



Cardiff
Metropolitan
University

Prifysgol
Metropolitan
Caerdydd

**Estates & Facilities Department
Property Services**

Carbon Management Strategy 2013-18



INVESTORS | BUDDSODDWYR
IN PEOPLE | MEWN POBL

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Executive Summary

In order to manage energy consumption and mitigate its impact on climate change, Cardiff Metropolitan University aims to reduce absolute carbon emissions by a minimum 15% by end 2017/18, against a 2012/13 baseline. An annual reduction of 3% will be targeted to work towards this, in-line with Welsh and UK Government long-term ambitions.

This Strategy continues and builds on the University's preceding strategy and implementation plan for carbon management which concluded in 2012/13 and the principles of which have continued through the 2013/14 period. The challenge to continue to reduce emissions following a period of successful and sustained carbon management is recognised and accepted within this new strategy.

The reduction targets are primarily applicable to all Scope 1 and 2 emissions and selected scope 3 emissions where data is available. During the period of this Carbon Management Strategy the University will also take steps to improve measurement and reporting on scope 3 emissions in general, with a view to influencing reductions where possible.

In order to achieve its aims, the University commits to:

Strategy & Procedures

- Determine and transparently report its carbon emissions reporting boundary in-line with the Greenhouse Gas (GHG) Protocol Corporate Standard.
- Measure and transparently report annual emissions in-line with ISO 14064-1: 2006
- Develop a carbon management plan to identify, prioritise and implement energy efficiency and carbon reduction initiatives.
- Incorporate life cycle cost principles as part of design and procurement procedures and decision making, where appropriate.

Built Environment

- Continue to operate a comprehensive metering, monitoring and targeting programme across the University.
- Continue to implement a behavioural change programme for energy reduction.
- Seek to minimise heat loss from buildings and maintain comfortable indoor environments.
- Seek to continually improve the efficiency of heating and hot water plant, electrical equipment and lighting.

Travel & Transportation

- Benchmark 2012/13 performance by calculating and reporting applicable travel and transportation emissions against the baseline year. (Bi-ennial Travel Survey and Annual Travel Plan)
- Continue to promote alternative forms of transport for business and commuting travel, and seek to influence wider travel and transportation emissions among staff and students.

Procurement

- Review utilities agreements at appropriate times with consideration to both financial and carbon costs.

- Work with key suppliers to understand and influence where possible wider emissions beyond the University's direct control.

Progress against each of the items above will be reported on an annual basis.

1. Introduction

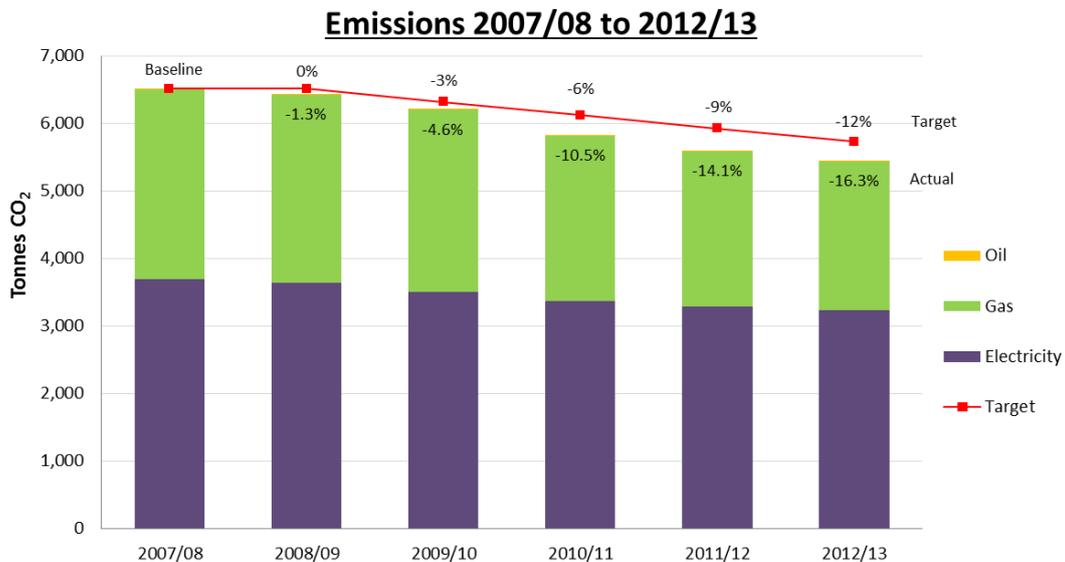
As a responsible organisation, Cardiff Metropolitan University (“the University”) recognises the need to minimise its energy consumption and carbon emissions. Through this Carbon Management Strategy the University aims to demonstrate a commitment to achieving this, and to outline activities we commit to undertaking to work towards these aims.

This strategy has been developed in accordance with the HEFCW Carbon Management Policy (W14/09HE)¹, published March 2014, and aims to deliver carbon emissions reductions in-line with Welsh Government long-term ambitions.

1.1 The climate case

At the end of the 2012/13 academic year, the University completed its first five-year strategy and implementation plan for carbon management. The strategy focused on monitoring and targeting energy consumption within the University estate, targeting 3% reduction each year from 2008/09, against a 2007/08 baseline. By the end of the five-year programme, emissions were reduced by 16.3%, bettering a 12% target.

The University is committed to building on this performance, while recognising the increasing challenge of achieving continual improvement on the significant reductions already achieved.



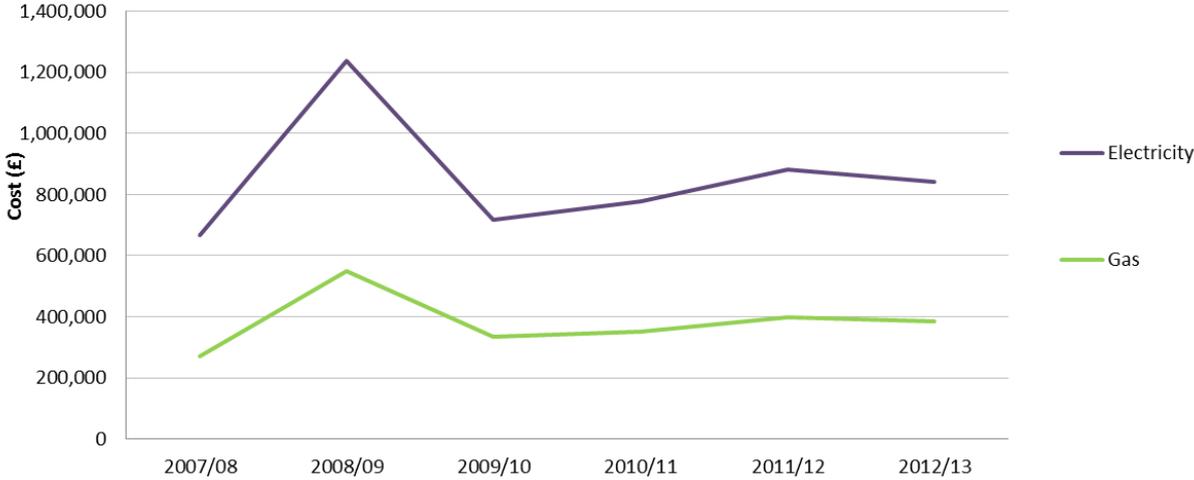
In 2012/13 the University emitted 5,438 tonnes CO₂e from electricity and fossil fuel consumption within its estate. In addition to these emissions from the estate, the aims of this strategy will also include Scope3 water supply and treatment emissions. The University aims to reduce these emissions by 3% each year against the 2012/13 baseline, achieving a minimum 15% reduction by 2017/18.

1.2 The business case

¹ http://www.hefcw.ac.uk/documents/publications/circulars/circulars_2014/W14%2009HE%20Carbon%20Management%20Policy.pdf

Over the five-year period of the preceding carbon management strategy, the University's energy costs per unit consumed (kWh) increased dramatically, with electricity costs rising by an average 49% and gas by 70%. The implementation of that strategy mitigated the impact of these cost increases by reducing consumption, with overall costs from 2007/08 to 2012/13 increasing by 31%.

Electricity & Gas Costs 2007/08 to 2012/13



In 2012/13 the University spent £1.23million on electricity and gas, representing 1.5% of total University expenditure.

Government forecasts predict year-on-year increases in the wholesale prices of oil, gas and coal for the UK over the duration of this new strategy². These will be reflected in retail energy prices and – alongside increasing distributor charges, supplier charges and Government policy charges – present a compelling business case for continued investment in reducing energy consumption.

Forecasts predict continued strong growth in retail energy costs for the service sector over the period of this strategy to 2018, with electricity projected to increase by up to 35% and gas by 25%. The University has in the past been subject to considerably higher increases than the average Government-published figures.

Using average retail price increases and assuming constant energy consumption levels, without action the University's annual energy cost by 2018 will increase by circa £400k to £1.62m.

² <https://www.gov.uk/government/collections/fossil-fuel-price-projections>

2. Regulation and Associated Stakeholders

2.1 The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme

The University qualifies for the CRC Energy Efficiency Scheme³, a UK Government scheme aimed at improving energy efficiency and reducing emissions by applying a charge for every tonne of CO₂ emitted, thus incentivising carbon emissions reduction. To comply with the scheme, the university purchases and annually surrenders allowances equal to its emissions from mains electricity and gas consumption.

2.2 Welsh Government

The Welsh Government established its vision for energy efficiency and carbon footprint reduction within its One Wales: One Planet scheme⁴, and is expected to strengthen these through the proposed Future Generations Bill⁵. The Welsh Government approach and target to reduce greenhouse gas emissions by 3% a year is consistent with the carbon budget approach adopted by the UK Government through the Climate Change Act 2008, and target to reduce emissions by 80% by 2050, against 1990 levels. Targets adopted by the University within this strategy are consistent with Welsh and UK Government long-term carbon reduction ambitions.

2.3 Higher Education Funding Council for Wales (HEFCW)

The development of this strategy was undertaken with consideration to the HEFCW Carbon Management Policy (W14/09HE)⁶, published on the 27th March 2014, which intends to support and demonstrate effective carbon management across the higher education sector in Wales. The University has and will continue to work closely with HEFCW and other institutions in Wales to drive best practice across the sector.

2.4 Carbon Trust

In 2012/13 HEFCW and the Carbon Trust Wales commissioned the Higher Education Carbon Management Review (HECMR)⁷. The project examined carbon management practice at each of the Welsh universities and assessed this against eight key features of effective carbon management to enable comparison across the sector and other public sector organisations. Cardiff Metropolitan University was assessed to be among the leading institutions for carbon management within the higher education sector in Wales.

2.5 Environmental Association for Universities and Colleges (EAUC)

The University is a member of EAUC⁸, a not-for-profit charity supporting sustainability within the UK tertiary education sector. The University will implement this Strategy in-line with the values of the EAUC by sharing best practice and disseminating relevant information where relevant.

2.5 People & Planet Green League

The University is committed to maintaining a First Class award in the People and Planet Green League⁹, which assesses, benchmarks and publishes institutions' environmental and carbon management performance.

³ <https://www.gov.uk/crc-energy-efficiency-scheme>

⁴ <http://wales.gov.uk/topics/sustainabledevelopment/publications/one-wales-one-planet/?lang=en>

⁵ <http://wales.gov.uk/topics/sustainabledevelopment/future-generations-bill/?lang=en>

⁶ http://www.hefcw.ac.uk/documents/publications/circulars/circulars_2013/W13%2038HE%20Carbon%20Management%20Policy.pdf

⁷ http://carbontrust.quadrant.uk.com/presentations/HECM%20R%20wkshp_final121213.pdf

⁸ <http://www.eauc.org.uk/>

⁹ <http://peopleandplanet.org/greenleague>

3. Carbon Footprint Boundary

The University will determine its carbon footprint boundary in-line with the Greenhouse Gas (GHG) Protocol¹⁰ – the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions.

The Protocol requires organisations to determine carbon footprint boundaries according to the following defined Scopes:

- Scope 1:** All direct GHG emissions from sources that are owned or controlled by the reporting entity.
- Scope 2:** Indirect GHG emissions from consumption of purchased electricity, heat or steam.
- Scope 3:** Other indirect emissions, such as transport-related activities in vehicles not owned or controlled by the reporting entity, waste disposal etc.

In accordance with the HEFCW Carbon Management Policy, targeted reductions and reporting requirements within this strategy apply to all Scope 1 and 2 emissions. In addition, the University will take steps to measure selected Scope 3 emissions, with a view to influencing reductions where possible.

4. Measurement and Reporting

A comprehensive network of metering and monitoring technology has been installed across the University estate during the first phase Carbon Management Strategy, and we commit to maintaining this network for the duration of this new Strategy. All University buildings greater than 1000m² are sub-metered for electricity, gas and water consumption, allowing identification of energy use within these buildings.

The University commits to measure and transparently report annual emissions in-line with ISO 14064-1: 2006¹¹, and will report annually on performance against the following KPIs:

- Total Scope 1 and 2 emissions (tonnes CO₂e)
- Total Scope 1 and 2 emissions per FTE student on the non-residential estate.
- Total Scope 1 and 2 emissions per square metre gross internal area.
- Total Scope 1 and 2 emissions per £million turnover.

These will be reported within the University's Annual Sustainability Reports, and will be consistent with Estates Management Record (EMR) data reported to the Higher Education Statistics Agency (HESA).

¹⁰ <http://www.ghgprotocol.org>

¹¹ http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=38381

5. Objectives and Targets

Over the course of the first phase Carbon Management Strategy, the University were successful in achieving a significant 16.3% reduction in absolute emissions by 2012/13 against a 2007/08 baseline. The challenge to continue previous reduction levels is therefore all the more challenging, but the University is determined to investigate and implement more energy efficient operations in order to continue to meet and exceed Welsh Government targets.

For the period of this Carbon Management Strategy, the University will aim to achieve the targets outlined below. Following approval of this strategy, the University has embarked on a significant programme of construction together with consolidating its estate from four main campuses down to three. Construction currently underway is not included within the 2012/13 baseline and therefore the accommodation of this additional footprint within the existing carbon emissions targets presents a major challenge. Therefore, to account for this growth and a potential increase in student and staff numbers, we will also report carbon emissions on a full time equivalent basis to provide a true picture of our progress.

Cardiff Metropolitan's Targets by source

Source	Target
Energy	Reduce absolute carbon emissions from energy by 15% by 2017/18, compared to the 2012/13 baseline. This is equal to a 3% reduction in energy related CO ₂ e emissions per annum.
Water	Reduce absolute carbon emissions from water by 15% by 2017/18, compared to the 2012/13 baseline. This is equal to a 3% reduction in water related CO ₂ e emissions per annum.
Waste	Waste target to be 75% of landfill by end of 2015.
Travel	To reduce single occupancy car journeys to Cardiff Met and the dependency on vehicles to support its activity

Carbon Emissions Baseline Data

The following table illustrates the University carbon footprint (tCO₂e) from the baseline year 2012/13 for scope 1 and 2 emissions.

Fuel	2012/13	2013/14	2014/15	2015/16
Electricity	3506	3710	3556	3323
Gas	2081	2152	2055	1931
Fuel oil	10	5	5	5
Total Emissions	5597	5867	5616	5259
FTE Staff	1,050	1,114	1,176	1,209
FTE Students	8,544	8,432	8,460	8,569
Total FTE	9594	9546	9636	9,778
Carbon emissions per FTE	0.58	0.61	0.58	0.54

6. Structure, Roles and Responsibilities

The Vice Chancellor's Board holds ultimate responsibility for the energy and carbon emissions performance of the University.

The Chief Operating Officer will report energy and carbon emissions performance to the Vice Chancellor's Board.

The Energy and Environmental Engineer will promote the development of an energy efficient estate through the Estates and Facilities department and Director of Estates & Facilities, and with schools and units to identify improvements and promote energy efficient working practices.

Internal and external resources will be engaged where relevant and as identified, to assist in delivering the aims of this Strategy.

7. Carbon Management Plan

A Carbon Management Plan has been developed that outlines how we aim to deliver the aims of this Strategy. The Plan details a wide range of potential projects which will deliver energy and carbon reduction savings for the University. This plan is included in Annex 1.

Annex 1 Cardiff Metropolitan Carbon Management Plan 2015-16

Category	Project	Description	Estimated cost (£)	Estimated Annual CO2e saving (t)	Responsibility	By when	Status	Simple payback (years)
Energy	Lighting upgrades	Upgrade existing low efficiency lighting in student areas with LEDs. Install PIRs where appropriate to enhance savings.	£150k (I2Save) loan	275t (8%)	EM	September 2016	Implemented over 2015-16.	1.5 -7
Energy	NIAC Arena Spotlights	Upgrade existing high bay spot lights with LEDs in main arena.	£32k	82t	EM/RMM	August 2015	Completed	1.4
Energy	NIAC Aerial lights	Upgrade existing aerial fluorescent tubes in NIAC arena with LEDs.	£51k	97t	EM	Dec 2015	Completed	1.9
Energy	Upgrade building management system (BMS)	Develop a business case for upgrading the existing BMS across the University.	£400k	175t (6%)	EM	February 2016	Not completed - business case refused.	15
Energy	Voltage Optimisation	Consider feasibility for installing a Powerstar Max system into the electrical substation in Llandaff campus to reduce supply voltage.	£58,380	78t (10%)	EM	July 2016	Pending	3.7
BMS	BMS Controls optimisation	Review existing heating and ventilation controls/time schedules across the University and investigate opportunities to improve operational efficiency of plant.	£0	100-200t (5-10%)	EM	March 2016	Implemented and ongoing.	0.2
Projects/ Energy	Lighting, heating and	Seek opportunities for investigating options for	£varies	50-100t	EM/PM	July 2016	Implemented	3-7

	ventilation upgrades	upgrading existing lighting, heating and ventilation during project refurbishments across campuses.						
Energy	Improve AM&T system and maintain infrastructure	Work closely with contractor to understand, improve and obtain best value from existing AM&T system. Investigate opportunities for improving metering and reporting capabilities.	£10k	50-100t	EM	July 2016	Ongoing	2-3
Energy	TM44 assessments	Commission completion of assessments and review options for upgrading and/or replacing plant based on recommendations and results.	£10k		EM/MM	April 2016	Completed – options to be reviewed.	
Energy	Dentistry heating	Undertake review of temperatures in Dentistry block in T Block following issues of overheating.	£0	10t	EM/PM	December 2016	Implemented – overheating reduced.	0
Energy	Display Energy Certificates	Renew Display Energy certificates each year and review opportunities to target poorest performing buildings.	£1500	10-50t	EM	Jan – Mar 2016	Completed – data improvements required for following year.	2-3
Energy	Utility Supply Contracts	Review utility contracts to ensure VFM and contract arrangements based on energy market.	£0	250	EM	August 2016	Completed	0
Energy	Boiler Replacement	Review options for upgrading heating boilers in Cyncoed Gyms.	£15k	TBC	EM/RMM	August 2016	Not completed.	TBC

Energy	Tennis Centre Lighting Upgrade	Develop and award tender for upgrade of existing lighting to LEDs.	£35-40k		EM	August 2016	Completed - December 2016	3-4
Energy	Llandaff data centre	Investigate options for upgrading existing AHU in A block data centre.	£35-45k		EM/PMM	September 2016	Review completed but implementation delayed due to planned reduction in server loads.	NK
Energy	P Block overdoor heater	Install time clock in overdoor heater to prevent fans blowing cold air when heating is switched off	£500	1-2t	EM	May 2016	Completed	0.5
Energy	Awareness	Develop and issue energy reports for schools and blocks and meet periodically to discuss options to improve utility performance.	£0	200t	EM	September 2017	Pending	NA
Energy	Awareness/Communication	Develop inter-halls energy reduction competition to increase student awareness of energy use.	£0	100t	EM/RM	September 2016	Project delayed until following year	NA
Energy	Awareness/Communication	Develop student based 'energy bills' to inform student of their energy consumption and costs and improve understanding of billing for when they move into student houses.	£0	TBC	EM/RM	September 2016	Project delayed until following year	NA
Energy	Air conditioning	Investigate potential for installing remote PIR controls to	£145 per unit	5t	EM	July 2016	Project delayed until following year	0.3

		prevent units running during unoccupied periods.						
Water	Urinal water reduction	Consider cost and water savings produced through installation of Ureco urinal product.	£15k	9.5t	EM	July 2016	Pending	1.5

Key

EM – Energy Manager, PM – Project Manager. PMM – Planned Maintenance Manager, RMM – Reactive Maintenance Manager, RM – Residences Manager

Cardiff Metropolitan Carbon Management Plan 2016-17

Category	Project	Description	Estimated cost (£)	Estimated Annual CO2e saving (t)	Responsibility	By when	Status	Simple payback (years)
Energy	Lighting upgrades	Phase 1 - Upgrade existing low efficiency lighting in student areas with LEDs. Install PIRs where appropriate to enhance savings.	£114k Salix loan	220t (5%)	EM	September 2018	Implement over 2017-18.	1 -7
Energy	Tennis Centre Lighting Upgrade	Upgrade existing high bay fluorescent lights with LEDs in main hall.	£37k	44t	EM	December 2016	Completed	3.2
Energy	Upgrade building management system (BMS)	Develop a business case for upgrading the existing BMS across the University. Carry out Phase 1 Works in Plas Gwyn and Llandaff Campuses.	£150k	75t	EM	September 2018	Implementation over 2017-18.	7.5
BMS	BMS Controls optimisation	Review existing heating and ventilation controls/time schedules across the University and investigate opportunities to improve operational efficiency of plant.	£0	100-200t (5-10%)	EM	March 2016	Implemented and ongoing.	0.2
Energy	Awareness/Communication	Develop Energy reports for 14qty schools and cost overspend league tables to provide focus on key areas.	£0	50-100	EM	September 2017	Draft reports developed, seeking feedback.	NA
Energy	Awareness/Communication	Develop a dedicated case study for completed Invest 2 Save LED Upgrade Programme and publish on website to raise awareness of	£0	N/K	EM	November 2016	Completed and published.	NA

		energy, carbon and cost savings generated for staff and students.						
Energy	AM&T	Develop an electrical schematic for Cyncoed campus to develop understanding of electrical distribution across whole site and opportunities to improve metering.	£1,300	10-30	EM	November 2016	Completed	2
Energy	Boiler Upgrades	Upgrade existing boiler in Cyncoed Library plant room.	£16,700	16.5	RMM	December 2016	Completed	
Energy	Lighting Upgrades	Carry out lighting upgrade in the Cyncoed library (ground floor) area and reception.	£5,000	20	EM	December 2016	Completed	4
Energy	Electrical and Mechanical Works	Contribute to Summer Portfolio Development Programme of Works from electrical and mechanical standpoint. Free issue LED lights accordingly.	TBC	40	EM/PM	October 2017	Ongoing	5
Energy	Data Centre	Consolidate server racks to reduce energy demand of main data centre.	TBC	TBC (20%)	EM	2020	Ongoing	TBC

Projects Planned from 2017-18 onwards

Category	Project	Description	Estimated cost (£)	Estimated Annual CO2e saving (t)	Responsibility	By when	Status	Simple payback (years)
Energy	Lighting upgrades	Phase 2 - Upgrade existing low efficiency lighting in student areas with LEDs. Install PIRs where appropriate to enhance savings.	£75k Salix loan	90t (3%)	EM	September 2018	Implement over 2017-18.	1 -7
BMS	Upgrade building management system (BMS)	Carry out Phase 2 – Cyncoed Campus upgrade to BMS.	£200k	100t	EM	September 2018	Implementation over 2017-18.	7.5
Energy	Heating Upgrades	Replace heating units in Cyncoed Tennis Centre.	£35k	TBC	RMM	September 2017	Pending	TBC
Energy	Heating Upgrades	Replace heating units in Cyncoed Swimming pool with modular units.	£17k	TBC	RMM	September 2017	Pending	TBC