Brunel University Carbon Management Plan

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Brunel University Carbon Management Plan

Message from the Vice-Chancellor

The Brunel Vision is:

"To be a world-class creative community that is inspired to work, think and learn together to meet the challenges of the future"

One of the major future challenges, not only for Brunel but for the whole of mankind, has to be Global Warming and its affect on the world in which we live, and we all have an important part to play in its reduction and prevention. All the journeys we make, the actions we take, including the products we buy impact on the global environment, our environment.

This Carbon Management Plan is an important part of the planned actions we are taking in reducing our impact on the environment. The 2008 Climate Change Act commits the UK to a long-term carbon reduction target of 80% by 2050 against 1990 levels, as does the Higher Education sector's own targets. The inclusion of Sustainability in our taught curriculum will further enhance the life skills of our current and future Students enabling them to ensure the 2050 their children will live in will be environmentally improved reflecting the actions we are taking today. To achieve this, action is needed at all levels and we as citizens can use our powers to ensure governments, businesses and other organisations play their part. Each and every one of us must take a lead through personal action ensuring the world of 2050 is an environmentally improved inheritance.

Chris Jenks
Vice Chancellor
Brunel University
May 2010

1. Executive summary

Brunel University acknowledges that climate change is a real and growing threat for countries, economies, and organisations. The University is taking the opportunity to make significant changes towards lessening the impact that its activities have on the local and global environment, and is contributing to HE sector and national commitments to reduce its emissions of carbon dioxide (tCO_2).

The aim of this Carbon Management Plan is to take the lead in changing Brunel University to a more energy efficient, sustainable, bio-diverse University in line to meet the HE sector, national and world reduction targets.

The University has set out clear responsibilities for carbon management in this document, which include the identification of solutions, reporting templates, levels of responsibilities, targets or sector milestones and continued monitoring of progress with regular updates. This is to be achieved by a quarterly report of all emissions against targets and a yearly overall Energy consumption and Emissions Report.

The Carbon Management Plan (CMP) sets out in detail our strategy for reducing carbon emissions over the next three years with yearly updates. The plan details a range of measures and actions to reduce emissions across the University estate. These fall into two main categories; technical measures which require capital investment to achieve a direct reduction in emissions and; enabling measures which help embed carbon management in the operational and strategic processes and policies of the University.

This document includes the University's

- Overall strategic plan for the reduction of emissions;
- CO_2 emissions 2008/09, a baseline year of 2005/06 and emissions, milestones and targets for future years;
- Financial strategy to meet the targets set for the reduction of emissions;
- Implementation Plan of CO_2 saving solutions.

Please note: in this document where it refers to "Targets" these are legislation driven targets or Higher Education Funding Council for England (hefce) sector targets. Where in this document it refers to "Milestones" these are the University's and HE sector inspirational targets or milestones for CO_2 reduction.

The University will also develop a strategic Carbon Reduction Plan (CRP). The plan will link with this CMP to highlight all activities that will be undertaken in the year with clear timescales and deliverables. The CRP will include actions against all carbon saving initiatives, awareness campaigns, training to be undertaken and individual activities to be achieved.

Once this CRP is complete it will be regularly updated and reported to the Environmental Strategy Group (ESG)

- **1.1 CO_2 Emissions**
    - **Scope 1 and 2 emissions**

      Overall Brunel University has reduced its carbon emissions from (2005/06 to 2008/09) by 1,660 tCO_2 for fossil fuels and electricity consumption (Scope 1 and 2 tCO_2 emissions)*

tCO_2	Scope 1[1]	Scope 2	Scope 1 & 2
Baseline 2005/06	11,345	12,398	**23,743**
Actual 2008/09	8,719	13,364	**22,083**
Difference	**Reduction 2,626**	**Increase 966**	**Reduction 1,660**

An overall Scope 1 and 2 reductions since 2005/06 of 7.3%[2]

Using benchmark calculations, this shows a reduction of emissions due to the changing estate and student population of:

- Total kWh/m² pa has shown a 35% overall reduction;
- Total kg tCO_2/m² pa has shown a 31% overall reduction; and
- Total kg tCO_2/student numbers pa has also shown a 22% overall reduction.

- **Scope 3 emissions**

  We are required by hefce at this stage to consider Scope 3 emissions, such as:

  - **Water**
  - **Waste**
  - **Land-based business travel and commuting by both staff and students**
  - **Air travel (by international students, for business purposes, and via international student exchange programmes)**
  - **Procurement - the supply chain**
    Emissions for some of these have not been individually calculated but along with all other scope 3 emissions, they will be calculated using the latest Defra reporting method (2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting).

    This will be signed off by the relevant committees and will be completed by November 2010.

- **1.2 Targets and Milestones**

  - **Targets and Milestones for Scope 1 and 2 emissions**

    Reductions of Scope 1 and 2 emissions of 20% by 2012 and 35% by 2017 with a target of 48% by 2020 against the 2005/06 Baseline

Total Scope 1 & 2 Emissions	tCO_2
Baseline 2005/06	**23,743**
Actual 2008/09	**22,083**
Milestone Reduction 20% 2012/13	**18,995**
Milestone Reduction 35% 2017/18	**15,433**
Target 48% 2020/21	**12,346**

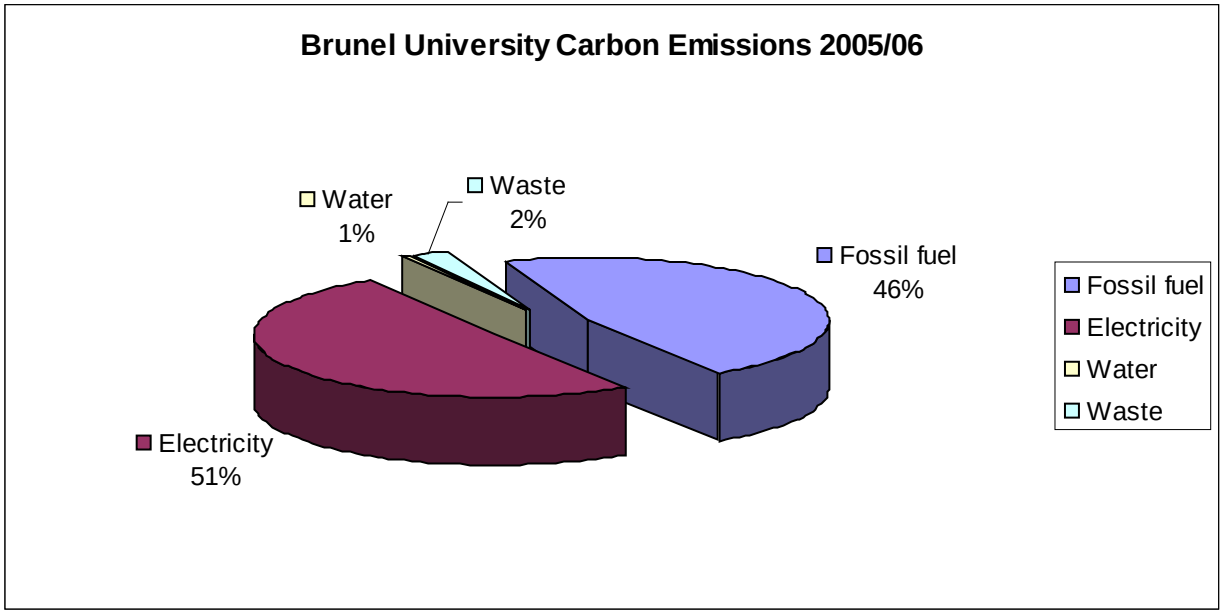
[1] Scope 1 emission, Fossil fuels, Scope 2 emissions Electricity
[2] The area of the University has increased by 35% since 2005/06 (162,780m2 to 220,400m2)

- **Targets and Milestones for Scope 3**

  Reductions of Scope 3 emissions will meet HE sector, national, world reduction targets and Brunel University's Sustainability Targets and Milestones.

- **1.3 Brunel University's overall emissions 2005/06 Baseline of carbon dioxide (CO_2)**

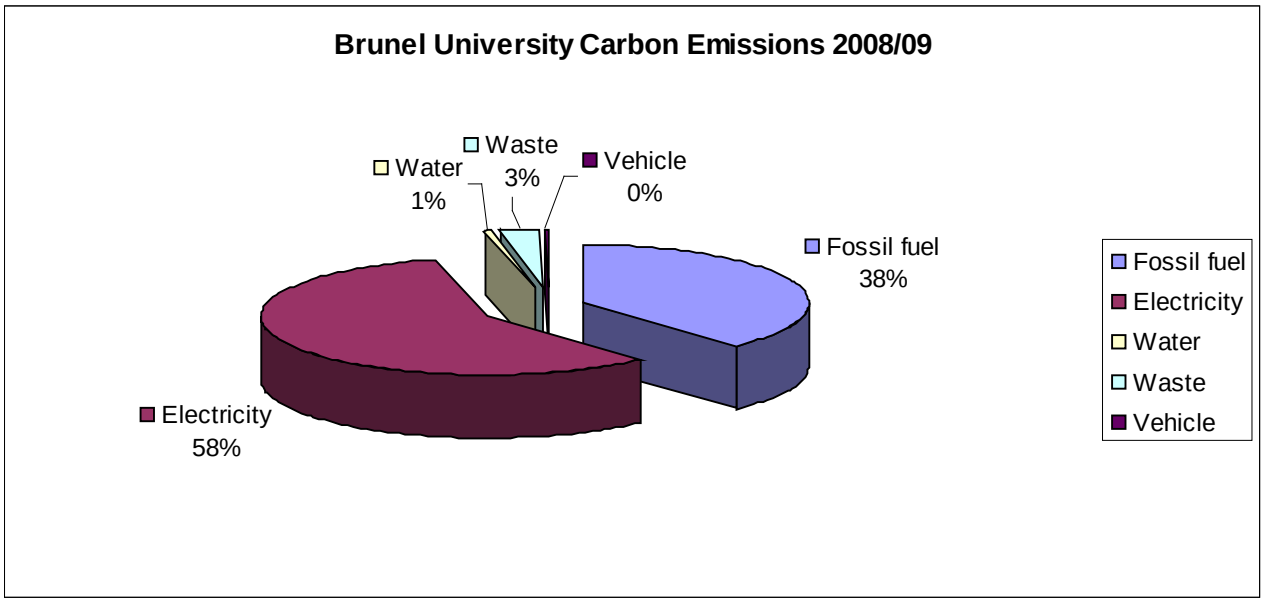
Brunel's total tCO_2 is 24,465 excluding scope 3 emissions listed below



Note
Not including scope 3 emissions of:-
Procurement, Land-based business travel, Commuting (both staff and students)
Air travel (international students; international student exchange; business

- **1.4 Brunel University's overall emissions 2008/09 of carbon dioxide (CO_2)**

Brunel's total tCO_2 is 22,903 excluding scope 3 emissions listed below



Note
Not including scope 3 emissions of procurement, land-based business travel, commuting by both staff and students
Air travel (international students; international student exchange; business)

An overall CO_2 Emissions difference of 1,562 tCO_2 between 2005/06 and 2008/09

2. Introduction

- **2.1 Drivers for Change**

  Legislation, Funding and Perception

  - **Climate Change Act (CCA) 2008**

    The CCA sets out the broad objectives of reducing carbon emissions from the UK to achieve legally binding emission reductions targets on the UK government of 26% by 2020 and 80% by 2050 against a 1990 baseline level. The 26% reduction by 2020 in the primary legislation was later proposed to be amended to 34% by 2020 in April 2009 and this is now the UK government target for 2020. The legislation allows for the introduction of regulations to enact specific measures to achieve these targets.

  - **Carbon Reduction Commitment (CRC) Energy Efficiency Scheme**

    The CRC is a regulatory carbon management cap and trade scheme introduced under the powers of the CCA that will apply to large non energy-intensive organisations; this will include Brunel University as a full participant under this scheme.
    The CRC is a complex scheme designed to promote carbon reduction through attaching a financial and reputation price to carbon emissions. Essentially good performance (carbon emissions reduction) is rewarded and poor performance is penalised through financial incentives and penalties and through publication of a league table of performance.

    Also included in the CRC legislation is:

    - Early Action Metric – aims to demonstrate good energy management (2 components) - % of emissions covered by voluntary automatic metering and % of emissions covered by Carbon Trust Standard.
    - Absolute metric (metric of change) – measure of organisations performance in reducing emissions – current year's performance judged against average emissions over last 5 years/beginning of scheme.
    - Growth Metric - change in emissions per unit of turnover/revenue, designed to benefit organisations which grow in a low carbon way – % change in emissions per unit of turnover (revenue expenditure)

  - **Sustainable Development in Higher Education (2009/03)**

    This document was first published by the Higher Education Funding Council (hefce) in 2005 and updated in February 2009. It sets out key sustainability objectives for hefce which are strongly related to the government objective to reduce carbon emissions in line with the requirements of the Climate Change Act 2008.The document aims to "facilitate a carbon reduction culture to significantly reduce carbon emissions across the sector" and identifies the requirement for capital spending plans to identify their sustainability benefits.

  - **Carbon Reduction Target and Strategy for Higher Education in England (2010/11)**

    The document sets out hefce expectations in respect of carbon reduction and identifies the link between universities preparing Carbon Management Plans and future capital allocations. The document requires that institutions set targets for 2020 for scope 1 and 2 carbon emissions against a 2005 baseline. Scope 1 emissions are direct emissions that occur from sources owned or controlled by the university e.g. boilers/furnaces/vehicles. Scope 2 emissions are those in respect of the generation of purchased electricity consumed by the organisation. 2005/06 was adopted as the baseline year as universities have reliable baseline data for this year.

- **Capital Investment Framework Consultation on the Assessment Process (2009/10**)

  This consultation document introduces carbon management considerations into requirements to obtain capital funding allowances from hefce. The requirements include:
  • preparing a carbon management plan;
  • implementing an environmental management system; and
  • new buildings to be BREEAM rated, environmental impacts of facilities and infrastructure, particularly waste and water use, are to be monitored and managed.

  The carbon management plan is to identify absolute targets for carbon reduction against the 2005 baseline for Scope 1 and 2 emissions. For Scope 3 emissions (indirect emissions from use of goods and services) institutions are encouraged to measure a baseline and in the longer term hefce would expect these to be included within the carbon management plan.

- **Universities Green League 2009**

  The Universities Green League 2009 was published by People and Planet, a non-governmental organisation (www.peopleandplanet.org), using publicly available information regarding the environmental performance of UK universities. Brunel was ranked 84th with a score of 29.5 out of 70.

- **2.2 Reference**

'Good Practice Guidance Carbon Management Strategies and Plans (2010/02)' recommends the following:

- HEI's have a Carbon Management Policy and strategy;
- The CMP must be publicly available;
- HEI's have a commitment to monitor progress toward targets regularly and to report publicly annually;
- The Carbon Management Plan and targets are signed off by the governing body;
- A Clear responsibility for carbon management;
- HEI's will be asked in June 2010 to confirm they have carbon management plans which meet the requirements detailed above. Hefce has already signalled to institutions a more demanding approach to carbon reduction and the need for a CMP;
- A carbon baseline for 2005/6 that covers all scope 1 and 2 emissions: this year is being used as a baseline because it is used for reporting against UK targets, and the SQW Report, commissioned by hefce, demonstrated that robust data for scopes 1 and 2 is available for that year at institutional level. This will provide consistency across the HE sector against which progress can be monitored and reported. Institutions are encouraged to measure a baseline for scope 3 emissions and in the longer term hefce will expect these to be included;
- Carbon reduction targets: these must cover scope 1 and 2 emissions, although institutions can choose to set additional targets for wider aspects. They must be set against a 2005/6 baseline and set to 2020, because this is the timescale for interim government targets. Institutions may also set interim milestones. Currently, targets are proposed for scope 1 and 2 emissions only; there is a degree of uncertainty for scope 3 emissions for 1990;
- In the hefce Statement of Policy (January 2010/10) it advised that "The higher education sector in England has agreed to commit to meet the government targets for carbon reductions in scopes 1 and 2 of 48% by 2020 and 84% by 2050 against a 2005 baseline;
- The HE sector believes that it is important to have milestones and these milestones have been set in line with the five year national carbon budgets and are 12% increase by 2012 and 18% reduction by 2017 against 1990 levels;
- These take account of sector growth since 1990 and are equivalent to a reduction of 20% by 2012 - 35% by 2017 with a target of 48% by 2020 against a 2005/6 baseline;

- Note: in 2012 hefce will review the 2017 milestones in light of experience
- This policy also recognises the significant diversity of the sector and institutions are asked to set targets and develop plans that are appropriate to their individual circumstances but within the national target framework and a wish to develop consistent methodology for reporting scope 3 emissions;
- Travel emissions will be part of the CMP, hefce have indicated that although only fleet vehicle emissions will be required to be monitored in the current year, we are also required to consider commuting and travel for students and staff to and from the University; this will include international students;
- An implementation plan to achieve absolute carbon emission reductions across Scopes 1, 2 and 3 including timescale and resources. These may cover capital projects and actions to embed carbon management within the institution (achieved through corporate strategy and communication);
- The recent Capital Investment Framework (CIF2) consultation document, proposes expanding the metrics to include a more specific and demanding requirement in relation to carbon emissions, requiring institutions to report on progress in implementing the CMP and on the results achieved;
- Failure to satisfy the metrics on carbon and environment will result in only 60% of CIF being made available;
- Carbon offsetting may not be used to meet an institution's carbon reduction target for Scopes 1 and 2. However, it may form part of the institution's carbon management plan for mitigating the effects of essential activities that create emissions under Scope 3.

3. Overview of Strategy

Summary Objectives and General Milestones

- **3.1 Management Process**

  Objective – Embed carbon management into all the processes of the University to help ensure effective carbon management and reporting

  Milestone 1 – Carbon Management/Reduction commitments to be written in to all the Universities policies and processes by 2011

  Milestone 2 – fully engage students and staff in the process of reduction of CO_2 Emissions throughout the University by 2011

- **3.2 Brunel University's overall emissions calculations**

  Objective – Complete overall tCO_2 and other emissions reporting using the latest Defra reporting calculation method 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting

  Milestone – Complete Scope 3 emissions calculations and assess where the shortfalls are by Nov 2010

- **3.3 Utilities**

  Objective – To meet HE sector, national, world reduction targets and Brunel University's Sustainability Targets and Milestones

  Milestone 1 – Achieve 16,411 tCO_2 by 2012/13 and 13,334 tCO_2 emissions by 2020/21

  Milestone 2 – Reduce Scope 2 emissions (electricity) ongoing drive downwards

  Milestone 3 - Yearly Consumption / Emissions Report 2009/10

- **3.4 Waste**

  Objective – To achieve and maintain 15% total waste to landfill growth from 2010 onwards and reduce CO_2 emissions from waste

  Milestone 1 – A complete up to date assessment of the waste CO_2 emissions using the latest Defra reporting method, 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting by 2011

  Milestone 2 – To move 100% of Halls of Residence Food Waste from the Waste Stream to on-site composting by 2012/13

  Milestone 3 – To achieve a recycling rate of 50% by 2012 (this includes construction waste) Ensure that construction waste management and carbon reduction is written into new contracts

- **3.5 Procurement of Goods and Services**

  Objective – To ensure the prudent use of natural resources

  Milestone –The impact of procurement on certain items such as food and the University's ability to use local suppliers will be the subject of specific targets that will be integrated into the University's target setting process. (Dates to be confirmed)

- **3.6 Travel**

  Objective – Measure all Scope 3 emissions associated with travel by 2010/11.

  Milestone 1 – increase walking to campus to 32% by 2013

  Milestone 2 – reduce single occupancy car to 10% by 2013

  Milestone 3 – increase cycling to campus to 8% by 2013

  Milestone 4 – increase car share to 10% 2013

  Milestone 5 – To maintain travel plan co-operation with outside organisations, this includes the Uxbridge Travel Plan Partnership Group, of which the University is Chair

- **3.7 Vehicle Fuel Use**

  Objective – To develop solutions that reduces travel and transport impacts generated by the University

  Milestone – To introduce a green campus based vehicle fleet for the University by 2013

- **3.8 Construction and Refurbishment**

  Objective – To ensure that all new build and refurbishment projects achieve a level of sustainability performance that is equivalent to a BREEAM Excellent standard

  Milestone – Ensure compliance with current legislation and CMP by Sept 2010

4. Approach to Carbon Reduction and Strategic Objectives

The objective of carbon management for every organisation, of whatever sector, is to minimise the risks and maximise the opportunities arising from carbon emissions and climate change, in the short, medium and long term, against a background of rapidly evolving regulations, market forces and stakeholder concerns.

The University's Environmental Policy is a dynamic document for staff, students and stakeholders and has become a reference point for carbon reduction. The Environmental Policy points to all the other policies which have an influence on carbon reduction in the University including this CMP.

The University will also develop a Carbon Reduction Plan (CRP) to support this CMP to highlight all activities that will be undertaken in the year with clear timescales and deliverables. The CRP will include actions against all carbon saving initiatives, awareness campaigns, and training to undertaken and individual activities to be completed.

Once the CRP is complete it will be regularly updated and reported to the Environmental Strategy Group (ESG) and the Estates Management Group (EMG). This in turn will be fed into other committees and groups through SPARC.

The key aspects that will move the University towards carbon reduction are set out below:

- **Existing environmental management structure**

Carbon management will continue to be progressed through the University's existing cross functional environmental management structure, with relevant communication updates given to staff, students, governors and other external stakeholders;

- **Technical and inter-personal carbon saving measures**

Emissions savings to be sought through a combination of technical/infrastructural measures & change management/human interaction measures;

- **Policies**

Ensure that all the University strategy and policies share the common goal of carbon reduction and are regularly updated to move with legislation, target and milestones;

- **Funding**

Explore further Higher Education Funding Council for England (hefce) and Salix Finance to secure innovative carbon reduction opportunities and funding;

- **Data collection**

The reporting of technical energy reduction measures and then the verification of emissions savings are to be based on data gathered from the University's automatic sub-meter monitoring and analysis. Ensure that an easy and understandable process of showing the data to inform the university community;

- **Sector networking**

The University will keep up to date with the development and use of innovative carbon saving measures and best practice within the HE sector;

- **Environmental benchmarking**

Environmental benchmarking against other HEIs is to be undertaken.

5. Brunel University Carbon Emissions Data 2008/09

Brunel University's total overall emissions for 2008/09 is 22,903 tCO_2 excluding scope 3 emissions (pie chart shown at 1.3) of procurement, land-based business travel, commuting and air travel.

- **5.1 Scope 1 and 2 Emissions**

'Scope 1' emissions are direct emissions that occur from sources owned or controlled by the University, for example emissions from combustion in owned or controlled boilers/ furnaces/ vehicles.

'Scope 2' accounts for emissions from the generation of purchased electricity consumed by the University.

tCO_2	**Baseline Emissions 2005/06**	**Actual Emissions 2008/09**	**Actual Emissions 2008/09 % Reduction/ Increases against Baseline**
Scope 1 Emissions (Fossil fuels)	**11,345**	**8,719**	**30% Reduction**
Scope 2 Emissions (Electricity)	**12,398**	**13,364**	7% Increase

**Now includes Vehicle Carbon Emissions.

Note: the total area of the University (Student Residences in particular) has increased by 35% since 2005/06 (162,780m² to 220,400m²)

By adding Scope 1 and 2 emissions together the reduction is 7%.

tCO_2	**Baseline Emissions 2005/06**	**Actual Emissions 2008/09**	**Actual Emissions 2008/09 % Reduction/ Increases against Baseline**
Scope 1 & 2 Emissions	**23,743**	**22,083**	7% Reduction

- **5.2 Scope 3 Emissions**

'Scope 3' covers all other indirect emissions which are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation – for example, commuting and procurement.

The main scope 3 emissions are water, waste, procurement, land-based business travel, commuting by staff and students, air travel by international students, for business purposes, and via international student exchange programmes.

The University will also monitor and set targets of reduction for all other Scope 3 emissions to include, Water, Waste and Transport. As all the emissions are not monitored at the moment and reporting template has been defined, which will be the latest Defra reporting method,2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting.This will be signed off by the relevant committees and will be completed by Nov 2010.

- **Water**

Good quality data is available for the volume of water consumed at the University. Although emissions from this source are small, they have been included in the baseline as consumption data is readily available. Emissions from water consumption relate to those produced during the treatment, transport and disposal of water.

tCO_2	**Emissions 2008/09**
Scope 3 Emissions (Water)	**123**

- **Waste**

It is our aim to divert 85% of the University waste away from landfill in the 12 months leading to July 2010; this will be achieved by a combination of measures to increase our recycling rates and by diverting the remaining waste to provide Energy from Waste. The figures set out below include all University waste, not just general bagged waste.

The current calculation used a nominal figure for this CMP only of 447 tCO_2/tones of waste. Future CMP updates will use the Defra / DECC's GHG Conversion Factors for Company Reporting.

tCO_2	**Emissions 2008/09**
Scope 3 Emissions (Waste)	**618**

- **Land-based business travel and commuting by both staff and students**
- **Air travel (including by international students, business trips, and via international student exchange programmes)**
- **Procurement-the supply chain**

Emissions for these activities have not been individually calculated but along with all other scope 3 emissions will be calculated using the latest Defra reporting method, 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. This will be signed off by the relevant committees and will be completed by Nov 2010.

6. Brunel University's Assessment against a baseline of the University's emissions of 2005/06

Brunel University's total overall emissions 2005/06 is 24,465 tCO_2 including scope 3 emissions from water and waste.

- **6.1 Scope 1 and 2 Emissions**

'Scope 1' emissions are direct emissions that occur from sources owned or controlled by the University, for example emissions from combustion in owned or controlled boilers/ furnaces/ vehicles.

'Scope 2' accounts for emissions from the generation of purchased electricity consumed by the University.

We aim to reduce Scope 1 and 2 carbon emissions with targets of 20% by 2012/13, 35% by 2017 and 48% by 2020 against our baseline of 2005/06.

tCO_2	Baseline Emissions 2005/06	Actual Emissions 2008/09	Actual Emissions 2008/09 % Reduction/ Increases of Baseline	20% Milestone Emissions 2012/13	35% Milestone Emissions 2017/18	48% Target Emissions 2020/21
Scope 1 Emissions (Fossil fuels)	**11,345**	**8,719**	**30% Reduction**	**9,076**	**7,374**	**5,899**
Scope 2 Emissions (Electricity)	**12,398**	**13,364**	7% Increase	**9,918**	**8,059**	**6,447**

*Now includes vehicle carbon emissions.

By adding Scope 1 and 2 emissions together there is a overall reduction of 7%

tCO_2	Baseline Emissions 2005/06	Actual Emissions 2008/09	Actual Emissions 2008/09 % Reduction/ Increases against Baseline	20% Milestone Emissions[3] 2012/13	35% Milestone Emissions 2017/18	48% Target Emissions 2020/21
Scope 1 & 2 Emissions	**23,743**	**22,083**	**7% Reduction**	**18,995**	**15,433**	**12,346**

In the strategy part of this document, the University will show how it will reduce its emissions in line with the above targets and milestones.

- **6.2 Benchmarking**

The area of the University has increased by 35% since 2005/06 (162,780m² to 220,400m²) Therefore benchmark calculations of:

- Total kWh/m² pa has shown a 35% overall reduction
- Total kg tCO_2/m² pa has shown a 31% overall reduction and
- Total kg tCO_2/student numbers pa has also shown a 22% overall reduction

[3] Note the milestone and CRC target emissions are based on hefce HE sector milestones/targets against a 2005/06 baseline; the University takes note of national and world targets and will strive to reduce their targets further.

- **A benchmark of KWh/m² pa is:**

KWh/m² pa	2005/06	2008/09	%
Scope 1 Emissions (Fossil fuels)	328	192	41% Reduction
Scope 2 Emissions (Electricity)	141	111	21% Reduction

  - **A 35% overall reduction**

- **A benchmark of $KgCO_2/m^2$ pa is:**

$KgCO_2/m^2$ pa	2005/06	2008/09	%
Scope 1 Emissions (Fossil fuels)	70	40	43% Reduction
Scope 2 Emissions (Electricity)	76	61	20% Reduction

  - **A 31% overall reduction**

- **Also a benchmark of $KgCO_2$/student numbers pa is:**

$KgCO_2$/student numbers pa	2005/06	2008/09	%
Scope 1 Emissions (Fossil fuels)	914	589	36% Reduction
Scope 2 Emissions (Electricity)	999	903	10% Reduction

  - **A 22% overall reduction**

- **6.3 Scope 3 Emissions**

'Scope 3' covers all other indirect emissions which are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation – for example, commuting and procurement.

- **Water**

  Good quality data is available for the volume of water consumed at the University. Although emissions from this source are small they have been included in the baseline as consumption data is readily available and the appropriate emissions factor is known. Emissions from water consumption relate to those produced during the treatment, transport and disposal of water.

tCO_2	Baseline Emissions 2005/06	Actual Emissions 2008/09	10% Milestone Emissions 2012/13	20% Milestone Emissions 2017/18	30% Target Emissions 2020/21
Scope 3 Emissions (Water)	132	123	119	106	95

- **Waste**

  It is our aim to divert 75.6% of the University waste away from landfill in the 12 months leading to July 2010; this will be achieved by a combination of measures to increase our

recycling rates and by diverting the remaining waste to provide Energy from Waste. The figures set out below include all University waste not just general bagged waste.

Waste Tonnage Targets					
Year	**Recycling**	**Incinerated**	**Energy from Waste**	**Landfill**	**TOTAL**
2005/06	330	0	0	1321	1651
2008/09	571	9	0	1367	1947
2009/10	577	8	888	474	1947
2010/11	588	8	1174	177	1947
2011/12	646	8	1023	170	1847
2012/13	699	8	879	161	1747
2013/14	768	8	765	156	1697
Waste Percentage Targets					
Year	**Recycling**	**Incinerated**	**Energy from Waste**	**Landfill**	**TOTAL**
2005/06	20	0	0	80	100
2008/09	29.3	0.5	0	70.2	100
2009/10	29.6	0.4	45.6	24.4	100
2010/11	30.2	0.4	60.3	9.1	100
2011/12	35.0	0.4	55.4	9.2	100
2012/13	40.0	0.5	50.3	9.2	100
2013/14	45.3	0.5	45.1	9.2	100

The University has started to calculated the waste split into individual types of waste and will adopt the Defra / DECC's GHG Conversion Factors for Company Reporting method for calculating waste emissions.

Emissions from the other scope 3 emissions will be calculated using the latest Defra reporting method, 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. This will be signed off by the relevant committees and will be actioned by July 2010.

7. Carbon Management Finance Plan

The Brunel University Carbon Management Plan (CMP) is expected to significantly reduce energy costs into the future, through the delivery of a programme of investment in energy conservation measures.

These measures will require both capital investments, as well as ongoing operating expenditure to ensure that the programme is delivered. In parallel to the investment programme, a behavioural management programme will also be introduced.

All investments in both time and money will inevitably vary in scale and duration, however they will all seek to maximise the cost-effectiveness of reducing carbon emissions over time, through means of financial appraisals.

Through carefully balancing the level of investment required against the expected increase of the unit cost of energy, the University will be able to make the CMP plan self-financing, in that the various projects will seek to achieve payback periods of less than 10 years.

- **7.1 Funding**

  The methods of funding for the delivery of this Carbon Management Plan will draw from various funders as listed below:

  - Brunel Stock Condition Budget **£2.1M**
  - The Rolling Green Fund (Salix) **£500k**
  - Energy savings reinvested **£70k**

  The above figures highlight the status of securing the various forms of funding, which will be needed to deliver both the intended capital investments across the delivery of the CMP.

  - **The Revolving Green Fund (RGF)**

  The Revolving Green Fund (RGF) is a partnership between hefce and Salix Finance Ltd which has two strands for funding: Institutional Small projects (ISP) fund and Transformational Fund. Brunel is already participating in the ISP fund and currently has £500k ring-fenced to implement carbon reduction schemes which meet the qualification process of Salix funding. The fund will cover the investment into capital assets which will deliver the reduction of projected carbon emissions – all proposed projects need strict Salix approval and must project carbon reduction over a fixed period acceptable to Salix.

  Once a project has been commissioned, the actual saving to the energy budget will be monitored against the projected carbon reduction and the actual/projected savings need to be repaid to the ring fenced RGF for further projects to be considered.
  As a simple guide, RGF projects using the ring fenced fund need a maximum repayment period of 5 years.

  There is currently no time limit to the ring-fenced RGF scheme, but there is a requirement for 60% of the RGF fund to be continually committed to carbon reduction projects, otherwise the Salix funding has to be re-paid to Salix.

  The transformational fund is for larger projects which will transform the institutional approach to managing its energy consumption and reducing its emissions.
  Depending on the emerging government policy following the election, Salix are currently awaiting confirmation of further funding award opportunities for the larger carbon reduction projects.

Once clarified there may be opportunities for projects to be part funded by Salix and match funded by the institutions with longer payback periods.

- **The types of solutions considered**

Initial investigations suggest that we could reduce our carbon emissions on the newer halls of residence with Combined Heat and Power (CHP) plant on Lancaster and Bishop Hall complex on campus within a 10 year payback period.
Other investigations into photo-voltaic cells on the IAC suggest that a payback period of 12 years or more would probably make this type of investment unfavourable compared to CHP plants.
Further feasibility studies are underway to evaluate potential projects to be considered for carbon reduction.

- **7.2 Benefits and Savings**

The university expects that the CMP will have both substantial financial and carbon saving benefits, as well as intangible benefits, through the implementation of sensible investment in both capital and structural projects.

Quantified Benefits: Financial

Estimated Reductions in £					
Reductions	***Jul-10***	***Jul-11***	***Jul-12***	***Jul-13***	***Jul-14***
RGF	£3,468	£98,515	£119,340	£119,340	£119,340
Save IT	£40,928	£40,928	£40,928	£40,928	£40,928
Energy wise	£7,871	£18,887	£18,887	£18,887	£18,887
SCW	£0	£1,573	£3,936	£10,234	£15,725
Others	£2,380	£3,936	£13,379	£18,887	£10,234
	£54,647	***£163,838***	***£196,469***	***£208,276***	***£205,114***

Quantified Benefits: $KgCO_2$

Estimated Reductions in $KgCO_2$					
Reductions	***Jul-10***	***Jul-11***	***Jul-12***	***Jul-13***	***Jul-14***
RGF	22,073	627,019	759,564	759,564	759,564
Save IT	260,492	260,492	260,492	260,492	260,492
Energy wise	50,097	120,210	120,210	120,210	120,210
SCW	0	10,009	25,048	65,136	100,085
Others	15,148	25,048	85,153	120,210	65,136
	347,809	***1,042,778***	***1,250,467***	***1,325,612***	***1,305,487***

*Save It – Switch Off - This is a Campus wide awareness raising campaign
*Energy wise – Is a project IT is working on in conjunction with CISCO.
*SCW – Stock Condition Work – Planned upgrade of all 60s and 70s building stock

- **Un-quantified Benefits:**

The delivery of the CMP will undoubtedly deliver benefits that will be difficult to calculate financially. However, the University feels that it is important to highlight some of the potential intangible benefits that could be achieved through its delivery:

- Enhanced Reputation amongst stakeholder groups
- Attractiveness of the Estate
- Effective management and participation of stakeholder groups

- Potential for future funding for research work on the basis of exemplar environmental performance

- **Additional Resources**

The level of investment as listed out in this CMP is deemed sufficient to deliver the programme. Therefore, it is not anticipated additional resources will be required, this true at the time of compiling this plan. However, it is not possible to fully account for all eventualities beyond the medium to long term. As a consequence, the University will endeavour to remain flexible and include resources when reviewing the CMP annually.

8. Implementation Plan

- **8.1 Carbon Reduction Solutions/ Projects**

The University has actively worked to include sustainability and carbon reduction elements in all its decision making processes for new solutions and projects. This process runs through to the whole day to day running of the estate. This ethos will not only include new specifications but also maintenance.

The University will consider not only value for money but the most efficient carbon saving solutions for all its projects. As for maintenance, it is not a case of fitting a like for like replacement again is value for money but also the most efficient carbon saving solution.

These Carbon Reduction Solutions/ Projects will include new builds, major refurbishments and general refurbishments:

- New builds will be rated based on a BREEAM excellent standard.
- Major refurbishments will also be completed to a BREEAM standard.
- All refurbishments and new builds will show a carbon reduction projection to be inserted into the CMP.
- All buildings will have a Display Energy Certificate to ensure that they show their efficiency and a like for like comparison can be made.

The drivers of the above will be:

- Academic needs and aspirations
- Space utilisation efficiency
- Carbon reduction

A review process will take place to evaluate the potential building to be worked on to clearly demonstrate that a process has taken place of energy/carbon efficiency and value for money in the longer term. The review may consider that it might be more energy/carbon efficient to provide a new build instead of completing a major refurbishment of a 1970s building. A template will be issued by July 2010.

Following completion of a new build and refurbishment, and carbon reduction projects, all carbon projections will be monitored by the automatic metering system to show if the CO_2 saving projections are being delivered. This is essential for the repayment of the RGF fund from the utility budget and meeting the milestones and targets set in the CMP.

The Estates Project delivery team will install commission and complete the solutions/projects/refurbishments, including the carbon reduction projections for each proposed project. The Ops Environment and Sustainability team will monitor the carbon reduction projections and ensure that targets are being met and reported to the Environmental Strategy Group (ESG).

A matrix of evaluation of projects past, present and the future has been devised.

Please see the figure 'Quantified Benefit: $KgCO_2$' in **7.2 Benefits and Savings** on p18.

- **8.2 RGF (details in section 7)**

The fund has been split into 3 stages:

- Stage 1 works Voltage Optimiser equipment installed into building to show an electricity saving.
- Stage 2 works again Voltage Reduction equipment installed into building to show an electricity saving.
- Stage 3 works to include lighting controls, viable speed drives on pumps and motors and the resetting of internal space temperature.

The overall financial and energy savings are indicated as below by Salix Finance Ltd.

Stage 1 Works	**Total Annual kWh Units Saved**	**Total Annual GBP Savings**	**Total Annual CO2 Savings Tonnes**	**Cost per Tonne CO2 Saved**
WBB Voltage Optimiser	88,480	£7,521	48	£42
Fleming Voltage Optimiser	99,957	£8,496	54	£35
Galbraith Voltage Optimiser	57,754	£4,909	31	£51
Stage 2 Works				
Isambard A Voltage Reduction	189,110	£16,074	103	£29
Isambard B - Voltage Reduction	231,600	£19,686	126	£25
Cleveland Road Voltage Reduction	148,779	£12,646	81	£36

- **8.3 Save It – Switch Off**

Save It – Switch Off is a campus-wide awareness-raising campaign currently using light switch stickers, leaflets, posters, and drinks coasters. The campaign started in September 2009 at Fresher's Fair and was directed at the new student intake, this was subsequently directed to the returning students and staff. It is a continuing campaign and is presently included in many of the activities that are held on campus – green week, one world week and Fairtrade fortnight.

Further work will be started in June so we can re-launch this September to the new students, returning students and staff. The new campaign will include wide publicity of the CMP and the milestones and targets the university needs to meet.

- **8.4 Energy wise**

Energy wise is a project that Computing and IT are working on in conjunction with CISCO and some other partners. In summary, it is designed through system/network efficiency software to reduce energy consumption along with remote shutdown of PCs, phones, and parts of idle network.

- **8.5 SCW – Stock Condition Work**

SCW – Stock Condition Work – proposes upgrade of all 60s and 70s buildings and existing building stock on campus. It is a form of total building refurbishments including services and envelope, with an eye on carbon reduction and efficient space utilisation. The programme will be subject to prevailing finance conditions. The current carbon reduction is based on the identified and planned work programme.

- **8.6 Other works**

Other potential works may include replacing all electrical heating, up-grade of heating controls, improve glazing and better insulation. There are current aspirations to consider further CHP plant and possible renewable energy sources such as, solar, thermal, PV and a wind turbine generation.

9. Governance and Progress Monitoring

- **9.1 Responsibility for Action**

The Strategic Planning and Resources Committee (SPARC) have overall responsibility for the development and monitoring of the University Strategic plan on behalf of the University governing body - Council. SPARC has a key role to play in scrutiny and overseeing the implementation of the Carbon Management Plan (CMP).

Environmental Strategy Group (ESG) is a sub-committee of SPARC and provides leadership, policy development and monitoring on all university environmental issues, which include carbon management. The co-ordination and monitoring of the carbon management plan will be the responsibility of the ESG who will regularly receive reports on progress from the Environment and Sustainability manager. ESG will then feed the reports for scrutiny onto SPARC for consideration and approval on behalf of Council.

Estates Management Group (EMG) is sub-committee of SPARC and provides Estate management and development policy and refurbishment on all university buildings, which will include carbon reduction.

Key members of staff in this process are the Director of Resources and Operations, Head of Operations, Director of Estates and the Environmental and Sustainability Manager.

Day to day responsibility for monitoring carbon reduction plans, projects and actual emissions currently lies with one full-time member of staff dedicated to carbon reduction – Environmental and Sustainability Manager. He is supported by Grounds Manager and Support Services Manager, both of which are also full-time posts.

An additional resource to assist in the launch of the carbon management plan will be employed during the summer period.

Environmental and Sustainability Manager has responsibility for environmental policy, objectives and monitoring implementation (including carbon management), energy awareness, communications and energy monitoring. He is also responsible for day-to-day energy management.

Grounds Manager has responsibility for the wildlife habitat/Educational/meadow and grassland areas on campus in accordance with the agreed Landscape management strategy, all arboreal matters, general estate, sports facilities and river bank management in close liaison with the Environment Agency.

Support Services Manager has responsibility for waste management, hazardous waste disposal, WEEE disposal, Hygiene services and on site food composting.

Head of Operations has overall responsibility for the Operational Team and reports directly to the Director of Resources & Operations, who in turn reports to the Vice-Chancellor.

Director of Resources and Operations chairs both the EMG and ESG committees and is also a member of SPARC, and the Head of Operations and Director of Estates are committee members of both EMG and ESG.

- **9.2 New Responsibility for Action**

Incorporating the Carbon Management Plan
The Carbon Management Plan is to be imbedded into all strategic policy and planning within the University.

We aspire to be in a position where environmental responsibility (including responsibility for carbon reduction) becomes a core value of the University and not just the responsibility of a few dedicated staff. Senior staff will leading by example, and all staff will be encouraged to recognise how this responsibility impacts on them and be encourage to act on that duty.
In order to achieve this level of buy-in across the University, it will be necessary to go beyond communications campaigns. For example, an environmental duty will be placed on all staff through a standard statement in all job descriptions, which makes clear that all employees are expected to go about their responsibilities in an environmentally responsible manner.

Appointment of Energy Champions
We will establish a group of volunteer Energy Champions in Schools and departments across the University to champion energy efficiency among colleagues/students and to assist with the dissemination of energy awareness campaign messages. They could be tasked with taking action to reduce waste, for example by switching off lights and equipment.

We will begin the process to have an Energy Champion sitting on each of the follow groups/committees:

- Students Union
- Campus Life Committee – reports to Senate
- Finance Committee – reports to Council
- Strategic, Planning and Resources Committee (SPARC) - reports to Council
- Senior Management Group (SMG) – reports to the Vice-Chancellor
- Academic Management Group (AMG) – reports to Vice-Principal
- Information Steering Group (ISG) – reports to SPARC
- Estate Management Group (ESG) – reports to SPARC
- Environment Strategy Group (ESG) – reports to SPARC

Energy Communications Plan
We understand that raising awareness among the Brunel community is essential and this can be done through systematic training and aggressive information-sharing. Therefore the University needs an Energy Communications Plan, which is updated annually for the start of each academic year. This includes regular communications via the staff IntraBrunel portal, Bulletins, student publications, social networks, distribution of energy awareness bookmarks and posters, competitions, information stands on campus and participation in national campaigns such as Energy Saving Week. This Communications Plan will be updated to reflect the aims and scope of the Carbon Management Plan and to ensure that progress against agreed targets is feed back to staff and students at regular intervals.

Every effort will be made to raise awareness of any training requirements that students or staff may need to fulfill their roles of Energy Champions either on groups/committees or as volunteer Energy Champions.

- **9.3 Carbon Management Monitoring & Reporting**

Substantial investment has been made in main meter monitoring and additional sub-meters for all buildings and remote monitoring equipment allows the University to measure consumption closely, using half-hourly readings, so that we can better understand and manage our utilities use. This Automatic Remote Monitoring System covers all three utilities and allows us to identify and target areas with high consumption and potential problems early, avoiding unnecessary waste.

Our current contract for waste management provides us with accurate weight based data for both waste converted to energy (in place of disposal in landfill) and materials recycled.

The University fleet transport data is collected across the campus by the Energy and Sustainability Manager to ensure that the carbon footprint of fleet transport is recorded for scope 1 requirements. We also carry out annual bus and travel census, the travel census data is required for an annual report.

This data will be analysed throughout the year of the Carbon Management Plan using the latest Defra reporting method, 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting to ensure that progress against agreed targets is monitored on a monthly basis. Regular feedback will be provided to the Environment Strategy Group (ESG) and the Strategic, Planning and Resources Committee (SPARC).

A set of sophisticated data sets are being developed by the Environmental and Sustainability Manager to ensure that data is readily available to satisfy reporting requirements for all external statutory and other obligations such as the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme and the Carbon Trust Standard.

- **9.4 Finance and Investment**

  - Finance and investment is critical if the university is to meet the carbon reduction milestones and targets. The CMP will be embedded into the finance strategy and the carbon management finance plan will be embedded into university budget planning processes.

- **9.5 Policy Alignment**

  The University will review key policies to ensure that they imbed the Carbon Management Plan, including:

  - University overall Strategic Plan
  - Estate Strategy (includes capital projects and stock condition works)
  - Environmental and Sustainability Policy
  - Finance Strategy (includes travel and expenses)
  - Space Management
  - Procurement Policy
  - Travel Plan
  - Human Resources policy
  - University Equality Policy.

  This process will be managed/monitored by SPARC.

- **9.6 Strategic Ownership**

  Brunel University recognises the need for good governance of this CMP and the strategy, including senior level strategic ownership of the carbon reduction target.The governance of the Carbon Management Plan, as well as strategic ownership of the carbon reduction target, rests with University Council. The Strategic, Planning and Resources Committee (SPARC) will scrutinise the CMP on behalf of council.

- **9.7 The University Council**

  University Council is the University governing body, meets a 3 to 4 times a year and is led by the Chair of Council.

  - **University Council Membership**
    Council Chair
    Vice-Chancellor
    Vice-Principal
    Members elected from Senate
    Members elected from the Academic community
    Members elected from the Non-Academic community
    President of the Student Union
    14 independent Members

- **9.8 The Strategic, Planning and Resources Committee (SPARC)**

  The Strategic, Planning and Resources Committee (SPARC) will be responsible for scrutiny the carbon management plans and monitoring performance against the targets on behalf of Council. The role also includes overseeing the strategy, encourage delivery, ensuring coherence and coordination of carbon reduction activity and the identification of, and removal of barriers.

  - **SPARC Membership**
    Vice-Chancellor, Chair
    Vice-Principal
    Pro-Vice-Chancellors
    4 Council Members
    President of the Student Union
    Director of Finance
    Director Resources & Operations
    Director of Human Resources
    Head of Planning

- **9.9 The Environmental Strategy Group (ESG)**

  The Environmental Strategy Group (ESG) will monitor carbon management on behalf of SPARC and will advise of SPARC any necessary action together with annual reports to ensure the implementation of the CMP remains on target. The ESG will also review the CMP yearly and will submit recommendations to SPARC of any changes for scrutiny and acceptance on behalf of Council.

  The ESG meets a minimum of once per term.

  - **ESG Membership**
    Director of Resources & Operations, Chair
    Head of Operations

Director of Estates
Environment & Sustainability Manager
President of the Student Union
Computer & IT Centre
Residences
SU Environment Chair
Planning & Policy
Support Services Manager
Institute for the Environment
Sports Centre
School of Engineering & Design
Business School
Central Procurement

Carbon Management Responsibility
May 2010