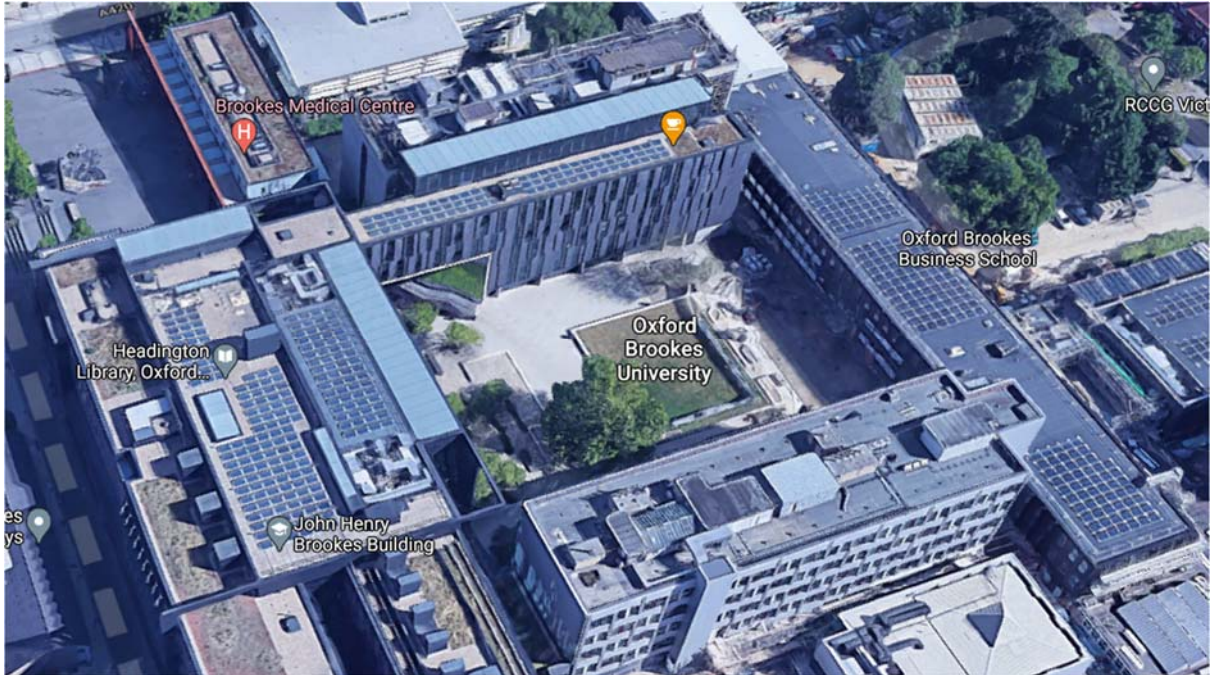


Oxford Brookes University

Interim Carbon Reduction Strategy



Sponsor: Jerry Woods, Director of Estates and Campus Services

Owner: Gavin Hodgson, Carbon and Energy Reduction Manager

Approval Route

	<i>Date approved</i>
Vice-Chancellor's Group	25th October 2021

Consultation: Environmental Sustainability Team, Energy Management Advisory Group, Senior Leadership Team Estates & Campus Services.

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1. Executive summary

The carbon and energy reduction agenda is now extremely high profile and continues to gather pace. Oxford Brookes has achieved its carbon reduction target of a 35% reduction four years ahead of plan, but new targets and challenges both locally and nationally mean that we must increase our intensity of work and bring forward strategic decision making and associated work streams. It is a crucial time to make decisions on our carbon strategy as these decisions will either lock us into unsustainable systems or bring about a resilient future with benefits for the University, our stakeholders and wider society.

This new interim strategy proposes to bring Oxford Brookes in line with the UK Government's near term target of a 68% reduction in emissions by 2030 and supports the City of Oxford's ambitions to be net-zero by 2040. It also shows our commitment to alleviating the harmful effects of climate change by recognising a climate emergency within our proposed strategic vision.

This interim target is seen as a pragmatic approach that can be largely delivered within the scope of existing initiatives, with the bulk of carbon savings coming from the proposed delivery of the Oxford Campus Vision. The additional funding implications required in support of this interim strategy are a one off cost of £80k within FY 2021/22 (Please see appendix D), undertake appraisal of Energy & Carbon Reduction Manager role plus the creation of a new post of Building Energy Management Systems (BeMS) Manager within Estates & Campus Services Directorate (Please see Table 1, deliverable 2 on pages 11 & 12).

In further support of this we will also optimise the performance of our buildings, decarbonise heating, hot water and cooling as a part of our ongoing maintenance investment plans, remove all f-gases from our estate by 2030 and move to operating ultra-low emission vehicles within our fleet in-line with our transport strategy. We will also, subject to contract, look to support the Oxfordshire economy by purchasing local green electricity that can also be used towards mitigating our climate related impact and financial risks.

As we move forward on this timeline, the continued work on our carbon reduction strategy and associated action plan will widen the basket of emissions that we are reducing, from just our direct emissions (Scope 1 & 2) to a whole institution approach, encompassing University research, learning, teaching, procurement, operations and investments. A significant part of the initial work required to deliver a 2040 net-zero carbon strategy will be to undertake a new assessment of Scope 3 emissions

across the institution based on a whole life approach. We will also develop work streams to achieve net zero carbon from construction and business travel and we will shortly start development of a 2040 net-zero carbon strategy which will be externally validated by a recognised awarding body and completed before 2023 (funding permitting).

We predict that adopting the commitments within this strategy (see section 4.1) will reduce our future carbon tax liability by some £1.3 million per year in present cost terms by 2030.

2. Introduction

Oxford Brookes is predominantly a teaching-led organisation and has made major investment in its estate over the last 10 years, reducing carbon emissions by some 5,000 tonnes or 35% against a 2005/6 baseline, meeting our 2025 target reduction of 35% (See Appendix B).

In Oxford, the City Council's Climate Emergency Strategy Support report¹ found that 81% of Oxford's total emissions come from buildings. Residential buildings are the largest contributor to emissions at 29% and institutional buildings are the second largest contributor at 26% of total emissions. Oxford Brookes accounts for 2% of Oxford city's emissions, which is just slightly more than the City Council.

The University's current strategy states that 'social responsibility demands that all aspects of our activity should be sustainable'. With strategic goals stating that 'our infrastructure and services provision will be a sector-leading, high quality, sustainable and cost-effective service, operating within a culture of continuous improvement'. The 2035 University Strategy is currently under consultation, but sustainability is recognised as a key enabler underpinning the strategy in line with societal, student and staff expectations.

In the Higher Education sector 53 UK universities have already committed to a net-zero target (sector average target date is 2035).

¹ https://www.oxford.gov.uk/downloads/file/6660/climate_emergency_strategy_support_report_2019

3. Key Drivers

Climate change is the biggest environmental threat the world currently faces. The reduction of carbon emissions, the main cause of climate change, should now be a key priority for all organisations, including higher education establishments.

Some of the key factors supporting this are:

A) Legislative drivers and commitments to zero carbon

- i. The UK is a key signatory of the Paris Agreement which formally acknowledges the urgent need to scale up our global response to climate change. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels, thus avoiding the worst effects of climate change.
- ii. In June 2019 the UK Government committed to a legally binding target of reducing all greenhouse gas emissions to net-zero by 2050. This is supported by legal interim targets of a 68% reduction in emissions by 2030, and 78% by 2035.
- iii. Oxford Brookes has committed to collaborate to achieve the City of Oxford's target of achieving net-zero carbon by 2040.

B) Financial

- i. Carbon taxes, levies and other statutory obligations on Oxford Brookes' electricity bills have increased from making up 15% of the total bill in 2012 to 37% in 2020. Increases in carbon taxation also flow through to the goods and services that we use, forcing adaptation.
- ii. There is also presently a gap in carbon pricing. As part of the most recent Budget announcement, the Government confirmed that the Carbon Price Support will continue to operate at £18 per tonne of CO₂ up to 2022. After the Brexit transition period, the UK will aim to apply an "ambitious carbon price" that could be linked to the EU Emissions Trading Scheme. This was predicted to be in the range of £40 to £80 per tonne, however most sources are now assuming a price of £80 per tonne by 2030². Government has also recently increased the shadow price of carbon to £248 per tonne

² <https://www.euractiv.com/section/emissions-trading-scheme/interview/analyst-eu-carbon-price-on-track-to-reach-e90-by-2030/>

for 2022³. This shadow price is used as a basis for policy decisions, but gives an indication of what carbon taxation may be if the real world cost of carbon was used as a basis in the future. We predict that adopting the carbon reduction targets proposed within this strategy will reduce our future carbon tax liability by up to £1.3 million per year by 2030, this value of this financial saving is based on the central price scenario of £80 per tonne.

- iii. The UK delivers carbon emission reductions through regulatory and market based mechanisms. Direct legislation changes within Building Regulations, local planning (Oxford Local Plan 2036) & Energy Performance of Buildings regulations (EPBD) all represent additional compliance costs to the University. Government has also recently indicated that after 2030 it will take an increased regulatory approach to driving change.
- iv. Many funding bodies (for example UK Research and Innovation) now require research institutions to measure their carbon emissions, and have offsetting schemes for research work undertaken, to be considered for funding.
- v. There is also an emerging trend towards sustainability-linked finance which has been growing in recent times, where there is a link between interest and fees paid on loans and the progress that an organisation makes against its carbon targets.

C) Student expectations

The 2020-21 NUS student survey⁴ reported that:

- i. How seriously the university takes environmental and global developmental issues is reported to be a factor influencing their choice of place to study by 54%, up from 45% in 2018-19
- ii. 91% say they agree their place of study should actively incorporate and promote sustainable development compared to 88% in 2018-19

The Oxford Brookes Student Union have also put forward a motion for the Union and Oxford Brookes to declare a climate emergency.

³ <https://www.gov.uk/government/publications/valuing-greenhouse-gas-emissions-in-policy-appraisal/valuation-of-greenhouse-gas-emissions-for-policy-appraisal-and-evaluation>

⁴ <https://sustainability.nus.org.uk/resources/sustainability-skills-2019-20-he>

D) Maintaining performance and competitiveness with our peers

In the HE sector 53 UK universities have already committed to a net-zero target and declared a climate emergency. The sector average target date is 2035. Currently 140 Universities in the UK University network⁵ have committed to set targets for scope 1 and 2 emission reductions which support the government's plans for reducing emissions by 78% by 2035 compared to 1990 levels and achieving net zero by 2050 at the latest.

E) Benefits to the local community

The majority of assembled members within the Oxford Citizens Assembly for Climate Change⁶ Imagining a 'net zero' Oxford where enhanced biodiversity was central to the overall 'net zero' vision of Oxford with increased flora and fauna in the City, along with more cycling, walking, and public transport, and far fewer cars. These items need to be considered as a part of Oxford Brookes' indirect emissions. The Oxford Citizens Assembly reflected a wide cross section of the Oxford demographic, the recruitment of participants was undertaken by Ipsos MORI.

F) Climate change adaptation

Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. There is increased likelihood, or severity, of the climate change adaptation risks which Oxford Brookes will have already identified. For example – more regular and severe overheating of buildings, including student residence halls, leading to ill health, reduced productivity and increased costs.

⁵ <https://www.universitiesuk.ac.uk/sites/default/files/field/downloads/2021-10/confronting-the-climate-emergency.pdf>

⁶ https://www.oxford.gov.uk/info/20011/environment/1343/oxford_citizens_assembly_on_climate_change

4. Recommendations

The work undertaken within this report provides a basis for forming the following strategic vision and objectives.

4.1. Adopted vision and strategic objectives

Oxford Brookes recognises that urgent action is required to reduce or halt climate change and avoid potentially irreversible environmental damage resulting from it.

Our strategic goal is to reduce emissions in accordance with legislation and the requirements of the Paris Agreement, which aims to limit the rise of global temperature to no more than a 1.5°C above pre-industrial levels.

In support of this commitment we intend to achieve:

1. A reduction in Scope 1 & 2 emissions of 68% by 2030.
This reduction in emissions, from a 2010 baseline, relates to the operation of our buildings and infrastructure.
2. To become a net-zero carbon organisation by 2040, where only unavoidable emissions are offset.

4.2. Supporting rationale

In 2008 The Climate Change Act committed the UK to an 80% reduction in carbon emissions relative to the levels in 1990, to be achieved by 2050. In June 2019, secondary legislation was passed that extended that target to “at least 100%”. Our current carbon reduction commitments do not address legislative, financial or stakeholder requirements.

Putting into action the recommendations of the Committee on Climate Change will ensure that Oxford Brookes is in-line with the UK’s obligations and Oxford Brookes’ commitment to social responsibility. It also demonstrates commitment from the University to bring about the benefits associated with reducing carbon emissions and helping to limit some of the worst climate risks that we face.

It should be noted that a definition, with associated principles and guidelines, of net zero for organisations has yet to be agreed, but the Science Based Targets initiative (SBTi) is seeking to achieve this. Targets submitted to SBTi during the second half of 2021 must have a target year between 2026 and 2036. The SBTi may allow targets that are slightly longer or shorter than this period. However, at present it seems prudent to align Oxford Brookes’ interim carbon reduction strategy with the existing commitment we have already made to support the City Council’s 2040 Zero Carbon Oxford initiative – we will then revisit the timescale for delivery based on the final definition which will be issued by SBTi during 2021⁷ and the supporting work undertaken (Table 1, deliverables 6 through 9).

For reference, the SBTi’s proposed working definition for net zero is presently: ‘achieving a state in which the activities within the value-chain of an organisation result in no net impact on the climate from greenhouse gas emissions’⁸. This definition differs from that of the Carbon Trust whose definition includes all Scope 1 and 2 emissions, plus selected Scope 3 emissions - specifically exported waste, transmission & distribution and transportation (BASIC+). The Carbon Trust presently deem this reasonable if an organisation is in pursuit of a scientific based plan to achieve 1.5°C. However, the scientific basis for this has not been assessed by Oxford Brookes, and excluding an evaluation of emissions from the full value chain is perceived as having the potential to significantly under-report Oxford Brookes’ true carbon emissions and create a policy gap.

⁷<https://sciencebasedtargets.org/net-zero#:~:text=A%20final%20net%2Dzero%20framework,will%20be%20released%20in%202021.>

⁸ Towards a science-based approach to climate neutrality in the corporate sector, 2019

There are significant costs involved in transitioning the estate to the Oxford Campus Vision, and also within the University's maintenance investment plans for the decarbonisation of heat and the removal of f-gases from our estate. These costs remain to be fully developed, and in particular they are reliant upon the completion of the heat decarbonisation study outlined within this interim strategy. However, the fact that these costs are already being driven by the wider needs of the University and existing minimum planning and legislative requirements are thus not considered herein.

Given the recent financial requirements that Covid-19 placed upon the operation of the University this interim strategy has been intentionally designed to be largely cost neutral at this stage, whereas the 2040 net-zero carbon strategy, which will be published by 2023 (funding permitting), will likely require considerable resources due to the breadth of the challenge at hand. For it to be compliant with science based targets, and the adopted 2040 net-zero target for Oxford City, the new 2040 net-zero carbon strategy would need to cover all of Oxford Brookes' greenhouse gas emissions along with a full costed action plan for dealing with these additional emissions (scope 3). This will take some considerable time to develop, hence the need for this interim strategy which delivers the necessary groundwork and also sees some significant new developments such as the completion of Oxford Brookes' first heat decarbonisation scheme in the form of a £2.3m geothermal heat pump on Headington Campus.

Modelling of Oxford Brookes' scope 1 & 2 emissions suggested that a 68% reduction in line with the Committee for Climate Change recommendation can be readily adopted based upon the initiatives as outlined within this strategy.

The baseline used is now 2010, this differs from the 2005/6 baseline used in our previous carbon reduction strategies, however, the impact is not of any real consequence because the University's emissions were effectively flat between 2005/6 and 2010.

4.3. Resources needed to accomplish the objectives

Table 1 below summarises some of the key deliverables necessary to achieve the strategic aims as provided in Section 4.1.

A 68% reduction in Scope 1 & 2 emissions from the 2010 level of 14,640 tonnes means that our emissions will need to be under 4,685 tonnes by 2030.

Our emissions for 19/20 are presently at 9,547 tonnes, so direct emissions need to be reduced by a further 4,862 tonnes to achieve the 70% reduction target. The planned deliverables listed in Table 1 should deliver a saving of 5,951 by 2030, thus exceeding this target and also maximising our opportunities towards the 2040 net-zero carbon strategy. This is an interim strategy on our way towards zero carbon, so all cost-effective opportunities should be taken to further mitigate our environmental impact, carbon taxation liability and the future cost of offsetting.

Savings relating to Objective 2: Net-zero carbon cannot be provided at this stage, these deliverables are essentially enabling works.

Table 1: Headline summary of deliverables

	Objective and summary description	Estimated contribution in reducing annual carbon emissions	Estimated cost/resource implications	Carbon savings to be delivered by	Ownership
Deliverables – supporting strategic objective 1 (scope 1 & 2 emissions of 68% by 2030)					
1	Rationalisation and modernisation of the estate GIA of the estate decreases by some 11,000m ² as a result of the Oxford Campus Vision. Delivered in accordance with Oxford's Local Plan for 2036 and full compliance with Oxford Brookes' own Sustainable Design Criteria. Outcomes: reduced energy use by some 39%	4,483 tonnes	Delivered through existing initiatives	2030	ECS, namely Capital Projects Team.
2	Smart and optimised buildings Building Energy Management Systems (BeMS) Manager will be appointed. This role is integral to fulfilling our Oxford Campus Vision, the development of a 'Smart Campus' and the implementation of our Carbon Reduction Strategy, eventually leading to a Net Zero Carbon Campus. Therefore we recommend the appointment of a BeMS Manager who would deliver building energy optimisation through smart control systems and data integration. This would allow for a more responsive management of the campus environment - helping provide a better student experience.	>566 tonnes	1 new member of staff (BeMS Manager) BeMS manager will also utilise the existing £250k ECS carbon reduction budget to implement control improvements.	2025 Savings will be generated from the first year, however it will take until 2025 at the earliest for all buildings to be optimised and full benefits delivered (i.e. suggested 10%	Estates, Capital Projects and Sustainability Team

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	<p>We will develop and deliver a programme of building optimisation, which considers improving BMS systems to EN15232 Class A, the use of Smart Readiness Indicators and enabling demand response.</p> <p>In addition to this we will also improve design performance procedures for capital projects and post-occupancy evaluation using the BUS methodology.</p> <p>Outcomes: Energy use reduced by at least 10% once fully implemented, payback achieved in year 1. Improved staff and student satisfaction. Ensuring ongoing performance of new equipment / systems.</p>		<p>Larger projects will be supported by individual business cases for Salix / Capital investment funding as required.</p> <p>Undertake appraisal of Energy & Carbon Reduction Manager role to manage this new function (see Appendix E)</p>	<p>reduction on utility bills).</p> <p>Demand response functions would be implemented on a project by project basis, completion by 2030 in line with campus redevelopment – this will deliver a further energy benefit and potential source of income.</p>	
3	<p>Decarbonising heating, hot water and cooling in existing buildings</p> <p>Heating: No assumption has been made to proactively remove/replace gas boilers in existing buildings other than at end of life and via the natural rate of planned replacements based on legislative requirements and the MIP. Systems being installed will be assessed based on best available technology not entailing excessive cost. We will however remove or replace all CHP units with lower carbon heating systems by Summer 2023 and fuel switch the boat house away from oil heating by 2030. The carbon savings presented here assume that the CHP unit in JHBB will be replaced by a geothermal heat pump installation (subject to the award of grant funding).</p> <p>Hot water: No action for electric systems as this technology is already optimal from an environmental perspective. Hot water distribution circuits and local storage systems will be reviewed. There is no assumption made regarding a requirement for solar hot water within the proposed carbon savings as it is presently deemed not to be as beneficial as other approaches.</p> <p>Cooling: We will replace all f-gas using equipment and refrigeration by 2030 in line with legislative guidance. We will only use natural refrigerants and R-1234ze refrigerant types (or those with a GWP of <10) for new installations from 2022 onwards. HCFs will not be used for commercial refrigeration. This is as per Oxford Brookes' f-gas procedure (draft).</p>	<p>>200 tonnes</p> <p>With expectations of significantly higher reductions in the long term.</p>	<p>>£1.2million</p> <p>These costs are already being driven by existing minimum planning and legislative requirements and are thus not considered herein as additional expenditure for the strategic commitments being proposed. Planned MIP costs will increase in the region of £1.2 million for the f-gas replacements alone. And the additional costs associated for not being able to replace boilers like-for-like in the future due to regulation changes is also not accounted for. The costs of having to specify low carbon heating systems (such as heat pumps) in replacement of boilers are likely to significantly increase the MIP budget and this will need to be formally assessed. Replacing the University's four existing CHP units with</p>	<p>Removal of all CHP units on or before Summer 2023</p> <p>Removal of all f-gases by 2030</p> <p>Hot water distribution to be reviewed prior to 2023.</p> <p>All other changes carried out as a part of the MIP.</p>	<p>Estates and Sustainability Team</p>

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			heat pumps is dependent upon a trial (e.g. in John Henry Brookes building) and cost analysis. Installations will be evaluated on project by project basis.		
4	<p>Power Purchase Agreement (PPA)</p> <p>Purchase 20% of annual electricity via a credible PPA which allows these offsite renewables to be counted against our carbon reduction targets. This will ideally be through a local supplier, i.e. Low Carbon Hub, which will help support Oxfordshire's local economy. Will also act as a hedge against future price risks.</p>	689 tonnes	<p>£20k</p> <p>For development of scheme and external specialist assistance with strategic decision making and subsequent recommendation to VCG.</p> <p>The aim of a PPA is that it will be cost neutral to the University in terms of utility bill costs.</p>	March 2022	Energy & Carbon Reduction Manager
5	<p>Vehicle fleet</p> <p>New Fleet vehicle procurement procedure is in draft, it requires a business case for each vehicle and a review of need along with regional policy changes.</p>	13 tonnes	<p>No additional cost</p> <p>New procedure ensures a business case approach to all new vehicle purchasing/leasing. Each Business case will address vehicle need and the consideration of national and regional policy changes as an integral part of the procurement process. An EV strategy for the University will be proposed as part of the new Transport Strategy (Dec 2021)</p>	Ongoing	Transport Team
Deliverables – supporting the future strategic objective 2 (2040 net-zero carbon strategy)					
6	<p>Assessment of Scope 3 emissions</p> <p>To allow decision making, the development of appropriate targets and to quantify the costs associated in delivering net-zero carbon we need to:</p>	<p>TBC</p> <p>Please note that the basket of emissions for Scope 3 is likely to be</p>	<p>£40k</p> <p>Delivered via an external consultancy. £40k is the maximum budget</p>	2022	Sustainability Team and

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	<ol style="list-style-type: none"> 1. Allocate a status to each of the 15 Scope 3 GHG Protocol categories according to its applicability: namely the ability for emissions to be quantified and our ability to influence emissions in each category. 2. Quantify emissions for each of the screened categories of scope 3 emissions according to a whole life methodology. 3. Review and define reporting methodologies for each applicable category. 4. Develop an approach to internal and supplier engagement, including training and workshops 5. Prepare and implement policy objectives, procedures and practices for each category. These will be managed through ISO 14001, alongside scheduled reviews of all scope categories in case we are able to quantify or influence additional categories in the future (an iterative process). Procurement team will lead on embedding best practice. 6. Define the total carbon and financial savings resulting from these policy objectives. Quantify the remaining tonnes of carbon we will need to offset to achieve net-zero. 7. Ensure that these are in alignment with our chosen net-zero carbon benchmark methodology. <p>This work aims to enable the creation of institutional change and a reduction of total scope 3 emissions. It will also move Oxford Brookes away from expenditure based measurement proxies towards a Life Cycle Assessment (LCA) or "market-based" approach that would allow for the creation of more robust and ongoing action plans in each category of emissions.</p>	<p>some 15-35,000 tonnes. Therefore significantly dwarfing our Scope 1&2 emissions.</p> <p>There are likely large carbon & financial savings that can be made through institution and procurement change.</p>	<p>anticipated as this work has not yet been tendered. Undertake appraisal of Energy & Carbon Reduction Manager role to manage this new function (see Appendix E)</p>		Procurement Department
7	<p>External assessment and validation of 2040 net-zero carbon strategy</p> <p>Appoint an external verification body to certify us against a 'science based' standard for zero carbon (e.g. SBTi, PAS2060, Carbon Trust or future Government Standard). SBTi is presently looking like a more attractive option as opposed to the Carbon Trust, but it needs a review once the standards/methods are actually known and can be compared. For example, Absolute Contraction (basic linear approach) or Sectoral Decarbonisation Approach (more detailed dynamic methodology).</p>	N/A	<p>£20k</p> <p>This fee is also intended to cover verification, lodgement and joining costs to the awarding body – these are presently unknown so it is just an estimated budget.</p>	2022	Energy & Carbon Reduction Manager
8	<p>Carbon off-setting scheme development</p> <p>Further research needs to be undertaken internally by Oxford Brookes to establish a scheme for offsetting construction (embedded carbon), business travel and fleet emissions.</p> <p>This objective is being taken forward in parallel with the Scope 3 work (Deliverable 6) because there is an immediate need to have a scheme in place to support research funding bids where emissions need to be offset for the award of funding. There is also a need to prepare for senior management the costs for abating carbon emissions</p>	TBC	<p>£ TBC</p> <p>Undertake appraisal of Energy & Carbon Reduction Manager role to manage this new function (see Appendix E)</p>	2022	Energy & Carbon Reduction Manager, Transport Team and

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	<p>associated with the delivery of the Oxford Campus Vision and future redevelopment works. Reason being that these emissions are potentially significant.</p> <p>There is also an unavoidable need to pilot the way forward for offsetting as we approach 2030, because after this date, and having achieved our scope 1 & 2 targets, we will be heavily reliant upon offsetting because our ability to reduce emissions within the boundary of our operations will be insufficient to achieve zero carbon.</p> <p>Construction and transport are areas which already have systems in place, so are the logical places for Oxford Brookes to develop our approach.</p>				Capital projects.
9	<p>Heat decarbonisation strategy</p> <p>Closely linked with Oxford Campus Vision strategy – covering all of the estate (academic and residential, new and old stock).</p> <p>This work will define the actions needed to decarbonise heat, such as physical improvements needed for buildings to accept low temperature distribution, heat networks and heat pumps.</p> <p>By 2030, new and replacement fossil fuel heating systems are unlikely to be allowable according to UK regulation trajectory.</p> <p>This work also supports access to future grant funding where heat decarbonisation plans are becoming a prerequisite.</p>	TBC	<p>£63k</p> <p>This is being externally financed using grant funding received through Salix/LCSF.</p>	2022	Energy & Carbon Reduction Manager and Capital projects team.

Appendix A: Reference definition of scopes 1, 2 and 3



Scope 1 = Direct Emissions

i.e Boilers, fleet Vehicles, heating & cooling

Oxford Brookes ~ 7,000 tonnes pa

Scope 2 = Indirect Emissions:

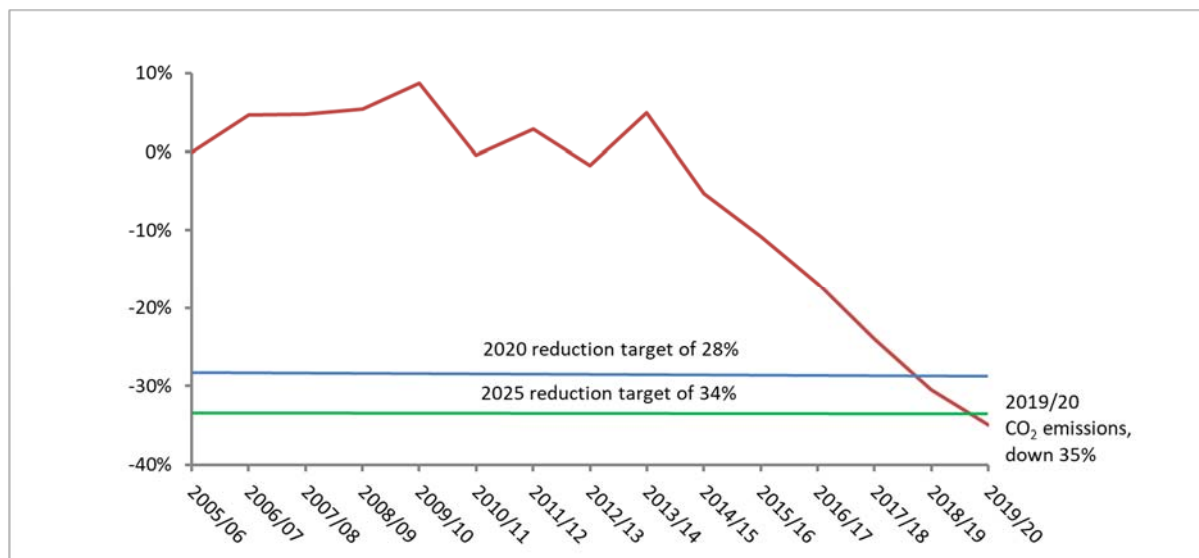
i.e Electricity Use

Oxford Brookes ~ 3,000 tonnes pa

Scope 3 = all other indirect emissions.

Oxford Brookes likely range 15-35,000 tonnes pa (pending further assessment and adoption of revised methodology).

Appendix B: Our performance to date

Graph 1: Performance against historic targets**Table 2:** Detailed scope 1 & 2 emissions data (HESA dataset and reporting methodology).

Carbon Emissions (kgCO ₂ e)	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Grid electricity	7,072,015	5,958,459	5,078,286	4,044,823	3,585,563	2,896,316
Oil	22,255	19,388	26,223	24,632	24,202	22,493
Natural gas	5,983,394	6,337,613	6,370,051	6,447,059	6,068,249	6,606,448
Vehicle diesel	36,905	50,196	40,988	26,223	20,089	13,098
Vehicle petrol	27,033	21,383	14,734	12,123	9,385	9,156
Total scope 1 and 2 carbon emissions	13,141,603	12,387,038	11,530,282	10,554,860	9,707,488	9,547,511
Non-residential scope 1 and 2 carbon emissions total	7,806,431.51	7,506,695.49	6,831,582.55	6,381,915.77	5,784,052.56	5,453,857
Residential scope 1 and 2 carbon emissions total	5,271,233	4,808,764	4,642,978	4,134,598	3,870,493	4,071,400
CO ₂ e conversion factors (kg CO ₂ e per kWh)						
Electricity	0.462	0.412	0.352	0.283	0.256	0.23314
Oil	0.247	0.247	0.247	0.268	0.247	0.26775
Natural Gas	0.184	0.184	0.184	0.184	0.184	0.18387
Diesel	2.584	2.612	2.600	2.627	2.594	2.54603
Petrol	2.194	2.197	2.198	2.203	2.209	2.16802

Oxford Brookes is not reporting on Scope 3 emissions within this interim strategy. Whilst there have been a number of assessments of the University's Scope 3 emissions undertaken in the past, the methodologies used were all based on spend and this is a poor metric for setting strategic objectives. In addition to this there was historically no requirement to formally report. The resources needed to correctly benchmark our scope 3 emissions and set policy objectives and procedures around this are stated in Table 1.

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Scope 3 emissions effectively cover all areas which are not direct fuel (Scope 1), or direct energy / indirect fuel (Scope 2) consumption. Scope 3 emissions therefore arise from the procurement of other products and services which result in indirect CO₂ emissions.

Appendix C: Key future events timeline

Date	National objectives	Local objectives	Oxford Brookes Objectives
2021	<ul style="list-style-type: none"> ● UK Future buildings standards and Heat in Buildings Strategies published ● Governments Hydrogen Strategy 	<ul style="list-style-type: none"> ● Zero Carbon Oxforde Net-Zero Action Plan published. 	<ul style="list-style-type: none"> ● Interim Carbon Reduction Strategy Approved ● Microturbine CHP units phased out ● Evaluation of scope 3 emissions commissioned
2022	<ul style="list-style-type: none"> ● 	<ul style="list-style-type: none"> ● Oxford Zero emissions zone full rollout 	<ul style="list-style-type: none"> ● Oxford Brookes' new Sustainability Strategy comes into effect. ● New member of staff begins work on optimising buildings (rolling programme, with all buildings being covered by 2025) ● Rollout of a further 300kWp of PV at Oxford Brookes (PSDS funded) ● Installation of battery storage system at Lloyd building (PSDS funded) ● 500kW geothermal heat pump becomes operational in JHBB (PSDS funded) ● PPA agreement in place, supplying Oxford Brookes with approximately 20% of its electricity via offsite renewables. ● Assessment of Scope 3 emissions complete – policy and procedures developed as a result of this are put into place to drive change. ● Carbon offsetting scheme is established.

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			<ul style="list-style-type: none"> ● EV Feasibility plan completed (as per travel strategy).
2023	<ul style="list-style-type: none"> ● Environment Bill comes into force. 	<ul style="list-style-type: none"> ● Oxfordshire Plan for 2050 published 	<ul style="list-style-type: none"> ● Hot water distribution and efficiency reviewed. ● Oxford Brookes produce fully costed zero carbon strategy and action plan, which has been externally assessed and validated according to science based target. ● Remaining CHP units in JHBB and Harcourt Hill decommissioned.
2024			
2025	<ul style="list-style-type: none"> ● ‘No new fossil fuel’ - UK ban on new gas and oil boilers in domestic premises ● 100% buildings constructed to EPC band A ● UK gas grid blended with 20% hydrogen. 1GW of UK Production capacity in operation. 	<ul style="list-style-type: none"> ● Oxford will have completed exploring opportunities to increase carbon reduction opportunities within the Local Plan. ● Oxford aiming to set up a bulk buying scheme for low carbon equipment (solar PV and heat pumps) ● Delivery hubs and ‘Last mile’ delivery being actively trialled in Oxford. 	<ul style="list-style-type: none"> ● All buildings now optimised, correctly commissioned as a part of rolling programme. ● MIP programme to replace F Gas using equipment commences.
2026			
2027			
2028			
2029			
2030	<ul style="list-style-type: none"> ● UK Minimum Energy Efficiency Standards (MEES) for Landlords – landlords proposed to have buildings that are all B rated by 2030. ● No new fossil fuel heating systems allowed in the UK 	<ul style="list-style-type: none"> ● Oxford City Council becomes net-zero. ● Oxfordshire County Council reduces emissions by 50% ● Oxford City seeking establishing joined-up generation, storage and demand 	<ul style="list-style-type: none"> ● Rationalisation of the estate in-line with the Oxford Campus Vision is largely complete – buildings are now ‘SMART’ and also incorporate demand response technology.

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	<ul style="list-style-type: none"> ● UK ban on sales of new petrol and diesel vehicle's comes into force. ● UK Clean growth strategy enabling businesses and industry to improve energy efficiency by 20% ● UK interim target of 68% reduction in greenhouse gas emissions 	management between Universities and other large organisations.	<ul style="list-style-type: none"> ● Removal of all f-gas using equipment ● Boat house is fuel switched away from oil prior to 2030 ● Vehicle fleet now 100% EV / ULEV ● Oxford Brookes achieves 68% reduction in emissions (scope 1 & 2 only)
2031	<ul style="list-style-type: none"> ● UK government takes an increasingly regulatory approach to driving down carbon emissions. 		
2032			
2033			
2034			
2035	<ul style="list-style-type: none"> ● UK interim target of 78% reduction in greenhouse gas emissions. ● Large number of Universities within the UK become net-zero (sector average). ● All of the UK's electricity production will be zero carbon ● UKs motorways and major A roads will have some 6,000 high powered charge points installed. 	<ul style="list-style-type: none"> ● University of Oxford achieves net-zero and biodiversity net gain. 	
2036			
2037			
2038			
2039			
2040	<ul style="list-style-type: none"> ● 15% of homes connected to heat networks 	<ul style="list-style-type: none"> ● Oxford City becomes net-zero carbon. 	<ul style="list-style-type: none"> ● Oxford Brookes becomes net-zero carbon

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		<ul style="list-style-type: none">• Oxford Health Foundation Trust becomes net-zero.	
2050	<ul style="list-style-type: none">• UK achieves net-zero carbon.		

[Note: the above is going to be professionally laid out]

Appendix D: Summary of funding requirements for 2021/22

The funding implications for FY 2021/22 required in support of this interim strategy are:

1. The creation of the new post of Building Energy Management Systems (BeMS) Manager (Grade 9+) to deliver building optimisation. Appraisal of the Energy & Carbon Reduction Manager role has also been undertaken to include the increased scope of responsibility and deliverables for delivering this strategy (see Appendix E). Both roles have already been put forward and subsequently approved in principle by VCG. The acceptance of the commitments within this strategy requires these staff resources to deliver.
2. £40k to undertake the scope 3 emissions assessments
3. £20k for specialist advice to take forward the proposed power purchase agreements, and
4. £20k to help develop and externally validate our full zero-carbon strategy (due on or before 2023).

Oxford Brookes' Energy & Carbon Reduction Manager has been fortunate to secure £63k worth of grant funding to support the development of a heat decarbonisation plan for the University, thus avoiding this expense.