Subject to approval by College Board

Collage of Life and Environmental Sciences

Carbon Management Plan 2013

Introduction

This plan reports on progress against the College of Life and Environmental Science's "LES" Energy Reduction Programme (2011) and identifies further opportunities to reduce the carbon footprint.

LES, contributes to 8% of the University's carbon footprint (including residences) and has reduced its footprint by 14% since 2009/10 compared with the 2.1% target. LES, by the nature of many of its activities and use of laboratory and other specialised facilities, is energy intensive. This is reflected in the diverse teaching and research undertaken within the College for example Prof John Colbourne and the new Daphnia Facility in Biosciences and Prof. Chris Miall and the Imaging Centre in Psychology.

The School of Geography, Earth and Environmental Sciences "GEES" contains the Meteorology and Climate research theme which has a unique international reputation for a broad range of pure and applied atmospheric research, including significant knowledge transfer to the international meteorological market place. Modelling is a particular strength of the group from small scale street canyon turbulence models (used for revealing the key mechanisms that affect urban climate and pollution level) to global circulation models (used for predicting future climate change). These models are used to quantify the impact of weather and climate on the economy, society, and the built environment. Many aspects of the teaching and research link to the theme of climate change, both mitigating the impacts and adapting to them. Other research groups within GEES focus on renewable and low-carbon energy, nuclear waste management, fuel poverty, community resilience and climate change mitigation strategies. Future research programs linking GEES and Biosciences are likely to examine the effect of increase in CO_2 levels on natural ecosystems.

Further measures are expected to produce a 4% reduction based upon the existing level of activity, via a focus on the operations of LES and technical interventions both identified and subject to further investigation. This reduction is subject to changes in the research profile of the College.

Achievements to Date

Since 2009/10 LES carbon footprint has reduced by 14%, table 1. This has been achieved by energy reduction measures, direct actions by staff together with the removal of the temporary oil fired boilers that supplied heat to Biosciences during part of 2009/10 and the increased efficiency and lower carbon intensity of producing heat in the CHP station with the completion of the steam main to the Medical School.

Building	**Floor Area m^2**	**Carbon footprint Tonnes CO_2/ year**			**Change 09/10 to 11/12**		**Carbon Intensity 2011/12 $kgCO_2/m^2$**
		11/12	10/11	09/10	**Tonnes**	**%**	
					(-ve=reduction)		
Biosciences	19,856	2,473	2,509	3,065	-530	-17%	125
Insectory[1]	227	62					273
Sportex	7,081	422	508	484	-62	-13%	60
Frankland and Annex	3,906	315	337	300	-15	-5%	81
Aston Webb A Block	2,942	185	221	236	51	-22%	63
Geography and Environmental Sciences	2,316	182	174	192	-10	-5%	76
Hills Building	2,263	127	143	123	4	3%	56
Total	**38,591**	**3,766**	**3,892**	**4,400**	**-634**	**-14%**	**98**

Table 1 Carbon performance of LES buildings

[1] Metering Installed 2011

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Figure 1, below, presents the carbon footprint by building, which identifies that Biosciences, which accounts for half the floor area, produces two thirds of the emissions. Figure 2 presents the carbon intensity by building. The Insectory being the most energy intensive, due to activities carries out and all climate control being electrically powered.

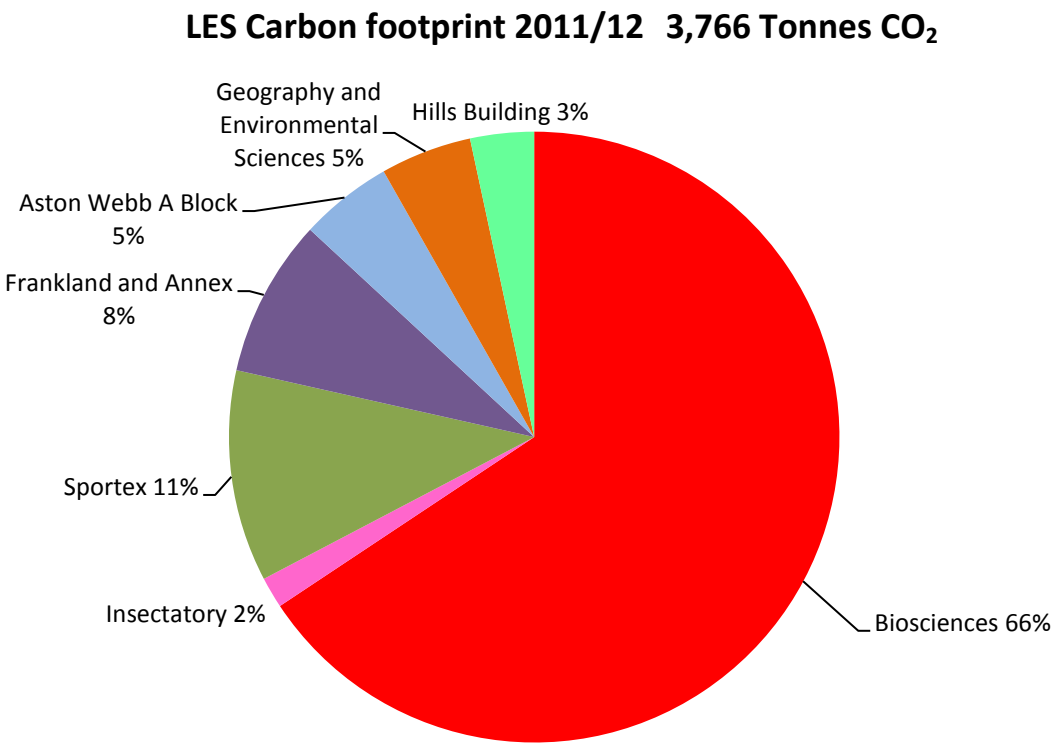

Figure 1 Carbon footprint by building 2011/12

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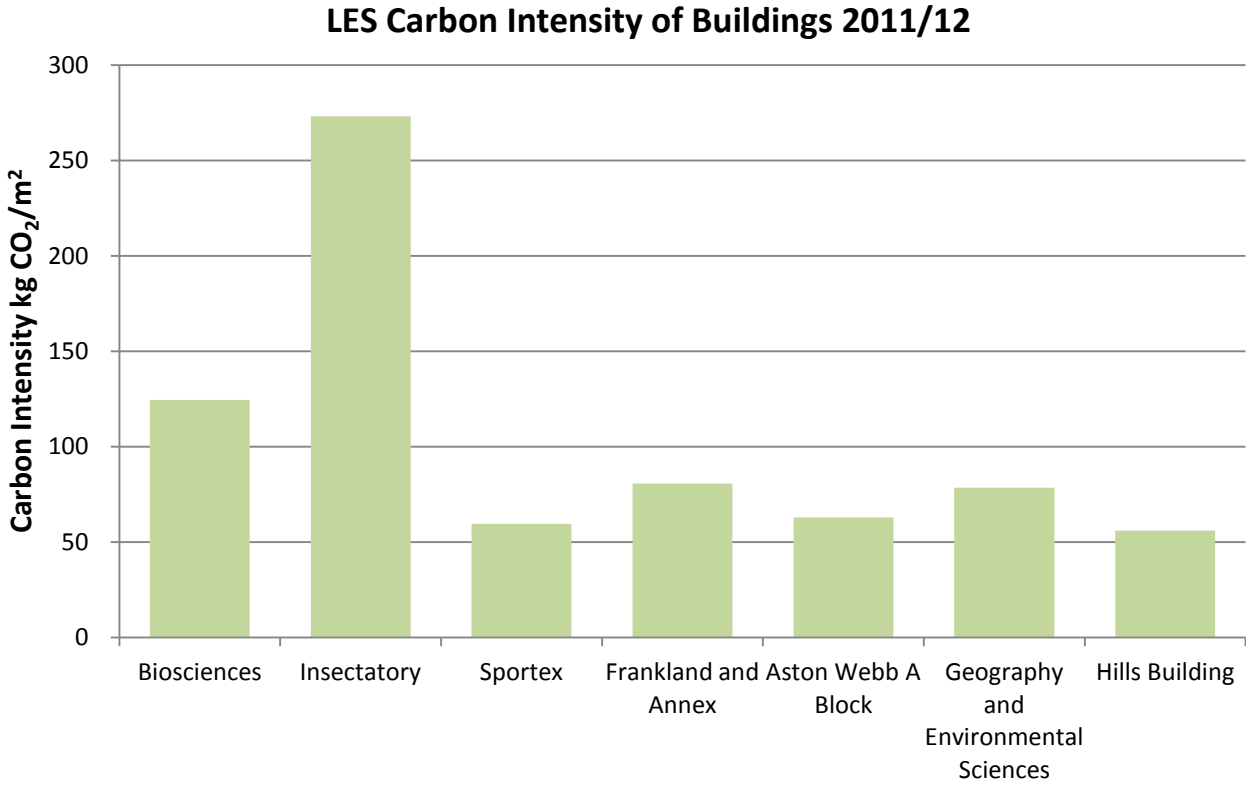

Figure 2 Carbon Intensity of EPS buildings

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The reductions in the carbon footprint have been achieved by the following measures:-

Project	Expected Carbon saving Tonnes CO_2	Notes
Biosciences		
8th Floor of Tower – rationalisation of cooling	5	
Draft stripping of windows	85	
Laboratory 414 & 405 installation of high efficiency lighting with occupancy and daylight controls	5	
Insectory		
None		
Sportex		
Installation of LED lighting in corridors.	16	
Other measures implemented pre 2009/10 resulted in 25% reduction in electricity consumption		
Frankland and Annex		
Draft stripping	13	
Aston Webb A Block		
Draft stripping	10	
Geography and Environmental Sciences		
Reduced heat loss through roof		Pre 2009/10
Hills Building		
Control of stairwell lighting	1	
Draft stripping	5	
General		
Green Impact, including installing timers on equipment decommissioning freezers, no longer required improved housekeeping.	25	
Removal of temporary oil fired boiler supplying Biosciences and replacement with steam from CHP station.	270	This boiler was required to maintain steam supply during major infrastructure works.
Reduction in the carbon intensity of heating and process steam with the extension of the district heating system to supply the Medical School	180	

Table 2, carbon reduction measures

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Action Plan

The measures to reduce energy consumption and the carbon footprint in from 2012/13 onwards are presented in table 3 below. Where known the expected reduction in carbon footprint is given. Increasingly reductions in carbon footprint will need to be delivered from the way operations are conducted. This includes a particular focus on energy used for IT, the storage and preservation of biological samples, equipment sharing and energy use in laboratories. With a combination of a focus of the operation of College processes, technical interventions identified and awaiting the results of trials a further reduction in the carbon reduction footprint of 4% is anticipated.

Project	**Expected Carbon Reduction [Tonnes CO_2]**	**Notes**
Biosciences		
Review ventilation and cooling arrangements for freezer room		This measure is likely to increase carbon emissions as it will involve the installation of active cooling, it will however support on-going work on freezer locations and protect core business.
Lighting Improvements in corridors – Trial	1	Trial in part of ground floor corridor 2013
Lighting Improvements in corridors – Whole Building	42	Project raised to carry out work
Insectory		
Investigate high level and lack of variation of consumption with external conditions.	7	
Sportex		
Sportex workshops LED lighting	1	
Frankland and Annex		
Lighting Improvements	1	
Aston Webb A Block		
Refurbishment of Lapworth Museum – including installation of high efficiency lighting and controls	5	Carbon reduction to be confirmed pending production of full scheme. Way well be greater than stated.
Improvements to Lighting	4	
Geography and Environmental Sciences		
None		
Hills Building		
Corridor lighting	1	
General		
Extension of Green Impact and similar schemes (for example (S-Lab) with a particular focus on laboratories.	TBC	A key group of staff identified in this respect are the Research Infrastructure Managers to who the electricity consumption will be made available on a floor by floor basis in Biosciences
Examine the possibilities for adjusting the temperatures of cold storage and a freezer replacement policy.	TBC	
Examine potential of consolidation of server rooms and reduction in energy requirements for cooling.	TBC	
Examine use of high efficiency filters in ventilation system. This is subject to the result of on-going trials in the Learning Centre. If successful consideration will be given to applying to LES buildings especially Biosciences, Sportex and Frankland Buildings.	To be determined	

Table 3 carbon reduction measures 2012/13 onwards