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YSJ CARBON MANAGEMENT PLAN (V. 1.4)

1 INTRODUCTION

This document sets out York St John University's Plan to manage and reduce carbon emissions, and outlines a programme of greenhouse gas (GHG) reduction initiatives that will:

- **Support York St John University's goal of becoming sector-leading in environmental sustainability, as specified in the University's Strategy.**

- **Achieve specific and measurable targets:**
    a. **A 70% reduction, from the 2005 baseline, in Scope 1 and 2 carbon emissions by 2025, and an 80% reduction by 2030.**
    b. **50% of electricity direct from low-carbon sources by 2026, as specified in the University's 2026 Strategic Plan**
    c. **Achieve Scope 3 emissions reduction targets from Business travel, Waste, Water use, Staff and student commuting as detailed in Table 7.0.1**
    d. **Expand the quantitative monitoring of Scope 3 carbon emissions by 2026.**

- **Fulfil our responsibility to support the UK's 2050 net zero target.**

This plan provides a summary of ongoing and proposed activities, projects and project opportunities, as well as identifying targets and providing predicted costs. It is intended to be a held within the Estates Directorate, to be reviewed and updated periodically as we progress towards our targets.

2 SCOPES OF CARBON EMISSIONS

Three emissions Scopes provide a framework for the management and reduction of carbon emissions:

- Scope 1: Direct emissions from the burning of oil, gas, and other fossil fuels in university-owned assets.
- Scope 2: Indirect emissions from the use of grid electricity generated by a third party.
- Scope 3: Indirect emissions that are a result of the university's activities but are from sources beyond our direct control.

The University's carbon reduction targets currently refer to Scope 1 and Scope 2 emissions.

Table 3, below, identifies areas for action by providing a summary of the nature and status of activities that fall within each of the three scopes.

Table 3.0:

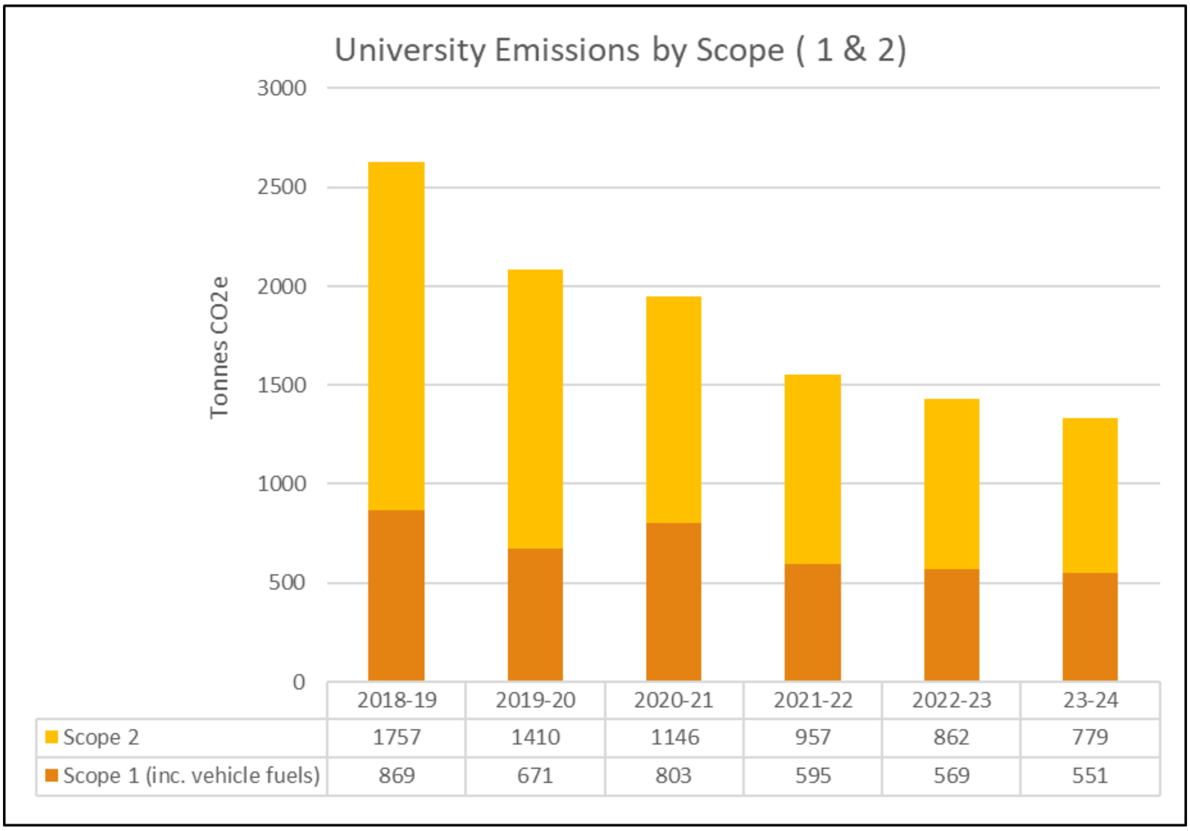
Reporting Scope	Source of emissions
Scope 1 **Direct emissions from the use of oil, gas and other fuels in university-owned assets**	Natural gas for heating buildings and hot water and other uses (eg. Bunsen burners)
	Petrol and diesel for university-owned vehicles
Scope 2 **Indirect emissions from electricity generated by a third-party**	Grid electricity for heating, ventilation, air conditioning, lighting and equipment
	Grid electricity for electric vehicles
Scope 3 **Indirect emissions, that occur as a result of business activity but from sources not owned or controlled by the university[1]**	Financed emissions (investments, endowments and pensions)
	Business travel
	Staff and student commuting
	Water supply and treatment
	Procurement of goods and services
	Waste (refuse)

[1] NB: One organisation's Scope 3 emissions are another organisation's Scope 1 and 2 emissions. The possibility of double or triple counting Scope 3 emissions must be considered during calculations.

3 CURRENT UNIVERSITY EMISSIONS

3.1 SCOPE 1 & 2 EMISSIONS

Fig 3.1.1 shows the University's total Scope 1 and 2 emissions over the past five academic years. In addition to this, the relative metrics of Scopes 1 and 2 by m^2 of building space, and by staff and student full-time equivalents (FTEs), are shown in Appendix A, Figs A3.1.1 and A3.1.2 respectively.



	2018-19	2019-20	2020-21	2021-22	2022-23	23-24
Scope 2	1757	1410	1146	957	862	779
Scope 1 (inc. vehicle fuels)	869	671	803	595	569	551

3.1.1 University Emissions by Scope, 2018-19 to 2022-23.

It can be seen that both the relative and absolute Scope 1 and 2 emissions have decreased, in line with our emissions targets.

3.2 SCOPE 3 EMISSIONS

Monitoring Scope 3 emissions is challenging and resource-intensive due to their variety, complexity, and reliance on external data sources. It requires collaboration with external organisation, careful selection of methodology, and careful interpretation of data.

Scope 3 data collected by the University is currently limited, being restricted to sources that are readily and reliably measured. This includes:

- Monthly business travel emissions
- Monthly waste/refuse emissions (using DEFRA conversion factors)
- Annual emissions from water supply and wastewater treatment.

Figure 3.2.1 shows business travel emissions for the past ten years, 2016 – 2025.

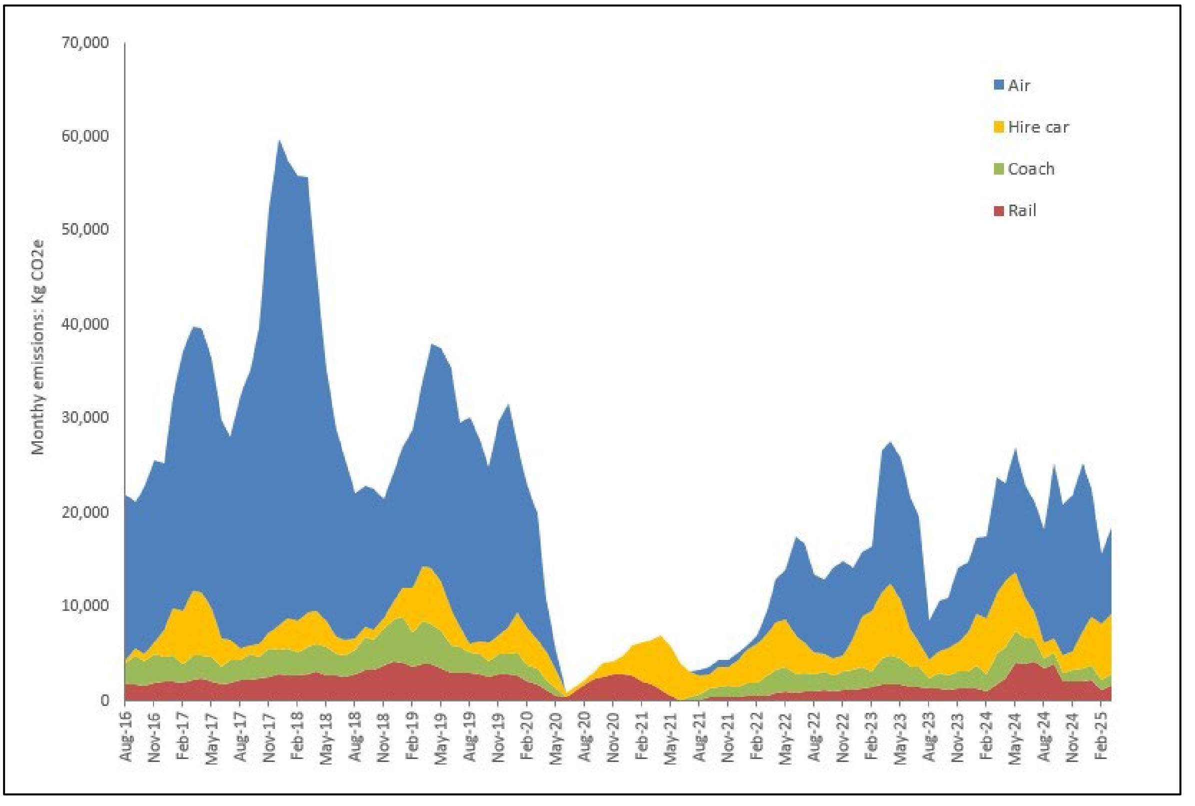


Fig 3.2.1 University Emissions from Business travel, 2016 to 2025 (smoothed, running mean)

4 PATHWAY TO 80% EMISSIONS REDUCTION BY 2030

The University aims to be sector-leading in sustainability and has targeted emissions reductions of 70% by 2025, 80% by 2030 for Scopes 1 and 2, and Net Zero by 2050.

Setting ambitious but achievable targets has proved challenging, given the global uncertainty of recent years, and the resulting dearth of evidence-based forecasting. Particularly against government policy regarding decarbonisation of the electricity grid between now and 2030.

Whilst some other institutions have set much closer Net Zero targets, we believe this is unrealistic and unachievable without significant reliance on carbon offsetting, which is of dubious efficacy (see section 9). Our focus will remain on minimising, rather than off-setting, carbon emissions.

Along with energy efficiency improvements, much of the potential for carbon reduction lies with de-gasification of buildings and a switch to low-carbon electricity for heating, but this will significant capital and revenue cost implications, as well as local electricity grid capacity limitations.

The target to achieve an 80% reduction by 2030 is realistic but remains ambitious in the context of these challenges, an expanding university estate and the wider financial context of the sector.

Fig 4.0. shows the historical and projected pathways to achieving the 2025 and 2030 emissions reduction targets in Scope 1 and Scope 2 emissions, from the 2005 baseline. Those targets, of 70% and 80%, correspond to total annual emissions of 1454 tonnes CO2e in 2025 and 970 tonnes CO2e in 2030.

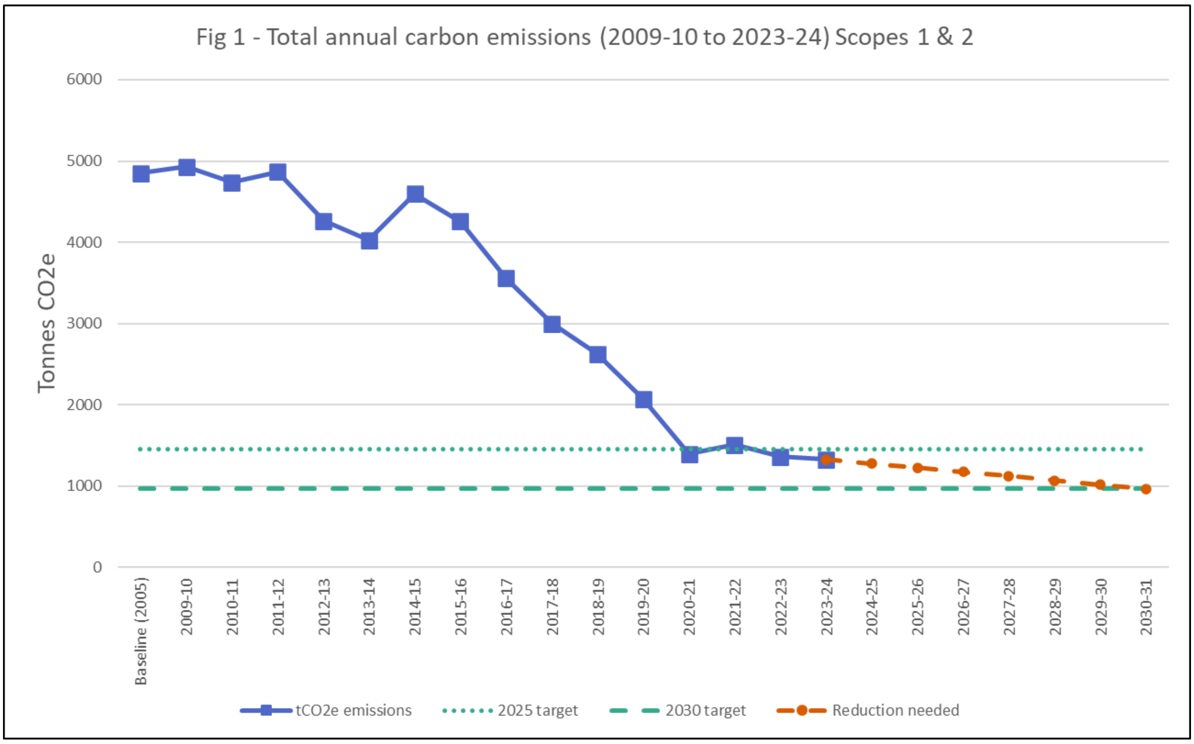


Fig 4.0.1 Total university emissions (Scope 1 & 2) and trajectory to 2030.

As we approach 100% reduction against the 2005 baseline it becomes more difficult to cut emissions, with much of the 'lower hanging fruit' already realised. Therefore, we anticipate that the curve of this downward trajectory will continue to flatten out to reflect this, as shown in Fig 4.0.1

Scope 1 and Scope 2 emissions for 2022-23 were 1426 tonnes CO2e, meaning that additional reductions of 360 tonnes CO2e are required to achieve the 2030 target. This has been represented in Figure 4.0.1 as an average annual reduction of **51.4 tonnes CO2e per year**.

The dramatic progress that has been made in reducing emissions during the last decade is due to a combination of:

- Continuous work to improve energy use and efficiency;
- The purchase of electricity directly from renewable sources, through Corporate Power Purchase Agreements (*n.b.* this is not the same as 'green tariff' electricity);
- On-site energy efficiency improvements across the University estate;
- The 'greening' of the UK's electricity generation infrastructure, which has led to significant reductions in the carbon intensity of grid electricity (See Figure 7.2.);
- The de-gasification of the university estate (still ongoing), to maximise the benefits of the 'greener grid'. For example, the University's catering operations now use no gas at all in any outlets.

5 METHODOLOGIES FOR ACHIEVING KEY REDUCTION TARGETS

This section of the strategy details the methods which will be implemented to achieve the 2025 and 2030 carbon reduction targets. The 'carbon reduction methods' specified in Table 5.0 above will form sub-headings within this section including;

- Energy efficiency
- De-gasification of the estate
- Renewable energy
- Construction and refurbishment

5.1 ENERGY EFFICIENCY

The University recognises that energy efficiency plays a pivotal role. This section outlines our approach to achieving energy efficiency across our campuses. By implementing targeted strategies, we aim to reduce our environmental impact while maintaining operational excellence.

Table 5.0

	Method	Targeted Next Steps
Monitoring and reporting	**Energy monitoring** For emissions monitoring the university currently carries out a baseline read of all meters, including sub-meters, each July, at the end of the financial and academic year. Finer temporal resolution (e.g. monthly, quarterly) is not currently routinely used or required (but see 'Annual Assessment and Report', below). Challenges to be addressed include installation of additional sub-meters for greater spatial resolution, and the need for specialised skills for some aspects of data analysis and interpretation.	Expand sub-metering to provide data granularity and allow active building-by-building monitoring of energy use.
	Energy data analysis YSJ uses SystemsLink for utility billing verification. In 2024 the system was upgraded to allow automatic uploading of meter data, but the analysis functions continue to be underutilised due to a lack of specialist expertise. Additional training for the energy team is underway.	Optimised use of SystemsLink carbon reporting by those completing training. Cross team Energy Working Group established.
	Annual assessment and report Currently energy use and carbon emissions are reported annually and included in the university's annual directors report and financial report. The University has recently committed to reporting on carbon reduction activities twice-yearly.	Bi-annual carbon reporting

	Alarms and ongoing performance The use of 'smart' alarms to identify abnormal energy use in automatically monitored meters was introduced in 2024. This will be further refined and developed in 2025.	Ongoing monitoring of smart alarms.
Reduction of energy use	**Reduce energy demand for heating and hot water** Building heating is a significant cause of carbon emissions. Works necessary to address this vary, and buildings will be assessed for the viability and cost/benefit of the following: • Energy surveys of buildings, and prioritisation • Insulation (roof, thermal drylining, etc) • Secondary glazing • Expansion and improvement of Building Management System • Replacement / upgrade of existing heating systems with lower emission systems	Energy Working Group to identify and drive energy reduction projects.
	Reduce non-heating electrical demand Periodic energy saving campaigns for both students and staff are currently implemented. These will continue with further work needed to improve their impact. The introduction of mandatory energy efficiency and sustainability training (via online training platform Ihasco) for all staff is being evaluated.	Continue periodic energy saving campaigns. Evaluate online training options for energy efficiency and sustainability.
	Greater expectation on the wider university community and relevant departments. Current efforts are undertaken almost exclusively by and within estates.	Expand targeted efforts and senior level expectation to other relevant teams (particularly where impact is high, e.g. ITS).

5.2 DE-GASIFICATION OF THE ESTATE

Currently, approximately one third of the university's consumed energy comes from gas, which is primarily used to heat buildings during winter months, but also for year-round hot water provision in a number of buildings.

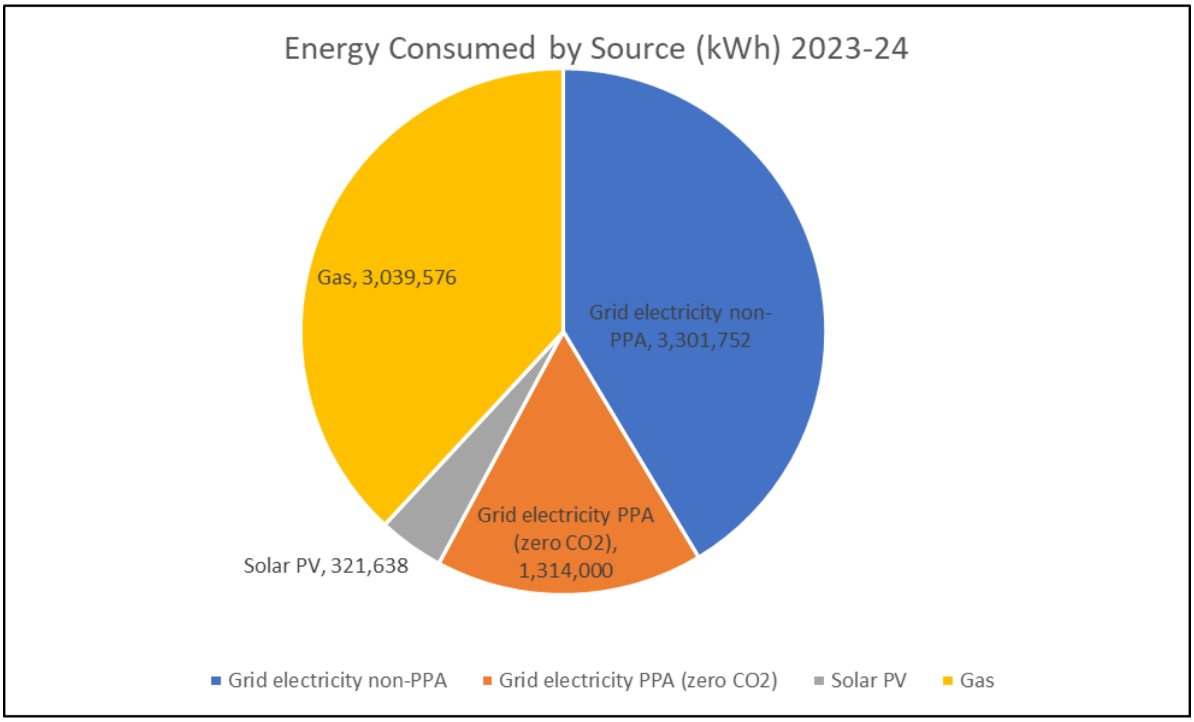


Fig 5.2.1 University energy sources mix 2023-24 (kWh)

The carbon intensity of natural gas at **0.183kgCO2e/kwh**, has barely changed over the last decade, and is unlikely to change substantially in the foreseeable future. (Source: UK Government carbon conversion factors[2]).

In contrast, carbon emissions per kWh of grid electricity have fallen dramatically over the last decade, from **0.445kgCO2e/kWh** in 2013 to **0.207kgCO2e/kWh** in 2024, primarily due to the rapid growth of renewable energy supplied to the grid, and the replacement of carbon-intensive coal-fired power generation with less carbon-intensive gas-fired generation (Fig 5.2.2). This trend is expected to continue in future years due to the addition of renewable energy generation, albeit at a slower rate.

The UK Climate Change Committee (CCC) has proposed that the grid should be fully decarbonised by 2035. However given the inaccuracy of similar predictions in the past we have included a 30% safety margin to these carbon predictions where the used in calculating our emissions reductions.

[2] https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

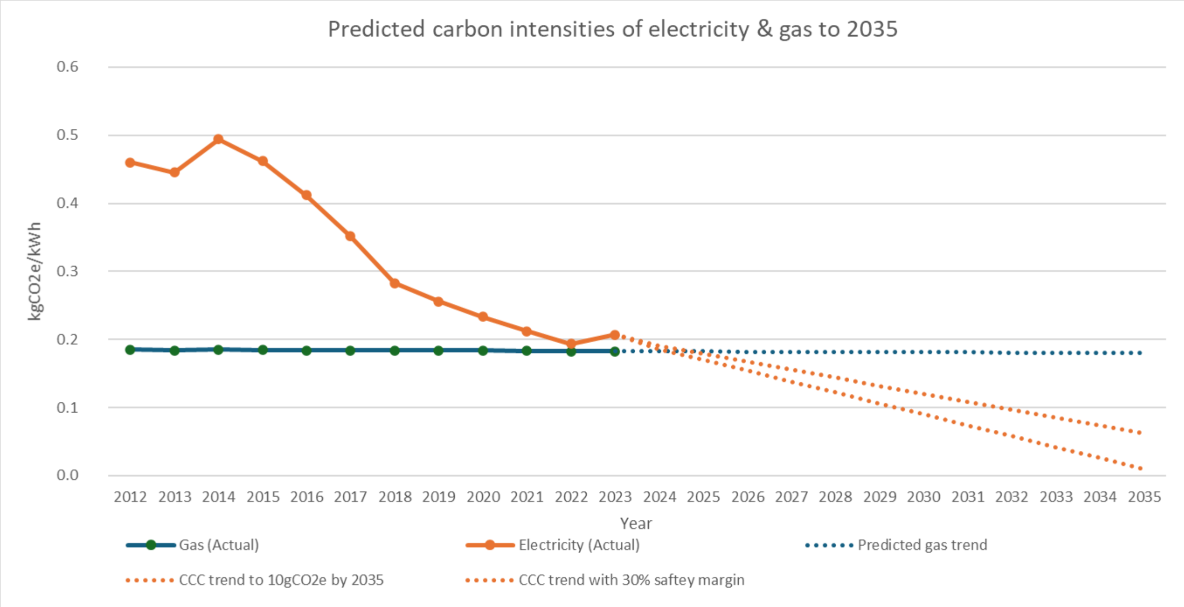


Fig 5.2.2. Carbon intensity trend of UK grid electricity & natural gas supplies, 2012 to 2035.

The university also currently sources 29% of its electricity directly from renewable sources. This proportion will increase as further opportunities arise, although timescales for substantial additions are currently uncertain (see section 5.3) due to the medium-term effect of recent price shocks and volatility on future energy markets following e.g. the invasion of Ukraine.

In this broad context of increasingly cleaner electricity supplies, the conversion to electricity of existing gas-fired heating and hot water systems on the estate will play an important role in reduction of Scope 1 emissions across the university.

It is important to note, however, that the current cost of electricity is approximately three to four times that of natural gas per kWh, so the use of more efficient technologies, such as air source heat pumps or occupancy-based heating controls, must be utilised where possible. The capital cost of such equipment is higher, but this approach avoids most of the impact on operational expenditure.

It should be noted however, that in any scenario focussed on decarbonisation, relative heating costs will likely rise in the short to medium-term, due to these carbon reduction measures, hence the simultaneous focus on energy efficiency to mitigate this impact.

5.2.1 Current University Buildings consuming gas (as of 2025)

Figure 5.2.3 below shows the university buildings which currently use gas, in order of highest gas usage per annum to lowest. Table A5.2.1 in the Appendix shows the planned list of projects for fully or partially eliminating gas use from the highest gas consuming buildings, along with preliminary cost and emissions savings estimates.

It should also be noted that the existing systems have a limited lifespan. A number of the systems listed in Table A5.2.1 will be due for replacement in the next several years, as they come to the end of their useful lifespans.

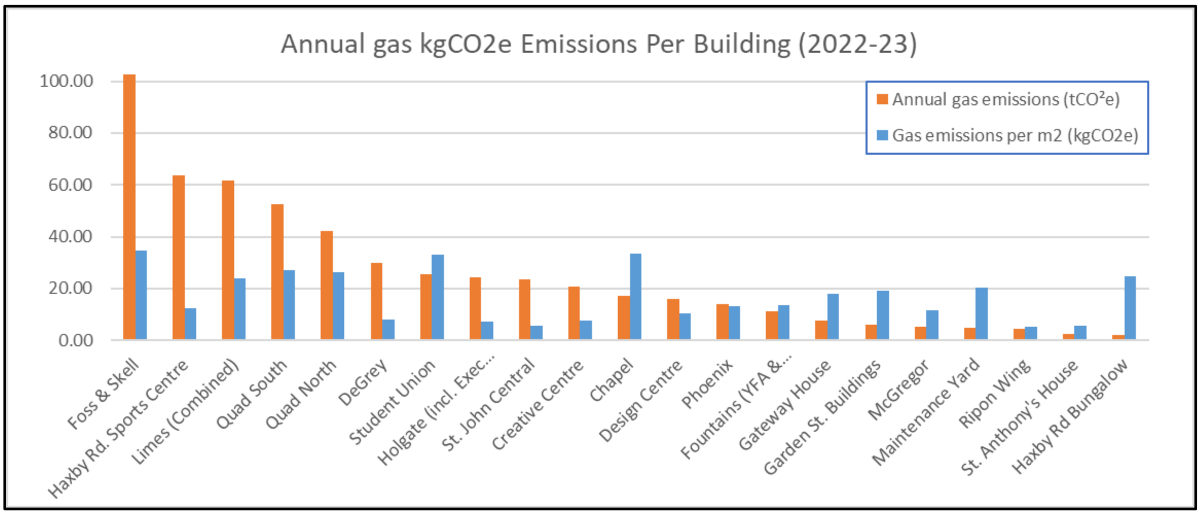


Fig 5.2. Annual emissions due to use of natural gas by building (absolute & per m2), 2022-23.

5.3 RENEWABLE ENERGY

The university has committed to sourcing 50% of its electricity from renewable sources by 2026, as part of its 2026 strategy. Table 5.3 summarises the methods by which the proportion of renewable energy in the mix used by York St John will be increased.

Table 5.3

Carbon Reduction Method	Summary	Targeted Next Steps
Corporate Power Purchase Agreements	Since 2019 a fixed 1,314MWh of renewable electricity is purchased annually through a 15-year Corporate Power Purchase Agreement (CPPA), amounting to approximately 24% of all electricity used in 2022-2023. This is due to end in 2029. Recent volatility of interest rates & energy prices means that no additional CPPAs have become available since the first CPPA was signed. If this situation persists there is a risk that the 2026 target of increasing this proportion to 50% may not be met but, in the expectation that new CPPAs will become available we will continue to prioritise these as a long-term procurement-based solution, while also providing budget certainty.	Monitor CPPA opportunities
On-site Renewables	Since 2021 solar photovoltaic panels have been installed at ten locations across three of the university's York sites, supplying 6.5% of the University's electricity during 2023-24. Although we have reached the practical limit of on-site generation permitted by the local electricity infrastructure at Lord Mayor's Walk, possibilities for further solar PV at other YSJ sites in York will be assessed as they arise, primarily at The Grange and Limes Court.	Monitor for opportunities

5.4 CONSTRUCTION, REFURBISHMENT, AND EFFICIENT USE OF BUILDINGS

Significant emissions reductions from the normal use of buildings can, in very broad terms, be achieved by:

- Refurbishment of existing buildings to higher efficiency standards.
- Setting and adhering to high environmental design standards for new builds (surpassing the requirements of current building regulations).

Additionally, the need for new buildings can be reduced by maximising space utilisation efficiency in existing buildings.

Table 5.4

Carbon Reduction Method	Summary	Targeted next steps
Building refurbishment	YSJ's '*Sustainable Building Criteria*' will continue to be met for all refurbishment projects. High value, large refurbishment projects will be certified to a relevant environmental standard as appropriate to the project, such as BREEAM or SKA.	Review *Sustainable Building Criteria* and update as necessary. Support refurbishment projects in achieving environmental targets.
New construction	YSJ's in-house '*Sustainable Construction Criteria*' will continue to be met for all new build projects. The requirements far exceed building regulations in areas including fabric efficiency, water efficiency and construction waste management. The *Sustainable Building Criteria* ensure that construction projects result in low carbon buildings, minimising or avoiding the increase in carbon emissions associated with a growing university. As per the *Sustainable Construction Criteria*, BREEAM Excellent will be achieved for all new build projects.	Review *Sustainable Construction Criteria* and update as necessary. Support new build projects in achieving environmental targets. This implies a c.5-10% construction cost premium.
Efficient use of buildings	Efficient space utilisation can provide opportunities to significantly reduce carbon emissions. It is still common to see rooms unoccupied all week or specialised spaces only being available for certain courses. The Directorate of Estates Management and Development will attempt to improve space utilisation through agreed projects as part of the Campus Optimisation Programme. This is contingent upon a complimentary suite of processes surrounding pedagogy and strategic cooperation across all schools.	Continue with planned projects and aims within the Campus Optimisation Programme.

6 ENERGY AND CARBON USE PREDICTIONS TO 2030

This section outlines the projected energy consumption and carbon emissions for various decarbonisation projects and energy sourcing initiatives across the estate. The predictions are based on current estimates and the planned projects in Table A5.2.1.

These projects are aimed at reducing the reliance of gas on the estate, sourcing low-carbon electricity and enhancing energy efficiency. The university will also actively investigate additional projects as opportunities and technologies become available. We will also discount proposed projects that are shown to be unfeasible; therefore, it is expected that these predictions will likely change and develop over time.

The figures 6.0.1 & 6.0.2 display the predicted energy use by type from 23-24 through to 2030-31 for the 'do nothing' scenario and following the proposed carbon reduction project plan. It can be seen the combined projects significantly reduce gas use to electricity and increase the proportion of electricity sources from low carbon CPPAs.

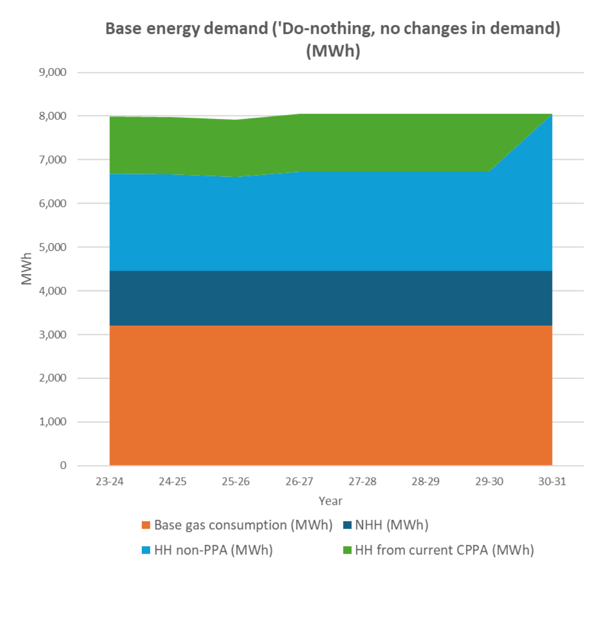


Fig 6.0.1. 'Do nothing' predicted energy demand (2023-24 to 2030-31)

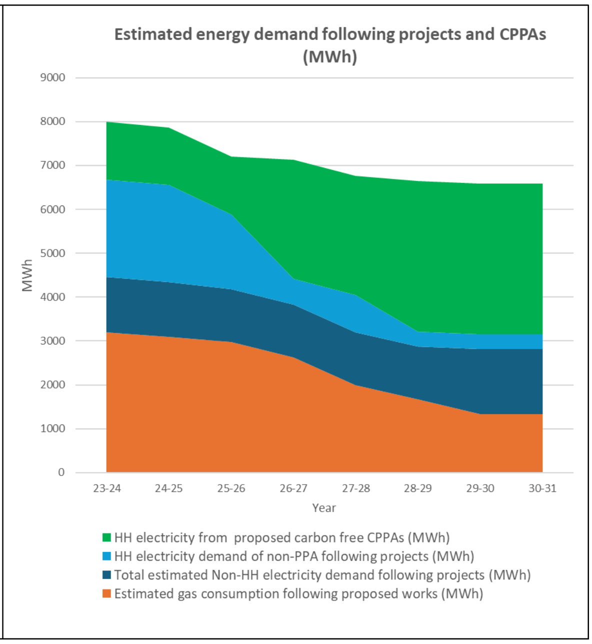
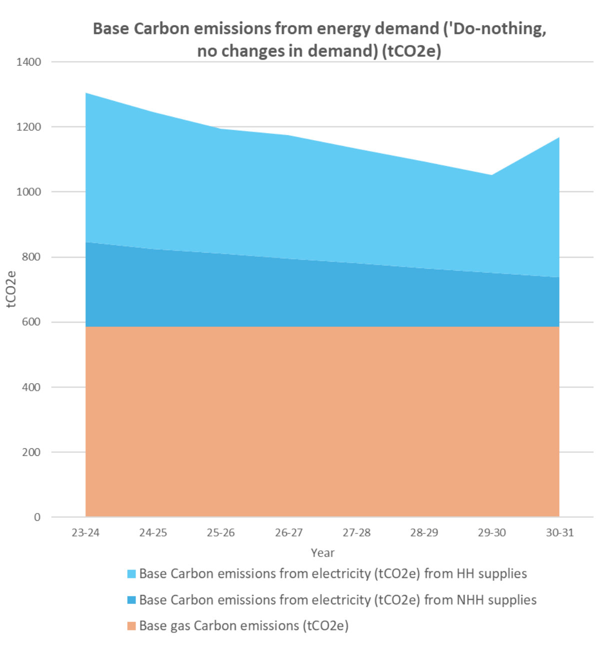


Fig 6.0.2. predicted energy demand following proposed Carbon reduction projects (2023-24 to 2030-31)

Figure 6.0.3 shows the carbon emissions based on the 'do-nothing' scenario. This shows the effect of the greening of the UK electricity grid. Whilst this brings us close to our energy target this does not take into account the expansion of the existing university estate.

Any expansion of the estate may have a significant impact on these emissions. Particularly if the expansion includes older, inefficient buildings. Or leased floors of buildings where we cannot leverage CPPAs on the electricity used.

In comparison Fig 6.0.4 shows the predicted reduction in carbon emissions following the successful completion of each of the carbon reduction projects, using the estimates of carbon reduction and completion dates from Table A5.2.1.



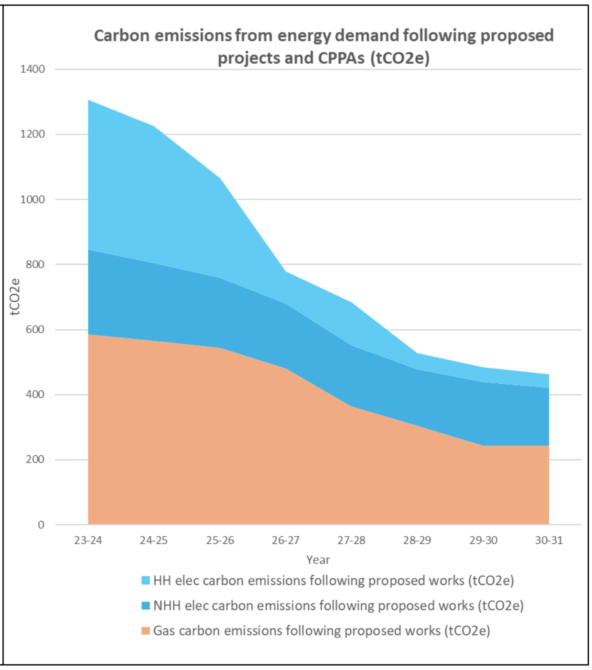


Fig 6.0.3. 'Do nothing' scenario prediction, Scope 1 & 2 carbon emissions

Fig 6.0.3. Prediction following proposed Carbon reduction projects, Scope 1 & 2 carbon emissions

These projects put the university Scope 1 & 2 emissions comfortably below the current 80% reduction by 2030 target. However, any expansion of the university estate, the abrogation of unfeasible projects or changes in the governments approach to supporting green energy may have significant impact on these estimates.

Therefore, continual re-evaluation will be required, especially considering potential estate expansion, evolving technologies and challenges, to ensure that carbon reduction targets are achieved over time.

7 SCOPE 3 CARBON EMISSIONS: TARGETS AND ACTIONS

York St John University's Scope 3 emissions are, in broad terms, the Scope 1 and 2 emissions of York St John's external suppliers of goods and services. However, it is acknowledged that the university may have significant influence over the reduction of these emissions by, for example, conscientious procurement decisions.

Four categories of Scope 3 emissions are currently monitored at York St John University:

- Business travel
- Waste
- Water supply, including wastewater
- Staff and student commuting

The priority until 2030 will be to expand monitoring to include procurement of other key goods and services, to cut emissions as per the targets in table 7.0.1 below, and to raise awareness among staff and students about the need to reduce Scope 3 emissions.

The following targets have been set for reducing Scope 3 carbon emissions:

Table 7.0.1

Scope 3 Category	Baseline Year	Baseline t/CO2e	2030 Carbon Reduction Target	2030 Carbon Emissions Target t/CO2e
Procurement (supply chain)	2022-23	21376.9	10%	19,239.20
Business travel	2018-19	349	20%	279.00
Staff and student commuting	2024-25	4,025	10%	3,623.00
Waste	2019-20	6.049	20%	4.84
Water supply	2022-23	6.841	10%	6.15
Wastewater	2022-23	7.380	10%	6.56

The table below sets out 'next steps' for achieving the above.

Table 7.0.2

Scope 3 emissions source	Summary	Targeted next steps
Business travel	Carbon emissions from business travel will continue to be recorded by the YSJ Travel Team who manage all university business travel bookings	Carry out awareness raising activities on YSJ business travel carbon emissions. Work with department representatives to reduce carbon emissions associated with business travel.
Waste	Continue to analyse monthly waste reports to identify opportunities for reducing waste tonnages and associated carbon emissions.	Work with university departments to minimise waste, establish sustainable procurement practices, reducing, re-using and recycling unwanted goods.
Water	Continue to monitor and report water use and minimise water waste through swift repair of leaks and use of water efficient fittings. Continue to invest in rainwater harvesting for watering University grounds.	Investigate and resolve spikes in water use. Procure water efficient fittings. Increase rainwater harvesting capacity.
Staff and student commuting	A staff and student travel survey in 2024 has provided baseline data for monitoring Scope 3 carbon emissions associated with commuting. The results will inform target setting and the development of a Sustainable Travel Plan.	Use Travel Survey results to develop a Sustainable Travel Plan (2025) and prioritise carbon-cutting initiatives

Procurement of goods and services	Continue work on implementing sustainable procurement practices across all departments. Expand Scope 3 emissions monitoring to include the procurement of goods and services.	Expand Scope 3 monitoring into the procurement of key goods. Implement sustainable procurement practices across all departments.

8 CARBON OFFSETTING & CARBON INSETTING

8.1 CARBON OFFSETTING

A national target of Net Zero by 2050 has been set for the UK[3]. To achieve this, it will be necessary to both a) reduce carbon emissions to close to zero and b) offset any residual emissions.

Offsetting presents significant challenges. Global carbon offset markets currently lack the rigour and transparency needed to ensure that offsets are both genuine *and* lasting. The University's view of the current carbon offsetting industry is that it does not yet offer a robust method for offsetting carbon emissions, and therefore that is not something to be invested in at present.

The University has therefore taken the decision not to set a Net Zero target, which would necessitate carbon offsetting. Instead, we shall continue with setting targets for absolute emissions cuts (rather than cuts relative to any metric such as 'per student' or 'per square meter') for Scopes 1 and 2 and to working towards achieving those targets.

The nature and effectiveness of the carbon offsets market will be kept under review and, if it becomes clear that offsetting has become a demonstrably genuine, effective, and durable tool for global emissions reduction, the University's stance on offsetting shall be revised.

8.2 CARBON 'INSETTING'

In the absence of reliable carbon offset initiatives, a number of organisations are considering 'insetting', the investment of money, that would otherwise have gone to external offsetting projects, in carbon reduction projects within the institution instead.

This approach has its own challenges, such as ensuring additionality, accurately measuring carbon reduction, and externally verifying carbon reduction claims to provide stakeholder confidence. As with carbon offsetting, the University is committed to keeping up to date with developments in this area.

[3] https://assets.publishing.service.gov.uk/media/6569cb331104cf000dfa7352/net-zero-government-emissions-roadmap.pdf

9 RESPONSIBILITIES & GOVERNANCE

The Carbon Management Plan includes actions that impact all areas of the University.

The Directorate of Estates Management and Development will have ownership of the plan as part of its oversight of Corporate Sustainability and will be responsible for achieving the targets set, ensuring alignment with the university's strategic objectives and reporting to the Executive Board as part of our annual report alongside the University accounts.

Each school and department will be responsible for the facilitation and implementation of carbon reduction measures in their respective areas, providing reports on monitoring and progress of carbon reduction initiatives as required.

All staff and students are encouraged to contribute to carbon reduction efforts, fostering a culture of sustainability across the university.

10 FINANCING CARBON REDUCTION

Implementation of the Carbon Management Plan will present difficult funding decisions in the years ahead, particularly where there is little or no financial return on investment and cheaper, more polluting options are available.

The University recognises that we face a global climate emergency and is therefore fully committed to meeting our targets as quickly as possible. Internal as well as external sources of funding will continue to be leveraged to aid progress.

As we work towards our carbon reduction goals, to 2030 and beyond, decision-making, financial or other, will increasingly need to engage and align with the agreed decarbonisation path.

Capital costs outlined in Figure 10.0.1 will form part of proposals presented as part of the University's existing capital programme process.

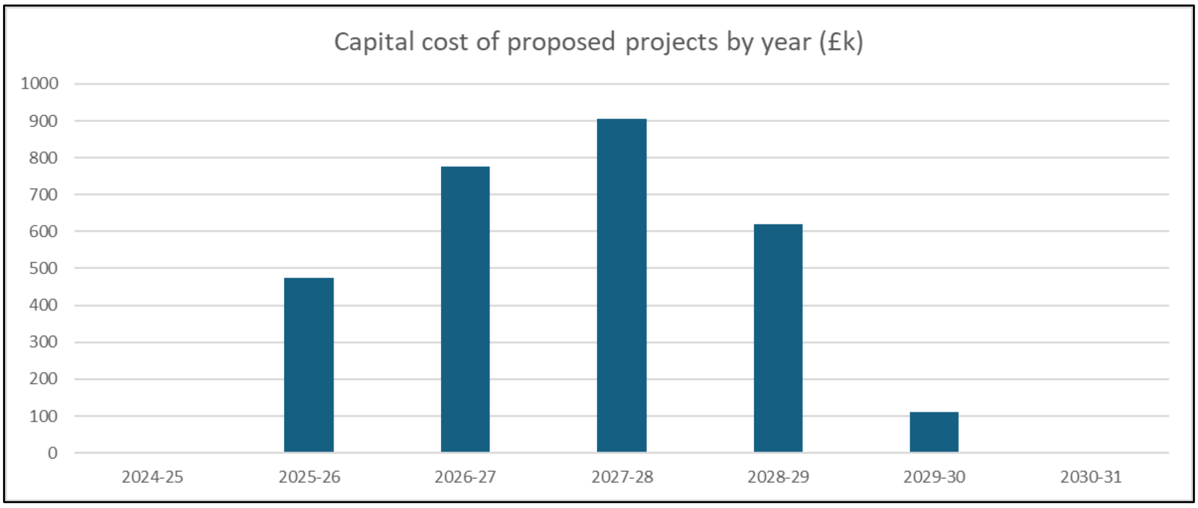


Fig 10.0.1 Projected Capital cost of Carbon Reduction Projects, 2024-2030

It is estimated that annual utilities costs will increase due to the increased reliance on more expensive electricity versus gas, however as cam be seem in Figure 10.0.2 due to the global uncertainty in energy markets in preceding years (particularly in relation to the Russian-Ukraine conflict) these costs should decrease in the short term.

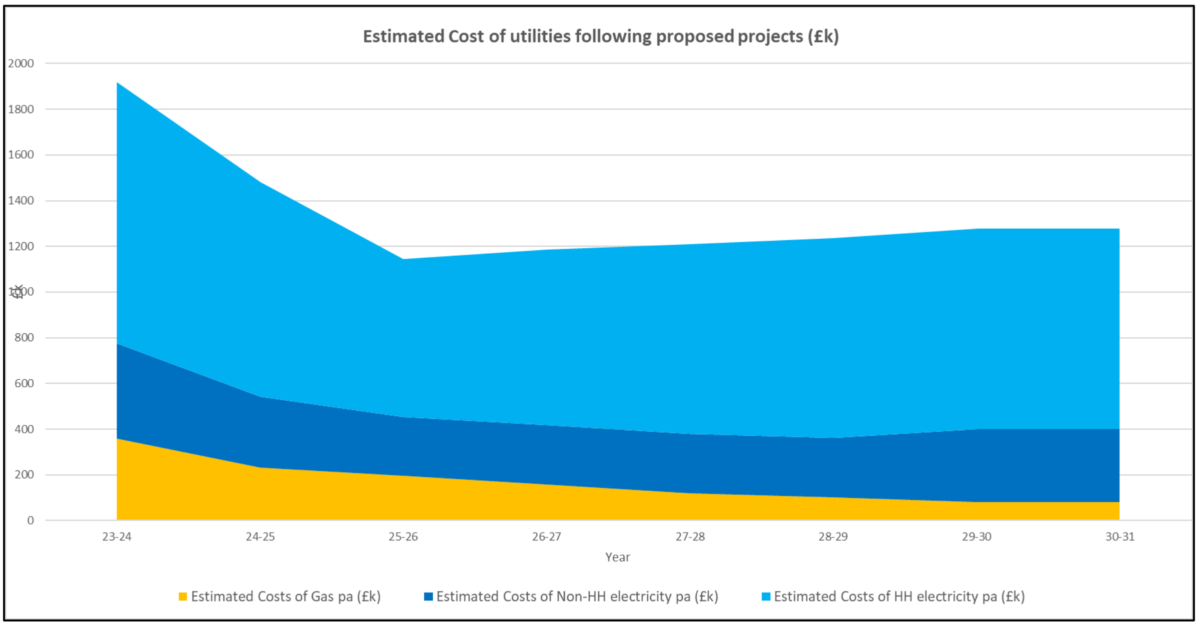


Fig 10.0.2 Estimated Annual Utilities Costs forecast, based on Proposed Carbon Reduction Projects, 2024-2030

11 RISKS AND CONSTRAINTS

There are two ways to consider risk in relation to carbon emissions; the risks of 'doing nothing' and continuing without a carbon reduction plan in place, and the risks that may prevent the University from meeting its targets.

11.1 THE 'DO NOTHING' SCENARIO

The infographic in Figure A11.0 (Appendix A) has been taken from the Climate Change 2023 Synthesis Report[4] produced by the Intergovernmental Panel on Climate Change's (IPCC). Globally, we are aiming to limit warming to 1.5^{o}C and the blue line in the first graph highlights just how rapidly we need to cut emissions.

If we 'do nothing' and cut carbon emissions at a rate based on the governmental policies already in place when the report was written, we can expect a temperature rise of 3.2^{o}C.

Figure 11.1 (Appendix A) is another infographic from the same IPCC report, highlighting the impacts of climate change, some of which are unavoidable and we already experiencing, and all of which will worsen as temperatures rise.

Reputationally, based on the results of the SOS UK "Sustainability Skills Survey 2022-23" (Figure 11.2(Appendix A), it is clear that a significant and increasing number of students are influenced by how seriously their university or college takes environmental and global development issues.

Specifically, 54% of respondents consider the institution's stance on environmental issues a factor influencing their choice of university. Given this data, there would be a significant risk of hampering the University's ability to attract new and increasingly environmentally conscious students.

Much progress has been made in recent years to cut carbon emissions at York St John University, but a lot more can still be done. To 'do nothing' would be both unethical and a significant reputational risk to the organisation, given the urgent nature and scale of the global challenge in tackling climate change.

11.2 RISKS THAT MAY LIMIT OUR ABILITY TO MEET TARGETS

The following key risks have been identified in achieving the proposed carbon reduction targets;

- **Insufficient funding available to meet targets**
  Mitigation: If targets are to be met the University will need to commit funding. Indicative costs for some of the measures necessary have been included in this document. Resources, including staffing, will be needed to allow external funding opportunities to be investigated and secured.

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[4] Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

- **Insufficient capacity to deliver the actions identified**
  Mitigation: Responsibility will need to be assigned to relevant roles across respective university departments to implement actions and share achievements. Actions to support delivery will ideally need to be integrated into the University strategy.

- **Insufficient involvement from schools/departments in implementing necessary actions**
  Mitigation: Establish broad, reportable expectations across a wider range of schools and directorates, with identified leads, with progress from all reported to the University's Executive Board in line with recently agreed external audit recommendations.

12 APPENDIX - A.

Fig A3.1.1 University Emissions per m2 GIA (2016-23)

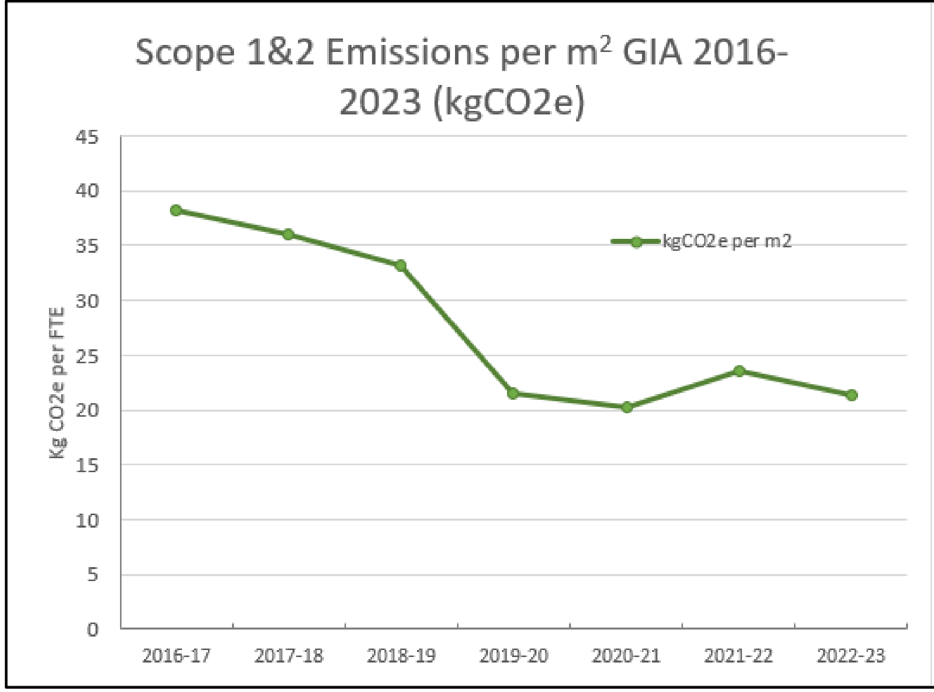


Fig A3.1.2 University Emissions per FTE (2016-23)

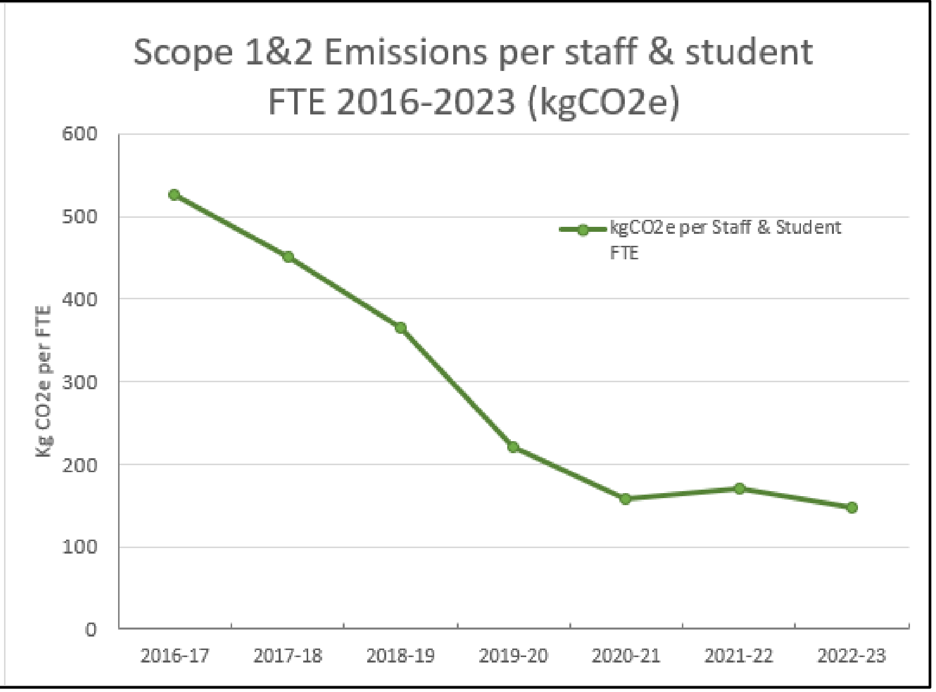


Table A5.2.1 Cost estimates associated with de-gasification solutions.

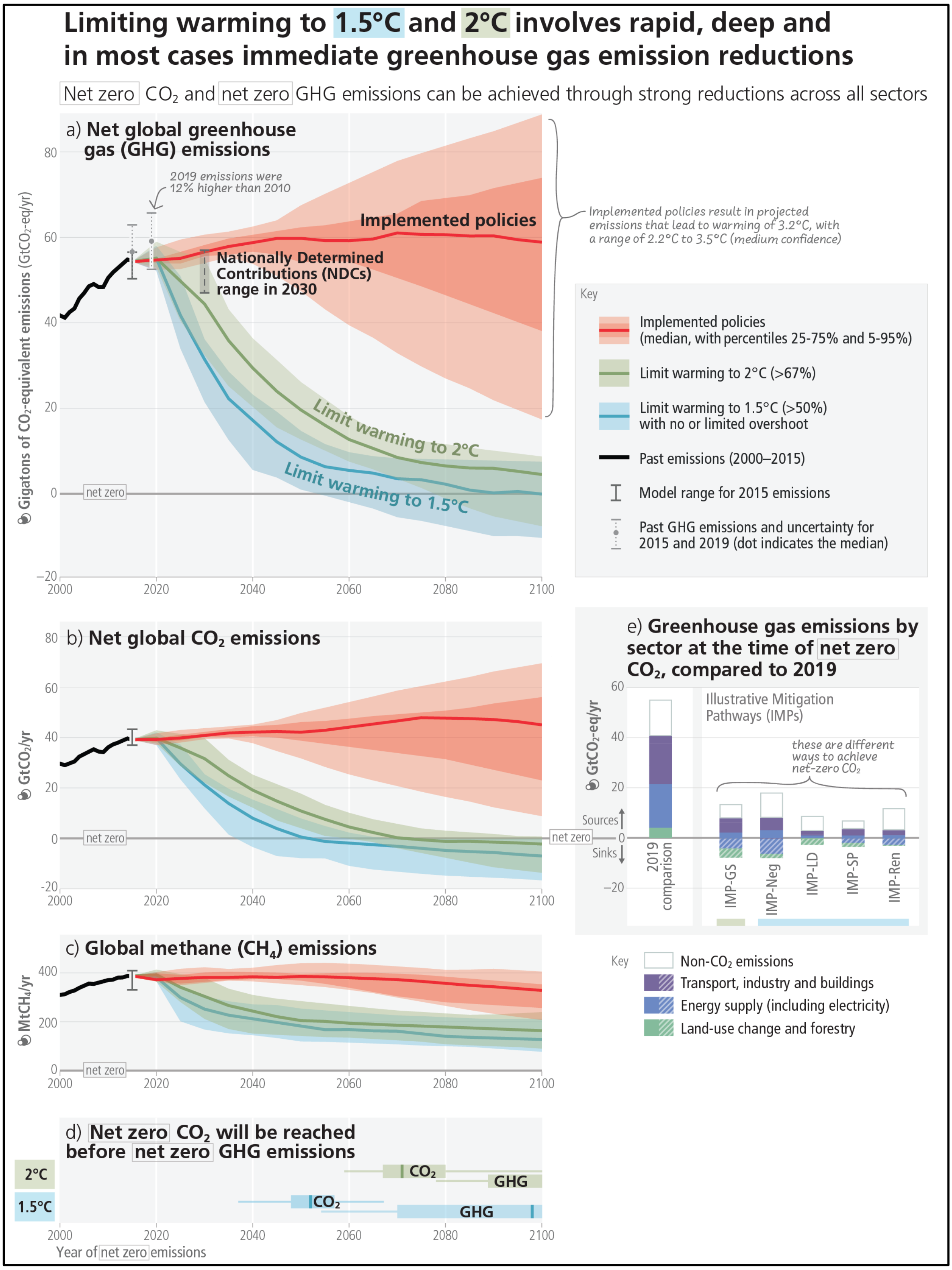
(These are indicative and not intended to suggest that all solutions could or should be undertaken. Rather, it is a guide to assist with identification of cost-effective carbon reduction opportunities as this plan is implemented.)

Project type	Building	Project	Annual gas emissions (tCO^{2}e) of building	Estimated % gas reduction from project	Estimated Carbon Saved from de-gas (tO2e)	Reduction in current total gas consumption	Estimated capital cost (£k)	Proposed Year of completion	Risk of project failure	% Electrical efficiency of proposed system (vs. existing gas system)	Estimated increase in HH elec consumption (MWh/pa)	Estimated increase in Non-HH elec consumption (MWh/pa)	Estimated increase in carbon emissions from HH electricity use (tCO2e)	Estimated increase in carbon emissions from Non-HH electricity use (tCO2e)	Estimated carbon savings (using current conversion factors) (tCO2e)	Estimated capital cost per kgCO2e carbon saved (£)	Notes
Decarbonisation Project	Foss & Skell - heating, hot water & bunsen burners	Foss & Skell Decentralised hot water	102.71	20	20.54	3.82	40	2025	Low	120	93.54	Nil	17.12	Nil	3.42	11.68	Currently bunsen gas is unmetered, therefore a conservative 40% assumed until data is available)
Decarbonisation Project	Foss & Skell - heating, hot water & bunsen burners	Foss & Skell Decentralised A/C	102.71	40	41.08	7.64	150	2026	Low	300	74.83	Nil	13.69	Nil	27.39	5.48	
Decarbonisation Project	Haxby Rd. Sports Centre - heating & hot water	HX Heat pump to wet heating system	35.97	100	35.97	6.69	300	2027	Med	250	78.63	Nil	14.39	Nil	21.58	13.90	
Decarbonisation Project	Haxby Rd. Sports Barn - heating	HX Heat pump to sports barn AHU	27.69	100	27.69	5.15	200	2027	Low	250	60.52	Nil	11.08	Nil	16.61	12.04	
Decarbonisation Project	Limes (29 houses) - heating & hot water	Limes Perfect heating an hot water to all 29 houses	61.75	100	61.75	11.48	110	2029	Low	120	Nil	281.19	Nil	51.46	10.29	10.69	Limes is on NHH electricity meters, which cannot currently be part of any low carbon CPPA. Therefore is less of a priority as HH metered building, until such time as a NHH CPPA is developed or the grid is further decarbonised.
Decarbonisation Project	Quad South - heating	QS Prefect to small rooms/offices (inc fabric improvements)	52.48	35	18.37	3.42	105	2027	Low	150	66.92	Nil	12.25	Nil	6.12	17.15	
Decarbonisation Project	Quad South - heating	QS Heat pump to residual radiators	52.48	60	31.49	5.86	300	2028	High	150	114.72	Nil	20.99	Nil	10.50	28.58	This work has multiple technical hurdles to overcome & therefore is marked as high risk of failure
Decarbonisation Project	Quad North - heating	QN Prefect to small rooms/offices	42.33	55	23.28	4.33	125	2026	Low	150	84.82	Nil	15.52	Nil	7.76	16.11	
Decarbonisation Project	Quad North - heating	QN Heat pump to residual radiators	42.33	45	19.05	3.54	300	2028	High	250	41.64	Nil	7.62	Nil	11.43	26.25	This work has multiple technical hurdles to overcome & therefore is marked as high risk of failure

Project type	Building	Project	Annual gas emissions ($tCO^{2}e$) of building	Estimated % gas reduction from project	Estimated Carbon Saved from de-gas (tO2e)	Reduction in current total gas consumption	Estimated capital cost (£k)	Proposed Year of completion	Risk of project failure	% Electrical efficiency of proposed system (vs. existing gas system)	Estimated increase in HH elec consumption (MWh/pa)	Estimated increase in Non-HH elec consumption (MWh/pa)	Estimated increase in carbon emissions from HH electricity use (tCO2e)	Estimated increase in carbon emissions from Non-HH electricity use (tCO2e)	Estimated carbon savings (using current conversion factors) (tCO2e)	Estimated capital cost per kgCO2e carbon saved (£)	Notes
Decarbonisation Project	DeGrey - heating & hot water	DG Heat pump to underfloor	42.33	80	33.87	6.30	300	2027	Med	300	61.69	Nil	11.29	Nil	22.58	13.29	
Decarbonisation Project	DeGrey - heating & hot water	DG Decentralised hot water	42.33	20	8.47	1.57	20	2028	Low	120	38.55	Nil	7.06	Nil	1.41	14.17	
Decarbonisation Project	Fountains LC	LED lighting conversion Fountains					90	2025	Low		-127.261	Nil	-26.35		26.35	3.42	Based on Goodlight quote and savings calculations
Decarbonisation Project	LMW Campus	LED lighting conversion of remaining fluorescent lights across campus					284.85	2025	Low		-402.78	Nil	-83.41		83.41	3.42	Assumed 50% of LMW campus already have LED lighting. Estimated Cost & energy savings use based FT Goodlight quote /m2 of FT, multiplied by 50% of m2 remaining campus
Decarbonisation Project	All Estate	Surveying and refurbishment of existing building fabric						2030	Low								
Decarbonisation Project	Accommodation sites	LED lighting conversion of remaining fluorescent lights across accommodation sites					60	2025	Low			-56.66		-11.73	11.73	5.11	
Decarbonisation Project	Student Union Heating	Ground Source heat pump for student Union	25.56	100	25.56	4.75	450	2029	Med	375	37.24	Nil	6.81	Nil	18.74	24.01	
~~Energy Sourcing~~	~~LMW Campus~~	~~Off-site, Behind-the-Meter power generation project~~					~~Nil~~		~~Failed~~		~~c.-290~~		~~c.-60~~			0.00	~~This is paid for per unit of generated electricity used on campus. Contract term c. 25 years. (MWh est. from base ie. Sat & Sun HH demand from SW1 & 2 x 12hours of sun x 365 days) This is likely to be a conservative estimate.~~
Energy Sourcing	All Estate	Corporate Power purchase low-carbon elec to 'half hourly' (HH) metered electricity supplies (est 40% of current HH electricity 1410MWh)					Nil	2026	Low		-1410		-292			0.00	This is paid for as a monthly purchase of HH electricity. Contract term c. 15 years.
Energy Sourcing	All Estate	Corporate Power purchase low-carbon elec to 'half hourly' (HH) metered electricity supplies (est 20% of current HH electricity 705MWh)					Nil	2028	Low		-705		-146			0.00	This is paid for as a monthly purchase of HH electricity. Contract term c. 15 years.

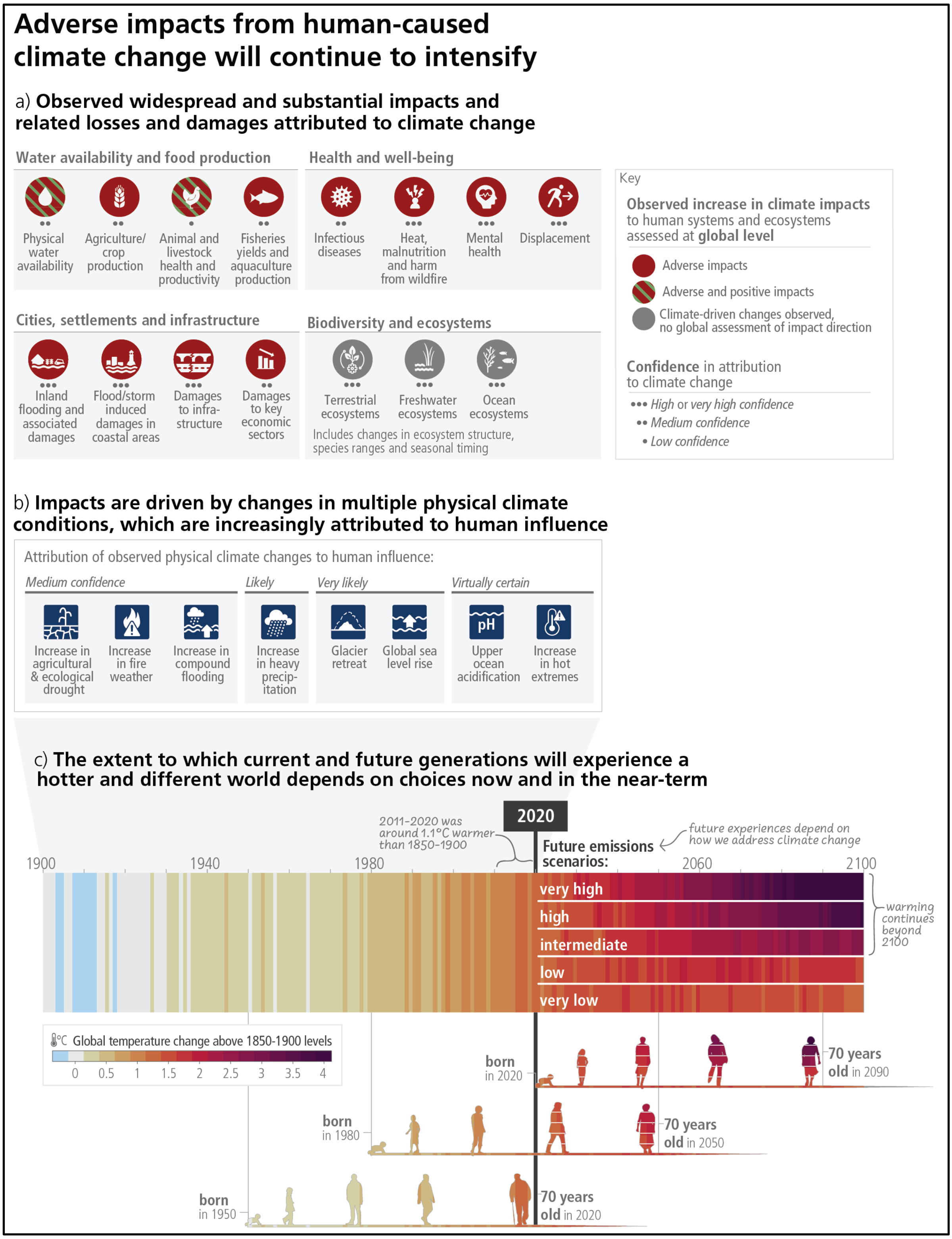
Project type	Building	Project	Annual gas emissions (tCO^2e) of building	Estimated % gas reduction from project	Estimated Carbon Saved from de-gas (tO2e)	Reduction in current total gas consumption	Estimated capital cost (£k)	Proposed Year of completion	Risk of project failure	% Electrical efficiency of proposed system (vs. existing gas system)	Estimated increase in HH elec consumption (MWh/pa)	Estimated increase in Non-HH elec consumption (MWh/pa)	Estimated increase in carbon emissions from HH electricity use (tCO2e)	Estimated increase in carbon emissions from Non-HH electricity use (tCO2e)	Estimated carbon savings (using current conversion factors) (tCO2e)	Estimated capital cost per kgCO2e carbon saved (£)	Notes
~~Energy Sourcing~~	~~Grange Site~~	~~Privatisation of Grange susbstation to allow conversion to HH metered supplies (to Maximise CPPA)~~							~~Failed~~							0.00	~~This would allow all of the grange site to be metered as part of our HH electricity, which can then be sourced through a low-carbon CPPA - SSE have advided that the project is too small to be viable 25.07.24~~
Energy Sourcing	All Estate	Renewal of Current PPA, which is due to end in 2029					Nil	2030	Low		-1314		-272.09655			0.00	Renewal of the current PPA is likely to be available at the end of the current term.
Energy Sourcing	All Estate	CPPA for Non-half hourly electricity (1,000MWh say)					Nil	2031	High				-207.08		207.08	0.00	This is still under investigation by TEC as to whether it is technically possible using smartmeters

Figure A11.0: Limiting warming to 1.5 °C and 2 °C



Source: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647 https://www.ipcc.ch/report/ar6/syr/

Figure A11.1: Adverse impacts from human-caused climate change

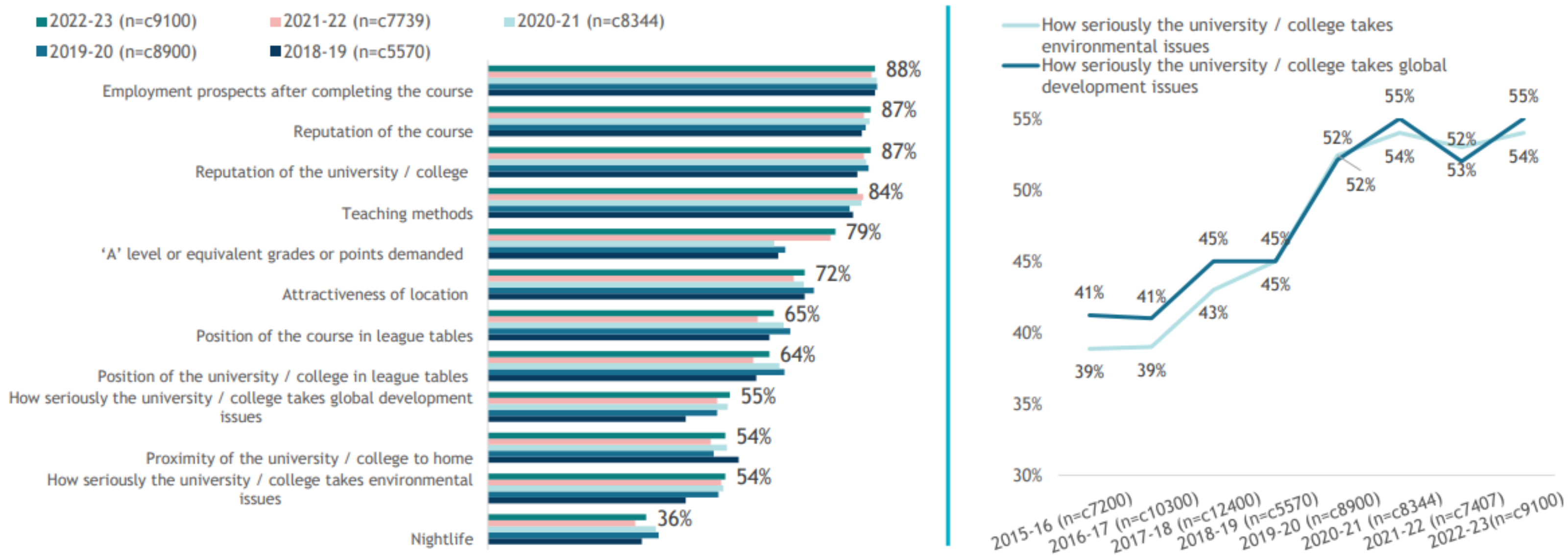


Source: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647 https://www.ipcc.ch/report/ar6/syr/

Figure A11.2: What factors influence choice over place of study.

What factors influence choice over place of study?

Respondents were asked to identify how important a range of factors were to their decision on where to apply to study. Primary motivations for respondents include, employment prospects on completion of their course reputation of their course and institution and the teaching methods used. However, over half (54%, n=4862) of respondents were influenced by the action their place of study takes on environmental issues. A similar proportion of respondents report they are motivated by how seriously their university or college takes global development issues (55%, n=4934). These motivations have significantly increased over the course of this research. International students from outside the EU are most likely to say how seriously the university / college takes global development issues (76%, n=1712) and environmental issues (71%, n=1590) are most likely to influence their choice.



Sustainability Skills Survey 2022-23

Q. How important were the following when choosing which college or university to apply to? Weighted base: c.9100 (2022-23) Balance: No response and not rated as 'important' or 'very important'

Source: SOS UK Sustainability Skills Survey 2022-23 pp15

13 KEY TERMS AND DEFINITIONS

13.1 KEY TERMS

TERM	DEFINITION
Net zero carbon	Reducing carbon emissions to a very low level, such that remaining / residual emissions "*can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero [additional carbon] in the atmosphere*"[5].
Greenhouse Gas (GHG) emissions	Emissions due to human activity of gases (carbon dioxide (CO_2), methane (CH_4) and fluorocarbons, amongst others) that trap heat in the earth's atmosphere.
Decarbonisation	The process of reducing or eliminating carbon dioxide (CO2) and other greenhouse gas (GHG) emissions.
Carbon dioxide equivalents (CO_2e)	A standardised measure of the climate impact (called the Global Warming Potential, or GWP) of a greenhouse gas, usually expressed as kilogrammes (kg) or tonnes (t) of carbon dioxide. Carbon dioxide has a GWP of 1 but over a 20-year period methane, for example, has an impact 81.2 times greater than carbon dioxide, meaning that 1 kg of methane released into the atmosphere is equivalent, in climate impact terms, to 81.2 kg of carbon dioxide over the same period.
Scopes 1, 2 & 3	For measuring, recording and reporting purposes GHG emissions are separated into three categories, or Scopes. • Scope 1 includes all emissions from assets owned by the reporting organisation (e.g. gas for heating, fuel for vehicles). • Scope 2 includes indirect emissions from the generation of purchased energy, such as electricity from the national grid. • Scope 3 includes emissions from assets not owned or controlled by the reporting organization, but that the organization indirectly affects. For example, its supply chain, waste disposal, and business travel. The Scope 3 emissions of one organisation are generally the Scope 1 and Scope 2 emissions of that organisations' suppliers of goods and services.

[5] https://www.un.org/en/climatechange/net-zero-coalition

13.2 ACRONYMS

ASHP – Air Source Heat Pump
BREEAM – Building Research Establishment Environmental Assessment Method
CPPA – Corporate Power Purchase Agreement
EAUC – Environmental Association of Universities and Colleges
FTE – Full Time Equivalent
GHG – Greenhouse Gases
GWP – Global Warming Potential
HE – Higher Education
PV – Photovoltaic Panel
YFA – Yorkshire Film Archive
YSJ – York St John University