

Carbon Management Plan

UNIVERSITY OF WESTMINSTER



Important Information

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Carbon Management Plan Summary

**2020/21 target -
8,180 tCO₂**

A step change in carbon management activity is required to get the University back on track to achieve the HEFCE 2020/21 target of 8,180 tCO₂, based on past performance shown in figure 1.

**↑ 67% invoiced
energy cost**

Despite a reduction in consumption of energy and emissions at the University, invoiced energy cost has increased from £1.7m in 2005/06 to £2.9m in 2011/12. This is a 67% increase in 6 years.

Objectives

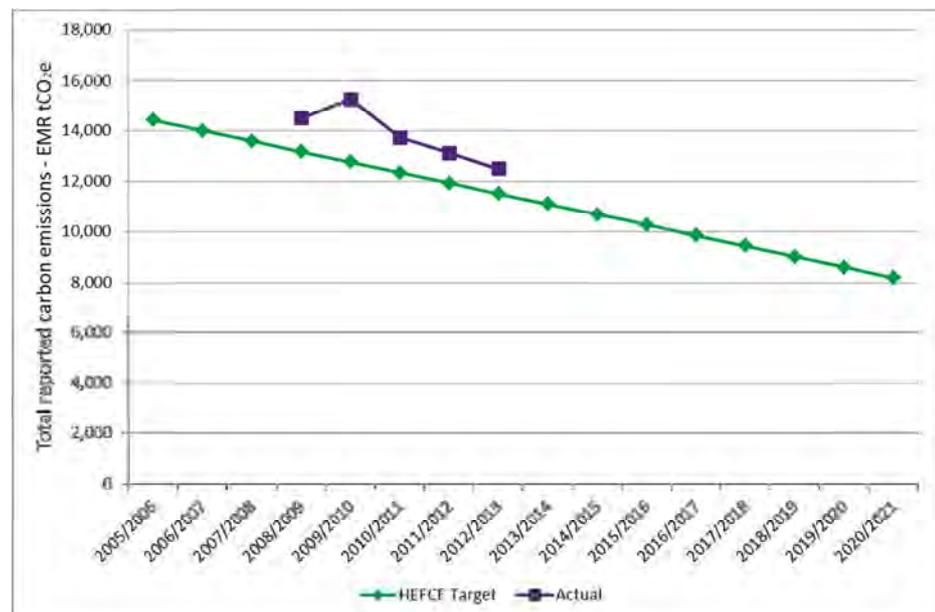
An optimised Carbon Management Plan (CMP) will allow the University of Westminster to overcome the barriers to energy performance optimisation in order to achieve savings and mitigate the risks presented by the 'energy trilemma': rising energy costs, pressure to reduce emissions and security of supply. To achieve this, the CMP is designed to:

1. Cover all appropriate sources of emissions (including scope 3 emissions)
2. Achieve buy-in across the organisation
3. Add value to the Sustainability Team
4. Enable the University's Energy and Carbon Groups to drive action
5. Ensure continuity of ownership
6. Achieve long term success



The governance structure and data management system required to support the CMP and achieve these aims are outlined in sections 3 and 6 of this document respectively.

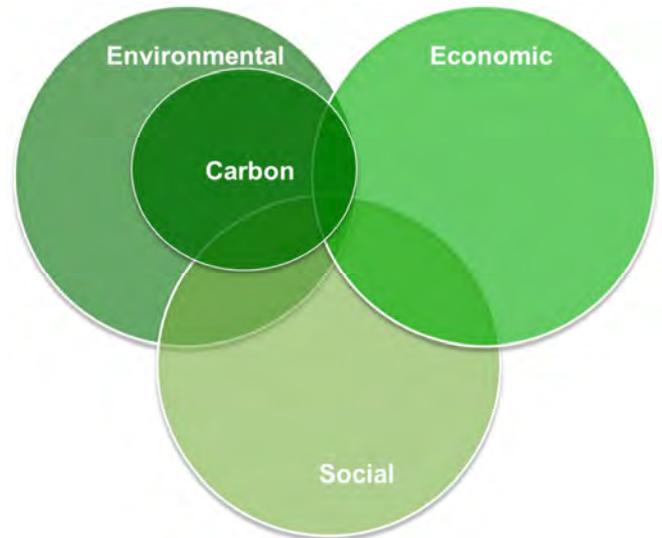
Figure 1: University of Westminster reported emissions and the HEFCE target path



Carbon Management and Sustainability

Carbon Management is a key part of sustainability, and the carbon performance of the University will go a long way to improving the 'triple bottom line' of Environmental, Economic and Social Sustainability - the diagram to the right shows where carbon sits in this.

It is important to distinguish this within the scope of works. This plan clarifies a structure for teams to focus on distinct areas of energy and carbon emissions, ensuring resources are used efficiently and effectively.



Approach

Carbon Credentials has advised the University of Westminster (UoW) to take a pragmatic, systematic and analytical approach to maximise the investment opportunity and returns from a CMP. The CMP is both strategic and project focused, with thorough consideration of data, culture and engineering issues, clearly defining the embedding actions for success.

Three project groupings are proposed for the Energy Team to achieve significant carbon emissions reductions from **electricity, gas and refrigerants**:

1. [Technical building energy projects](#)
2. [IT projects](#)
3. [Staff and student engagement projects](#)

Further groups will be set up to manage scope 3 emissions, including **waste, travel and procurement**.

Emissions Reductions and Targets

In 2011/12, UoW emitted 13,016 tCO₂, predominantly from electricity and gas used in buildings. The University needs to achieve a 37% (4,836 tCO₂) reduction in emissions from 2011/12 to 2020/21 to meet the target recommended by HEFCE. Maintaining the annual average rate of savings will not be sufficient for the 2020/21 target to be met and therefore a step change in carbon management activity is required.

Drivers for Reducing Carbon Emissions

1. HEFCE targets for carbon emissions (including scope 3 emissions)
2. Rising energy prices
3. The cost of allowances for the CRC Energy Efficiency Scheme
4. Increasing staff and student awareness of carbon and sustainability
5. Marketing potential
6. The LiFE index (Learning in Future Environments)

Measuring Scope 3 Emissions

The University seeks to improve the measurement and management of scope 3 emissions, including waste, water, transport and procurement emissions. Section 5 and Appendix B of this document outline 18 actions for the University to improve the management of scope 3 and refrigerant emissions. This includes agreeing a formal GHG Policy Statement, which would acknowledge the University's obligation to quantify and report GHG emissions and communicate its chosen approach.

Next Steps to Embedded Carbon Management

- 1.** Embed a Carbon Management Implementation structure, with each stakeholder's role defined in Appendix 1.
- 2.** Complete the Project List spreadsheet, with clearly defined embedding actions for the success of each project.
- 3.** Allocate resources for implementation.
- 4.** Review data collection methodology and specify an appropriate system.
- 5.** Achieve approval and sign off of this CMP.
- 6.** Implement carbon management.

----- End of Executive Summary -----

1. Approach to Carbon Management at UoW

History of Carbon Management at the University of Westminster

The first Carbon Management Plan (CMP) for the University of Westminster (UoW) was produced in 2008 as part of the publically funded 'Higher Education Carbon Management Plan'. The plan was revised in 2011 to account for more detailed energy studies of the university's estate; it proposed a shift in focus from renewable energy to building energy efficiency. Both plans have been useful and emissions savings have been realised. However, the latest plan is not currently being utilised as a tool to support carbon reduction. Savings are being made through ad-hoc projects, and emissions are reducing, but the University is behind target and there is not a fully coordinated approach to managing and reducing emissions.

In this third iteration of the CMP, the University is working with Carbon Credentials to design and implement a refined bespoke approach to carbon management, which will best suit the organisation's current systems and processes.

The University of Westminster's Vision of Carbon Management

A successful Carbon Management Programme will help the University overcome the barriers to energy performance optimisation in order to achieve savings and mitigate the risks presented by the 'energy trilemma': rising energy costs, pressure to reduce emissions and security of supply.

To do this, the CMP is designed to:

1. Cover all appropriate sources of emissions, including 'scope 3 indirect emissions'
2. Achieve buy-in across the organisation, specifically engaging key stakeholders such as:
 - a. Top Management
 - b. Estates & Facilities
 - c. Human Resources
 - d. Information Services
 - e. On-Site Contractors
 - f. Academics
7. Add value to the Sustainability Team
8. Enable the University's Energy and Carbon Groups to drive action
9. Ensure continuity of ownership
10. Achieve long term success

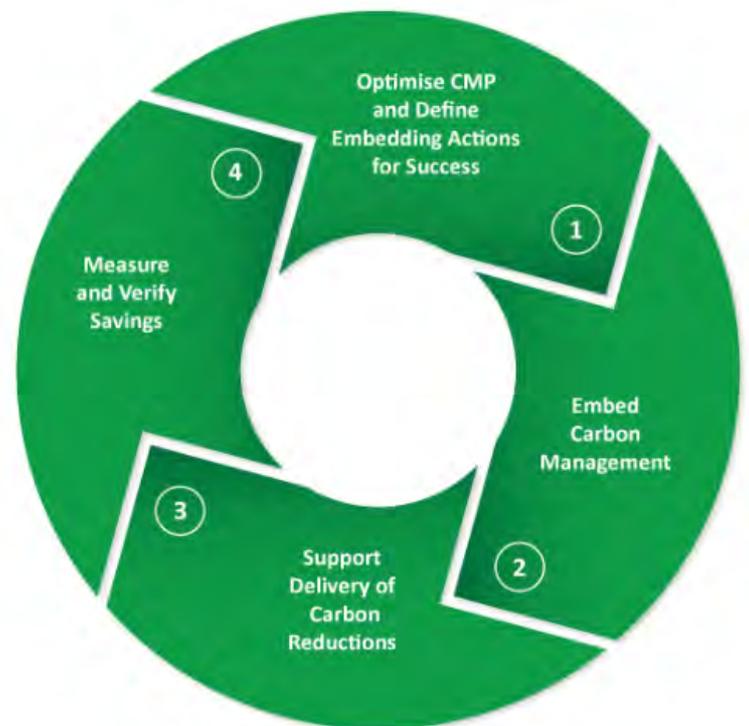


Carbon Credentials has advised the University to take a pragmatic, systematic and analytical approach in order to maximise the investment opportunity and returns from a Carbon Management Programme. The CMP is project focused, but takes a coordinated approach, with thorough consideration of data, culture and engineering issues, clearly defining the embedding actions for success. Managing these considerations from the start of projects right through to completion and ongoing measurement will ensure long term success is achieved.

Carbon Performance Optimisation

The diagram below shows the 4-stage approach that the University is taking to achieve Optimised Carbon Performance.

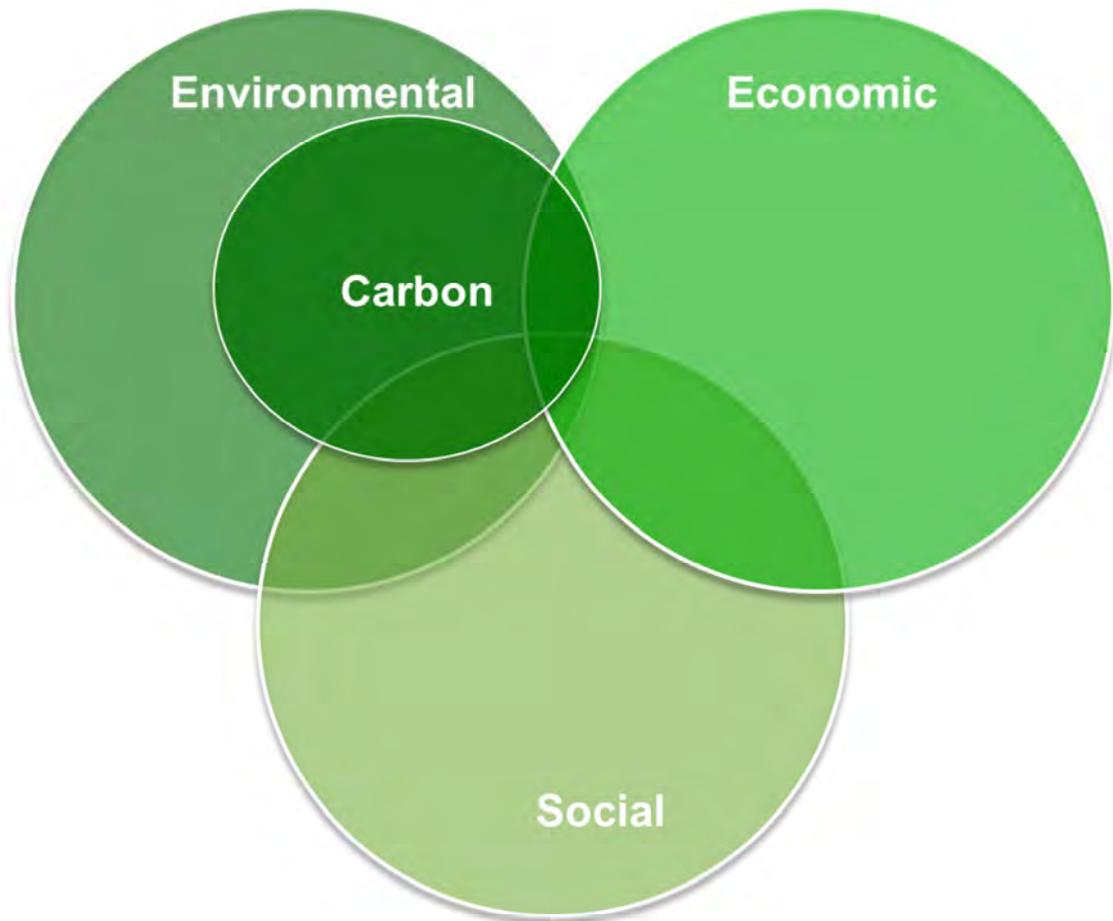
- This CMP is focussed on the first stage: ***‘Optimising the Plan and Defining Embedding Actions for Success’***. The document is designed to provide the basis for carbon management, with particular focus on the ‘embedding actions’.
- Stage 2 will involve completing these actions to fully embed carbon management across the necessary parts of the University.
- Stage 3 will be implemented alongside stage 2, with the Energy and Carbon Groups supporting delivery of carbon reductions.
- Stage 4 typically begins once the first set of projects is implemented. However, it is important for the University to measure and verify savings from recently implemented projects, therefore this process will need to start immediately. This document includes an outline approach to measurement and verification for each set of projects.



An Optimised CMP must be easy to understand, both in value and implementation. The actions must be clear and measurable, providing understanding of each individual’s contribution to the end goal of Optimised Carbon Management.

Carbon Management and Sustainability

Carbon Management is a key part of sustainability, and the carbon performance of the University will go a long way to improving the 'triple bottom line' of Environmental, Economic and Social Sustainability -the diagram below shows where carbon sits in this.

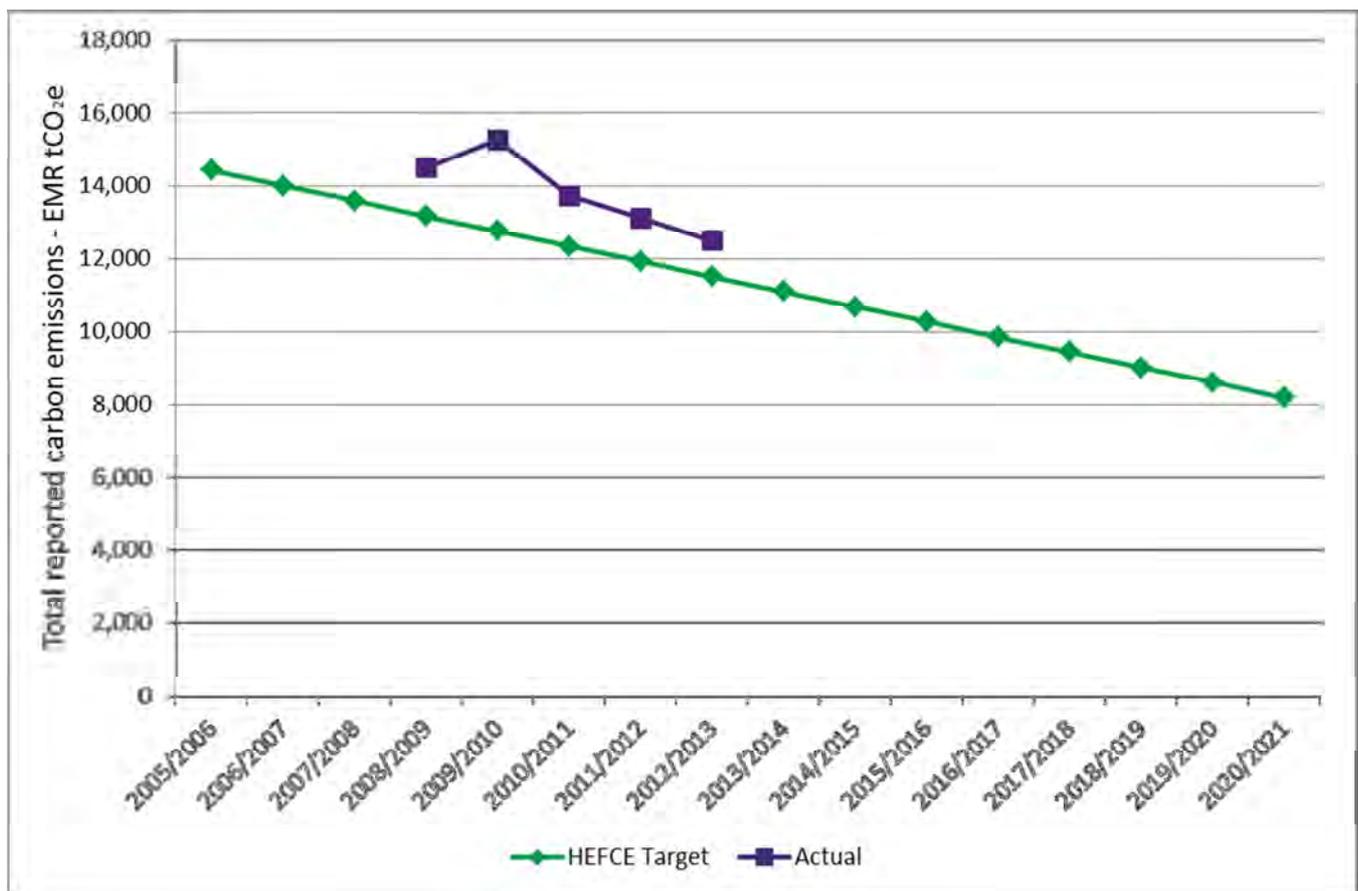


2. Carbon Reduction Drivers and Targets

Current Energy Consumption and Carbon Emissions

In 2011/12, the University emitted 13,016 tCO₂, predominantly from electricity and gas used in buildings. The target recommended by the Higher Education Funding Council for England (HEFCE) for 2020/21 is 8,180 tCO₂. Therefore the University needs to achieve a 37% (4,836 tCO₂) reduction in emissions from 2011/12 to 2020/21. Savings have been made from 2005/6 when the baseline was set at 14,350 tCO₂, but maintaining the annual average rate of savings will not be sufficient for the 2020/21 target to be met. A step change in carbon management activity is required to get the University back on track to achieve the 2020/21 target.

Figure 2: University of Westminster reported emissions and the HEFCE target path



Despite the reduction in consumption and emissions, invoiced energy cost has increased from £1.7m in 2005/06 to £2.9m in 2011/12. This is a 67% increase in 6 years.

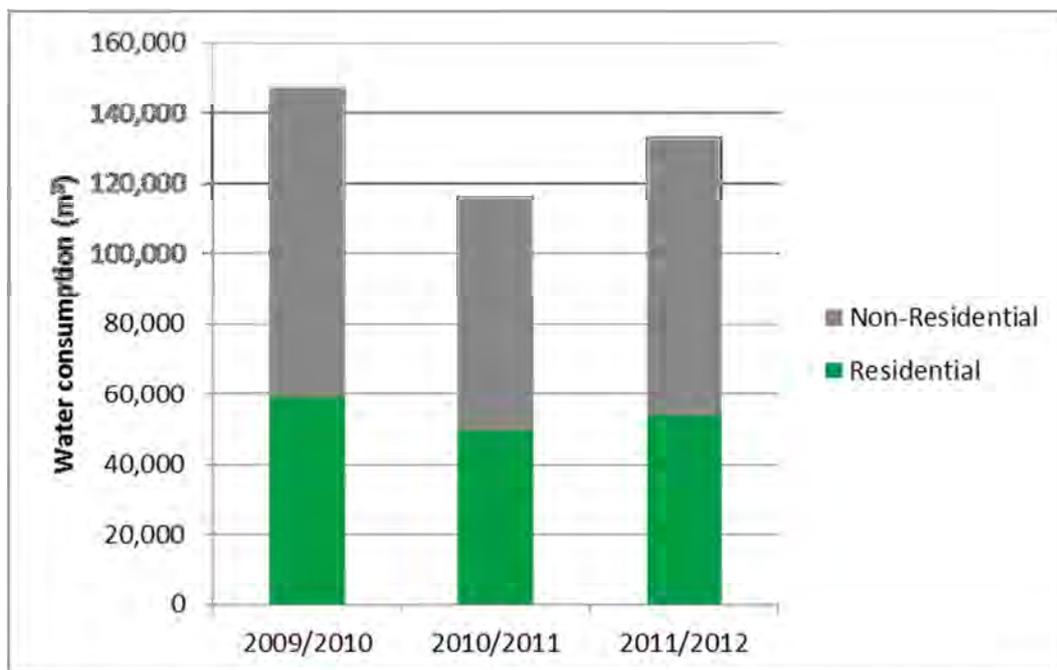
Scope 3 Emissions

Scope 3 emissions were considered for the first time in the 2013 CMP update, as HEFCE guidance has put additional focus on recording emissions from transport, water and waste.

Transport emissions were estimated from a survey by Travel Plan Services Ltd (TPS) at 9,930 tCO₂e per annum. This means transport emissions are almost as high as those from electricity and gas consumption. 89% of transport emissions were from public transport and 8% from air travel.

Water consumption has varied in the 3 years that Higher Education Statistics Agency (HESA) data is available for. At the time of writing, 2012/13 data on water consumption has not yet been made available, but will be published by HESA in April 2014.

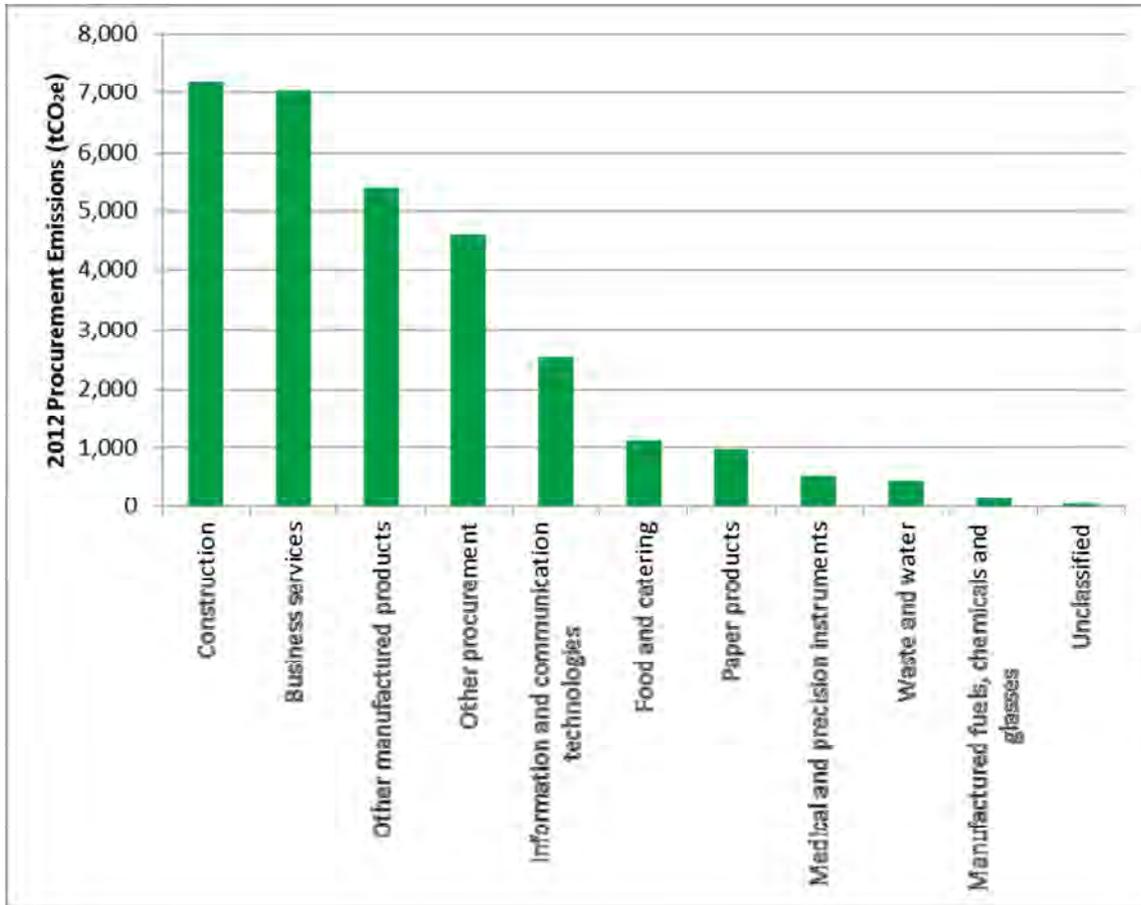
Figure 3: Water consumption as reported to HESA Estates Management



Waste generated by the residential campus reduced by 73% between 2008/09 and 2011/12, but a 28% increase from the academic campus over the same period meant an overall increase. The increase was attributed to construction projects. Tonnage of waste is recorded, but the CMP update report states that figures on different waste types would be required to assess the carbon impact of the waste.

Procurement emissions are now also being considered by HESA. The University has calculated emissions from procurement to be 30,000 tCO₂e in 2012. This is more than twice the emissions from buildings. The emissions are calculated by multiplying procurement spend by a HEFCE defined carbon factor, therefore the only way of reducing procurement emissions under this framework is by reducing procurement spend.

Figure 4: Procurement emissions breakdown



Drivers for Reducing Carbon Emissions

The University's drivers are numerous, with carbon reduction very clearly a high priority. One of the University's core values is 'Sustainability', and several staff have noted that 'being as green as possible in everything we do' is a regular consideration. Specific drivers for this include:

1. HEFCE targets for carbon emissions, including consideration of scope 3 emissions
2. Rising energy prices
3. The cost of allowances for the CRC Energy Efficiency Scheme
4. Increasing staff and student awareness of carbon and sustainability
5. Marketing potential
6. The LiFE index (Learning in Future Environments – see below)

How the LiFE Index supports the CMP

The University of Westminster reports on sustainability using the LiFE Index (Learning in Future Environments). The LiFE Index manages performance improvement across four institutional priority areas. These priority areas have been developed to accurately reflect specific challenges that face the higher and further education sectors.

- Leadership and Governance
- Learning, Teaching and Research
- Partnerships and Engagement
- Estates and Operations

The Carbon Management Plan will support and enhance the LiFE index assessment, providing clearly defined actions for reducing emissions, with measured and verified savings.

How the ‘Estates Strategy 2008-2018’ supports the CMP

The estates challenge is summarised within the strategy with the following statement:

“The University is in the middle of a period of profound change with a move from ten schools to seven, a reorganisation of corporate and professional services and a revised management structure with four new Deans of Schools.”

The Estates Strategy includes eight ‘measures of success’. The ‘energy and environment’ measure includes the following targets:

- Cumulative cost savings in utilities 2008-2013: £1.5million
- Cumulative reduction in tonnes of carbon dioxide produced 2008-2013: 12,856 tonnes
- Improved water cost per square metre in line with peer benchmarking

The CMP provides a framework for measuring and reviewing progress against these targets, and a basis for setting new targets from 2014 onwards.

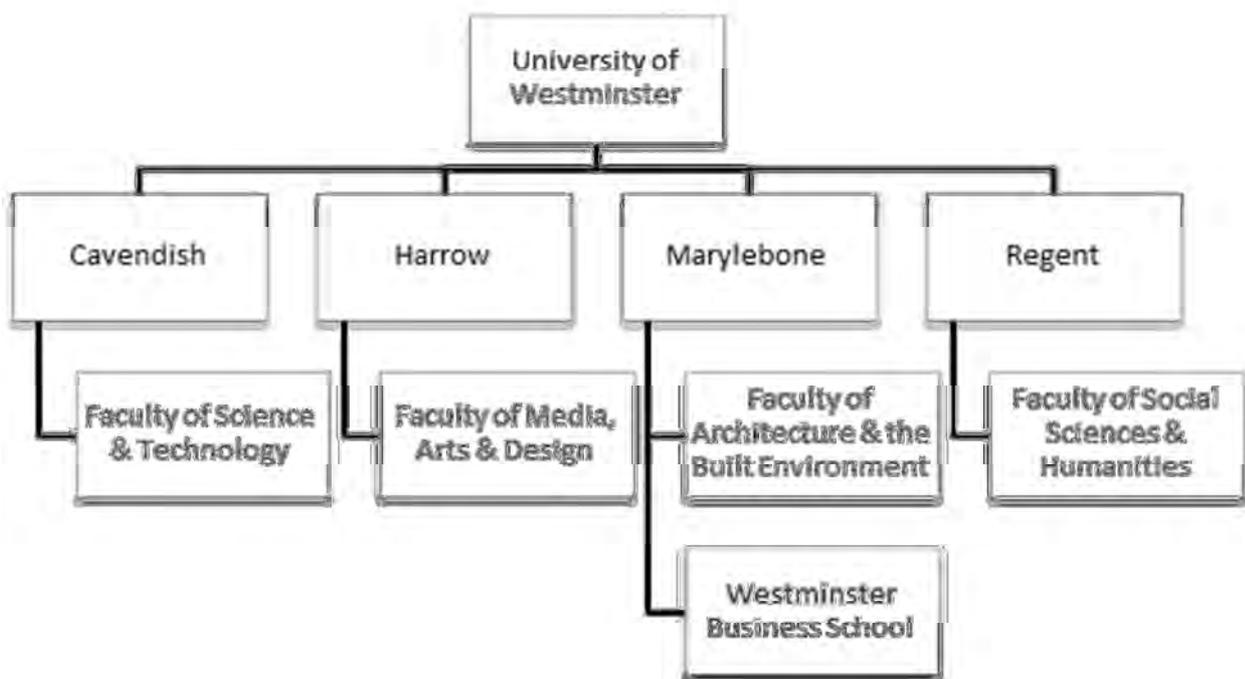
The Estates Strategy is clear from the outset that reducing energy consumption and environmental impact is a key aim, which the CMP can support. The strategy also aims to ensure the estate is maintained to a minimum *“Condition B: Sound, operationally safe and exhibits only minor deterioration”*. This means being ahead of any major repair or replacement requirements; a goal that can be utilised as an additional benefit of plant upgrades for energy efficiency. The University has carefully consider how the CMP and Estates Strategy interlink and support each other, to ensure the most efficient and effective implementation structure is put in place.

Major projects that need careful consideration by the Carbon Management Plan include:

- Development of the Marylebone site (2008-2017, £16.3 million)
- Development of the Harrow site (2008-2013, £37 million)
- Develop an additional 600 bedrooms at Harrow (2008-2017, £35.75 million)
- Development of the International House site to deliver approximately 250 beds (ongoing)

Estimated funding for the strategy is £135m, with external finance such as Salix identified as a potential option to supplement capital, revenue and charitable sources. A range of energy efficient financing solutions are available, which are assessed within the revised CMP. Therefore the CMP should be able to both support application for and draw from the £135m budget cost.

The chart below shows the University's four main sites and five schools, which is an update from the seven schools shown in the Estates Strategy.



The estate must primarily support **teaching and learning**, enabling the forward looking aims of the university to be achieved. This includes measures which could be considered contrary to carbon reduction, such as 'round the clock' facilities and high levels of computing power.

There is an interesting note about working towards becoming 'One University'. Values are an essential part of this. Communicating values through carbon reduction engagement across the University could present an opportunity to support the 'One University' aim.

The Estates Strategy references the 2007/08 “Carbon Management Strategy and Implementation Plan”. The 2014 revision of the CMP will continue to support the objectives set out in 2007/08 and further drive them forward.

Space utilisation was noted in the Estates Strategy at 28% for core classrooms at the West End sites and 48% at Harrow. The strategy was to increase overall utilisation to 60% by 2010. However, David Haylor, who manages this process for the University, has stated that he believes this target to be unachievable. David confirmed utilisation is currently around 20% and that the highest levels achieved in the Higher Education sector is around 35%. Any increase in activity without increasing teaching space should reduce relative energy consumption, but needs to be monitored to demonstrate if there is a noticeable effect.

Space utilisation aims to increase the teaching and learning capacity of the University within the existing estate. A space policy and timetabling policy has been produced, which provide the rationale behind a new space and timetabling system that will be implemented for the September 2014 student intake. The policy system will attempt to group working spaces, enabling sections of buildings to be isolated at certain times, which should lead to energy savings if there is a link to BMS schedules.

The Estates Strategy also notes proposals for a new space charging system. This has not yet been implemented; the CMP needs to relate to the proposed new system of space charging if it is implemented, and feed into its development if possible, as the goals of the two programmes overlap. However, there is currently a notional space charge leaved by finance based on space allocation.

Additionally, there is a move towards ‘social learning space’ and open plan offices. Social learning space means utilising communal open areas rather than reserved rooms. Open plan offices also improve space efficiency as the office areas require less gross floor area per desk.

Where there is significant movement of high energy using equipment, such as relocating IT technology to underground levels of 25 Marylebone Rd, this must be understood and built into the CMP measurement and verification plan.

Development is happening at all sites, with student numbers expected to increase, most notably at Harrow and Marylebone. The CMP should be developed and implementation should monitor and respond to these significant changes.

3. Embedding a Carbon Management Structure

The University of Westminster's Sustainability Team knows there is potential to make long lasting change in the carbon culture of the organisation. They are making great steps towards realising this potential, through programmes such as the 'Student Switch Off' campaign and 'Green Impact', the 'Green Buzz' blog, and the implementation of several technical energy efficiency projects.

Sustainability is now part of the student induction process, and there is a general consensus amongst those individuals leading sustainability at the University that most staff and students are engaged.

Carbon Management is a key part of sustainability, requiring similar levels of engagement. Across the University, there are clear signs that staff are looking to reduce energy consumption where possible and to be 'green' - it is seen as part of the organisation's values. The aim of the CMP is to engage with staff and students, allow the Carbon Group to drive action, but also to manage, monitor and measure all activity that will impact carbon emissions. Having a structure in place to achieve this must be central to the Carbon Management Plan.

Engaging with Key Carbon Management Stakeholders

The key stakeholders for Carbon Management at the University of Westminster are listed in Appendix A. Each individual listed will need regular and appropriate engagement to ensure they continue to fulfil their agreed role in the Carbon Management Programme. Cost and time pressures mean stakeholders often make carbon reporting a lower priority than more urgent day-to-day tasks, therefore continually emphasizing the value is paramount.

Engagement must also tackle conflict resolution between teams - for example, when a department has to make an investment that will benefit another department but not themselves.

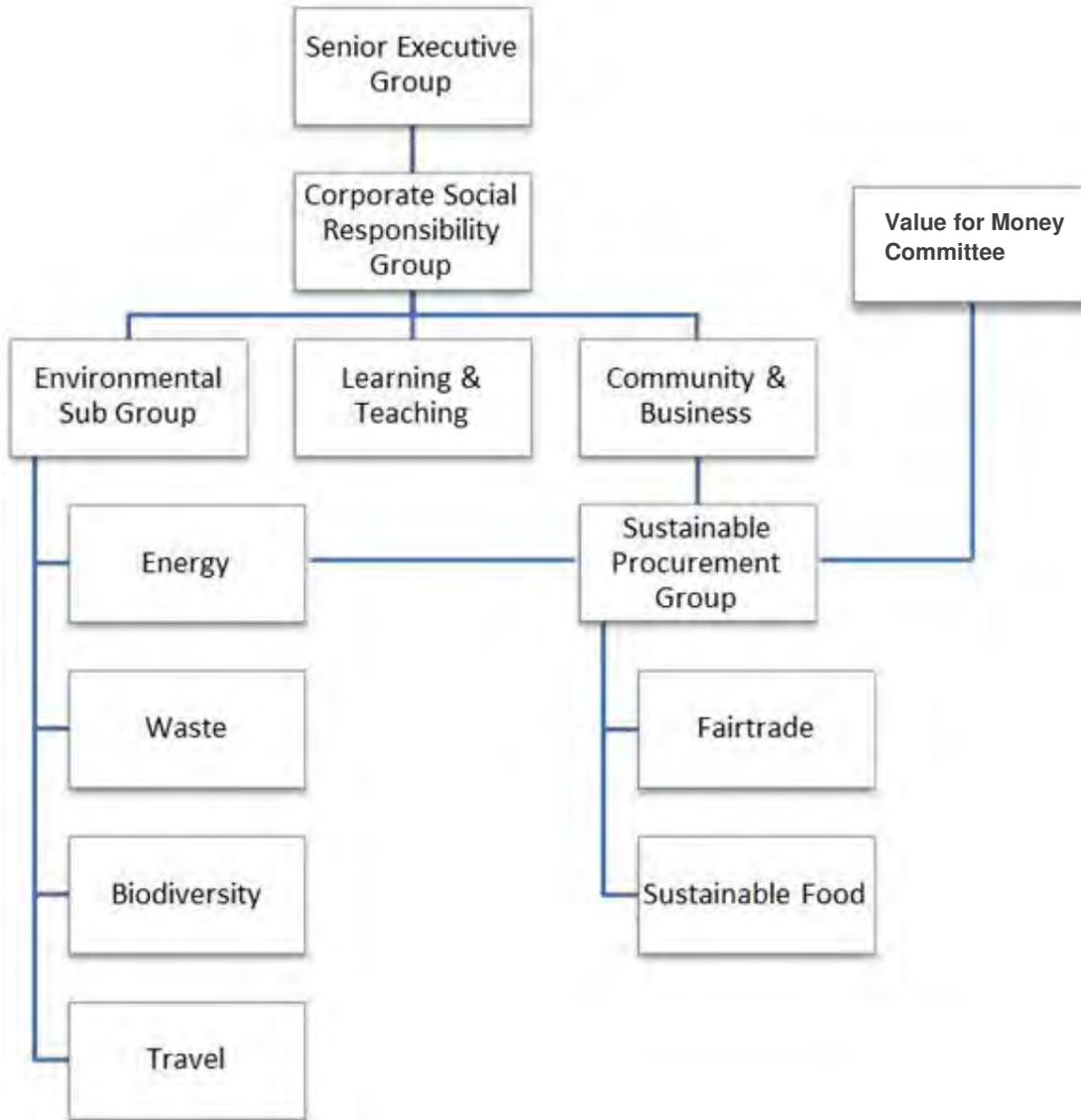
Governance and Reporting Structure

The governance structure on the following page has been created to demonstrate the various groups reporting and utilising the CMP. The main group for implementation of the CMP will be the Energy Group, as the majority of projects are focused on electricity and gas reduction. Carbon savings will also come from the work of the waste, travel and procurement groups, whose involvement will impact the carbon emissions totals in varying ways.

It is proposed that a representative from each group reports to its parent group quarterly.

Jandi Pearman is in the process of defining the Terms of Reference for each group, which will help define the membership and actions they will take.

Communication between these teams will be vital to success of the CMP.



4. Energy Team: Embedding Actions for Success

A coordinated project focussed approach to Carbon Management is recommended for the University of Westminster Energy Team, specifically targeting electricity and gas consumption in buildings.

Three groupings are proposed:

1. **Technical building energy projects**, focused on investment in building services and optimised controls, which will be developed and implemented by specific members of the Estates Team.
2. **IT projects**, identified and implemented by the IT department.
3. **Staff and student engagement projects**, targeting key groups to reduce energy waste from equipment running unnecessarily and windows left open.

A 'Project List' spreadsheet has been produced by Carbon Credentials, to help the Energy Group manage and measure each project. For each project, the following items are considered and reviewed:

- Progress made so far
- Current planned actions
- Current calculation detail and steps to refinement
- Savings overlap with other projects
- Responsibility for taking project to investment readiness
- Responsibility for delivery
- Engineering knowledge gaps / risks
- Data risks to successful implementation
- Culture risks to successful implementation
- Mitigation actions
- Delivery Action Plan
- Expected cost saving
- Expected carbon saving
- Investment required
- M&V proposals
- Other comments

1. Key technical building energy project areas for projects team:

This is focused on investment in building services and optimised controls, which will be developed and implemented by specific members of the Estates Team. These investments should include the following:

- BMS optimisation and upgrades
- Voltage optimisation and tap down – this project is now considered complete
- Pump/fan upgrades and VSDs
- Plant room insulation
- Boiler upgrades
- Cooling plant upgrades
- Lighting upgrade programme and strategy – a £300,000 tender is to be issued early 2014, with budget allocated for a further £500,000 to be spent by August 2014.
- Building fabric upgrades
- Low and zero carbon energy – biomass at Harrow and CHP at Marylebone

In the Project Review Workshop it was agreed that technical projects will be driven based on condition liability, maintenance costs and energy saving potential. For example, when part of the roof at New Cavendish Street was recently replaced, energy saving was used to support the business case, but the main driver was the deteriorating condition. Therefore an aim of the Energy Group should be to support the energy saving part of the calculation, so that projects with high carbon savings are prioritised and bigger budgets are made available for implementation.

The last condition survey of the estate was undertaken in 2007. It was agreed that a revised survey, taking account of energy efficiency opportunities, would be highly beneficial to carbon management. The specification for the condition survey would need to be designed to ensure the results supported the technical carbon management projects.

It was also agreed that standard 'outline' specifications should be developed for projects, to ensure they are designed for maximum efficiency. The specification will highlight considerations the project teams must make at the design stage and throughout implementation to ensure the end result fully supports the University's carbon management goals.

It is important that the Energy Group also understands why some projects have had problems, for example the recently installed CHP project at Marylebone. Understanding this will provide continuous learning and ensure future projects are more successful.

2. IT projects

An ICT 'Green Agenda' is being produced, which contains projects identified by the IT department. They have the technical knowledge and the drive to reduce energy consumption while increasing computing power. One of the strategies currently being considered is centralising computing power using virtual

desktops and application streaming, which would reduce both electricity consumption from computers and cooling requirements in computer rooms.

3. Staff and student engagement projects

The Sustainability Team is very active with engagement, through a number of programmes. There are lots of programmes described as ‘grass routes’, which are performing well but savings are not being measured or linked to carbon reporting. A well designed measurement process will both demonstrate success and help ensure low carbon attitudes persist in the long term.

The following focus areas are proposed:

- Kitchen staff engagement – only using equipment when it is needed and evening/weekend/holiday shutdown procedures.
- Security staff engagement – turning off lights, computer screens, and closing windows.
- Staff with responsibility for specified areas, i.e. Librarians, turning off lights, computer screens, and closing windows.
- General staff and student engagement.

A specific strategy for how each group will be engaged and empowered to reduce emissions must be developed.

5. Managing Scope 3 and Refrigerant Emissions

Appendix B contains an emissions assessment review undertaken by Carbon Credentials. It reviews the approach the University currently takes to calculating and reporting greenhouse gas emissions, with consideration of the current and proposed HEFCE reporting requirements.

The review includes 18 actions for the University to improve emissions reporting. This includes agreeing a formal GHG Policy Statement, acknowledging the University's obligation to quantify and report GHG emissions and communicate its chosen approach.

Waste Group Actions

The Waste Group will be set up to monitor waste to landfill and recycling rates, and to identify, implement and measure emissions from waste produced by the University.

Travel Group Actions

Only emissions from the 6 vehicles owned by the University are recorded in the HESA statistics. However, the Travel Group will look at all sources of travel related to the University, including:

- Staff and student commuting
- Staff business travel including flights
- Student travel for course related activity

Several on-going programmes already look at this, and this work should be continued, using the drivers in the CMP. The Travel Group should carefully consider where emissions are, and where the group's actions are likely to have the biggest impact, for example, it was discussed in the CMP workshop that attempting to restrict international travel to conferences may not be the most appropriate strategy.

Managing Refrigerant Emissions

Carbon Credentials have provided a 'Fugitive Emissions Import Datasheet', which the University should use to record emissions from refrigerants. It is a legislative requirement for organisations like the University of Westminster to maintain an F-Gas register, which should be used to monitor refrigerants purchased. Standard practice is to assume purchased refrigerant is equal to refrigerant lost, therefore it is only necessary to measure purchased refrigerant gas, not losses from equipment.

The Energy Group would be the most likely team to take on this task, as it is largely the responsibility of Capital Projects and Maintenance teams.

Once a robust register of refrigerants is compiled, the University can use this data to identify options for reducing refrigerant emissions.

6. Data Management System

Project implementation should be integrated with a robust data management plan, to ensure projects are monitored and measured effectively, and that the overall University performance can be tracked. This will demonstrate success by considering all variables and drive further performance improvement.

Data collection

Data collection must include:

- Carbon emissions data
 - Electricity and gas consumption for all buildings
 - Water consumption
 - Travel
 - Waste
 - Procurement data where appropriate
- Consumption drivers
 - Student numbers
 - University financial metrics
 - Building occupation
- Static factors
 - Building refurbishments
 - New builds and extensions
 - Buildings sold or demolished
 - Changes to operating hours
 - Space utilisation changes
 - Operational changes that involve high energy using equipment, for example laboratory equipment or data centres

The following proposed developments would be considered static factors. It is important to fully understand the impact they will have on carbon emissions, and to build this into the measurement and verification process.

- Estate development at Marylebone - £16m
- Estate development at Harrow - £37m + £36m for halls
- Development of accommodation at International House
- Moving to 24 hour facilities
- Estate rationalisation
- Estate strategy for minimum 'Condition B'
- Space utilisation

Sub-metering consumption is recommended for certain areas, specifically:

- Laboratories
- Cold stores
- Kitchens
- Plant rooms
- Data centres

A strategy should be developed for sub-metering, focusing on areas where data will support the CMP projects.

Managing and Measuring Delivery

The project team firmly agreed that measurement and verification (M&V) of savings needs to be part of the business case for all projects. It is vital to the success of the programme that each project has a plan for measuring achieved savings, alongside monitoring of interactive and static factors that could drive carbon emissions.

The International Performance Measurement and Verification Protocol (IPMVP) provides a recommended methodology for different types of projects. IPMVP is designed to help identify project savings against a backdrop of variable operation such as unexpected changes in consumption profiles. IPMVP will also identify factors which may have caused the change, such as fluctuations in occupancy, operating times and 'other' events. These factors are used in performance measurement to adjust the baseline consumption.

Collecting data listed above into a data management system will make the M&V process simple and effective. Proposals for M&V for each project are included in the 'Project List' spreadsheet produced to support implementation of the CMP.

7. Next Steps to Embedded Carbon Management

- 1.** Embed a Carbon Management implementation structure, with each stakeholder's role defined in Appendix 1.
- 2.** Complete the Project List spreadsheet, with clearly defined embedding actions for the success of each project.
- 3.** Allocate resources for implementation.
- 4.** Review data collection methodology and specify an appropriate system.
- 5.** Achieve approval and sign off of this CMP.
- 6.** Implement carbon management.

8. Appendix A: Key Delivery Stakeholders

The table below has been compiled in discussion with the key stakeholders listed. It proposes carbon management involvement for key individuals, but it should be noted that this involvement has not been formally agreed. Stakeholders and their role should be updated by the relevant Energy and Carbon groups on an on-going basis, ensuring roles and responsibilities are clearly defined.

Stakeholder	Current Role	Current and proposed involvement in Carbon Management Programme	Working groups
Jandi Pearman	Sustainability Manager	Leading key groups and reporting to the senior groups	
Martin McKenna	Assistant Director Estates	Senior level responsibility for Carbon Management	
Mitch Dalgleish	Head of Procurement	Senior role in the Value for Money group, which has oversight of Carbon Management spending	
Fola Bolarinwa	Costs & Programme Manager	Supporting development of the business case for carbon management projects	
Shaun Crump	Building Maintenance Manager	Responsible for implementation of minor projects	
Peter Clarke	Consultant Project Manager (not directly employed by UoW)	To be completed by the Energy and Carbon Groups	
Andy Norris	HR – Organisational Development Team	Part of Andy’s role is leading the Sustainability Team, focusing on staff and student engagement. He uses the LIFE framework (Learning In Future Environments) and has also lead Green Impact for the last 5 years. Andy has a small team that is a shared resource with Jandi Pearman. Andy and Jandi work closely and are a key partnership for carbon engagement.	

Stakeholder	Current Role	Current and proposed involvement in Carbon Management Programme	Working groups
Lee Rose	Associate Director of ICT	Lee sits on the CSR group and sub-groups, but has not had a specific role. Lee agrees that ICT can have a large impact and that he is a central player in managing carbon. He is producing a 'Green ICT Agenda' – this needs to be formalised, with an implementation plan, carbon saving calculations and M&V plan.	
Chris Melon	Business Manager	Chris is the Business Manager, who looks after Sports Facilities & Conference and Venue Services. This includes managing the team responsible for letting the Halls of Residence as a hotel in summer and function room hire. Chris supported the 'Green Impact' initiative, facilitating staff and resources to achieve Gold Standard at the Sports Facilities. Chris is clearly engaged in carbon reduction. His role is likely to affect carbon emissions (i.e. from increased facility use), therefore he needs to feed into reporting and ensure his work minimises carbon impacts where possible.	
Alfred Bauer	Contracts Manager for Soft FM contracts	Alfred looks after Front of House, Reprographics, Post, and outsourced services, e.g. Security, Catering, Cleaning etc. He has led a number of sustainability initiatives, including reducing paper in reprographics and chemical use for cleaning. Contracted service providers report monthly on sustainability – this should be reviewed to ensure it is driving the agenda and if it can be utilised for carbon management.	
David Haylor	Space Management & Utilisation	David supports and produces statistics on space utilisation, which should be monitored to demonstrate carbon impact.	
Debbie Rumball	To be added by the Energy and Carbon Groups	Debbie manages all the Halls of Residence at Westminster.	

9. Appendix B: Emissions Assessment Review

In the 2008 and January 2009 grant letters to HEFCE the then Secretary of State set out the need for HEIs to contribute to the Government's targets for a reduction in carbon emissions and for future capital funding to be linked to this. Successful carbon management planning relies on the effective quantification, monitoring, reporting and auditing of organisational GHG emissions.

Carbon Credentials have produced this report for the University of Westminster to provide:

1. An overview of the University's current position with regard to emissions reporting.
2. An assessment of current emissions reporting capabilities relative to HEFCE requirements.
3. Recommendations for continuous improvement of emissions monitoring, quantification and disclosure at the University of Westminster.

The purpose of this report is therefore to:

- Enhance the credibility, consistency and transparency of GHG monitoring, quantification and reporting.
- Enhance the integrity of GHG information.
- Ensure compliance with HEFCE obligations.
- Facilitate the development of carbon management planning.
- Facilitate the ability to track performance and progress in the reduction of GHG emissions.

Current Position

General

In 2011/12, the University of Westminster emitted 13,016 tCO₂e from energy consumed in buildings. Key drivers for emissions monitoring, quantification and reporting have been identified during this assessment as:

- CRC Energy Efficiency Scheme compliance
- Eco Campus Environmental Management System
- HEFCE requirements
- Reputational risk
- Opportunities for reducing the University's cost base
- Learning In Future Environments (LIFE)

Reporting Boundaries

HEFCE's 'Carbon management strategies and plans: a guide to good practice' (HEFCE 2010/02) states that *"the establishment of boundaries is key to developing a Carbon Management Plan, identifying potential actions and informing wider estate strategies"* and requires that *"a justification of the choice of the carbon boundary needs to be provided in the plan"*.

The most widely-adopted emissions reporting frameworks (such as the GHG Protocol, ISO14064-1:2006 and Defra's Environmental Reporting Guidelines) require organisations to consolidate facility level emissions using either the control (operational or financial) or equity share approach. Though no documentary evidence was available during our review, it can be ascertained from current practice that the University of Westminster currently adopts the **financial control** approach.

An organisation has financial control over an operation if it has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities. The University of Westminster **organisational boundary** (as at 20th January 2014) therefore constitutes all such operations and their facilities¹. In summary, this represents:

- All four campuses: Regent Campus, Cavendish campus, Marylebone Campus and Harrow Campus
- Three off-campus halls of residence: Wigram House, International House and Alexander Fleming
- Six vehicles

The establishment of operational boundaries involves identifying GHG sources that occur within the defined organisational boundary, and categorising these according to their scope. The University of Westminster's operational boundary (as at 20th January 2014) is illustrated at the end of this report, highlighting greenhouse gas (GHG) sources that are currently accounted for versus those that are not.

Emissions Reporting Assessment

A) Compliance

This section has been prepared in order to assess the University of Westminster's current compliance position relative to HEFCE's requirements for GHG quantification and reporting.

¹ A facility is defined by ISO14064-1: 2006 as *"a single installation, set of installations or production processes (stationary or mobile), which can be defined within a single geographical boundary, organisational unit or production process"*

The results of our compliance review for Scope 1 and 2 emissions against the corresponding requirements outlined within HEFCE's 'Carbon management strategies and plans: a guide to good practice' (HEFCE 2010/02) are shown within the table below:

Requirement		Compliance Status	Next Steps
1.13b	Establish a carbon baseline for 2005 that covers all scope 1 and 2 emissions.	Published within the UoW's 'HECM Programme FINAL Strategy and Implementation Plan (SIP) (2011)'.	UoW do not currently include Scope 1 fugitive emissions from RAC equipment, including A/C in owned vehicles. Testimonial evidence and research confirmed that there are no other outstanding Scope 1 & 2 GHG sources. <i>Carbon Credentials has issued a fugitive emissions calculation tool to UoW in order to quantify emissions from this GHG source in future reporting years.</i>
1.13c	Set a carbon reduction target to 2020 covering all scope 1 and 2 emissions against a 2005 baseline.	Published within the UoW's 'HECM Programme FINAL Strategy and Implementation Plan (SIP) (2011)'.	UoW do not currently include Scope 1 fugitive emissions from RAC equipment, including A/C in owned vehicles. Testimonial evidence and research confirmed that there are no other outstanding Scope 1 & 2 GHG sources. <i>Carbon Credentials has issued a fugitive emissions calculation tool to UoW in order to quantify emissions from this GHG source in future reporting years.</i>
1.13c	Targets must be made publicly available.	Published within the UoW's 'HECM Programme FINAL Strategy and Implementation Plan (SIP) (2011)'.	None.
1.13f	Commit to monitoring progress towards targets regularly and report publicly annually.	Last published within the UoW's 'Carbon Management Update 2012/13'.	Historically, this has not been reported publicly each year. Carbon Credentials advise that this is published at the end of each reporting year from now on.

Requirement		Compliance Status	Next Steps
2.15	Provide a justification of the choice of the carbon boundary within the Carbon Management Plan.	Not available.	More detailed documentation containing both justification and an explanation of the reporting boundaries in each reporting period is required
2.19	The reporting period is the academic year.	Various documentary evidence was made available confirming compliance.	None.
2.27	Carbon offsetting cannot contribute towards meeting the 2020 target.	UoW has offset in the past, though this has not contributed towards meeting the 2020 carbon target.	None.
2.42 & 3.18	All greenhouse gas data should be converted into tCO ₂ e using Defra conversion factors.	It is the responsibility of HEFCE and HESA to calculate tCO ₂ e on behalf of UoW.	None.
3.6	Grid electricity should be reported separately from non-grid (on-site generation) electricity.	Testimonial evidence confirmed that UoW currently records red diesel (gas oil) combustion within building back-up generators at Harrow and Marylebone.	Ensure that kWh consumed from building back-up generators are reported separately from consumed grid electricity.
3.8	Electricity from on-site CHP should be monitored but not included in reported emissions – only gas should be counted.	UoW currently has a CHP plant at the Marylebone Campus. This is currently not operational.	UoW must ensure that any electricity consumed from CHP plant is not reported, only natural gas consumption is required.
3.18	Do not include biomass.	Testimonial evidence confirmed that UoW is responsible for some biomass combustion at the Harrow Campus. This is not currently reported.	None.

From 2012-13 there will be provision in Estates Management Statistics (EMS) for the calculation of all Scope 3 emissions - from water supply, wastewater treatment, waste, travel and supply-chain (procurement). The return of data in respect of travel and supply-chain (procurement) is currently recommended rather than mandatory; however this may change in the future.

The results of Carbon Credentials' compliance review for Scope 3 against the corresponding Estates Management Statistics requirements outlined within HEFCE's 'Measuring scope 3 carbon emissions – water and waste: A guide to good practice' (HEFCE 2012/01) are shown within the table below:

Requirement		Compliance Status	Next Steps
D38b	The annual volume, measured in m ³ of metered fresh water consumed.	Testimonial evidence confirmed that this figure is straightforward to compile. Water consumption is metered and corroborated against supplier invoices.	None
D77a & D77b	<p>Meter readings from all meters on-site related to wastewater volume and trade effluent:</p> <ul style="list-style-type: none"> • If the water utility contracted by the institution provides a factor to calculate the wastewater volume based on the water supply volume, use the factor provided by the water utility. • Otherwise, the annual volume, measured in m³ of metered fresh water consumed can be multiplied by 95 per cent (as a default value). <p>The figure for wastewater volume should be added to values of non-mains water supply of greywater for potable and non-potable used by an institution from rainwater, greywater and borehole extraction (volume taken, not licensed volume).</p>	Testimonial evidence confirmed that the annual volume, measured in m ³ of metered fresh water consumed is used to compile this figure and no greywater, rainwater or borehole extraction occurs at UoW.	None

Requirement		Compliance Status	Next Steps
D73	<p>The annual mass (tonnes) of waste managed by the institutions in different waste disposal/treatment methods: recycling, incineration, energy recovery from waste and others.</p> <p>Where possible, the data are reported for non-residential buildings (C13), residential buildings (C14) and the total estate (C1).</p>	Testimonial evidence confirmed that this data is provided by the current waste contractors.	Engage with contractors to ensure the accuracy and integrity of their reported figures

B) Continuous Improvement

This section has been prepared in order to provide actionable recommendations for improving the relevance, completeness, consistency (comparability), accuracy, and transparency of reported figures in line with best-practice GHG methodologies.

In light of the evidence provided, Carbon Credentials proposes the following actions to improve compliance efforts and establish a robust management system for emissions quantification and reporting:

Action #	Action Details
1.	<p>Implement a GHG reporting methodology to a well-known and accepted standard by developing a set of aligned procedural documentation.</p> <p>This will greatly improve the auditability of UoW reported emissions and mitigate against any single point of failure risk.</p>
2.	<p>Finalise and agree upon a suitable UoW GHG Policy Statement for internal use.</p> <p>This statement should acknowledge the institution's obligation to quantify and report GHG emissions and communicate its chosen approach.</p>
3.	<p>Implement procedures for relevant staff and contractors to ensure that the risk of any accidental interference, malfunction, missing calibrations or improper installation of meters (currently electricity, gas and water) is reduced so that activity data is neither lost nor recorded inaccurately (e.g. drift).</p>
4.	<p>Create a formal Register of Responsible Persons for emissions reporting at the University of Westminster. This should include detailed descriptions of the duties required by each role within the GHG reporting system.</p> <p>Defining and documenting roles and responsibilities is an important component of any management system. Segregating duties and keeping an up-to-date record of staff involved in GHG</p>

	reporting, from invoice processing to final sign-off, ensures a straightforward compliance process, maintains continuity, and can help foster shared responsibility for wider environmental impacts amongst staff.
5.	Record the approach to consolidating the organisational boundary within a formal document and communicate this to all responsible parties within the GHG reporting system. Ensure that this document is reviewed and kept up-to-date in each reporting year.
6.	Agree on how to consolidate (using the financial control approach) GHG emissions from the Wembley @ Student Court halls of residence, which are owned and managed by Apt Student Living on behalf of the University of Westminster. An organisation has financial control over an operation if it has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities.
8.	Document the University of Westminster Operational Boundary in each reporting year to include all Scope 1 and 2 GHG sources, as well as Scope 3 GHG sources currently reported on. Ensure that this document is reviewed and kept up-to-date in each reporting year. The establishment of operational boundaries involves identifying GHG sources that occur within the defined organisational boundary, and categorising these according to their scope.
11.	Consider disclosing annual emissions in tCO ₂ e within the University of Westminster <i>Annual Report and Financial Statements</i> to improve transparency over climate change impact.
13.	Expand AMR coverage to 100% of natural gas supplies. Greater AMR coverage has the capability to eliminate estimated billing and this means less staff time is taken up with reconciling inaccurate bills.
14.	The University of Westminster currently has some error-checking techniques in place (e.g. Management Information Officer performs vouching of reported figures against Agresso finance system information). It is recommended that all internal controls and error-checking techniques currently employed are documented within a Controls Register, to include consistency checks, cross-referencing, vouching and recomputation as a minimum.
15.	Use the Import Datasheet provided by Carbon Credentials labelled 'Fugitive Emissions Import Datasheet' to record and calculate fugitive emissions information from RAC equipment. Commit to reviewing the RAC Asset Register on an annual basis at least.
16.	Apply a materiality threshold of 5% for emissions reporting purposes and state this within relevant procedural /methodological documentation

18.

Consider adopting an intensity ratio of tCO₂e per number of staff/students in reporting year.

In addition, consider measuring 'carbon exposure' as an additional performance metric. This is the sum total of all energy expenditure and carbon taxation costs within a reporting year. 'Carbon dependency' can then be measured by observing any increase or decrease in carbon exposure between reporting years.

University of Westminster Operational Emissions Reporting Boundary

On-site Natural Gas Combustion	On-site Red Diesel (Gas Oil) Combustion	Petrol Combustion in Owned Vehicles	Diesel Combustion in Owned Vehicles and vehicles with Finance/Capital Leases	Fugitive Emissions from On-Site Refrigeration and A/C Equipment	Fugitive Emissions from A/C in Owned Vehicles	SCOPE 1	
Electricity purchased for own consumption							SCOPE 2
Emissions from waste disposal	Emissions from water consumption	Emissions from wastewater treatment	Supply Chain (Procurement) emissions	Emissions from vehicles with operational leases	Emissions from staff business travel (e.g. air/rail/taxi/ferry/metro travel, grey fleet and car hire)	Emissions from Staff/Student Commuting	

Either not currently quantified/reported or not required for reporting by HEFCE 

10. Appendix C: Walk-round Audit Findings

Carbon Credentials undertook a 'walkround' energy survey of University of Westminster buildings at Regent St, Little Titchfield St, Cavendish St and Marylebone. This was not a full energy survey; it was undertaken to help understand how services operate and to identify the key project areas to focus on. The results have fed into creating this CMP and the Project List. This Appendix contains a summary of the notes and observations made.

309 Regent Street

Staff at the front desk have stated that the building opens at 6am during term time and closes at 11:00pm. During weekends the building is open from 8am to 6pm. Building remains completely shut and alarmed during public hours and non-operating hours.

The building consists of various offices, teaching rooms, lecture halls, gym, computer rooms, large multi-purpose room and a cinema room.



Energy Consumption

Information from the building's DEC is shown below. The DEC was noted to be expired and is due for renewal.

Rating	Total Useful Floor Area (m ²)	Annual Energy Use for Heating (kWh/m ² /year)	Annual Energy Use for Electricity (kWh/m ² /year)	Valid Until
C	12,862	87	83	30/12/2012

According to data provided by the University of Westminster, 309 Regent Street building has a total of three electricity meters and one gas meter as summarised in the table below. The following meters were

identified during the audit in two switch rooms. Both switchrooms included a voltage optimiser showing 35kW and 160kW incoming supply.

Meter-Type	MPAN/MPRN	Consumption (kWh) (Aug 12 – Jul 13)	Estimated Annual Cost
Half-hourly Electricity	1200010085963	107,574	£ 10,800
Half-hourly Electricity	1200010085972	879,504	£ 88,000
Half-hourly Electricity	1200061189368	26,250	£ 2,600
Gas Meter	997707	156,578	£4,700

The image to the right shows the two gas meters seen in the walk-round energy audit - one main gas meter and a gas sub-meter monitoring usage in the kitchen. A pulse stark logging system connected to the main meter was noted to be disconnected at the time.

Heating, Cooling & Ventilation

The building is mechanically ventilated through various air handling units which are centrally controlled by a BMS. 3 AHUs are located in an outdoor area one of which providing ventilation for the cinema area. The larger AHU includes a heat recovery system. Several windows were also noted to be left open around the building providing some natural ventilation. In addition, various 'split' air conditioning units are located around the building.



Heating is primarily supplied by three 282 kW BMS controlled gas-fired boilers which feeds to AHUs and radiators.

Lighting

309 Regent Street contains various types of lighting which are either controlled by manual switches or sensors. Sensor controlled compact fluorescent lamps are the predominant type in corridors. T5 fluorescent tubes were also seen in various rooms with light switches which are occasionally concealed behind objects. Certain areas including the Graduate Lounge and lecture rooms contained high frequency T8 fittings. Halogen bulbs are also fitted around the building including lecture rooms (50W fittings) and café (AR11 75W fittings).

General Energy Observations

- All screens in unoccupied computer rooms are left on.

- Computer room in basement showed the possibility of heating and cooling clash from the grilled supply ventilation and split A/C units.
- Plant room has uninsulated valves.
- Kitchen contained walk-in fridge with a walk-in freezer behind it. The freezer door was not shut properly at the time of visit – the lock is faulty so shutting requires considerable force.
- Empty fridges were left on during the holiday period.
- At the time of the survey one multi-purpose room which was locked had 37no. 100W halogen fittings left on.
- Lights on an external stairway are left on all day despite daylight being sufficient.



Summary of Questions:

- Does anyone make sure all lights are switched off before the building is locked?
- Is there any policy or automatic timers in place to switch computers off?

4-12 Little Titchfield Street

Building is typically in operation 24/7 for access to the library.



Energy Consumption

Information from the building's DEC is shown below. The DEC was noted to be expired and is due for renewal.

Rating	Total Useful Floor Area (m ²)	Annual Energy Use for Heating (kWh/m ² /year)	Annual Energy Use for Electricity (kWh/m ² /year)	Valid Until
D	7,596	94	121	30/12/2012

According to data provided by the University of Westminster, 4-12 Little Titchfield Street has a total of two electricity meters and one gas meter as summarised in the table below.

Meter-Type	MPAN/MPRN	Consumption (kWh) (Aug 12 – Jul 13)	Estimated Annual Cost
Half-hourly Electricity	1200010073008	889,173	£88,900
Non-Half-hourly Electricity	1200030812180	8,286	£800
Gas Meter	61852509	95,109	£2,900

Heating, Cooling & Ventilation

The building is mechanically ventilated through various air handling units which are centrally controlled by a BMS. 2 AHUs with frost, heating and cooling coil have been identified in the boiler house to supply conditioned air to a large lecture theatre. Ventilation to Portland hall is provided by AHU 11 which includes a 56kW electric frost coil. The AHU is also controlled by an occupation CO₂ sensor. The outdoor plant includes an additional AHU with heat recovery and thermal wheel. A free cooling chiller was also identified to provide chilled air in the building through the AHUs.

Heating is primarily supplied by three 600kW gas-fired boilers. Electrical heating radiators were also identified in the front hall. The cafeteria also included split air-conditioning.

Lighting

4-12 Little Titchfield Street contains various types of lighting which are either controlled by manual switches or sensors. Energy-efficient LEDs were seen in corridors, main hall and cafeteria. T5 lighting fluorescent fittings were also seen in the library and various classrooms. The library also has high frequency ballast T8 fluorescent tubes in the aisles.

PIRs were present around the building for lighting control including photocell sensors on the top floor.

General Energy Observations

- Boiler room was noted to be really hot due to reduced insulation.
- Boiler room contained dated belt-driven pumps with no variable speed drives.



Cavendish Street Building

Cavendish street building consists of three blocks: Tower block, Copland and Tutorial. The building is in operation from 8am-10pm on weekdays and 9am-5pm on weekends. The building's library is occasionally in operation for 24 hours.



Energy Consumption

Information from the building's DEC is shown below. The DEC was noted to be expired and is due for renewal.

Rating	Total Useful Floor Area (m ²)	Annual Energy Use for Heating (kWh/m ² /year)	Annual Energy Use for Electricity (kWh/m ² /year)	Valid Until
F	28,426	102	181	30/12/2013

According to data provided by the University of Westminster, Cavendish Street has a total of four half-hourly electricity meters and three gas meters, as summarised in the table below. The main switch room was included in the survey and it included a voltage optimiser.

Meter-Type	MPAN/MPRN	Consumption (kWh) (Aug 12 – Jul 13)	Estimated Annual Cost
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Half-hourly Electricity	1200010054361	1,117,701	£111,800
Half-hourly Electricity	1200010054370	924,043	£92,400
Half-hourly Electricity	1200010054380	0	-
Half-hourly Electricity	1200060834804	1,204,018	£120,400
Gas Meter	994606	1,529,434	£45,883
Gas Meter	48958010	21,412	£642
Gas Meter	9088073606	360,648	£10,800

Heating, Cooling & Ventilation

Each block in the building is mechanically ventilated. The tower block is ventilated by three AHUs which are located in the plant room on the roof. The AHUs have a heating coil with supply fans going down the building for local re-heat. Ventilation supplied to the Tutorial building is supplied by a similar plant on the roof of its block.

Two supply and extract fans are located on the roof of the Copland block. Carbon Credentials were unable to identify whether the AHUs had any heat recovery system. A VSD was noted to be installed on the supply fan, with a reading of 23 Hz.

A separate AHU with a heating and cooling coil was identified to supply conditioned air to a large lecture theatre.

Heating to the Tower block is provided by three Erensan boilers in a very well insulated plant room comprising of new equipment. Heating for the Copland building is also supplied by boilers in a dated plant room that is not well insulated.

Two free-cooling chillers were identified on the roof providing chilled air to the University's data centre and cold stores.

Lighting

Cavendish Street building contains various types of lighting which are either controlled by manual switches or by PIRs. Fittings included CFLs in the main foyer and T5s in the corridors. Some classrooms had T8 fittings. LEDs have also been fitted in certain rooms including the boiler house and a small lecture room.

General Energy Observations

- Various laboratories in the building using energy intensive equipment including 3 cold stores and fume cupboards.
- Plant rooms on roof were noted to be considerably noisy.
- Large kitchen comprised numerous fridges, a walk-in fridge and freezer and big conveyor dish washer.

35 Marylebone Road (incl. Halls of Residence)

The building is in operation from 8am-10pm on weekdays and 8am-6pm on Saturdays and closed on Sundays. Marylebone's library is occasionally in operation for 24 hours. The halls of residence operate 24 hours a day during term time.



Energy Consumption

Information from the building's DEC is shown below. The DEC was noted to be expired and is due for renewal.

Building	Rating	Total Useful Floor Area (m ²)	Annual Energy Use for Heating (kWh/m ² /year)	Annual Energy Use for Electricity (kWh/m ² /year)	Valid Until
35	D	27,738	145	84	30/12/2013

Marylebone					
Halls of Residence	D	6,233	152	88	30/12/2013

According to data provided by the University of Westminster, 35 Marylebone Road including the halls of residence has a total of two half-hourly electricity meters and five gas meters, as summarised in the table below.

Meter-Type	MPAN/MPRN	Consumption (kWh) (Aug 12 – Jul 13)	Estimated Annual Cost
Half-hourly Electricity	1200010079310	2,354,141	£235,417
Half-hourly Electricity	1200010079339	1,369,083	£136,908
Gas Meter	8856329310	3,064,632	£91,939
Gas Meter	70688310	4,665,811	£139,974
Gas Meter	12494203	18,727	£562
Gas Meter	12493504	541,194	£16,236
Gas Meter	12494001	312,117	£9,364

Heating, Cooling & Ventilation

35 Marylebone Road is mechanically ventilated through various AHUs. The primary AHU with a heating coil was identified at the basement plant to supply ventilation from the ground up to the second floor. All AHUs are on a time schedule with the BMS. At the time of the site survey, there were signs of windows in some rooms being left open when unoccupied.

Heating for the entire building is supplied by three large gas-fired 1758 kW boilers. A newly installed Cogenco CHP was also identified to support providing useful heat to the building. Cooling is provided by a Daikin chiller located in the basement plant area.

Three large water storage tanks supply domestic hot water for the halls of residence.

Lighting

A large array of lighting types was observed in the building. The front foyer comprised a combination of CFLs, T5s, and halogen bulbs. The building has mainly progressed to T5s but some T8 fluorescent tubes

were seen in various classrooms. Energy intensive external flood lights which are on for 24 hours were seen in the basement plant. It is understood that they will be replaced with LEDs.

Lights are either controlled by manual switches or sensors.

General Energy Observations

- Pipes along the basement area were noted to be installed with electric heat tracing.
- Windows in the building's main hall are controlled by a BMS to provide natural ventilation.
- Boiler house was noted to be very hot due to poorly insulated plant.
- Medium size kitchen using only electrical appliances. Energy intensive appliances include conveyor dishwasher and two walk-in fridges.

11. Appendix D: CMP Workshop Report

The Carbon Management workshop was undertaken on 26th February 2014 at 115 New Cavendish Street.

Objectives of Attendees

At the beginning of the workshop we asked a portion of attendees to share their objectives:

1. Broaden awareness of carbon management and understand how my role fits in.
2. Why should we re-create the wheel? We should understand and cherry pick the best ideas and best practices.
3. Understand how to engage with suppliers to encourage sustainable procurement.
4. How IT can support carbon management, and how we can move forward.
5. Understand how to embed the right ways of thinking amongst staff and students.
6. Understand how carbon management can support challenges around space management.

What are the Drivers for Carbon Reduction?

We asked the group to discuss University of Westminster's drivers for reduction carbon emissions:

1. The CRC Energy Efficiency Scheme.
2. HEFCE targets.
3. Ethical Drivers: Awareness of the issues, concerns for future generations and ambitions to be sustainable.
4. Reputation, marketing and credibility – including attracting new staff and students.
5. Cost savings and the prioritisation of expenditure and investment.
6. Maintenance issues.
7. Increasing awareness amongst students and pressure for change.
8. Commitment and motivation from senior leadership.
9. Space efficiency (very expensive real estate).

What is Carbon Management for the University of Westminster?

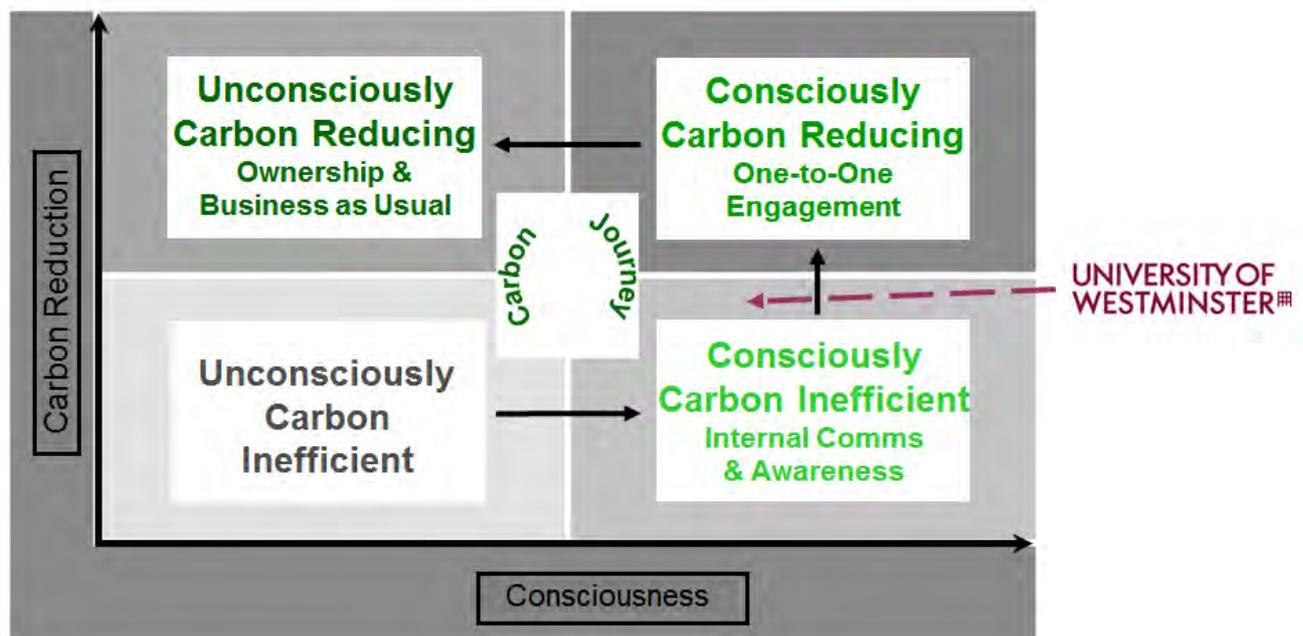
1. Better use of the University's estate and facilities.
2. Understanding and reducing the cost of running the estate.
3. Linking carbon to perceived business needs of the University, such as weekend courses and 24 hour libraries.

4. Performing well in league tables.
5. Improving building efficiency.
6. Meeting targets.
7. Raising a broader awareness and improving culture and behaviours.
8. Encouraging collaboration between academics, students and corporate services.

Where is the University of Westminster on its Change Journey?

The figure below illustrates the change journey that organisations progress through when implementing and embedding carbon management practices. Attendees believed that the University is currently on the boundary in between being 'consciously carbon inefficient' and 'consciously carbon reducing'.

Although the University has successfully reduced carbon emissions over the last few years there is an understanding that this has been driven largely through the efforts of the Estates and Facilities teams, rather than the activities of the wider community. While there are pockets of consciously carbon reducing staff and students, on average the University is carbon inefficient.



What could be Blocking Success?

Blocker	Solution
Competing priorities and competing values.	Unify the university and align priorities through partnership working and carbon management groups (for example, involve the Estates team in the development of Faculty business plans).
Individual needs over those of the organisation.	Strong commitment from senior leadership and wider organisation.
Resistance to change	Engage the disengaged by positioning carbon reduction initiatives as 'no-brainers' and resolving common challenges
Financial limitations.	While there was debate as to whether the budget is a limiting factor, it was agreed that it was important that 'no-brainers' appeal to the wider university.
Lack of understanding.	Awareness and engagement efforts.
Lack of time.	Enable a wider stakeholder group to get involved in carbon management.