Leeds Arts University

Carbon Management Plan

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Foreword by the University Principal

I am pleased to introduce Leeds Arts University Carbon Management Plan, which formalises our commitment to putting sustainability at the heart of activities, including any new build projects/refurbishments, the operation of existing buildings and processes and within the activities carried out by our students and staff. The Carbon Management Plan aims to drive change which is necessary to lessen our impact on the environment.

The Carbon Trust's 2009 carbon audit of the University and subsequent recommendations formed the initial stages of our action plan and are fully supported by the senior management team. The plan will help the University realise its vision of developing its core business in a more sustainable way. Two key aims will be accomplished through the implementation of the carbon reduction projects identified in this report: making a significant contribution to HEFCE, government and global carbon reduction goals; and controlling a major operating cost. As a resource intensive institution we are a major consumer of energy and by reducing our usage we are freeing up funds which can be spent in a variety of ways to further improve the student experience and reduce our carbon footprint.

At the outset of the programme, I asked the team to set an aspirational target for the University. I believe that the reduction compared to the business as usual baseline that we are aiming to achieve provides a challenging but attainable target and that we will continue to look for further savings wherever possible.

The plan has been prepared by the Head of Estates, working in conjunction with other staff and advisors. It covers all aspects of University life and I would wish that all students, staff, governors and stakeholders work to achieve its aims as it is only through a joint, concerted effort that we will succeed.

Signed

Simone Wonnacott
Principal

From Carbon Trust

The Carbon Trust has worked with Leeds Arts University on carbon management in 2009. Part of the previous assistance encompassed adopting a robust carbon management plan moving forward. The University have continued this quest using external consultancies to realise carbon and cost savings.

Foreword from Carbon Trust Consultant

This plan has been produced in conjunction with the University, it reflects the outcome of extensive consultation undertaken both prior and following the University's move to HE. The consultation demonstrated the importance of this issue to the University and the commitment to their staff to ensure that they act now to reduce carbon emissions.

The UK government has identified the Higher Education sector as key to delivering carbon reduction across the UK in line with the Climate Change Act targets, and the HE Carbon Management Programme is designed in response to this. It assists higher education institutions in saving money on energy and putting it to better use elsewhere, whilst making a positive contribution to the environment by lowering carbon emissions.

Dr Keith Winter BSc (Honours), CEng IET

Management Summary

In January 2010, HEFCE published a Carbon Reduction Target and Strategy for Higher Education in England and updated in September 2010. The key points being:

A. A sector-level target for carbon reductions that is in line with UK targets.
B. A requirement for institutions to set their own targets for 2020 for scope 1 and 2 emissions against a 2005 baseline. This year is being used as a baseline because it is used for reporting against UK targets, and work done for HEFCE by SQW Consulting demonstrated that robust data for scopes 1 and 2 are available for that year at institutional level. This will provide consistency across the sector against which progress can be monitored and reported.
C. A commitment from institutions to achieve actual improvements through actions that is appropriate for their institution, recognising the diversity of the sector.
D. Support from HEFCE, UUK and Guild HE for institutions to achieve carbon reductions.
E. Funding incentives – in particular HEFCE will link capital funding to performance against carbon management plans.
F. Plans for annual monitoring and reporting on progress against the sector-level target.
G. A method of regularly evaluating the approach and taking action to learn from progress to date.

This Carbon Management Plan has been initiated and published based on the above HEFCE sound methodology.

Leeds Arts University's Key Carbon Management Plan Strategy

This document presents the University's Carbon Management Plan (CMP) which covers two sites with a third being added September 2015. By implementing the CMP, the University will reduce the CO2 emissions from its activities by a minimum of 35% by 2020 compared to the business as usual baseline from 2005/06. The base line carbon footprint for the University was 903 tCO2 in 2005/06 based on Scopes 1 and 2 only with 99% deriving from non-residential buildings and the remainder from the University's transport. Scope 3 activities such as waste to landfill were excluded from the initial baseline carbon calculation as they could not be quantified at the time of writing. The University are now adopting Scope 3 measures and these will be included as appropriate as the CMP develops.

The key strategic themes are:

1. Integrating carbon reduction activities
2. Policy review
3. Monitoring and targeting
4. Embedding carbon savings
5. Strategic investment
6. Future innovation in managing carbon
7. Improve energy efficiency in existing buildings
8. Investigate the procurement of green electricity
9. Improved design of new and refurbished buildings
10. Introducing on-site renewables

Funding will be agreed and allocated for projects already identified either off balance sheet or other funding mechanisms where applicable. In addition, the University's Sustainability Committee will be responsible for implementing the plan.

The Sustainability Committee's duties will be to manage the CMP, chaired by the Principal.

The University will ensure that all staff have access to information on climate change and sustainability through our intranet and regular features across our media. Awareness of staff

will continue to be raised more generally through media friendly campaigns, regular internal events and news items. More specific awareness and skills development is being made available for staff with specific responsibilities (e.g. estates staff, those involved in the leasing and management of property and information technology).

Most University's and we are no exception have no set operational agenda; room allocation, later opening, weekend opening and student numbers contribute significantly to increased energy consumption.

Future development of additional Key Performance Indicators (KPI) including the above parameters is vital to producing accurate analysis.

Contact Us
We all want to reduce carbon emissions. You can show your support for the department's commitment to reduce emissions by emailing our Sustainability Committee team at: joanne.newsome@leeds-art.ac.uk

1. Introduction

Climate change poses a real threat to society. Universities are increasingly aware of their environmental responsibilities, and institutional position within 'green' league tables is an important factor for many students choosing which university to attend. The 'carbon footprint' of an organisation is also becoming important. The University's sustainability depends at least partly on our ability to reduce greenhouse gas emissions.

The most common greenhouse gas is carbon dioxide (CO_2) and two of the largest global sources are electricity and heat (32%) and transportation (17%).

Service-sector companies' activities contribute to these sources through their electricity use, heating, cooling and travel.

Service-sector companies have an opportunity to influence their operations, supply chains, customers, employees, and other stakeholders and to help change those behaviours necessary to curb the most dangerous effects of climate change.

Now that the University has measured its emissions, it can start to manage them. Its GHG inventory / Carbon Footprint will help determine the best emission reduction opportunities.

For example, is it better to reduce your own electricity consumption or to influence supply chain emissions. The University will use this document to fix emission reduction targets to demonstrate commitment and intentions, and to track progress through public reporting.

Economic factors are important. Fluctuating fuel prices means the University cannot afford to be wasteful with its energy use. Higher education needs to play its part in meeting national targets for carbon emissions reduction. The University is working towards placing sustainability and carbon emissions reduction at the heart of many policies, strategies, plans and projects. Examples where this will be done include an Environment Policy, Mobility Policy, and a range of practical energy saving projects carried out as part of general maintenance, modernisation and capital projects.

The University Carbon Management Plan will reduce carbon emissions by a minimum of 35%. The plan uses a baseline established for the 2005/6 financial year. The process used to develop the plan follows the five steps laid out by the Carbon Trust and summarised by the diagram below:

The process leading to this plan has been undertaken with wide consultation across the University on the opportunities for carbon emissions reduction. These opportunities have been analysed and evaluated against a range of criteria to develop this Carbon Management Plan. The University is developing separate policies for managing energy, waste, travel, procurement and construction. The Carbon Management Plan provides a framework which will allow the University to develop a consistent environmental approach which demonstrates to all stakeholders that we understand our corporate responsibilities and are becoming a sustainable business.

2.   Carbon Management Plan

The Department of Energy & Climate Change (DECC) works to make sure the UK has secure, clean, affordable energy supplies and promote international action to mitigate climate change. DECC is a ministerial department, supported by nine agencies and public bodies and responsible for:

- energy security – making sure UK businesses and households have secure supplies of energy for light and power, heat and transport
- action on climate change – leading government efforts to mitigate climate change, both through international action and cutting UK greenhouse gas emissions by at least 80% by 2050 (including by sourcing at least 15% of our energy from renewable sources by 2020)
- renewable energy – sourcing at least 15% of our energy from renewable sources by 2020
- affordability – delivering secure, low-carbon energy at the least cost to consumers, taxpayers and the economy
- fairness – making sure the costs and benefits of our policies are distributed fairly so that we protect the most vulnerable and fuel poor households and address competitiveness problems faced by energy intensive industries
- supporting growth – delivering our policies in a way that maximises the benefits to the economy in terms of jobs, growth and investment, including by making the most of our existing oil and gas reserves and seizing the opportunities presented by the rise of the global green economy
- managing the UK's energy legacy safely, securely and cost effectively.

From an HE sector policy perspective, work and consultation undertaken by the Higher Education Funding Council for England (HEFCE) established that HE sector emissions are generally understood to have increased over the last decade. The result is that reduction targets need to be higher to bring the sector in line with government targets. As most institutions have reliable data starting from 2005/6, a revised sector target has been agreed using a 2005/6 emissions level.

HE guidance target for scope 1 and 2 carbon emissions against 2005/06 levels

- 43% reduction by 2020
- 83% reduction by 2050

The University will endeavour to achieve a minimum target of 35% reduction by 2020 and will work towards the target set by HEFCE. It is recognised that all institutions will be different and some will be able to reduce emissions more than others. The University has recently entered the HE sector and has some work to do in establishing reliable data with regards to carbon emissions. However, initial data shows that we are performing either in line or better than our peer group in many categories already therefore our ability to reduce emissions even further will be less than some of our peers. We are also a resource intensive, small institution with part listed buildings which affects our overall energy usage.

From a legislation perspective the EU Energy Performance of Buildings Directive has shaped many UK energy efficiency schemes. Over recent years there have been regular revisions to Building Regulations, new requirements for buildings to display energy certificates and assess air conditioning systems, the Carbon Reduction Commitment Energy Efficiency Scheme (CRC Energy Efficiency Scheme) and most recently Energy Saving Opportunities Scheme (ESOS).

The context and mandatory drivers for carbon management and their implications are summarised in this section plus commentary on some of the optional schemes. The section also describes the carbon emission reduction strategic opportunities which encompass the majority of actions that will move the University towards its low-carbon vision.

Leeds Arts University's vision is to become a low carbon establishment.

This plan identifies carbon emissions reduction measures achievable. The strategic approach focuses on activities which are likely to deliver the greatest overall reduction in carbon emissions; this means a focus on projects to reduce electricity consumption first, and gas consumption second. Work will continue as normal to reduce emissions from generated waste, water consumption and procurement activities.

2.1   Context and Drivers for Carbon Management

HEFCE capital funding policy
By 30 March 2012 HEFCE expects higher education establishments to have carbon management strategies approved by their governing bodies which meet certain criteria. HEFCE expects a commitment to reduce carbon emissions up to 2020 and to report publicly and annually on absolute or relative carbon emission reductions to satisfy Capital Investment Framework (CIF2) funding requirements. An expectation of HEFCE is for the HE sector to be consistently achieving absolute carbon emission reductions. At present the University's efforts are not achieving absolute reductions but when compared to recent increases in income, a relative reduction in carbon emissions ($kgCO_2/£$ income) can be demonstrated. This plan starts the journey towards absolute reductions for the long term.

Energy costs are another real driver and, in common with most other Universitys, the University has seen steep rises in gas and electricity prices over the past years that show little sign of abating in the long term. There are therefore clear economic incentives for reducing energy usage and these are being reinforced by government schemes such as the introduction of the Climate Change Levy (CCL) and the Energy Efficiency Carbon Reduction Commitment (EE CRC).

Reputation
Several schemes use league tables to judge performance. The CRC Energy Efficiency Scheme will use league tables and People and Planet have used a 'green' league for several years to compare environmental performance amongst higher education establishments. Performance in environmental league tables is important to the University.

Security of energy supply
Energy security is becoming increasingly important in political circles. Ageing nuclear power plants are being supported by coal fired plants, both of which currently remain part of the future energy supply mix for the UK alongside renewable energy technologies. Reducing the load on the ageing national grid is also a national concern. The immediate security issue is demonstrated by the National Grid's Short-Term Operating Reserve project (STOR). STOR aims to maintain domestic electricity supplies at peak times by entering into reserve power agreements with large organisations able to shut down non-essential equipment at short notice. To maintain non-domestic gas supplies national gas supply networks operate a statutory right to shut down gas supplies to non-domestic 'large end users'.

If the UK carbon emissions reduction target and secure levels of energy supply are to be achieved it is most probable that mandatory legislative instruments such as energy efficiencies through revised Building Regulations and the new CRC Energy Efficiency Scheme are going to become increasingly prevalent. HE sector policies and optional schemes will support these measures.

2.2   Mandatory energy/carbon emission reduction schemes

Building Regulations 2010 – Part L (Conservation of Fuel and Power)
The latest revision which came into force on 1 October 2010 intends to reduce carbon emissions per m^2 by 25% over the 2006 Building Regulations which is an overall improvement of 44% on the 2002 regulations. The updated standard proposes to introduce a move towards zero carbon non-domestic buildings. The standard specifies minimum energy performance levels and the calculation of CO2 emissions. All new buildings and retrofits are affected and the implication is higher construction costs but lower energy bills and where applicable lower CRC Energy Efficiency Scheme costs. At present, the University is not affected by the aforementioned CRC EES as it falls below the statutory half hour meter energy consumption of 6,000MWh to become a full participant. However, a disclosure was submitted before the September 2010 deadline.

With regards to refurbishment projects, energy efficiency is high on the agenda and forms part of the University procurement strategies.

Non-domestic electricity and gas bills already apply a carbon tax in the form of climate change levy (CCL) currently set at £0.047 for every kWh of electricity consumed and £0.0164 for every kWh of gas consumed.

Building energy certificates
The scheme implemented by the 2007 Energy Performance of Buildings Regulations introduced energy certification of buildings. A Display Energy Certificate (DEC) is required for a public building over 1000m2 gross internal floor area and frequently visited by the public. An Energy Performance Certificate (EPC) is for new, significantly modified, sold or rented buildings. These certificates rate buildings energy use in terms of carbon emissions on an A-G scale and are designed to inform building users or prospective occupiers of a building's carbon/energy efficiency.

The University currently has TWO buildings which require DEC certificates to be updated annually. Accompanying the first DEC carried out in February 2009 was an Advisory report highlighting areas where improvements towards reducing energy and hence carbon may be possible. These have been explored and included within the overall action plan. A revision of the EU Directive responsible is recommending an increase in the number of buildings affected by reducing the floor area to $250m^2$ for both types of certificate. This would impact by 2013 and result in the addition of two more buildings requiring a DEC certificate and individual energy metering.

Air conditioning system inspections
Systems with a rated capacity over 250kW had to be inspected for energy efficiency and appropriate sizing from January 2009 and those over 12kW from January 2011. Although action upon the inspection advisory report is not compulsory it is good practice to review reports as they could reduce energy consumption and operating costs. Inspections on two buildings have been undertaken to comply with the initial capacity rating and have to be re-inspected within five years. Recommendations will be actioned.

<u>Renewable energy/low carbon requirements</u>
The EU has a binding target of 25% of total energy consumption coming from renewables by 2020. The UK's share of this is proposed to be 15%.

There are numerous UK schemes to promote renewable energy, the most notable mandatory one being the 2008 Planning and Energy Act which allows the local planning authority to set the proportion of energy to be supplied by renewable energy or low carbon sources in new developments.

2.3 Optional energy/carbon reduction schemes

Building Research Establishment Environmental Assessment Method (BREEAM) sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance. A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.

The University policy adopted in spring 2012 will require BREEAM 'excellence' wherever practical for all new build and refurbishment projects moving forward. The new car park extension development due to be completed in 2017 will be aiming to achieve the BREEAM excellent rating. A BREEAM consultant has been appointed to co-ordinate this process.

<u>Carbon Trust Standard or equivalent</u>
There are now several schemes available which provide accreditation for proven carbon emissions reduction. The University are not a full participant of the CRC EES (Carbon Reduction Commitment Energy Efficiency Scheme) and do not have a need to commit to Early Action Metrics designed to improve league table standing and hence will investigate alternative systems.

<u>Environmental Management System</u>
Existing ISO standards for quality management practices (ISO 9000 series) and environmental management systems (ISO 14000 series) have successfully stimulated substantial, continuous efficiency improvements within organisations around the globe. An energy management standard is expected to similarly achieve major, long-term increases in energy efficiency.

Energy management is all about reducing the cost of energy used by an organisation, particularly now with the added spin of minimising carbon emissions as well. The BS EN 16001:2009 and latterly ISO 50001:2011 provides clear guidance with regard to defining objectives to meet an organisations energy policy.

The University believe that at our strategic level, an energy policy is a public commitment or undertaking which states, for the benefit of employees and contractors, what the organisation expects of them in general terms of its overall energy performance. It should define the scope and boundaries of an organisations energy management system and provide a framework for action including the following three commitments:

1. To the continual improvement in energy efficiency

2. To ensure the availability of information and all necessary resources to achieve objectives and targets, and
3. To comply with all applicable requirements (legally required or voluntarily agreed by the organisation.

Of the above commitments the first two are crucial since they bind senior management of the University to creating the necessary environmental and resources to make progress.

Achieving ISO 140001 compliance can be a daunting task and very time consuming let alone the cost of attaining and managing such a system. The list of requirements is substantial - policies, procedures, audit and much more.

ISO 140001 is voluntary, with its main aim to assist organisations in continually improving their environmental performance, whilst complying with any applicable legislation. Organisations are responsible for setting their own targets and performance measures, with the standard serving to assist them in meeting objectives and goals and the subsequent monitoring and measurement of these.

The University will adopt and work towards an environmental policy as part of this Carbon Management Plan without the added cost of achieving ISO 140001, the policy will be specifically designed to achieve continual improvement of the University's environmental performance. The policy will include a Plan-Do-Check-Act methodology. For example:

1. A framework for integrating energy efficiency into management practices
2. Making better use of existing energy-consuming assets
3. Benchmarking, measuring, documenting, and reporting energy intensity improvements and their projected impact on reductions in greenhouse gas (GHG) emissions
4. Transparency and communication on the management of energy resources
5. Energy management best practices and good energy management behaviours
6. Evaluating and prioritising the implementation of new energy-efficient technologies
7. A framework for promoting energy efficiency throughout the supply chain
8. Energy management improvements in the context of GHG emission reduction projects

The International Standards Organisation (ISO) has identified energy management as a priority area meriting the development and promotion of International Standards. Effective energy management is a priority focus because of the significant potential to save energy and reduce greenhouse gas (GHG) emissions worldwide.

ISO 50001:2011, Energy management systems – Requirements with guidance for use, is a voluntary International Standard developed by ISO (International Organisation for Standardisation). ISO 50001 gives organisations the requirements for energy management systems (EnMS). ISO 50001 provides benefits for organisations large and small, in both public and private sectors, in manufacturing and services, in all regions of the world. ISO 50001 will establish a framework for industrial plants; commercial, institutional, and governmental facilities; and entire organisations to manage energy. Targeting broad applicability across national economic sectors, it is estimated that the standard could influence up to 60% of the world's energy use.

ISO 50001 will provide public and private sector organisations with management strategies to increase energy efficiency, reduce costs and improve energy

performance. The University will initially operate within the guidelines of ISO 50001:2011 but will consider full accreditation by 2015. The drive for accreditation is about improving the University's overall environmental reputation but would also have carbon emissions reduction benefits through improvements in resource efficiency, i.e. scope 3 emissions waste and water management, and areas likely to require measurement in the future, i.e. procurement and business travel.

2.4 Strategic Opportunities

Previous assessments carried out by external consultants in January 2009 included the process of identifying carbon and cost reduction opportunities. This previous assessment provided the starting point from which the University will build; however, new technologies have emerged since the previous audit took place. With energy and carbon reduction firmly embedded within the University's procurement policy the University plan to re-evaluate the previously identified projects highlighted below. A new government initiative, Energy Saving Opportunities Scheme (ESOS) was introduced in 2014 of which Leeds Arts University are a participant. Part of this process was to carry out fresh audits of the two sites which include detailed savings opportunities (see sections 2.5 and 5.0 for more detail).

Between 2005 and 2008 Blenheim Walk was subject to a large extension and hence increases in energy consumption inevitably followed. The site is now due for further expansion to BREEAM standards with completion in 2017. Since this Carbon Plan was ratified, both staff and student numbers have increased, this too will have an adverse effect on energy consumption. In addition a court yard at Blenheim Walk has been covered with the internal space providing extra usable space. This has increased the sites Gross Internal Area (GIA) to 11,160m^2.

Improvement of Energy Management Practises

Early in the opportunities identification process it became evident that a Communication Strategy was needed to engage staff and students and raise awareness. The Communication Strategy included setting up a group of 'Green Champions' for buildings and a system for providing feedback on energy consumption to building users.

Moving forward an sustainability committee is now in place, regular meetings are scheduled to identify where improvements can be made and allocate resources. Only 4% of waste now goes to landfill.

Installation of Automatic Metering Reading (AMR) Units

AMR is generally seen as a process, which manages energy and environmental issues in the same way as a facility manages other costs and risks. It is in essence an approach, which identifies, achieves and maintains best practice. Metering equipment provides the information needed to save money on utilities and other hidden costs of operating facilities. A well organised monitoring and reporting system would identify where and how energy is consumed, the biggest users and areas likely to reap the largest benefits from energy management efforts. With AMR systems Specific Energy Consumption (SEC) figures for each major area can be derived and used to evaluate departmental costing.

Both Blenheim Walk & Vernon Street facilities now afford smart metering to the electricity and gas intake points capable of providing half hour data enabling the Estates team to identify plant operating cycles and identify waste streams.

Lighting Equipment and Control

The lighting industry has improved its product range over recent months with LED much better than when first introduced into the commercial building market place resulting in a transition from standard lighting to LED being rolled out.

Motors and Drives

A substantial amount of the energy consumed by many pumps and fans is wasted. This is because most fan and pump systems are oversized, usually because of too much contingency planning in the system design, and then rounding up to the next standard motor size or due to changes in demand/downsizing. Consequently, significant amounts of energy are expended unnecessarily, and the operating cost of the system is as much as 50% more than it should be.

There are also significant indirect cost savings available by extending motor life, reducing maintenance time and cutting overall noise levels.

The overall savings to be made in energy and indirect costs rely upon the effective application of variable speed AC inverter drives; for example, a 15% reduction in fan or motor speed will achieve a 40% energy saving.

The University plan to evaluate all motive power plant items to maximise the savings available.

Heating Controls

The automatic meter reading equipment will allow real time analysis of how the BMS operates the gas fired boilers, degree day analysis showed this to be an area for improvement and new TREND Building Management Systems are to be deployed at both buildings during 2016.

Insulation Improvements

Insulation of the sites is considered good with the exception of un-lagged valves & flange fittings. These items alone can be easily improved by installing proprietary insulated and removal jackets. This along with other projects is under consideration during boiler replacement at Vernon Street.

IT Infrastructure Improvements

Proprietary software is utilised to isolate all personal computers after backup and updates are completed. Unfortunately this still leaves monitors and other periphery equipment energised and on standby. Systems are currently being investigated to provide accurate controllability of these items of IT equipment.

2.5 Energy Saving Opportunities Scheme (ESOS)

New Government Legislation the Energy Saving Opportunity Scheme (ESOS) Regulations 2014 bring into force Article 8 of the EU Energy Efficiency Directive and mandate that all large businesses in the UK undertake comprehensive assessments of energy use and energy efficiency opportunities at least once every four years. Leeds Arts University have been identified as a full participant to the ESOS scheme operated and managed by the Environment Agency (EA).

To comply with the regulations, a 'Lead Energy Assessor' who has already been appointed will need to complete an ESOS assessment to:

- Measure the University's total energy consumption for buildings, industrial processes and transport
- Identify areas of significant energy consumption, accounting for at least 90% of the University's total energy consumption
- Identify cost-effective energy efficiency recommendations for areas of significant energy consumption
- Report compliance to the Environment Agency

The University currently operates two campuses, Blenheim Walk and Vernon Street, therefore a 100% energy assessment of each building was carried out.

Results and findings of the ESOS audits will enhance the University's existing Carbon Management Plan which is regularly assessed and reviewed by the Higher Education Funding Council for Education (HEFCE).

Whilst there is no statutory requirement to take action on these opportunities, not to do so is to reduce ESOS to a costly compliance exercise rather than a means to achieve real savings. An opportunities table can be found

Some completed energy reduction projects to date include the following:

Blenheim Walk –
- Voltage optimisation
- Various lighting upgrades

Vernon Street –
- Voltage optimisation
- Various lighting upgrades

2.6   Target and Objective

University 2020 target (HE Carbon Management Programme)

The baseline includes emissions from activities where there is reasonable data and methodology, i.e. scope 1 and 2 emissions and part scope 3 emissions (waste generated and water consumption). Once all available data from the re-evaluation process for carbon emission reduction opportunities have been quantified, it is anticipated they will translate into the following 2020 target.

> HEFCE 2020 Target of 43% by 2020
>
> Leeds Arts University Carbon Management Plan Target:
>
> A minimum of 35% by 2020

The HEFCE global target is equivalent to a reduction of 43% by 2020 against a 2005 baseline. HEFCE state that how each institution is able to reduce will vary considerably and as a resource intensive institution with part listed buildings our carbon footprint will be greater

than some institutions. The University has recently entered the HE sector and has some work to do in establishing reliable data with regards to carbon emissions. However, initial data shows that we are performing either in line or better than our peer group in many categories already therefore our ability to reduce emissions even further will be less than some of our peers. We have committed to reducing by 35%, this is a minimum target and we will strive to exceed this and work towards the target set by HEFCE.

This plan documents how this will be achieved.

3   Emissions Baseline and Projections

In order to take a more strategic approach to carbon management, the University has quantified it's baseline annual carbon emissions as a starting point against which to measure future performance. This section provides details of how the University's CO2 emissions baseline was calculated and explains the assumptions to allow a figure to be estimated.

At the start of the project the team felt that it was important to include areas that, whilst not monitored at present, could be included at a later date to improve carbon management and reduce the overall footprint of the University.

3.1   Scope

The Greenhouse Gas Protocol (GHG Protocol) categorises activities into scope 1, 2 and 3 emissions. It is universally recognised that some activities result in higher carbon emissions and that some activities have data which is harder to record/quantify before conversion to kgCO2. For each activity (Table 3.1) the government department DEFRA publish carbon emission (kgCO2) conversion factors. Versions in excel and PDF format can be downloaded by visiting the DEFRA website (archive.defra.gov.uk).

Table 3.1 - Carbon Emission Conversion Factors

Activity and Unit Supplied	Carbon conversion factor (tCO$_2$)
Electricity (kWh) varies year on year subject to national energy supply mix	0.000547
Gas (kWh)	0.000185
Diesel (per litre)	0.002322
Petrol (per litre)	0.014970
Waste (per tonne)	0.447
Water (per m^3)	0.000404

The scope of carbon emissions from which the baseline and targets are derived in this plan are scope 1 and 2 emissions and part scope 3 emissions:

Scope 1:   Gas use (kWh), fleet vehicle fuel use (litres)
Scope 2:   Electricity use (kWh)
Scope 3:   Water use (m^3), general waste and recycling volume (tonnes)

Scope 3 of the GHG Protocol also includes emissions from a range of other activities which are generally more problematic to measure and record. They are emissions from activities

that include procurement, business travel (land and air), and commuting (land and air) for both staff and students. The University is implementing processes to capture and better understand its business and commuter travel emissions. It is understood that HEFCE will produce a methodology to support the recording of procurement emissions in 2012 and so a revision of data recording for scope 3 emissions will be undertaken during 2013 baseline checklist. Future scope 3 data collection improvements will include vehicle mileage logging and international travel destinations and type of transport.

3.2 Recorded 2005 Baseline

2005 Baseline Carbon Emissions per Utility

Utility	Purchased Energy	Purchased Energy	Cost	Cost	Carbon Emissions
2005	kWh/ year	%	£ / year	%	tCO2
Grid Electricity	1,107,668	41.6%	62,209	42.9%	603.7
Natural Gas	1,555,696	58.4%	62,029	42.8%	286.2
Water M3	0	N/A	20,718	14.3%	7.5
Total Energy	2,663,363	100.0%	144,956	100.0%	897.4

Breakdown Carbon Emissions 2005 Base Year by Scope

Utility	Units	Scope 1	Scope 2	Scope 3	Carbon Emissions tCO2
Grid Electricity	kWh	0	1,107,668	0	605.5
Natural Gas	kWh	1,555,696	0	0	287.8
Diesel	litres	0	0	1,100	2.6
Petrol	litres	0	0	0	0
Waste	tonnes	N/A	N/A	N/A	N/A
Water	m3			18,551	7.5
Total		1,555,696	1,107,668	19,651	903

The table below shows the climate change direct impacts from University's operations.

Leeds Arts University Activity	Main Green House Gas Emissions Produced
Energy use in buildings (electricity and space heating)	Carbon dioxide
Transport	Carbon dioxide & Nitrous oxides
Waste from the Universitys operations	Methane and carbon dioxide
Procurement of goods and services	Carbon dioxide, methane and nitrous oxides

Landfill figures were unavailable for the base year, however, the University has recently commenced collating this information from their waste management contractor and can now document that only 4% of waste is sent to landfill.
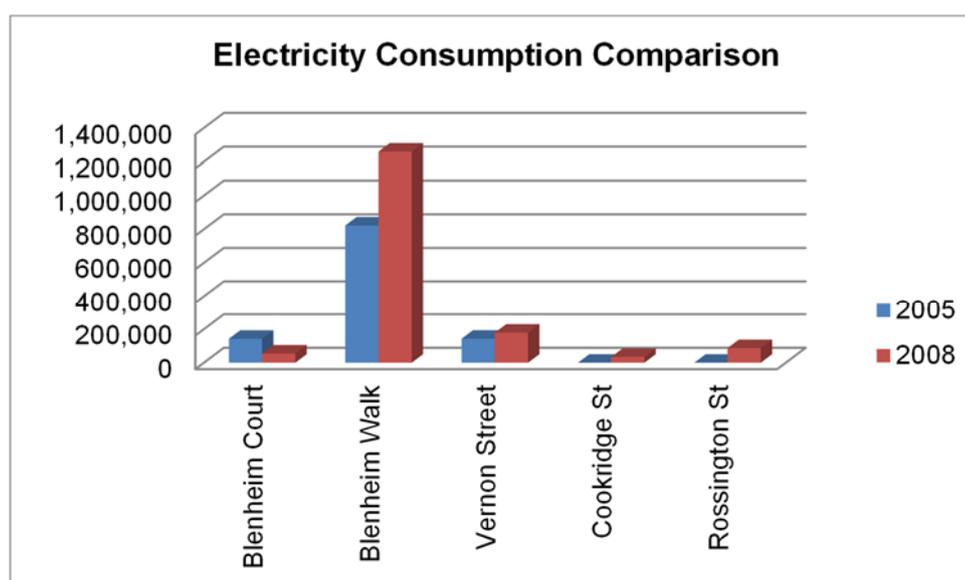
3.3 Recorded 2008 for Comparison

2008 Carbon Emissions per Utility

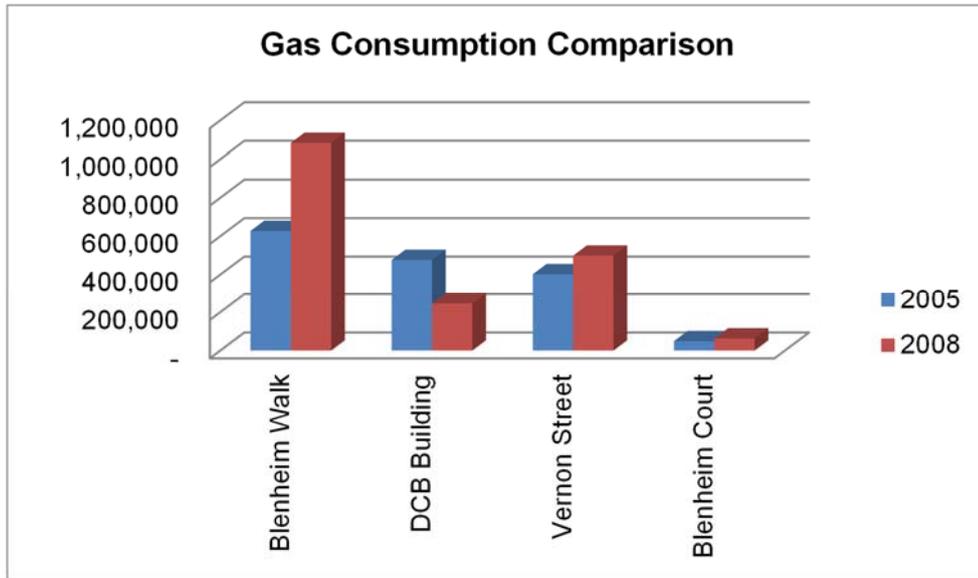| Utility	Purchased Energy	Purchased Energy	Cost	Cost	Carbon Emissions
2008	kWh/ year	%	£ / year	%	tCO2
Grid Electricity	1,614,273	46.1%	200,843	68.8%	879.8
Natural Gas	1,890,376	53.9%	65,614	22.5%	347.8
Water M3	0	N/A	25,384	8.7%	8.1
Total Energy	3,504,649	100.0%	291,841	100.0%	1,227.6

From the 2005 and 2008 tables above it is clear that energy consumption has risen due new extensions at Blenheim Walk. Incidentally, this period was very volatile in the energy price market and electricity cost has risen by 25%.

| Utility	Units	Scope 1	Scope 2	Scope 3	Carbon Emissions tCO2
Grid Electricity	kWh	0	1,614,273	0	879.8
Natural Gas	kWh	1,890,376			347.8
Diesel	litres	0	0	1,100	2.6
Petrol	litres	0	0	0	0
Waste	tonnes	N/A	N/A	N/A	N/A
Water	m3			20,041	8.1
Total		1,890,376	1,614,273	21,141	1,238

Comparison Breakdown of Electricity Consumption/Building

Comparison Breakdown of Gas Consumption/Building

Comparison Breakdown of Water Consumption/Building
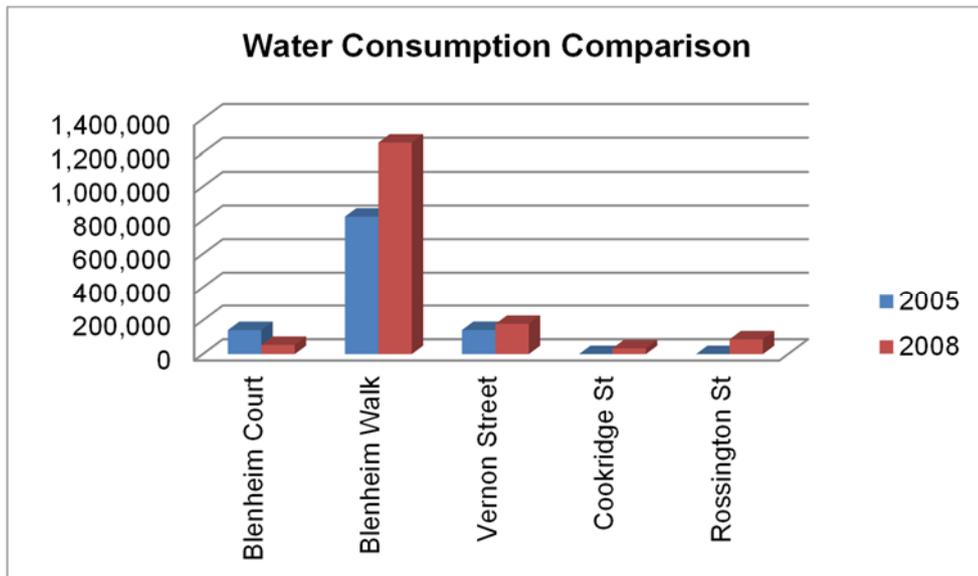
3.4 Recorded 2015 for Comparison

Utility	Purchased Energy	Purchased Energy	Cost	Cost	Carbon Emissions
2015	kWh/ year	%	£ / year	%	tCO2
Grid Electricity	1,441,296	46.7%	173,630	76.1%	779.7
Natural Gas	1,642,750	53.3%	54,381	23.9%	300.6
Total Energy	**3,084,046**	**100.0%**	**228,011**	**100.0%**	**1,080.4**

Current year verses 2008

Utility	% Difference vs 2008
Grid Electricity	-12%
Natural Gas	-15%
Totals	**-14%**

Current consumption against 2008 shows a 14% decrease

4 Future Considerations to Carbon Footprint Capture

The Carbon Footprint in section 3 includes all direct emissions (scope 1) where applicable; electricity (scope 2) and other selected indirect emissions (scope 3).

Where there is a strong causal link between an organisation's activities and an emission source, strong preference is given to including it. This applies to water and waste disposal at all three sites. Consideration may also be given to including the direct emissions of third parties that an organisation has a strong influence upon, such as employee's travel in their own private cars for company business. Employee commuting could also be considered, but would be a lower priority than business travel. Below is a list of common emissions sources listed by Scope for future consideration.

Scope 1*	Scope 2	Scope 3**
Gas	Emissions from purchase of electricity	Employee Business Travel in Private Car
Gas Oil		Employee Business Travel by Aeroplane
Bottled liquid or gaseous fuels;		Employee Commuting
Propane		Water
Acetylene		Waste Disposal to Landfill
Argon		Paper Consumption
Oxygen		Post
Nitrogen		Shipping
(for welding)		Supply Chain
Owned Vehicles		Student travel
Fugitive emissions: Refrigerant (e.g. replacement of losses due to leakage and maintenance)		
Any Other		

* Vehicles which are owned or the University holds long-term hire contracts for should be included in Scope 1

** Vehicles which are used by the University or their employees on University business but not owned should be included in Scope 3. This includes short-term hire of vehicles.

Wherever possible re-cycling schemes are already in use.

Further consideration the University may seek to add as Scope 3 emissions is student travel indicated in the table below.

Emission Source	Student commuting to and from the University
Description	Students are responsible for carbon emission travelling to and from the University.
Reason for Exclusion/non-quantification	Precise details of student travel are unknown at this point.
Qualitative information on size of source if appropriate (otherwise insert n/a)	The Carbon Trust offers an average value per commuter which evaluates, an average commuter, travelling an average distance, in an average car will produce almost 1 tonne of CO_2 per person. If student numbers who commute in personal vehicles or public transport are known, it would be more realistic to include an emission for this subject. Although difficult it should not be impossible for the University to research this information.

In January 2012, HEFCE commissioned – Measuring Scope 3 emissions covering supply chain procurement which will be used to evaluate the University's activities in this area.

5   Carbon Management Projects

Projects selected for inclusion in the plan were first identified by the Carbon Trust Consultants in a facilitated 'Opportunities Assessment Survey'. Carbon emission reduction opportunities were posted in an action plan table along with an assessment of current energy management practices which were scored using a pre-determined matrix

Projects considered difficult to implement with medium to low effect (i.e. ineffective) are excluded. The majority (7.2%) of identified measures fall under the Improve Energy Management Practices, this category would include items such as good housekeeping, better data collection etc. and be classed as low cost to implement. The remaining identified items would fall into the Medium Cost to implement sector whilst High Capital Expenditure would include some renewable technologies such as Combined Heat and Power or indeed any new build projects. The table below has been revised from the previous 2009 listing to account for items already implemented, in the pipe line to progress into a project or altered due to new technologies. The latter will be captured in a second table generated from the ESOS process.

Full implementation of the above table will provide savings of 22% carbon and 16% energy and against the University's 2008 figures. High cost measures will be highlighted during the planned re-assessment of all sites; this will allow a more robust long term strategy to be formed.

The table below shows additional improvements identified by the ESOS assessments some of which are due to improved technologies in such items as LED lighting for example and it is anticipated that savings gained will actually increase.

Recommendations	Electricity (kWh)	Gas (kWh)	Carbon (tCo2)	Predicted Annual Saving (£)	Capex (£)	Pay Back (Years)
New BMS Blenheim	35,721	150,780	46.5	10,649	30,000	2.8
New BMS Vernon St	8,646	115,722	25.8	4,362	10,000	2.3
Vernon - Boiler Replacement	0	146,581	27.0	4,356	150,000	34.4
Vernon - Insulated Jackets	0	11,572	2.1	344	650	1.9
Blenheim- Insulated Jackets	0	30,156	5.5	1,151	2,000	1.7
Air System Optimisation	11,250	0	2.1	1,201	3,000	2.5
Blenheim - Burner Optimisation	0	65,338	12.0	2,493	11,200	4.5
VSD to Chiller pumps	76,500	0	19.4	10,486	25,000	2.4
Blenheim Lighting Replacement	214,323	0	112.5	29,377	120,000	4.1
Vernon - Lighting Optimisation	51,877	0	9.5	5,536	65,000	11.7
TOTALS	398,317	520,150	262.5	69,954	416,850	6.0

The new initiatives above relate to reductions of 27%, 29% and 32% for electricity, gas and carbon respectively.

Although smart meters at both sites have been implemented quotations and specifications are also being sought to possibly implement sub-metering. This objective will provide the tools to carry out utility invoice validation but also improve energy management practices. Sub-metering will allow the Sustainability Committee to scrutinise specific areas and or plant operation in-line with room allocation.

Finally, two feasibility studies took place, the first being to utilise Evaporative cooling in IT server rooms as an alternative to air conditioning, and the second to investigate CHP and Biomass for Vernon Street, neither objectives were found to be suitable mainly due to size and location of plant.

Buildings Rationalisation

Building rationalisation is linked to space utilisation and this opportunity is about optimising the space the University has to better match timetabling requirements. This includes measures such as ensuring that the number of serviced buildings open out of hours is minimised which will enable the University to limit the hours of building use with consequent savings in energy consumption. There is specific reference to space management in HEFCE's carbon strategy document. HEFCE will seek to understand better how institutions are performing and to maintain focus on space management through the Capital Investment Framework.

6   Carbon Management Plan Financing

The senior management team allocate funding to support appropriate planned projects. This will be done through details for each with regard to cost, payback period and relative CO_2 reduction figures (ref: "project sign off sheet" page 22). The Carbon Reduction Plan is a live process and will be constantly under review in order to keep the University on track to achieve its Carbon Reduction Targets.

7 Actions to Embed Carbon Management

The Carbon Trust report provided an Energy Management Assessment Matrix of where the University was at the time of the audit. The marks in brown are where the University was in 2009. Those in green are indicative of the University's position in 2015.

Level	Energy Policy	Organising	Training	Performance Measurement	Communication	Investment
4	Energy policy, Action Plan and regular review have active commitment of top management	Fully integrated into management structure with clear accountability for energy consumption	Appropriate and comprehensive staff training tailored to identified needs, with evaluation	Comprehensive performance measurement against targets with effective management reporting	Extensive communication of energy issues within and outside of organisation	Resources routinely committed to energy efficiency in support of business objectives
3	Formal policy but no active commitment from top management	Clear line management accountability for consumption and responsibility for improvement	Energy training targeted at major users following training needs analysis	Weekly performance measurement for each process, unit, or building	Regular staff briefings, performance reporting and energy promotion	Same appraisal criteria used as for other cost reduction projects
2	Un-adopted Policy	Some delegation of responsibility but line management and authority unclear	Ad hoc internal training for selected people as required	Monthly monitoring by fuel type	Some use of company communication mechanisms to promote energy efficiency	Low or medium cost measures considered if short payback period
1	An unwritten set of guidelines	Informal, mostly focused on energy supply	Technical staff occasionally attend specialist courses	Invoice checking only	Ad-Hoc informal contacts used to promote energy efficiency	Only low or no cost measures taken
0	No explicit energy Policy	No delegation of responsibility for managing energy	No energy related staff training provided	No measurement of energy costs or consumptions	No communication or promotion of energy issues	No investment in improving energy efficiency

Although improvements have been implemented continued progress is now part of the University Carbon Management Plan. Regular meetings will be conducted to discuss how,

when and by whom these improvements will take place. Buff coloured cells were the matrix results in 2009, green coloured cells indicate where the University is assessed in 2015.

7.1 Sustainability Framework

The terms sustainability and 'sustainable development' are subject to many different interpretations and definitions with the definition outlined in the United Nations Brundtland Report (1987) being the one most widely recognised:

- Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs
- The United Nations World Summit (2005) affirmed the concept of three 'pillars' of sustainability - the economic, social and environmental factors that need to be taken into consideration, and their cultural context.

Drawing on both the 1987 definition and its 2005 recalibration, the present HEA guidance defines education for sustainable development as follows:

"Education for sustainable development is the process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic well-being, both in the present and for future generations".

Sustainability to Leeds Arts University is about operating within a framework, which helps educate our students about long-term, cultural, economic and environmental health and vitality together with the importance of linking social, financial, and environmental well-being.

The Framework operates within three top-level headings of People, Place and Process that naturally interlink and overlap and which are graphically represented below. The relevant policies and procedures relating to the operation of this framework can be found on portal.

In the aspiration to achieve the highest possible standards of sustainability across the University, key aims have been identified to inform action plans within each category. Progress against action plans will be monitored and reported upon annually through the Sustainability Committee. Sustainability progress can be found at the following link: http://www.leeds-art.ac.uk/about-us/sustainability/

Sustainability Committee		
Senior Committee		Senior Management Team
Officers	Chair	The Principal
	Minutes Secretary	The Principal's Secretary
	Convenor	Head of Estates in liaison with the Chair
	Members	The Principal, Head of Estates, Health and Safety Officer, Facilities Supervisor, Head of IT, Head of HR, Head of FE, Students' Union Liaison Officer, HE Administration Manager, 2 HE academic staff, Senior Workshop Manager, Senior Workshop Manager Academic Computing, 1 student representative

Term of membership	Continuing for named members. Nominated members to serve for 3 years after which they may be re-appointed
Type of record	Minutes with actions
Destination of meeting record	Senior Management Team
Quorum	7 members to include the Principal or authorised deputy
Frequency of meetings	Minimum 3 per academic calendar
Terms of Reference	

The Committee will promote and co-ordinate the development and implementation of sustainability initiatives across all areas of the University, fulfilling the University's commitment to incorporate sustainability into its core activities.

The Committee is responsible for advising the Principal on the environmental and sustainability issues of the institution as follows:

a) maintaining high environmental standards in the conduct of teaching and learning activity undertaken either at, or under the auspices of, Leeds Arts University;

b) considering the University's performance on sustainability, including its observance of external commitments and obligations and reporting on such;

c) monitoring, reviewing and making recommendations to minimise/reduce where practicable the environmental impact of the University's operations, policies and procedures;

d) promoting environmentally responsible practices throughout the University, increasing awareness and understanding of challenges and opportunities to staff and students;

e) advising on how to embed sustainability in and across all areas of University activity;

f) advising on sustainability related teaching and research and facilitating collaboration across specialisms to integrate sustainability consistently.

g) considering any other matters as the Senior Management Team or the Principal may refer to the Sustainability Committee.

The sustainability committee consists of the following representatives.

Sustainability Committee	
Title	Name
The Principal	Simone Wonnacott
Head of Estates	Graham Morley
Health & Safety Officer	Andrew Thompson
Facilities Manager	Corina Kettlewell

Head of IT	Chris Parkin		
Head of HR	Graham Curling		
Head of FE	Suzanne Archer		
Students' Union Liaison Officer	Emma Cook		
HE Administration Manager	Kayte Hides		
Senior Workshop Manager	Phil Smith		
Senior Workshop Manager Academic Computing	Michael Flower		
Head of Marketing and Communications	Andrew Craske		
Management Accountant	Ian Blades		
		Date appointed	
2 HE Academic Staff	David Collins Sam Hudson	Oct 2015 Nov 2014	3 years 3 years
1 Student Representative	Fran Tredget		1 year but may be re-appointed

8   Management of the Carbon Programme

Success of the CMP is based on working collaboratively; the University recognises the need for good programme governance which will encourage:

1.   senior, strategic ownership of the carbon reduction target
2.   bringing together, in one place, the diverse set of projects across the University
3.   oversight of the programme to encourage delivery by the identification and removal of blockages
4.   project owners coming together to ensure coherence and coordination of carbon reduction activity

All projects identified for the CMP will be assigned a Responsible Person for delivering the project. All projects will require sign off by the Finance Department, Head of Estates and these projects are to be discussed at regular meetings.

Projects generally need to payback within five years through direct energy savings however if there are extra advantages i.e. through reduced maintenance costs then these costs can be factored into the payback period. Simple payback can be used to prioritise projects.

Projects will also be assigned a cost per tonne CO_2 value derived from the capital cost of the project divided by the annual carbon savings. Below is a sample project sign off sheet

which requires specific job roles, signature and date spaces adding by a dedicated member of the environmental team.

Project Reference:	*A short description of project*
Project Manager	*Name of the person responsible for delivering the project*
Department	*Which part of the organisation the project sits within*
Description	*A short description of the project, no more than a paragraph*
Benefits	• *Financial savings £(x)* • *Payback period: (x) years* • *CO_2 Emissions reduction: (x) tonnes of CO_2* • *Cost/tCO_2*
Funding	• *Project cost, e.g. the initial cost of implementing the project* • *Operational costs, e.g. annual maintenance or running costs* • *Source of funding: Internal, external, investment criteria to be met etc.* • *Say how/when decision on funding will be made*
Resources	• *Additional resource (.e.g people) requirements to enable delivery and where these will come from* • *If this project will be delivered within current resources, say so*
Ensuring Success	• *Key success factors, or things that will need to happen for this project to succeed* • *Principal risks: technical, financial (e.g. what happens if the project is insufficiently resourced), etc*
Measuring Success	• *Metrics for displaying performance or achievement* • *When success will be measured/evaluated*

Timing	• *Milestones/key dates e.g.*
	   o *Start date: dd/mm/yyyy*
	   o *Completion date (when it will deliver savings): dd/mm/yyyy*
	   o *Interim deliverable/decision points*
	(you could also lay these out as a milestone chart for ease and clarity)

With regards to validating the predicted emissions with actual emissions, the following points should be noted:

1. Projects will be implemented throughout the year thus full annual savings may not be achieved until the following year.

2. Other projects not currently captured in the plan will achieve further carbon savings not yet included.

3. In addition to the annual review, there will be further incremental reviews undertaken quarterly throughout the year to check on the progress being made with the implementation of projects and the CO2 savings being generated as a result.

The review will assess actual performance against anticipated expenditure and target emissions savings each year included in the plan.

Appendix 1 – Leeds Arts University Energy Policy for use in Buildings

The University recognises the growing concern over climate change and the link to the use of fossil fuels. It also acknowledges that energy costs are controllable and specific actions need to be taken and highlighted within the University's business planning and management processes.

This policy has been developed to direct the focus on energy use within the buildings under the control of the University. To this end the following principles have been adopted:

- Concern for the environment is a fundamental and integral part of the University business strategy.
- The University will endeavour to work closely with all statutory authorities and appropriate bodies in order to meet, or exceed, all relevant legislation and regulation.
- The University requires good energy management practice in its business operations.
- The University is committed to continual improvement in its environmental performance.
- This policy will be subject to regular review.

This document shall be made available to all employees ensuring that they are aware of their duties and responsibilities. This document is also freely available to any interested parties.

Our objectives are to:
1. Reduce our expenditure on energy
2. Increase our level of energy efficiency (energy consumed per unit of service delivered) consistent with the operational needs of our activities
3. Reduce our carbon dioxide emissions
4. Reduce our consumption of finite fossil fuels
5. Increase the proportion of renewable energy used
6. Increase our investment in clean, low carbon, energy efficient technologies.

To achieve this we will:
1. Designate staff with responsibility for energy within the University's operations
2. Improve energy management structures to help reduce energy consumption and costs through areas like good housekeeping.
3. Installation of energy meters on site to help monitor and report on energy usage.
4. Set and publish targets for energy efficiency and renewable energy
5. Examine ways of reducing the direct and indirect use of fossil fuels in our buildings
6. Expect and encourage all staff to use energy responsibly
7. Provide training in energy efficiency to all staff, as appropriate
8. Develop energy efficient building and engineering specifications for all work undertaken for the University
9. Use energy efficiency as a criteria in our procurement procedures.

This policy has been endorsed by the Board of Governors.

Dated:

Signed by

Appendix 2 – Environmental Policy

The University aims 'to be in the top quartile of University's on the 'People and Planet Green League Table'.

The University encompasses the principles of corporate and social responsibility and acknowledges that its activities impact on the environment, specifically in relation to waste management, energy consumption and air emissions. As such, the University conducts it's business efficiently while honouring it's community and environmental responsibilities in an open and transparent manner through systematic management programmes. We are committed to:

1. Regulatory compliance and implementing relevant industry codes of practice
2. Pro-active pollution prevention through operational best practice, emissions management, waste minimisation, efficient resource use, local conservation awareness, and statutory authority liaison
3. Setting objectives and targets to achieve continual environmental performance improvement
4. Specifically target a minimum 35% reduction in our energy consumption by 2020
5. Communicating this environmental policy to our employees and providing appropriate training
6. The public availability of our environmental policy and supporting local community liaison

This policy has been endorsed by the Board of Governors.

Dated:

Signed by

Appendix 3 – Green Travel Policy

Student and staff travel management is extremely difficult to control and their travel to and from the University is a characteristic of the way we operate.

We recognise that travel is associated with our activities and that our employees have a direct impact on the environment, particularly through vehicle emissions, fuel consumption and our impact on local congestion. Inefficient business travel also results in significant and unnecessary costs to our activities.

The University actively supports alternative methods of transport getting to and from the University. We are currently investigating the "cycle to work scheme" which encourages University employees to purchase a new bicycle (of their choice) through their employer. The bicycle should be used to get (fully or partially) to and from work and is tax exempt. This offers our employees up to between 32%-42% saving on a brand new bicycle.

In order to reinforce this commitment to alternative methods of transport we have established the following objectives:

1. Consider carbon impact when purchasing any future vehicles
2. Encourage the use of teleconferencing and teleworking
3. Providing cycle facilities at our main sites
4. Work with local authorities to improve bus services and alternative forms of travel
5. Offer flexible working arrangements where appropriate and possible and in line with our Flexible Working Policy.
6. Provide public transport information to staff and how to reduce the environmental impact of car travel.

This policy will be implemented at a site-specific level through the development of local travel plans. The purpose of these plans will be:

1. To reduce the environmental impact of our business travel and staff commuting
2. To improve the efficiency & effectiveness in how we travel to reduce costs to the University

This policy has been endorsed by the Board of Governors.

Dated:

Signed by