on these excluded sources, what they consist of and why they are currently deemed outside the remit of Net Zero commitments.

4.2.1.1. Procurement

Emissions resulting from procurement at the University are the largest single category of emissions. These emissions are incurred through the procurement of goods and services (excluding specialist categories such as energy or business travel that are reported separately) and are the emissions associated with the manufacture or supply of the things we buy. Procurement emissions present a significant challenge for the HE sector as we have limited control over the scale of these emissions and we will, despite efforts to reform or improve our procurement practices, always require some level of procurement to support core business.

Within this category notable trends are that emissions from the procurement of laboratory and medical related materials represent the largest of eleven sub-categories, with other business services and IT also major emissions sources.

As manufacturers and suppliers progress along their own Net Zero journeys, it is expected that these emissions will gradually decrease over time. However, sustainable, conscientious procurement practices will be needed to ensure that the University's impact is as minimal as possible. To that end, supporting and encouraging climate-friendly procurement has emerged as a particular focus of public sector procurement consortia.

It should also be noted that the current sector methodology for calculating these emissions is based on emissions per £ spent. While this is not regarded as best practice, it represents the sector's current default position and is therefore the reporting norm. This issue is discussed further in Section 6.

Given the limited control we have over procurement emissions and the anticipated decarbonisation of supply chains as suppliers reduce their own Scope 1 & 2 emissions, the current guidance is that these emissions should not form part of an organisation's Net Zero commitment but remain a material part of its overall emissions footprint.

4.2.1.2. Student Relocation

As an international institution, the emissions associated with students travelling from around the world to study in Aberdeen are included in our reported emissions profile. The impact of overseas student recruitment, and the reliance on air travel for international relocation, is evident in this category which is one of the largest single sources of emission we track. It is also a category of emission that is largely confined to the HE sector.

Given the limited control universities have over how students travel to study at their campuses, guidance suggests these emissions be tracked but not included within Net Zero

commitments. It should be noted, however that some institutions are exploring voluntary schemes to partially mitigate their impact, for example through tree planting or other initiatives.

4.2.1.3. Commuting

Emissions resulting from staff and student commuting are estimated using a biannual travel survey as the basis for reporting assumptions. The University has limited control over these emissions, but there are a number of activities that can affect these, for example promoting sustainable travel e.g., walking, cycling, car-sharing, encouraging public transport use etc.

4.2.1.4. Well-to-Tank

So-called well-to-tank emissions are a technical category of emissions directly linked to energy consumption at the University. These are emissions that occur from extracting and processing Scope 1 fuels that are then directly consumed by the University or used by generators of steam and electricity that the University purchases. Progress to reduce energy consumption and fleet use will cause these emissions to reduce.

5. The Impact of No Action

Without proactive action to tackle emissions, we can assume that a 'business-as-usual' model i.e. one without targeted changes in how we conduct our business, is unlikely to see our emissions reduce at the rate required to meet our Net Zero target.

While some positive national trends in emissions might be seen, for example through the further decarbonisation of the supply chain and grid electricity, or the gradual switch to electric vehicles, these changes will be insufficient in themselves to drive Net Zero.

Figure 5-1 shows the predicted emissions profile for the University up to 2040 if no action towards Net Zero is taken. This models the impact of key external influences that will see reductions in certain categories of emissions, but also indicates that without action, over 50% of our baseline emissions would remain and would require removal through offsetting or equivalent activities that would have a significant financial impact.

Figure 5-1: Emissions Profile If No Action Taken

The following local and national activities and initiatives will impact the University's emissions:

#	Year	Activities
1	2022/2023	• The impact of previously completed emissions reducing projects and initiatives between the 2015/2016 baseline and 2022/2023.

		• The implementation of the Sustainable Business Travel Policy (40% reduction by 2025/2026 & 50% total reduction by 2030/2031). • The impact of the reactivation of Crombie. • The impact of the correction of NHS Grid Electricity Double Counting.
2	2030/2031	• London Underground Net Zero target resulting in decarbonisation of associated travel.
3	2035/2036	• National Grid Net Zero target for electricity grid - Impacting emissions for grid electricity consumption (and T&D), electric fleet/travel, train travel, hotel stays, and working from home. • Impact of ScotRail and National Rail Net Zero short-term targets on business travel, student relocation, and commuting emissions. • Government 2035 ban on the purchase of new petrol/diesel cars
4	2039/2040	• Impact of ScotRail and National Rail Net Zero long-term targets.

Table 5-1: Known Key External Activities Impacting Emissions

Taking no or limited action also has a reputational risk, with students increasingly alert to the sustainability performance of institutions [4], while the sector is under pressure to be among the exemplars in delivering governmental expectations around Net Zero. The Public Bodies framework and our Outcome Agreement with the Scottish Funding Council place heavy emphasis on pro-active implementation of Net Zero practices, pathways, and targets.

Despite the current challenging environment for Higher Education in Scotland and the UK, achieving our sustainability and Net Zero commitments will be critical for our future success, both in terms of attracting new students and our national and international reputation and impact.

There is also potential for fines or other ramifications to be developed and enforced by the Scottish Government, Scottish Funding Council or other regulators and organisations if universities are not seen to be taking significant action towards Net Zero.

Insufficient progress towards Net Zero could have conceivably impact on league table rankings. Both the Times Higher Education (THE) and QS have launched sustainability rankings for universities in recent years, with the University of Aberdeen performing well, ranking 48th in the 2024 Times Higher University Impact Rankings and 37th in the 2024 QS Sustainability Ranking.

In the THE Impact Ranking, the analysis of SDG 13 “Climate Action” focuses on issues such as the institutional commitments to carbon neutrality and low carbon energy use, with the University ranked 90th in the world in 2024. The QS Sustainability ranking evaluates a variety of activities related to net zero, including institutional commitment, progress towards net zero targets, policies on climate strategy, emissions efficiency, and staff perception of the University’s commitment to climate change action as measured through reputation surveys. Insufficient progress towards Net Zero would therefore have a direct impact on these global sustainability rankings.

However, the impact would also be seen more widely. In its 2024 ranking, QS introduced a sustainability metric into its World University Rankings (WUR) for the first time, based on the

QS Sustainability Ranking. Aberdeen performed well on this metric with the WUR, ranking Aberdeen 37th in the world and 15th in the UK in 2024, having a positive impact on our overall global rank. A lack of progress towards Net Zero could therefore have a negative impact on wider institutional reputation and global ranking.

6. Net Zero Before 2040

Achieving the University's target of Net Zero before 2040 would ensure that the University achieved Net Zero 5 years in advance of Scotland's 2045 commitment as part of the Climate Change Act 2019.

Scotland plans to reach net zero by 2045 and, despite the 2024 abandonment of its interim target for 2030, the Scottish Government's 2045 ambition remains. At the same time, the nation plans to adapt and build resilience to the impacts of climate change alongside actions to reduce emissions.

To meet these ambitious targets, a significant and rapid transformation across all sectors of our economy and society is required and several key sectors have set decarbonisation targets in response.

6.1. Achieving Net Zero

The University's journey to achieving Net Zero can be split into 4 key phases as outlined in Figure 6-1:

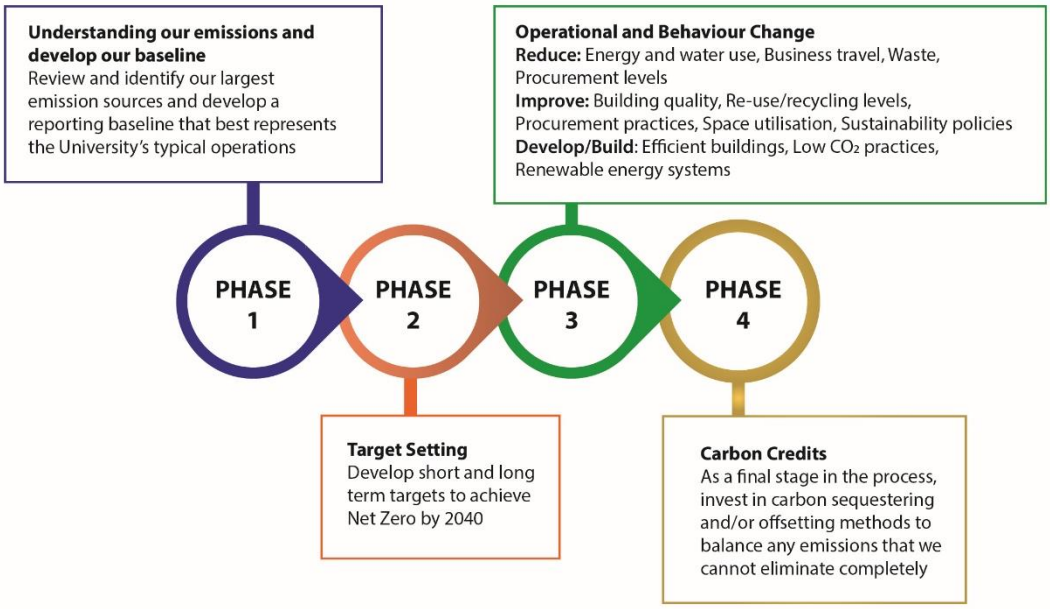


Figure 6-1: Net Zero Journey - 4 Phases

It should be noted that, in practice, while Phases 1 and 2 are being undertaken, Phase 3 will also be underway as part of typical University operations.

Each stage of this journey will involve engagement and collaboration across the institution to ensure stakeholders are engaged and that every part of the University is contributing to achieving Net Zero.

Figure 6-2 details the process of reflection that will enable the impact of activities to be reviewed, internal and external best practice to be identified and adopted, and lessons learned to ensure the effective allocation of funding and resources as our strategy evolves.

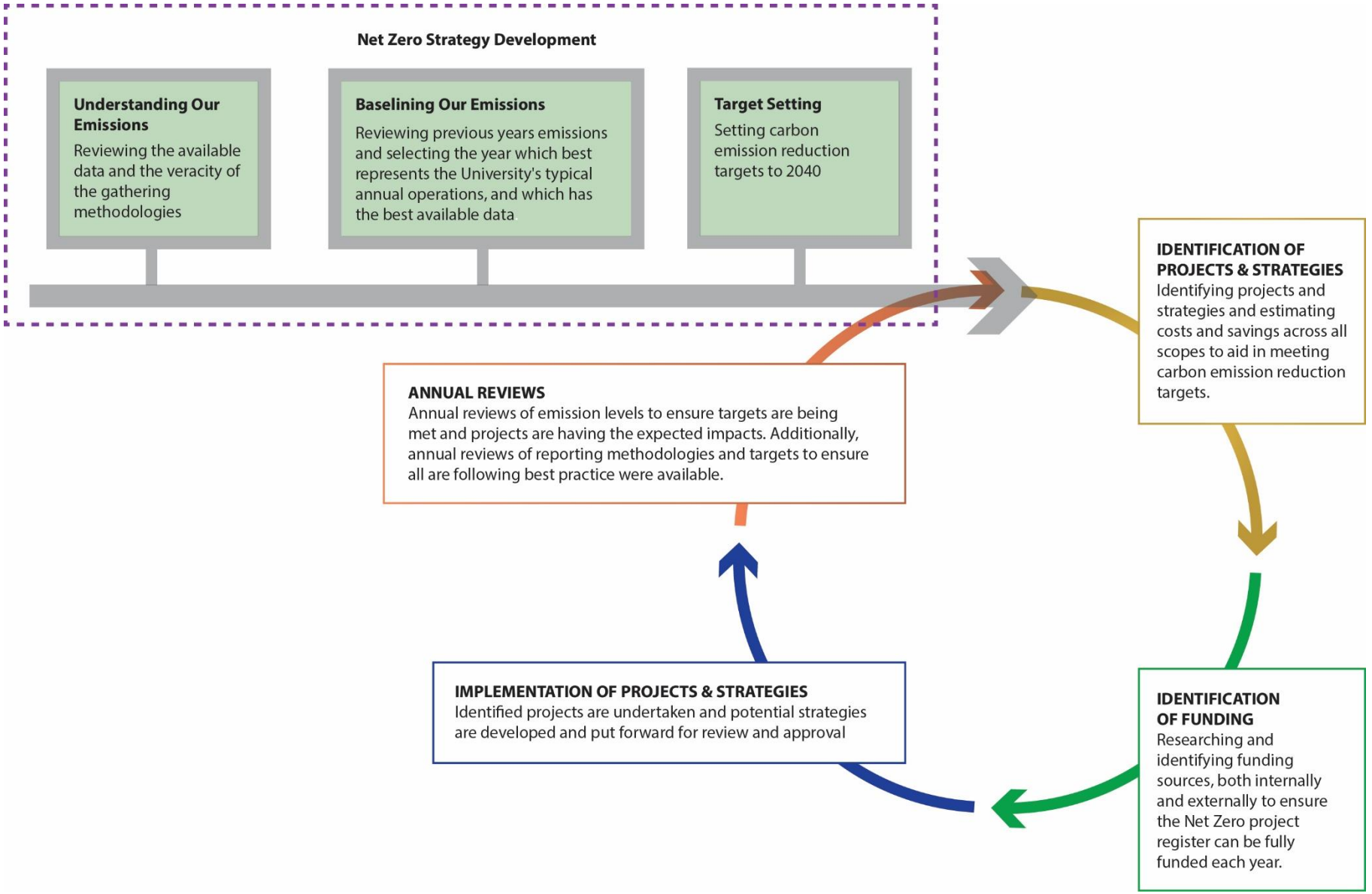


Figure 6-2: Annual Cycle

6.2. Decarbonisation Pathways

When it comes to achieving Net Zero, there are two key components:

- Scope 1, 2 and 3 emissions need to be reduced as far as is reasonably possible, with elimination where practical.
- Any direct or indirect emissions that the University can directly influence[4] but that cannot be eliminated must be neutralised through greenhouse gas removal, either through active sequestering or carbon credits[5], so that these residual emissions are balanced by removals.

To achieve the first of these strands, eleven decarbonisation pathways for key emission sources and activities have been developed, with associated actions to achieve Net Zero:

- Behaviour Change and Empowerment
- Biodiversity
- Decarbonised Construction & Maintenance
- Decarbonised Heat
- Digital Sustainability
- Green Fleet
- Low Carbon Energy Generation and Storage
- Minimised Waste
- Sustainable Business Travel
- Sustainable Labs
- Sustainable Procurement

These pathways have been created to assist in the identification of projects, targeting of funding, exploration of collaboration opportunities, development of institutional targets, and long-term strategic planning.

The pathways were developed by the Net Zero Targets and Strategies Working Group with stakeholder workshops and engagement undertaken to ensure the activities are relevant and will produce the required impact.

A number of the pathways focus on emission sources that are excluded from our Net Zero boundary, however, as an institution, we can still seek to positively influence behaviours, policy, planning, and guidance, which will in turn have positive impacts on these sources. This also reflects the expectations from Scottish Government for all public bodies.

Acknowledging the value our academic and student community places on the United Nations' (UN) Sustainable Development Goals (SDGs) as a framework that should inform our academic endeavour and our operational sustainability activities, each pathway is mapped against one or more of 17 Global Goals.

Figure 6-3: Sustainable Development Goals

[4] This will result in certain Scope 3 emission sources being excluded from offsetting activities (i.e., Procurement, student relocation, commuting, etc.). This does not remove the need for the University to alter its operations to positively influence these emissions.

[5] Insetting is expected to be undertaken in conjunction with whatever method selected.

The 17 SDGs were created in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The 17 SDGs are integrated and recognize that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability. [5]

6.2.1. Decarbonised Heat

The University of Aberdeen experiences a considerable heat demand due to its geographic location and the age of its buildings.

To achieve Net Zero, and in order to support the Scottish Government's Heat Network ambitions, the University needs to enhance and decarbonise its aging heating infrastructure, moving rapidly towards a modern network.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Improve the operations and efficiency of University Heat Centres.
- Decarbonised heat source for existing heat networks
- Connection of Hillhead and Old Aberdeen District Heating Networks
- Upgrade the Hillhead (HH) Student Village heating station and system.
- Improve the fabric conditions (e.g., insulation, windows, etc.) of University buildings.
- Survey the heating equipment (e.g., radiators) in all University buildings for suitability for a Low Temperature District Heating Network
- Internally survey the Old Aberdeen (OA) network pipework
- Upgrade insulation of the Old Aberdeen network pipework
- Expand and improve metering systems.
- Connection of the outlying Old Aberdeen sites to the district main.
- Installation of buffer vessels into the Hillhead and Old Aberdeen district heating networks.
- Reduce the operating temperatures of the district heat networks.
- Replace fossil fuel heating systems with low carbon alternatives or electrification for sites that cannot be connected to a Heat Network.
- Investigate connection of the OA and HH networks to the civic district network.

6.2.2. Sustainable Labs

As a large research University, Aberdeen has a significant number of laboratories across its campuses. By their nature, laboratories are energy and resource intensive, and have a significant impact on our emissions profile through energy use, waste and procurement.

As part of the Net Zero journey, shifting laboratory operations towards a sustainability focus is required. Undertaking this change also links with the other components of the Aberdeen 2040 strand of encouraging and educating our staff and students to work sustainably and also to become leaders in protecting the environment.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Operationalise the outcomes of the climate and sustainability assembly on green labs.
- Develop sustainable laboratories guidance across energy efficiency and waste including reviewing operating procedures in line with sustainability principles.
- Encourage all laboratories to sign up to a sustainability accreditation scheme (i.e., LEAF scheme) to ensure consistent benchmarking and performance.
- Develop laboratory focussed Net Zero training and behaviour change campaigns across teaching and research.
- Upgrade, rationalise or optimise scientific equipment e.g., lasers, MRI, freezers.
- Develop guidance on purchasing new equipment and sustainable procurement.
- Encourage the use of shared services and equipment to create central locations/model.
- Support the establishment of Green Lab groups within and across lab-based schools

6.2.3. Decarbonised Construction & Maintenance

In terms of the Estate, achieving Net Zero will require a significant programme of refurbishment and upgrade of existing buildings to improve the thermal and energy efficiency of our campus, and meeting best practice sustainability requirements for all new builds.

While our current practice emphasises the attainment of BREEAM accreditation, our construction and maintenance guidance is limited in terms of the wider spectrum of sustainability, and as a result our practices are not fully aligned with Net Zero.

This pathway aims to achieve the following:

- Embed the understanding of Net Zero and sustainability by projects and maintenance-linked teams.
- Development of guidance to ensure that Net Zero and sustainability are core features of all campus works.
- Reduction of energy demand of sites.
- Introduce the expectation that all project and maintenance work is able to demonstrate a reduction in emissions and/or improvement in biodiversity.

This will result in a progression towards Net Zero targets by ensuring that sustainability is included from the start of every project and is not value engineered out. Additionally, the pathway will improve confidence when engaging with consultants/contractors/suppliers.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Identify energy, water, and carbon emission minimum targets for all projects.
- All maintenance and project activities carried out must demonstrate a reduction in energy use.
- Use existing standards for aligning small works and maintenance with sustainability.
- Update of the design guide to include sustainability/adaptation/net zero/biodiversity practices. Including:
    - Quantifiably improve biodiversity levels with every project.
    - Adoption of circular economy practices in all projects.
    - All projects have the aim of making a building suitable for a low temperature district heating system.
    - All projects will include carbon life cycle analysis.
    - Cessation of natural gas fired boiler installations from 2024.
    - Develop a checklist for standard energy efficiency improvements for all capital projects.
- Develop maintenance purchasing and operational guidance.
- Include sustainability/Net Zero criteria in evaluation of tenders and selection of contractors/sub-contractors.
- Expectation that all consultants/designers/contractors have demonstrable experience in Net Zero/Sustainability.
- Increase awareness and understanding about Net Zero and Sustainability:
    - Increase awareness of legislation for all teams.
    - Develop toolbox talks and maintenance specific sustainability/Net Zero training.
- Increase staff capacity, with the aim to have a Net Zero Project Manager.
- All sites are efficiently space managed to make full use of all buildings.
- Utilise spaces as they have been designed for or design spaces to be flexible to meet potential future needs without significant alterations.
- All lighting to be upgraded and maintained with the most efficient LEDs available.
- Review of chillers, and other large electrical consumers (e.g., air-handling units, water-pumps, air-conditioning).
- Develop building asset profiles to highlight sustainability levels.
- Create sustainability submission portal for maintenance staff to submit ideas/suggestions/observations.
- Create in-situ plate heat exchanger (PHE) rolling cleaning program.
- Improved assets register of estates to improve monitoring and targeting programs

6.2.4. Low Carbon Energy Generation and Storage

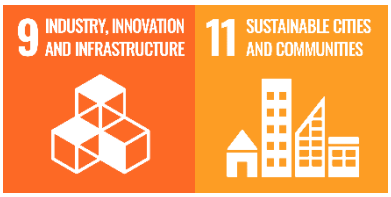
The Kings College Campus has a natural gas fired Combined Heat and Power (CHP) engine which provides 70% of the campus' electricity demand. As the engine moves towards the end of its financially viable life, the University will need to review how electricity is generated/sourced across all of its campuses and outlying sites.

Moving away from fossil fuel fired electricity generation sources, decarbonising electricity generation at the University, transition to a modern, fit for purpose, grid, and supporting the Scottish Government's local renewable ambitions are key in reaching the University's Net Zero target for Scopes 1 & 2.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Reduce demand of electricity demand of sites to as low as possible.
- Eventual replacement of the natural gas fired CHP engine on the Kings College campus.
- PV installation across our campuses (for example: installation of PV car park covers), and optimisation and upgrade of existing installations e.g., Hillhead installation.
- Installation of battery storage capacity on our sites to store renewably generated energy onsite and provide the flexibility required for additional demands.
- Engagement with NHS on their energy generation decarbonisation plans.
- Investigation of sleeving[6] options to ensure grid consumption can be reported as renewable.

6.2.5. Green Fleet



The University maintains a number of fleet vehicles across its core and satellite sites. These vehicles are used for a variety of operational uses (e.g., teaching, catering, maintenance,

[6] Sleeving involves the supply of energy from electrical generation assets to specified sites. These are not directly connected to the generating asset, instead each unit of energy exported from the asset is deemed equivalent to one supplied to a nominated building via the national grid network. This mechanism is achieved via a contracted arrangement with the DNO, the supplier concerned and the recipient. Although the electricity is physically routed via the grid, a 'sleeved' supply can be set up so that demand at each site is matched to generation from a named asset, thus ensuring additionality. [13]

portering, grounds, etc.). The decarbonisation of owned, leased, and grey fleet vehicles is a key part in the University's decarbonisation journey.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Transition all fleet vehicles to EV, or other low emission fuel, except those which cannot for operational reasons.
- Work with the procurement team to ensure low emission options are available and considered as vehicles are replaced.
- Develop and implement an EV charging network on campus to support the transition to an EV fleet.
- Work in partnership with Procurement to ensure EV and low emission options are embedded in all short and long term fleet contracts.
- Develop a convenient and efficient charge payment process for EV fleet users.
- Improve data collection and engage with the sector to improve the accuracy of emissions data.
- Seek resource to develop and deliver a strategy to rationalise fleet use.
- Educate and train staff in the use and charging of EVs.

6.2.6. Sustainable Business Travel

As a university with significant international reach and relations, business travel and the associated emissions are unavoidable. As such, Sustainable Business Travel Guidelines[7] have been developed to provide guidance on how the University can continue to operate and grow while also reducing the significant impact of travel.

This Pathway aligns with these guidelines and envisages the following actions to assist in achieving Net Zero before 2040:

- Allocate resource to develop a business travel strategy.
- Monitor and report business travel emissions and develop a targeted approach to minimising emissions while maximising the benefits of travel.
- Monitor the use and effectiveness of the Business Travel Hierarchy.
- Consider the introduction of incentives for supporting low carbon travel, caps on high carbon travel, School based targets on business travel emissions, etc.
- Explore novel financial mechanisms for supporting sustainable travel e.g. increasing parking charges to support a sustainability projects fund or subsidise bus travel.
- Lead discussions with local travel providers to encourage sustainable travel behaviour.

[7] https://www.abdn.ac.uk/about/sustainable/sustainable-business-travel-2484.php#panel2496

- Review and develop a policy or mechanism for offsetting business travel emissions to meet external funding requirements.

6.2.7. Digital Sustainability

Digital technologies have a dual role in sustainability, acting as both a solution and a problem. These technologies can drive sustainability by enabling more efficient working methods, automating processes, help to foster innovation, provide paperless communications and information storage. However, they also contribute to energy consumption, generation of e-waste, and impact the supply chain.

This pathway aims to minimise the negative impact of Digital technologies on the environment, promote responsible use of Digital resources, and contribute to the overall sustainability goals of the University and society.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Energy efficiency: Using energy-efficient Digital hardware and infrastructure, optimising data centre operations, and implementing power management techniques to minimise energy consumption.
- Resource conservation: Minimising the use of resources such as water, materials, and electronic waste (e-waste) through responsible procurement, recycling, and waste management practices.
- Renewable energy: Incorporating the use of renewable energy sources to power Digital operations and reduce reliance on fossil fuels.
- Lifecycle management: Adopting responsible practices for Digital asset management, including proper disposal or recycling of electronic equipment, and extending the lifecycle of Digital equipment through upgrades and repairs.
- Cloud computing: Leveraging cloud computing services to optimise resource utilisation, reduce hardware and energy requirements, and promote shared infrastructure and virtualisation.
- Sustainable software development: Incorporating sustainable practices in software development, such as optimising code for performance and efficiency, reducing resource consumption, and promoting sustainable design principles.
- Environmental reporting: Measuring, monitoring, and reporting on the environmental impact of Digital operations, and using the data to drive continuous improvement and decision-making.

Activity specific sub-pathways have been developed to assist in achieving sustainability within the University's Digital operations.

6.2.8. Sustainable Procurement

While it is anticipated that supply chain linked emissions will reduce as companies providing goods and services themselves work towards net-zero, procurement emissions are likely to be among the most difficult to reduce.

The University will need to undertake a behavioural shift when it comes to how and what we procure. Moving to looking at leasing options, recycling, standardising furniture, increased training in Net Zero and Sustainability in addition to supporting staff capacity.

This pathway aims to achieve the following:

- Embed the understanding of Net Zero and sustainability in the procurement team.
- Development of guidance documents and strategies to ensure Net Zero/Sustainability focussed behaviours are practiced across the University.
- Encourage our suppliers and contractors to join and aid us in the Net Zero journey.
- Having the procurement team acting as champions, while also providing guidance and expectations of staff on how and what they procure, will enable a shift in the University's mindset. Additionally, improving our requirements will support our suppliers to change their practices.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Engagement with APUC/EAUC/Sector to improve emissions calculation methodology tool.
- Create a database of sustainability focussed procurement questions.
- Develop a sustainable procurement guide for schools and professional service Directorates and accompanying training for purchases under £50k.
- Increase sustainability weighting in tenders.
- Update project practices to ensure circular economy is considered and encouraged.
- Standardise office furniture and ensure options are not available in storage before procuring.
- Improve storage facilities to allow the full implementation of re-use practices.
- Improve asset management system to allow staff to search for equipment already available/in storage.
- Improve staffing levels to allow dedicated resource for supplier engagement with regard to Net Zero/sustainability.
- Train procurement staff and those who are involved in procurement practices (devolved procurement) on sustainable procurement practices.
- Update sustainable procurement strategy to include:
    - Circular economy
    - Repair and re-use
    - Rent or share instead of purchase
- Update finance practices to encourage long term leasing instead of purchasing.
- Engage with research funding bodies to allow flexibility in how money is spent.

- Engagement and backing of senior staff on sustainable procurement practices.

6.2.9. Minimised Waste

Significant work has already been done to reduce the emissions associated with waste. As such this pathway focuses primarily on waste minimisation and encouraging re-use and recycling whilst ensuring waste does not exceed 1,000 tonnes per annum and recycle or reuse 80% of waste produced at the University.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- Continue to apply the waste hierarchy to all waste produced at the University.
- Limit waste produced by the University to ~1,000 tonnes p.a.
- Recycle or reuse 80% of waste produced at the University.
- Implement the recommendations of the 2021 benchmarking review.
- Work proactively with Procurement and significant waste producers (e.g., Commercial Services) to adopt more reusable and recyclable goods. Adopt circular economy goods where feasible.
- Develop a recurring engagement strategy to encourage and enable students to segregate and recycle their waste.
- Ensure recycling bins are available in all buildings and all external spaces where general waste bins are present.
- Deliver the Deposit Return Scheme (DRS) scheme if and when it is introduced by the government.

6.2.10. Biodiversity

Biodiversity is intrinsically linked to carbon sequestration and many wider sustainability issues, and therefore needs to be considered for a holistic Net Zero strategy. However, as an issue it is poorly understood by many people, often hard to quantify and will frequently be outcompeted by many other strategic challenges.

This pathway aims to achieve the following:

- The biodiversity of our land is understood, regularly monitored, and the management of our land is quantifiably improving these levels.

- Biodiversity becomes a core requirement during master planning and all other design/management decisions including planting schemes of new developments, or insetting initiatives.
- The university takes steps to identify and limit negative wider operational effects of the organisation (e.g., procurement) on biodiversity.
- Staff, students and visitors understand the importance of biodiversity and can communicate this to others and can recognise their own impact on biodiversity and identify and contribute to the university's biodiversity enhancements on campus.

This pathway envisages the following actions to assist in achieving Net Zero before 2040:

- The university has identified all areas of greenspace it owns/manages and identified a baseline level for biodiversity for all these areas.
- Create short life biodiversity working group with the purpose of:
    - Creating a biodiversity policy.
    - Creating a biodiversity action plan for all managed sites which will include regular reporting on KPI's (this requires commitment of resources to regularly monitor biodiversity on our land and to develop projects/change management to deliver gains, as well as a communication strategy around changes to greenspaces).
- Further develop guidance around biodiversity for an updated Design Guide.
- Regular training/toolbox talks on biodiversity to be given to appropriate departments such as SMT, Projects, Grounds, Clerk of Works, Cruickshank Gardens staff etc.
- Expectation that all consultants/designers/contractors have demonstrable experience in sustainability.
- Biodiversity module to be included in baseline staff e-learning module currently being developed by sustainability team.
- Work with relevant departments such as energy, procurement, catering, projects etc., to try to identify wider negative environmental impacts beyond carbon emissions and take reasonable steps to reduce or mitigate these impacts.

6.2.11. Behaviour Change and Empowerment

Alongside action to tackle operational and infrastructure emissions, a whole institution approach is required to encourage, empower, and enable staff and students to understand the individual and collective impact their choices on emissions and solutions.

This pathway aims for all staff and students at the university to understand, lead, and support action on addressing our emissions. The aim is for behavioural impacts to be understood, and guidance to be made available to empower positive actions e.g., travel and procurement choices.

Further development and actions required to assist in achieving Net Zero before 2040 include:

- Identify appropriate dedicated and devolved capacity to support and encourage behaviour change including:
    - Enhanced capacity in the central Sustainability Team.
    - Identification of areas within other operational units that require additional staffing resources to deliver the Net Zero Strategy
- Sustainability to be reflected in all job descriptions and staff appraisal discussions.
- Robust staff communications to ensure that all staff recognise and support programmes that encourage good 'housekeeping' e.g., switching off lights, limiting printing etc.
- Leadership by example with SMT promoting positive sustainability behaviours.
- Introduction of a sustainability e-learning module promoted to all staff (and then work with AUSA to develop student training).
- Maintain a bi-annual programme of Climate and Sustainability Assemblies to continually gather staff feedback and ideas.
- Establishment of an engagement framework, so that employees from different areas of the university can engage with sustainability on an ad-hoc basis.
- Develop and monitor KPIs and survey data that provide insight into whether behaviour is improving (e.g., business travel metrics, staff surveys).
- Institution-wide policy review to ensure sustainability impacts (and how to avoid them) are reflected in wider policy framework.
- Schools and Directorates given budgetary authority to make sustainable choices (e.g., to justify more energy efficient equipment choices, choosing a different travel mode etc).
- Creation of a central discretionary fund to support behaviour change (e.g., ability to justify replacing kit with more efficient model for a higher cost but reduced running costs).

6.3. Targets

To monitor the University's progress towards Net Zero, overarching Scope specific targets, as well as illustrative annual linear reduction targets, have been established.

Additionally, a series of activity specific targets, linked to the decarbonisation pathways, have been developed.

6.3.1. Scope Targets

As part of the Scottish Government's 2021 public sector leadership guidance on tackling the climate emergency, the following expectations were highlighted:

- All areas of direct emissions that can be reduced, are to be reduced to absolute zero.
- Areas of direct emissions that cannot be reduced to absolute zero due to the nature of the emissions sources e.g., livestock, process emissions, should be covered by a net zero target instead.
- All direct emissions targets should have interim targets so that performance is transparent.
- Indirect emissions targets must focus on emissions reductions.
- Net zero targets for indirect emissions may be set but the organisation must specify absolute emissions reduction target(s) as well.

In setting our targets, we have also been informed by globally acknowledged Science Based Targets Initiative (SBTi) and the global 2050 Net Zero targets and guidelines it supports.

Science-Based Targets (SBTs) provide a pathway for organisations to reduce greenhouse gas emissions, helping prevent the worst impacts of climate change and future-proof growth. Targets set under this methodology are considered 'science-based' if they are in line with the latest climate science and support the goals of the Paris Agreement i.e., limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

The Higher Education (HE) sector has embraced the SBT initiative as a tool to develop robust long-term Net Zero targets.

To ensure compliance with the Scottish Government emissions reductions guidance, and providing consistency with the SBT initiative, the minimum targets we need to set as a University to deliver our Aberdeen 2040 Net Zero commitment are as follows:

- Scope 1 Target – an absolute reduction in emissions of 100% by 2040.
- Scope 2 Target – an absolute reduction in emissions of 100% by 2040.
- Scope 3 Target – an absolute reduction in emissions of 55% by 2040, with a reduction of 90% by 2050 [8].

In recognition of the University's historic carbon reduction efforts (see Section 3 for more information), the targets are assessed against the 2022/2023 emissions profile. These

[8] NOTE: The sector discussion surrounding Scope 3 and the emission sources within this boundary is still in its infancy and this target will likely change in the future to reflect the direction of these discussions.

reductions are comparative to the historic carbon management plan target of a 4% annual reduction.

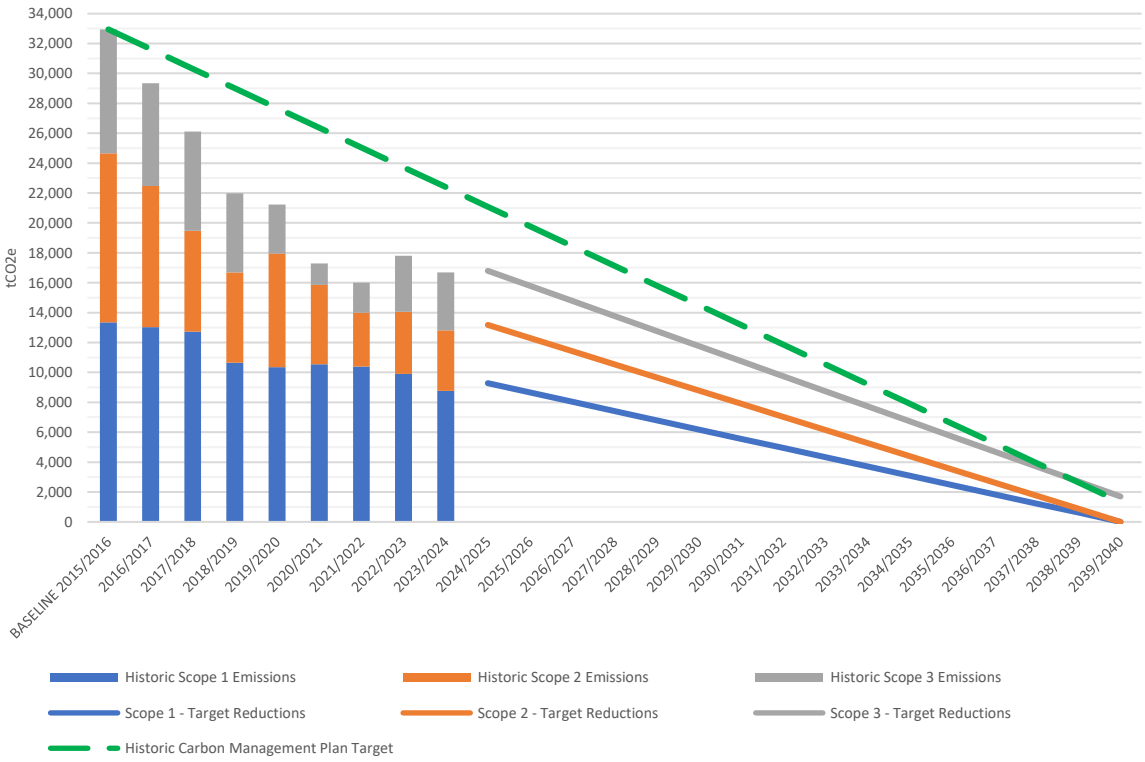


Figure 6-4: Historic Carbon Emission Levels with Net Zero and Historic CMP Targets

Our strategy, therefore, envisages the absolute elimination of Scope 1 & 2 emissions before 2040, but in recognition of the complexities of tackling indirect emissions, we have established a differential Scope 3 target consistent with the SBT definition of Net Zero.

In practice, the elimination of all Scope 3 emissions is widely seen as all but impossible. This is reflected in the SBT guidance for Scope 3 emissions and as such, the 55% target is consistent with the SBT framework's linear reduction methodology. Any remaining Scope 3 emissions for which we are responsible will still need to be eliminated through GHG removal. A summary of Science Based Targets can be found in **Appendix B**.[9]

This differential approach also acknowledges that the national and sectoral discussion around how best to track, manage and reduce Scope 3 emissions is still evolving. As such, we anticipate impactful changes in the statutory guidance we are required to comply with, including potentially significant guidance as to which categories of Scope 3 emissions we are deemed responsible for that will affect which categories of emissions we have to include in Net Zero targets. This may result in certain substantial categories of Scope 3 emissions falling

[9] It should be noted that there is currently no formal SBT guidance for the HE sector. In lieu of such guidance, the sector is encouraged to ensure that SBT methodologies are applied when developing Net Zero targets and noting that the EAUC is currently developing a verification process for the sector.

outside the remit of this strategy and requiring a different track, manage and reduce approach.

Additionally, it is acknowledged that certain Scope 1 & 2 energy streams, like steam currently purchased from the NHS, or grid electricity, carry a risk of not being fully decarbonised by 2040. There may also be some residual carbon-based fuel use, for example gas use in laboratories or if back up heat generation is required to supplement renewable alternatives e.g. during periods of maintenance.

These scenarios suggest that some consumption of carbon intensive energy may remain despite our best efforts to eliminate its use. As such, while the target remains a 100% reduction in Scope 1 & 2 emissions, any unavoidable residual emissions will also need to be offset as required.

As highlighted in Section 6.1, these targets will be reviewed every year to ensure that they remain appropriate and consistent with the University's operations and ambitions.

6.3.2. Annual Targets

The following linear annual reduction targets for scope emissions have been set to ensure the University achieves the 2040 targets detailed above:

- Scope 1 – 6.25% absolute annual reduction in emissions
- Scope 2 – 6.25% absolute annual reduction in emissions
- Scope 3 – 3.44% absolute annual reduction in emissions

Additionally, 5-year reporting targets have been established from these annual linear reduction values:

Scope	5-Year Target (2028/2029)	10-Year Target (2033/2034)	15-Year Target (2038/2039)
1	31.25%	62.50%	93.75%
2	31.25%	62.50%	93.75%
3	17.19%	34.38%	51.56%

Table 6-1: 5-Year Reduction Targets

It should be noted, however, that the journey to Net Zero is unlikely to track a linear reduction. As the University progresses along the various decarbonisation pathways, there will be key transition periods that trigger step-change reductions e.g. following the completion of key activities.

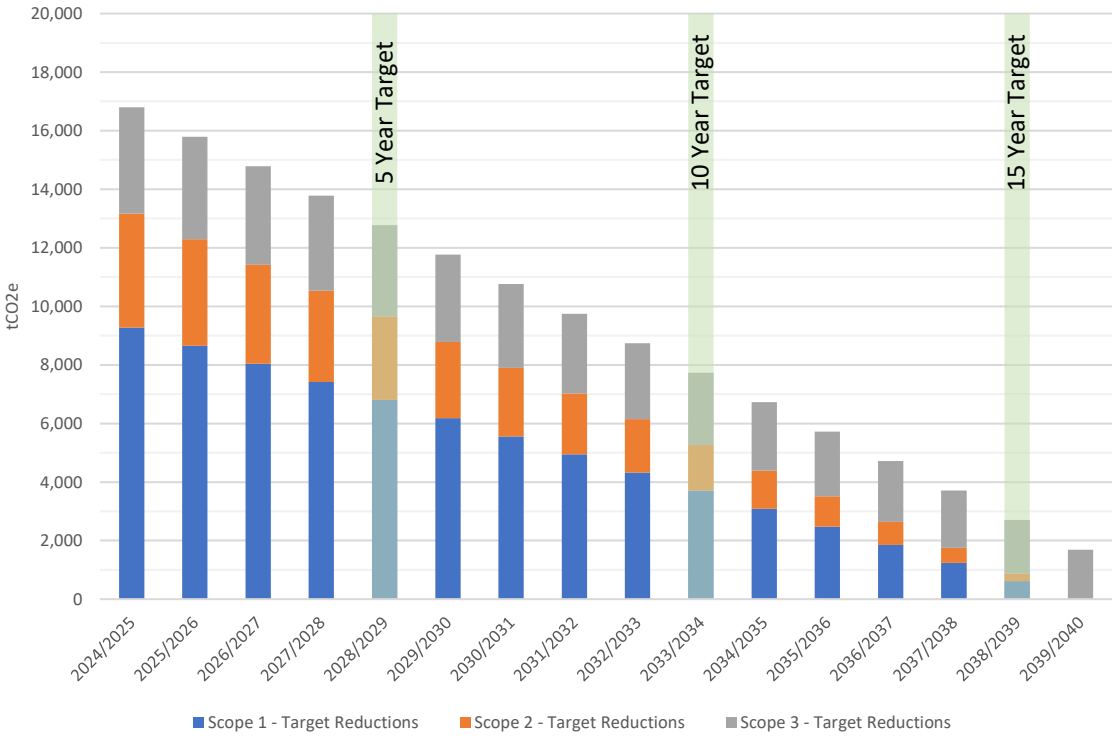


Figure 6-5: Annual Linear Reductions Targets

For example, the transition to a zero-carbon heat source for our Old Aberdeen and Hillhead campuses will eliminate almost all natural gas emissions for those sites, resulting in the effective elimination of a major source of Scope 1 emissions. This transition to alternative heat sources, most likely electrically powered, will also result in an increase in grid electricity emissions until such time as the grid is fully decarbonised. These are the necessary trade-offs that the Net Zero journey will require.

Equally, investment in renewable electricity generation at scale (whether from internal funds or in partnership) has the potential to largely eliminate Scope 2 electricity use.

6.3.3. Pathway Activity Actions

In addition to establishing annual overall reduction targets, our decarbonisation pathways have established associated actions to support emissions reduction. A selection of short term (5-year), mid-term (up to 2033/2034), and long term (before 2039/2040) actions are highlighted below:

Pathway	Activity	Completion Target
Sustainable Labs	Develop sustainable laboratories guidance	Short Term
Sustainable Supply Chain	Develop a sustainable procurement guide for Schools and Directorates and accompanying training for purchases under £50k	Short Term
Construction & Maintenance	Update of the design guide to include sustainability / adaptation / net zero / biodiversity practices including:	Short Term

	• Quantifiably improve biodiversity levels with every project. • Adoption of circular economy practices in all projects. • All projects have the aim of making a building suitable for a low temperature district heating system. • All projects will include carbon life cycle analysis. • Develop a checklist for standard energy efficiency improvements for all capital projects.	
Behaviour Change and Empowerment	Sustainability to be reflected in all job descriptions and staff appraisal discussions.	Short Term
Digital Sustainability	Establish a Digital Sustainability Reporting capability.	Short Term
Digital Sustainability	Monitor and optimise lifecycle management improvements.	Short Term
Waste	Waste segregation - implement the deposit return scheme when it is introduced by the government.	Short Term
Decarbonised Heat	Upgrade the Hillhead Student Village heating station and system.	Short Term
Green Fleet	EV familiarisation - educate and train staff in the use and charging of EVs.	Short Term
Construction & Maintenance	All lighting to be upgraded and maintained with the most efficient LEDs available.	Short Term
Decarbonised Heat	Upgrade insulation of the Old Aberdeen network pipework.	Short Term
Decarbonised Heat	Reduce the operating temperatures of the district heat networks.	Mid Term
Decarbonised Heat	Decarbonised heat source for existing University owned heat networks.	Mid Term
LC Electricity Generation and Storage	Eventual replacement of the natural gas fired CHP engine on the Kings College campus.	Mid Term
Waste	Waste disposal - recycle or reuse 80% of waste produced at the University.	Mid Term
Waste	Waste segregation - implement the recommendations of the 2021 benchmarking review.	Mid Term
Construction & Maintenance	All sites are efficiently space managed to make full use of all buildings.	Mid Term
Digital Sustainability	Evolve the Digital Sustainability Reporting capability.	Mid Term
Digital Sustainability	Use of renewable energy to power Digital.	Long Term
Green Fleet	Fleet composition – progressively transition all fleet vehicles to EV, or other low emission fuel, except	Long Term

	those which cannot for operational reasons. Work with the procurement team to ensure low emission options are available and considered as vehicles are replaced.	
Sustainable Labs	Upgrade, rationalise or optimise scientific equipment e.g., lasers, MRI, freezers.	Long Term
LC Electricity Generation and Storage	Reduce electricity demand of sites to as low as possible.	Long Term

Table 6-2: Pathway Activity Targets

The actions and targets associated with all of the decarbonisation pathways will be reviewed annually to ensure they remain appropriate and consistent with other internal and external strategies. A comprehensive list of targets and actions can be found in **Appendix C**.

7. Excluded Emission Sources and Activities

This strategy strives to provide decarbonisation pathways and targets for as many of the University's emission sources and activities as possible.

However, as previously highlighted, there are a small number of areas for which direct influence is less straight-forward and where a substantial shift in institutional, sectoral and national thinking may be required to address. At this stage we have not developed stand-alone pathways in these areas, but this will be reviewed as part of the rolling evaluation of this strategy. These areas include:

7.1. Staff & Student Commuting

The commuting habits of our staff and students have been monitored via travel surveys since 2006. During that time, a gradual reduction in single occupancy car use has been observed which, together with improvements in vehicle emissions, has resulted in lower commuting emissions. Staff and student commuting emissions are projected to fall further as the rollout of electric vehicles continues and new conventional petrol and diesel vehicles cease to be sold.

It is generally acknowledged that the University has limited direct influence on these emissions and cannot oblige staff or students to change the individual behaviours that drive these emissions. There are, however, some activities that can be undertaken to support more rapid reduction e.g., alongside work being done on under the Green Fleet pathway:

- Supporting active travel through enhanced on campus infrastructure and services.
- Working in partnership with the local authority and regional transport partnerships to support active and public transport options to the University.
- Developing an electric vehicle (EV) charging strategy to support the transition to EV use for commuters.

7.2. Student Relocation

The University has a significant international student community which travels from across the world to study at our campuses. As a result, the emissions associated with this student travel forms a large proportion of our emissions profile.

Given the University's International commitments in Aberdeen 2040, international student numbers will continue to be an important part of our institutional student recruitment strategy, meaning that these emissions will remain a significant part of our profile.

Factors that will influence these emissions will include the decarbonisation of the travel sector, as well as the proportion of overseas students choosing to study remotely. As a major category of emissions, the University will continue to monitor and report these emissions.

7.3. Home Working

The University's facilitation of hybrid and home-working practices following the COVID-19 pandemic has provided a number of positive benefits to staff, such as improved work/life balance, and reduced commuting. As such, these practices will continue to be supported.

The emissions associated with staff working from home are now included in the University's annual emissions profile and calculate using a sector agreed methodology. In practice, however, we have limited control over the *actual* energy consumption habits of staff in their own home, nor their selected energy supplier or tariff.

Where we can influence these actual emissions is in areas such as ensuring that the IT equipment we issue to staff is highly energy efficient (See Section 6.2.7) and by continuing to encourage colleagues to adopt positive sustainability behaviours in both their home and work lives.

7.4. Hotel Stays

Due to the geographical location of the University, hotel stays are often a required part of business travel activities. While we cannot directly influence the carbon intensity of hotels and accommodations across the globe, it is anticipated that as countries and organisations progress towards their own decarbonisation targets, their impact will reduce over time.

Additionally, the activities detailed in the Sustainable Business Travel pathway (see Section 6.2.6) and the Behaviour Change and Empowerment pathway (see Section 6.2.11) are expected to have a positive influence this source of emissions.

7.5. Sustainability in Teaching

While this strategy details a number of decarbonisation pathways for individual emission sources, it does not directly address teaching.

Thus, while the pathways for laboratories, procurement, business travel, and waste will have an impact on emissions resulting from teaching, and the pathways surrounding energy use and our buildings should ensure improvements in the use of our spaces for teaching, we do not set out here to directly influence 'how', 'what' or 'who' we teach. We do, however, need to remain aware that all of these have emissions impacts.

For example, while the University relies on strong student recruitment, including international student recruitment as part of its financial sustainability, we need to acknowledge and continue to monitor and report the emissions impact of that recruitment, including the potential that we may be required to offset the emissions from student travel.

In addition, Aberdeen 2040 already anticipates changes in what we teach our students consistent with a shared responsibility for the planet through our commitments to:

- Encourage everyone within our community to work and live sustainably, recognising the importance of our time, energy and resilience.
- Educate all our students and staff to be leaders in protecting the environment.

Actions in support of those commitments are already underway and include:

- Developing a new set of Attributes and Skills that include 'Active Citizenship' which encompasses 'Global Citizens', 'Sustainability' and 'Inclusivity and Cultural Awareness'.
- Identifying undergraduate and postgraduate courses that are linked to the SDGs.[10]
- Offering a wide range of courses and programmes that enhance our students' awareness and understanding of climate issues and constantly developing new content.

To ensure our students are gaining knowledgeable about Net Zero and sustainability across our degree paths, additional activities to be considered could include:

- Developing a Green Teaching Strategy to align the curriculum with the sustainability skills required in the modern workforce.
- Further aligning our curriculum with the Sustainable Development Goals, including identifying academic pathways and linkages across and between courses and degrees programmes.
- Exploring the potential for new cross-school collaborative degrees based around sustainability.
- Developing an online training module for students to complete to improve climate literacy.
- Encouraging students to complete at least one sustainability focussed course during their degree or undertaking an external sustainability related co-curricular or extra-curricular activity (linked to graduate attribute).
- Supporting the further development of hybrid or fully online courses and degrees.
- Developing training to encourage and support staff embed sustainability in their teaching.
- Encouraging the use of local sites for field work to reduce the emissions associated with field work.

Undertaking these types of activity will also, in addition to reducing our emissions profile, enhance the University's status as a sector beacon for sustainable education, attracting the best academic, researchers, operations staff, and students alike.

[10] https://www.abdn.ac.uk/about/sustainable/sustainable-development-goals-1668.php#panel2551

8. Carbon Credits / Sequestering / Offsetting

It is inevitable that, even if all of the decarbonisation pathways articulated in this strategy deliver significant emissions reductions, as an ambitious and growing institution the University will still have residual emissions to deal with.

To ensure that the target of Net Zero before 2040 is achieved, the University will need to consider some form of sequestering or offsetting of those residual emissions. Approaches include:

Carbon Sequestering [6]	Carbon Offsetting [7]	Carbon Insetting
Carbon sequestration is the capturing, removal and storage of carbon dioxide from the earth's atmosphere. Carbon sequestration can happen in two basic forms: biologically or geologically. **Biologically:** Biological carbon sequestration happens when carbon is stored in the natural environment. This includes what are known as 'carbon sinks', such as forests, grasslands, soil, oceans and other bodies of water. This is also known as an 'indirect' or passive form of sequestration. **Geologically:** Geological carbon sequestration happens when carbon is stored in places such as underground geological formations or rocks. This process is largely artificial or 'direct', representing an effective way of neutralising emissions arising from human practices, such as manufacturing or construction.	Also known as Carbon Credits, carbon offsetting is the practice of purchasing emission reductions from an external company that operates a carbon sequestering scheme. This could include tree planting, renewable energy projects or carbon capture. These transferable credits are certified by governments or independent certification bodies to represent an emission reduction of one metric tonne of CO_2, or an equivalent amount of other GHGs. The purchaser of an offset credit can "retire" it to claim the underlying reduction towards their own GHG reduction goals.	Carbon insetting is an emerging term for a form of biological sequestering that relates to the "carbon sink" potential of an institution's existing estate. From playing fields, to botanical gardens, to green roofs, an institution's green estate naturally acts as a passive form of sequestration. Once calculated, the annual carbon sink potential in tonnes is classified as carbon credits that then need to be verified through an external framework before being utilised for an institution's carbon profile.

Table 8-1: Sequestering & Offsetting Definitions

*Note: Science Based Targets (SBT) guidance states that offsets shall not be counted as reductions toward meeting a near-term SBT. Instead, organisations must account for reductions resulting from direct action within their operations or value chains. See **Appendix B** for more information on SBTs.*

At this stage, this Net Zero strategy does not cover offsetting, with a decision made at the outset to delink the development of our Net Zero Strategy from the complex and rapidly evolving issue of off-setting.

With government guidance changing, concern over the ethics and credibility of offsetting projects, and serious concern about the availability and longevity of offsetting credits, this is an issue that requires careful review and dedicated capacity to fully understand.

Given the considerable controversy surrounding the issue of offsetting, care is required to fully understand the impact, sustainability, and verification of approaches and schemes.

As such, the University commits to the following activities related to offsetting:

- We will establish a Task and Finish Group to develop a comprehensive institutional approach to offsetting to including:
  - Confirming the emissions sources that require offsetting (following formal guidance e.g. from Scottish Government).
  - Identifying potential offsetting schemes that align with our 2040 values.
  - Estimating the financial commitment required for an offsetting strategy.
  - Identifying sector best practice in offsetting / insetting approaches.
- The University will follow best practice and official guidance when it comes to pursuing any approach to offsetting as part of its Net Zero journey.

9. Delivery of Net Zero

The delivery of actions under the various decarbonisation pathways will require detailed sequencing and financial planning. Several of the activities detailed in the pathways are linked to the development and eventual replacement of key infrastructure systems across the University's estate. In some cases, these systems have critical operational and investment dates approaching, with strategic decisions required as regards the development of an optimal timetable for their continued use and eventual decommissioning e.g., the Combined Heat & Power (CHP) engine.

Additionally, the large-scale nature of the anticipated estate and operational system upgrades will require careful scheduling and the development of appropriate timelines and contingent planning before work can be implemented. From design work, to permitting, to environmental surveys, these projects will need to be carefully sequenced and aligned with current operational planning around the maintenance and management of existing infrastructure.

To that end, we anticipate that an institutional Net Zero Delivery Board will need to be established to lead the development and delivery of a programme of Net Zero works, including the development of appropriate capital investment plans to support the delivery of actions under each of the decarbonisation pathways.

In all cases the delivery of Net Zero will be undertaken in a way that is consistent with the approach taken to the implementation of the various strands of infrastructure development envisaged as part of the Reimagining the Campus process.

An initial high-level implementation plan for the strategy is detailed below:

Action	Description	Responsible Person/ Committee	Target Completion date	Outcome
Endorsement of Net Zero Strategy	The Net Zero Strategy is endorsed through the University's governance process.	Sustainable Development Committee, Senior Management Team, Finance & Resourcing Committee, and Court	31/12/2024	The approved strategy is published on the University's website.
Establishment of a Net Zero Delivery Board	The establishment of a delivery board with appropriate representation from across the University	Sustainable Development Committee and Senior Management Team	31/03/2025	The establishment of the University's Net Zero Delivery Board with suitable authority to progress the pathways.
Institutional approach to role of Net Zero delivery partners agreed	Institutional decision on the role and purpose of a strategic partner to assist in the delivery of critical	Net Zero Implementation Board	31/05/2025 Tendering and appointment	The appointment of a long-term delivery partner with the expertise to deliver

	infrastructure activities.		to follow in 3-4 months.	the infrastructure upgrades required.
Embedding of Net Zero as part of the annual cycle of capital project identification and funding prioritisation	Full integration of Net Zero as part of the annual cycle of capital programme development, including identifying new and emerging Net Zero priorities.	Net Zero Implementation Board	01/07/2025	Embedding of an annual exercise to identify potential new opportunities of emissions reduction and funding as part of institutional capital programme planning.
Development of pathway delivery plans	Sequencing exercise involving the analysis of critical pathway actions.	Net Zero Implementation Board with assistance from delivery partners	31/03/2026	A sequenced delivery programme detailing the linkages and key dates for projects.
Identification of funding sources	Exercise to identify and plan internal capital investment and external funding sources to address the scale of sustained capital investment required	Net Zero Implementation Board	31/03/2026	A multi-year funding programme for key large-scale projects linked to the delivery programme.[11]
Investment prioritisation exercise	Exercise to prioritise Net Zero projects for funding.	Net Zero Implementation Board	31/03/2026	A prioritised list of projects to be shared across various committees to assist in funding allocation.

Table 9-1: High Level Implementation Plan

While the focus of this programme is largely on the major capital investment required in campus infrastructure, the pathways that major on behaviour change, local empowerment, and policy or guidance arrangements, will require additional investment in staff resources and training to fully reflect the "whole institution" approach to sustainability that this strategy is built upon.

Delivery of these pathways will in part be supported by the embedding of key actions in School and Directorate Sustainability Reporting, a process due to be launched in academic year 2024/2025, with progress against these distributed actions being reported through the Sustainable Development Committee.

[11] In accordance with Scottish Government requirements.

10. Cost of Achieving Net Zero

It is acknowledged that achieving Net Zero before 2040, including delivering against the associated decarbonisation pathways and making progress towards the targets detailed, will require significant investment in capital and staffing resources.

A live Net Zero Project Register has been developed to collate a long list of potential decarbonisation projects for all of the emission sources highlighted in our baseline and pathways.

Examples of decarbonisation projects of varying scale include:

- Installation of a buffer vessel into the Old Aberdeen CHP District heating network
- LED lighting upgrades
- Installation of variable speed drives
- Installation of Solar Photovoltaic (PV) modules onto a selection of suitable buildings
- Review of plant room controls

The register provides high level project descriptions and estimates of emission reductions. These high-level details enable users to identify projects suitable for a particular building or funding source, or for further development and impact analysis.[12]

Each of these decarbonisation projects and activities has an associated investment cost, but estimating the eventual aggregate scale of investment required to deliver Net Zero is a challenge.

To that end, a consortium of sector bodies including AUDE, EAUC and BUFDG developed the "Cost of Net Zero Calculator" tool to assist universities in developing long term financial plans for achieving Net Zero. The tool provides high-level direct and indirect investment estimates for each emissions Scope.

Using this tool and applying VAT and some anticipated University specific costs and contingencies, the tool predicted that the headline direct investment cost estimate for the University was likely to be in excess of £100 million.

The majority of these investment costs are associated with the decarbonisation of our Scope 1 and 2 emissions, primarily the decarbonisation of our natural gas fired combined heat and power engine and heat networks, and the move to renewable electricity generation technologies, but also includes allowance for fabric upgrades of building to facilitate a shift to new heat technologies.

In order to provide greater clarity as to the 'actual' cost delivering Net Zero, it is anticipated that the University will need to develop long-term relationships partner with one or more delivery partners. Through such partnerships, we will be able to review our decarbonisation

[12] Please refer to **Appendix D** for more information.

pathways and establish tailored cost profiles and implementation plans with greater granularity than what the "Cost of Net Zero Calculator" tool can provide. Given the capital constraints facing the sector at large, such partnerships also afford the opportunity of exploring alternative funding models.

10.1. Sources of Funding

As the journey to Net Zero is a long-term commitment requiring sustained focus and investment for more than a decade, there is an expectation, including from sector funders, that the investment required must be incorporated into the institution's long term financial planning, with annual budgets for smaller projects and activities, and the costs of significant projects identified in advance and included in planning.

With public funds and institutional capital limited, it is anticipated that external funding, including grants, loans, and third-party capital, will need to be identified to support the University in its implementation of these strategies.

Thus, as well as making an annual capital allocation available for the delivery of Net Zero projects from institutional funding, the following funding sources and financial schemes are among those that the University will explore to fund its Net Zero Journey:

- Loans, grants, and match-funding e.g., the SALIX scheme
- Power and heat purchase agreements e.g., long-term arrangements in exchange for capital investment
- External funding partnerships e.g., exploration of third-party capital investment
- Government frameworks
- Internal "reinvestment" fund from cost savings e.g., recycling savings back into Net Zero projects

10.2. Additional Costs

In addition to the capital investment required to complete decarbonisation projects and initiatives, there are additional costs associated with undertaking the journey to Net Zero.

10.2.1. Indirect Operational Costs

As all parts of the supply chain move towards Net Zero, how all businesses operate will have to change. It is expected that there will be increases in the price of certain goods and services as their providers pass on their costs of decarbonising. The higher cost of electric vehicles, or the investment in electrification of processes and factories are, for example, likely to be passed on to the consumer.

The "Cost of Net Zero Calculator" tool estimates that these increases in costs amount to almost £30 million for procurement alone, although the true scale of this is yet to be truly realised.

10.2.2. Staff Resourcing and Knowledge Upskilling

The staff resource requirement for achieving Net Zero extends beyond the Estates & Facilities section of the University. An expansion in certain teams across the University seems inevitable and will be needed in addition to the establishment of more behaviourally focussed "Net Zero

or Sustainability Champions". Areas where it is reasonable to assume that additional staffing capacity will be required include:

- Procurement e.g., supply chain engagement and power purchase agreements
- Finance e.g., offset budgeting and power purchase agreements
- Transport and Waste
- Energy
- Projects & Small Works team
- Sustainability

Additionally, a widespread programme of upskilling staff and teams across the University, including through internal engagement and directed CPD, will be necessary to ensure that everyone is confident in applying current standards and seizing opportunities. This development of a "whole institution" approach will be an ongoing process, reflecting the rapidly evolving Net Zero landscape and magnified as we move rapidly towards statutory government targets and deadlines.[13]

10.2.3. Audits and Surveys

To aid in focussing Net Zero project funding appropriately, it is expected that some enabling spend on energy auditing and specialist surveying of University buildings and operations will required. This activity is likely to include the following:

- Roof Condition Surveys e.g., to investigate the potential for installing solar or other renewable energy systems.
- Building Surveys e.g., focussing on insulation, heating efficiency, windows, electrical equipment, and space utilisation.
- Energy Audits e.g., surveying buildings to determine how much energy a building uses and identifying ways to reduce energy consumption.

[13] HESPA's "Integrating climate into strategy and planning in universities" report, published in November 2023 in partnership with SUMS Consulting, highlights the need for strategic planners to receive sustainability/net zero training to enable them to become advocates in planning and governance.

11. Monitoring and Reporting Progress

A key component of Net Zero is ensuring that progress, positive or negative, is consistently and transparently monitored and reported in a suitable format. The University's progress against its targets will, where possible, be monitored twice a year by relevant pathway owners and stakeholders. It is anticipated that internal reporting will include, for example:

- Quarterly reports to:
    - Sustainable Development Committee
    - Estates Committee
        - With updates to Financial Resources Committee / Court
- Annual reports to be uploaded onto the University's Sustainability website:
    - Emissions (all Scopes)
    - Energy
    - Waste
    - Travel
- In-year progress available through the Sustainability Dashboard
- Ad-hoc presentations to staff and students
- Annual analysis and reporting of the quality of data and calculation methodologies (see **Appendix D**)

External reporting will typically be linked to governmental or sectoral initiatives, including:

- Public Bodies Climate Change Duty (PBCCD) i.e., our annual statutory report with a deadline of the end of November
- Higher Education Statistics Agency (HESA) i.e., annual data reporting submitted in early spring.
- Scottish Funding Council (SFC) i.e., annual outcome agreements compiled every academic year.
- United Kingdom Emissions Trading Scheme (UK ETS) i.e., annual returns and audits
- Medium Combustion Plant Directive (MCPD) i.e., annual returns and audits
- Combined Heat and Power Quality Assurance (CHPQA) i.e., monthly monitoring and annual return of quality of produced CHP.
- HM Revenue and Customs (HMRC) i.e., monthly monitoring and annual return of quality of produced CHP.

12. External Influences

As part of our Net Zero strategy, we acknowledge that the journey to achieving Net Zero will be, in part, dependent on a number of external factors and influences.

While some of these can be influenced by the University e.g. through sector consultations, it is likely that the most of these factors will be beyond our control:

- Target for National Grid achieving a Net Zero grid electricity infrastructure/system by 2035.
- Suppliers/contractors/manufacturers having their own Net Zero targets and strategies.
- Manufacturers reducing the embodied emissions in the items they produce.
- Uptake of low carbon technologies (i.e., electrical fleet vehicles) by suppliers/contractors.
- Government funding or grants to support Net Zero initiatives.
- Government targets and other political developments.
- Gradual impact of renewable generation sources on grid electricity emission conversion factors.
- Role and impact of hydrogen as a contributing fuel in national and regional decarbonisation.
- The continued recruitment of international students across the HE sector and in Aberdeen.
- Availability of schemes to reduce the operating costs of low carbon technologies.
- Developments in the standard methodology for calculating procurement emissions, notably a shift away from reliance on spend-based towards commodity-based methods to incentivise behaviour change and climate-friendly procurement practices.

The University will work to remain appraised of all these trends, work collaboratively where possible to influence factors within its control, and reflecting changing Net Zero practice as we evaluate and track our progress towards our own 2040 targets.

13. Beyond 2040

Once we have reached 2040, any remaining residual institutional emissions will need to be removed via offsetting or active sequestration, but this will not remove or reduce the need for ensuring Net Zero and sustainability remain embedded in day-to-day operations and long-term ambitions.

Any activities or targets detailed in the decarbonisation pathways that remain relevant but have not been completed by 2040 should be retained as part of longer-term planning.

As previously acknowledged, aspects of our Scope 3 emissions are expected to be challenging to eliminate, meaning that work to avoid or reduce these emissions will still be required.

Indeed, the recurrent cost of offsetting will serve as a constant reminder of the need to drive down operational emissions wherever possible.

While the immediate focus of Net Zero is on decarbonisation before 2040, the imperative to manage and reduce emissions is now an established norm that will remain part of institutional thinking for the foreseeable future. Embedding Net Zero thinking now will ensure that the long-term growth and development of the University and its operations can remain sustainable well into the second-half of this Century.

Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
AoC	Association of Colleges
APUC	Advanced Procurement for Universities & Colleges
AUDE	Association of University Directors of Estates
BREEAM	Building Research Establishment Environmental Assessment Methodology
BUFDG	British Universities Finance Directors Group
CHP	Combined Heat and Power
CHPQA	Combined Heat and Power Quality Assurance
CMPs	Carbon Management Plans
CO_2	Carbon Dioxide
CPD	Continuous Professional Development
DEFRA	Department for Environment Food and Rural Affairs
DNO	Distribution Network Operators
DRS	Deposit Return Scheme
EAUC	Environmental Association for Universities and Colleges
EMT	Energy Management Team
EV	Electric Vehicle
FTE	Full Time Equivalent
GHG	Greenhouse Gases
Grey Fleet	Employees' private vehicles used for business travel
HE	Higher Education
HESA	Higher Education Statistics Agency
HESCET	Higher Education Supply Chain Emissions tool
HESPA	Higher Education Strategic Planners Association
HH	Hillhead
HMRC	HM Revenue and Customs
k	Thousand
KPI	Key Performance Indicator
kWh	Kilowatt Hour
LC	Low Carbon
LEAF	Laboratory Efficiency Assessment Framework
LED	Light Emitting Diode
M	Million
M&T	Monitoring and Targeting
MCPD	Medium Combustion Plant Directive
MRI	Magnetic Resonance Imaging
NHS	National Health Service
OA	Old Aberdeen
p.a	Per Annum
PBCCD	Public Bodies Climate Change Duties
PHE	Plate Heat Exchanger

PV	Photovoltaics
QS	Quacquarelli Symonds
REGO	Renewable Energy Guarantee of Origin
SBT	Science Based Targets
SBTi	Science Based Targets Initiative
SCEF	Standardised Carbon Emissions Framework for Further and Higher Education
SDGs	Sustainable Development Goals
SFC	Scottish Funding Council
SMT	Senior Management Team
SSN	Sustainable Scotland Network
T&D	Transmission & Distribution
tCO2e	Tonnes of Carbon Dioxide Equivalent
THE	Times Higher Education
UK	United Kingdom
UK ETS	United Kingdom Emissions Trading Scheme
UUK	Universities UK
VAT	Value Added Tax
WEEE	Waste Electrical and Electronic Equipment
WFH	Work From Home
WUR	World University Rankings

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Appendix A. Detailed Emission Source Summary

A breakdown of the University's emissions sources that form part of the 2015/2016 reporting baseline.

Emission Source	Total tCO_2e	% Proportion of Total
Diesel	38.88	0.12%
Petrol	5.11	0.02%
Natural Gas	13,050.68	39.61%
Gas oil (Grounds)	0.00	0.00%
Grid Electricity - Generation	0.00	0.00%
Gas oil (Heating) (litres)	232.30	0.71%
Gas oil (Heating) (kWh)	5.33	0.02%
Purchased Heat and Steam	8,373.48	25.41%
LPG (Heating) (kWh)	2,945.37	8.94%
LPG - Litres	0.00	0.00%
Transmission and Distribution - Electricity	757.38	2.30%
Transmission and Distribution - Steam	0.00	0.00%
Water - Supply	51.76	0.16%
Water - Treatment	102.35	0.31%
Domestic flight (average passenger)	951.46	2.89%
Short-haul flights (average passenger)	1,099.77	3.34%
Long-haul flights (average passenger)	-	-
International flights (average passenger)	3,149.91	9.56%
Rail (National rail)	79.03	0.24%
Bus (local bus, not London)	27.18	0.08%
Average Car - Unknown Fuel	243.32	0.74%
Ferry	5.71	0.02%
Taxi (regular)	30.58	0.09%
London Underground	1.14	0.00%
Diesel Claimed (Business Travel)	46.27	0.14%
Petrol Claimed (Business Travel)	69.21	0.21%
Sanitary	0.00	0.00%
Organic Food & Drink Composting	0.22	0.00%
Paper & Board (Mixed) Recycling	6.41	0.02%
Mixed Recycling - Other Recyclate	0.00	0.00%
Mixed Recycling	0.00	0.00%
Asbestos	0.15	0.00%
WEEE (Mixed) Recycling	0.02	0.00%
Glass Recycling	0.83	0.00%
Organic Garden Waste Composting	0.61	0.00%
Metal Cans (Mixed) & Metal Scrap Recycling	2.71	0.01%
Refuse Mun/Comm/Ind to Combustion	0.00	0.00%
Other - Wood Recycled	0.00	0.00%
Other - Clinical Waste (Incinerated for energy)	13.00	0.04%
Other - Chemical Waste (Recovery and disposal)	0.00	0.00%
Working From Home	-	-
Refuse Municipal to Landfill	229.87	0.00%

Plastics (Average) Recycling	0.11	0.70%
Construction (Average) Recycling	0.04	0.00%
F-Gases - R410a	0.00	0.00%
F-Gases - HFC-32	0.00	0.00%
F-Gases - R407c	12.95	0.04%
F-Gases - R417a	0.00	0.00%
F-Gases - HFC-134a	0.00	0.00%
F-Gases - R422d	0.00	0.00%
F-Gases - R404a	0.00	0.00%
F-Gases - CFC-12/R12	0.00	0.00%
Hotel Stays - Travel Provider	-	-
Hotel Stays - Expenses - Trade Suppliers	815.89	2.48%
Hotel Stays - Expenses - Staff and Honorary Staff	476.98	1.45%
Hotel Stays - Expenses - 3rd Party	23.23	0.07%
Hotel Stays - Expenses - Students	99.74	0.30%
Total (tonnes)	**31,533.12**	

Appendix Table A: Detailed Emission Source Summary

Appendix B. Science Based Targets Summary

A brief overview of the Science Based Targets Initiative and the associated decarbonisation target approaches and deadlines.

Science-Based Targets (SBTs) provide a pathway for organisations to reduce greenhouse gas (GHG) emissions, helping prevent the worst impacts of climate change and future-proof growth.

The driving force behind SBTs is the Science-Based Targets Initiative (SBTi), a joint initiative of CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI) and World-Wide Fund for Nature (WWF), that develops methods and criteria for effective climate action and validates targets.

Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement i.e., limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

Such targets must take into account Scopes 1 and 2 according to the Greenhouse Gas Protocol Standard. If an organisation's Scope 3 emissions account for more than 40% of its total Scope 1, Scope 2 and Scope 3 emissions, the targets must also cover Scope 3.

The SBT guidance provides a selection of approaches organisations can take to reduce emissions [8]:

Scope	Approach	Definition
1 & 2 & 3	Absolute Contraction Approach	A method for setting absolute targets that uses contraction of absolute emissions. Through this approach, all organisations reduce absolute emissions at the same rate, irrespective of initial emissions performance. Consequently, an absolute emissions reduction target is defined in terms of an overall reduction in the amount of GHGs emitted to the atmosphere in the target year, relative to the base year. This method is a simple, straightforward approach to set and track progress toward targets that is applicable to most sectors.
1 & 2 & 3	Sectoral Decarbonisation Approach	A method for setting physical intensity targets that uses convergence of emissions intensity. An intensity target is defined by a reduction in emissions relative to a specific business metric, such as production output of the organisation (i.e., tonnes CO2e per tonne product produced). The SDA assumes global convergence of key sectors' emissions intensity by 2050. For example, the emissions intensity of steel production in China, the U.S., and Brazil is assumed to reach the same level by 2050, regardless of its current diversity.
3	Physical intensity reduction	Organisations can also drive physical intensity reduction to cap absolute emissions at a base year level and achieve a physical intensity reduction at a minimum 7% year on year reduction rate. For example, organisation could set a target to reduce scope 3 emissions at least 52% per pair of shoes by 2030 from a 2020 base year.

3	Economic intensity contraction	GHG Emissions per Value Added is a method for setting economic intensity targets using the contraction of economic intensity. Targets set using the GEVA method are formulated by an intensity reduction of tCO2e/$ value added.
3	Supplier or customer engagement targets	Supplier or customer engagement targets may be valuable if an organisation has yet to identify levers for more specific reduction opportunities amongst its value chain partners and/or if it has mostly indirect spend and therefore does not spend enough on individual suppliers to support collaborative reduction efforts. Supplier engagement targets may help to drive reduction behaviours that benefit other customers of the same supplier.

Appendix Table B: SBT Approaches

Setting a Net Zero target builds on a science-based target to define long-term actions required for a company to align to a 1.5°C pathway. SBT guidance and targets has been developed for achieving Net Zero for each of the three scopes [9]:

The table below is a summary of the target boundary, time frame, method eligibility and minimum ambition requirements for near- and long-term SBTs. For more detail on absolute activity pathways and physical intensity convergence pathways see the Net-Zero Standard document.

			Scope 1 and 2			*Scope 3*			
Near-term science-based targets	**Target boundary**		95% coverage of scopes 1 + 2			If scope 3 >40% of total emissions: boundary to cover min. 67% of scope 3.			
	Target year		5 – 10 years from date of submission			5 – 10 years from date of submission			
	Method eligibility and minimum ambition	*Method*	Absolute reduction	Sector-specific intensity convergence	Renewable electricity (scope 2 only)	Cross-sector absolute reduction	Sector-specific intensity convergence	Supplier or customer engagement	Scope 3 physical and economic intensity reduction
		Eligibility and min. ambition	• 4.2% linear annual reduction (LAR)	• Depends on sector and company inputs	• 80% RE by 2025 • 100% RE by 2030	• 2.5% LAR	• Depends on sector and company inputs (SDA)	• e.g. 80% of suppliers by emissions by 2025	• 7% year-on-year (both options)
Long-term and net-zero science-based targets	**Target boundary**		95% coverage of scopes 1 + 2			90% coverage of scope 3			
	Target year		2050 or sooner (2040 for the power sector)			2050 or sooner			
	Method eligibility and minimum ambition	*Method*	Absolute reduction	Sector-specific intensity convergence	Renewable electricity (scope 2 only)	Cross-sector absolute reduction	Sector-specific intensity convergence	Supplier or customer engagement	Scope 3 physical and economic intensity reduction
		Eligibility and min. ambition	• 90% reduction (cross-sector pathway) • 72% reduction for FLAG • Other sector pathways vary	• Sector / commodity pathways vary	• 100% RE	• 90% reduction (cross-sector pathway) • 72% reduction for FLAG • Other sector pathways vary	• Sector / commodity pathways vary	• Methods are not eligible for long-term SBTs	• 97% reduction (both options)

Not eligible | 1.5˚C ambition | Well-below 2˚C ambition

Appendix Figure A: Science Based Net Zero Targets

Appendix C. Decarbonisation Pathway Actions

The full list of actions associated with all the activities detailed in the decarbonisation pathways in Section 6. It should be noted that the majority are classified as short-term, highlighting the volume of work needing done to facilitate the decarbonisation journey.

Short Term Actions

Pathway	Activity
Sustainable Labs	Develop sustainable laboratories guidance
Sustainable Labs	Require all laboratories to sign up to a sustainability accreditation scheme (i.e., LEAF scheme)
Sustainable Labs	Encourage the establishment of Green Lab Champions within all schools
Sustainable Labs	Operationalise the outcomes of the climate and sustainability assembly on green labs.
Sustainable Supply Chain	Create a database of sustainability focussed procurement questions.
Sustainable Supply Chain	Develop a sustainable procurement guide for schools and professional services and accompanying training for purchases under £50k.
Sustainable Supply Chain	Improve sustainability weighting in tenders.
Sustainable Supply Chain	Update project practices to ensure circular economy is considered and encouraged.
Sustainable Supply Chain	Improve staffing levels to allow dedicated resource for supplier engagement with regards to Net Zero/sustainability/innovation/compatibility.
Sustainable Supply Chain	Train procurement staff and those who are involved in procurement practices (devolved procurement) on sustainable procurement practices to become sustainability champions and promote net zero and best practices.
Sustainable Supply Chain	Update sustainable procurement strategy to include: • Circular economy • Repair and re-use • Rent or share instead of purchase
Sustainable Supply Chain	Update finance practices to encourage long term leasing instead of purchasing
Sustainable Supply Chain	Engagement and backing of senior staff on sustainable procurement practices
Construction & Maintenance	Identify energy, water, and carbon emission minimum targets for all projects.
Construction & Maintenance	All maintenance and project activities carried out must demonstrate a reduction in energy use.
Construction & Maintenance	Update of the design guide to include sustainability/adaptation/net zero/biodiversity practices. Including: • Quantifiably improve biodiversity levels with every project. • Adoption of circular economy practices in all projects. • All projects have the aim of making a building suitable for a low temperature district heating system. • All projects will include carbon life cycle analysis. • Cessation of natural gas fired boiler installations from 2024.

	• Develop a checklist for standard energy efficiency improvements for all capital projects.
Construction & Maintenance	Sustainability/Net Zero to be a key component of all tenders and selection of contractors/sub-contractors.
Construction & Maintenance	Expectation that all consultants/designers/contractors have demonstrable experience in Net Zero/Sustainability.
Construction & Maintenance	Increase awareness and understanding about Net Zero and Sustainability: • Increase awareness of legislation for all teams. • Develop toolbox talks and maintenance specific sustainability/Net Zero training.
Construction & Maintenance	Create in-situ plate heat exchanger (PHE) rolling cleaning program.
Behaviour Change and Empowerment	Identify appropriate dedicated and devolved capacity to support behaviour change including: • Enhanced capacity in the central Sustainability Team • Identification of areas within other operational units that require additional staffing resources to deliver Net Zero Strategy
Behaviour Change and Empowerment	Sustainability to be reflected in all job descriptions and staff appraisal discussions
Behaviour Change and Empowerment	Robust staff communications to ensure that all staff recognise and support programmes that encourage good 'housekeeping' e.g., switching off lights, limiting printing etc.
Behaviour Change and Empowerment	Leadership by example with SMT modelling and promoting positive sustainability behaviours
Behaviour Change and Empowerment	Introduction of a sustainability e-learning module promoted to all staff (and then work with AUSA to develop student training)
Behaviour Change and Empowerment	Develop and monitor appropriate KPIs and survey data that provide insight into whether behaviour is improving e.g., business travel metrics
Biodiversity	Creation of a Biodiversity Review Group that will meet twice a year as a minimum, with group to include external members such as local community council representative, and local biodiversity partnership (NESBiP) coordinator/chair.
Biodiversity	Creation of a Biodiversity Policy outlining our high-level commitments to biodiversity
Biodiversity	Creation of a 3-year Biodiversity Action Plan (BAP) for all managed sites which will include yearly reporting on KPI's
Digital Sustainability	Establish a Digital Sustainability Reporting capability.
Digital Sustainability	Follow University recommended best practices and guidelines for sustainable procurement of Digital products and services.
Decarbonised Heat	Improve the operations and efficiency of University Heat Centres.
Decarbonised Heat	Installation of one or more buffer vessels into the Old Aberdeen district main.

Sustainable Labs	Develop laboratory focussed Net Zero training and develop behaviour change campaigns (how we plan experiments, how we use our equipment, where equipment is stored)
Sustainable Labs	Develop guidance on laboratory consumables
Sustainable Labs	Develop guidance on purchasing new equipment
Sustainable Labs	Encourage the use of shared services and equipment to create central locations/model
LC Electricity Generation and Storage	Eventual replacement of the natural gas fired CHP engine on the Kings College campus.
LC Electricity Generation and Storage	PV installation across our campuses, and optimisation and upgrade of existing installations e.g., Hillhead installation.
LC Electricity Generation and Storage	Installation of PV car park covers.
LC Electricity Generation and Storage	Installation of battery storage capacity on our sites to store renewably generated energy onsite and provide the flexibility required for a smart grid.
LC Electricity Generation and Storage	Investigation of sleaving options to ensure grid consumption can be reported as renewable.
Sustainable Supply Chain	Standardise office furniture and require any requests for new furniture first ensure options are not available in storage.
Sustainable Supply Chain	Improve asset management system to allow staff to search for equipment already available/in storage.
Construction & Maintenance	Develop maintenance purchasing and operational guidance.
Behaviour Change and Empowerment	Establishment of an engagement framework, so that employees from different areas of the university can engage with sustainability on an ad-hoc basis
Behaviour Change and Empowerment	Develop mechanisms and guidance to reinforce expected behaviours e.g., Sustainable Business Travel, support for circular economy procurement principles etc
Behaviour Change and Empowerment	Institution-wide policy review to ensure sustainability impacts (and how to avoid them) are reflected in wider policy framework
Behaviour Change and Empowerment	Creation of a central discretionary fund to support behaviour change e.g., ability to justify replacing kit with more efficient model for a higher cost but reduced running costs)
Waste	Waste segregation - implement the deposit return scheme when it is introduced by the government.
Waste	Waste segregation - ensure recycling bins are available for all commonly produced recyclable waste at the University.
Green Fleet	Fleet infrastructure - Develop and implement an EV charging network on campus to support the transition to an EV fleet.
Decarbonised Heat	Upgrade the Hillhead Student Village heating station and system.

Decarbonised Heat	Connection of Hillhead and Old Aberdeen District Heating Networks
Decarbonised Heat	Investigate the potential of a connection of the OA and HH networks to the civic district network.
Construction & Maintenance	Increase staff capacity, with the aim to have a Net Zero Project Manager who is dedicated to managing Net Zero projects.
Construction & Maintenance	Review of chillers, and other large electrical consumers e.g., air-handling units, water-pumps, air-conditioning.
Construction & Maintenance	Develop building asset profiles to highlight sustainability levels.
Behaviour Change and Empowerment	Schools and Directorates given budgetary authority to make sustainable choices e.g., to justify more energy efficient equipment choices, choosing a different travel mode etc
Biodiversity	Identification of all areas of greenspace and beneficial habitats (including artificial structures) the University owns/manages through a standardised ecological mapping methodology (UKHab). Followed by the calculation of Biodiversity Units by conducting site condition surveys with the UKHab mapping as its basis. This work will be reviewed regularly every 3 years as a minimum, but preferably yearly.
Digital Sustainability	Reduce data storage through data lifecycle management improvements.
Green Fleet	Data collection - Improve data collection and work with the sector to improve the accuracy of fleet emission data.
Green Fleet	External EV charging - develop a convenient and efficient charge payment process for EV fleet users.
Green Fleet	EV familiarisation - educate and train staff in the use and charging of EV's.
Waste	Waste minimisation - work proactively with the procurement team and APUC to ensure goods are reusable and recyclable. Adopt circular economy principles where feasible.
Green Fleet	Fleet management - consider centralising fleet management to allow the rationalisation of the fleet and to reduce reliance on the grey fleet.
Digital Sustainability	Monitor and optimise lifecycle management of Digital equipment
Decarbonised Heat	Internally survey the Old Aberdeen network pipework
Decarbonised Heat	Upgrade insulation of the Old Aberdeen network pipework
Decarbonised Heat	Connection of the outlying Old Aberdeen sites to the district main.
Construction & Maintenance	All lighting to be upgraded and maintained with the most efficient LEDs available.
Construction & Maintenance	Create sustainability submission portal for maintenance staff to submit ideas/suggestions/observations.
Digital Sustainability	Increase use of renewable energy to power Digital

Waste	User behaviour - Develop a recurring engagement strategy to encourage and enable students to segregate and recycle their waste.

Appendix Table C: Pathway Actions - Short Term

Mid-Term Actions

Pathway	Activity
Decarbonised Heat	Reduce the operating temperatures of the district heat networks.
Digital Sustainability	Evolve a Digital Sustainability Reporting capability.
Decarbonised Heat	Decarbonised heat source for existing University owned heat networks
Decarbonised Heat	Installation of one or more buffer vessels into the Hillhead district main.
Decarbonised Heat	Connection of Hillhead and Old Aberdeen District Heating Networks
LC Electricity Generation and Storage	Eventual replacement of the natural gas fired CHP engine on the Kings College campus.
LC Electricity Generation and Storage	Investigation of sleaving options to ensure grid consumption can be reported as renewable.
Biodiversity	Identification of all areas of greenspace and beneficial habitats (including artificial structures) the University owns/manages through a standardised ecological mapping methodology (UKHab). Followed by the calculation of Biodiversity Units by conducting site condition surveys with the UKHab mapping as its basis. This work will be reviewed regularly every 3 years as a minimum, but preferably yearly.
Waste	Waste disposal - recycle or reuse 80% of waste produced at the University.
Waste	Waste segregation - implement the recommendations of the 2021 benchmarking review.
Construction & Maintenance	All sites are correctly space managed to make full use of all buildings.
Construction & Maintenance	Utilise spaces as they have been designed for or design spaces to be flexible to meet potential future needs without significant alterations.

Appendix Table D: Pathway Actions - Mid-Term

Long-Term Actions

Pathway	Activity
Green Fleet	Fleet composition - transition all fleet vehicles to EV, or other low emission fuel, except those which cannot for operational reasons. Work with the procurement team to ensure low emission options are available and considered as vehicles are replaced.

Sustainable Labs	Upgrade, rationalise or optimise scientific equipment e.g., lasers, MRI, freezers.
LC Electricity Generation and Storage	Reduce demand of electricity demand of sites to as low as possible.
Digital Sustainability	Use of renewable energy to power Digital

Appendix Table E: Pathway Actions - Long Term

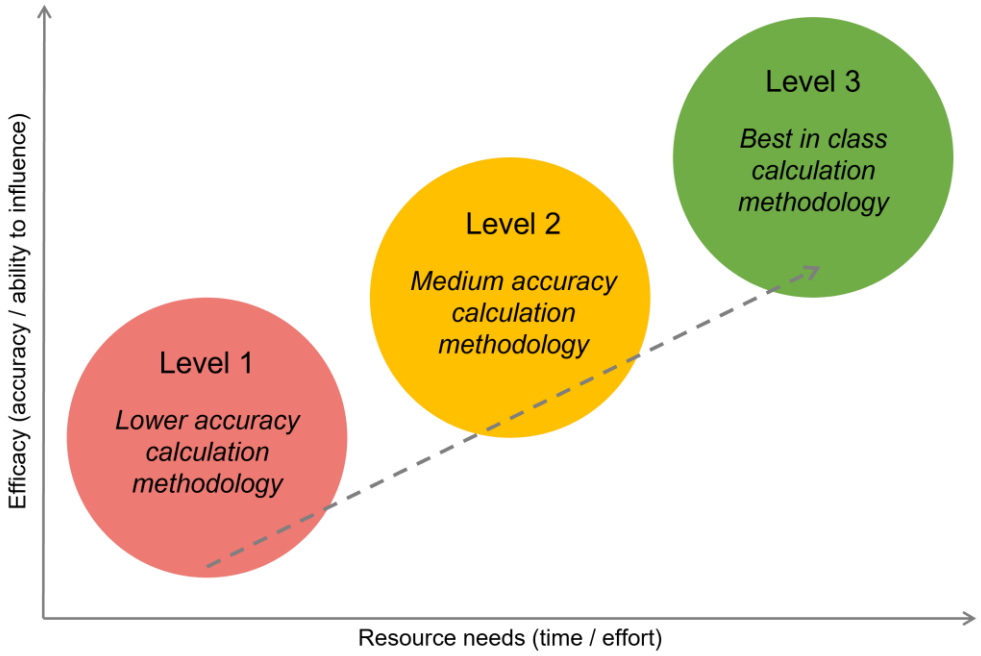
Appendix D. Data Quality

Analysis of the data gathering methodologies, through the SCEF guidance, associated for all emissions sources that form the University's profile.

A key component of SBTs is the quality of data used to measure an organisation's progress towards its targets. Due to the variety of emission streams, the methodologies for gathering data vary in complexity and accuracy.

In an effort to establish a standardised carbon emissions reporting and monitoring methodology for the Further and Higher Education Sector, the "Standardised Carbon Emissions Framework" [14] for Further and Higher Education (SCEF) was developed by the EAUC, in consultation with the Queens' Platinum Challenge participants[15] and other sector member bodies, including the Association of Colleges (AoC), Colleges Scotland and Universities UK (UUK). [10]

The Framework brings together good practice and guidance and is based on the GHG Protocol. It also lays the foundation for institutions that may wish to take a Science-Based Target approach to Net Zero.



Appendix Figure B: Data Quality Levels [Source: EcoAct]

Appendix Figure B illustrates the three 'levels' of reporting accuracy that have been developed to help institutions understand the maturity of their emissions data.

Using this framework, we have taken the opportunity to undertake a self-assessment of the University's current emissions data gathering methodologies. Appendix Table F indicates how our current data gathering fares against these standards.

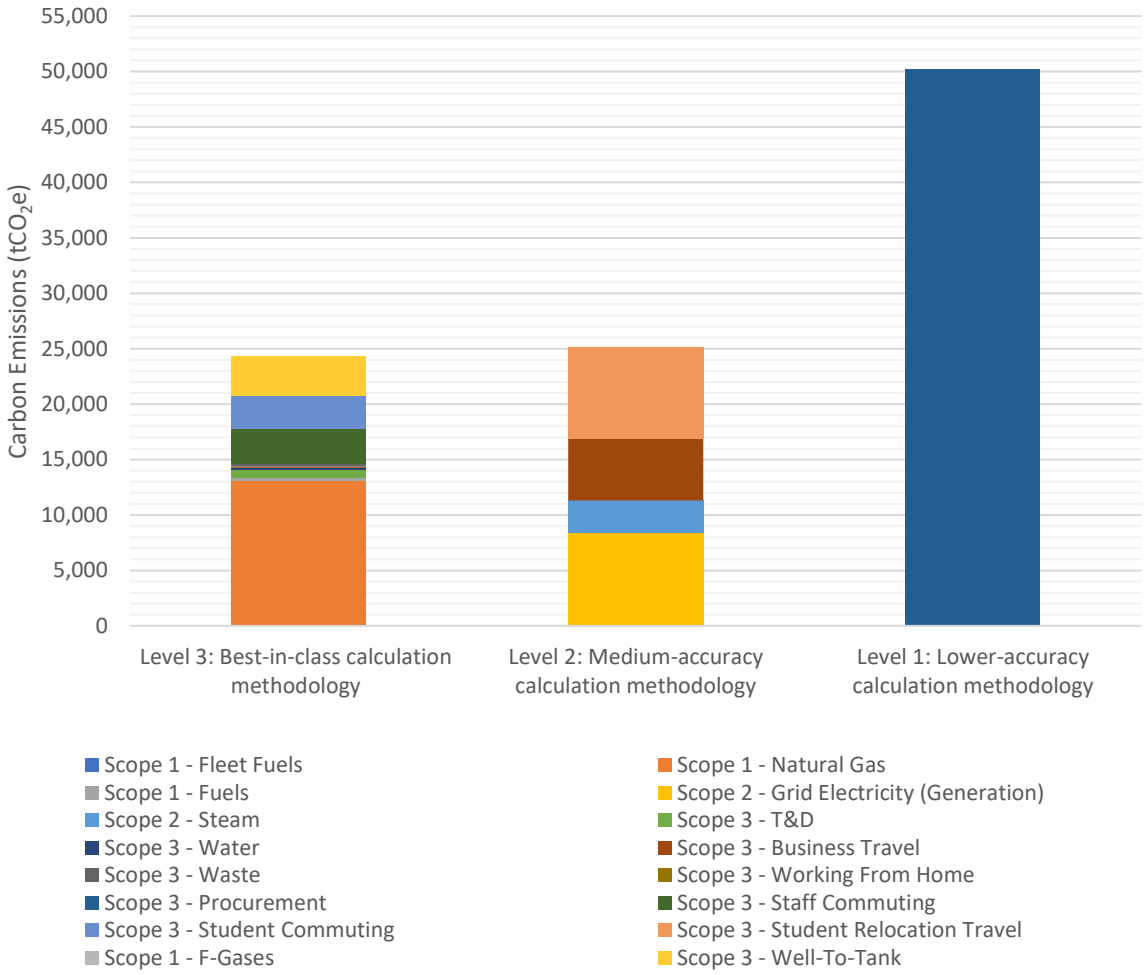
Level	Count	% Proportion
Level 3: Best-in-class calculation methodology	66	65.35%
Level 2: Medium-accuracy calculation methodology	22	21.78%

[14] https://www.eauc.org.uk/scef

[15] The University of Aberdeen was involved in a number of outputs for the Queen's Platinum Challenge that year.

Level 1: Lower-accuracy calculation methodology	13	12.87%

Appendix Table F: Data Gathering Methodology Quality Results



Appendix Figure C: Data Gathering Methodology Quality Results

While the data gathering and calculation methodology for the majority of the University's emission sources is classified as 'best-in-class', it is worth noting these 66 categories only accounts for 24.4% of our baseline emissions.

A further 22 emissions categories are assessed as having medium accuracy methodologies account for 25.2% of baseline emissions, while the remaining 13 emissions categories assessed as lower accuracy. account for 50.4% of baseline emissions. This imbalance is entirely due to the acknowledged limitations of using a spend-based calculation to quantify Procurement emissions, our biggest single source under Scope 3.

D.1. Level 3 – Best-In-Class

Currently all methodologies for Scope 1 emissions sources (fleet fuel use, natural gas, F-gases, and other heat fuels) are classified as best-in-class. These emissions account for 13.4% of our baseline emissions total.

The methodology associated with Transmission and Distribution (T&D) and well-to-tank emissions related to energy use are classified as best-in-class as they are using metered

energy use and DEFRA emission factors. However, it should be noted that there is only one methodology detailed in the SCEF document for both sources.

The Business travel methodologies relating to fuel claimed and the majority of waste methodologies are all classified as Level 3, but it is acknowledged that the methodologies still have a level of uncertainty.

The staff and student commuting methodologies are classified as best-in-class as they are drawn from the same travel survey issued once every 2 years.

Currently the University utilises regional Scottish government factors for water and sewerage, and also includes sewerage from grey water harvesting. This aligns with the best-in-class guidance in SCEF.

D.2. Level 2 – Medium Accuracy

Currently all methodologies for Scope 2 emissions sources (grid electricity and purchased steam) are classified as being level 2 – medium accuracy. These emissions account for 11.36% of our baseline emissions total.

The University utilises grid electricity emission factors from the UK government which are do not meet the Level 3 requirements of being supplier specific. It should be noted that the University previously purchased Renewable Energy Guarantee of Origin (REGO) certificates for all grid electricity it directly purchases but was unable to report this through Public Bodies Climate Change Duty at the time.

It is a similar situation with the steam the University purchases from the NHS and the fresh water purchased; the UK government factor is applied as part of our methodology instead of a supplier specific one.

The majority of business travel methodologies are classified as have medium accuracy:

- Domestic flight (average passenger)
- Short-haul flights (average passenger)
- International flights (average passenger)
- Rail (National rail)
- Bus (local bus, not London)
- Average Car - Unknown Fuel
- Ferry
- Taxi (regular)
- London Underground

The current methodologies do not provide enough detail to distinguish between travel class and vehicle type/class. Additionally, the University currently gathers travel through two methods; the first being a detailed report from our travel agency if a staff member has booked through them. The second is details submitted by staff as part of the reimbursement process. The second method has significant risks for inaccuracy and as such the University considers business travel to be a key area needing improvement.

While most waste streams are weighed when they are uplifted, and their treatment and final destination known, Waste Electrical and Electronic Equipment (WEEE) and Sanitary Waste do not meet this level of accuracy. In the case of WEEE, the treatment and final destination is not always known as equipment is graded for reuse, with material not suitable for reuse being dismantled and recycled in various different ways. In the case of Sanitary waste, we know the treatment and final destination of the waste but do not receive accurate weights.

The University's methodology for calculating student relocation emissions by calculating travel distance from the capital of home country to Aberdeen (with a layover in London for international students) and then applying assumptions on travel methods and 1 return journey a year. Our bi-annual travel surveys enable a higher-level granularity for the assumptions.

D.3. Level 1 – Lower Accuracy

one of the largest emission sources are classified as having Level 1 methodologies. Currently the data gathering methodology for procurement emissions, across the HE sector, is the Higher Education Supply Chain Emissions tool (HESCET) which utilises a spend based approach. All procurement spend[16] by the University is mapped to a defined list of 110 DEFRA categories which have individual carbon conversion factors.

Unfortunately, HESCET does not factor in the following key factors:

- Distance between the University and suppliers/service providers.
- Any sustainability/Net Zero/Circular Economy practices of the supplier
- Categories like meat are one group and do not have unique factors for each type.

Additionally, this tool penalises investment in more sustainable services and goods which typically have a higher cost associated with them.

The University utilises the PBCCD WFH methodology of a default factor per full time equivalent (FTE), however, this is classified as being a Level 1 accuracy methodology by the SCEF tool.

D.4. Recommendations

The SCEF tool is a useful method of evaluating the University's emission calculating methodologies and identifying areas of uncertainty and risk. However, the tool is, in certain areas, in conflict with the PBCCD reporting requirements and the University considers this the standard in which we will work towards. Until the PBCCD guidance is updated to reflect the SCEF guidance, the University will not be altering a number of our methodologies.

[16] The University removes the data relating to business travel, water, and energy from the spend data profile before using the tool as our methodologies for these sources are either Level 3 or Level 2 and we have a higher confidence the resulting emission totals.

It should be acknowledged that there are a number of University methodologies that were between two SCEF levels but we defaulted to the lower level.

Level	Recommendation
Level 3	For all currently classified Level 3 methodologies, the University will continue to monitor sector best practice and guidance to ensure they do not decrease in rating.
Level 2	Where possible, the University will engage with its suppliers for grid electricity and steam to obtain specific conversion factors. However, guidance from PBCCD will be needed as to whether these factors can be used instead of the default national values. The University will investigate the potential to improve business travel reporting accuracy. One option is to book all travel through our travel provider, but this would have time and cost implications which would need to be considered and mitigated. Improvements to waste reporting are likely to occur without intervention as waste contractors improve their own reporting systems. The possible exception to this is from WEEE as the mixed materials in the waste have multiple treatment and disposal routes. Improvements in this area may be out with the influence of the University. The University is going to continue to make use of the travel survey issued every 2 years to improve the assumptions used in the calculation of student relocation emissions. Significant additional work would need to be undertaken to achieve Level 3 and at this time the University will continue to review how it can achieve this.
Level 1	Until an alternative tool or methodology is developed to calculate procurement emissions and endorsed by the sector and PBCCD to replace the HESCET tool, these will continue to have a high degree of uncertainty. As the University is required to report WFH emissions using methodologies approved by PBCCD, and also due to the increased calculation and assumption requirements of the Level 3 methodology, the University will continue to utilise the PBCCD methodology until further guidance is issued.

Appendix Table G: Data Quality Recommendations

Appendix E. Decarbonisation Projects

Summary of Net Zero Project Register and Project Prioritisation Methodology

A live Net Zero Project Register has been developed and will be the main central repository for all projects that will aid the University in reaching Net Zero.

The register collates decarbonisation projects for all emission sources highlighted in our baseline and pathways. Examples include:

- Installation of a buffer vessel into the Old Aberdeen CHP District heating network
- Behaviour change campaign for the Foresterhill Medical Campus
- LED lighting upgrades
- Installation of variable speed drives
- Installation of Solar Photovoltaic (PV) modules onto a selection of suitable buildings
- Review of plant controls

The tool provides high level project descriptions and estimation of emission reductions. These details enable users to identify projects for a particular building or a funding source, for further development and impact analysis.

Where possible, projects will be managed internally, however, where highly specialised knowledge sets are required to ensure successful implementation of a project is required, external consultants or partners will be engaged.

As part of the annual Net Zero cycle, Figure 6-2, the register will be reviewed to ensure relevance of existing projects and to add any newly identified projects.

E.1. Project Prioritisation

The Sustainability Team, within Estates & Facilities, has developed a project categorisation methodology that assess projects against four criteria – "Cost, Carbon, Complexity, and Criticality", otherwise known as the "4Cs".

By grading a project by the four criteria, the associated benefits and drawbacks can be quantified, and projects then ranked to allow for a simplified funding allocation process:

	Cost	Carbon	Complexity	Criticality
High	>£250k	>200tCO_2e	Areas to Consider: • Stakeholders • External regulations • Building type • Internal competency requirements	Areas to Consider: • Operational • Financial
Medium	>£100k & <£250k	>100tCO_2e & <200tCO_2e		
Low	<£100k	<100tCO_2e		

Appendix Table H: Project Prioritisation

The score against Criticality and Carbon are used to calculate the benefit score of a project. For this score, the greater the value, the more favourable it should be viewed with regards to its benefits.

		Benefit Score		
Criticality	High	3	6	9
	Medium	2	4	6

Low	1	2	3
	Low	Medium	High

Carbon

Conversely, a project's Cost and Complexity are used to calculate the drawback score. For this score, the lower the value, the more favourable the project should be viewed as the potential issues are low.

		Drawback Score		
Complexity	High	3	6	9
	Medium	2	4	6
	Low	1	2	3
		Low	Medium	High

Cost

It should be noted that the 4 Cs are to be used as a guideline for allocating funding. If a project scores poorly with regards to benefits but there are other reasons to undertake it (such as convenience due to adjacent work), this should not stop the project being taken forward.

Additionally, the benefit and drawback scores should be regularly reviewed as the Net Zero landscape changes. For example, increases in grid electricity costs may improve the scores for PV or LEDs as the criticality score will increase.