Middlesex University

Carbon Management Plan

2018/19 – 2020/21

Version	Date	Author	Approval
3	Feb-19	Mario Kokkoris, Env. Data & Energy Bureau Analyst	Mark Wilkinson, Environmental Manager
2.3	Sep-14	Mark Norman, Environmental Manager	Melvyn Keen, Deputy Chief Executive
2.2	Mar-14	Mark Norman, Environmental Manager	Melvyn Keen, Deputy Chief Executive
2.1	Feb-13	Mark Norman, Environmental Manager	Melvyn Keen, Deputy Chief Executive
2	Oct-11	Susie Page, Environmental Manager	Steve Knight, Deputy Vice-Chancellor

1 Executive Summary

Global climate change is recognised as a key environmental threat facing the world. Concerns over fossil fuel depletion, security of energy supplies and rising energy costs are focussing the attention of individuals, organisations and governments on the need for energy conservation and carbon emission reduction.

In 2009, the University calculated its carbon emissions footprint, to set targets for reducing carbon emissions and to formulate a plan to deliver the target.

This document, the Carbon Management Plan, set out the University's strategy for reducing carbon emissions by 25% over a seven year period from 2008/2009 to 2014/15, from a baseline of 2005/06. An aspirational target for 2020 using the baseline of 2005/06 was also set at a 35% reduction.

In October 2018, the targets were revised to account for new building additions that took place across Hendon campus between 2014 and 2016. Short-term carbon reduction targets were set out for reducing carbon emissions by 5% by 2020/21 against a baseline year of 2016/17.

The carbon baseline for the year 2016/17 is made up of emissions from non-residential buildings and takes into account the footprint of their energy usage. Emissions from water and waste to landfill have not been considered in this baseline as previously done. This is because the University recognises that the carbon footprint of its energy usage has a larger impact.

Total emissions for the baseline year have been calculated at 1,653 tonnes of CO_2 equivalent (tCO_2e).

2 Introduction

This paper sets out Middlesex University's response to the need for providing a plan that will commit us to reducing our energy use and hence reducing our production of carbon into the atmosphere. Our Carbon Management Plan sets out our strategy for reducing carbon emissions from the baseline year of 2016/17 for the three year period 2018/2019 to 2020/21 and takes into account a range of strategic and technical measures which will reduce emissions over the Estate.

3 Carbon Management Strategy

3.1 Context and Drivers for Carbon Management

International

In the international arena the Kyoto Protocol remains the only worldwide binding agreement to reducing CO_2 emissions and there has been no successor to the Kyoto protocol.

European

At the European level, legislation includes the European Union Emissions Trading Scheme (EUETS) and the EU Energy Performance of Buildings Directive (EPBD). At Middlesex University, we are affected by the EPBD which requires us to display energy certificates on some of our larger buildings.

National

The Climate Change Bill introduced in 2007 by the UK Government commits the country to 60% reduction in CO_2 emissions by 2050.

The 2008 Climate Change Act (CCA) takes this commitment further by agreeing a carbon reduction target of 80% by 2050 against 1990 levels, with an interim target of a 26% reduction by 2020 and this made the UK to first country in the world to set legally binding targets.

In order to reach this target the Government introduced the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), in 2008 which is designed to encourage organisations with over 6000MWH per annum consumption to report their carbon emissions and pay £12 per ton of CO_2 emitted.

It is mandatory for all public sector organisations to take part in this scheme, and Middlesex University has submitted its first footprint and annual report to the Environment Agency in July 2011.

3.2 Our Low Carbon Vision

The University's Strategy (2017 – 2022) is committed to providing students with leaning, support and social spaces that are environmentally sustainable and this Carbon Management Plan includes that decision and its effect on our production of carbon.

The University has increased the value of its built estate at Hendon with several new buildings.

- Sheppard Library completed in 2007 incorporates temperature controlled automatic window ventilation systems and photo voltaic solar panels of 28.5 kW capacity
- Hatchcroft building opened in 2008 is BREEAM 'Excellent' with a Ground Source Heat Pump and photovoltaic panels of 29.79 kW capacity
- Grove opened in 2014 is BREEAM 'Excellent' with a CHP and temperature controlled automatic window ventilation system
- Ritterman completed in 2016 incorporates a green wall, photovoltaic panels of 14.7 kW and a CHP

3.3 Targets and Objectives

Middlesex University aims to:

- Reduce its carbon emissions from utilities by 5% by 2020/21 on 2016/17 baseline

To achieve the target of a 5% reduction in emissions there is a requirement to increase the resources available for carbon management. The University will achieve emissions reduction by:

- Engaging staff and students in the Carbon Management Plan through engagement events
- Investing in energy conservation measures in buildings where the payback period is short or can be addressed through the five year EFMS capital plan
- Improving utility metering so that the impact of such measures can be monitored
- Assessing the feasibility of other measures for reducing carbon emissions from buildings as well as other sources
- Reviewing and updating appropriate policies and plans to ensure that carbon management is fully integrated into the business strategy

4 Emissions baseline and projections

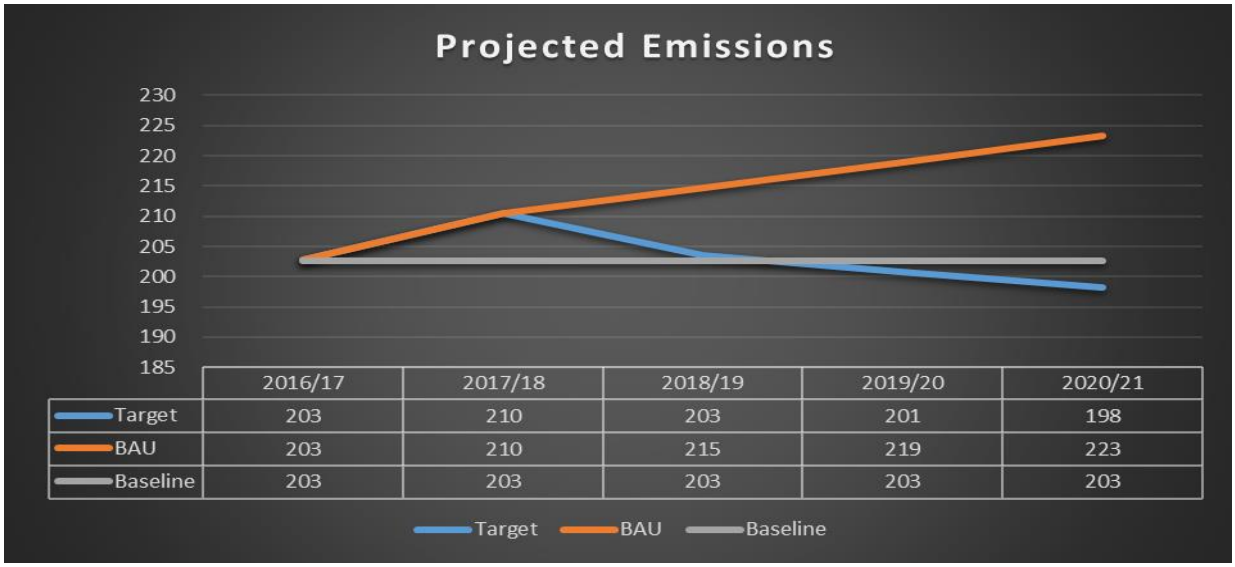
4.1 Scope

Non – residential buildings

All emissions from gas and electric in this sector are included in the baseline. In 2011 an energy software program was installed to further improve the accuracy of data measurement and reporting, which was then replaced SystemsLink in 2016 to improve data visibility and granularity.

4.2 Projections and Value at Stake

The below figure shows an estimated projection of emissions over the life of this plan. The business as usual scenario is based on the estimated emissions increases which would occur without additional carbon management investment and actions and is conservatively estimated at approximately 1% per annum.



	2016/17	2017/18	2018/19	2019/20	2020/21
Target	203	210	203	201	198
BAU	203	210	215	219	223
Baseline	203	203	203	203	203

5 Carbon Management Projects

5.1 Completed Projects

The following table summarises historic emission reduction projects.

No	Emission Reduction Opportunity	Action	Completion Date
1	**Strategic change**	Closure of Enfield Campus - minimum reduction in area of 900 m2	2009
		Closure of Cat Hill Campus - minimum reduction in area of 1,3000 m2	2011
		Closure of Trent Park campus - minimum reduction in area of 1,3357 m2	2012
2	**Engaging Staff and Students**	Develop Environmental website and include a facility for users to forward comments	2009
		Develop a range of University specific publicity materials, posters and stickers	2010
3	**Building Management Systems (BMS)**	Upgrade BMS controllers to enable intelligent support and maintenance provision	2010
		Provide access to system via the internet	2010
		Arrange BMS training for EFMS staff	2011
4	**Metering and Sub Metering Upgrade**	Install additional electric sub metering across all buildings and separate gas meters to individual buildings	2011
		Review use of current system and utilise direct data import facility	2011
		Upgrading electric sub-metering from pulse-out to Modbus across Hendon buildings	2018
5	**Improve efficiency of computing facilities**	Upgrade fluorescent lighting to high frequency with appropriate controls	2010
		Replace T12 tubes with T8 tubes where possible	2011
6	**Building Fabric and Heating Improvements**	Adjust heating systems to remove cold spots and then organise a programme to remove temporary electric heaters	2011
		Install Thermostatic Radiator Valves (TRV's) over a period to all areas	2012
		Survey buildings for cavity wall and ceiling insulation and roof insulation	2012
		Install of TRV's in the Town Hall	2018
		Williams building - refurbishment project	2018
7	**Water conservation**	Replace existing urinals with water-free urinals	2013
8	**Review Energy Supply Options**	Carry out further feasibility work on CHP and introduce to five largest building at Hendon	2012
		Introduce voltage reduction equipment at Hendon	2012

9	**Develop & Implement Communications Strategy**	Influence schools/services to consider energy efficiency in purchasing decisions	2009
		Provide a means of displaying energy and environmental information at key strategic locations	2009
10	**Embed into Strategy & Policy**	Include environmental considerations in Estate Plan	2009
		Make 'excellent' the minimum BREEAM rating for new builds	2008
		Embed carbon management into school/service business plans	2012
11	**Reduce Emissions From Transport**	Introduce measures to meet targets in the University Travel Plan	2010
		Begin the process of assessing scope three emissions for staff and student travel	2011
		Review cycle facilities provision for secure parking and showers/ changing areas	2012
		Assess the use of alternative fueled vehicles in the University's fleet when vehicle replacement is due	2013

5.2 Medium to Long Term Projects

The following table summarises the emissions reduction opportunities that have been identified.

No	Emission Reduction Opportunity	Action
1	**Engaging Staff and Students**	Delivery of energy and environmental induction to staff and students
		Publish environmental performance data across the campus
		Delivery of communication campaigns, events and updates on sustainability through various media
2	**Building Management Systems (BMS) Optimisation**	Review and adjust control strategy to remove potential heating and cooling conflicts, ad hoc overrides of automatic operations
		Ensure time schedules reflect normal occupation patterns and short term arrangements
		Carry out system maintenance or upgrades when and where required
3	**Metering and Data Analysis**	Ensure utilities data from all meters and AMR infrastructure is accurate
		Identify opportunities for further metering requirements in line with relevant standards (TM39)
		Conduct Regression and CUSUM analysis of energy data, benchmarking energy performance of buildings
4	**Energy Management System and Associated Projects**	Work with projects team and other stakeholders to identify energy efficiency projects driven by metering and data analysis
		Explore / make decision for incorporating an appropriate energy management standard (and its relationship to ISO14001)

6 Carbon Management Plan financing

Funding is provided by the University via a ‘spend to save’ budget allocated each year. Some additional funds may be allocated through long-term Estates plan, medium-term throuh the five year capital plan, and short-term budgets to address minor ad hoc issues.

7 Actions to Embed Carbon Management

7.1 Responsibility

Name and position in the University	Position	Interest / issue
Tim Blackman	Vice Chancellor	Reputation and performance of the University
James Kennedy	Chief Financial Officer	Executive sponsor for environment and sustainability
Andrew Dickie	Director of Estates and Facilities	Efficiency of services | Delivering best value
Jamie Smith	Deputy of Estates and Facilities	Delivering carbon management through estate projects
Mark Wilkinson	Environment Manager	Energy efficiency | Waste and recycling | Biodiversity
Mario Kokkoris	Environment Data and Energy Bureau Analyst	Energy monitoring | Utilities management
Nikki Littlefield	Green Travel and Transport Manager	Travel and Transport | Env. Communications

7.2 Data Management

Middlesex University has monitored its energy use and has installed SystemsLink energy software to better manage, monitor and target its energy use and streamline energy billing. The system includes a carbon module designed for compliance with Government CRC reporting.

7.3 Communication and Training

Staff induction, communication campaigns and events are in place to engage staff in environmentally friendly behaviours that support the Carbon Management Plan and flag up issues to improve environmental performance.

7.4 Annual Progress Review

Environmental issues are discussed at the University through the Environmental Steering Group. This is chaired by a member of the executive team and its role is to review and approve environmental policy and strategy work related to the environment on campus.