

Cranfield University Carbon Management Plan: Progress and amendments

Introduction

The Cranfield University Carbon Management Plan (CMP) was approved by the Executive in February 2009. This paper reports progress against the plan in 2009/10 and presents amendments, which were recommended by the University Executive for approval by Council. These amendments were agreed by Council in October 2010.

Progress so far

The existing CMP had a proposed 2008 start date but in fact got fully underway in Financial Year 2009/10 after gaining approval by the Executive and the Carbon Trust. Progress in reducing CO₂ emissions was therefore limited in 2008/2009 but the University achieved a 10% reduction in 2009/2010, the first full year of the programme, allowing us to meet our 10:10 commitment.

Given the actual implementation date of the CMP, the Executive recommended rebasing the start date from 2008 to August 2009.

Table 1. Emission reductions in 2009/10; actual and projected costs and savings for 2009/10 and 2020¹.

	2009/10		2020		
	Saving (tCO ₂ e)	Cost (£k)	Saving (£k)	Saving (£k)	Net Benefit (£k)
Silsoe move	348	0	60	660	660
Awareness raising	489	70	76	835	765
Energy efficiency	567	218	119	1190	972
Other	422	0	65	720	720
Total saving	1,826	288	320	3,405	3,117

Note: the data for 2020 illustrate savings that accrue over the lifetime of the plan.

Amendments to the plan

In the light of experience during the first year of operation, the current CMP was reviewed to prioritise areas where greater savings could be realised. In particular, improvements to lighting controls and the installation of more efficient lighting systems have been identified as a major source of potential savings. Other measures with a large potential include: insulation (pipe and building fabric); improvement to controls; computers and office equipment; and fan and pump motors. The CMP has therefore been revised to reflect these opportunities.

The University also needs to respond to external drivers. Firstly, from 2011, HEFCE will require HEIs to have approved CMPs, without which 40% of future CIF2 funding may be held back. To comply with HEFCE guidelines², CO₂ reduction targets must now relate to absolute reductions against a 2005 baseline meaning that we should no longer quote our emissions reductions against business

¹ Note: "Total savings" are calculated from actual consumption figures for Cranfield and Silsoe campuses; "Awareness raising" is estimated from the likely impact of the new Energy Policy and other awareness raising initiatives; "Energy efficiency" savings are based on detailed projections for Salix funding; "Other" includes savings from power factor correction and transformer tapping adjustments.

² HEFCE (2010.) Carbon management strategies and plans: A guide to good practice. HEFCE 2010/02.

as usual (BAU). CMPs must also set CO₂ reduction targets for 2020 to align with government milestones and must be approved by Council.

As a separate requirement, the University must also join the government's CRC Energy Efficiency Scheme, which carries financial benefits or penalties for good or poor performance respectively.

The Executive has therefore considered the actions necessary to make the University CMP compliant. The proposed amendments to our existing Carbon Management Plan:

- (i) reflect changes in response to opportunities and challenges identified in the first year of implementation of the existing plan;
- (ii) include tenants who we supply with utilities within our carbon footprint to align with the CRC Energy Efficiency Scheme requirements; and
- (iii) introduce a 2020 target to meet HEFCE Guidelines for CMPs.

The target for 2020 relies mainly on energy efficiency and related measures with a small reliance on renewable energy options. Further opportunities to generate renewable energy onsite will be kept under close review. In particular, the financial viability and operational feasibility of installing a large array of solar photovoltaics by April 2012 is being considered to take advantage of the current high feed in tariff.

Table 2. Projected costs and savings for the revised and extended Carbon Management Plans

	Unit	Existing CMP (2008-13)	CMP 2020 (2009-20)
2005 Baseline emissions	tCO ₂ e	16,000	19,300
Projected emissions (BAU)	tCO ₂ e	19,100	28,000
Target emissions in CMP	tCO ₂ e	9,500	9,900
Target saving (BAU)	%	50%	65%
Target saving (v baseline)	%	41%	50%
Average cost during plan	£M/annum	0.7	0.8
Average savings during plan	£M/annum	1.0	2.0
Total costs to 2030³	£M	3.5	9.1
Total savings to 2030	£M	12.3	40.1
Total benefit to 2030	£M	8.8	31.0

Note: The assumed growth rate for Business As Usual (BAU) projections is 2.5%.

Recommendations

The Executive believe that concerted action to reduce energy costs and hence CO₂ emissions is an essential part of implementing the University strategic plan. Achieving the plan not only contributes to financial and environmental sustainability but also recognises the importance of energy sector in Cranfield's research and education portfolio. Council was therefore requested to:

1. note the progress against target for 2009/10
2. approve the rebasing of the start date for the CMP from 2008 to 2009; and
3. approve the amended Carbon Management Plan to 2020.

The Council approved all three recommendations in October 2010.

³ Costs and benefits have been calculated to 2030 to take into account benefits from investments late in the CMP.

Appendix 1: Breakdown of proposed areas for CO₂ emissions reductions

The current energy bill is about £3 million and the amended Carbon Management Plan will reduce this by half by 2014 (at today's prices). Business as usual would increase the annual energy spend to £4 million at today's prices by 2020. Achieving the 2020 targets would cut the cost to one third of this. Energy prices are predicted to increase over the medium term above general inflation rates, increasing the value of taking action to reduce consumption and switch to cheaper fuels.

Table 3. Target emissions reductions under existing, amended 2020 Carbon Management Plans

Emissions reductions (tCO₂e)	Existing CMP 2014	Amended CMP 2020
Silsoe move	1,000	700
Awareness Raising⁴	1,960	4,000
Energy efficiency	2,090	7,900 ⁵
Space utilisation⁶	0	1,800
CHP⁷	1,500	2,000
Renewables	220	1,000 ⁸
Transport	10	*
Other	2,760	700
Total saving	9,540	18,100

Note: * included in energy efficiency

Note the Amended 2020 plan assumes interim milestones of a 20% reduction by 2012 and a 40% reduction by 2017

⁴ Awareness raising is a key area which could provide up to one quarter of the CO₂ savings needed. Achieving these savings will require a concerted effort across the University, led by but not limited to actions by the Carbon Management Board.

⁵ Further energy efficiency projects with less than 5 year payback are possible. Thereafter, projects with longer paybacks will need to be considered, though above-inflation increases in utility costs will reduce payback periods.

⁶ Further measures to improve space utilisation need to be investigated over and above the space savings resulting from the closure of Silsoe Campus. This is also a key driver from HEFCE related to CIF2 funds.

⁷ The CHP will realise its full potential only when more load from buildings that operate longer hours are switched or reconnected to the district heating system. CHP utilisation would also be further enhanced by identifying summer loads, which could for example include absorption chilling to use excess heat to provide cooling.

⁸ The target reduction could be achieved without investment in renewables and other novel technologies such as absorption chillers, however, if grants or other incentives are available payback periods may be similar to those for energy efficiency projects.