

carbon management programme **first year report** (2009-2010)

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Executive Summary	3
1. Introduction	6
2. First Year Progress - Carbon Management Plan	6
2.1 Salix Funded Projects	6
2.2 Carbon Management Awareness Campaign – “Getting Greener Campaign”	7
2.3 Carbon Savings	7
2.4 Environmental Management System - ECO-CAMPUS	7
2.5 Presentation of Certificate by the Carbon Trust	7
3. Carbon Management Performance	7
3.1 Carbon Management Comparison - HEFCE 2005/6 Scope 1 & 2 emissions baseline	8
3.2 Carbon Management - 2008/9 CMP compared with 2009/10 Scope 1, 2 and 3	9
3.3 CO ₂ Emissions Trend	11
4. New Challenges - HEFCE and Government Initiatives	12
4.1 HEFCE - Capital Investment Framework (CIF)	12
4.2 Ecocampus	13
4.3 Sustainable Procurement	14
4.4 Renewable Initiatives - Feed in Tarrifs (FITS)	14
5. Legislation	15
5.1 Carbon Reduction Commitment	15
5.2 European Directive for Energy Performance in Buildings	15
6. Quantifiable Benefits	15
7. Investment Required	16
8. Review of existing and introduction of new policies	17
9. Recommendations	17
APPENDICES	
Appendix A: Sustainable Procurement Policy	
Appendix B : Action Plan for "Going Greener" - Carbon Management Awareness Campaign	
Appendix C : Environmental Policy	



TABLES

Table 1. Comparison of Scope 1 and 2 carbon emissions

Table 2 . Carbon Emissions Sources for 2008/9 (CMP Baseline Year) compared with 2009/10

Table 3 Carbon Emissions – Buildings, Business Travel, Transport, Water and Waste

Table 4 Base line year Carbon Emissions, Number of Students, Floor Area and Turnover

Table 5 Annual Carbon Emissions per student, per square metre, and per £ of turnover

Table 6 Quantifiable Benefits

Table 7 Investment Required

Table 8 Implementation plan for 2009/10

Table 9 Implementation plan for 2010/11

Table 10 Implementation plan for 2011/12

Table 11 Implementation plan for 2012/13

Table 12 Implementation plan for 2013/14

Table 13 Implementation plan for 2014/15

FIGURES

Figure 1. Bar Chart Comparing Carbon Emissions with 2008/9, 2009/10 and 2005/6 HEFCE baseline year

Figure 2. Graph of CO2 Emission Trend



EXECUTIVE SUMMARY

This report provides a review of the first year's activity, highlights recent HEFCE and Government initiatives, and indicates the progress made in carbon management. It provides an update on our carbon emissions during 2009/10. These figures are referenced against the recent HEFCE suggested carbon emissions baseline year of 2005/6 (Carbon Baselines for Individual Higher Education Institutions in England published by HEFCE in August 2010), and our CMP baseline year of 2008/9.

The University remains committed to its carbon management programme, which is progressing as planned and agreed with earmarked funding from the minor works and the energy conservation budgets. This was assisted last year with funding from Salix finance which has now been drawn down. The capital development projects have also provided the benefits of carbon saving.

The potential to save carbon amounting to a 45% (1685 tonnes CO₂) of our five year 25% (3743 tonnes CO₂) target has been identified and may be realised at the end of this year through the projects that were completed within the programme's first year. The programme's second year projects are currently underway. It is envisaged that the first two years of the carbon management plan will deliver a saving of approximately 2620 tonnes CO₂ which equates to 70% of our 25% target.

An additional year has been added to the project plan which increases our target from 25% by 2013/14 to 32% (4738 tonnes CO₂) by 2014/15. This continues to move our target closer to the government's targets of 34% by 2020 and 80% by 2050 based on 1990 emissions, and the HEFCE target of 43% by 2020 and 83% by 2050 based on 2005/6 figures which are our ultimate target.

In November 2010 LJMU was presented with a certificate by the Chief Executive of the Carbon Trust in recognition of our work in reducing carbon emissions, cutting costs and the mitigation of climate change during 2010

Carbon Management Performance

Our performance in relation to carbon management can be assessed by comparing the carbon emission sources within the scope of the 2008/9 baseline with the 2009/10 carbon emissions and the 2005/6 emissions HEFCE baseline.

The HEFCE carbon emissions baseline refers to Scope 1 and Scope 2 carbon emissions only.

The emission sources within the scope of our CMP carbon emissions 2008/9 baseline year are shown as follows and include Scope 1, 2 and 3 carbon emissions:-

Scope 1 Carbon Emissions	Scope 2 Carbon Emissions	Scope 3 Carbon Emissions
<i>Directly occurring from sources owned/controlled by the institution</i>	<i>Direct emissions generated by the production of electricity in power stations</i>	<i>Indirect emissions as a consequence of the activities of the institution</i>
-Gas and oil (Fossil Fuel) -Fleet Transport	-Electricity	-Business Air and Rail Travel -Staff Car Mileage -Waste and Water

There will be further reference to Scope 1, 2 and 3 carbon emissions within this report

Table A. Comparing 2009/10 carbon emissions with the CMP 2008/9 baseline year

Our carbon management performance is shown in the following table which compares the 2009/10 data with the 2008/9 CMP emissions baseline year:-

	Total CO ₂ Emission (tonnes)	Buildings	Business Travel & Transport	Waste and water (tonnes)
2009/10 Baseline CO ₂ emissions (tonnes)	14,634	12,746	1,550	338
2008/9 CMP Baseline CO ₂ emissions (tonnes)	14,971	13,691	1,024	257

(The CO₂ conversion factors for 2008/9 have been applied to the data for 2009/10)

There has been an overall reduction of 337 tonnes CO₂ in our annual carbon emissions during 2009/10 when compared with our carbon emissions during 2008/9. The full benefit of the 945 tonnes of carbon savings associated with buildings has been offset by a significant increase in business travel carbon emissions. (The increase is due to the revised procedures for arranging and recording business travel which took place during 2009/10).

Travel and Transport account for approximately 11% of the 2009/10 carbon emissions.

The carbon management performance breakdown for buildings, transport and travel, waste and water is shown in the table below.

Table B. Comparison of CMP 2008/9 carbon emissions baseline year with 2009/10 & 2005/6

The information shown in the table shows the breakdown of the scope of carbon emission sources within the defined scope of our CMP 2008/9 carbon emission baseline and compares it with carbon emissions for 2009/10. The 2005/6 HEFCE baseline year data is also referenced.

UTILITY	Tonnes of CO ₂ Year 2005/6 (HEFCE)	Tonnes of CO ₂ Base Line Year 2008/9 CMP	Tonnes of CO ₂ Year 2009/10
Oil	0	72	76
Gas	5,244	4,425	3,704
Electricity	9,718	9,191	8,966
Transport (Fleet)	105	90	73
Business Car Use	n/a	130	123
Air Travel	n/a	767	1297
Train Travel	n/a	39	57
Waste	n/a	230	312
Water	n/a	27	26
TOTAL	15067	14971	14634

(The CO₂ conversion factors for 2008/9 CMP have been applied to the data for 2009/10)

(n/a :- not applicable - these sources of CO₂ emissions were not included in the 2005/6 HEFCE baseline year)



It should be noted that the HEFCE 2005/6 carbon emissions baseline year does not include Scope 3 emissions associated with business travel, waste and water. A more detailed evaluation of the carbon emissions is included within section 3 of this report.

It can be seen that our target to reduce our CO₂ emissions by 25% over a five year period was set against a far more challenging baseline for achieving carbon savings than using the HEFCE 2005/6 carbon emissions baseline year.

The level of carbon saving would have been greater in 2009/10 compared with the CMP 2008/9 baseline but for the increase in business travel due to the improved accuracy of the recorded air and train travel carbon emissions data for 2009/10 when compared with the 2008/9 data.

However the level of carbon savings associated with the 2009/10 Scope 1 and 2 emissions compared with the HEFCE 2005/6 baseline year is 14.9%.

1. Introduction

The purpose of this report is to:

- a. Provide an update on progress in relation to our Carbon Management Plan
- b. A review of the five year implementation plan
- c. Indicate any amendments that may have occurred or may be necessary in order to deliver the plan.
- d. Align our Carbon Management Plan with recent HEFCE and/or government initiatives.
- e. Identify the necessary financial and human resource in order to deliver the ongoing carbon management programme.
- f. Amend existing relevant policies and introduce new policies when appropriate.

During 2010 HEFCE published a number of documents relating to carbon management and sustainability. The document, "Carbon Baselines for individual Higher Education Institutions in England" published in August 2010 indicates consideration to include a carbon baseline year of 2005/6 for Scope 1 and Scope 2 emissions. (These carbon emissions are associated with gas, electricity, oil and fleet vehicle petrol/diesel consumption).

For this reason the data associated with HEFCE 2005/6 emissions baseline year has been included in this report as a reference year and a means of monitoring the progress that the University has made in relation to carbon management.

2. First Year Progress – Implementation of the CMP (2009/10)

The University remains committed to its carbon management programme, which is progressing as planned and agreed with earmarked funding from the minor works and the energy conservation budgets. This was assisted last year with funding from Salix finance which has now been drawn down.

The first year of the Carbon Management Programmes implementation plan has been completed. This has involved planning and delivering the planned carbon saving projects.

The major activities were completing the Salix Interest Free Loan Funded Projects and the introduction of an awareness campaign and joining the H.E. Ecocampus Environmental Management Scheme.

2.1 Salix Funded Projects

Much of the first year (2009/10) of the programme has included the assisted approved funding of £430,000 from SALIX Finance which is an interest free loan and is repayable in eight instalments over a four year period starting April 2011.

The majority of the projects indicated in the first year of the plan were completed during the summer of 2010. However there were some exceptions when some projects were withdrawn from the programme because of unforeseen practical and operational reasons. Salix agreed for the under spend to be reallocated to other suitable projects and that of a revised completion date. These projects have been allocated to the second year of the implementation plan. As a result some of the anticipated projected carbon savings in the first year of the CMP have now be transferred to the second year of the programme.

2.2. Carbon Management Awareness Campaign – “Getting Greener Campaign”

A carbon saving awareness campaign was launched at the start of November 2010. An awareness strategy was drawn up and the action plan is shown in Appendix B. The strategy includes a range of initiatives that will be communicated over a period of time to staff and students on a regular basis. The initiatives includes:-

- Staff Quiz
- In house training and presentations
- Update of the sustainability web site
- News stories
- Open days/road shows

2.3. Carbon Savings

Potential Carbon savings amounting to 45% (1685 tonnes CO₂) of our five year 25% (3743 tonnes CO₂) target have been identified and may be realised at the end of this year through the projects that were completed within the programme’s first year. The programmes second year projects are currently underway.

It is envisaged that the first two years of the carbon management plan will deliver a saving of approximately 2620 tonnes CO₂ which equates to 70% of our 25% target.

2.4. Environmental Management System (EMS)

The university has joined the Ecocampus scheme, which is a National Environmental Management System for the higher education sector. The scheme allows universities to be recognised for addressing key issues of environmental sustainability including carbon management. We will submit our application for the Bronze award during April 2011. Our target is to achieve the platinum award within three years.

2.5. Presentation by the Carbon Trust - Carbon Management Plan Certificate

LJMU was presented with a certificate by the Chief Executive of the Carbon Trust in recognition of our work in reducing emissions, cutting costs and the mitigation of climate change during 2010.

3. Carbon Management Performance

It should be noted that HEFCE produced a document (Carbon Baselines for individual Higher Education Institutions in England published in August 2010) which highlights carbon baselines years of 1990/1 and 2005/6 for Scope 1 and 2 emissions. The 2005/06 data have been taken from Estates Management Statistic (EMS) and is deemed to be derived from better quality and accurate information than the 1990/1 data.

HEFCE have indicated that 2005/6 would be an appropriate carbon emissions baseline to reference future carbon management performance.

For this reason the carbon emissions data produced by HEFCE for 2005/6 has been used in this report as a reference against our 2008/9 CMP and our 2009/10 carbon emissions.

Our CMP carbon emission baseline year was set to included Scope 1 and 2 emissions as well as some sources of Scope 3 carbon emissions and includes waste, water and business travel.

The emission sources within the scope of our CMP carbon emissions 2008/9 baseline year are shown as follows and include Scope 1, 2 and 3 carbon emissions:-

Scope 1 Carbon Emissions <i>Directly occurring from sources owned/controlled by the institution</i>	Scope 2 Carbon Emissions <i>Direct emissions generated by the production of electricity in power stations</i>	Scope 3 Carbon Emissions <i>Indirect emissions as a consequence of the activities of the institution</i>
-Gas and oil (Fossil Fuel) -Fleet Transport	-Electricity	-Business Air and Rail Travel -Staff Car Mileage -Waste and Water

Section 3.1 and 3.2 compares in more detail the annual carbon emissions associated with:

- The sources of carbon emissions in the HEFCE 2005/6 baseline year against the 2008/9 2009/10 carbon emissions. (Scope 1 and 2 emissions only)
- The sources of carbon emissions in 2008/9 and 2009/10 (Scope 1, 2 and 3 Emissions)

3.1. HEFCE 2005/6 baseline emissions compared with the 2008/9 CMP and 2009/10

Our carbon management performance for 2008/9 and 2009/10 is referenced against the HEFCE 2005/6 carbon emissions baseline and shown in the following table.

Table 1. Comparison of Scope 1 and 2 carbon emissions

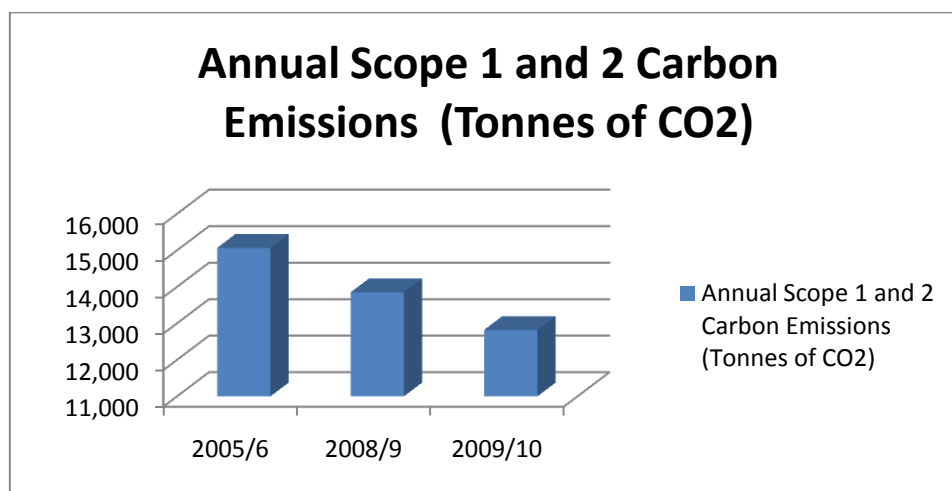
UTILITY/SOURCE	Tonnes of CO₂ Year 2005/6 (HEFCE)	Tonnes of CO₂ Base Line Year 2008/9 CMP	Tonnes of CO₂ Year 2009/10
Oil	0	72	76
Gas	5,244	4,425	3,704
Electricity	9,718	9,191	8,966
Transport (Fleet)	105	90	73
TOTAL	15,067	13,778	12819

(The CO₂ conversion factors for 2008/9 have been applied to the data for 2009/10)

It can be seen that there has been a reduction carbon emissions of 2248 tonnes of CO₂ when comparing 2005/6 CO₂ emissions with 2009/10. This represents a 14.9% reduction in emissions against the HEFCE 2005/6 baseline year.

Figure 1 Comparison of Scope 1 and Scope 2 emissions

The bar chart indicates a downward trend in carbon emissions when comparing the 2008/9 emissions and the 2009/10 carbon emissions against the HEFCE 2005/6 baseline year.



Many of the projects shown within the first year of our CMP are associated with Scope 1 and Scope 2 emissions. It should be noted that the carbon saving benefits from the first year carbon management implementation plan will not be fully realised until September 2011.

3.2 Comparison of sources of carbon emissions in 2008/9 and 2009/10 (Scope 1, 2 and 3 Emissions)

This section compares all the individual sources of carbon emission defined within the scope of the 2008/9 CMP carbon emissions baseline with 2009/10.

Table 2 . Carbon Emissions Sources for 2008/9 (CMP Baseline Year) compared with 2009/10

Table 2 shows the annual consumption and quantities of the of the sources of carbon emissions used in deriving our CMP baseline data which is then expressed in tonnes of CO₂

UTILITY/SOURCE	2008/9 CMP Baseline Year		2009/10	
	Annual Consumption	Tonnes of CO ₂	Annual Consumption	Tonnes of CO ₂
Oil (kWh)	286,758	72	303,260	76
Gas (kWh)	23,934,997	4,425	20,022,639	3,704
Electricity (kWh)	17,574,613	9,191	17,142,619	8,966
Transport (Fleet) litres - diesel	28,665	90	27,615	73
Business Car Use (km)	650,010	130	617,471	123
Air Travel (km)	5,393,163	767	10,807,571	1297
Train Travel (km)	640,078	39	960,184	57
Waste tonnes	515	230	697	312
Water m3	66,068	27	64,517	26
TOTAL		14,971	TOTAL	14,634

(The CO₂ conversion factors for 2008/9 have been applied to the data for 2009/10)

Our carbon emissions data shown in Table 3 compares the 2009/10 data with the 2008/9 CMP emissions baseline year in the following categories:

- Buildings
- Business Travel and Transport
- Waste and water

Table 3 Carbon Emissions – Buildings, Business Travel and Transport, and Water and Waste

This table has been included as a reference to the way the 2008/9 carbon emissions baseline was shown in our initial CMP and compares it with our 2009/10 emissions.

	Total CO ₂ Emission (tonnes)	Buildings	Business Travel & Transport	Waste and water (tonnes)
2009/10 Baseline CO ₂ emissions (tonnes)	14,634	12,746	1,550	338
2008/9 CMP Baseline CO ₂ emissions (tonnes)	14,971	13,691	1,024	257

(The CO₂ conversion factors for 2008/9 have been applied to the data for 2009/10)

Buildings

It can be seen that the 2009/10 carbon emissions associated with buildings has reduced by 945 tonnes CO₂, when compared against the 2008/9 carbon emissions baseline. The carbon emissions in buildings are associated with the consumption of electricity, gas and oil.

It should also be noted that the University has been engaged in energy efficiency projects prior to the 2008/9 HE Carbon Trust Carbon Management Programme and has previously achieved;

- Energy Efficiency Accreditation Scheme Award (2007)
- The Carbon Trust Standard (2009)

It is important that the progress already made in carbon savings is maintained. This will require continuous review of operational policies and procedures, investment in plant, equipment, financial and staff resource and awareness.

Travel and Transport

Business travel and transport now accounts for around 11% of the annual 2009/10 carbon emissions.

- **Air Travel**

There was a significant increase in carbon emissions associated with recorded air travel. This was because the number of km of travel recorded in 2009/10 increased by approximately 5.4 million km when compared with the 2008/9 figures. This accounts for much of the increase in carbon emissions associated with transport and travel.

However the method of arranging business travel has been influenced by the involvement and the procedures set up by the University Procurement Section. Previously business travel arrangements for staff was not necessarily arranged or directly recorded via the procurement section which was where the initial travel data for 2008/9 was from.

Revised policies and procedures have been introduced during 2009/10 by the procurement section. The revised process now captures all of the air and train travel arrangements. Also these arrangements have introduced an improvement in the quality of the data provided during 2009/10 by our travel providers. Our travel providers now have a better understanding of the University's requirements regarding data capture for our CMP.

The travel information is now being recorded from the suppliers on a monthly basis. This initiative has assisted in embedding carbon management issues and awareness between University staff and also our providers.

- **Train Travel**

There has been an increase in carbon emissions associated with train travel. The number of km travelled by train increased during 2009/10 by 320,000 km. This increase is also associated with the introduction of the revised policies.

- **Private Car Business Mileage and Fleet Vehicles**

In 2009/10 there was a decrease in the number of km travelled and subsequent decrease in carbon emissions associated with the use of privately owned and the University's fleet vehicles.

Waste and Water

There was a slight reduction in carbon emissions associated with the annual water consumption in 2009/10 compared with 2008/9 baseline year.

Waste going to landfill increased in 2009/10 when compared with the CMP baseline year. However much of this was associated with the waste generated through building closures and the movement of staff to different buildings.

3.3 CO₂ Emissions Trend

The trend in CO₂ emissions can be determined by comparing the ratio of annual carbon emissions with the corresponding floor areas, student numbers and turnover for the baseline years. These ratios are used by the Carbon Trust when assessing accreditation to the Carbon Trust Standard.

Table 4. Baseline Carbon Emissions, Number of Students, Floor Area and Turnover

Baseline Year	Carbon Emissions (Tonnes/yr) <i>Scope 1 & 2 only</i>	Number of Students (FTE)	Gross Internal Floor Area (m ²)	Turnover (£)
2005/6 (HEFCE)	15,067	17,883	167,944	131,837,000
2008/9 (CMP)	13,778	19,471	157,225	172,643,000
2009/10	12,819	20,353	164,210	178,971,000

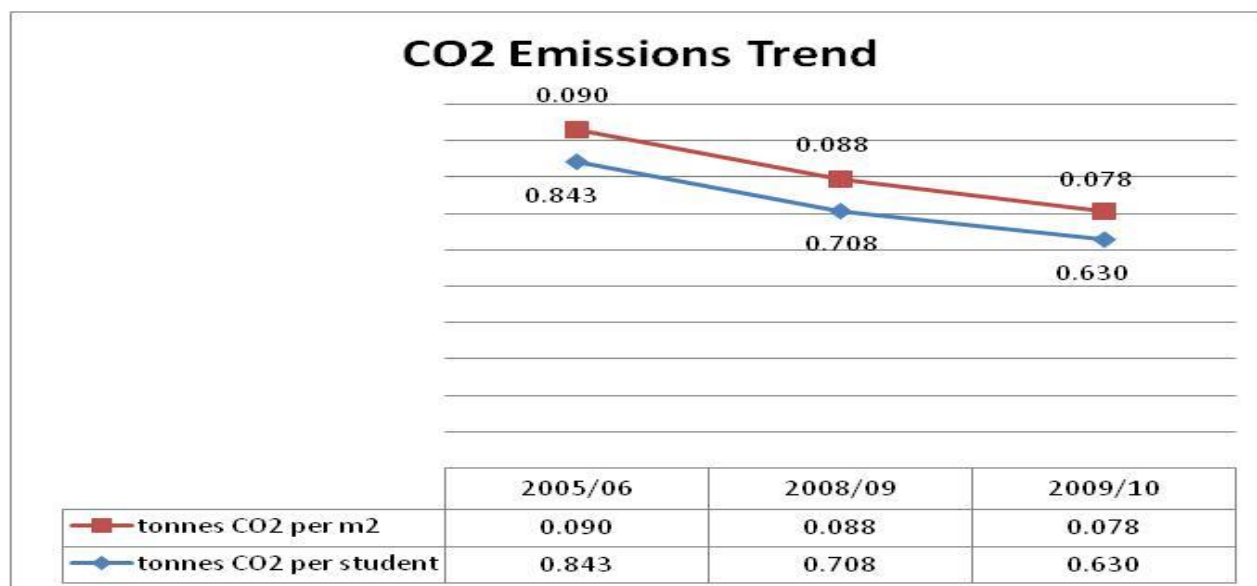
(Data for student headcount, floor area & turnover –sourced from Estates Management Statistic and Finance Dept)

Annual tonnes of CO₂ compared with annual student numbers, floor area and annual turnover provides an indication of the university's carbon management relative to baseline years. This provides an appreciation of the effect of changes in business operation on annual carbon emissions.

Table 5. Annual Carbon Emissions per student, per m2 and per £ of turnover

Baseline Year	Carbon Emissions (Tonnes/yr) <i>Scope 1 & 2 only</i>	Tonnes of (CO ₂ /student)	Tonnes of (CO ₂ /m ²)	Tonnes of (CO ₂ /£ Turnover)
2005/6 (HEFCE)	15,067	0.84253	0.08971	0.00011
2008/9 (CMP)	13,778	0.70762	0.08763	0.00008
2009/10	12,819	0.62983	0.07806	0.00007

Figure 2. Graph of CO₂ Emission Trend



It can be seen that from the data in table 5 and in Figure 2 that the ratios employed indicate a real reduction in the annual tonnes of CO₂ emissions.

4. New Challenges

There have been new initiatives by HEFCE to include sustainability and carbon management in Higher Education Institutions Capital Investment Framework submissions. There have also been a number of government initiatives in order to promote renewable energy technologies such as solar thermal applications and demand side energy management using "Smart Grids"

4.1 Higher Education Capital Investment Framework (CIF) - HEFCE Carbon Management Requirements

During 2010 HEFCE introduced a number of documents relating to sustainability, carbon management and baseline years for carbon emissions.



- Carbon Baselines for individual Higher Education Institutions in England published in August 2010 highlights carbon baseline years of 2005/6 for Scope 1 and Scope 2 emissions.
- Carbon Management Strategies and Plans – A guide to good practice 2010
- Carbon Reduction target and strategy for higher education in England (Sept 2010). This document outlines HEFCE's revised strategy for carbon reduction. The main effect of the changes relate to the sector level carbon reduction targets against 2005/6 levels for Scope 1 and Scope 2 emissions. The HEFCE target is a reduction of 43% by 2020 and 83% by 2050 based on 2005/6 emissions.

In future, carbon performance will be integrated into HEFCE's funding processes via the Capital Investment Framework (CIF). HEI's will need to demonstrate improvement in their emissions levels against a specified base year. To enable the process HEFCE have produced a document to provide individual HEI carbon baseline years calculated to cover Scope 1 and Scope 2 emissions as defined in the Green Gas House Protocol:

- 1990 (which relates to the 1990/91 academic year) as the year which most national and sector targets are set – However in many instances there is less quality data for individual HE institutions for this year.
- 2005 (which relates to the 2005/06 academic year) as a more recent year for which there is higher quality data available). The 2005/06 data have been taken from Estates Management Statistic (EMS) and is assumed to be derived from better quality and accurate information.

It was noted that HEFCE would also consider the H.E. institution's Environmental Management System (EMS) when evaluating a CIF submission. A higher education institution should consider having an Environmental Management System or equivalent in place which would include a nationally recognised Environmental Management Auditing Systems (EMAS). The recognised systems are such as the HE Ecocampus scheme, BS 8555 or ISO 14001.

LJMU have considered the various schemes and signed up to the HE Ecocampus scheme in October 2010. It is recommended that this will be included within the scope of the Terms of Reference of the Carbon Management Project Board and that progress is reported to the board.

4.2 - Environmental Management System - Ecocampus

Ecocampus is a national Environmental Management System (EMS) for the higher education sector. The scheme allows universities to be recognised for addressing key issues of environmental sustainability including carbon management.

The phased approach of the scheme means that Universities gain recognition for improved environmental performance through a series of awards; bronze, silver, gold and platinum. The platinum award is equivalent to the international standard ISO 14001.

Potential Benefits of Ecocampus status:

- Provide strategic direction for institutions
- Ensure that risk management practices are implemented
- Improve resource efficiency
- Achieve financial savings
- Help ensure compliance with environmental legislation
- Actively involve staff and students in an institutions move towards sustainability
- Provides evidence of responsible practice and enhancing the reputation of the institution
- Facilitate certification to standard such as ISO14001

- Demonstrates good corporate citizenship by improving institutional standing within the local community

An EMS will help identify and reduce the institutions impacts on the environment including carbon emissions. It will also help to set and achieve objectives and targets for environmental improvements. It should be noted that:-

- HEFCE CIF 2 submissions include a section regarding the institution's EMS status.
- People and Planet Green League Table include criteria associated with EMS status.

The scheme requires commitment of :-

- Human and financial resource
- Good communication and training
- Time to implement and maintain

It is anticipated that the university will submit its application for the Ecocampus Bronze award in April 2011 and has set a target of achieving the platinum status by 2013/14. .

4.3 Sustainable Procurement and Carbon Management

HEFCE have also indicated that they would be considering to introduce a measure of carbon management performance associated with sustainable procurement. The university has introduced a new Sustainability Procurement Policy (See Appendix A – Sustainability Procurement Policy).

Increased performance in reducing carbon emissions will be a factor in future capital allocations to institutions from HEFCE. This will also realise financial savings through CRC and assist in improving our future league table positions.

4.4 New Government Initiatives - Feed in Tariffs and Smart Grids (Electricity)

The UK government has introduced Feed in Tariffs (FITs) to be applied to renewable energy projects for producing electricity. These tariffs have the potential to make renewable energy projects more attractive to commit to. In addition energy suppliers are promoting localised Smart Grids in partnership with end electricity users.

The arrangements associated with these initiatives are meant to promote consideration for doing things differently. Their introduction is meant to promote local carbon saving applications and provide potential opportunities to form partnerships with energy suppliers, energy services companies (ESCO's) and local end users in order to minimise carbon emissions and achieve cost savings. Many of the partnership arrangements involve long term agreements/contracts which may be typically for a 25 year period. Such schemes may involve no capital cost but include Power Purchasing Agreements. The resulting carbon emissions saved can be accounted for within LJMU's carbon reduction. These type of schemes need to be considered with the estates long term strategy.

LJMU have received initial proposals which are currently under consideration and are included within the implementation plan.

5. Legislation Update

There have been a number of changes associated with some of the legislation associated with the Carbon Management introduced by the UK Government:-

5.1 Carbon Reduction Commitment (CRC)

There has been some significant initial changes to the CRC resulting from the UK Governments Comprehensive Spending Review (CSR) in October 2010. There has been a further consultation which finished on 15th December 2010 regarding simplifying the scheme. The outcome of the consultation is due out in April/May 2011.

However the significant changes highlighted from the government's CSR are as follows:-

- The first carbon allowance sales for 2011/12 emissions will now take place in 2012 rather than 2011(The date to be confirmed)
- There will be a cost in purchasing our carbon allowance. The original cap of £12/tonne of carbon has yet to be confirmed
- There will be no recycling of the carbon allowances to the participants of the scheme – these will now be used to support the public finance
- The university is required to submit auditable energy and carbon emissions data for the financial year April 2010 to March 2011 to the Environment Agency by the 29th July 2011

The administrator of the scheme (The Environment Agency) will be working with Government to understand the implication of the changes and will provide further information as it becomes available. The Environment Agency has arranged for a number of workshops to take place in February 2011 for the participants of the scheme to attend.

It should be noted that LJMU are registered as a mandatory participant in the scheme and auditable evidence of consumption data will be required to be submitted to the Environment Agency in July 2011. There will also be published league tables in October 2011.

5.2 Energy Performance in Buildings Directive (EPBD)

The next phase of the Directive is associated with air conditioning inspections on units which are rated over 12 kW was introduced on the 1st January 2011. This means that the majority of the university's air conditioning units will need to be inspected in terms of the "F" gas regulations (Green House Gases) and energy efficiency.

6. Quantifiable Benefits of the CMP

The following table indicates the amended quantifiable benefits of the CMP. The amendments are associated with:

1. The completion of 2009/10 Year 1 projects within the action/implementation plan. Some of the projects were not completed due to operational and practical reasons. Some were transferred to the following years of the CMP.
2. The change in energy prices (The University renewed its energy contracts from 1st August 2010 and will be on a 2 year fixed price agreement. This resulted in an approximate average

saving of 26%. However there will be an increase on these prices of 2.5% because of the increase of VAT from January 2011.

- The same 2008/9 carbon conversion factors have been applied to subsequent years.

Table 6 Quantifiable Benefits

The following table indicates the potential annual cost and carbon savings associated with the rolling programme which includes the first six years of the CMP. Within years 2011/12 and 2012/13 there are feasibility studies that will be conducted, and the proposed introduction of new carbon saving related policies.

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/6
Annual cost saving	-	£288,393	£206,567	£126,766	£98,245	£101,733	£119,325
Annual CO₂ saving	-	1,685	942	541	549	463	558
% of original target achieved	-	45%	25%	14%	15%	12%	15%

It is anticipated that the outcome from both the feasibility studies and the introduction of new policies and procedures will provide further potential carbon saving opportunities for the ensuing years of the ongoing CMP

7. Investment Required for the CMP

The required investment is part of an on the ongoing rolling programme of activity for the University's ambition to reduce its 2008/9 carbon emissions by 25% over a five year programme and to continue with the programme in order to address the government's targets and other relevant mandatory requirements of government legislation.

With this in mind and the governments targets to reduce the carbon emissions by 34% by 2020 and 80% by 2050 an additional year of required funding has been included as part of a rolling 5 year programme. This will then increase our target in reducing carbon emissions to 32% by 2014/15.

Table 7. Investment Required

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	TOTAL
Funding Required	£502,042	£534,495	£480,000	£507,150	£858,000	£575,500	£3,457,187
Allocated Funding	£502,042	£534,495	£470,000	£470,000	£470,000	£470,000	£2,916,537
Unallocated Funding To Be Agreed	-	-	£10,000	£37,150	£388,000	£105,500	£540,650

(Note - Allocated funding figures assume that current funding levels are maintained)

The continuous investment programme in carbon saving opportunities will include projects that will be developed during the programme and the costs to implement them may be shown initially as TBA (To be agreed). Such projects would include the outcomes of the feasibility studies and the introduction of new policies and programmes.

The 2013/14 funding requirements includes for a number of boiler replacement projects.

The funding source shown in the implementation tables as the “Energy Budget” is the aggregation of the Annual Energy Efficiency Budget and the Minor Works Budget.

It should be recognised that a degree of flexibility will be necessary in scheduling the projects in the implementation plans.

8. Review of existing Policies

The relevant policies will be reviewed as part of a continuous improvement strategy.

The appendices indicate the relevant policies that have been introduced for approval or have been modified as part of a review process.

The Environmental Policy will be reviewed as part of the ongoing requirements of the Ecocampus scheme.

9. Recommendations

That the Carbon Management Plan will:-

- Adopt the amendments in the Implementation Programme as shown in the Tables 8, 9, 10, 11, 12 and 13 within this report.
- Deliver a carbon saving opportunities that will meet or better the government’s targets of a carbon emissions reduction of 34% by 2020 and 80% by 2050 based on 1990 emissions and the HEFCE target of 43% by 2020 and 83% by 2050 based on 2005/6 figures.
- Provide a 5 year rolling programme of carbon saving initiatives
- Identify the carbon benefits resulting from the outcomes of the feasibility studies
- Continuously review and amend the programme to accommodate the changes in operational and overall business strategy
- Continue to be reported to the Carbon Management Project Board and include under its Terms of Reference the ECOCAMPUS scheme (Environmental Management Auditing System)

In order to realise our targets and to achieve CO₂ savings in line with or better than HEFCE and the Government’s targets it will be necessary to commit annual ongoing human and financial investment. The initial level of financial investment is indicated within in the implementation plans as shown in tables 8, 9, 10, 11, 12, and 13.

The funding source shown in the implementation tables as the Energy Budget is the aggregation of the Annual Energy Efficiency Budget and the Minor Works Budget. There will be other funding



sources such as the Long Term Maintenance (LTM) programme which will contribute towards projects associated with carbon saving.

Overall it is important to acknowledge that there will be an ongoing requirement for human and financial resource in order to be successful in developing, delivering, and maintaining environmental programmes such as the Carbon Management Plan and the ECOCAMPUS Environmental Management Auditing System (EMAS) scheme. The staged approach of the ECOCAMPUS will lead to the platinum award which will facilitate the University gaining the ISO 14001 accreditation. The scheme will assist in identifying and reducing the university's impacts on the environment including carbon emissions.

TABLE 8 - CARBON MANAGEMENT PROGRAMME

Year 1 Finance Year 2009/10 **Implementation Plan - Projects Identified to be completed in Year 1** Amended First Year

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
A1	EFFICIENT MOTOR DRIVES								
A1/1/1	Replace 35 Fume cupboard fan motors and fans	Byrom Street Campus	Electricity	350,000	£ 33,425	£93,400	2.79	167.95	salix
A1/1/2	Replace 3 Fume cupboard fan motors and fans	Byrom Street Campus	Electricity	30,000	£ 2,865	£12,200	4.26	16.2	Energy Budget
A5	VOLTAGE REDUCTION CONTROLS								
A5/1/2	Power Perfector Voltage Regulation	John Foster Building	Electricity	98,680	£ 9,424	£28,600	3.03	52.99	salix
A8	HEATING PIPEWORK INSULATION PROGRAMME								
A8/1/1	Pipe Insulation - Valves and Flanges	Byrom St - BH 1	Gas	23,000	£ 713	£3,250	4.56	2.26	salix
A8/1/2	Pipe Insulation - Valves and Flanges	Byrom St - Max Perutz	Gas	6,800	£ 211	£933	4.43	1.26	salix
A8/1/3	Pipe Insulation - Valves and Flanges	John Foster Boiler Room No1	Gas	11,000	£ 341	£1,206	3.54	2.04	salix
A8/1/4	Pipe Insulation - Valves and Flanges	John Foster Boiler Room No 2	Gas	12,600	£ 391	£840	2.15	2.33	salix
A8/1/5	Pipe Insulation - Valves and Flanges	John Foster Boiler Room No 3	Gas	30,000	£ 930	£1,260	1.35	5.5	salix
A8/1/6	Pipe Insulation - Valves and Flanges	John Foster Boiler Room No 4	Gas	12,500	£ 388	£1,770	4.57	2.31	salix
A8/1/7	Pipe Insulation - Valves and Flanges	Aquinas Building	Gas	13,000	£ 403	£840	2.08	2.41	salix
A8/1/8	Pipe Insulation - Valves and Flanges	Students Union	Gas	25,000	£ 775	£1,100	1.42	4.69	salix
A8/1/9	Pipe Insulation - Valves and Flanges	Joe Makin Building	Gas	23,000	£ 713	£1,300	1.82	4.26	salix
A8/1/10	Pipe Insulation - Valves and Flanges	Avril Roberts Boiler Room No 1	Gas	11,500	£ 357	£550	1.54	2.2	salix
A8/1/11	Pipe Insulation - Valves and Flanges	Avril Roberts AHU Basement plant Rm	Gas	16,750	£ 519	£300	1.2	3.1	salix
A8/1/12	Insulate Internal Pipework	Byrom Street Campus	Gas	75,000	£ 2,325	£5,200	2.24	11.84	salix
A8/1/13	Fit 60 Thermostatic Radiator Valves	Byrom Street Campus	Gas	45,000	£ 1,575	£6,813	4.33	8.53	salix
A8/1/14	Pipe Insulation - Valves and Flanges	IM Marsh Sudley B/House	Gas	5,500	£ 171	£540	3.17	1.01	salix
A8/1/15	Pipe Insulation - Valves and Flanges	IM Marsh Science B/House & Egg Bdg	Gas	35,000	£ 1,085	£1,540	1.42	6.43	salix
A8/1/16	Pipe Insulation - Valves and Flanges	IM Marsh Barkhill B/House	Gas	42,000	£ 1,302	£750	1.84	7.77	salix
A8/1/17	Pipe Insulation - Valves and Flanges	IM Marsh S/pool B/House/Filter House	Gas	29,000	£ 899	£2,920	3.25	5.57	salix
A8/1/18	Pipe Insulation - Valves and Flanges	IM Marsh Holmefield B/House	Gas	11,000	£ 341	£640	1.88	2.04	salix
A8/1/19	Pipe Insulation	Avril/Robarts/Tithebarn St	Gas	25,000	£ 775	£4,000	5.16	4.63	Energy Budget
A3	LAMP CHANGES (LAMP CHANGE PROGRAMME)								
A3/1/2	150 T8 to T5 lamp conversions (£18/lamp)	IM Marsh Campus Holmefield House	Electricity	15,560	£ 1,486	£17,860	12.02	5.72	salix
A3/1/3	485 T8 to T5 Lamp Conversions	IM marsh campus Barkhill Mossley	Electricity	28,800	£ 2,750	£8,300	3.02	15.47	salix
A3/1/4	135 T8 to T5 Lamp Conversions	Im Marsh Sudley Building	Electricity	7,422	£ 709	£4,600	6.49	3.99	salix
A3/1/5	52 T8 to T5 Lamp Conversions	IM Marsh Link Bdg	Electricity	2,990	£ 286	£1,900	6.65	1.61	salix
A3/1/6	105 T8 to T5 Lamp Conversions	IM Marsh Green Bank and Langden	Electricity	5,780	£ 552	£3,800	6.88	3.16	salix
A3/1/7	420 T8 to T5 lamp conversions	IM Marsh Science Bdg	Electricity	23,196	£ 2,215	£7,050	2.76	12.48	salix
A3/1/8	417 T8 to T5 lamp conversions	Dean Walters Building	Electricity	23,400	£ 2,235	£7,100	3.18	12.57	salix
A3/1/9	Replace 8ft Lamps with T5 lamps	IM Marsh Science	Electricity	28,600	£ 2,731	£15,800	5.78	15.16	salix
A4	VOLTAGE REDUCTION CONTROLS								
A5/1/4	Voltage Regulation	Aldham Roberts	Electricity	75,000	£ 7,163	£24,500	3.42	30.28	salix
A5/1/5	Voltage Regulation	IM Marsh Main Campus	Electricity	55,000	£ 5,253	£29,900	5.69	29.54	salix
A2	LIGHTING CONTROLS PROGRAMME								
A2/1/1	Lighting Controls (8 areas at £250)	Kingsway House Communal Areas	Electricity	4,500	£ 430	£2,500	5.82	2.42	salix
A2/1/2	Lighting controls (10 areas - £250)	IM Marsh Holmefield House	Electricity	4,600	£ 439	£2,500	5.69	2.47	salix
A2/1/4	Lighting Controls (£529)	Lecture Theatres	Electricity	24,000	£ 2,292	£11,930	5.21	5.73	salix
A2/1/6	Lighting Controls	IM Marsh External Lighting	Electricity	12,000	£ 1,146	£7,500	6.54	6.44	salix
A2/1/7	Lighting Controls(10 areas at £250)	IM Marsh Toilets/Wash rooms	Electricity	4,550	£ 435	£2,500	5.75	2.44	Maintenance
A2/1/9	Lighting Controls (20 areas at £250)	Dean Walters Bdg	Electricity	9,100	£ 869	£5,000	5.75	4.89	salix
A2/1/10	Lighting Controls (15 areas at £250)	Byrom Street Peter Jost	Electricity	6,820	£ 651	£3,750	5.76	3.65	Energy Budget
A2/1/11	Lighting Controls (20 areas at £250)	Henry Cotton	Electricity	9,100	£ 869	£5,000	5.75	4.89	salix
A2/1/12	Lighting Controls - Corridor areas	Tithebarn Street	Electricity	5,000	£ 478	£4,000	8.38	2.7	Energy Budget
A7	PLANNED CAPITAL DEVELOPMENT PROJECTS								
A7/1/1	Over Cladding (Insulation & D/Glazing)	Byrom St Tower/Phase 1/2/3	Gas	1,200,000	£ 42,000	Part Cap Dev		222	Cap Dev
A1	MOTOR CONTROLS								
A1/1/3	Inverter Controls on Circulating Pumps	IM Marsh Swimming Pool	Electricity	13,600	£ 1,299	£7,100	5.47	7.3	Salix
A15	INSTALL AMR TO UTILITY METERS								
A15/1/1	Phase 1 Metering	Fiscal Metering Campus Wide	Gas	57,000	£ 1,767	£10,000	5.66	10.55	Utility Budget
A15/1/2	Phase 1 Metering	Fiscal Metering Campus Wide	Electricity	20,000	£ 1,910	£10,000	5.24	10.74	Utility Budget
A7	BUILDING FABRIC UPGRADE								
A7/1/2	Repair/Insulate Flat Roof	Tithebarn Street	Gas	35,000	£ 1,085	£60,000		6.47	Maintenance
A13	IT MEASURES								
A13/1/1	Print Strategy	Campus Wide	Electricity	15,000	£ 1,433			7.95	funded
A13/1/2	Night Watchman Phase 2	Campus Wide	Electricity	600,000	£ 57,300	£46,000	0.80	318	Energy Budget
A11	UPGRADE BMS CONTROLS PROGRAMME								
A11/1/1	Front End upgrade - Pasa 1 (Est 3% Save)	Trend BMS Campus Wide	Gas	707,800	£ 2,194	£11,750	5.36	130.9	salix
A11/1/2	Front End upgrade - Pasa 1 (Est 3% Save)	Trend BMS Campus Wide	Electricity	527,202	£ 50,348	£11,750	0.91	281.5	salix
E2	AWARENESS CAMPAIGN PHASE 1								
E2/1/1	Awareness Campaign Phase 1 Part year	Campus wide	Gas	353900	£ 10,971	10,000	1.2	65.5	Energy Budget
E2/1/2	Awareness Campaign Phase 1 Part year	(assume 1.5% saving in annual energy)	Electricity	263600	£ 25,174	inc above		140.8	Energy Budget
TOTAL				5,069,850	£ 288,393	£502,042		1684.64	

Main Budget Expenditure

Energy Conservation Budget	£ 79,950
Maintenance Budget	£ 62,500
Capital Development Budget	not included
Salix Finance (Interest Free Loan)	£ 339,592
Utility Budget	£ 20,000
Funding not allocated	£ -
	£ 502,042

First Year Cost Saving

£ 288,393

CO₂ Saving

1684.64 tonne CO₂



TABLE 9 - CARBON MANAGEMENT PROGRAMME

Year 2 | Year 2010/11 | Implementation Plan - Projects Identified to be completed in Year 2 | Amended 2nd Year

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
A2 LIGHTING CONTROLS PROGRAMME									
A2/2/1	Lighting controls	John Foster Building	Electricity	18,200	£ 1,738	£5,900	5.75	9.77	Energy Budget
A2/2/1	Lighting controls	John Foster Building	Electricity	inc above	inc above	£4,100	inc above	inc above	Salix
A2/2/2	Lighting controls	Byrom Street	Electricity	20,000	£ 1,910	£5,500	5.24	10.74	Salix
A2/2/2	Lighting controls	Byrom Street	Electricity	inc above	inc above	£4,500	inc above	inc above	Energy Budget
A2/2/3	Lighting Controls (10 areas at £500)	JMU Tower	Electricity	9,100	£ 869	£5,200	5.98	4.89	Salix
A2/2/4	Lighting Controls (15 areas at £500)	Roscoe/Egerton Court	Electricity	6,820	£ 651	£7,500	11.52	3.65	Energy Budget
A2/2/5	Lighting controls 40 Areas at £400)	Byrom St Phase 1	Electricity	22,000	£ 2,101	£16,000	7.62	12.19	Energy Budget
A2/2/6	Lighting controls 10 Areas)	Henry Cotton	Electricity	11,000	£ 1,051	£5,200	4.6	5.91	Salix
A2/1/5	Lighting Controls	IM Marsh Sports Gym	Electricity	1,200	£ 115	£900	5.7	0.64	Salix
A2/1/6	Lighting Controls (Underground Carparks)	ound Park JMU Tower/Kingsway/Dean	Electricity	11,000	£ 1,050	£5,250	5	5.94	Salix
A3 LAMP CHANGES (LAMP CHANGE PROGRAMME)									
A3/1/1	350 T8 to T5 lamp conversion	IM Marsh Campus Sports Hall	Electricity	30,000	£ 2,240	£11,200	5.0	16.11	Salix
A3/2/1	Halogens to LEDs	Egerton Court	Electricity	4,820	£ 460	£4,200	9.00	1.20	Salix
A3/2/2	Halogens to LEDs	Haigh Building	Electricity	3,839	£ 367	£2,200	6.00	0.71	Salix
A2/2/3	Change 2D lamps to LED (40 off)	General-Corridor Areas	Electricity	6,283	£ 600	£4,800	8.00	3.39	Energy Budget
A11 SWIMMING POOL OPPORTUNITIES									
A11/2/1	Upgrade AHU Controls	IM Marsh Swimming Pool	Gas	32,258	£ 1,000	£6,000	6	5.94	Energy Budget
A11/2/1	Upgrade Trend Controls	IM Marsh Swimming Pool	Gas	107,527	£ 3,333	£20,000	6	19.9	Energy Budget
A11 UPGRADE TREND BMS CONTROLS									
A11/2/2	Trend BMS - Local Controls Upgrade	IM Marsh Science Bdg	Gas & Elec	36,000	£ 1,860	£12,000	8.76	9.5	Energy Budget
A11/2/3	Trend BMS - Local Controls Upgrade	Aquinas Building	Gas & Elec	17,000	£ 745	£6,500	9.52	3.86	Energy Budget
A11/2/4	Trend BMS - Local Controls Upgrade	Rodney House	Gas & Elec	75,000	£ 3,150	£14,000	4.44	16.36	Energy Budget
A11/2/5	Trend BMS - Local Controls Upgrade	Byrom St Tower/Phase 1/2	Gas & Elec	290,000	£ 12,450	£20,000	4.76	65.55	Energy Budget
A11/2/6	Trend BMS - Local Controls Upgrade	Byrom St - Peter Jost Bdg	Gas & Elec	30,000	£ 1,200	£6,000	5	5.55	Salix
A11/2/7	Trend BMS - Local Controls Upgrade	Byrom Street - Max Perutz	Gas & Elec	30,000	£ 1,200	£6,000	5	5.55	Salix
A11/2/8	Trend BMS - Local Controls Upgrade	IM Marsh - Refectory Bdg	Gas & Elec	32,000	£ 1,440	£7,200	5	5.92	Salix
A11/2/9	Free Cooling Option (Controls & Mechanical Mods)	Avril Roberts	Electricity	52,620	£ 5,788	£26,000	4.5	28.5	Energy Budget
A11/2/10	AHU Air Quality Sensor Replacement	Avril Roberts	Electricity	83,250	£ 9,158	£25,000	2.73	45.2	Energy Budget
A11/2/11	Trend BMS - Local Controls Upgrade	Kingsway House	Gas & Elec	76,087	£ 6,000	£25,000	7	14.0	Energy Budget
A11/2/12	Front End upgrade - Phase 2	Phase 2 Trend BMS Campus Wide	Gas	40,323	£ 1,250	£10,000	8.00	7.5	Energy Budget
A11/2/13	Front End upgrade - Phase 2	Phase 2 Trend BMS Campus Wide	Electricity	8,000	£ 764	£5,000	8	4.3	Energy Budget
A8 HEATING PIPEWORK INSULATION PROGRAMME									
A8/2/1	Internal LPHW pipework insulation	Byrom Street Central Riser	Gas	27,950	£ 863	£3,900	4.5173	5.15	Salix
A8/2/2	Internal LPHW pipework insulation	Byrom Street 10th Floor	Gas	18,890	£ 586	£2,645	5	3.49	Salix
A8/2/3	Internal LPHW pipework insulation	Byrom Street -	Gas	55,000	£ 1,705	£20,000	12	10.12	Energy Budget
A8/2/4	Internal LPHW pipework insulation	Kingsway house	Gas	2,717	£ 500	£2,000	4	0.50	Energy Budget
A11 UPGRADE NONE TREND TREND BMS CONTROLS									
A11/2/7	Upgrade None BEMS local controls	Twelve Quays	Electricity	22,000	£ 2,101	£5,000	2.38	11.9	Energy Budget
A11/2/8	Upgrade None BEMS local controls	LJM Tower	Electricity	35,000	£ 3,343	£10,000	2.99	18.9	Energy Budget
A11/2/8	Upgrade None BEMS local controls	Modular Building	Electricity	5,000	£ 478	£5,000	10.47	2.7	Energy Budget
F3/2/1	A/C equip and controls approx 300 units	Campus Wide	Electricity	80,000	£ 7,640	£ 50,000	6.54	43.2	Energy Budget
A6 INSTALL AMR TO UTILITY METERS									
A6/2/1	Phase 2 Sub Metering	None Fiscal	Gas	35,000	£ 1,085	£20,000	18.43	6.44	Energy Budget
A6/2/2	Phase 2 Sub Metering	None Fiscal	Electricity	20,000	£1,910	£20,000	10.47	10.8	Energy Budget
A7 PLANNED CAPITAL DEVELOPMENT PROJECTS									
A7/2/1	Over cladding	Byrom St East Elevation	Gas	45,000	£ 1,575	Cap Devel	NA	8.325	Cap Develop
A7/2/2	Byrom Street HV Infrastructure upgrade w low loss transformers (1% Min Saving)	Byrom Street Campus	Electricity	48,000	£ 5,280	Cap Devel	NA	25.44	Cap Develop
A7/2/3	General Internal Refurbishment of Byrom Street Campus £1.5 million per year over seven years	General Refurbishment including lighting and lighting controls and high efficiency equipment	Electricity	35,000	£ 3,850	Cap Devel	NA	18.55	Cap Develop
A7/2/4	Ground Floor refurbishment - includes lighting upgrade	Henry Cotton Building	Electricity	2,000	£ 220	Cap Devel	NA	0.37	Cap Develop
A7/2/5	Third Floor refurbishment	Henry Cotton Building	Electricity	2,000	£ 220	Cap Devel	NA	0.37	Cap Develop
A7/3/1	Over Cladding	Byrom St Engineering Workshops	Gas	45,000	£ 1,575	Cap Devel	NA	8.325	Cap Develop
A3a LAMP CHANGES (LAMP CHANGE PROGRAMME)									
A3a/2/1	Install LED Lamps to external lighting	Byrom Street Campus	Electricity	30,000	£ 2,865	£20,030	6.99	16.3	Energy Budget
A12 REINSTATE BIO MASS BOILER									
A12/1/1	Re instate the Bio mass Boiler	Art and Design Academy	Bio Mass	360,000	none	£10,200	none	68.4	Energy Budget
A7 BUILDING FABRIC UPGRADE									
A7/1/3	Curtain Wall Insulation and Double Glazing	IM Marsh Science Building	Gas	60,000	£ 1,860	LTM	NA	11.3	Maintenance
	Roof Insulation	Byrom St - Lecture Theatre	Gas	70,000	£ 2,170	LTM	NA	12.88	Maintenance
	Roof Insulation	John Foster - Upper Gym	Gas	50,000	£ 1,550	LTM	NA	9.2	Maintenance
	Roof Insulation	Byrom Street - Ind Chem Lab	Gas	27,027	£ 838	LTM	NA	5	Maintenance
	Solar shading/free cooling/free cooling	Peter Jost	Electricity	TBA	TBA	TBA	TBA	TBA	Energy Budget
E1 DEVELOP NEW POLICIES & PROGRAMMES									
E1/2/1	Lighting Policy and lamp replacement programme	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
E1/2/2	Motors and Drives Policy - planned programme	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
E1/2/3	Boiler Replacement Policy and programme	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
E1/2/4	A/C Policy and associated control strategy	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
E1/2/5	Travel Policy	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
E1/2/6	TREND BMS Policy and controls programme	Campus Wide	Figures to be calculated following completion of Policy	TBA	TBA	TBA	TBA	TBA	TBA
F2 RENEWABLE ENERGY PROJECT									
	Photo Voltaics	Byrom Street Workshops	Electricity	30,000	£ 1,200	FPA	NA	15.69	Utilities Budget
X BUILDING DISPOSAL									
X/1	Blackburn Place	Building Disposal	Gas	80,000	£ 2,480	none	NA	14.72	N/A
X/2	Blackburn Place	Building Disposal	Electricity	12,000	£ 1,146	none	NA	6.48	N/A
X/3	2A Myrtle Street	Building Disposal	Gas	120,000	£ 3,720	none	NA	3.72	N/A
X/4	2A Myrtle Street	Building Disposal	Electricity	110,000	£ 10,505	none	NA	59.4	N/A
X/5	Castle House	Building Disposal	Gas	50,000	£ 1,550	none	NA	9.2	N/A
X/6	Castle House	Building Disposal	Electricity	100,000	£ 9,550	none	NA	54	N/A
E2 AWARENESS CAMPAIGN (Phase 2)									
E2/2/1	Awareness Campaign Phase 2 Part year	Campus wide	Gas	100113	£ 3,104	£ 15,000	4.83	18.5	Energy Budget
E2/2/2	Awareness Campaign Phase 2 Part year	0.5% saving in annual energy cons	Electricity	85715	£ 8,186	in above		45.8	Energy Budget
E1/2/7	EMAS scheme - ECCOCAMPUS	Campus wide	Gas/Elec	TBA	TBA	£12,000	TBA	TBA	Energy Budget
A19 TRAVEL & TRANSPORT									
A19/2/1	Provide more and secure cycle stores	SEE DONNA FOR INFO & POSSIBLE CO	To be determined			TBA			Energy Budget
F FEASIBILITY STUDIES									
F1/2/1	Review the feasibility for CHP	Byrom Street	Electricity	TBA	TBA	£ 15,570	TBA	TBA	Energy Budget
F4/2/1	Review of Space management & Shared resources	Campus Wide	Gas & Elec	TBA	TBA	TBA	TBA	TBA	Energy Budget
F3/2/1	Review of A/C equip and controls approx 300 units	Campus Wide	Electricity	TBA	TBA	£ 5,000	TBA	TBA	Energy Budget
F7/2/1	Review of motors and drives	Campus Wide	Electricity	TBA	TBA	£ 3,500	TBA	TBA	Energy Budget
F5/2/1	Review Waste to Landfill	Campus Wide assume 15% saving	Waste	TBA	£ 27,600	TBA	TBA	37.5	Energy Budget
F19/2/1	Review of Air, Rail and Car Travel Arrangements	Anticipate a 5% saving per year	Travel	TBA	£ 32,825	TBA	TBA	67	Energy Budget
F6/2/1	Upgrade/Review of IT/Server Room	Campus Wide	Electricity	to be determined	TBA	£8,000	TBA	TBA	Energy Budget
F6/2/2	Renewable Energy Applications	Campus Wide	Various	TBA	TBA	£5,000	TBA	TBA	Energy Budget
F6/2/3	Review of the Heating and Cooling Requirements	Kingsway House	Gas & Elec	TBA	TBA	£10,500	TBA	TBA	Energy Budget
F ENERGY AUDITS/SURVEYS									
	Energy Audits/Surveys - A/C	Various Buildings	Gas & Elec	TBA	TBA	£20,000	TBA	TBA	Energy Budget
TOTAL				2,817,639	£206,567	£534,495		942.35	

Main Budget Expenditure (Year 2)

Energy Conservation Budget	£	465,000
Maintenance Budget	not included	
Capital Development Budget	not included	
Salix Finance (Interest Free Loan)	£	69,495
Funding not allocated		
	£	534,495

Cost Saving (Year 2)

	£	206,567
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CO₂ Saving (year 2)

	942.35	tonne CO ₂
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Project Expenditure

Year	Expenditure
1	£ 502,042
2	£ 534,495
Total	£ 1,036,537

Estimated Cost Savings

Year	Savings	Cumulative
1	£ 288,393	£ 288,393
2	£ 288,393	£ 576,786
<i>Based on current utility costs excluding inflation</i>		

Estimated CO₂ Savings

Year	tonne CO ₂	% of Target	Cumulative
1	-	-	-
2	1684.64	45.01%	1684.64
Total		45.01%	



TABLE 10 - CARBON MANAGEMENT PROGRAMME

Year 3 Year 2011/12 Implementation Plan - Projects Identified to be completed in Year 3 Amended 3rd Year

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
F	FEASIBILITY								
F6/3/2	Green IT - Thin Clients	Campus Wide	Electricity	TBA		TBA			TBA
A12	BOILER REPLACEMENT								
A12/3/1	Replace existing with Condensing Boilers	IM Marsh Sports Hall	Gas	18,000	£ 558	£8,000	14	3.3	Energy Budget
A12/3/2	Replace existing with Condensing Boilers	IM Marsh Swimming Pool	Gas	250,000	£ 7,750	£90,000	12	11.6	Energy Budget
A2	LIGHTING CONTROLS								
A2	Lighting Controls	Campus Wide	Electricity	52,356	£ 5,000	£30,000	6	28.3	Energy Budget
E1	SAVINGS - NEW POLICIES & PROGRAMMES								
E1/3/2	T8 to T5 lamp replacement / Install high effic Lamps	Campus wide program say 5000 lamps	Electricity	250,000	£ 27,500	£180,000	6.55	135.6	
E1/3/2	Motors and Drives Policy - planned programme	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
E1/3/3	Boiler Replacement Policy and programme	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
E1/3/4	A/C Policy and associated control strategy	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
E1/3/5	Travel Policy	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
E1/3/6	TREND BMS Policy and controls programme	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
F6/3/1	Upgrade/Review of IT/Server Room	Campus Wide							Figures to be included following completion of Policy which will be completed in year 2
F1	PROJECTS FROM FEASIBILITY STUDIES								
F1/3/1	CHP Scheme	Byrom Street							Figures to be included following completion of Policy which will be completed in year 2
A3	LAMP CHANGES (LAMP CHANGE PROGRAMME)								
A3/3/1	T8 to T5 lamp changes	TBA	Electricity	52,300	£ 5,000	£40,000	8.00	26.0	
A11	UPGRADE TREND BMS CONTROLS								
A11/3/1	Trend BMS - Local Controls Upgrade	Haigh Building	Gas & Elec	64,800	£ 3,240	£10,000	5.73	13.76	Energy Budget
A11/3/2	Trend BMS - Local Controls Upgrade	Swimming Pool	Gas & Elec	190,000	£ 5,890	£20,000	3.40	28.55	Energy Budget
A11/3/3	Trend BMS - Local Controls Upgrade	Tithebarn Street/Avril Roberts	Gas	250,000	£ 7,750	£30,000	3.87	60.3	Energy Budget
A7	PLANNED CAPITAL DEVELOPMENT PROJECTS								
A7/3/2	Refurbishment - Cladding/Lighting	Byrom St Max Perutz Building	Gas & Elec	100,000	£ 3,500	Cap Devel	N/A	18.5	Cap Dev
A7/3/3	General Internal Refurbishment of Byrom Street Campus £1.5 million per year over seven years	General Refurbishment including lighting and lighting controls and high efficiency equipment	Electricity	35,000	£ 3,343	Cap Dev	N/A	18.55	Cap Dev
A7/3/4	First and Second Floor Refurbishment	Henry Cotton Building	Electricity	5,000	£ 478	Cap Dev	N/A	2.65	Cap Dev
A7/3/5	General Internal Refurbishment	Tithebarn Street	Gas & Elec	10,000	£ 1,100	Cap Dev	N/A	5.4	Cap Dev
A7/3/6	LRCc Refurbishment	Avril Roberts	Gas & Elec	30,000	£ 3,300	Cap Dev	N/A	16.2	Cap Dev
A7/3/7	LRCc Refurbishment	Aldham Roberts	Gas & Elec	20,000	£ 2,200	Cap Dev	N/A	10.8	Cap Dev
A7/3/8	LRCc Refurbishment	IM Marsh	Gas & Elec	9,000	£ 990	Cap Dev	N/A	4.86	Cap Dev
A6	INSTALL AMR TO UTILITY METERS								
A6/3/1	Phase 3 Sub Metering	None Fiscal	Gas	17,000	£ 527	£10,000	18.98	3.128	Energy Budget
A6/3/2	Phase 3 Sub Metering	None Fiscal	Electricity	10,000	£955	£10,000	10.47	5.4	Energy Budget
A6/3/2	Phase 3 Sub Metering	None Fiscal	Water			TBA			Energy Budget
E2	AWARENESS CAMPAIGN (Phase 3)								
E2/3/1	Awareness Campaign Phase 3	Campus wide	Gas	100113	£ 3,104	£ 15,000	4.83	18.5	Energy Budget
E2/3/2	Awareness Campaign Phase 3	0.5% saving in annual energy costs	Electricity	85715	£ 8,186	in above		45.8	Energy Budget
E1/3/7	BMAS scheme - ECO CAMPUS	Campus Wide	Gas & Elec	inc above	inc above	£12,000	inc above	inc above	Energy Budget
E2	BUSINESS RAIL AND AIR TRAVEL								
A18/2/1	Review of Air, Rail and Car Travel Arrangements	Anticipate a 5% saving per year	Travel		£ 32,825			67	Energy Budget
E2	SWIMMING POOL COVER								
	Swimming Pool Cover	IM Marsh Pool	Gas & Elec	90,000	£ 3,571	£25,000	7	16.56	Energy Budget
TOTAL				1,639,284	£ 126,766	£480,000		540.77	

Main Budget Expenditure (Year 3)

Energy Conservation Budget	£	470,000
Maintenance Budget	£	-
Capital Development Budget		Not included
Salix Finance (Interest Free Loan)		Not included
Funding not allocated	£	10,000
Total	£	480,000

Cost Saving (Year 3)

£126,766

CO₂ Saving (year 3)

540.77 tonne CO₂

Project Expenditure

Year	Expenditure
1	£ 502,042
2	£ 534,495
3	£ 480,000
Total	£ 1,516,537

Estimated Cost Savings

Year	Savings	Cumulative
1		-
2	£288,393	£ 288,393
3	£206,567	£ 783,354

Based on current utility costs excluding inflation

Estimated CO₂ Savings

Year	tonne CO ₂	% of Target	Cumulative
1			-
2	1684.64	45.01%	1684.64
3	942.35	25.18%	4311.62
Total		70.19%	

TABLE 11 - CARBON MANAGEMENT PROGRAMME

Year 4 **Year 2012/13** **Implementation Plan - Projects Identified to be completed in Year 4** Amended Fourth Year

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
A12	BOILER REPLACEMENT PROGRAMME								
A12/4/1	Replace existing with Condensing Boilers	Aldham Roberts	Gas	122,500	3797.5	75,000	20	22.7	Energy Budget
A12/4/2	Replace existing with Condensing Boilers	IM Marsh Egg B/H	Gas	15,000	465	8,000	17	2.8	Energy Budget
A12/4/3	Replace existing with Condensing Boilers	IM Marsh Barkhill Mossley	Gas	250,000	7750	88,000	11	46.3	Energy Budget
A12/4/4	Replace existing with Condensing Boilers	Byrom Street Max Perutz B/House	Gas	100,000	3100	64,000	21	18.5	Energy Budget
A2	LIGHTING CONTROLS								
A2/4/1	Lighting Controls (15 areas at £250)	IM Marsh Science Bdg	Electricity	6,900	659	3,750	5.7	3.76	Energy Budget
A2/4/2	Lighting Controls (20 areas at 250)	IM Marsh Mossley	Electricity	9,100	869	5,000	5.8	4.89	Energy Budget
A2/4/3	Lighting Controls (20 areas at 250)	IM Marsh Barkhill	Electricity	9,100	869	5,000	5.8	4.89	Energy Budget
A2/4/4	Lighting Controls	IM Marsh Refectory	Electricity	1,450	138	800	5.8	0.78	Energy Budget
A7	BUILDING FABRIC UPGRADE PROGRAMME								
A7/4/1	Draughtproof 70 windows @ £60/window	Haigh Building	Gas	22,000	682	4,200	6.2	4.07	Energy Budget
A7/4/2	Draughtproof 50 windows @ £60/window	Joe Makin Building	Gas	16,000	496	3,000	6.0	2.96	Energy Budget
A7/4/3	Draughtproof 50 windows @ £60/window	Aquinas Building	Gas	14,000	434	3,000	6.9	2.59	Energy Budget
A7/4/4	Draughtproof 120 windows @ £60/window	Rodney House	Gas	41,000	1271	7,200	5.7	7.59	Energy Budget
A7/4/5	Draughtproof 120 windows @ £60/window	Edgerton/Roscoe Court	Gas	38,000	1178	7,200	6.1	7.05	Energy Budget
A7/4/6	Draughtproof 50 Windows	IM Marsh Holmfield House	Gas	15,000	465	3,000	6.5	2.78	Energy Budget
A7/4/7	Draughtproofing 200 windows	Barkhill and Mossley	Gas	57,000	1767	12,000	6.8	10.55	Energy Budget
A7/4/8	Draughtproofing 250 windows	Tithern Street	Gas	70,000	2170	15,000	6.9	12.95	Energy Budget
A7/4/9	Over Cladding/Refurbishment	Max Perutz	Gas	200,000	£6,200	TBA		37	Energy Budget
A11	UPGRADE TREND CONTROLS								
A11/4/1	Trend BMS - Local Controls Upgrade	Byrom St - Max Perutz	Gas & Elec	26,000	1660	8,000	17.86	17	Energy Budget
A11/4/2	Trend BMS - Local Controls Upgrade	Henry Cotton	Electricity	30,000	2865	8,000	2.79232	34.07	Energy Budget
A11/4/3	Trend BMS - Local Controls Upgrade	Joe Makin Building	Gas & Elec	20,755	802	5,000	6.23441	4.2	Energy Budget
A11/4/4	Trend BMS - Local Controls Upgrade	Marybone Lecture Theatre	Electricity	10,000	£550	5,000	9.09	5.4	Energy Budget
F	FEASIBILITY								
F1/3/2	Review the feasibility for CHP	IM Marsh Swimming Pool	Gas & Elec	210,000	£ 12,600	150,000	11.90	74.55	Energy Budget
E2	AWARENESS CAMPAIGN (Phase 4)								
E2/4/1	Awareness Campaign Phase 4	Campus wide	Gas	100113	£ 3,104	£ 15,000	4.83	18.5	Energy Budget
E2/4/2	Awareness Campaign Phase 4	5.5% saving in annual energy costs	Electricity	85715	£ 8,186	in above		45.8	Energy Budget
E1/4/7	EMAS scheme - ECO CAMPUS		Gas & Elec	inc above	inc above	£12,000	inc above	inc above	Energy Budget
E2	Rail and Air Travel								
A18/4/1	Review of Air, Rail and Car Travel Arrangements	anticipate a 5% saving per year	Travel		£ 32,825			67	Energy Budget
A7	PLANNED CAPITAL DEVELOPMENT PROGRAMME								
A7/4/10	General Internal Refurbishment of Byrom Street Campus £1.5 million per year over seven years	General Refurbishment including lighting and lighting controls and high efficiency equipment	Electricity	35,000	3343	Cap Dev		18.55	Cap Dev
X	BUILDING DISPOSAL								
A7/4/11	Refurbishment and removal of modular building	John Foster Building	Oil					72.1	TBA
TOTAL				1,504,633	£ 98,245	507,150		549.21	

Main Budget Expenditure (Year 4)

Energy Conservation Budget	£	470,000
Maintenance Budget	£	-
Capital Development Budget		Not included
Salix Finance (Interest Free Loan)		Not included
Funding not allocated	£	37,150
	£	507,150

Cost Saving (Year 4)

£ 98,245

CO₂ Saving (year 4)

549.21 tonne CO₂

Project Expenditure

Year	Expenditure
1	£ 502,042
2	£ 534,495
3	£ 480,000
4	£ 507,150
Total	£ 2,023,687

Estimated Cost Savings

Year	Savings	Cumulative
1	£ 288,393	£ 288,393
2	£ 206,567	£ 783,354
3	£ 126,766	£ 1,405,081
Total		

Based on current utility costs excluding inflation

Estimated CO₂ Savings

Year	tonne CO ₂	% of Target	Cumulative
1			
2	1684.64	45.01%	1684.64
3	942.35	25.18%	4311.62
4	540.77	14.45%	7479.38
Total		84.64%	



TABLE 12 - CARBON MANAGEMENT PROGRAMME

Year 5 Year 2013/14 Implementation Plan - Projects Identified to be completed in Year 5 Amended Year 5

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
A12	BOILER REPLACEMENT PROGRAMME								
A12/5/1	Replace existing w ith Condensing Boilers	J Makin	Gas	29,662	920	£25,000	27	5.49	none funded
A12/5/2	Replace existing w ith Condensing Boilers	Haigh Building	Gas	89,716	2,781	£60,000	22	16.6	none funded
A12/5/3	Replace existing w ith Condensing Boilers	Byrom Street Peter Jost	Gas	80,000	2,480	£45,000	18	14.8	none funded
A12/5/4	Replace existing w ith Condensing Boilers	Tithebarn/Avril Roberts	Gas	200,000	6,200	£180,000	29	37	none funded
A12/5/5	Replace existing w ith Condensing Boilers	Rodney House	Gas	40,000	1,240	£75,000	60	7.4	none funded
A12/5/6	Replace existing w ith Condensing Boilers	John Foster Bdg	Gas	300,000	9,300	£180,000	19	55.5	none funded
A12/5/7	Replace existing w ith Condensing Boilers	Byrom Street BH No 1	Gas	250,000	7,750	£85,000	11	46.3	Energy Budget
A12/5/8	Replace existing w ith Condensing Boilers	Henry Cotton Building	Gas	50,000	1,550	£60,000	39	9.25	none funded
A12/5/9	Replace existing w ith Condensing Boilers	2,4,6 Rodney Street	Gas	20,000	620	£26,000	42	3.7	none funded
A7	BUILDING FABRIC UPGRADE PROGRAMME								
A7/5/1	Draughtproof 500 w indow s @ £60/w indow	John Foster Building	Gas	130,000	4,030	£30,000	6.59	15.05	none funded
A7	SWIMMING POOL								
A7/5/2	Pool Cover	IM Marsh Sw imming Pool	Gas	45,000	1,395	£20,000	14.34	8.325	Energy Budget
A11	UPGRADE TREND BSM CONTROLS								
A11/5/1	Trend BMS - Local Controls Upgrade	Edgerton/Roscoe Court	Gas & Ele	20,000	1,225	£20,000	16.3265306	6.19	none funded
A11/5/2	Trend BMS - Local Controls Upgrade	John Foster Building	Gas & Ele	168,184	6,786	£25,000	4.57	35.37	none funded
E2	AWARENESS CAMPAIGN (Phase 5)								
E2/2/1	Aw areness Campaign Phase 5	Campus wide	Gas	100113	£ 3,104	£ 15,000	4.83	18.5	Energy Budget
E2/2/2	Aw areness Campaign Phase 5	0.5% saving in annual energy cons	Electricity	85715	£ 8,186	in above		45.8	Energy Budget
E1/2/7	EMAS scheme - ECCOCAMPUS								
E2	Rail and Air Travel								
A18/2/1	Review of Air, Rail and Car Travel Arrangem	Anticipate a 5% saving per year	Travel		£ 32,825			67	Energy Budget
A7	PLANNED CAPITAL DEVELOPMENT PROGRAMME								
A7/5/3	High energy efficiency environmental package and utility monitoring	Byrom St - Moving Life Science Support to Max Perutz	Gas & Ele	150,000	8,000	Cap Dev		52.5	Cap Dev
A7/5/4	General Internal Refurbishment of Byrom Street Campus £1.5 million per year over seven years	General Refurbishment including lighting and lighting controls and high efficiency equipment	Electricity	35,000	3,343	Cap Dev		18.55	Cap Dev
TOTAL				1,793,390	101,733	£858,000		463.26	

Main Budget Expenditure (Year 5)

Energy Conservation Budget	£	470,000
Maintenance Budget	£	-
Capital Development Budget		Not included
Salix Finance (Interest Free Loan)		Not included
Funding not allocated	£	388,000
	£	858,000

Cost Saving (Year 5)

£ 101,733

CO₂ Saving (year 5)

463.26 tonne CO₂

Project Expenditure

Year	Expenditure
1	£ 502,042
2	£ 534,495
3	£ 480,000
4	£ 507,150
5	£ 858,000
Total	£ 2,881,687

Estimated Cost Savings

Year	Savings	Cumulative
1	£	
2	£ 288,393	£ 288,393
3	£ 206,567	£ 783,354
4	£ 126,766	£ 1,405,081
5	£ 98,245	£ 2,125,052

Based on current utility costs excluding inflation

Estimated CO₂ Savings

Year	tonne CO ₂	% of Target	Cumulative
1			
2	1684.64	45.0%	1684.64
3	942.35	25.2%	4311.62
4	540.77	14.4%	7479.38
5	549.21	14.7%	11196.34
Total		99.31%	

TABLE 13 - CARBON MANAGEMENT PROGRAMME

Year 6 Finance Year 2014/15 Implementation Plan - Projects Identified to be completed in Year 6

Project Ref	Description of Project	Site/Building	Energy Type	Estimated Saving kWh	Financial Saving £	Capital Cost £	Payback Period Years	Annual CO ₂ Saved	Funding Source
A1	EFFICIENT MOTOR DRIVES								
A1/6/1	Install High Efficiency motors & Inverters	Campus wide programme		Figures to be included following completion of Policy which will be completed in year 2					
A5	VOLTAGE REDUCTION CONTROLS								
A5/1/1	Voltage Optimisation	ADA	Electricity	110,000	£ 10,505	£48,500	4.62	59.7	Energy Budget
A5/6/1	Voltage Optimisation	Henry Cotton	Electricity	73,000	£ 6,972	£40,000	5.74	39.6	Energy Budget
A5/6/2	Voltage Optimisation	Kingsway House	Electricity	54,500	£ 5,205	£32,000	6.15	29.6	Energy Budget
A12	BOILER REPLACEMENT PROGRAMME								
A12/6/1	Replace with Condensing Boilers	IM Marsh Science Block	Gas	129,032	£ 4,000	£80,000	20	23.7	Energy Budget
A12/2/1	Replace with Condensing Boilers	Aquinas Building	Gas	48,000	£ 1,680	£36,000	21	8.9	Energy Budget
A3	LAMP CHANGES (LAMP CHANGE PROGRAMME)								
A3/6/1	Install LED Lamps to External Lamps	John Foster Campus	Electricity	11,635	£ 1,111	£10,000	9	6.3	Energy Budget
A3/6/2	Install LED Lamps to external lighting	IM Marsh Campus	Electricity	9,519	£ 909	£10,000	11	5.1	Energy Budget
A3/6/3	Replace all Stairwell 2D type lamps with LED	Campus wide (approx 200 lamps)	Electricity	16,000	£ 1,760	£12,000	6.82	8.7	Energy Budget
A3/6/4	T8 to T5 lamp replacement / Install high effc Lamps	Campus wide program say 5000 lamps	Electricity	275,000	£ 30,250	£150,000	4.96	149.2	Energy Budget
A2	LIGHTING CONTROLS PROGRAMME								
A2/6/1	Install Lighting Controls	Campus wide	Electricity	54,550	£ 5,210	£30,000	5.76	29.588	Energy Budget
	PLANNED CAPITAL DEVELOPMENT PROJECTS								
	TBA								
	BUILDING FABRIC UPGRADE								
A7/2/6	Cavity Wall insulation	Byrom Street Phase 1	Gas	150,000	£ 4,650	TBA		27.75	none funded
F2	RENEWABLE ENERGY PROJECTS								
F2/6/1	Photo Voltaics	IM Marsh (Sports Hall Roof)	Electricity	43,000	£ 1,720	PPA	N/A	22.489	Utilities Budget
F2/6/2	Photo Voltaics	Byrom Street Peter Jost (Roof)	Electricity	31,000	£ 1,240	PPA	N/A	16.213	Utilities Budget
F2/6/3	Photo Voltaics	Byrom Street Max Perutz	Electricity	tba	tba	PPA	N/A	tba	Utilities Budget
A11	UPGRADE BMS CONTROLS PROGRAMME								
A11/6/1	Upgrade 20 year old Controls - From IQ 1 to IQ 2/3	Campus Wide Programme	Gas & Elec	tba	tba	£100,000	tba	tba	Energy Budget
	(£100,000/year Programme)								
E2	Rail and Air Travel								
A18/2/1	Review of Air, Rail and Car Travel Arrangements	Anticipate a 5% saving per year	Travel		£ 32,825			67	Energy Budget
F	FEASIBILITY STUDIES								
	TBA								
E2	AWARENESS CAMPAIGN PHASE 6								
E2/2/1	Awareness Campaign Phase 5	Campus wide	Gas	100113	£ 3,104	£ 15,000	4.83	18.5	Energy Budget
E2/2/2	Awareness Campaign Phase 5	inc 0.5% saving in annual energy consu	Electricity	85715	£ 8,186	in above		45.8	Energy Budget
E1/2/7	EMAS scheme - ECOAMPUS		Gas & Elec	inc above	inc above	£12,000	inc above	inc above	Energy Budget
	TOTAL			1,191,064	£ 119,325	£575,500		558.06	

Main Budget Expenditure

Energy Conservation Budget	£	470,000
Maintenance Budget	Not included	
Capital Development Budget	Not included	
PPA - Power Purchase Agreement (*5 year agreement)	Not included	
Utility Budget	Not included	
Funding not allocated	£	105,500
		£575,500

Year 6 Cost Saving

£ 119,325

CO₂ Saving

558.06 tonne CO₂

Project Expenditure

Year	Expenditure
1	£ 502,042
2	£ 534,495
3	£ 480,000
4	£ 507,150
5	£ 858,000
6	£ 575,500
Total	£ 3,457,187

Estimated Cost Savings

Year	Savings	Cumulative
1	£	
2	£ 288,393	£ 288,393
3	£ 206,567	£ 783,354
4	£ 126,766	£ 1,405,081
5	£ 98,245	£ 2,125,052
6	£ 101,733	£ 2,946,757
7	£ 119,325	£ 3,887,787

Based on current utility costs excluding inflation

Estimated CO₂ Savings

Year	tonne CO ₂	% of Target	Cumulative
1			
2	1684.64	45.0%	1684.64
3	942.35	25.2%	4311.62
4	540.77	14.4%	7479.38
5	549.21	14.7%	11196.35
6	463.26	12.4%	15376.58
7	558.06	14.9%	20114.87
Total	4738	126.60%	

APPENDIX A

Sustainable Procurement Policy

Introduction

This policy should be read in conjunction with the University's Procurement Strategy which makes reference to sustainability, sustainable development, assessing the impact of procurement activity upon the environment and local economy and developing ethical criteria in supplier and product/service selection.

In giving guidance to budget holders, buyers and suppliers on how Liverpool John Moores University (LJMU) is promoting and delivering sustainable procurement, this policy aims to:

- Outline the good practices LJMU has adopted to promote sustainable procurement;
- Describe how LJMU is helping its buyers achieve sustainable procurement/purchasing;
- Emphasise the importance for LJMU of sustainable procurement in meeting its carbon management targets.

Definitions of Sustainable Procurement and Purchasing

Sustainable procurement has been defined as "A process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole-life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment" (Sustainable Procurement Taskforce, Procuring the Future, June 2006).

The Higher Education Partnership for Sustainability's guidance on Purchasing for Sustainability, June 2003, gives a very clear statement for buyers.

"Sustainable purchasing is all about taking environmental and social factors into account in purchasing decisions. It's about looking at what your products are made of, where they come from and who has made them. It's even about looking at whether you need to make the purchase at all. If you consider all these factors, you can make better choices about what you buy, who you buy it from and how often you buy it. Ultimately, it is about minimising the environmental and social impacts of the purchases you make."

Good practices already established within LJMU

LJMU already has several arrangements in place that promote sustainability and sustainable procurement. Examples include:

- General Purchasing Advice from Procurement Services Team and from Property Services on Environmental Sustainability;
- Main commodities – e.g. furniture, stationery, computers - already assessed for their sustainability in the tender exercises as part of the national, or regional or local collaborative contracts;
- Policy of Fairtrade promotion, with LJMU and LSU (Liverpool Students' Union) jointly being recognised as a Fairtrade University by the Fairtrade Foundations since December 2005;
- Signatory since December 2005 to WRAP (Waste & Resources Action Programme) for recycled paper content;

- PRINT Strategy that focuses on document management systems and multifunctional devices and Print Room machines that are energy saving and use fewer consumables;
- Carbon Trust Foundation membership;
- Very Good BREEAM rating set for building developments;
- 15% of LJMU's electrical energy purchased from renewable sources;
- Procurement of materials and consumables from local or regional sources along recognised ethical lines where possible, including: legal and sustainable timber; locally produced, fair trade and organic food or beverages; and environmentally friendly stationery;
- Presentations to social enterprise organisations and others on Public Sector Buying;
- Signatory in June 2009 to StepClever 'Step Up to Supply' Buy-side project;
- Regular discussions with suppliers about sustainable issues as part of supplier relationship management.

The Procurement Services Team can provide further information on these and other actions already in place.

This policy extends the scope of this good work by:

- Reminding all staff that they should start by assessing whether they need to make a purchase;
- Promoting across the university the 3Rs – Reduce, Reuse and Recycle - whenever possible, and thus limit consumption through demand management;
- Encouraging buyers and budget holders to consider the life time costs of products including maintenance, energy consumption and disposal costs;
- Advising all buyers to consider the most energy efficient product and to select only those with the highest energy efficient rating where energy ratings apply, if possible. For instance for domestic electrical appliances, a rating of A or AA (according to type of appliance) identifies the most energy efficient products. Reducing LJMU's electricity consumption is essential in helping LJMU achieve its Carbon Management Plan targets.
- Encouraging staff to consider whether business travel is necessary when email contact and virtual meetings are possible and to choose more sustainable forms where travel is required;
- Reminding staff of the importance of buying goods at frequencies and in quantities that reduce delivery loads and packaging;
- Stressing to budget holders and buyers the need to use established contracts and ordering routines since, in general terms, both of these contribute to sounder environmental performance;
- Alerting staff to search for products with eco/green labels, e.g. as displayed in <http://www.defra.gov.uk/environment/business/marketing/glc/documents/shoppers-guide.pdf>;
- Assessing products from approved suppliers with an aim to encourage buying of only the most sustainable products, where economically viable.
- Advising staff to consider suppliers' environmental and social credentials, as far as is legally practicable, in the tender/PQQ (Pre Qualification Questionnaire) stage of the contract process.

Importance of Sustainable Procurement



Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. LJMU will pursue this aim wherever possible. The Procurement Services Team will continue to develop or adopt contracts that deliver sustainable procurement because to do otherwise puts at risk LJMU's reputation as an organisation that is concerned with corporate social responsibility, committed to carbon reduction and keen to promote social justice and equity.

Implementing the Policy

The Pro Vice-Chancellor (Infrastructure) is the Strategic Management Group (SMG) member with responsibility for ensuring that LJMU continues to develop its good practice in sustainable procurement.

The Executive Director, Infrastructure Planning, is responsible for implementing the actions that arise from this policy and reporting on their impact.

The Procurement Services Team at all times seeks to achieve sustainable procurement whenever possible - as contracts are negotiated, when assessing suppliers for goods, services and works, and in advising buyers about the specifications to include in their requisitions. It routinely advises LJMU's Network of Buyers, budget holders and staff generally about good practice. It provides training for staff about green labels and purchasing routines that are more environmentally friendly.

All members of staff should recognise that they can actively contribute to promoting and achieving ethical and environmental purchasing and sustainable procurement.

Policy prepared in December 2010 and to be reviewed annually

APPENDIX B

“GETTING GREENER” - AWARENESS CAMPAIGN: Communications Action Plan 2010 - 2015

Objectives of Getting Greener Awareness Campaign

- To raise awareness of LJMU’s environmental agenda and encourage “greener” behaviour across the university.
- To engage and encourage all staff to actively participate by considering the way they undertake their daily activities.
- To embed behavioural change and maintain “greener” behaviour in all working practices.
- To assist in reaching carbon reduction targets by collective reduction in carbon and energy use by staff through raised levels of awareness.
- To work closely with the LSU to align university campaign with LSU green initiatives and to actively raise awareness and encourage behaviour change for students from academic year 2011- 2012.

The getting greener campaign will take detailed focus from the Carbon Management Plan and the Eco Campus frameworks; however it is important to note that the campaign also seeks to endorse and reflect the University’s wider corporate social responsibility agenda and provide a structure for bringing together and communicating all sustainability initiatives.

Targets of the campaign

Overall target: to assist LJMU to reduce carbon emission by 25% by 2015 against the 2008/2009 baseline figures contained within the Carbon Management Plan (CMP). There is an assumed 1.5% annual energy saving incorporated into the implementation plan (Table 12) of the CMP from this campaign for years 2009/10 and 2010/11.

The getting greener campaign will be the main marketing and communication tool to assist in the behavioural changes needed to help achieve this.

In order to be successful the campaign messages necessitate both a bottom up and top down approach; in encouraging individuals’ behavioural changes and in promoting changes in university practices and infrastructure decided at the strategic level. The campaign must therefore be proactive in communicating this senior support to assist in encouraging engagement of staff and students alongside encouraging individualisation of potential actions and benefits.

Measurable targets

- The success of the campaign will be partially measured by the monitoring of the targets within the CMP. The awareness campaign will report on progress on scheduled carbon abatement and embedding projects the details of which are defined within the CMP. The main tools for reporting progress and success will be the web pages and staff news items and news updates.

The scope of CMP currently includes measures for reducing emissions from:-

- Utilities use (gas, electricity and water) in all university managed buildings
- Fleet transport (university owned vehicles)
- Business air and rail travel
- Staff car mileage
- Waste Management

Sources of emissions to be considered in the future and extending this scope include:

- Staff and student commuting (targets within Travel Plans)
 - Student placement travel
 - Visitor, contractor and supplier travel
 - Resource consumption other than utilities
 - Car and coach hire
 - Procurement, including supplier chain
- A staff quiz will be undertaken in Nov/ Dec 2010 the response rates and results will provide a baseline for staff awareness. The quiz will then be repeated in Nov / Dec 2011 to ascertain changes in awareness levels.
 - The staff suggestions scheme will be promoted to allow staff to make formal suggestions for green initiatives. The type and amount of suggestions will be monitored as an indication of raising levels of awareness and engagement.
 - The getting greener email will be monitored to ascertain support and allow staff and students to highlight projects / research taking place within their school / department. The type and numbers of emails coming though on a monthly basis will be monitored.
 - Statistics will be provided by the web team on hits to the “getting greener” web pages and these will be reported on a monthly basis.

Staff Behavioural Influences

The following areas have been identified as areas in which staff can participate and take individual actions.

- Air conditioning usage
- Switching off lights
- Procurement – energy rating of electrical equipment, supplier chains
- Recycling
- Travel – business and commuter
- Screens – turning off (alongside Night Watch Man for PCs)
- Projectors and AV equipment
- Plasma Screens

Action Plan for Getting Greener Campaign 2010 – 2011

The following shows a detailed action plan for the Getting Greener Campaign for the next 12 months from November 2010.

Outcomes will be monitored and the plan will be updated annually.

	Aim	Outcomes	Timeframe	Responsibility
1	Staff quiz - to achieve an understanding of the baseline of staff awareness of environmental issues and the CMP	<ul style="list-style-type: none"> • Online quiz to take place Nov/ Dec 2010 • Snapshot questions to obtain basic baseline of awareness and ascertain interest via response rate • Green prizes to be given as incentives 	<p>Quiz to be launched w/c 29th Nov</p> <p>Quiz to run for approx 2 weeks till 10th Dec, prizes drawn w/c 13th Dec</p> <p>Analysis to take place and be reported w/c 10th Jan</p>	<ul style="list-style-type: none"> • BS/IW to provide questions and guidance on prizes • BS to purchase prizes • DG and CC to edit and publish quiz using Bristol online • CC to design promotional material and DG/ BS to assist in distribution
2	Utilise IT to promote quiz and campaign messages	<ul style="list-style-type: none"> • To promote the quiz and research potential of pop up box on log in • Use screen savers to highlight messages regarding turning off PCs / Screens • Use screen savers and message on plasma • Encourage staff to turn off projectors and AV in lecture and seminars rooms 	To commence Nov 2010 and then ongoing	<ul style="list-style-type: none"> • DG/ CC to speak to Mark Wynne re the use of screensavers and pop up screens to promote messages • IW/ BS to decide on use of signage near projectors/AV equipment to encourage switch off
3	Communication of implemented initiatives / good news stories	<p>Reports on progress and completion of the following projects taken from :-</p> <ul style="list-style-type: none"> • Insulation – plant rooms • Overcladding – Byrom Street • Biomass boiler • Lamp Changes • Lighting controls • Travel Plan initiatives • Voltage reduction controls • Eco roofs 	<p>To commence Nov 2010 and then ongoing .</p> <p>Updates to be included on web / in news items about savings made after designated period i.e. six months, annually etc</p> <p>Order of communication</p>	<ul style="list-style-type: none"> • IW/BS to feed information and data to DG • DG to provide draft articles to CC • CC to finalise copy and publish

		<ul style="list-style-type: none"> • LED lighting • Wood burner – ADA 	to be decided by IW/BS	
4	Feasibility studies communication of progress and potential implementation	<p>Highlight planned and potential feasibility studies and how they will fit into achieving CMP targets</p> <p>Potential studies include:-</p> <ul style="list-style-type: none"> • CHP • Solar Thermal applications • Photo Voltaics • Cavity Wall insulation • Space Management and shared resources • Review of A/C equip and controls • Review of electric motors and drives • Review Waste to landfill • Review of business travel arrangements • Upgrade / review of IT/ server room • Green IT – thin clients – new data room 	Commencing January 2011 and then ongoing with monthly updates	<ul style="list-style-type: none"> • IW/ BS to advise information and details to DG • DG/CC to draft copy for website and news items • CC to finalise and publish copy
5	Open days / road shows	<p>Three roadshows to be planned – one at each campus site - to be open to staff and students</p> <p>External partners to be invited to attend and provide stands and promotional materials including Sita, Carbon Trusts, Gas and Electrical suppliers etc</p>	Events to be tied into national campaigns and dates of internal promotions – timings to be confirmed. Events to take place between Jan – Nov 2011	<ul style="list-style-type: none"> • Planning and resources to be confirmed at next meeting of getting greener campaign team meeting – November 2010 • BS/DG to explore resources and tying into national events • CC to offer guidance and support in design and printing of LJMU branded materials.
6	Embedding “green	To embed knowledge of green initiatives, CMP, CRC and encourage	Planning stages	<ul style="list-style-type: none"> • To be discussed at next meeting



	behaviour”	<p>green behaviours via staff inductions, training and PDPR process.</p> <p>To engage with faculty and academic staff and current and potential research topics for staff / students</p>	from Jan 2011	<p>of the getting greener campaign team</p> <ul style="list-style-type: none"> • SB to advise of HR perspective and inclusion of green awareness message at staff induction • Possibility of a green on line training module to be explored by campaign team • MR to offer guidance to campaign team on engaging with faculty / academic staff
7	Setting the awareness campaign within broader CSR and sustainability context	<p>Incorporating the campaign messages and targets into LJMU’s CSR agenda.</p> <p>Utilising the website and other marketing tools to provide the structure to bring all sustainability initiatives together in a coherent and uniform manner.</p>	To commence Nov 2010	<ul style="list-style-type: none"> • IW to speak to Paul Evans about how the campaign, CMP and all ongoing initiatives sit within the CSR agenda • IW to feed back to awareness campaign team to decide on the next steps • CC and DG to explore requirements for changes to the web structure

(abbreviations of staff: DG – Donna Gutteridge, BS – Bob Steventon, IW – Ian Webster, CC – Corporate Communications, SB – Samantha Birkett, MR-Mike Reilly)

APPENDIX C

ENVIRONMENTAL POLICY

Liverpool John Moores University Environmental Policy

Aims

As part of its corporate identity, the University is committed to the implementation and promotion of sustainable policies which aim to minimise environmental impact wherever it occurs, and maximise energy efficiency, resource conservation and the recycling of waste.

In accordance with its role as a provider of quality education, the University will seek to integrate environmental principles into the curriculum, research activities, staff development and in its relationships with the wider community.

1. Principles

The University recognises that it has environmental responsibilities as both a globally recognised institution and as a local provider of employment, knowledge and community relations. The University is therefore committed to principles of sustainability which where possible minimise carbon use (and its contribution to climate change) and the consumption of natural resources in all of its operations.

The University acknowledges the relationship between environmental impact and human rights, is committed to a policy of ethical procurement, and works to promote these values with its staff, students and clients.

2. Responsibility

In accordance with its environmental aims and principles, the University recognises:

- The environmental regulation, law and codes of practice are essential benchmarks for the implementation of the environment policy.
- The implementation of the environment policy is dependent on an effective management system.
- The acknowledgement of the important contribution that all of its staff can make through participating in and promoting sustainable activities, whether in their professional or personal lives.
- The need for continuously updating and improving its environment policy through the production of annual performance reviews, the setting of environmental action plans and targets.
- It's committed to informing its staff, students, suppliers and other clients of its environment policy, and to work to minimise the impact that their actions are having on the environment.

3. Reducing Environmental Impact

In accordance with its environmental aims and principles, the University will:

- Endeavour to promote a comprehensive energy conservation and efficiency strategy, and to source electricity from renewable sources where possible.
<http://www.ljmu.ac.uk/Sustainability/index.htm>
http://www.ljmu.ac.uk/PRS/PRS_docs/CARBON_MANAGEMENT_PLAN_LJMU_15-03-10.pdf
- Encourage staff, students and clients to participate in more sustainable forms of transport, such as cycling, car sharing, and public transport, including minimising air travel where possible.
<http://www.ljmu.ac.uk/Sustainability/index.htm>
- Endeavour to minimise waste in all its operations through the prevention of unnecessary waste, reusing of materials and recycling, and the establishment of water saving technologies where possible. <http://www.ljmu.ac.uk/Sustainability/84921.htm>
- Maximise the procurement of materials and consumables from local or regional sources along recognised ethical lines where possible, including: Legal and sustainable timber; locally

produced, fair trade and organic food or beverages; and environmentally friendly stationery and office equipment. <http://www.ljmu.ac.uk/infrastructure/70595.htm>

- Endeavour to ensure that refurbishments to existing buildings and the planning and execution of new buildings reflect an environmentally-responsible approach to the use of materials and methods of construction, including the automatic consideration of renewable energy sources for new buildings.
- Ensure that the management of University land will be along environmentally responsible lines including the promotion of wildlife conservation, facilitating biodiversity, and discouraging the use of pesticides and other harmful chemicals and known toxins.
- Assess and monitor the environmental impact of its suppliers and work with them to improve their performance.

4. Administrative and Management Arrangements

- The University has appointed an Energy & Environment Manager; and a Waste & Recycling Manager with specific responsibilities in relation to the environmentally sound energy consumption and waste management. Both are supported by a volunteer network of Sustainability Coordinators across Faculties and Services.
- The University has centralised Procurement Management arrangements to support environmentally friendly and ethical procurement.
- The University has an Award Winning Travel Plan in place, which is kept under review, by a designated Travel Planning Officer.
- The University's Corporate Social Responsibility Agenda, including environmental sustainability, is shaped and overseen by the CSR Special Interest Group of the Strategic Management Group (SMG)
- The University has a Carbon Management Plan with Scope 1, Scope 2 and Scope 3 carbon emission reduction targets.
- The university signed up to the HE Ecocampus Scheme in October 2010
- The Carbon Management Project Board has included within its terms of reference for reporting environmental issues associated with Carbon Management and the Ecocampus scheme.

The University seeks to:

- Promote resource efficiency (including energy, transport and water use associated with the day to day activities and with new developments)
- The promotion of environmentally friendly purchasing
- Managing the University's estate in an environmentally sensitive manner
- Raising the awareness of staff and students of all the University's environmental impact and performance by promoting good practice.

An essential feature of the above is an Environmental Management System (EMS) such as Ecocampus and a commitment to improving environmental performance.

5. Targets and Action Plans

- The targets and action plans associated with mitigating our environmental impacts are included within our Carbon Management Plan and will be continuously developed through our commitment to progress through the various award stages relating to the HE Ecocampus scheme. http://www.ljmu.ac.uk/PRS/PRS_docs/CARBON_MANAGEMENT_PLAN_LJMU_15-03-10.pdf

6. Implementation and Responsibility

The Pro Vice-Chancellor (Infrastructure) is the Strategic Management Group (SMG) member with responsibility for ensuring that LJMU continues to develop its good practice in environmental management.

Reporting: *Being updated for approval for approval during March 2011*