



FOR ALL STAFF AND STUDENTS

## Carbon Management Plan

## Amendment record

Date	Section	Issue	Modifications	Approved (Print name)
Apr 2011		1	Introduced	Carbon Advisory Group
Mar 2016	All	2	Rewritten	Carbon Advisory Group

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# Plymouth University Carbon Management Plan

## 2016-2020

### Overarching Aim

Plymouth University will become carbon neutral by 2030.

This will be achieved by:

- reducing the University's operational emissions as far as possible and
- compensating the remaining emissions by:
  - reductions achieved through research and development of innovative technologies and
  - instilling low carbon values and habits into its students

The operational targets are 43% by 2020 and 52% by 2030, with respect to the 2005 baseline, the remaining emissions being offset through relevant research and teaching activities to deliver carbon neutrality.

### Relevance

#### Climate Change

Climate change is one of the great challenges for modern society. The Stern review made it clear that the benefits of strong early action on climate change outweighed the costs.

#### International and national regulation

Under the Kyoto Protocol, the UK Government agreed to set national targets in reducing carbon emissions, 34% by 2020 and 80 % by 2050, with respect to a 1990 baseline year. This provoked legislative responses such as the EU Energy Performance of Buildings Directive. The UK government has introduced more stringent Building Regulations and enacted the Energy Performance of Buildings Regulations (2007). In addition the Carbon Reduction Commitment has been implemented forcing large organisations, such as the University, to pay for its gas and electricity related carbon emissions. This equates to an annual charge in the region of £190k (2014/15).

#### HEFCE requirements

The Higher Education Funding Council for England (HEFCE) has adopted carbon reduction targets in line with UK Government; a **43% reduction from a 2005 baseline by 2020**. HEFCE's Capital Investment Framework (CIF II) directly links the allocation of capital funding for Universities to carbon reduction.

### **Increasing and volatile energy costs**

The average unit cost of gas and electricity has risen by 36% and 109% respectively (2014/15) since the 2005 baseline, a strong incentive for investment in carbon reduction measures and energy efficient design.

### **Reputational drivers**

Increased exposure in the media regarding climate change fuels a rising concern from staff, students and the wider public about global warming and the environmental impact of the institution. To help alleviate some of these concerns the University has implemented an Environmental Management System accredited to ISO 14001. The environmental, political, economic and social context is naturally a driver in terms of the University's academic response, be it in terms of developing sustainability aware citizens or research into solutions to respond to the global concerns of climate change.

### **[Links with Other Plymouth University Strategies](#)**

This Carbon Management Plan directly supports the delivery of the University Strategy 2020, particularly in addressing the ambition to achieve resilience, sustainability and effectiveness.

The Carbon Management Plan spans a number of key strategies such as:

- Energy and Water
- Sustainable Strategy, including procurement
- Estate and Facilities campus strategies
- Transport and Travel
- The Environmental Management System
- Flexible Working Procedure and other HR strategies where appropriate
- TIS operations incorporating IT strategies and new technologies

### **Plymouth's Approach**

Four key elements to attain carbon reduction have been identified:

1. **Behaviour/Institutional Change** (including travel, procurement and Building Management System improvements as well as other long term institutional behaviour changes)

*Including but not exclusive:*

- How the University functions; including operational parameters, e.g. the virtual campus, home/remote and flexible working, e-invoicing, improved use of technology, making use of video conferencing and reducing the need for paper.
- No cost / low cost good housekeeping measures such as introducing policies around seasonal space temperature set points.

- Awareness campaigns, aimed at both staff and students. There is a keen interest in developing energy / carbon awareness campaigns.
  - Development of 'projects' that create environmental understanding throughout a student's pedagogical development. This will directly reduce operational carbon emissions and in addition, the student will carry a strong environmental philosophy with them into future careers.
2. **Improving Space Utilisation** and rationalisation of buildings (includes new builds and property disposals)
- The university's Estate Strategy informs and guides the use, disposal, and new development of the building stock.
3. **Fuel Conversion** (includes use of bio-fuels and Combined Heat & Power)
- These projects focus on the opportunities to move to alternative low carbon fuels, such as bio-fuels and implementing combined heat and power projects (CHP). In the case of the latter the University is working with Plymouth City Council to develop a district wide CHP heating scheme. There is currently a 300kWe CHP unit, installed in 2012, supplying heat to nearly 50% of the campus.
4. **Carbon Reduction Projects** (compliant with the Revolving Green Fund)
- RGF1. The University has ring fenced a budget of £374k to undertake small scale carbon reduction schemes, an initiative in partnership with HEFCE/Salix.
  - RGF2. Campus Information and Control. A £971k project to provide greater transparency of university consumptions and consequently a pathway to reducing their impact.

## Goals

1. To reduce energy usage in buildings and equipment through:
  - more efficient use of space
  - more efficient use of heating, cooling and ventilation systems
  - reducing heat loss from existing buildings
  - encouraging building occupants not to overheat buildings in winter or to overcool in summer
  - making sure all new buildings and building refurbishments are undertaken to the best achievable energy standard
  - improving energy efficiency of lighting and electrical equipment by replacing with more efficient alternatives
  - encouraging users to keep electricity usage to the minimum.
2. To make use of alternative and renewable energy sources were cost effective.

3. To reduce emissions associated with waste and procurement by:

- active demand management – STOR
- using the least environmentally damaging goods and services
- using whole life costing methods incorporating environmental and social impact in the determination of value for money
- raising awareness of Sustainability in the procurement cycle (cradle to grave)
- developing a sustainable supply chain through overcoming barriers to entry to SMEs and local suppliers
- benchmarking performance and continued improvement

4. To reduce emissions associated with travelling and vehicles by:

- reducing the need for business travelling
- active encouragement of alternatives to private car use (business travel and commuting)
- making use of alternative fuels

5. To create policies and processes which will ensure that carbon management remains at the core of all University activities.

6. To communicate with and involve key stakeholders in order to develop and implement the CMP, this includes all staff, students and local community organisations.

7. To embed educational guidance for students' in environmental matters:

The University aims to lead in the Higher Education sector in offering students from all disciplines a basic understanding of the science and issues of climate change. This is taken forward by the Directorate of Teaching and Learning.

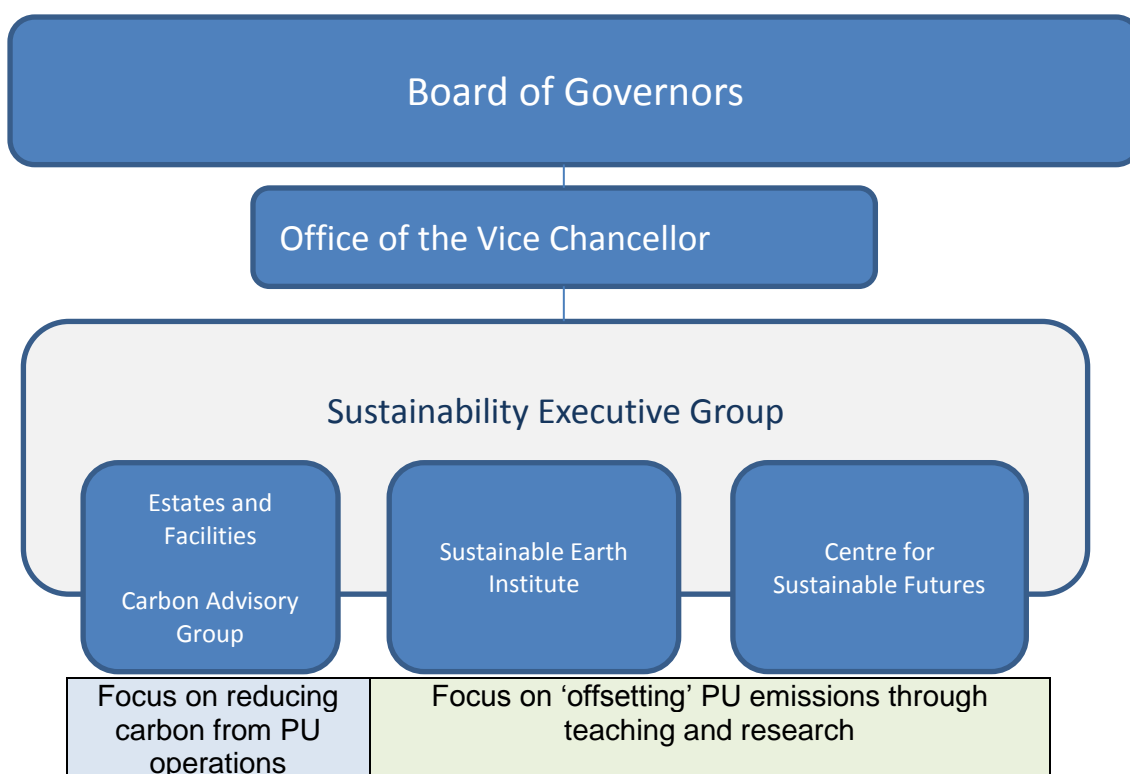
8. To augment environmental dialogue and communication with stakeholders: The University is recognised by staff, students, peer organisations and the local community as an institution which has made a major effort to reduce and continue to further reduce its carbon emissions and to achieve the emissions targets set for public institutions by the Government. In continuing with this regime, it will demonstrate and publicise good practice in carbon management for the environmental and academic benefit of its students.

9. Develop an auditable strategy, embedding a reporting methodology, to show how the University carbon neutral targets can be achieved through the work undertaken by the Sustainable Erath Institute and Centre for Sustainable Futures.

## Achieving Goals

**Sustainability Executive Group (SEG).** The responsibility for achieving the **carbon neutrality target rests with the SEG**. This Group brings together representatives of the three strands of university activity (operational carbon reduction, research and teaching). Estates and Facilities (EF) focus on reducing carbon from PU's operations, the Sustainable Earth Institute (SEI) and the Centre for Sustainable Futures (CSF) work towards carbon off-set measures through research and curriculum development respectively. The SEG reports to the OVC and the Board of Governors. The members of the SEG have oversight of the programme to encourage delivery and identify, and remove, the barriers to success.

**Carbon Advisory Group (CAG), has strategic ownership of the operational carbon reduction target.** The CAG supports the University in realising its aim to achieve carbon neutrality by reducing operational emissions. The CAG reports to the SEG



*Dia. 1*



## Scope, Baseline and Projections

It is important to recognise the scope of emissions that this CMP covers. The University has measured its Carbon Footprint in the 2005/6 and 2014/15 academic years. Emissions are defined within three Scopes as set out by the World Business Council for Sustainable Development:

- **Scope 1** – covers direct GHG emissions generated on site eg gas and oil consumption and from onsite company owned vehicles and facilities.
- **Scope 2** – includes net indirect emissions from energy imports and exports, particularly imported and exported electricity and steam.
- **Scope 3** – includes other indirect GHG emissions, such as employee business travel, product transport by third parties, outsourcing of core activities and off-site waste disposal/management activities, water consumption and procurement related emissions

The table below shows a summary of known scope emissions in 2005/6 and the current identified range of carbon emissions.

WBCSD	Type	2005/6	2013/14
Scope 1	CHP	Not Applicable	Included
	Solid fuels	Not Applicable	Included
	Liquid fuels	Included	Included
	Gaseous fuels	Included	Included
	Vehicle fleet	Data Not Available	Included (C)
	Refrigerant Gases	Data Not Available	Included
Scope 2	Grid electricity	Included	Included
	Heat purchased	Not Applicable	Included
Scope 3	Water	Included	Included
	Waste	Data Not Available	Included
	Business Hire Vehicles	Data Not Available	Included
	Rail Travel	Data Not Available	Included
	Air Travel	Data Not Available	Included
	Employee Commuting	Data Not Available	Included (C)
	Student Commuting	Data Not Available	Included (C)
	Intersite bus	Data Not Available	Included
	Procurement Related (General)	Data Not Available	Data Not Available
Not Scope	Procurement related Building	Data Not Available	Data Not Available

nb Procurement related Building emissions are not in scope. ie Not part of regular operations.

E = Estimate C = Calculated

Table 1.

The University has set a carbon reduction target for Scope 1 and 2 emissions against the 2005/6 academic year baseline. Measuring performance against 2005/6 ensures the University will be aligned with the rest of the sector as defined in the HEFCE reporting guidance. In 2005/06 Scope 1 and 2 carbon emissions were 12,645 TCO<sub>2</sub>, comparative emissions in 2014/15 were 10180 TCO<sub>2</sub>, a reduction of 19%. The estimated overall carbon emissions in 2014/15, including Scope 3 emissions, equate to over 41000 TCO<sub>2</sub>. The University will use 2012/13 as the base year for Scope 3 emissions and will review the target at a later date.

**Carbon Emissions = Tonnes CO<sub>2</sub> pa**

<b>Responsibility:</b>	2005/06	2012/13	2013/14	2014/15	2020	2030	
<b>Operations</b>	<b>base year</b>				<u>Target 43%</u>	<u>Target 52%</u>	
Scope 1	<b>4051</b>	2924	2615	2480	2309	1944	
<i>Reduction to base year.....</i>		-27.8%	-35.4%	-38.8%	<b>-6.9%</b>	<b>-22%</b>	
		<b>% Reduction needed from 2014/15</b>					
Scope 2	<b>8594</b>	8128	8206	7727	4899	4125	
<i>Reduction to base year.....</i>		-5.4%	-4.5%	-10.1%	<b>-37%</b>	<b>-47%</b>	
		<b>% Reduction needed from 2014/15</b>					
Scope 3		<b>11388</b>	15467	14735	TBA		
<i>Reduction to base year.....</i>				-4.7%			
Procurement		<b>16396</b>	<b>16396</b>	<b>16396</b>	TBA		
<i>Reduction to base year.....</i>		0.0%	0.0%	0.0%			
<b>Total Emissions</b>	12645	38837	42684	41338	<b>48546</b>	<b>47408</b>	

To achieve carbon neutrality the carbon emissions highlighted in yellow will require to be offset.

*Table 2*

The above table also provides an indication of the amount of carbon that needs to be offset (highlighted in yellow), through work undertaken by SEI and CSF, for the university to claim carbon neutrality.

Table 3 below provides an overview of the identified carbon emissions. Utility based carbon emissions (Scopes 1 & 2) account for approx. 25% of total carbon emissions. It's clear that utility based carbon reductions alone will not achieve the set targets. In addition, there is little data on Scope 3 emissions for the baseline year 2005. Because of this the University has agreed to use 2012/13 as the base year for Scope 3 emissions. There is currently no Government set target for Scope 3 emissions and the University will address this at a later date.

**TOTAL CARBON EMISSIONS ACADEMIC YEAR - (AUG - JUL)**  
TONNES CO2

Red = Estimated until year end

Scope	Source	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2020	2030	
(GHG TCO2e)	1 Gas	3631	2576	3330	1867	2241	1984	1799	2756	2491	2383	2070	1743	
	Oil	419	290	286	250	62	0	0	0	0	0	239	201	
	Fleet Vehicles					40	31	18	25	32	28	23	0	
	Solid Fuel							2	20	10	2	11	0	
(GHG TCO2e)	Refrigerant Gases			40	276	183	2	156	123	81	67	158	0	
(GHG TCO2e)	2 Electricity	8594	9025	9596	8139	8948	8565	8916	8117	8202	7725	4899	4125	
	Heat Purchased							6	11	4	2	6	0	
(GHG TCO2e)	3	Water	681	823	783	744	564	470	439	519	518	486	388	327
(GHG TCO2e)		Waste			59	68	55	72	81	75	70	113	39	28
		Business Hire Vehicles					53	60	49	333	64	40	34	26
		Rail Travel					136	176	169	216	63	120	100	65
		Air Travel					693	919	1033	2576	3997	3279	524	333
		Employee Commuting						1613	1453	2012	2382	1891	828	774
		Student Commuting						686	2254	5658	8210	8630	1285	329
		Intersite bus									163	176		
(GHG TCO2e)	Procurement Related (General)							16396	16396	16396	16396	9346	7870	
<b>NOT IN SCOPE</b>	Procurement Related (Construction)							13702	0	0	0	0	0	

TOTAL SCOPE CARBON EMISSIONS	13325	12715	14093	11344	12976	14578	32774	38837	42684	41338	19949	15822
% Difference between this and last yr	-2%	-5%	11%	-20%	14%	12%	125%	19%	10%	-3%		
% Difference between this and base yr												

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2020	2030
Scope 1	4051	2866	3656	2393	2527	2017	1975	2924	2615	2480	2500	1944
Scope 2	8594	9025	9596	8139	8948	8565	8923	8128	8206	7727	4905	4125
Scope 3	681	823	842	812	1501	3996	21876	27785	31863	31131	12544	9752

COMBINED UTILITY - TOTAL (G,O & E)	12645	11892	13212	10255	11252	10549	10715	10874	10693	10108	7207	6069
% Difference between this and last yr	-4%	-6%	11%	-22%	10%	-6%	2%	1%	-2%	-5%		
% Difference between this and base yr	0%	-6%	4%	-19%	-11%	-17%	-15%	-14%	-15%	-20%	-43%	-52%

**Table 3**