Carbon Management Plan Update

December 2015

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1 Introduction

Northumbria University is committed to reducing its impact on Climate Change, by tackling its operational CO_2 emissions. This policy links with the University's wider Sustainability aims, to strive to protect the environment and prevent pollution. In addition, we acknowledge our responsibility to ensure that all our students have an understanding of their impacts on our fragile eco systems, and to provide them with skills, knowledge and understanding so they are able to contribute to a more sustainable world. A key part of this is leading by example.

The 2010 Carbon Management Plan laid the foundations for the university to start to tackle its CO_2 emissions. At a time of large growth for the university, the plan was successful in limiting the impact of the expansion. Despite the fact that overall emissions have increased from our baseline, the emissions per square metre from our buildings have reduced by 17% to 80kg CO_2/m^2. This compares favourably to the sector average of 95kg CO_2/m^2 (AUDE 2014 annual report).

However, our commitment is to deliver real reductions in emissions from all of our operations. To achieve our original target of reducing our emissions to 11,500 tonnes per year will now require reductions of 42%. To achieve this ambition will be a major challenge which will require time and resources, as well as the help of every member of staff and every student. It will mean that some of the ways in which we have traditionally operated will have to change, along with many behaviours.

However, the benefits are great;

- Financial, with lower costs of utilities
- Reputational, as we deliver a more appealing and engaging Sustainable campus
- Environmental, lowering our impact on the global and local environment and enhancing the student experience

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2 Governance Structure and Responsibilities

Carbon Management Programme Board

A Programme Board has been established in 2015, to

- Champion and provide leadership on Carbon Reduction
- Embed a Carbon Reduction ethos at every level across the university
- Monitor progress towards meeting the objectives and targets
- Review and champion plans for the financial provision of Carbon Reduction projects
- Agree spend on Carbon Reduction projects within the allocated budgets
- Programme and prioritise Carbon Reduction projects
- Review highlight reports for projects and remove obstacles to successful completion
- Set and review the strategic direction and targets
- Ensure that there is a framework in place to coordinate projects in the Carbon Reduction Programme
- Approve the annual emissions report and publicise performance
- Oversee compliance of Carbon emissions legislation (including CRC, DECs, ESOS)

Membership

Damon Kent – Chair and Programme Sponsor
Keith Slater – Carbon Manager
Andrew Mowbray – Head of Campus Planning and Development
Brian Cowan – Assistant Director, Facilities Services
Katie Ridley - Sustainability Advisor

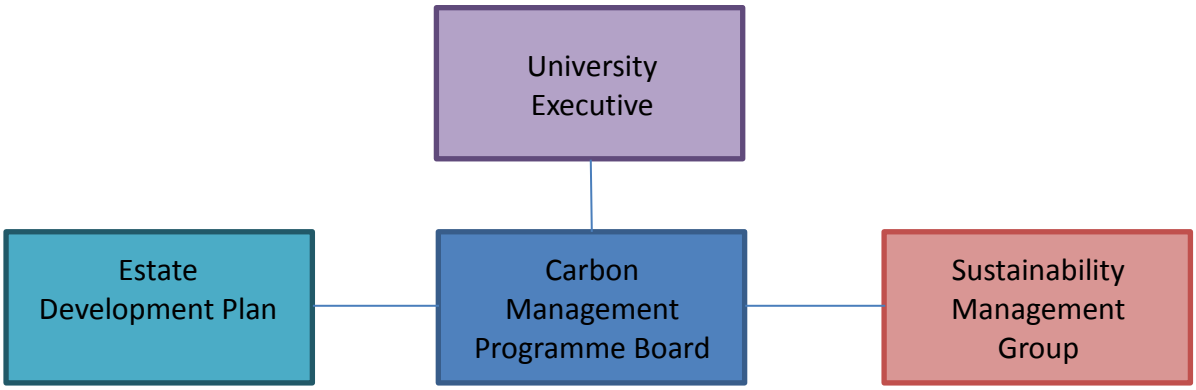
Additional members may be co-opted on to the Board if deemed appropriate to assist with specific projects.

Reporting

The Programme Board will provide quarterly reports to the University Sustainability Management Group (Carbon Manager).

Annual reports on performance will be sent to the University Executive.

The Programme Board will also feed in to the Estate Development Plan to ensure future developments contribute to the reduction of CO_2 emissions.



3 Targets and Objectives

The key objective of this plan is to put the university on course to deliver real savings in CO_2 emissions and achieve the original target of a 32.5% reduction in Scope 1 and 2 emissions from the 2005/6 baseline by 2020, as well as quantifying and reducing Scope 3 emissions to reduce the total Carbon Footprint.

Key Performance Indicators

1. Annual minimum year on year reductions of Scope 1 and 2 emissions of:
    a. 6% 2015/16
    b. 7.5% 2016/17
    c. 10% 2017/18 to 2019/20
2. Annual improvement in building efficiency (CO_2 emissions per m^2) of at least 3%
3. Overall reduction in Scope 1, 2 and 3 emissions of:
    a. 4% 2015/16
    b. 5% 2016/17
    c. 7% 2017/18 to 2019/20
4. Reduce emissions per student by at least 3% per year

Scope 1 & 2 Emissions Objectives

- Emissions to return to below baseline levels from 2017/18
- To be in the top 25% of universities for CO_2 reduction by 2019.
- Investigate the potential of renewable energy installations
    - 100kWp of solar PV to be installed by Jan 2016
    - All viable solar installations on existing buildings completed by January 2018
- Deliver whole building retrofit projects
    - four buildings completed by September 2016
- Ensure buildings are suitable for the functions within them, and are well utilised
    - Develop accommodation plan which enables 50% reduction in energy use over the summer period by 2020.
- Ensure all capital works and refurbishments actively reduce energy use and CO_2 emissions from January 2016
    - All new buildings to aim to be zero carbon and achieve A rated Display Energy Certificates

Scope 3 Emissions Objectives

- Improve data quality and establish annual reporting of total carbon
    - Emissions from university business travel, water consumption and waste reported annually from 2014/15
    - Analyse emissions data for procurement to develop an emissions reduction strategy by September 2018
    - To accurately measure staff commuter travel and develop an emissions reduction strategy by September 2018
- Reduce water consumption by 2% per year from 2015/16 (based on litres per student)
- Analyse business travel emissions and develop plan to reduce by September 2016

All emissions Objectives

- Publish annual reports showing Scope 1, 2 and 3 emissions for the year and progress towards our targets on the university website from 2014/15
- Embed energy efficiency and carbon management principles across the organisation
    - Develop a targeted staff and student engagement plan by July 2016
    - Carbon Incentive Scheme for all departments by 2018
- Achieve level 5 across all areas of the Carbon Management Embedding Matrix (appendix A)

4 Actions

The table below shows the actions we plan to take over the next couple of years to reduce energy use and CO_2 emissions. This list of actions will be updated each year as new projects are developed and included in the Annual Carbon Management Report.

Scope 1 & 2 emissions

Action	***Rationale***	***Estimate of CO2 emissions reductions***	***Capex (£000s)***	***Estimate of annual financial savings***
Actions for 2015/16 (6% target = 1,150 tonnes CO_2)				
District Heating Boilers	Replacing the temporary gas boilers for the district heating network, and network improvements. No direct emissions savings, but payback within four years due to cost of temporary boilers	45	200	75,000
Solar PV array on Sports Central	Feasibility studies have been completed showing potential for around 100kW of solar PV. A priority due to Government consultation on abolishing Feed in Tariff	40 tonnes	176	18,000
Overhaul of BMS controls and protocols of Top 10 buildings	Study conducted showing potential to reduce energy use through changes to BMS	620	50	125,000
Whole building retrofits Phase 1: five buildings: Squires, Squires Annex, Trinity, Burt Hall and Glenamara	A trial of carrying out whole building retrofits, to improve all aspects of energy use in the buildings	25% of energy use Total 281 tonnes	750	75,000
Develop a five year Staff/student awareness campaign	The level of savings needed to meet the reduction targets will need a fundamental shift in the culture within the university. Carbon Trust suggests that savings of 10% can be achieved by changing staff behaviour.	1.5% of energy use in year 1 290 tonnes		67,500
Corridor Lighting replacement Phase 2: Sport Central and CCE1	Following success of Ellison and Northumberland buildings, to change lighting to LED and add sensors	110,000 kWh electricity 50 tonnes CO_2	250	27,000
Metering	To update and improve the metering of energy use across the university to enable effective monitoring and targeting of energy consumption, highlight areas of	Savings of £5,000 through efficiency savings, and	38	5,000

	high consumption and validate invoices, leading to reductions in energy consumption and savings in energy costs.	bill validation		
	Totals	**1,325 tonnes CO_2**	**£1,454**	**392,500**
Longer term actions – planning starting in 2015/16				
Investigate potential of "free" cooling through evaporative cooling in the two main datacentres	At present the two data centres have 320kW of cooling, costing approx. £200,000 per year. Evaporative cooling can reduce that by 90% per year.	Feasibility only 800 tonnes if feasible in 2016/17 to 2017/18	200	75,000
Whole building Retrofits, further phases	Following a successful phase 1 trial, further phases will be implemented up to 2020, prioritising those buildings with the greatest potential for savings.	Eight year payback. Buildings to be identified to enable quickest paybacks first	750 p.a.	75,000
Investigate options for Biomass boilers at Coach Lane Campus East	Biomass boilers can reduce emissions from heating by 80%. Coach Lane East Campus has the space to accommodate a biomass energy centre.	Feasibility only 200 tonnes of CO2 if feasible (80% of gas use)	300	
Develop accommodation plan which enables 50% of buildings to be shut down during the summer and Christmas periods by 2020.	Summer occupation levels are approx. 10% of term time occupation. By planning summer activities so they take part in a few "core" buildings at least 50% of buildings can be shut down.			
Feasibility study for solar PV across the whole estate, including ground mounted array in the car park at Coach Lane Campus East.	Feed in Tariff enables solar PV to be a feasible renewable energy option. The university has a large roof area which could be suitable, as well as the car park at Coach Lane East which would be suitable. We need to take advantage of FIT before it is removed	Assume 800kW of PV. 315 tonnes of CO2 if feasible across 2016/17 and 2017/18	960	96,000

Scope 3 emissions

Action	Rationale	Estimate of CO2 emissions reductions
Actions for 2015/16		
Commence annual reporting of emissions from water, business travel, refrigerant gases and waste	Data for these sources of emissions is already collected by the university	n/a
Monitor water consumption with data loggers to determine out of hours losses	Up to 30% of water use can occur during unoccupied periods, due to leaks and faulty sanitary ware.	

Appendix A - Carbon Management Embedding Matrix

For each column below please write down: a) where you feel your organisation is **now** (a score of 1-low to 5-high); b) where you feel you organisation should be **in 5 years** time (a score of 1-low to 5-high); c) which area(s) you think will provide the greatest **challenge** (please tick)

Now							
5yrs							
Challenge							

	CORPORATE STRATEGY	PROGRAMME MANAGEMENT	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	POLICY ALIGNMENT *

BEST 5	• Top level target allocated across organisation
	• CO_2 reduction targets in Directorate Business Plans
		• Cabinet / SMT review progress against targets on quarterly basis
		• Quarterly diagnostic reports provided to Directorates
		• Progress against target published externally
			• CM integrated in responsibilities of senior managers
			• CM part of all job descriptions
			• Central CO_2 reduction advice available
			• Green Champions leading local action groups
				• Quarterly collation of CO_2 emissions for all sources
				• Data externally verified
				• M&T in place for:
				  ○ buildings
				  ○ street lighting
				  ○ waste
					• All staff given formalised CO_2 reduction:
					  ○ induction and training
					  ○ communications
					• Joint CM communications with key partners
					• Staff awareness tested through surveys
						• Finance committed for 2+yrs of Programme
						• External funding being routinely obtained
						• Ring-fenced fund for carbon reduction initiatives
							• CO_2 friendly operating procedure in place
							• Central team provide advice and review, when requested
							• Barriers to CO_2 reduction routinely considered and removed

4	• CO_2 reduction commitment in Corporate Strategy
	• Top level targets set for CO_2 reduction
	• Climate Change Strategy reviewed annually
		• Sponsor reviews progress and removes blockages through regular Programme Boards
		• Progress against targets routinely reported to Senior Mgt Team
			• CM integrated in to responsibilities of department heads
			• Cabinet / SMT regularly updated
			• Staff engaged though Green Champion network
				• Annual collation of CO_2 emissions for:
				  ○ buildings
				  ○ street lighting
				  ○ transport
				  ○ waste
				• Data internally reviewed
					• All staff given CO_2 reduction:
					  ○ induction
					  ○ communications
					  ○ CM matters communicated to external community
						• Coordinated financing for CO_2 reduction projects via Programme Board
						• Finances committed 1yr ahead
						• Some external financing
							• Comprehensive review of policies complete
							• Lower level policies reviewed locally
							• Unpopular changes being considered

3	• CO_2 reduction vision clearly stated and published
	• Climate Change Strategy endorsed by Cabinet and publicised with staff
		• Core team regularly review CM progress:
		  ○ actions
		  ○ profile & targets
		  ○ new opportunities
			• An individual provides full time focus for CO_2 reduction and coordination across the organisation
			• Senior Sponsor actively engaged
				• Collation of CO_2 emissions for limited scope i.e. buildings only	• Environmental / energy group(s) given ad hoc:
					  ○ training
					  ○ communications
						• A view of the cost of CO_2 reduction is developing, but finance remains ad-hoc
						• Some centralised resource allocated
						• Finance representation on CM Team
							• All high level and some mid level policies reviewed, irregularly
							• Substantial changes made, showing CO_2 savings

2	• Draft Climate Change Policy • Climate Change references in other strategies	• Ad hoc reviews of CM actions progress	• CO_2 reduction a part-time responsibility of a few department champions	• No CO_2 emissions data compiled • Energy data compiled on a regular basis	• Regular awareness campaigns • Staff given CM information on ad-hoc basis	• Ad hoc financing for CO_2 reduction projects	• Partial review of key, high level policies • Some financial quick wins made
1 **Worst**	• No policy • No Climate Change reference	• No CM monitoring	• No recognised CO_2 reduction responsibility	• No CO_2 emissions data compiled • Estimated billing	• No communication or training	• No specific funding for CO_2 reduction projects	• No alignment of policies for CO_2 reduction

* Major operational policies and procedures, e.g. Capital Projects, Prourement, HR, Business Travel