The University of Northampton

Carbon Management Plan (CMP)

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Contents

Foreword from the Vice Chancellor

This second revision of the University's Carbon Management Plan commits us to a 30% reduction in our CO_2 emissions by 2020, compared to our 2005/6 baseline. This is a challenging target given that the University continues to grow in student numbers and building floor area, with the resultant increases in carbon emissions between 2009 and 2011. As a responsive institution we accept our responsibility to contribute to reducing the sector's overall CO_2 emissions.

Our Carbon Management Plan has been developed in line with HEFCE's carbon reduction target and strategy for higher education in England, which in turn is based on the UK government's historic 2008 Climate Change Act. It provides an opportunity for us to take significant strides towards lessening the impact that the University's activities have on the local and global environment, while lessening our reliance on fossil fuels and reducing the risk to the institution of volatile energy markets.

Our transition to a lower-carbon institution will impact on every member of the University community, but will also provide opportunities for us to benefit from the growing low-carbon economy through research, innovation and social enterprise. Embedding carbon management into the workings of the University is a strategic process and as such I am requesting the support of students, staff and our stakeholders alike in order to achieve our goal.

Achieving the targeted reduction in CO_2 emissions will be both a major challenge and a sensible precaution for the future financial and environmental sustainability of the University. By establishing carbon management as a core business process, we will become better able to identify opportunities for enterprise and adapt to an increasingly carbon-constrained economy.

Professor Nick Petford
Vice Chancellor
The University of Northampton

Mr Andrew Scarborough
Chair of Governors
The University of Northampton

Management Summary

The University of Northampton acknowledges that climate change is a real and growing threat for countries, economies, and organisations in the public and private sector.

The University's Low Carbon Vision:

To be known as an organisation that pro-actively manages carbon in an efficient and environmentally responsible manner; thereby reducing our environmental impact and our exposure to the cost of carbon.

Following the HECM Programme the first Carbon Management Plan (CMP2009) was created in 2009 and revised in 2011. Under the direction of the Occupational Health, Safety, Welfare & Environment Committee, the University has been implementing the actions set out in CMP2011 and has spent in excess of £2.4m on carbon management projects and initiatives since 2008.

The purpose of this updated Carbon Management Plan (CMP2017), which follows-on from CMP2011, is to set out the framework to deliver a carbon management strategy and implementation plan for The University of Northampton up to 2020, in line with Government Department for Business Energy Industrial Strategy (BEIS) proposal in October 2017 for a 30% reduction by 2020 in *Leading by Example: Cutting Energy Bills and Carbon Emissions in the Wider Public and Higher Education Sectors.* This is part of the wider UK Government *Clean Growth Strategy 2017* and the United Nations COP21 Paris Agreement to keep global warming below 2 °C and pursue efforts to limit warming to 1.5°C increase compared to pre-industrial levels.

The University's principal carbon reduction target:

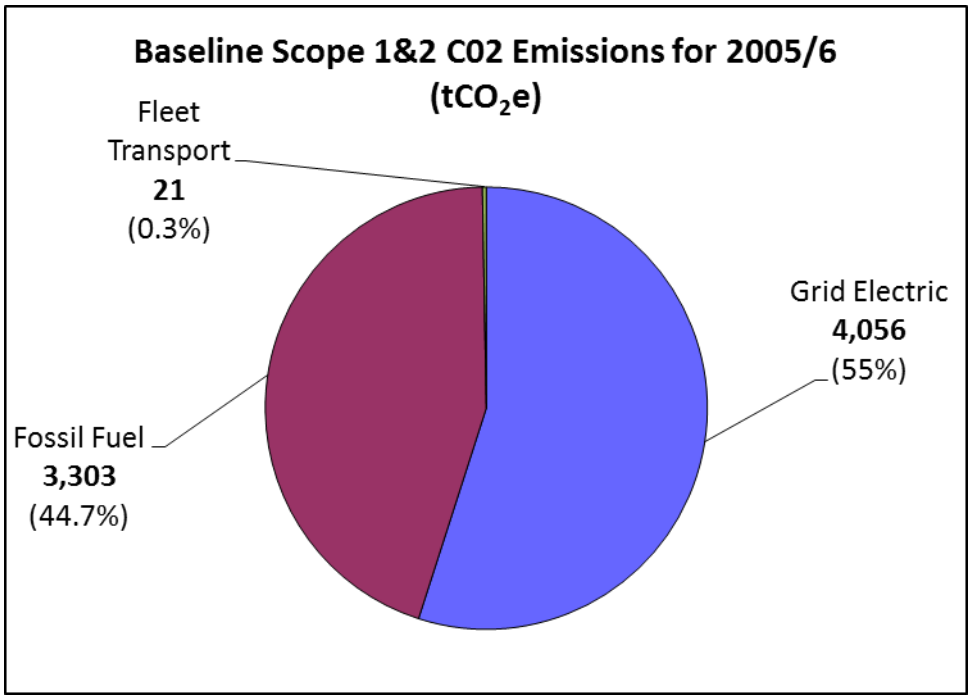
The University of Northampton will reduce its annual Scope 1 and 2 CO_2 emissions by 30% to 5,166 tonnes of CO_2 by the end of 2019/20 academic year, compared to its 2005/6 emissions baseline of 7,380 tonnes of CO_2.

The University's principal target aligns with the HE sector target set by HEFCE in support of the national targets set by the UK Government in the 2008 Climate Change Act, and focuses on Scope 1 CO_2 emissions (from direct on-campus combustion of fossil fuels) and Scope 2 CO_2 emissions (from indirect combustion of fuel due to on-campus usage of grid-supplied electricity).

Achieving this CO_2 emissions target will present a significant challenge for the University and will require radical and significant changes to the way that the institution operates and manages its infrastructure. The transition to a lower carbon University will impact every member of the University community, but will also provide opportunities for the institution to show leadership and to benefit from the growing low-carbon economy and reduce its risk to volatile energy markets.

Achieving the targeted reduction in CO_2 emissions is both a major challenge and a sensible precaution for the financial and environmental future of the University.

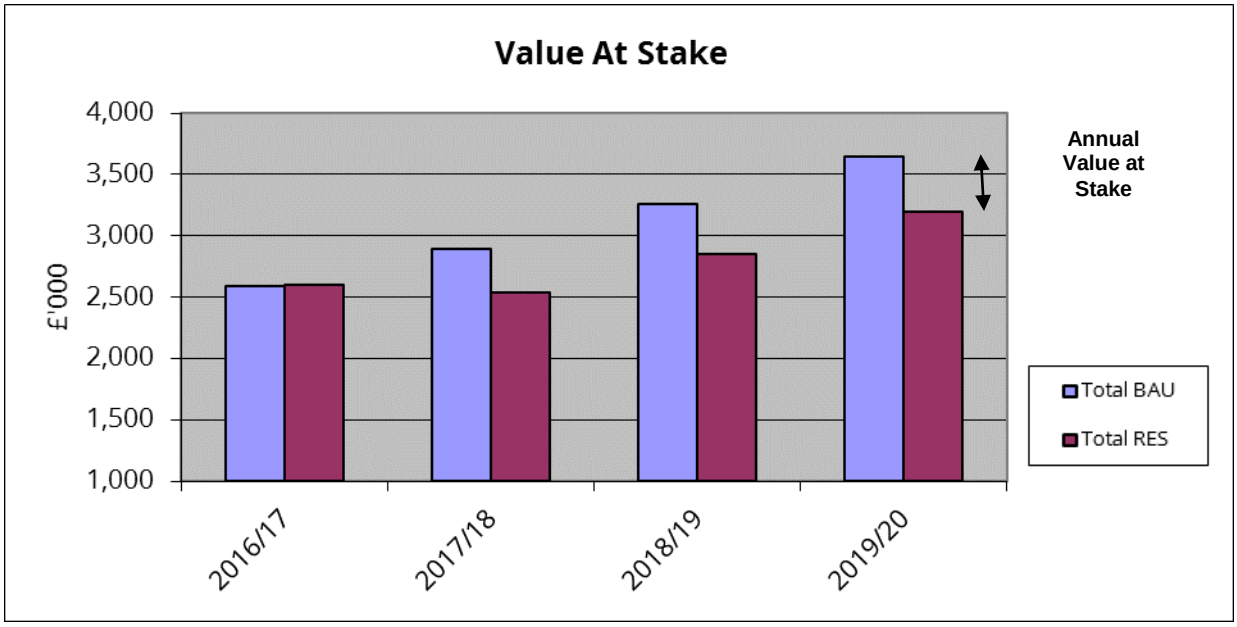
The University's carbon emissions baseline for Scope 1 and 2 emissions has been calculated using data from the 2005/6 academic year (1st August 2005 to 31st July 2006), including



emissions due to gas and electricity used at both Avenue and Park Campus, and from fuel used by the University's transport fleet.

Figure A: Breakdown of baseline figure for Scope 1 and 2 CO_2 emissions for 2005/6.

Based on the University's emissions baseline and actual emissions up to 2010/11, two different consumption scenarios have been projected: **The Business As Usual (BAU) scenario** predicts the effect on cost and carbon emissions of taking no action to limit the organisations increasing consumption of energy, while **the Reduced CO_2 Emissions Scenario (RES)** predicts the effect on cost and carbon emissions of reducing the emissions baseline by the targeted 30% by 2020.



The Value At Stake (VAS) is the difference in emissions or costs between the BAU and the RES; that is, the hypothetical potential value that could be obtained by undertaking a carbon management approach and implementing emissions reductions initiatives in order to reduce baseline emissions by 30% by 2020.

Figure B: Energy-related Value At Stake to 2020.

The total aggregated Value At Stake postulated from 2016/17 to 2019/20 in energy-related costs is £1.2 million and 2,411 tonnes of CO_2e .

Thirteen distinct project areas across Scopes 1, 2 and 3 have been identified to achieve the carbon reduction targets set out in this CMP; each area contains a number of carbon saving actions, activities or technologies which will be progressed over the course of implementing the CMP to 2020. Further details on specific project areas can be found in Chapter 4 and Appendix B. Projects have been grouped within the following categories:

Scope 1 and 2 emissions:

- Low Carbon ICT
- Building management technologies
- Awareness & behaviour campaigns
- Low and zero carbon energy generation
- A range of non-technical solutions

Scope 3 emissions:

- Divert waste from landfill
- Reduce water consumption
- Sustainable travel
- Sustainable procurement

1. Introduction

The University of Northampton is a dynamic, modern university situated in the heart of England, which was awarded full university title and research degree awarding powers in 2005. The University has almost 12,000 full and part-time students and over 1,000 staff based on two campuses within Northampton which cover 100 acres of land. The campuses house nearly 70 buildings comprising
140,797m^2 of property, including more than 2,000 bed spaces in residential accommodation. The University is currently building a new low carbon Waterside Campus set to complete for the new academic year September 2018. The entire Park Campus excluding 3 residencies will relocate to Waterside.

The University of Northampton acknowledges that climate change is a real and growing threat for countries, economies, and organisations in the public and private sector. In 2008/9, the University participated in the Carbon Trust's Higher Education Carbon Management (HECM) Programme in order to take a strategic view of carbon emissions and to contribute to national commitments to reduce emissions of CO_2.

Since the launch of CMP2009 in March 2009, the University has spent over £2.4m implementing many of the carbon reduction projects listed in section 4. Over the same period of time the University has seen the number of students studying on its campuses increase by over 20% and has weathered two of the harshest winters in the last twenty years; neither scenario was predicted in CMP2009, but these circumstances have led to increased CO_2 emissions in 20 08/9 and 2009/10 (see chart 2 in section 3.3 for details). The plan was updated once in 2011 before the current update CMP2017 including Waterside Campus carbon into the estate.

In preparing this updated CMP2017, the University has used the learning gained from its participation in the HECM programme to build on CMP2011 and extend its carbon reduction target and programme of proposed projects up to 2020, in alignment with HEFCE's carbon management strategy and Government BEIS proposed strategy and targets.

2. Carbon Management Strategy

The objective of carbon management for every organisation, of whatever sector, is to minimise the risks and maximise the opportunities arising from carbon emissions and climate change, in the short, medium and long term, against a background of rapidly evolving regulation, market forces and stakeholder concerns.

The University of Northampton recognises carbon management as a strategic, whole-organisation approach that integrates with our existing strategy and management, enabling the institution to understand the impact of carbon emissions, to identify key risks and opportunities, to formulate a plan to reduce carbon emissions, to effectively implement, review and update the plan into the future, and to communicate success.

The outcome of successfully adopting and implementing carbon management is an increased awareness of the potential impacts of climate change on the HE sector and on the University as an individual HEI, and a greater capacity to identify and deal with these impacts. By establishing Carbon Management as a core business process, we will become better able to adapt to an increasingly carbon-constrained economy.

2.1 Context and Drivers for Carbon Management

Climate change is real. Over the period to 2050 the world will change fundamentally. The daily effects of climate change, the availability and price of fossil fuels, environmental regulation and new technology will change the face of energy supply and use, and make the emission of greenhouse gases one of society's key concerns.

In 2000 the Royal Commission on Environmental Pollution (RCEP) recommended that, in order merely to contain the effects of global warming, the UK should reduce CO_2 emissions by 60% below existing levels by 2050. In 2008 the UK's Climate Change Committee recommended introducing a target to reduce emissions by 80% below 1990 levels by 2050, which has since been included in the UK government's historic Climate Change Act 2008.

There are good reasons why the adaptation to and mitigation of climate change are of concern to HEIs. HEIs are permanent institutions that plan for the long term. Climate change-driven regulation will increasingly impact the HE sector, for example through the Energy Performance of Buildings Directive and the CRC Energy Efficiency Scheme (CRCEES), and pressure from central government to engage with sustainability and carbon emissions issues will rise in future. HEIs are concerned with the provision of education and research, with the application of knowledge to solve contemporary problems, and ultimately with the transformation of individuals and of society. They have a global context for their funding, research, teaching and student recruitment, and need to communicate values and to differentiate their brands in an increasingly competitive environment. Many internal and external stakeholders of HEIs are concerned about and affected by climate change.

The HE sector is a significant user of energy and emitter of CO_2. Taken as a whole the HE sector has an annual primary energy consumption costing around £200M. Electricity and gas prices have seen significant volatility, partly in response to increased climate change regulation. The HE sector is reported to occupy some 9% of the UK's total office space and have an estimated carbon footprint of around 3.3mtCO_2 per annum. The sector is still growing, with student numbers increasing by a factor of five over the past thirty years, and with a current policy to increase participation rates, although the future is somewhat uncertain due to changes in future funding arrangements.

HEIs are often substantial businesses, operating in an increasingly competitive environment. Other leading organisations in the private and public sectors recognise the need to reduce carbon emissions as a critical business issue for today. Climate change is set to have a fundamental impact on business performance and value. Leading businesses are putting this issue at the heart of their strategic thinking and are already taking advantage of the opportunities and managing the risks associated with climate change. The University recognises the importance of climate change adaptation and acknowledges the need to manage future risks and modify operations accordingly (see section 2.5).

There are many drivers that have led to the University strengthening its focus on sustainable development and environmental management over the last few years, including legislation, cost factors, increased stakeholder awareness and ethical aspects. More specifically, the key drivers that have led the University to engage with carbon management more significantly are listed in Table 1. The list highlights the key drivers; however, it should not be regarded as entirely exhaustive as many other factors continue to have an impact upon the University's objective of reducing its carbon emissions.

Table 1: The key drivers for carbon management

Generic Category	Driver	Areas of Impact	Nature of Impact	Importance (High, medium or low)	Consequences/ opportunities/ issues for carbon management
Political	HEFCE carbon reduction target and strategy for higher education in England (HEFCE 2010/01)	The University	HEFCE's carbon reduction target has set overall HE sector targets with individual HEIs required to set own targets	High	Capital funding is now being related to sustainability criteria including progress against carbon management plans
Economic	Rising cost of utilities and volatility of energy market (plus rise in CCL charge)	The University	Utility prices unstable and rising – lead to financial pressures & less money to spend overall	High	Opportunities for lower utilities consumption & usage of renewables to lessen exposure to market volatility
Ethics	Corporate Social Responsibility	The University	Responsibility to do the right thing	High	Taking a leading role in local, town, county & regional community, as well as in HE sector
Legislative	UK CRC Energy Efficiency Scheme	The University	Annual financial and reputational impact	High	Carbon seen to have further economic value especially when traded on open market
Legislative	EU Energy Performance of Buildings Directive	Estates Management	All campus buildings >1000m^2 require a DEC (energy label)	Medium	Higher visibility of carbon performance by all building users
Legislative	Building Regulations	Estates Management	Stricter design controls for refurbishment & construction	Medium	Added up-front cost means life-cycle analysis is now a very high priority
University Policy	Environmental Policy and Environmental Management System (EMS)	The University	University's Environmental Policy updated in 2010	Medium	Energy reduction targets set as part of EMS objectives

Reputation	P&P League Table / Sound Impact Awards	The University / The Student Union	Environmental performance ranked in league table	Medium	Improvements in CO_2 emissions, waste arisings & water usage will improve ranking
Reputation	Perception of potential students & the public	The University	Improved image to enhance recruitment	Medium	Increased public awareness of climate change offers opportunity
Reputation	The University's teaching and research	The School of Applied Sciences	Improved image to enhance recruitment	Medium	Two-way link with Environmental Science staff and courses

2.1.1 Dependencies and Assumptions

Dependencies and assumptions that have been taken into account during the programme include:

a. The University's financial year runs from 1st August to 31st July;
b. Budgetary requirements must be submitted by January of the prior financial year, in order to be agreed and included in capital or revenue budgets;
c. The University's official academic terms start in late September and run to early July, although an increasing number of courses operate throughout the year;
d. The University will be moving to Waterside Campus in early 2018.
e. The retained estate will include Park Campus East Halls, Avenue Campus Bassett Lowke, Isham, Students' Union, Walgrave, Heyford, Newton and parts of Maidwell. ICON in Daventry, University of Northampton Innovation Centre, the old Black Bottom Club, Vulcan Works and St John's Halls of Residence.
f. Predictions about the size of the University's student population up to 2020 are not readily available, with uncertainty caused by future funding changes;
g. The University's teaching facilities and accommodation are being promoted more and more as a conferencing venue during the summer and other holiday periods;
h. The University has historically procured gas and electricity through fixed price contracts and then through energy brokers. Since October 2016 the University is in contract with Crown Commercial Services public sector framework.

2.2 Our Low Carbon Vision

To be known as an organisation that pro-actively manages carbon in an efficient and environmentally responsible manner; thereby reducing our environmental impact and our exposure to the cost of carbon.

2.3 Strategic Themes

The key aspects that will move the University towards our low carbon vision are set out below:

a. Existing environmental management structure
Carbon management will continue to be progressed through the University's existing cross-functional environmental management structure, with relevant communication updates given to staff, students, governors and other external stakeholders;

b. Technical and inter-personal carbon saving measures
Emissions savings to be sought through a combination of technical/infrastructural measures & change management/human interaction measures;

c. External partnerships and funding
Partnerships will be further cultivated with external organisations such as Northampton Enterprise Partnership (NEP), Northamptonshire County Council (NCC), Northampton Borough Council (NBC), Northamptonshire Enterprises Ltd (NEL), Carbon Trust (CT), Building Research Establishment (BRE), Higher Education Funding Council for England (HEFCE) and Salix Finance to secure innovative carbon reduction opportunities and funding; The University successfully bid to the HEFCE LGM Fund in 2010 and is leading a project entitled 'Keeping it Local: Shared Solutions for Sustainability' which aimed to secure local shared solutions to key sustainability challenges such as improving energy efficiency and reducing carbon emissions.

d. Data collection
The building of business cases for technical energy reduction measures and then the verification of emissions savings are to be based on data gathered from the University's automatic sub-meter monitoring and analysis;

e. Sector networking
The University will keep up to date with the development and use of innovative carbon saving measures and best practice within the HE sector by using its membership of the Environmental Association for Universities and Colleges (EAUC) and East Midlands Universities Association (EMUA) to network with other HEIs and suppliers;

f. Environmental benchmarking
Environmental benchmarking against other HEIs is to be undertaken via the joint EAUC and AUDE Green Scorecard

2.4 Targets and Objectives

The University's key carbon reduction target is set out below:

The University of Northampton will reduce its annual Scope 1 and 2 CO_2 emissions by 30% to 5,166 tonnes of CO_2 by the end of 2019/20 academic year, compared to its 2005/6 emissions baseline of 7,380 tonnes of CO_2.

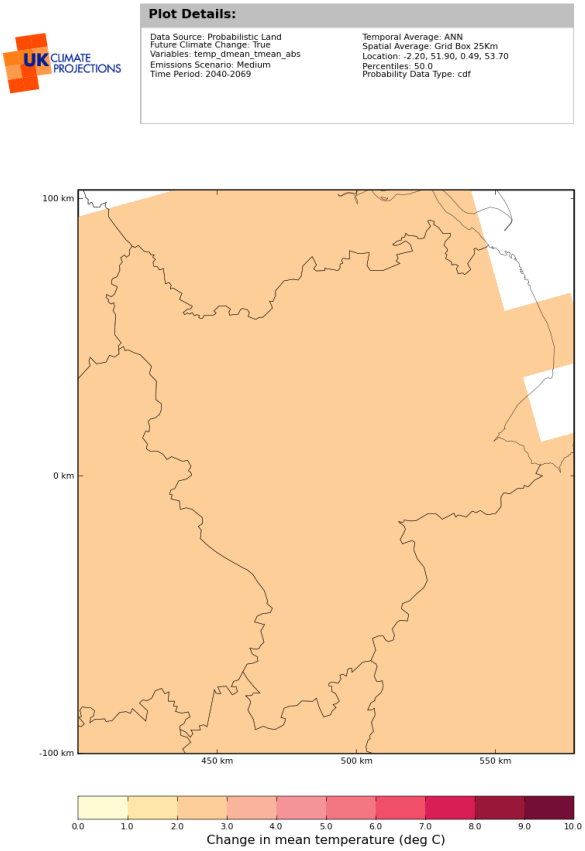
Further objectives are set out here:

a. The University will raise awareness of climate change and carbon management at both strategic and individual levels across the University, and encourage collective responsibility and action amongst staff and students;
b. Carbon management and emissions reduction related funding will be actively sort and considered by the University;
c. The University will participate in the annual Green Scorecard corporate responsibility index, and aims to improve its overall index score year on year;

d. The University

2.5 Adaptation to Climate Change

Adaptation to climate change means ensuring the delivery of core services to staff, students and relevant stakeholders through the future-proofing of the University's assets, services and infrastructure against the risks associated with climate variability. Additionally, adaptation means having appropriate contingency plans to deal with extreme climatic events when they arise. Within this CMP, which is time bound to 2020, the risks associated with climate change are considered as minor. The University is confident that it is able to manage the risks associated with climate change adequately and that significant actions are not required at present.



December 2015 saw the mildest winter and September 2016 had the highest maximum ever recorded on the Park Campus weather station over a period of 40 years. In the longer term it is apparent that adaptation to climate change will need to be substantial and significant, with projections of warmer, drier summers; milder, wetter winters; and increases in the number of storm events, including periods of significant rainfall. By adopting a proactive approach to climate change adaptation the University will increase the resilience of its assets, services and infrastructure to manage risks presented by climate change. Responding to the impacts of climate change will potentially result in significant capital expenditure, but from an estates perspective decisions that are made today can materially affect the capability of the University to adapt to climate change, whether in 2020 or 2080.

UKCIP projections under a medium emissions scenario (UKCIP, 2009[1]) indicate that the average mean daily temperature in the East Midlands in 2050 will increase by 2.5°C against a baseline of average mean daily temperatures calculated between 1961 and 1990; however, the increase could be as much as 4.7°C.

3. Emissions baseline and projections

3.1 Scope

Calculating an emissions baseline is the first step in enabling the University to quantify its carbon footprint and to gain a better understanding of its overall carbon contribution. This section will

[1] UK Climate Change Impact Projections 2009 (UKCIP09). East Midlands 2050. Available at: http://ukclimateprojections.defra.gov.uk/content/view/1384/499/

detail the sources that have been included and how the emissions baseline has been calculated. The baseline will be used to measure the University's emissions reduction performance as carbon-saving initiatives are implemented during future years.

3.1.1 Source Boundaries

All the emissions sources to be included in the Scope 1 and 2 baseline calculation are under the direct control of the organisation. Other indirect emissions do occur as a result of the organisation's activities, from sources not directly controlled by the organisation, and will be included in the University's future Scope 3 baseline calculation.

3.1.2 Material Emission Sources

The emission sources included in this CMP are detailed below and in the associated diagram:

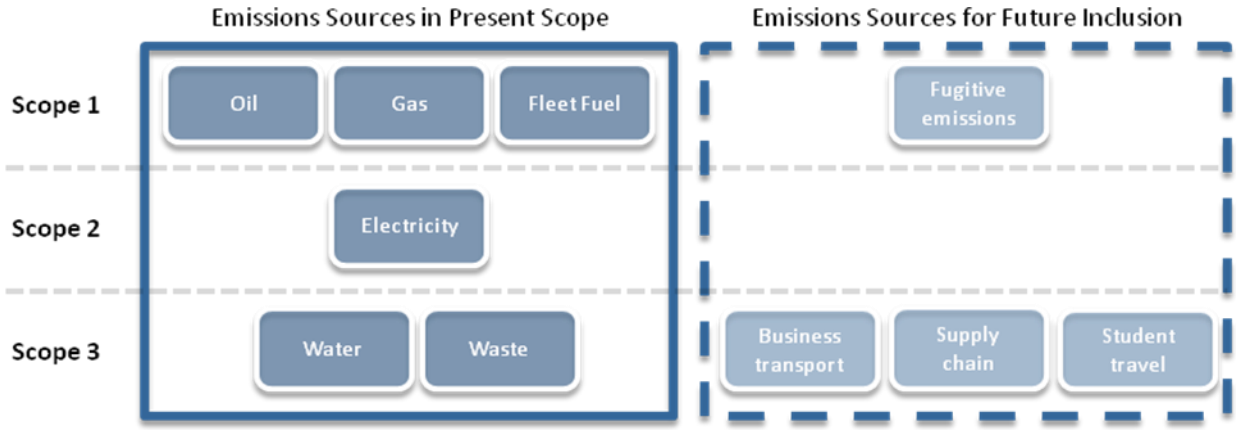
Scope 1 and 2:

a. **Energy consumption** (gas and electricity; no oil utilised);
b. **Fleet transport** (fuel used in University owned or leased vehicles).

Carbon emissions relating to residential and non-residential buildings on both Avenue Campus and Park Campus have been included. Gas and electricity usage at the University-managed Podiatry Clinic, based at Northampton General Hospital, have also been included.

Scope 3:

a. **Water consumption;**
b. **Life-cycle emissions due to waste arisings (from 2007/8).**



3.2 Scope 1 and 2 Baseline

The institution's carbon emissions baseline has been calculated using data from 2005/6 academic year (1st August 2005 to 31st July 2006). This year has been chosen as it is the earliest year for which reliable and complete data is readily accessible, and is the year that HEFCE is using for the HE sector emissions baseline. The University's financial year also runs concurrently with the academic year from 1st August to 31st July so resource implications and financial savings will be reported concurrently.

3.2.1 Compilation of Scopes 1 and 2 Baseline Data

Table 2 identifies the sources of data used to calculate the baseline, as well as assumptions and CO_2 conversion factors (as utilised by HEFCE). This information is documented to ensure that any

future carbon emissions calculations can be performed using the same methods, therefore ensuring consistency throughout the programme.

Table 2: Data obtained to calculate Scope 1 and 2 baseline.

Data	Owner	Sources	CO_2 Conversion Factors
Gas consumption	Estates Services	Invoices, backed up by meter readings & automated sub-metering system	Gas 0.18404 kgCO_2e/kWh
Fleet transport (University's owned or leased vehicles)	Estates Services	Fuel purchases & mileage records; Purchase orders; Vehicle tracking data	Diesel 2.67 kgCO_2e/litre Petrol 2.32 kgCO_2e/litre
Electricity consumption	Estates Services	Invoices, backed up by meter readings & automated sub-metering system	2005/6: 0.47552 kgCO_2e/kWh 2006/7: 0.46950 kgCO_2e/kWh 2007/8: 0.48385 kgCO_2e/kWh 2008/9: 0.49476 kgCO_2e/kWh 2009/10: 0.48885 kgCO_2e/kWh 2010/11: 0.47552 kgCO_2e/kWh 2011/12: 0.45670 kgCO_2e/kWh 2012/13: 0.45154 kgCO_2e/kWh 2013/14: 0.47394 kgCO_2e/kWh 2014/15: 0.47555 kgCO_2e/kWh 2015/16: 0.43294 kgCO_2e/kWh 2016/17: 0.37676 kgCO_2e/kWh

Notes to Table 2:

1. CO_2e is a unit into which greenhouse gases other than CO_2 are converted so that they can be directly compared ('e' is for equivalent);

3.2.2 Estimate of Emissions

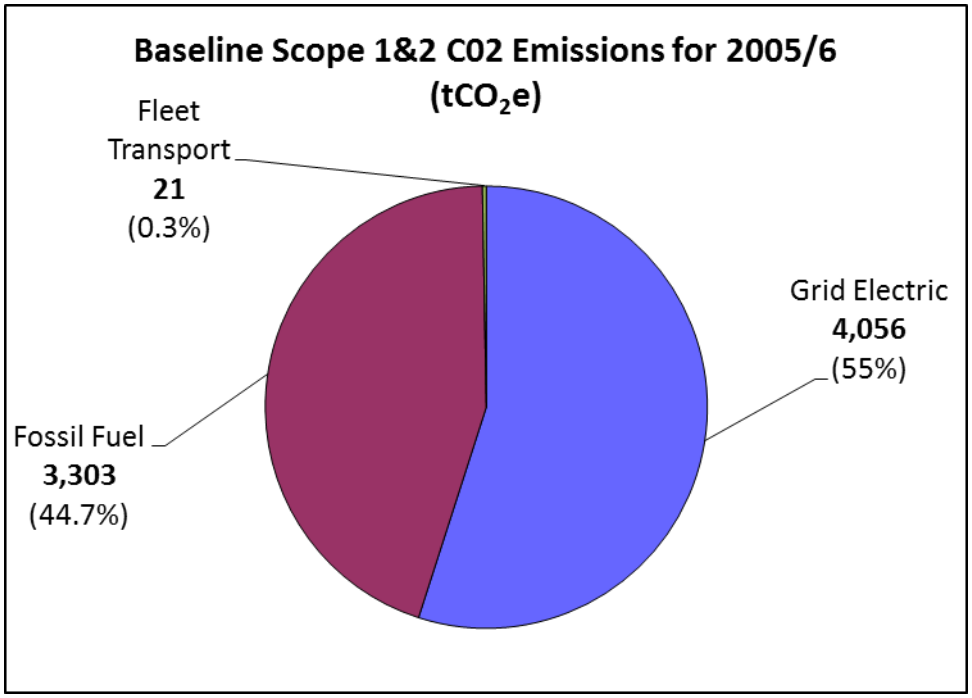
The overall University electricity and gas consumption and fleet fuel consumption have been entered into the Carbon Trust's Emissions Baseline Tool; the tonnes of CO_2e calculated using the conversion factors listed in Table 2 are shown in Table 3 and Chart 1.

The University's Scope 1 and 2 CO_2 emissions baseline for 2005/6 is 7380 tCO_2e.

Table 3: Breakdown of Scope 1 and 2 baseline CO_2 emissions for 2005/6

	Tonnes of CO2 (tCO_2e)			
Baseline Year	Electricity	Fossil Fuel	Fleet Transport	Annual Total
2005/6	4056	3303	21	7380

Chart 1: Breakdown of baseline CO_2 emissions for 2005/6



3.3 Scope 1 and 2 Emissions since Baseline Year

The overall University electricity and gas consumption and fleet fuel consumption for the years since the baseline have been calculated using the conversion factors listed in Table 2 are shown in Chart 2.

Chart 2: The University's actual annual Scope 1 and 2 emissions from 2005/6 to 2015/16

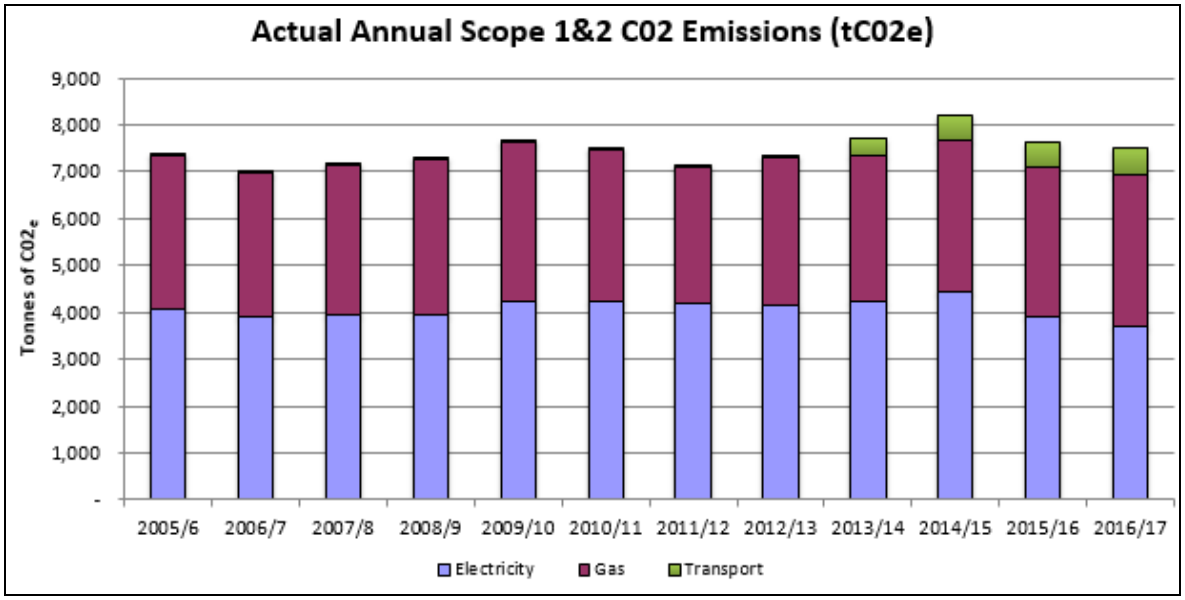


Chart 3: Scope 1 & 2 emissions per FTE student

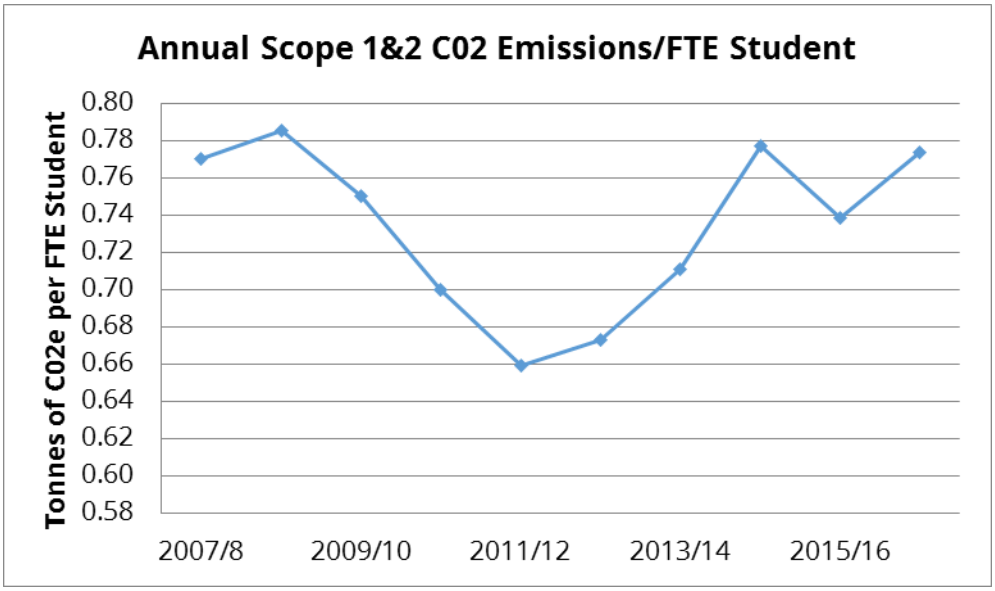


Chart 4: Scope 1 & 2 emissions for 2016/17

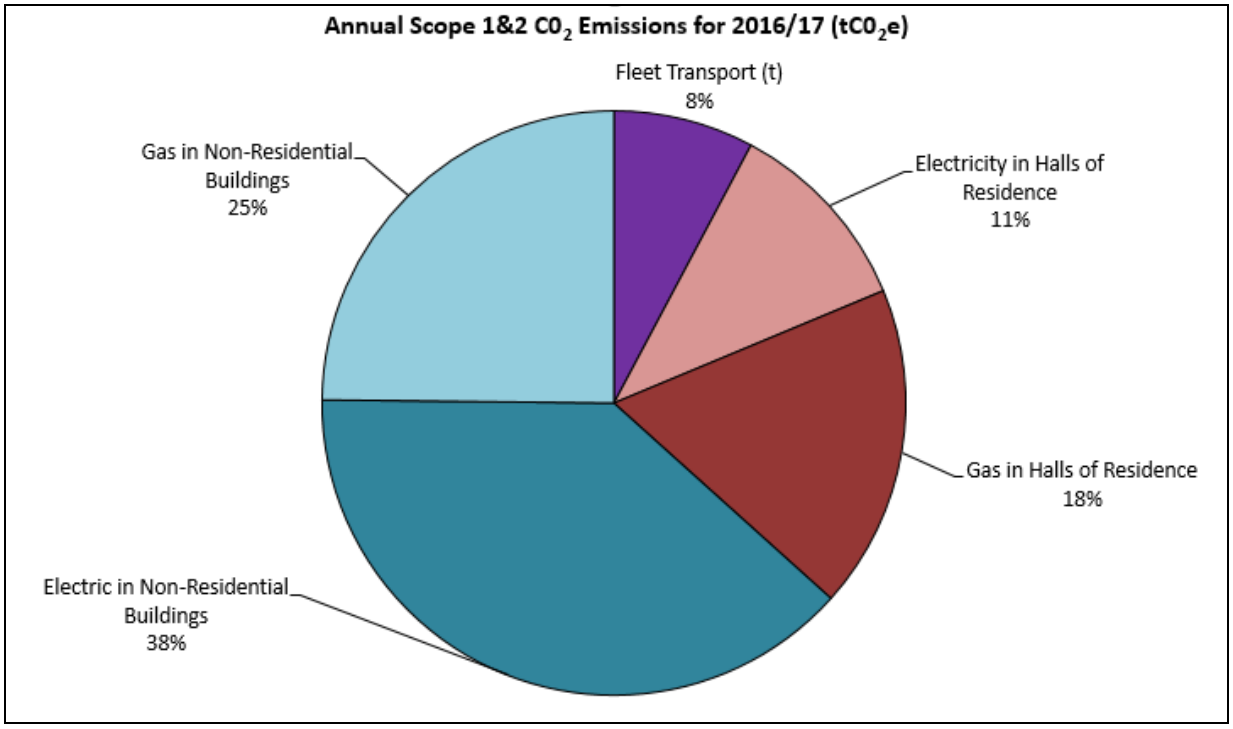


Chart 4 shows that in 2016/17 academic year 29% of the University's Scope 1 and 2 CO_2 emissions came from electricity and gas consumption in Halls of Residence, 63% came from non-residential usage and 8% from fleet transport.

3.4 Scope 3 Data Sources

Table 4: Information about Scope 3 data sources

Data	Owner	Sources	Data accuracy	CO_2 Conversion Factors	Inclusion date
Water consumption	Estates Services	Invoices, backed up by meter readings & automated sub-metering system	Accurate	Water supplied 0.344 $kgCO_2e/m^3$ Water treated 0.708 $kgCO_2e/m^3$ Emissions calculated using GHG conversion factors 2016.	Included in CMP - data from 2005/06 onwards
Lifecycle waste emissions	Estates Services Waste contractors	Invoices; Tonnage estimate or actual weight for waste sent to landfill and recycling	Accurate	Life cycle waste emissions depend on material type and disposal route; emissions recorded using GHG conversion factors 2016	Included in CMP - data from 2007/08 onwards
Business air travel	Travel Team	Centralised booking	Accurate	Will be calculated using GHG conversion factors 2016	2012/13
Land based business travel	Finance Department	Expense claims	Inaccurate at present	Will be calculated using GHG conversion factors 2016	2016/17
Commuting (staff and students)	Estate Services	Travel survey	Staff – Accurate but limited Students – Inaccurate	Will be calculated using GHG conversion factors 2016	2016/17
Air travel – International students	International Office	Data not collected	N/A	Will be calculated using GHG conversion factors 2016	
Air travel – Student exchange	International Office	Data not collected	N/A	Will be calculated using GHG conversion factors 2016	
Procurement	Finance Department	Limited data	N/A	To be confirmed	

1. CO_2e is a unit into which greenhouse gases other than CO_2 are converted so that they can be directly compared ('e' is for equivalent);
2. The emissions for waste arisings are based on life-cycle values including the extraction of raw materials, processing, disposal according to waste stream and energy saved by re-use, recycling or energy recovery;

3.5 Scope 3 Emissions

At present the University is able to accurately calculate carbon emissions based on reliable data sources for two specific Scope 3 carbon emission sources; water consumption and lifecycle emissions from waste (see Table 4 above). Availability and accuracy of data prevents the University from reporting on wider Scope 3 emissions sources at the present time.

The University is able to monitor water consumption utilising a sub-metering system to provide real time consumption and cross referencing information with utility billing. To establish carbon emissions associated with water consumption it is necessary to acknowledge that emissions are a result of two processes, namely the supply of water and in the treatment of waste water. In Table 5a below it is assumed that the volume of water supplied and treated is equal.

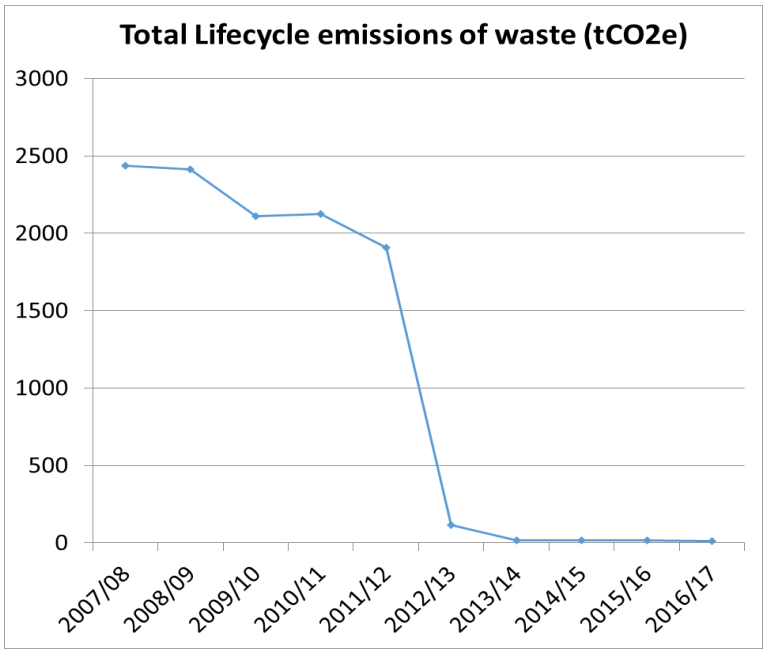
Table 5a: Emissions from water consumption

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Total University water consumption ('000m3)	94	88	87	89	108	107	108
Emissions due to water supply (t CO_2e)	32.3	30.3	29.9	30.6	37.2	36.8	37.2
Emissions due to water treatment (t CO_2e)	66.6	62.3	61.6	63.0	76.5	75.8	76.5
Total emissions (t CO_2e)	98.9	92.6	91.5	93.6	113.6	112.6	113.6

Emissions from waste detailed in Table 5b take into account emissions generated as a result of extraction, processing, manufacturing, transporting and disposal of waste. Emissions have been calculated on the assumption that all waste generated by the University is general commercial waste. In future years it is anticipated that further information will be collected to differentiate the different waste streams and establish associated carbon emissions. Construction waste is not included within the figures in Table 5b.

Table 5b: Lifecycle emissions from waste

Year	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17
Waste to landfill (tonnes)	632	583	457	460	413	22	0	0	0	0
Energy from Waste	0	0	0	0	0	207	231	244	221	195
Waste recycled (tonnes)	220	267	293	256	281	532	442	477	457	425
Emissions of recycling & EFW (t CO2e)	5	6	6	5	6	16	14	15	14	13
Lifecycle emissions of general waste (t CO_2e)	2431	2409	2106	2120	1903	101	0	0	0	0
Food AD energy generation	0%	0%	0%	0%	0%	5%	9%	7%	7%	8%
Percentage of waste recycled or reused	**26%**	**31%**	**39%**	**32%**	**36%**	**70%**	**68%**	**68%**	**70%**	**72%**
Total Lifecycle emissions of waste (t CO_2e)	**2436**	**2415**	**2112**	**2125**	**1909**	**117**	**14**	**15**	**14**	**13**



3.6 Scope 3 transport emissions

Following the centralisation of University travel booking in 2016 this has allowed for increased scope 3 transport data.

Annual flight and rail trips	1,465
Total (t CO2e)	1,191

With the removal to most of the non-residential student car parking at Waterside Campus this will significantly reduce the scope 3 emissions from students who would normally drive.

3.7 Projections and Value At Stake

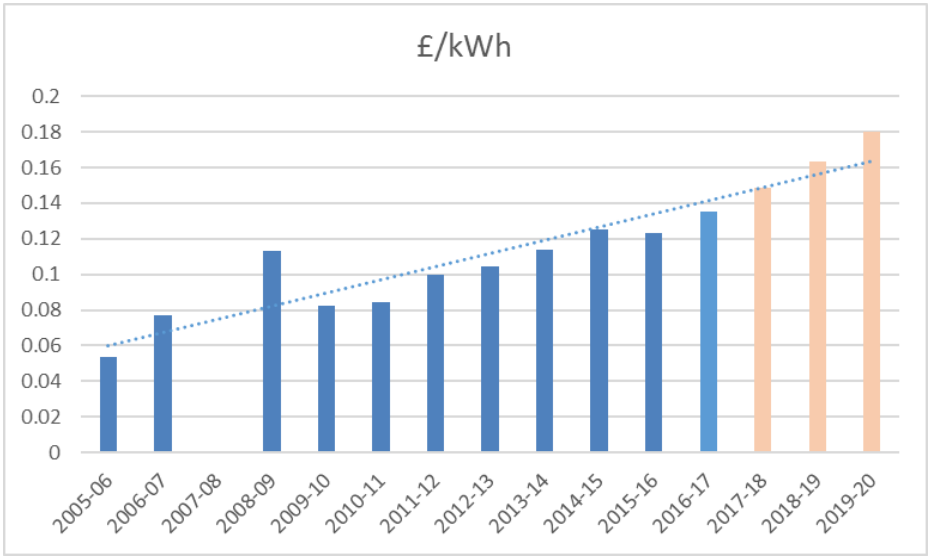
3.7.1 Context and Assumptions

Given the extremely volatile nature of energy markets during the recent past it is very difficult to predict the price of fuel and utilities in a year's time, let alone in ten year's time. This is highlighted from oil reaching an unprecedented high during the last CMP2011 and hitting a 15 year low in 2015. This has led to all costs within the carbon saving projects being costed at-2017 prices.

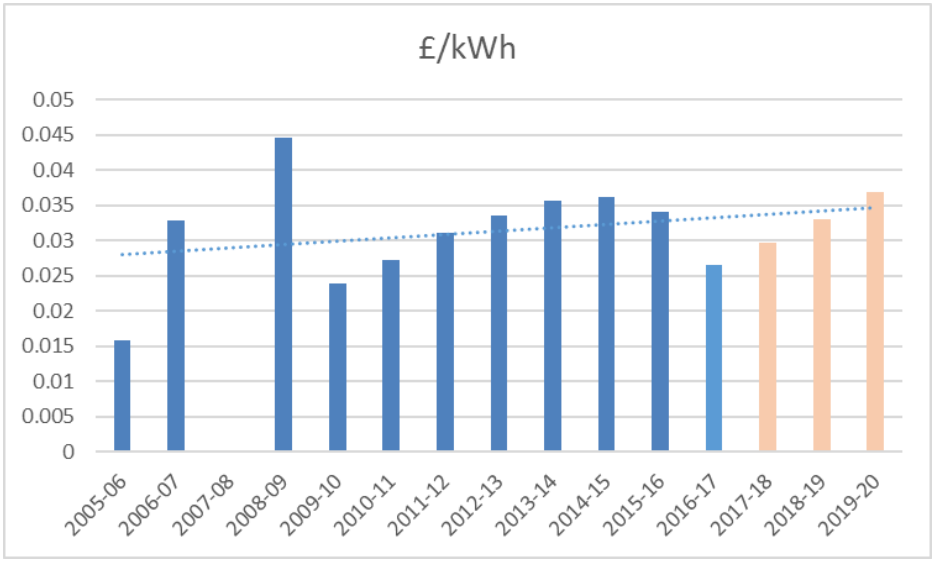
The University historically purchased gas and electricity on fixed price contracts, changing to flexible contracts. Since October 2016 the University purchases through Crown Commercial Services the largest public sector framework for utilities.

Electricity including all costs and taxes has increased 153% over the past 11 years (14% per year) and gas has increased 67% respectively (6% per year). A large financial saving in gas costs were made in 2016-17 through Crown Commercial Services using Corona Energy with equivalent savings over £140,000.

Electricity Costs



Gas Costs



Climate Change Levy (CCL) is paid by the University on all non-residential gas and electricity consumption. Current and future costs are listed below with over a 50% increase by 2019 in electricity costs and a 73% increase in gas costs.

Main rates of CCL

Taxable commodity	CCL Rate from 1 April 2016	Rate from 1 April 2017	Rate from 1 April 2018	Rate from 1 April 2019
Electricity (p/kWh)	0.559	0.568	0.583	0.847
Natural gas (p/kWh)	0.195	0.198	0.203	0.339

The UK Government's CRC Energy Efficiency Scheme is a carbon trading scheme that the University is mandated to participate in due to the volume of our electricity and gas consumption. Credits were ordered in the forecast sale at £16.10/tonne for 2016/17-2017/18 period to save costs.

CRC Credits	2015/16	2016/17	2017/18	2018/19	New Scheme 2019/20
£ per tonne (forecast cost)	15.6	16.1	16.6	17.2	17.7*

* The scheme will finish at the end of 2019 however, a similar scheme or tax will likely be introduced from then onwards.

3.7.2 Waterside Campus and future University estate

The University estate has increased over time. In 2008 a grade II listed building Newton (4000m2) was purchased. In 2010 ICON (4000m2) in Daventry was built followed by extensions to Sulgrave and Cottesbrooke on Park Campus. In 2013 the University completed St John's Halls of Residence (12700m2) based in the town centre with five core buildings followed and in 2014, the University of Northampton Innovation Centre was also completed with four floors and (4000m^2). Future use of Vulcan Works for leather (2,950m2) and the Black Bottom Club (1930m2) for the Students Union are set for 2018/19.

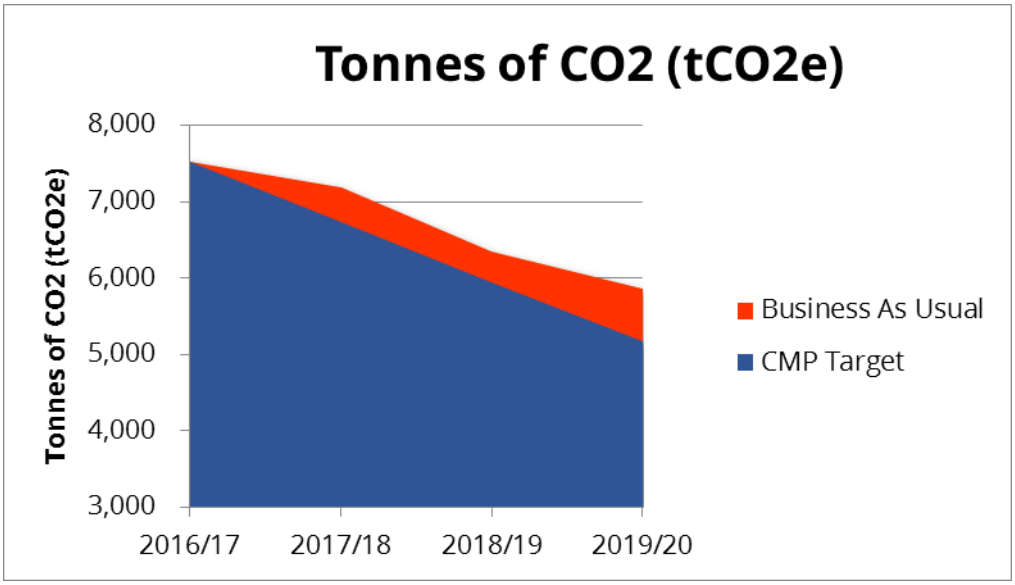
The largest change will be from September 2018 when the University moves to Waterside Campus. Including Maidwell, Walgrave, Isham, Students' Union, Heyford and Quinton at Avenue the total will increase the GIA by 19,639m2 with over +9% increase compared to the current estate.

Buildings	GIA	Percentage Change
2015/16 Current University estate	121,775	
2017/18 Waterside Campus and retained estate	113,436	-6.8%
2017/18 Waterside Campus, retained estate including additional Avenue Campus buildings	133,075	+9.2%

Biomass Boiler

The 995KW biomass boiler at Waterside Campus Energy Centre will significantly save financial and carbon costs compared to gas. The boiler is estimated to generated 4,750,000 kWh which will save over 812 tonnes C02 annually (11% saving from baseline emissions). Due to the RHI payments the annual saving compared to gas will be approximately £140,000 per year at 2018 projected gas prices.

BAU Tonnes of CO2 (tCO2e)						
Baseline year	**Electricity**	**Fossil Fuel**	**Biomass Woodchips**	**Fleet Transport**	**Annual Total**	**Data Accuracy**
2005/6	4,056	3,303		21	7,381	Actual
2006/7	3,899	3,089		21	7,009	Actual
2007/8	3,935	3,192		21	7,147	Actual
2008/9	3,967	3,311		19	7,297	Actual
2009/10	4,249	3,399		19	7,666	Actual
2010/11	4,251	3,202		17	7,470	Actual
2011/12	4,179	2,938		19	7,136	Actual
2012/13	4,140	3,178		20	7,338	Actual
2013/14	4,230	3,098		397	7,725	Actual
2014/15	4,417	3,232		525	8,187	Actual
2015/16	3,874	3,217		530	7,641	Actual
2016/17	3,717	3,216		585	7,518	Actual
2017/18	3,384	3,219		585	7,188	Estimated
2018/19	3,414	2,285	62	585	6,346	Estimated
2019/20	2,932	2,285	62	585	5,864	Estimated



This means that in order to reach the target of a 30% reduction in 2020 against the 2005/6 baseline (meaning actual emissions of 5,166 $tC0_2$ in 2020), the University will have to save a further 698 tC02 (16%) from Business As Usual projects of 5,864 tC02.

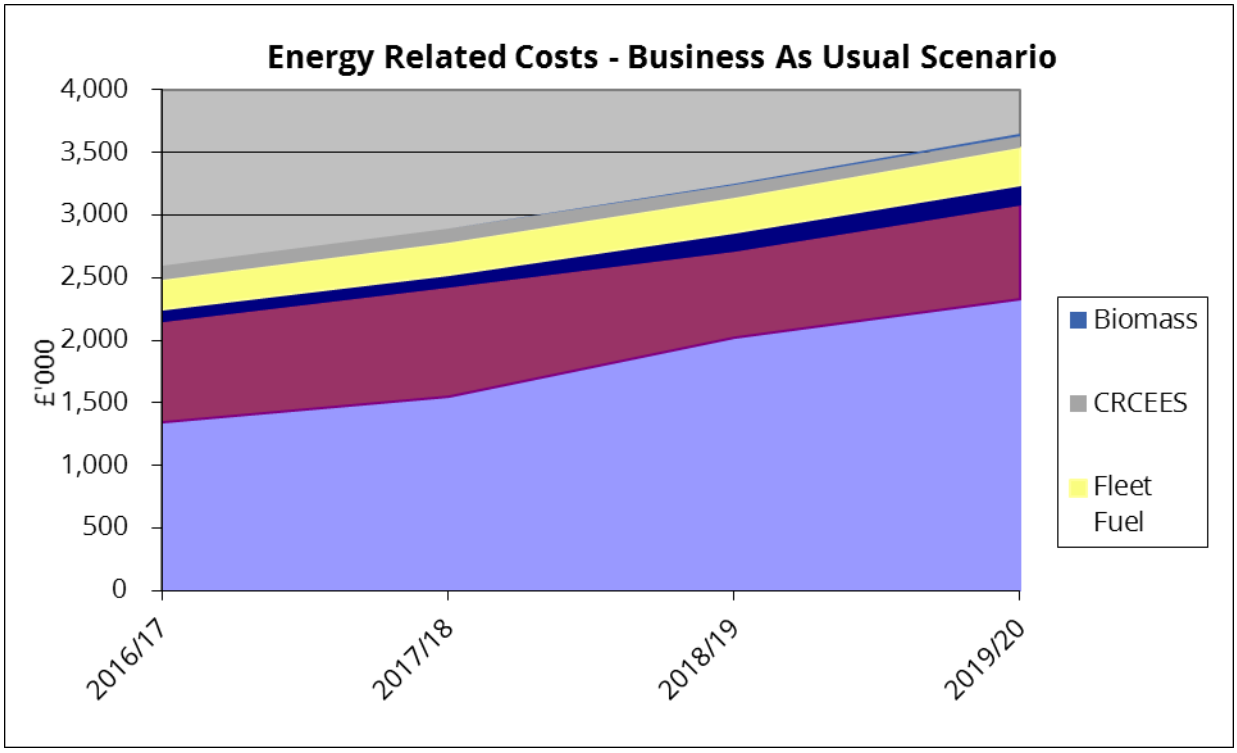
3.7.3 Business As Usual Scenario

The Business As Usual (BAU) scenario predicts the effect on cost and carbon emissions of taking no action from 2017 to limit the organisations increasing consumption of energy, as well as the extra cost of energy associated with *inflation and market related increases. The assumptions used within the BAU calculation are highlighted in Table 8.*

Table 8: Business As Usual assumptions

Aspect	***Assumption***
Gas unit cost	*Contract cost up to end of 2016/17 and then rising 10% per annum*
Electricity unit cost	*Contract cost up to end of 2016/17 and then rising 10% per annum*
Fleet fuel cost	*Rising 5% per annum*
Gas consumption	*Rising 2% per annum*
Electricity consumption	*Rising 2% per annum*
Fleet fuel consumption	*Rising 2% per annum*
CRC Energy Efficiency Scheme	*Cost of allowances rising 20% per annum after Phase 1*
Sites Included	*Waterside Campus, Park Campus East Halls, Avenue Campus excluding Portfolio and 50% of Maidwell, St John's Halls and House, Innovation Centre, Black Bottom Club, Vulcan Works, Podiatry and ICON.*

Chart 5: Projected energy costs based on Business As Usual Scenario



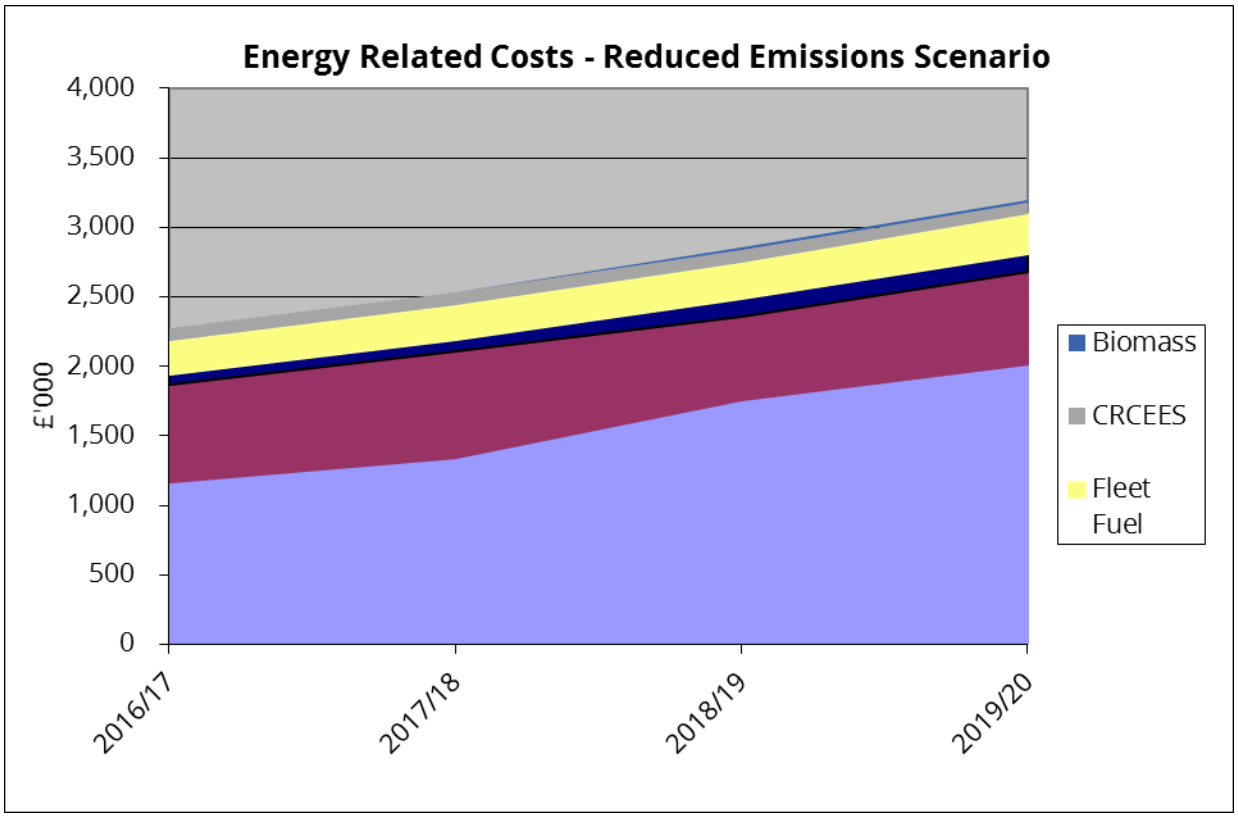
3.7.4 Reduced Emissions Scenario

The Reduced CO_2 Emissions Scenario (RES) predicts the effect on cost and carbon emissions of the targeted 30% reduction in CO_2 emissions by 2020 against the 2005/6 baseline while off-setting this against the extra cost of energy associated with inflation and market related increases. The assumptions used in the RES calculation are highlighted in Table 9.

Table 9: Reduced CO_2 Emissions Scenario assumptions

Aspect	***Assumption***
Gas unit cost	*Contract cost up to end of 2015/16 and then rising 10% per annum*
Electricity unit cost	*Contract cost up to end of 2015/16 and then rising 10% per annum*
Fleet fuel cost	*Rising 5% per annum*
Gas consumption	*Falling 14% per annum from 2015/16 (based on achieving CMP target)*
Electricity consumption	*Falling 14% per annum from 2015/16 (based on achieving CMP target)*
Fleet fuel consumption	*Rising 1% per annum from 2015/16*
Sites Included	*Waterside Campus, Park Campus East Halls, Avenue Campus with 5% of Maidwell, St John's Halls and House, Innovation Centre, Black Bottom Club, Vulcan Works, Podiatry and ICON.*

Chart 6: Projected energy costs based on Reduced Emissions Scenario



The results of the BAU and RES calculations for costs and emissions can be seen in Table 10 below.

3.7.5 Value At Stake

The Value At Stake (VAS) is the difference in emissions or costs between the Business as Usual Scenario and the Reduced Emissions Scenario; that is, the hypothetical potential value that could be obtained by undertaking a carbon management approach and implementing emissions reductions initiatives in order to meet the CMP target. The VAS has only been calculated for Scope 1 and 2 energy-related costs.

VAS can be aggregated over a period of time or calculated for a particular year.

The total aggregated Value At Stake postulated from 2016/17 to 2019/20 in energy-related costs is £1.2 million (see Table 10 and Chart 7 for details) and 2,411 tCO_2e (see Table 10 and Chart 8 for details).

Table 10: Energy-related Value At Stake monetary and carbon breakdown

	2017/ 2018	2018/ 2019	2019/ 2020
Total BAU (£'000)	2,892	3,256	3,649
Total RES (£'000)	2,535	2,853	3,192
VAS per year (£'000)	356	403	456
VAS aggregated savings (£'000)	356	760	1,216
Total BAU (tCO_2)	7,177	6,372	5,892
Total RES (tCO_2)	6,278	5,586	5,166
VAS per year (tCO_2)	898	786	726
VAS aggregated savings (tCO_2)	898	1,685	2,411

Chart 7: Monetary Value At Stake to 2020

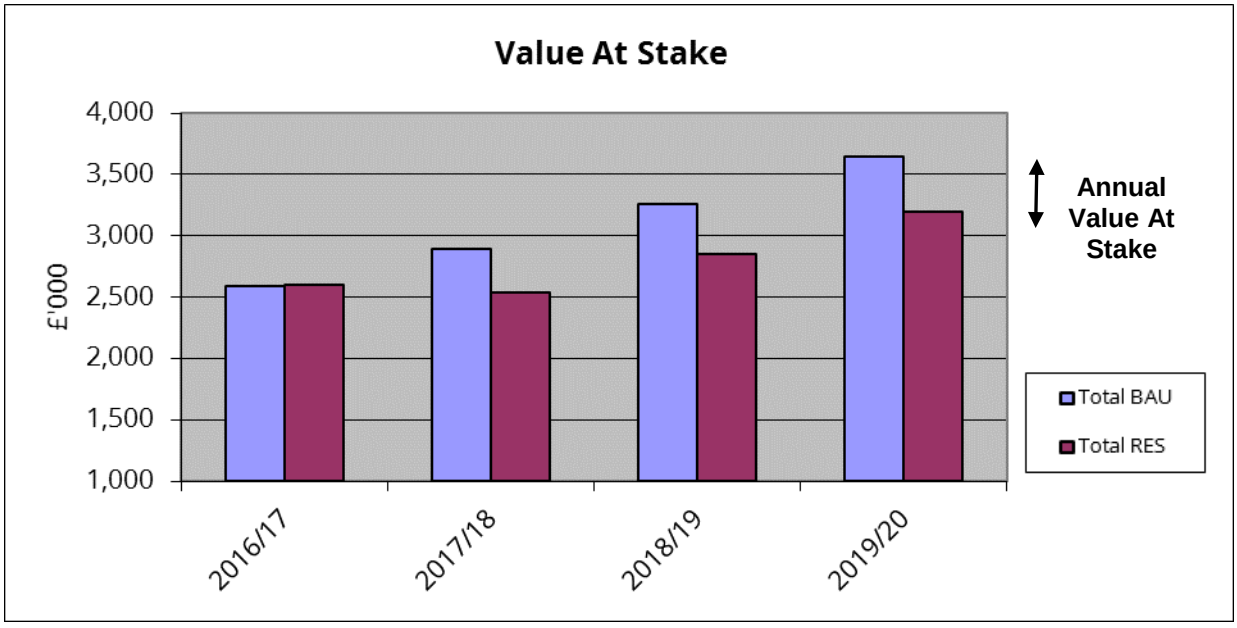
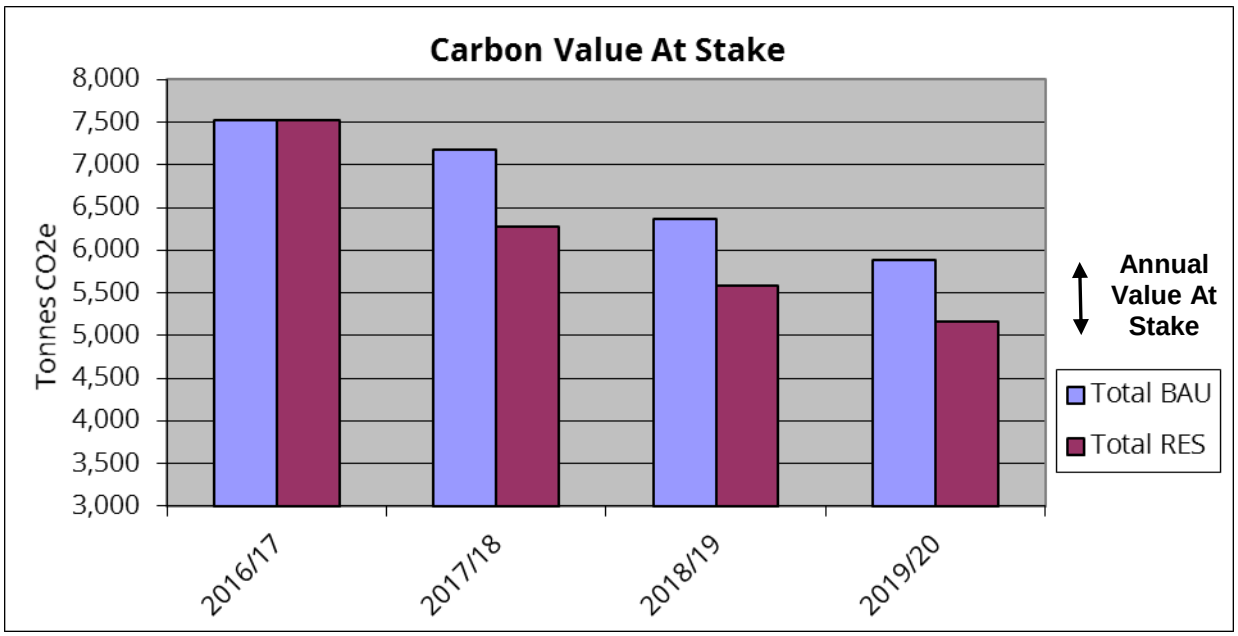


Chart 8: Carbon Value At Stake to 2020



4. Carbon Management Projects

Since 2005/6, under the direction of CMP2009, the projects and initiatives listed in Table 11 have been undertaken.

4.1 CMP2009 Projects Implemented (Table 11)

Ref	Project	Lead	Cost		Annual Saving		Pay back	% of Target	Year
			Capital	Revenue	Fin	CO_2			
i).	**Sub-Metering of Utilities in Campus Buildings**	Terry Cox, Deputy Director Estates	£150,000	£2,670 pa	N/A	N/A	N/A	N/A	2008
ii).	**Lighting & Control Upgrades – various buildings**	Terry Cox, Deputy Director Estates	£280,000		£30,200 pa	165t pa	9.3 years	7.4%	2008
iii).	**Boiler Upgrades in 10 buildings plus district heating at Park Campus**	Derrick Harris, Estates Manager	£735,000		£22,700 pa	140t pa	31.0 years	6.3%	2008-2010
iv).	**Computer Out-of-Hours Automatic Shutdown (Student PCs managed by IS)**	Alan Clark, IT Technical Infrastructure Manager	£5,200		£7,500 pa	56t pa	<1 year	2.5%	2009
v).	**Voltage Optimisation –**	Terry Cox, Deputy	£60,331		£16,160 pa	88t pa	3.7 years	3.9%	2009

	Phase 1 – Avenue Campus	Director Estates							
vi).	**Improve Insulation – Fit Valve Insulation Jackets**	Robert Morsley, Project Manager	£8,000		£2,250	14t pa	3.6 years	0.6%	2009
vii).	**Spatial Heating & Cooling – Building Insulation**	Terry Cox, Deputy Director Estates	£54,401		£11,173	55t pa	4.8 years	2.4%	2009
viii).	**Improve Insulation – Fit Loft & Cavity Wall Insulation in Buildings Across the Campuses**	Robert Morsley, Project Manager	£60,000		£6,000	37t pa	10 years	1.6%	2010
ix).	**Install Variable Speed Motor Drives on A/C Units**	Derrick Harris, Estates Manager	£29,324		£6,374	34t pa	10.0 years	1.5%	2010

The implementation of the projects in Table 11 has led to carbon savings equivalent to 3,417 tCO_2.

4.3 CMP2011 Projects Completed 2011-2015 (Table 13)

Ref	Project	Lead	Cost		Annual Saving		Pay back	% of Target	Year
			Capital	Revenue	Fin	CO_2			
1.	**Podiatry TRVs**	Terry Cox, Deputy Director Estates	£750		£400	1.8t pa	1.8 years	0.08%	2012
2.	**Newton computer room upgrade**		£32,355		£10,000	52t pa	3.2 years	2.3%	2011
3.	**Low and Zero carbon energy generation – Sulgrave Solar**	Terry Cox, Deputy Director Estates	£34,859		£4538	3.24t pa	7.6 years	0.1%	2011
4.	**Low Carbon ICT – Server Room Cooling**	Alison Brook, Deputy Director of IS	£37,255		£27,149	197t pa	1.3 years	8.8%	2011
5.	**Puma ventilation system – BMS control**	Derrick Harris, Estates Manager	£3,966		£2,190	11.4t pa	1.8 years	0.5%	2012
6.	**Spatial Heating & Cooling – Condesing boilers in Margaret Bondfield Hall**	Derrick Harris, Estates Manager	£25,055		£6,000	27t pa	4.1 years	1.2%	2012
7.	**Spatial Heating & Cooling – Boiler Upgrades to 12 buildings**	Derrick Harris, Estates Manager	£550,000		£45,000	277t pa	~12 years	10.2%	2012

8.	**Lighting & Control Upgrades – T5 Upgrades (Cottesbrooke stairs & Library)**	Terry Cox, Deputy Director Estates	£16,680		£4,400	23t pa	3.7 years	1%	2012
9.	**Lighting & Control Upgrades – Maidwell Lighting**	Terry Cox, Deputy Director Estates	£37,932		£8,852	46t pa	4.2 years	1.1%	2012
10.	**Lighting & Control Upgrades – LED Replacements for Halogens in SMC**	Terry Cox, Deputy Director Estates	£6,759		£4500	23t pa	1. years	1%	2012
11.	**Voltage Optimisation – Park Campus Transformer 1**	Terry Cox, Deputy Director Estates	£86,000		£17,000	93t pa	5.0 years	4.2%	2012
12.	**Voltage Optimisation – Park Campus Transformer 2**	Terry Cox, Deputy Director Estates	£52,400		£5,800	32t pa	9.0 years	1.4%	2013
13.	**Low and Zero carbon energy generation – St John's solar**	Terry Cox, Deputy Director Estates	£48650		£3700	4.6t pa	13 years	0.2%	2013
14.	**Voltage Optimisation – Park Campus Transformer 3**	Terry Cox, Deputy Director Estates	£56,350		£6,500	35t pa	8.7 years	1.5%	2014
15.	**Awareness & Behaviour Campaign**	Simon Pole, Environment Adviser		£26,500 pa	£45,000	245t	0.5 years	11%	2015-2017

The implementation of the projects in Table 11 has led to carbon savings of 4,765 tCO_2.

4.4 Scope 1 and 2 Projects 2017-2020 (Table 14)

Ref	Project	Lead	Cost		Annual Saving		Pay back	% of Target	Year
			Capital	Revenue	Fin	CO_2			
1	**BMS Health Check**	Alan Shuffill, Head of 1DF	£2,040		£8,771	37t $C0_2$	0.25 years	1.6%	2018
2	**Circosense Trial**	Alan Shuffill, Head of 1DF	£5,500		£697	6t $C0_2$	7.8 years	0.2%	2018
3	**Endotherm**	Alan Shuffill, Head of 1DF	£12,000		£39,650	300t $C0_2$	0.3 years	13.5%	2018
4	**Computer Out-of-Hours Automatic Shutdown (Staff PCs)**	Rob Palfreman, Head of IT	None		£3,750 pa	28t pa	N/A	1.2%	2018
5	**LED lighting upgrade Spencer**	Matthew Waite, Head of	£61,50		£23,803	107t $C0_2$	2,5	4.8%	2018

	Perceval	Projects	0				years		
6	**Low flow shower head and ShowerBob water saving timers**	Simon Pole, Environment Adviser	£5,350		£95,300	180t pa	<0.25 years	8.1%	2018
7	**Decommissioning Maidwell**	Terry Cox, Head of Infrastructure			£235,515	718t pa		32.4%	2018
8	**Biomass Boiler**	Vital Energi			£140,000	812t pa		36.5%	2018

The implementation of the projects in Table 14 will lead to carbon savings equivalent to 1,645t $C0_2$ by 2020.

4.5 Scope 3 Projects (Table 15)

Ref	Project	Lead	Cost		Annual Saving		Pay back	Planned Implementation
			Capital	Revenue	Fin	CO_2		
1	**Diverting Waste from Landfill**	Paul R. Taylor, Sustainability Officer	TBC		£43,200 pa	In excess of 150t CO_2e pa	TBC	Completed 2013
2	**Reduce Water Consumption**	Simon Pole	TBC	TBC	TBC	TBC	TBC	2016-2020
3	**Sustainable Travel Projects**	Simon Pole, Becky Bradshaw, Travel Officer	TBC		TBC	TBC	TBC	2016-2020
4	**Sustainable Procurement**	Julia Gough, Procurement Officer	TBC		TBC	TBC	TBC	2012-2016
5	**SMART working at Waterside Campus**	Jane Bunce	TBC		TBC	TBC	TBC	2018
6	**Reduction of student parking at Waterside Campus**	UMT	TBC		TBC	TBC	TBC	2018

Further information about the Scope 3 projects above can be found in Appendix B. Projects will be further developed in light of the conclusions from the HEFCE-funded Scope 3 research being undertaken in 2011.

5. Implementation Plan financing

Based on the information in Tables 14, the financial costs due to Scope 1 and 2 emission reduction projects to be implemented from 2015/16 to 2019/20 have been aggregated together in Table 16 below. The associated annual emissions savings are shown in Table 17.

5.1 Assumptions

- Cost of electricity: 13.53p/kWh
- Cost of gas: 2.74p/kWh
- All costs for future carbon saving projects are quoted at 2017 prices.

5.2 Financial Costs Due to Existing and Planned Projects up to 2019/20 (Table 16)

	2020
Total annual capital cost	86,390
Total annual revenue cost	0
Total costs	86,390

5.3 Benefits / Savings Due to Existing and Planned Projects up to 2020 (Table 17)

	2020
Annual CO_2 saving (tCO_2e)	658
% of target achieved from 2005-6 baseline	29%

6. Actions to Embed Carbon Management in the Organisation

In 2008 the Vice Chancellor signed student campaign group People & Planet's 'Green Education Declaration' and in 2010 the Vice Chancellor signed Universities UK's 'Statement of Intent on Sustainable Development' acknowledging that the education sector has a key role to play in addressing the challenge of climate change through teaching and learning, research and innovation, as well as in estates' management. These declarations included a commitment to take decisive and strategic action to reduce the carbon emissions of the University year-on-year.

This CMP, which sets out the University's low carbon vision, its CO_2 saving target and its plan to achieve it, is endorsed by the Vice Chancellor and the Board of Governors, and is available publically, making the institution's commitment to embedding carbon management clear.

Appendix A shows the Carbon Management Embedding Matrix which consists of seven subject headings with embedding actions for each subject that are ranked in five levels from worst to best practice. The actions highlighted in colour show the University's perceived current position for each subject. Discussion of each subject, along with plans and actions to improve the University's position are set out below:

6.1 Policy

The institution's Environmental Policy states that *'The University of Northampton recognises that its activities impact upon the environment through both its routine internal operations and its*

infrastructural development, as well as through its influence and effects on the wider community. It acknowledges a responsibility for protection of the environment at all levels, and a commitment to reducing its environmental impact. The University is developing an environmental management system (EMS) to achieve this in a structured way'.

The Environmental Policy includes sections on energy/carbon, transport, waste/recycling, sustainable procurement, biodiversity and sustainable construction. It states that 'the University is committed to making efficient and environmentally responsible use of energy, to help lessen the consumption of finite resources and emissions of greenhouse gases. The University will investigate and undertake actions across the estate to improve its energy efficiency, and encourage staff and students to eliminate wasted energy.' The Environmental Policy is reviewed every year by the Safety Health and Environment Team so that changes can be made when deemed necessary.

As part of its ongoing development of an Environmental Management System through Investors In The Environment, the University will produce performance targets for all key environmental aspects, and set out annual objectives for itself and to be approved by the Occupational Health, Safety, Welfare & Environment Committee.

6.2 Responsibility

Strategic carbon management is the full-time responsibility of the Environment Adviser, while day-to-day energy management is the responsibility of the Head of 1st Degree Facilities. The Head of Infrastructure Services.

In November 2008, the Heads of Departments and Deans of then Schools were set a 'Greening Objective' for their areas of influence, which has required them to consider how aspects of environmental management, including carbon management, can be integrated into their day-to-day responsibilities and departmental/school planning. Updated Green objectives will be set in collaboration with the new Faculty deans and managers.

The programme management and governance of the Carbon Management Plan is covered in Section 7 of this Plan.

6.3 Data Management

The University's sub-metering system allows the remote half-hourly reading of gas, electricity and water meters in most buildings. This data is reviewed internally and allows accurate bill validation and consumption checking to be undertaken.

A key embedding aspect of data management is enabling any member of staff to access the sub-metering data remotely. This will give them the ability to view the consumption data for areas they are interested in, or responsible for, thereby enabling them to monitor usage and act to saving energy wastage. A web based cloud system Meter Web II has been procured for Waterside Campus through Elcomponent. Multiple users can log in and view the data from the web including building users and managers.

The annual collation of CO_2 emissions data for buildings has historically been based on billing data; while there has historically been no collation of waste or vehicle fleet emissions data.

From 2009 onwards, however, the CO_2 emissions data for buildings has been based on sub-metering data as well as invoice data, while the weight of waste generated on campus is collated monthly by the Environment Adviser from data supplied by the University's waste contractor. This data is currently only reviewed internally however, it is hoped that external verification could be undertaken within the timescale of this CMP.

Emissions data for the University's owned and leased fleet vehicles is based on data from the centralised Travel team however, such data for other business travel cannot be easily extracted from expense claims currently because travel costs are combined with subsistence costs. However, the Travel Policy has been update to restrict travel over 100 miles on transport by own car and sustainable travel methods are favoured beyond this limit.

6.4 Communication and Training

The Safety, Health & Environment team have undertaken a significant amount of raising awareness on campus, particularly to students living in Halls of Residence who have a large influence on energy usage. This has included having information displays during the University's Welcome Week and Freshers' Fair, as well as talking to groups of students as part of their Hall of Residence induction programme. During term-time one-to-one communication with residential students has taken place to remind them about how to save energy and how to recycle waste. These publicity campaigns will be further enhanced during future academic years with joint activities being planned by the Safety, Health & Environment Team, Student Services department and the Students' Union.

Carbon Management communications to staff are through the staff magazine Unify, the SHE Co-ordinators who are the energy champions. The local OHSE committees and SHE Co-ordinator forums are also used for communication. Student communications is through marketing, the environment website and social media through student Facebook groups.

Environment section included in the Safety, Health & Environment awareness e-learning module that all new staff are required to complete as part of probation.

Section 7.4 of this Plan sets out further details of stakeholder management and communications.

6.5 Finance and Investment

This aspect of embedding Carbon Management is covered in Section 5 of this Plan.

6.6 Procurement

Between 2005 and 2008 the University engaged as a partner in a government-funded project entitled 'What Price Sustainability?' which investigated how to implement sustainable procurement in the higher education sector. Run by the EAUC, the project brought together a number of institutions and sector bodies and culminated in March 2008.

As a result of the University's involvement in the EAUC project a number of training events have been held to help embed environmental and carbon considerations into the day-to-day work of departmental procurers.

To assist in addressing the many aspects of procurement that need to be considered the University has used the Government's Flexible Framework for Sustainable Procurement, as set out in its 2007 document 'Procuring the Future'. Using the Framework has allowed the University to investigate issues such as whole life costing and the integration of sustainability criteria in tendering.

6.7 Monitoring & Evaluation

This aspect of embedding Carbon Management is covered in Section 7 of this Plan.

7. Management of the CMP

The governance of the CMP, as well as the strategic ownership of the carbon reduction target, rests with the Programme Board, composed of appropriate members of senior staff. The Board has oversight of the Plan and should be in a position to remove blockages when identified.

Project Team meetings give the opportunity to bring together, in one place, the diverse set of projects and owners from across the organisation to ensure coherence and coordination of carbon reduction activity.

7.1 The Programme Board – Strategic Ownership and Oversight

The Programme Board is made up of the CMP's senior sponsors and champions. The Board is chaired by the Chief Operating Officer. The new members of the team are listed in Table 18. Following the approval of the CMP the Safety, Health and Environment manager with reinstate regular meetings of the board.

Table 18: Programme Board members

Role in Carbon Management	Name and position in the University	Contact details
Principle Sponsor	Terry Cox Head of Infrastructure Services	01604 892019 terry.cox@northampton.ac.uk
Board Level Sponsor	Terry Neville Chief Operating Officer	01604 892049 terry.neville@northampton.ac.uk
Academic Sponsor	John Sinclair Dean, Arts Science and Technology	01604 893004 john.sinclair@northampton.ac.uk
Finance Champion	Mark Hall Director of Finance, Infrastructure, IT and Commercial Services	01604 892348 mark.hall@northampton.ac.uk

The Board meets to review the progress of projects, the overall risks to the programme, and the status of overall cost and carbon savings. The Board reports to UMT and the VC via the Chief Operating Officer.

7.2 The Carbon Management Team – Delivering the Projects

The Carbon Management Team is a group formed by the expansion of the University's existing Energy Management Working Group. The team meets every term and is chaired by the Sustainability Officer. The members of the team are listed in Table 19.

Table 19: Project Team members

Role in Carbon Management Team	Name and position in the University	Contact details
Project Leader	Simon Pole Environment Adviser	01604 892950 Simon.pole@northampton.ac.uk
Deputy Project Leader	Becky Bradshaw Safety, Health and Environment Manager	01604 893566 becky.bradshaw@northampton.ac.uk
Student Representative	Ethics and Environment Officer, Students' Union	01604 892550
Role in Carbon Management programme	**Name and position in the University**	**Contact details**
Team members	Sophie Hose Safety, Health and Environment Assistant	Sophie.Hose@northampton.ac.uk 01604 893565
	Steve Booker Head of Procurement and Commercial Services	01604 892561 Steve.booker@northampton.ac.uk
	Alan Shuffill Head of Facilities and Maintenance Services	01604 893193 alan.shuffill@1stdegreefacilities.co.uk
	Kevin Sheehan Building Services Engineer (Mechanical)	01604 893207 Kevin.Sheehan@1stdegreefacilities.co.uk
	Matthew Waite Head of Projects	01604 892982 matthew.waite@northampton.ac.uk
	Nick Redmund Building Services Engineer (Electrical)	01604 893145 Nick.Redmond@1stdegreefacilities.co.uk
	Rob Palfreman Head of IT	01604 893560 Rob.palfreman@northampton.ac.uk
	Phil Sturgeon Chief Executive Officer	01604 892550 Phil.Sturgeon@northampton.ac.uk
	Wray Irwin Head of University Centre of Employability and Engagement	01604 892707 Wray.irwin@northampton.ac.uk

	Gayle Glover School Manager (Faculty of Arts Science and Technology)	01604 893215 Gayle.glover@northampton.ac.uk
	Jane Clark School Manager (Faculty of Education and Humanities)	01604 892754 Jane.clark@northampton.ac.uk
	Lynn Hookings School Manager (Faculty of Business and Law)	01604 893026 Lynn.hookings@northampton.ac.uk
	Lucie Armstrong-Kurn School Manager (Faculty of Health and Society)	Lucie.Armstrong-Kurn@northampton.ac.uk 01604 892114

7.3 Succession Planning for Key Roles

The role of Project Leader will be covered by the Safety Health and Environment Manager if the Environment Adviser is unable to undertake the role at any time.

The role of Project Sponsor will be covered by the Director of Finance.

7.4 Ongoing Stakeholder Management

Stakeholders are those parties either within or external to the University who will be affected by the programme and may influence its success. The key stakeholders have been identified in Table 20 below.

Table 20: Key Stakeholders and Communication Plan

Stakeholder	Influence	Key issues/concerns	Means of communication	Responsibility
Governing Body	High	Strategic support CMP Approval	Committees Annual report	Head of Infrastructure Services, UMT,
VC & University Management Team	High	Budgets & funding Future strategic goals Reputation/profile of institution	UMT Meetings	Director of Finance, UMT
Deans & Heads of Departments	High	Budgets Staff numbers Space utilisation	Planning & Resources Committee	Director of Finance, UMT
Finance	High	Financial planning	Departmental	Director of

		Procurement & contracts	communications	Finance
Infrastructure Services	High	Estates Strategy Running costs Capital implications New build / refurbs	Departmental communications	Head of Infrastructure Services, UMT, 1DF
Staff	High	Comfortable working environment Cost & ease of travel Job security	Unify staff newsletter and staff Facebook group	Infrastructure Services Marketing
Students	Medium	University's customer Expectations Growing environmental awareness	Welcome Week Printed materials Website Students Union	Marketing
Local Authorities & Agencies	Medium	Local Area Agreement Funding to University	LAA meetings Direct meetings	Marketing
Contractors & Suppliers	Medium	Retain contract Added cost burden	Contract tenders / meetings	Infrastructure Services
Media & Press	Low	Corporate image	Press releases	Owen Morris
Community	Low	Travel congestion Corporate image	Press releases	Owen Morris

General principles of the Communication Plan:

1. The University's Marketing Team will help the project leaders to continue to develop the plan as the project progresses;
2. Existing meetings and committee structure will be used as much as possible to communicate key messages;
3. Sustainability information linked to Ashoka U Changemaker accreditation and Social Impact both internal and external communications;

Internal reporting to be undertaken:

1. Termly report to be submitted to Occupational Health, Safety, Welfare and Environment Committee
2. Annual environmental report generated by Safety, Health and Environment Team to include summary of key project information;
3. Annual report to be presented by the Safety, Health & Environment Manager to the Audit Committee.

External reporting to be undertaken:

1. Information on 'Sustainability' section of the University website available to the public;
2. Information for media and press when required;

3. The University's key environmental data is submitted annually to HEFCE as part of the Estates Management Statistics return;
4. The executive summary of the University's annual report to be made available in a public format.

7.5 Annual Progress Review

A formal annual review will be undertaken by the Project Team in August of each year, in order to review the progress against the plan for the previous academic year.

The review will:

- cover the cost and all benefits from the Programme:
  - financial savings, either cashable or returned to the 'rotating spend-to-save fund';
  - CO_2 savings against target;
  - Less-quantifiable benefits, such as influencing the student body / local community.
- be viewed by the Programme Board before being passed to the SMT.

Appendix A: Carbon Management Matrix - Embedding

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION

5 BEST	• SMART Targets signed off
	• Action plan contains clear goals & regular progress reviews
	• Strategy launched internally & to community
		• CM is **full**-time responsibility of a **few** people
		• CM integrated in responsibilities of **senior** managers
		• VC support
		• Part of **all** job descriptions
			• **Quarterly** collation of CO_2 emissions for all sources
			• Data **externally** verified
			• M&T in place for:
			  ○ Buildings
			  ○ Waste
				• All staff & students given formalised CM:
				  ○ Induction
				  ○ Training Plan
				  ○ Communications
				• CM matters **regularly** communicated to:
				  ○ External community
				  ○ Key partners
					• **Granular** & **effective** financing mechanisms for CM projects
					• **Finance representation on CM Team**
					• **Robust** task management mechanism
					• **Ring-fenced fund** for carbon reduction initiatives
						• **Senior** purchasers consult & adhere to ICLEI's **Procura**+ manual & principles
						• Sustainability comprehensively integrated in **tendering** criteria
						• Whole life costing
						• Area-wide procurement
							• Senior management review CM process
							• Core team regularly reviews CM progress
							• Published externally on website
							• Visible board level review

4	• SMART Targets **developed but not** implemented	• CM is **full**-time responsibility of an **individual**
		• CM integrated in to responsibilities of department **managers**, not all staff
			• **Annual** collation of CO_2 emissions for:
			  ○ Buildings
			  ○ Transport
			  ○ Waste
			• Data **internally** reviewed
				• All staff & students given CM:
				  ○ **Induction**
				  ○ Communications
				• CM communicated to:
				  ○ External community
				  ○ Key partners
					• Regular financing for CM projects
					• **Some** external financing
					• **Sufficient** task management mechanism
						• Environmental demands incorporated in tendering
						• **Joint procuring** between HEIs or with LAs.
							• **Core** team **regularly** reviews CM progress:
							  ○ Actions
							  ○ Profile & Targets
							  ○ New opportunities quantification

3	• **Draft** policy
	• Climate Change **reference**
		• CM is **part**-time responsibility of a **few** people
		• CM responsibility of department champions
			• **Collation** of CO_2 emissions for limited scope i.e. buildings only	• **Environmental** / **energy** group(s) give ad hoc:
				  ○ Training
				  ○ Communications
					• **Ad hoc** financing for CM projects
					• Limited task management
					• No allocated resource
						• **Whole life** costing occasionally employed
						• Some **pooling** of environmental expertise
							• CM team review aspects including:
							  ○ **Policies / Strategies**
							  ○ Targets
							  ○ Action Plans

2	• No policy • Climate Change **aspiration**	• CM is **part**-time responsibility of an **individual** • No departmental champions	• **No CO_2** emissions data compiled • Energy data compiled on a regular basis	• Regular poster/awareness campaigns • **Staff & students** given ad hoc CM: ○ Communications	• Ad hoc financing for CM **related** projects • Limited task coordination **resources**	• **Green** criteria occasionally considered • Products considered in **isolation**	• Ad hoc reviews of CM actions progress
1 Worst	• No policy • **No** Climate Change reference	• No CM responsibility designation	• Not compiled: ○ CO_2 emissions • Estimated billing	• No communication or training	• No internal financing or funding for CM related projects	• No Green consideration • No life cycle costing	• No CM monitoring

Appendix B: Definition of Projects

During the time of this CMP2017 being updated the decision and construction was completed of the biomass boiler at Waterside Campus energy centre. This has had a significant impact by reducing the University Carbon emissions by 812 tonnes (11% saving from baseline emissions) and will save £140,000 annually compared to equivalent gas costs.

Project: **Reference:**	**Waterside Campus Biomass Boiler** *Completed July 2017*
Owner (person)	
Department	Vital Energy, Mace, Infrastructure Services
Description	
Benefits	• **Financial:** £140,000 per year • **Payback:** TBC • **CO2 savings:** 812t CO_2 per annum
Funding	• **Project cost:** TBC • **Operational costs:** TBC • **Source of funding:** Waterside Campus capital cost • **Decision on funding:** Senior Management Team
Resources	• Funded through Waterside capital costs
Ensuring Success	• Provision of capital • Effective collaboration between design and construction team
Measuring Success	**Metrics:** • Monitoring of boiler efficiency and heat output through metering. • Regular maintenance • High quality G50 woodchip with 25% moisture content and no contamination of waste wood
Timing	**Milestones / key dates:** • *Completed July 2017*
Notes	

Project: **Reference:**	**BMS Health Check** **1.**
Owner (person)	
Department	Infrastructure Services and 1st Degree Facility

Description	
Benefits	• **Financial:** 0.5% of gas and electric spend £8,771 • **Payback:** 0.25 years • **CO2 savings:** 37t CO_2 per annum
Funding	• **Project cost:** £2,040 (inc VAT) • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** Internal • **Decision on funding:** Head of Infrastructure Services and Director of Finance
Resources	• Funded primarily through Infrastructure Services budget.
Ensuring Success	• Provision of capital. • Collaborative approach between consultant and 1st Degree Facilities for training purposes.
Measuring Success	**Metrics:** • Reduction in electric and gas consumption demonstrated by sub-metering/data logging. • No adverse impact on provision of ICT reported by users.
Timing	**Milestones / key dates:** • BMS health check to be implemented in 2017.
Notes	

Project: **Reference:**	**CircoSense Trial** **2.**
Owner (person)	
Department	Infrastructure Services and 1st Degree Facility
Description	
Benefits	• **Financial:** £697 per annum • **Payback:** 7.8 years • **CO2 savings:** 6t CO_2 per annum
Funding	• **Project cost:** £5,500 trial • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** Internal • **Decision on funding:** Head of Infrastructure Services and Director of Finance
Resources	• Funded primarily through Infrastructure Services budget.
Ensuring Success	• Provision of capital. • Collaborative approach between Infrastructure Services and 1st Degree Facilities to progress project from planning to implementation.

Measuring Success	**Metrics:** • Reduction in energy consumption demonstrated by sub-metering/data logging. • No adverse impact on provision of ICT reported by users.
Timing	**Milestones / key dates:** • Project to be implemented in between 2017 and 2018.
Notes	

Project: **Reference:**	**Endotherm** **3.**
Owner (person)	
Department	Infrastructure Services
Description	Central heating efficiency additive
Benefits	• **Financial:** £39,650 • **Payback:** 0.3 years • **CO2 savings:** 300t CO_2 per annum
Funding	• **Project cost:** £12,000 • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** Internal • **Decision on funding:** Head of Infrastructure Services and Director of Finance
Resources	• Funded primarily through Infrastructure Services budget.
Ensuring Success	• Provision of capital. • Collaborative approach between Infrastructure Services and 1st Degree Facilities to progress project from planning to implementation. • Trial in Innovation Centre has reduced consumption by 9%.
Measuring Success	**Metrics:** • Reduction in gas consumption demonstrated by sub-metering/data logging. • No adverse impact on heating
Timing	**Milestones / key dates:** • Project to be implemented in phases between 2017 and 2018.
Notes	

Project: **Reference:**	**Computer out-of-hours shut down.** **4.**
Owner (person)	
Department	Infrastructure Services
Description	
Benefits	• **Financial:** £3,750 • **Payback:** • **CO2 savings:** 28t CO_2 per annum
Funding	• **Project cost:** No capital cost • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** • **Decision on funding:** Head of IT and Director of Finance
Resources	• Resourced through IT staff
Ensuring Success	• Collaboration between IT and Safety, Health and Environment Team.
Measuring Success	**Metrics:** • Reduction in electric consumption demonstrated by sub-metering/data logging.
Timing	**Milestones / key dates:** • To be delivered during 2018 refurbishments of Spencer Perceval
Notes	

Project: **Reference:**	**LED Lighting upgrade to Spencer Perceval** **5.**
Owner (person)	
Department	Infrastructure Services
Description	
Benefits	• **Financial:** £23,800 • **Payback:** 2.5 years • **CO2 savings:** 107t CO_2 per annum
Funding	• **Project cost:** £61,500 • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** Internal • **Decision on funding:** Head of Infrastructure Services and Director of Finance

Resources	• Funded primarily through capital budget.
Ensuring Success	• Provision of capital. • Organised installation and working between Infrastructure Services, Head of Projects and approved contractor
Measuring Success	**Metrics:** • Reduction in electric consumption demonstrated by sub-metering/data logging.
Timing	**Milestones / key dates:** • To be delivered during 2018 refurbishments of Spencer Perceval
Notes	

Project: **Reference:**	**Low flow shower heads and ShowerBob water saving timers** **6.**
Owner (person)	
Department	Infrastructure Services, 1st Degree Facilities, Marketing Department
Description	
Benefits	• **Financial:** £95,300 • **Payback:** <0.25 years • **CO2 savings:** 180t CO_2 per annum
Funding	• **Project cost:** £5,350 • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** Internal • **Decision on funding:** Head of Infrastructure Services and Director of Finance
Resources	• Funded primarily through capital budget
Ensuring Success	• Provision of capital. • Organised installation and working between Infrastructure Services, Head of Projects and approved contractor
Measuring Success	**Metrics:** • Reduction in gas and water consumption demonstrated by sub-metering/data logging.
Timing	**Milestones / key dates:** • Pilot to be delivered in early 2018. • Roll out to be delivered in 2018.
Notes	

Project: **Reference:**	**Decommissioning Maidwell** **7.**
Owner (person)	
Department	Infrastructure Services, 1st Degree Facilities
Description	
Benefits	• **Financial:** £235,515 per annum • **Payback:** NA • **CO2 savings:** 718t CO_2 per annum
Funding	• **Project cost:** No capital cost • **Operational costs:** No increase in marginal operational cost. • **Source of funding:** NA • **Decision on funding:** NA
Resources	• Infrastructure services for planning and 1DF for implementation
Ensuring Success	• Provision of capital. • Organised communication and working between Infrastructure Services, Head of Projects and 1DF.
Measuring Success	**Metrics:** • Reduction in gas and water consumption demonstrated by sub-metering/data logging.
Timing	**Milestones / key dates:** • Planning spring 2018 • Implementation Summer 2018 following move out of staff.
Notes	Decommissioning with 5% energy usage remaining to keep infrastructure operational for example preventing water freezing in pipes or potential blocking of system if completely shut down.