Carbon Reduction Management Plan 2021 – 2030

Foreword by the Vice-Chancellor

Climate change is widely accepted as one of the greatest threats facing the world today and we all have a part to play in tackling it. Through its long-term planning approach and position of influence on future generations, the Higher Education sector is uniquely placed to demonstrate leadership in the field of carbon reduction and sustainability.

Our response to this has been to redouble our efforts to manage our climate impacts by declaring a Climate Emergency and confirming our target of Net Zero emissions by 2030, first established in 2018.

At Bath Spa University, we are committed to excellent carbon management. This has been demonstrated over the first ten years of work through our 2010 Carbon Reduction Management Plan, which, during a period of unprecedented growth for the University, has led to a reduction in carbon intensity of approximately 66% per m^2 of floor space and 50% per FTE.

The energy conservation programme implemented to date has been based on sound business economics and, in addition to reducing carbon emissions, has greatly improved the working and studying environment for staff and students.

By setting out and reaffirming our clear long-term vision for the University to become Carbon Neutral by 2030, this revised Carbon Reduction Management Plan demonstrates Bath Spa's commitment to being a leader in the field of sustainability. This ambition aligns perfectly with our purpose, which is to challenge our students and staff to realise their talent and thrive, for their own benefit and for the wider good. By doing this we will think and make the world better.

Meeting the targets in this plan will be challenging, especially if the University continues to grow as planned. However, given the success of our efforts to date, I am confident that the University will be successful in meeting these targets as they are an integral part of achieving our vision and ambitions.

Professor Sue Rigby
Vice-Chancellor

1 Executive Summary

In 2010, Bath Spa embarked on ten-year carbon and energy reduction plan, which aimed to cut CO_2 emissions in half from 4,000 to 2,000 tonnes per year by 2020. The programme of energy conservation measures outlined in the Carbon Reduction Management Plan (CRMP) was completed in 2018 and, has so far led to the avoidance of over 14,000 tonnes of CO_2 emissions (2020). This is estimated to have saved the University around £3.0M in energy costs against business-as-usual (by end 2020), and is expected to break even on expenditure to date by around 2022. At this point we will have spent in the region of £4M on energy and carbon reduction activities and saved approximately the same amount in energy costs. By this time, annual savings against business-as-usual will be in the order of £650k per year, which means that our carbon-reduction activities to date will become cost-positive for the University.

In the first four years of the programme, gas consumption was reduced by almost 50% and electricity by 11%, equating to a 23% decrease in CO_2. However, the University has since grown significantly, increasing floor area by *c.*50%, campus operations by 20-25%, staff and students by *c.*10% and students in University-owned accommodation by around 900. The consequent increase in carbon emissions has now been mitigated.

Reflecting the increasing urgency to tackle climate change, in Feb 2020, BSU, along with our Students' Union, declared a Climate Emergency and committed publicly to reach Net Zero carbon emissions by 2030.

This document outlines the progress we have made so far and sets out a vision, strategy and high-level plan to reach this goal. It is intended to be a "live" document and will be updated regularly as our business changes, as our plans unfold and as decarbonisation technology continues to develop.

Our Strategic approach will have six broad elements:

- Continually improving the energy efficiency of our estate by eliminating energy waste through close control of heating, cooling and ventilation plant, implementing best available technologies, up-skilling of the estates team and the fostering of energy-aware behaviours throughout the BSU community.
- Decarbonising heat at Newton Park with heat pump technology, driven by renewable electricity.
- Ensuring all new developments align with our Net Zero target, e.g. through Passivhaus design.
- Developing on and off-site renewable energy generation where practicable.
- Reduce Scope 3 emissions from transport, construction, waste and water.
- Offsetting what cannot be eliminated by the above means, through certified afforestation programmes that can provide ongoing education, research and recreation opportunities for staff and students.

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2 Introduction

In 2010, the Bath Spa University Board of Governors ratified our Carbon Reduction Management Plan (CRMP), which spanned the period 2010-2020. This plan set out a programme of energy conservation, efficiency and renewable energy initiatives that were forecast to deliver Scope 1 and 2 carbon savings of 2,000 tonnes per year, halving our annual emissions in 10 years, from a 2008/9 baseline of 4,000 tonnes.

The programme set out in the 2010 CRMP was delivered in full by 2018 and, despite a 50% growth in the footprint of our estate, a significant increase in the operational hours of our campuses and an increase in both staff and students, we have reduced annual emissions to *c.*2,300 t (pre-Covid).

This updated plan briefly describes our journey to date and sets out the scope and boundary of our Net Zero 2030 target and outlines how we will achieve it.

The one certainty we have come to accept in recent times is that everything can change. This plan is intentionally set at a high level and is flexible in order to accommodate the inevitable changes that will happen to our business over the coming decade, whatever they may be.

In our previous Plan, we addressed what are known as Scope 1 and 2 emissions. These represent direct emissions from burning fuels on site, such as gas, oil, biomass and fleet vehicle fuels (Scope 1) and emissions from the production on electricity (Scope 2). In this Plan, we will be including Scope 3 emissions, which are those produced in our supply chains, business travel and commuting, and in the wastes we produce.

The physical work in our 2010 CRMP was primarily focused on energy waste reduction and efficiency, coupled with some renewable energy development, in the form of biomass boilers and a limited amount of rooftop solar PV. While the focus on energy efficiency improvements continues, the primary interventions in this plan are the decarbonisation of heat at NP, through the use of heat pump technology, fuelled by renewable electricity and the setting of minimum standards for the energy efficiency of new developments. The inclusion of Scope 3 emissions into this Plan will provide increased focus on reducing commuting and business travel emissions and construction-based emissions. There will also be a focus on understanding our procurement-based supply chain emissions, with a view to managing these down in later iterations.

Finally, for the emissions that we cannot eliminate, our only remaining option is to offset by buying carbon sequestration services elsewhere, such as via forestry development through a certified scheme. As with all our carbon reduction activities to date, it will be essential for the offsetting component to have a circular benefit to the business by providing research and education opportunities for staff and students.

3 Context

The warming impact on our climate of anthropogenic greenhouse gas (GHG) emissions from the burning of fossil fuels is now well established science. It is also widely accepted that without radical change, this will lead to large-scale irreversible disruption to our climate in the near future, which is likely to have civilisation-threatening, worldwide economic and social consequences. The scientific consensus is that, in order to avoid serious economic, social and environmental consequences, global warming must be kept below 2°C and ideally below 1.5°C above pre-industrial levels.

We have just reached 1.2°C.

In 2008 the Department of Energy and Climate Change (DECC) published The Climate Change Act (2008)[1], which commits the UK to achieve an 80% reduction in CO_2 emissions by 2050, based on a 1990 baseline, with an interim target of 34% reduction by 2020. In view of the increasing urgency, this target has now been updated to net zero emissions by 2050, with an interim target of 78% by 2035.

In November 2016, the United Nations' Framework Convention on Climate Change (UNFCCC) "Paris Agreement" came into force. This international treaty, in which the 194 member states have made voluntary national commitments to cut GHG emissions, is designed to keep global temperature increase below 1.5 - 2°C. However, it is widely accepted that the measures proposed under the Paris Agreement fall well short of the measures needed to meet these targets.

The world's HE sector is crucial for the future prosperity of mankind, which includes playing a leading role in the decarbonisation of society. Recognising this, The Secretary of State for Innovation, Universities and Skills, in the Grant Letter to HEFCE of January 2009, made clear that the UK HE sector is expected to play a leading role in achieving The Climate Change Act. This mantle has been taken forward by a collaboration between the Association of Colleges, EAUC, GuildHE and Universities UK, in the form of the Climate Commission for UK Higher and Further Education (https://www.eauc.org.uk/climate_commission).

The Bath Spa University community recognises that all our activities have an impact on the environment, particularly in terms of carbon emissions and that we have our role to play in achieving the targets set in Paris and the Climate Change Act.

This Carbon Reduction Management Plan 2030, outlines Bath Spa's response to this most pressing of needs.

4 The story so far

During 2010, we published our first Carbon Reduction Management Plan (CRMP), which set out how we would reduce our annual Scope 1 and 2 emissions (see Figure 3) by 50%, or 2,000 tonnes, over the following 10 years to 2020. This was a challenging target due to the large proportion of Heritage buildings within our estate and the particular constraints related to the Listed Landscape of Newton Park, which restricts the opportunities for renewable electricity generation.

We have made great progress since, implementing just about every measure in the plan by 2018, and more besides. As a result, we have so far managed to avoid emitting over 14,000 tonnes of CO_2, against a "business as usual" model and have reduced the carbon intensity of our business in terms of CO_2 per unit of turnover by 60% (Table 1).

Table 1. CO_2 emissions per unit of turnover (t CO2/£M), Showing a consistent decoupling of carbon emissions from business growth.

Year	Turnover (M)	t CO_2/£M turnover
2009/10	£ 51	69.87
2010/11	£ 52	62.90
2011/12	£ 49	64.20
2012/13	£ 53	60.32
2013/14	£ 58	54.01
2014/15	£ 69	57.31
2015/16	£ 76	47.53
2016/17	£ 83	43.18
2017/18	£ 84	36.37
2018/19	£ 86	29.91
2019/20	£ 83	28.20

Despite our estate being approximately 50% larger than it was in 2008/9 (Figure 1), our operating hours being over 20% greater and the number of students living in University-owned accommodation having more than trebled, we came close to meeting our absolute target, reducing total annual Scope 1&2 emissions to 2,350 tonnes…and falling (Figure 2). This has been helped by a reduction in UK electricity grid carbon, due to the displacement of coal-generated electricity with renewables. However, when viewed in the context of our expanding Estate, Figure 1 reveals a picture of steadily increasing efficiency, both in terms of CO_2 per m^2, which has reduced by 66% since 2008/9 from 90kg to 31kg $CO_2/m^2/y$ and energy, which has reduced by 45% from 291 to 160 $kWh/m^2/y$ (Figure 1).

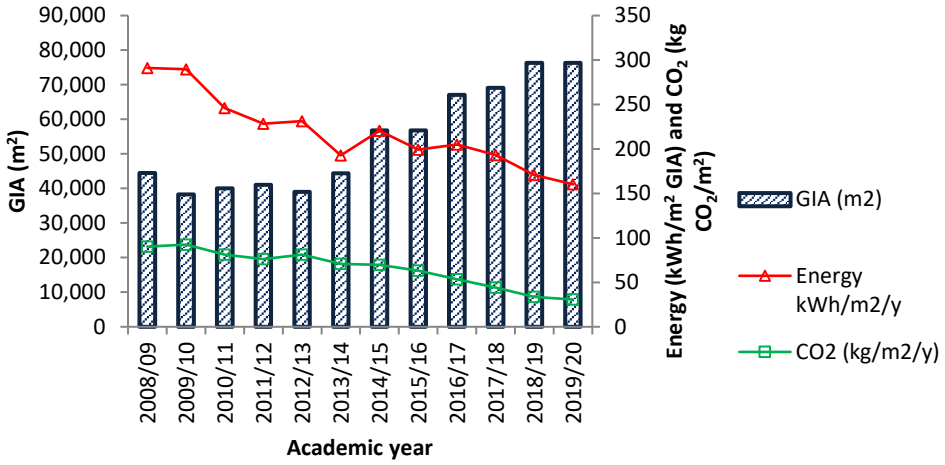


Figure 1. Energy consumption and carbon emissions per m^2 of floor space (red and green lines respectively) against increasing floor area (GIA m^2) (bars).

In the planning of Phase 1 of our CRMP, we modelled in detail the energy, carbon, cost and cost savings of all the projects. This model was updated annually, as new projects emerged and our understanding of the performance of past projects improved. It was also updated to reflect changes in the size and operation of our estate. This has enabled us to track progress in carbon reduction and to demonstrate the cost-effectiveness of the programme as a whole.

Figure 2 shows our progress to date in terms of total Scope 1 & 2 carbon emissions (green line) against our original forecast model (dark blue line with squares) and business-as-usual (BAU) (purple line with triangles). The solid blue line shows our carbon emissions if we count our electricity supply, which is certified 100%

renewable under the REGO scheme, as zero carbon. The BAU line has been updated annually with changes to the Estate and its operations, which were not part of the CRMP.

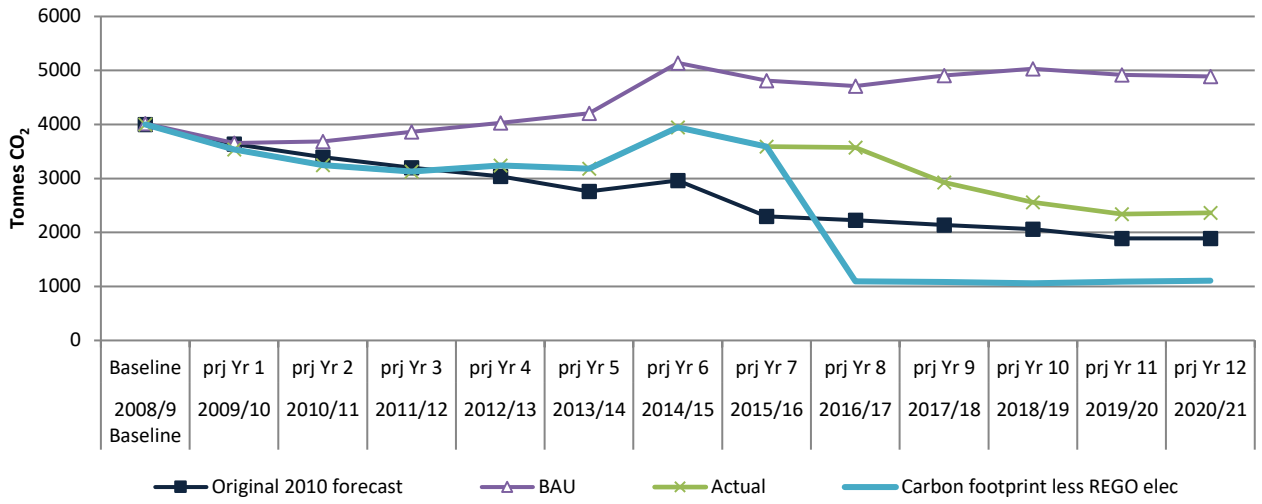


Figure 2. Carbon reduction model (2021 update). All data in tonnes CO_2 per year. Dark blue line with squares shows original 2010 model forecast of annual carbon emissions, based on implementation of projects in 2010 CRMP. Upper purple line with triangles shows "business as usual" (BAU), based on not implementing the CRMP. Green line shows actual annual carbon emissions. Solid blue line shows actual carbon emissions but counts our REGO-backed green electricity as Zero carbon.

By understanding the energy use profile for both the CRMP trajectory and the BAU model, we can estimate the cost effectiveness of the programme, based on annual energy cost reduction. There are many variables that affect this figure, including the impact of fluctuating energy prices and the division of cost in the implementation of CRMP projects to account for upgrades that may have occurred anyway. Nevertheless, our monitoring and verification approach gives us good confidence that the *c.*£4M spent to date will be cost neutral by around 2023 and will be saving us around £800k per year thereafter.

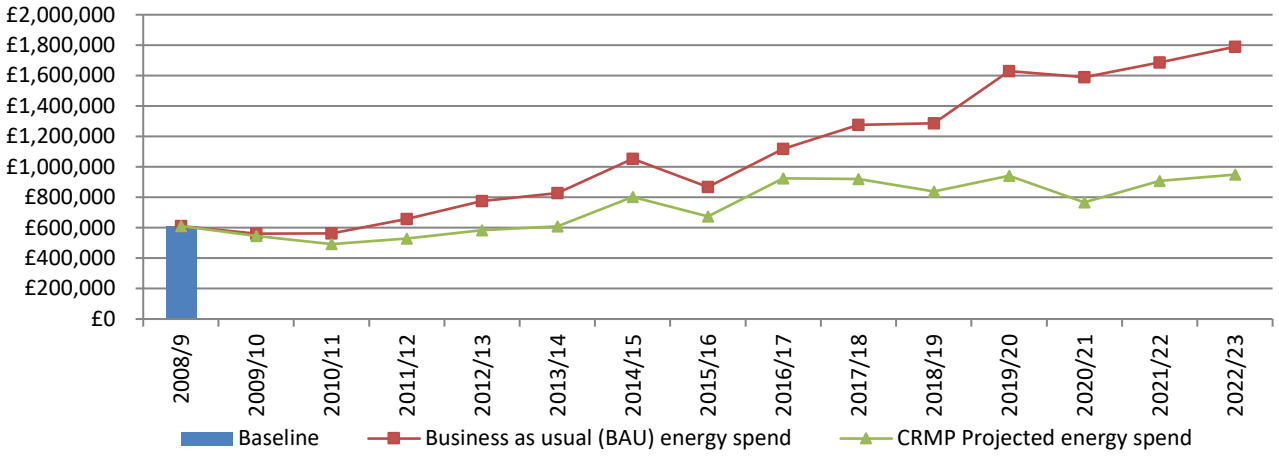
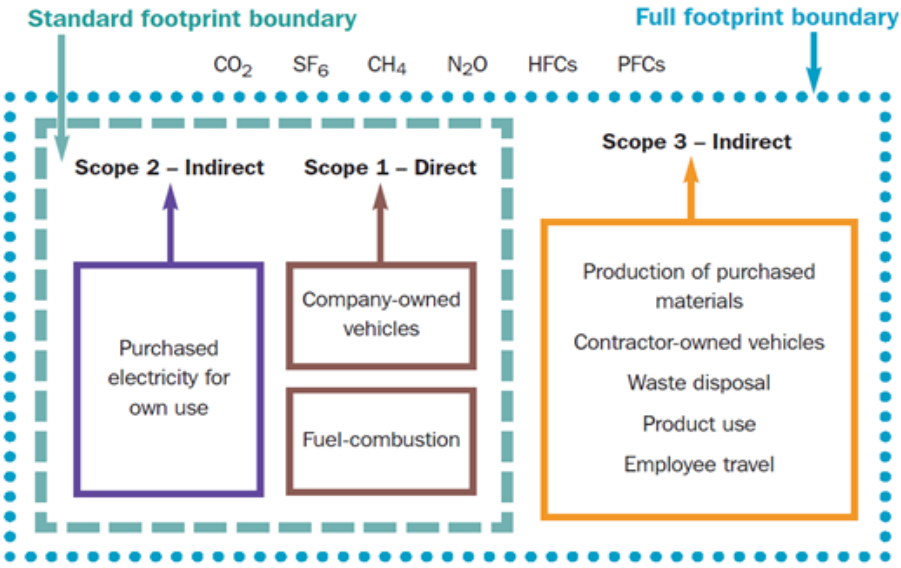


Figure 3. Energy cost model. Business as usual (red line with squares) shows estimated annual energy cost if the CRMP was not implemented. Green line with triangles gives actual energy costs to 2021 and projected cost to 2023, following implementation of the CRMP

Now that Phase 1 of our CRMP 2010-2020 has been completed, the majority of the available cost effective opportunities for energy efficiency at Newton Park have now been implemented. Going forward, our primary focus during the next phase will be on continuing optimisation of the Building Energy Management System (BEMS), optimising operations at Locksbrook Road and decarbonising heat at Newton Park by installing heat pump technology on our district heat networks (DHNs). We will of course continue to search out and implement cost-effective energy-saving and efficiency projects wherever possible, strive to ensure our new developments achieve the highest practicable levels of efficiency and continually engage with staff and students over energy-aware behaviours.

4.1 Emissions Scopes 1, 2 & 3

By international convention, carbon emissions are separated into Scopes 1, 2 and 3, according to the World Resources Institute (WRI) definitions, embodied in the Green House Gas (GHG) Protocol.



Source: Clean Air-Cool Planet and Forum for the Future (2008)[15]

Figure 4. Definition of emission classes from World Resources Institute.

Vision

Our Vision is to play a leading role in the decarbonisation of the HE sector, to deliver on our responsibilities under the Climate Change Act 2008, the Paris Agreement of 2016 and their future iterations, and to share our learning with our students and the wider HE community.

4.2 Strategic approach

This Plan forms a cornerstone of our institutional strategy to think and make the world better by challenging our students and staff to realise their talent and thrive, for their own benefit and the wider good. This Plan also forms a strategic component of our Sustainability Strategy.

Our Strategic approach will be based on these six broad elements:

1. Continually improving the energy efficiency of our estate by eliminating energy waste through close control of plant, implementing best available technologies, up-skilling of the estates team and the fostering of energy-aware behaviours throughout the BSU community.
2. Decarbonise heat at Newton Park with heat pump technology, driven by renewable electricity.
3. Ensuring all new developments align with our Net Zero target, through Passivhaus design.
4. Develop on site renewable energy generation where practicable.
5. Reduce Scope 3 emissions from business and commuting transport, construction, waste and water.
6. Offset what cannot be eliminated by the above means, through certified afforestation programmes that can provide ongoing education, research and recreation opportunities for staff and students.

4.3 Planning and operation

Planning, implementation, monitoring and reporting of progress will be managed through our ISO50001 Energy Management System (EnMS).

Progress will be reported annually to Senior Management and the Board of Governors, via the Sustainability Steering Group (SSG).

Transport-related Scope 3 emissions will be managed and reduced by the Transport Planning Group, via our Travel Plan. Emissions will be reported annually to SSG.

Waste minimisation and water efficiency will be managed by the Estates Team and via our ISO14001 Environmental Management System (EMS) and Scope 3 emissions from these sources will be reported to ESG.

Our primary carbon reduction target will remain as an “absolute” target and will not be relative to such metrics as FTE, Gross Internal Area or turnover. This is to reflect the fact that there is a finite limit to the quantity of global carbon emissions that can be safely emitted. However, such relative metrics will be monitored and reported as they are useful measures of decarbonisation progress and business efficiency.

4.4 Governance

Reporting to:	Vice-Chancellor and Board of Governors
Steering:	Sustainability Steering Group, Chaired by the Pro Vice Chancellor-Finance and Infrastructure
Delivery management:	Sustainability Manger
Delivery Group:	Estates and Services Department

4.5 Carbon reduction Policy

Bath Spa University recognises that the energy, products and services it consumes cause the emission of greenhouse gases to the atmosphere, which contribute to climate change. As part of our overall goal of sustainable development, we are committed to continual improvement in the management and reduction of energy consumption and carbon emissions.

To this end we will:

- Manage energy consumption via a systematic, auditable energy management system, accredited to ISO50001
- Ensure continual compliance with energy related legislation, HESA requirements and corporate commitments
- Implement a sustainable energy strategy to reach Carbon-Neutrality* by 2030
- Ensure any new development or refurbishment contributes to our Net Zero 2030 target
- Continually improve the energy efficiency of our existing estate
- Regularly monitor and review energy consumption against our reduction targets
- Ensure the necessary resources are made available to achieve these goals, cost-effectively
- Manage Scope 3 emissions from waste, water, transport, products and services, via our ISO14001 Environmental Management System
- Promote energy awareness among our staff and student body
- Communicate progress to internal and external stakeholders

* Certified to internationally-recognised PAS 2060 Carbon Neutral Standard or similar appropriate standard at the time. This policy will be reviewed annually to ensure it continues to reflect Bath Spa University's commitment to reducing carbon emissions.

4.6 Scope boundary of BSU Carbon Reduction Management Plan

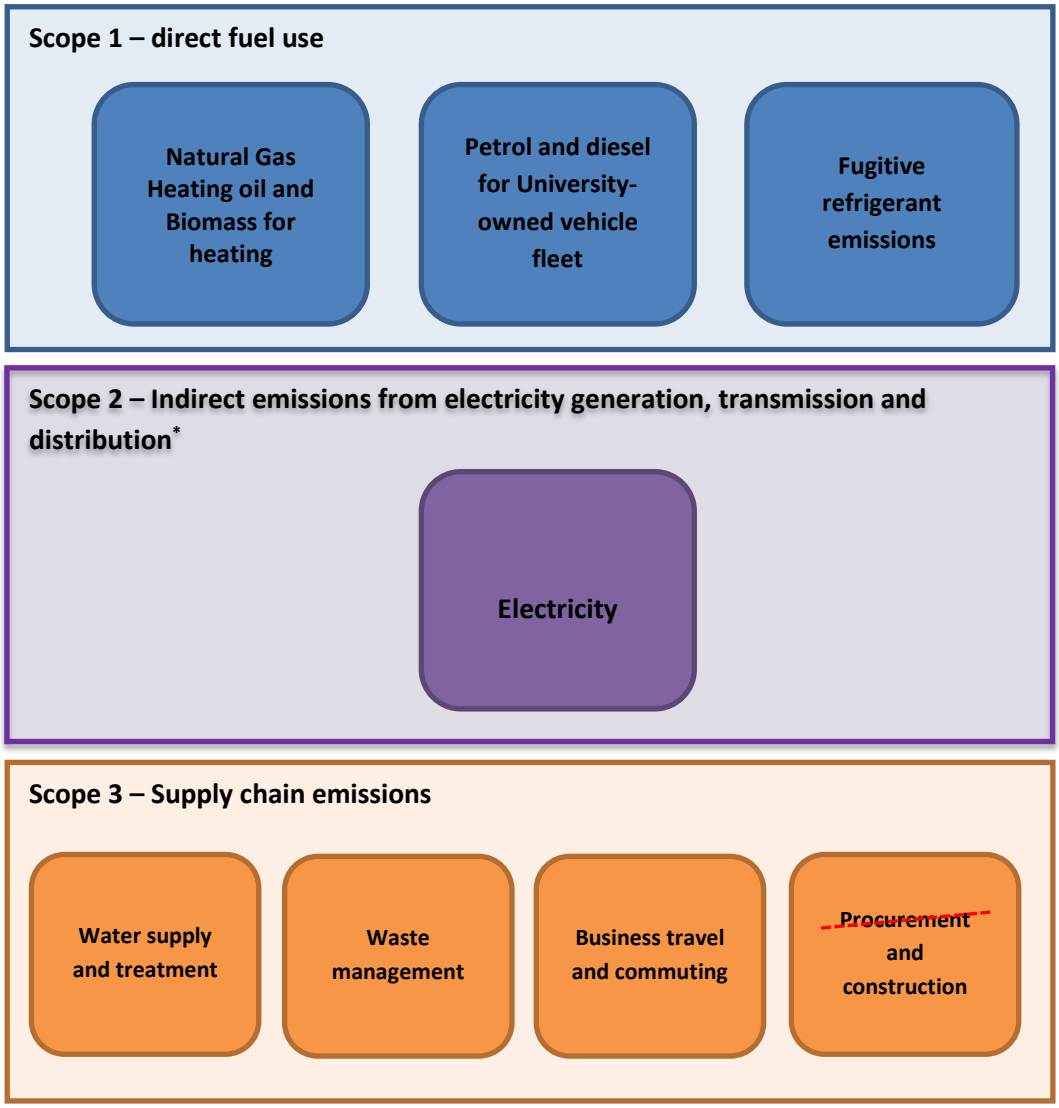


Figure 5. Scope boundary for Bath Spa Carbon Reduction Management Plan, including Scope 1, 2 and 3 emission classes.

4.7 Carbon emission baselines, targets

Table 2. Baselines and targets for Scope 1, 2 & 3 emission classes.

Emission source	Baseline year	Absolute Baseline – total CO_{2e} emissions (tonnes)	2019 (pre-Covid)	2025 Target	2030 Target
Electricity	(2005 - 2008/9)	2,200	0 (1,275)*	0	0
BSU fleet vehicle fuels	(2005 - 2008/9)	25	20	15	0
Fugitive emissions**	(2005 - 2008/9)	25	20	15	0
Heating fossil fuels	(2005 - 2008/9)	1,770	1,045	1,000	400
Biomass	(2017)	7	50	50	0
Total Scope 1 & 2	**(2005 - 2008/9)**	**4,020**	**1,255 (2,410)***	**2,000**	**400**
Waste	(2017)	12	15	10	10
Water	(2017)	60	85	80	75
Daily commuting	(2015 – 2017)	3,246	3,000	2,500	2,000
Overseas commuting	(2015 – 2017)	1,339	1,300	1,300	1,300***
Business travel	(2015 – 2017)	630	600	550	520
Construction	2017	2,112	2,112	N/A	TBC****
Procurement	2017	5,214	5,214	N/A	N/A*****
Scope 1, 2 & 3 emissions to offset			**13,461 (14,736)**	**5,520**	**4,305********

*Grid average emissions in brackets, reported as zero due to procurement of certified (REGO) renewable electricity procurement

**Refrigerants

***Overseas commuting is by international students coming to BSU to study. It is estimated by assuming one return flight per year from the students' home countries. Any further flights to and from BSU are assumed to be the students' individual choice and hence their own carbon responsibility. This may be subject to change if a sector-wide methodology is agreed.

****Construction emissions will be dependent on whether or not any developments are undertaken in any particular year. Construction emissions will be managed on a development-specific basis

*****Supply chain emissions are excluded from our Net Zero 2030 target and from offsetting (Section 5.5 below). However, supply chain emissions will be measured and reported using available sector-specific tools

******This figure excludes construction based emissions, which will be managed on a development-by-development basis

5 The way forward

5.1 Improving energy efficiency

The primary focus of our efforts over the last decade has been on reducing energy waste and improving efficiency. This has been successful in reducing energy consumption per unit of floor area by 45% from 291 to 160 kWh/m^2/y (Figure 1). This work continues, through our ISO50001 certified Energy Management System. We work closely with our BEMS service provider to continually optimise the control of our plant. Over the next two years, our main focus will be on optimising the controls and equipment at our new Locksbrook Road campus and optimising our Newton Park district heating networks (DHNs). Both of these projects are currently under way and we expect it will take the next two heating seasons of detailed monitoring, targeting, implementing and testing to maximise the efficiency of these complex systems.

5.2 Decarbonising heat

Building the DHNs at Newton Park enabled us to displace approximately 40% of our main campus gas consumption with wood chip heat, via two 500kW biomass boilers. Although we ensure that the woodchip is locally sourced (SW England) in a sustainable supply chain (currently sourced from local sawmill waste wood), it is still a combustion technology, which causes local pollution. The boilers are also maintenance-intensive and have a limited economic lifespan, which is unlikely to extend beyond 2030. The long-term thinking behind the development of the DHNs was to enable both gas and biomass plant to be replaced with electrically-driven heat pump technology, when this became cost-effective at the scale required. Rapid advancements in heat pump technology has bought this point forward more quickly than expected. Within the next five years, it will be cost-effective to replace the existing plant with new, efficient heat pumps that will be powered by 100% renewable electricity.

This will require substantial modifications to the existing infrastructure, which is the subject of a current feasibility-stage study. We expect significant Government support to be made available for heat decarbonisation over the coming decade and plan to use this to help with the cost. Our current expectation is that these works will be carried out after 2025. This plan will be updated with further details of this work as the project develops.

This will leave our Locksbrook Road and Corsham Court campuses running on gas. Replacement of the gas hardware with heat pump technology at Locksbrook road should be relatively straightforward. However, this plant is new and will probably not be replaced until close to or after 2030.

The situation at Corsham Court is more complex, due to the ownership and historic nature of the site and it is unlikely that the gas fired plant will be replaced with heat pumps in the foreseeable future.

Decarbonising Newton Park's heat will reduce CO_2 emissions by around 650 tonnes per year. Decarbonising Locksbrook Rd would reduce emissions by an additional 170 tonnes. However, it is by no means certain that the Locksbrook element will be achievable by 2030 so has not been included in the projected emission reductions for 2030.

The University is planning to concentrate all operations into Newton Park and the Locksbrook Rd area. Hence, this report assumes that all other outlying property will be relinquished before 2030 (excluding Corsham Ct).

5.3 Ensuring new developments align with our Net Zero target

It is essential that any new developments or major refurbishments do not lock us into further carbon emissions that will make reaching our Net Zero 2030 target more difficult and expensive than it needs to be. Further, any new developments must play a key role in helping us to achieve decarbonisation. This begins with our Masterplan to consolidate our property in the Newton Park and Locksbrook Rd areas, which have good public transport and direct active transport links.

Building residential and academic developments to the Passivhaus standard is feasible and cost-effective over the longer term. Building to this standard will minimise energy and maintenance costs going forward and will minimise the need for expansion of our existing DHN infrastructure at Newton Park. Passivhaus buildings are also climate-change resilient, in terms of requiring minimal cooling during hot periods, as well as minimal heating during the winter.

In addition, the choice of building materials will have a significant impact on the embedded carbon of any new development, which will incur significant offsetting costs.

To this end, we have developed a BSU Sustainable Construction Policy to guide decision making:

5.3.1 BSU Sustainable Construction Policy

The continued improvement of our Estate and potential expansion to meet future rising demand are essential to the success of our business. Such development can have many positive impacts, including the provision of sustainability-led education to more students. However, the construction and operation of our buildings and infrastructure have negative environmental impacts, including the emission of greenhouse gases. Minimising these emissions will be essential for us to meet our Net Zero Carbon 2030 target cost effectively. This Policy sets out the measures we will take to minimise these impacts and to make our infrastructure as socially and environmentally positive as possible.

While in the first instance, ensuring that buildings provide spaces that meet the current needs of the University, with the flexibility necessary to accommodate future needs, the following policy statements will guide our decision making:

- *We will seek to consolidate our estate into geographically compact areas that are serviced by existing public transport links*
- *We will continue to optimise the space utilisation of our existing estate to minimise the requirement for new space*
- *Refurbishment will be prioritised over new build where practicable*
- *All new developments will be designed and built to Passivhaus or equivalent standards*
- *All major refurbishments will be designed and built to Enerphit standards or equivalent*
- *Construction and operational carbon emissions will be modelled at the early design stage and used to inform design stage iterations to minimise these emission sources*
- *Climate-change resilience with minimal reliance on additional energy consumption will be integral to the design of all new builds and major refurbishments*
- *No fossil fuel energy sources will be included in the design of new buildings or major refurbishments*

- *Only refrigerants with low/zero Global Warming Potential (GWP) will be used in space conditioning systems*
- *All construction projects will be delivered using full Soft Landings approach or equivalent*
- *All new builds and major refurbishments will use approaches such as the Well Building Standard and Biodiversity Net Gain guidance to optimise occupant wellbeing biodiversity enhancement*

5.4 Developing renewable energy installations

Developing large scale renewable energy installations is not part of BSU's 2030 decarbonisation strategy. However, we do intend to expand our rooftop solar PV capacity from its current size of 90kW and to integrate battery storage where feasible. This will not reduce our headline carbon emissions figure as we procure 100% certified renewable electricity, which is allowable as zero carbon in the PAS2060 Standard. However, installing PV and battery storage to new developments and existing buildings where possible will displace grid electricity, increase resilience in the face of power outages and will be carried out on financial merit alone.

At Newton Park, we have capacity for *c.*250 kW of rooftop PV installation on buildings that do not have historic listings. This would provide *c.* 215MWh/y, with a value of around £30k p.a. at 2021 electricity prices, which is equivalent to around 50 tonnes of CO_2 at current grid average emissions.

Planning permission has been refused in the past for this work to be undertaken and is part of current discussions with the Local Authority, in light of their own decarbonisation aspirations.

5.5 Reducing Scope 3 emissions

Scope 3 emissions included in our Net Zero 2030 target (Table 3) are from commuting and business travel, construction, waste and water. Emissions from the construction of new developments and refurbishments are addressed in Section 5.3 above. Emissions from waste production and water consumption are relatively small and are managed through a process of continual improvement via our ISO14001 Environmental Management System.

Table 3. Scope three categories and estimated emissions to 2030 (t CO_{2e}) (from Table 2).

Scope 3 Emission source	**Baseline (tonnes CO_{2e})**	**2019 (pre-Covid)**	**2025 Target**	**2030 Target**
Waste	12	15	10	10
Water	60	85	80	75
Daily commuting	3,246	3,000	2,500	2,000
Overseas student commuting	1,339	1,300	1,300	1,300*
Business travel	630	600	550	520
Construction	2,112	2,112	N/A	TBC**
Procurement	5,214	5,214	N/A	N/A***
Scope 3 emissions to offset				**3,905****

*Overseas commuting is by international students coming to BSU to study. It is estimated by assuming one return flight per year from the students' home countries. Any further flights to and from BSU are assumed to be the students' individual choice and hence their own carbon responsibility. This may be subject to change if a sector-wide methodology is agreed.

**Construction emissions will be dependent on whether or not any developments are undertaken in any particular year. Construction emissions will be managed on a development-specific basis
***Supply chain emissions are excluded from our Net Zero 2030 target and from offsetting (Section 5.5 below). However, supply chain emissions will be measured and reported using available sector-specific tools
****This figure excludes construction based emissions, which will be managed on a development-by-development basis

Embedded emissions from our procurement of goods and services are excluded from the scope of our Net Zero 2030 target. There are several reasons for this, which include; supply chain emissions are poorly understood and characterised currently; tools that would enable us to demonstrate reduced emissions through procurement decision making are not yet sufficiently well developed; Scope 3 emissions from our supply chains are the Scope 1 and 2 emissions of other organisations and so could be viewed as double-counting if we were to include them in our own footprint, while our suppliers were including them in theirs. Once these issues have been resolved satisfactorily, the situation can be reviewed. We do however, measure and report our supply chain emissions using the sector available "HESCET" tool and will continue to do so.

Following the decarbonisation work we have already undertaken, transport-related emissions from commuting and business travel have become our largest source by far. By 2030, if no specific measures are implemented to reduce these sources, we expect they will total around 3,820 tonnes p.a. This assumes similar travel behaviours as we currently experience (Covid notwithstanding), with a marginal increase in the use of video technology to replace overseas flights, a UK-average increase in electric vehicle uptake and general transport efficiency improvements.

During the last 18 months, it has become clear that we are able to operate effectively without necessarily travelling to our place of work or overseas for business meetings. While it is clear that new ways of working have been widely successful, it remains to be seen how much this will change behaviour in the long term. As working practices settle into a post-Covid norm, these projections will be re-evaluated. In view of both the relative scale of our transport-related emissions and the increased practice of home working and video conferencing, we are currently developing a new Travel Plan to set out a new emissions reduction plan. When the updated Travel Plan is agreed and published, the transport-related emission targets in this document will be reviewed accordingly.

5.6 Offsetting

The final piece of the jigsaw is to offset the remaining emissions that we are unable to eliminate through other means. This will be done primarily through UK-based afforestation and rewilding projects that are certified through the UK Woodland Carbon Code.

Our view is that carefully chosen offsets that are environmentally and socially positive can provide a helpful but temporary solution to enable us reach our Net Zero 2030 target. Committing to the cost of offsetting our residual carbon is, in effect, a self-imposed carbon tax, which will help to drive further decarbonisation activities by increasing their cost effectiveness.

We intend to do this in a partnership approach, with landowners and offsetting service providers. In order for offsetting schemes to be considered, they must meet certain criteria.

- Be certified under the UK Woodland (or Peatland) Carbon Code (WCC/PCC)
- Be accessible for research, education and recreational purposes by BSU staff and students
- Include species-rich woodland, comprising species native to the local area
- Not displace biodiverse or otherwise environmentally-valuable habitats (part of WCC criteria)
- Not include more than 25% commercial forest
- Be designed to achieve broad ecosystem service gains
- Provide good value for money

We are currently scoping suitable projects that will provide the offsets we need by 2030 in the most cost-effective manner possible. This report will be updated with details of these as they are confirmed.