

# Report

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**Title:** Carbon Management Plan Annual Report 2017/18

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**Date:** 23 January 2018

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## 1. Carbon Management Strategy and Targets

This annual report provides details on progress achieved and performance improvements made during the 2017/18 academic year against the University's target to reduce carbon emissions from gas and electricity by 20% by 2020 (compared to a 2005/06 baseline) and from water by 30% by 2020 (compared to a 2009/2010 baseline).

In 2010, the Higher Education Funding Council for England (HEFCE) published the carbon reduction target for the sector. The sector targets for carbon emission reductions in scopes 1 and 2 (mainly energy consumption) are 43% by 2020 and 83% by 2050, against a 2005 baseline.

The University's Carbon Management Plan (CMP) was signed off by the University Council in March 2011 with the aim of achieving the carbon emissions targets.

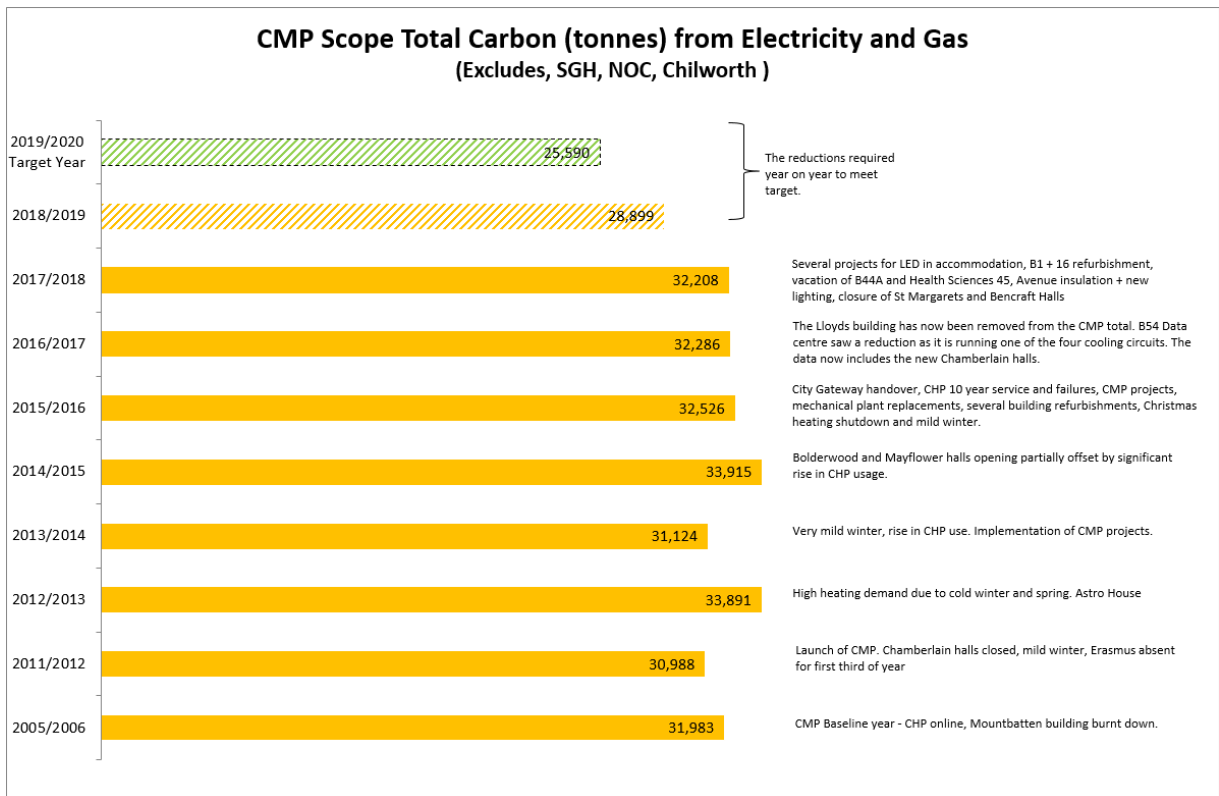
The University is committed to reducing its carbon emissions as part of meeting sector targets but also in recognition of the risks related to the physical impacts of climate change, the transition to a low-carbon economy, and the rising but uncertain future costs of energy.

## 2. Summary of Key Performance Indicators for 2017/2018

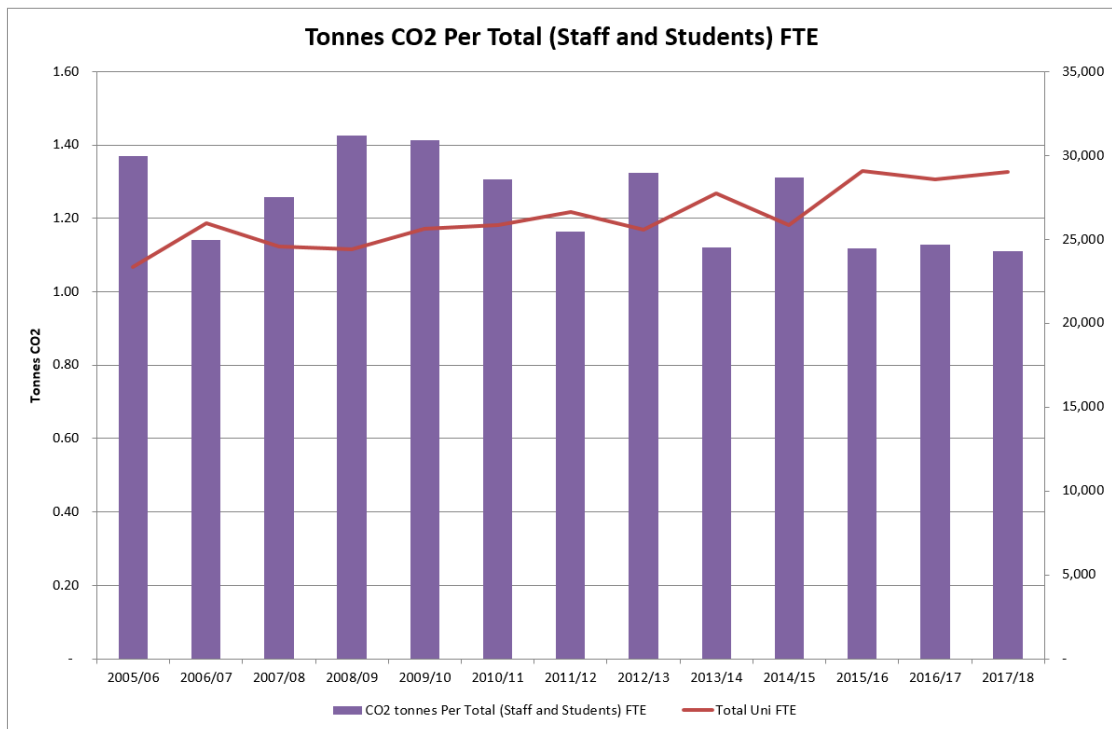
Table 1. Key Performance Indicators for Energy Management

	Target	Baseline	2016/17	2017/18	2017/18 performance compared with 2016/17	2017/18 performance compared with baseline (and with target)
<b>Absolute Carbon Emissions (scope 1 &amp; 2, tonnes)</b> Graph 1	To reduce carbon emissions from energy consumption by 20% by 2020 based on a 2005/06 baseline	32,000	32,286	32,208	0.24%	1% (26%)
<b>Carbon per Staff and Student FTE (tonnes/FTE)</b> Graph 2	To reduce carbon emissions from energy consumption per staff and student FTE by 20% by 2020 based on a 2005/06 baseline	1.37	1.13	1.11	-2%	-19%

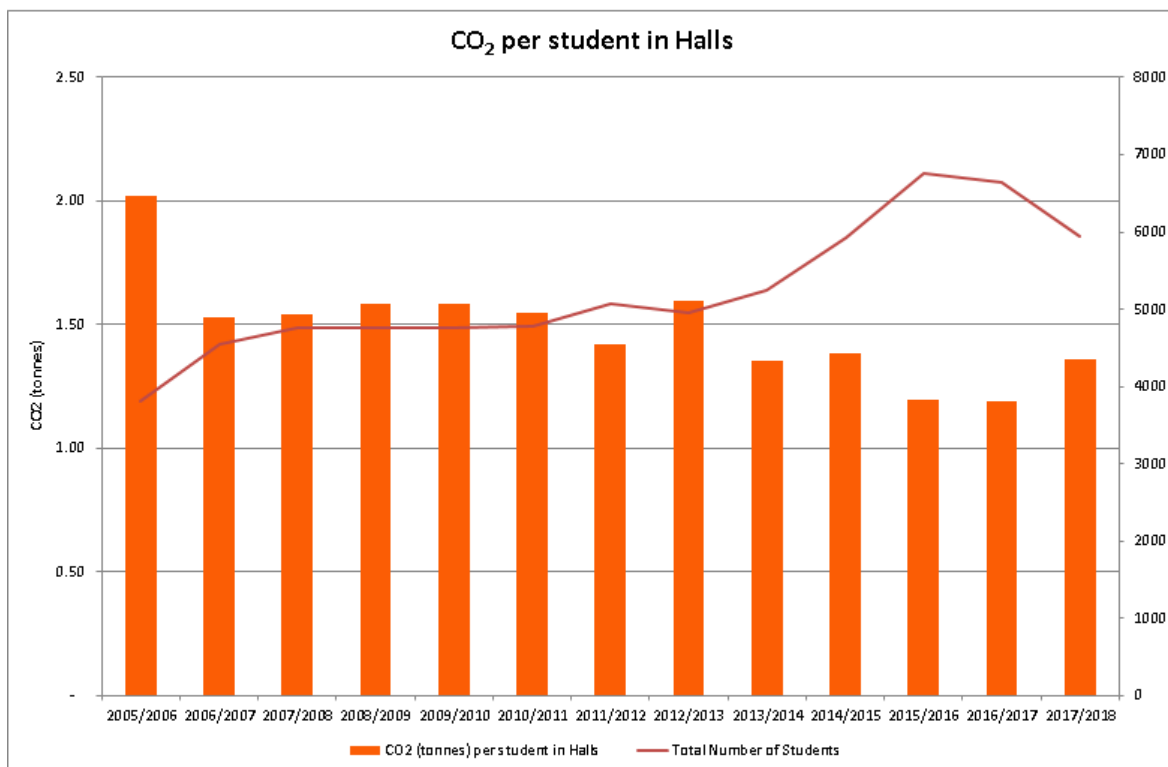
	Target	Baseline	2016/17	2017/18	2017/18 performance compared with 2016/17	2017/18 performance compared with baseline
<b>Carbon per £ turnover</b> (kgCO <sub>2</sub> /£)	To reduce carbon emissions from energy consumption per £ turnover by 20% by 2020 based on a 2005/06 baseline	0.103	0.055	0.055	0%	-27%
<b>Electricity</b> (kWh)	To achieve a 20% reduction in electricity use by 2020 based on a 2005/06 baseline	35,868,000	31,702,000	33,228,981	5%	-7%
<b>Gas</b> (kWh)	To reduce gas consumption by 20% by 2020 based on a 2005/06 baseline	86,838,000	97,462,100	93,736,722	-4%	8%
<b>Carbon per student occupancy halls</b> (tonnes CO <sub>2</sub> /student occupancy)	To reduce carbon emissions from energy consumption per student occupancy in halls by 20% by 2020 based on a 2005/06 baseline	2.02	1.19	1.36	14%	-33%
<b>Water (m<sup>3</sup>)</b>	To reduce water consumption by 30% by 2020 from a 2009/10 baseline	567,000	497,257	432,107	-13%	-24%
<b>Water (tonnes carbon)</b>	To reduce carbon emissions from water consumption and disposal by 30% by 2020 based on 2009/10 baseline	552	482	419	-13%	-24%



Graph 1. CO<sub>2</sub>e tonnes from electricity & gas Baseline, and years 2011/2012 to 2017/2018.



Graph 2. CO<sub>2</sub>e tonnes per FTE staff and students.



Graph 3. Carbon emissions per student in UoS accommodation

### 3. CMP Projects completed in 2017/2018

Project Number & title	Cost	Annual CO <sub>2</sub> e Saving (tonnes)	Payback (years)
CMP 209 Replacement AMS System	£14k	N/A	N/A
CMP 219 B9 Lighting Replacement LED	£20	18	5
CMP 251 Library AHU6 Rebuild	£23k	9	8.3
CMP 254 Chemistry/Life Sciences/NOC More efficient Drying Cabinets	£50k	37	7.2
CMP 256 Winchester School of Art - Free cooling to Server Room	£10k	4.6	7.8
CMP258 Glen Eyre Terrace LED Replacement - Block Q only	£11k	7	8
CMP 259 Lanchester B07 - Replacement to LED lamps in L2 Labs	£10.1k	9.5	5

#### 4. Other factors affecting carbon emissions for the year

- Closure of Bencraft Halls November 2017
- Closure of St Margarets House February 2018
- Reduction in students in accommodation due to rise in alternative options.
- Vacation of Health Sciences B45 – staff moved to Nightingale B67 early 2018.
- Vacation of two floors and refurbishment of B67.
- Vacation of Building 44A prior to demolition in following academic year.
- Transfer of IT servers to more efficient Astro House from Mathematics B54
- Replacement of LED lighting in many blocks of accommodation
- Vacation and complete refurbishment of B1 and B16. Buildings not occupied during works.
- Draught lobby and new entrance to Parkes Building, Avenue Campus.

#### 5. Conclusion

In the 2017/2018 academic year, the University continued to fall short of its carbon emissions target by a large margin; in 2017/2018 carbon emissions were 26% above the target level. However where the University is growing and student numbers increasing, it is not surprising that energy consumption will also increase.

The *relative* performance indicators tell a different story. The University actually *reduced* the carbon emissions per FTE (staff and students) by 19% this year against the baseline, and 27% against baseline turnover. Although it is disappointing that the carbon emissions per student in our accommodation increased by 14% it is considered likely that the percentage increase is more a result of a decrease in students, rather than poorer energy performance in the halls, given the programme of improvements being carried out. The level of emissions continues to be substantially lower than the average before 2012.

In other words, the University is continuing its trend of reducing its carbon emissions relative to its growth. It has also performed very well in reducing water consumption and the carbon emissions related to water in absolute terms by 24%.

Several projects have been completed using Carbon Management Plan during the 2017/18 year. These projects are expected to result in a reduction in our carbon emissions of approximately 85 tonnes per year based on their project bids. The CMP fund is currently under review. The Fund is considered important to continuing the carbon reductions and saving money on energy costs, which will be increasing in future.

More generally there is a growing trend across the campus towards greater awareness of energy efficiency, seen for example in the formation of the Faculty of Engineering and Physical Sciences' (FEPS) new Electricity Working Group, and the nascent Building Managers Forum. The Forum should help to support and encourage building managers to improve operational efficiency and to reduce energy and water waste.

Our new Environment & Sustainability Manager, Nicola Turvey, is also contributing to the enthusiasm around energy efficiency, among her other sustainability aims, and with the backing of the new Environment and Sustainability Board there is also expected to be greater attention on staff awareness and behaviour change. The Board will encourage the message of sustainability to be more fully disseminated through senior management and this aim could be incorporated into job descriptions and appraisals.

Finally, we have a great opportunity to reach our carbon targets in the 10 year plan. We are adding new buildings of our own design, in which sustainability and energy/water efficiency aspects can be included from the start. Examples include reducing the amount of solar gain by avoiding excessive glazing, ensuring correct sizing of AHUs, and simple but effective and practical LED lighting systems. Incorporating these factors as part of original design is of course much cheaper and easier than retrofitting and structural changes later. As part of the plan we are also investigating the potential of reducing the campus internal area by rationalising staff and faculty accommodation. This practice has been seen to result in huge percentage energy reductions in other public sector organisations.

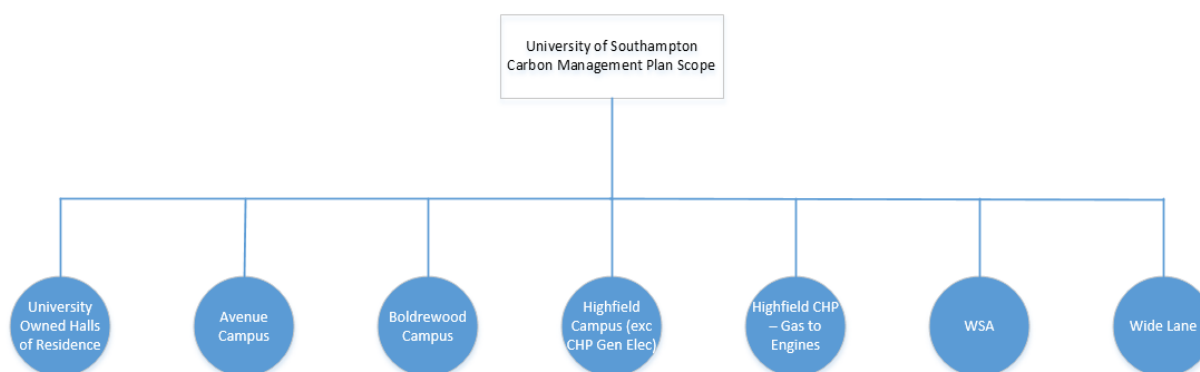
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## Appendix 1.

We measure our emissions from activities according to the following scopes:

Scope 1 – direct emissions	Gas boilers Gas to power CHP providing electricity (approx. 50%) and heating for the University’s Highfield Campus. All of the electricity is used on site but not all of the heat generated is used with the remainder being dumped due to mechanical issues with the CHP or the inability to use all the available heat.
Scope 2 – indirect emissions	Purchased electricity
Scope 3 – other indirect	Water – consumption and wastewater are measured and included within this report. Waste and recycling generated by University activities are monitored and measured but not reported in terms of carbon emissions. Emissions generated from business travel and our supply chain are not measured. The University’s Travel Plan reports data on staff and student commuting.

For carbon reporting, emissions from across the University estate are included with the exception of the National Oceanography Centre, Southampton General Hospital and Chilworth Science Park.



### Carbon management plan scope

Baseline Year	1 August 2005 – 31 July 2006
Reporting period	1 August 2017 to 31 July 2018
Student Staff FTE	Student Staff FTE is the total number of staff and students at the university expressed as the Full Time Equivalent (FTE). This data is obtained from Finance.
Turnover	The turnover figure includes turnover data which is out of scope. This figure has been used consistently over the reporting period.
Student Occupancy	Data is provided by the Residences team and is based on the number of students at intake. These figures do not take into account the occupancy of the halls during the summer by conferences or pre-sessional students.
Conversion Factors	Conversion factors are used to convert activity data – such as litres of fuel used – into greenhouse gas emissions. The University uses the figures provided by HESA in the 2005/06 EMR return. Electricity = 0.422 kg CO <sub>2</sub> per kWh Gas = 0.194 kg CO <sub>2</sub> per kWh  It should be noted that if the current BEIS conversion factors were used in the report – more accurately reflecting current supply carbon content - our carbon emissions would be lower.  Conversion factors 2018: Electricity = 0.30482 kg CO <sub>2</sub> per kWh Gas = 0.18362 kg CO <sub>2</sub> per kWh
CO <sub>2</sub>	The conversion factor used for our annual reporting is based on carbon dioxide, and does not account for the warming potential of other greenhouse gas emissions (expressed as CO <sub>2</sub> e).
Accuracy & Verification	Data is managed by the Energy Management Team and is checked firstly by the team then by the Head of Engineering Design.
CRC	The University qualifies to participate in the CRC Energy Efficiency Scheme (formally known as the Carbon Reduction Commitment) and purchases allowances each year. The scope of the CRC includes Chilworth Science Park (but excludes National Oceanography Centre and Southampton General Hospital).