



# UNIVERSITY OF HULL

## Carbon Management Annual Plan – July 2018

The University's Carbon Management Plan (CMP) is in line with HEFCE carbon reduction and Climate Change Act (2008) targets.

The CMP is reported on annually via the Energy and Environmental Manager to senior management and board for approval prior to being placed on the public website.

Created and monitored in conjunction with both student and staff representatives the CMP is backed by a protected budget with consideration given not only to payback times but also to environmental benefits.



Scope 1 & 2 Emissions - The CMP sets out a series of carbon reduction measures to meet this year's contribution towards the Universities Scope 1 and 2 interim 2020 target of a reduction of 5,279 tCO<sup>2</sup> from 2005 levels; this equates to a 16% reduction from 1990 levels. The final target contained in the overall plan is to reduce the scope 1 & 2 CO<sup>2</sup> emissions from the University Estate from 19,090 tCO<sup>2</sup>/year in 1990 to 12,599 tCO<sup>2</sup>/year in 2020; a 34% overall reduction.

Proposal	Target	Responsible Person	Detail	Resource Requirement	Timescale	Projected Savings
Building Optimisation	10 highest consuming buildings to achieve a 5% reduction	Stewart Hugill	Along with control optimisation buildings to be surveyed for potential reduction projects.	Free surveys from suppliers. Resultant projects to be funded on merits. Dedicated budget allocated for works.	Jun-19	800 tonnes CO <sub>2</sub> in total on completion of project
LeD replacement/installation	All replacements to be LeD	Maintenance Dept.	All light replacements will be LeD if possible	Undertaken as part of general maintenance and budgeted accordingly.	Jul-19	56 tonnes CO <sub>2</sub>

New Build/Refurbishment	BREEAM/SK A excellence or very good	Pat Chapman	All new projects to attain highest possible environmental score for works.	Included in Capital Works budgets.	On-Going	£200 million refurbishment/new build scheme. CO2 savings to be confirmed following commission.
CHP install/ boiler replacement	5 year return on investment	Dave Hill	Replacement of in-efficient HVAC boilers.	£120,000 per unit subject to individual proposals.	Jul-20	106 tonnes CO2
Education	All staff and students to be offered access to Sustainability training portal	Stewart Hugill	On-line sustainability training availability.	ITC and Marketing to assist with maintaining relevance.	On-Going	26 tonnes CO2
Space Management	5% reduction in consumption per sqm/person	Rob Labrom	Optimisation of space within estate to reduce under occupancy rates.	Space Management team to manage.	On-Going	52 tonnes CO2
HVAC Optimisation	20% reduction in A/C unit consumption	Stewart Hugill	Successful trial complete of Coolnomix optimisation equipment	£500 per unit, initially £75,000 of works proposed.	Apr-19	74 tonnes CO2
Battery Storage	Increased resilience and 5 year payback	Stewart Hugill	To deploy a 2Mw battery to allow for better use of off peak electricity.	Circa £2million dependant on funding vehicle	Jan-20	N/A but better able to store future renewables and offer grid protection.

Collection of personal heaters	To allow BMS sensors to operate correctly	Stewart /H&S department	After collection problem heating areas can be identified and addressed.	H&S and Maintenance already have this covered as part of usual roles.	On-Going	Over 100 heaters collected giving a 30 tonnes CO2 saving.
Water Mains replacement	£90,000 pa saving through leak reduction	Pat Chapman	Replacement of existing 100 year mains.	£250,000 pa for three years of phased works.	Oct-20	39,130 cubic metres of water.
Utility Retro Audit	250,000kWh	Stewart Hugill	External auditors to check historic bills for accuracy	Appointment of external contractors on a share/save scheme.	Dec-18	28 tonnes CO2
Waste - 164 tonnes/CO2	5% reduction pa for three years	Stewart Hugill	Education	NUS switch off campaign to be complimented by staff/student training	Throughout 2018	25 tonnes CO2 pa.

Scope 3 Emissions – Reduction targets for the Scope 3 emissions reported to HESA (<https://www.hesa.ac.uk/>) are targeted as follows:

<b>Emission (Tonnes CO2 pa)</b>	<b>Target</b>	<b>Responsible Person</b>	<b>Proposal</b>	<b>Resource Requirement</b>	<b>Timescale</b>	<b>Projected Savings</b>
Supplied Water – 75.6 tonnes/CO2. (Does not include existing grey water recovery at BJL).	15% reduction pa for three years	Stewart Hugill	Leak repairs/new main for main campus	£250,000pa for three years	Due for completion 2020	11 tonnes Co2
Waste water – 148 tonnes/CO2	5% reduction pa for three years	Stewart Hugill	Water Chillers to be installed in Chemistry	£160,000	Install completed successfully Oct 2017	22 tonnes CO2 pa.
Travel – 109 tonnes/CO2	5% reduction pa for three years	Phil White/John Findlay	Car Share	£17,400	Currently under evaluation for further roll out.	5 tonnes CO2 pa

## Current Position

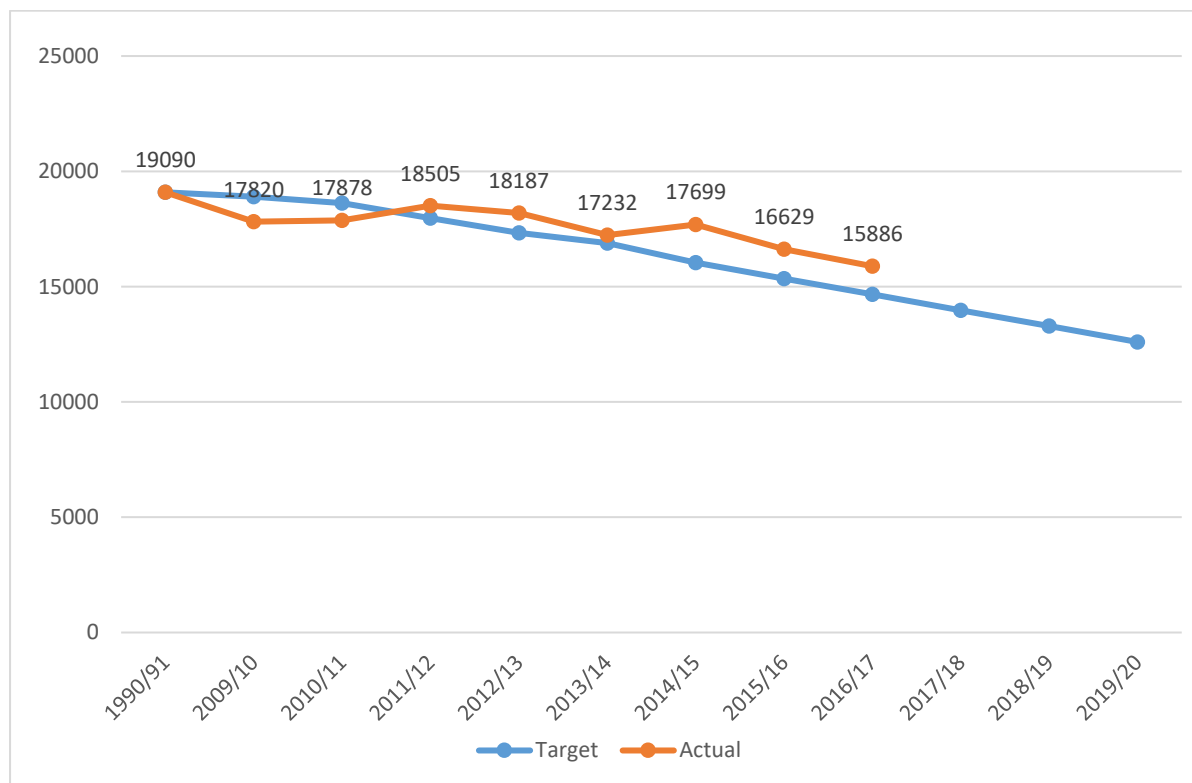
The current Scope 1 & 2 consumption is reported as 15,886 tCO<sup>2</sup> for the most recent HESA reporting year 2016/17; however this does not fully reflect the considerable changes underway to either the estate, student numbers, or campus occupancy.

Of this 21604258kWh (10,154 tonnes CO<sub>2</sub>) is residential consumption that will be dramatically reduced this year following the replacement of large parts of our older accommodation.

This will be complimented by the energy reduction measures being proposed for the academic estate as part of the Capital Improvement Plan.

### Scope 1 & 2 carbon emissions (direct consumption reported on via utility bills

s to date against targets



## Future reporting

For future reporting we intend to continue to report on baseline consumption in the same manner as previously but we will be looking to include additional benchmarking of data.

With a changing number of students being housed on campus, along with considerable re-development works, this will allow us to track actual consumption per student and also per m<sup>2</sup> and building type, giving better focus for future saving opportunities.

Although the CMP reporting is primarily focused on reducing overall CO<sup>2</sup> levels we will also be looking to report on any fiscal savings to highlight market/contractual changes during the period.

## **Consumption Rationale**

Major re-development of the main campus including the Sports Hall, Allam Medical Centre, and Student Residences all involve considerable energy consumption both during construction and on initial occupation.

By better benchmarking actual consumption per building against occupancy levels over the course of the year, we will be able to more accurately detail any changes to the estate.

## **Immediate/Current Initiatives**

The need to improve on our overall approach to sustainability in terms of Carbon Savings, but also innovative engagement with our students and staff, is being addressed by the appointment of a dedicated Energy and Environmental Manager and associated support.

This has been further complimented by the additional appointment of a Head of Space Planning, all working in conjunction with the wider Estates team to more fully optimise building occupancy and improve actual efficiency.

As part of this identifying work we are currently in the process of linking all utility meters (both sub and main) to a single front end system that will allow for real time consumption data reporting for each building. This will allow not only specific targeting of areas of high consumption and the deployment of out of range alarms, but also will provide better student engagement via display screen data. Initially the display facility is proposed for the new student residences but can be adopted for any building if effective. Also included is the upgrade of the current University Building Energy Management System to a full Trend Controls System integrated onto the University's network and able to be remotely monitored.

In addition to this approach is an initial investigation of historic utility billing data, (initial audits of water alone have delivered savings in excess of £50,000pa), to identify potential rebates but also give a more detailed understanding of individual buildings usage patterns. With the full opening of the Water market in April 2017 allowing for complete supply changes for the first time, and the University's Gas and Electric contracts also due for renewal next year, we will be able to identify and claim back any potential overcharges as well as being able to better detail any future supply requirements.

Although not directly linked to immediate Carbon reductions, the Estates team maintains the newer ISO 14001:2015 accreditation awarded last year. This qualification will provide external validation of the current Environmental Management System (EMS). It is also expected to help focus further Carbon reduction measures including improved Waste Disposal.

There will be reductions associated with the disposal of residential properties however exact numbers have still to be confirmed.

In addition to more major projects it should be noted that the Maintenance team adopts a continual improvement ethos. Typically they seek to replace redundant equipment with modern, more efficient alternatives detailed on the Government Enhanced Capital Allowance list as being efficient (please note that as a University we are not able to benefit from the associated tax rebates for this equipment, rather it is used as an indicator of best practice). Typical examples would be LED alternatives to fluorescent lights that are now on the EU prohibited list; such works are discussed with the Energy Manager to both maintain assets lists and confirm suitability.

- Chemistry Building replacement of smaller inverter driven pumps – Replacement of old and oversized heating pumps.
- The Lawns Centre Accommodation Boiler and BEMS replacement – Downs, Grant, Lambert, Morgan, Nicholson and Reckitt halls.

### **Previous Years Actions**

Examples of work that have been carried out already:

- All wall thermal elements cavity insulated.
- All lofts insulated to Building Regulations Standard.
- 80% of gas fired boilers used for space and hot water heating will be high efficiency condensing boilers with only a small number of boilers older than 2006.
- 80% of areas have lighting controls (occupancy & daylight) fitted.
- All plant rooms and hot distribution pipework fully insulated.
- Taylor Court switched from electric to gas heating.

### **Renewables**

The University currently has two renewable sources of energy; however given the current Government policy changes to subsidies we are not looking to increase this until a more viable payback is achievable.

- A 214kW, 856 panel solar photovoltaic (PV) system installed on top of the Aire, Dearne, Larkin, and Enterprise Centre buildings generating circa 181,850kWh of clean energy per year.
- 2 x CHP (Combined Heat and Power) plants in relation to the new student halls and Health Campus (awaiting post commission data prior to reporting on efficiency).

### **Third Party Use**

- The University has three external telecoms masts on the Cottingham Road Campus; as part of the linking in of meters to a single front end BEMS we will be able to better detail their electricity consumption.
- Investigation of STOR (Short Term Operating Reserve) type schemes. This would allow our generators to be available to the National Grid as reserve but still remaining under full University control.

### **Training**

Forming part of our process of better engagement with both staff and students, we have implemented Sustainability training along with a very brief overview presentation for new starters.

### **Summary**

Although the Estates department has followed best practice in relation to Carbon Management we would now look to adopt a more commercial approach. This will tie in with the new Strategies aimed at firstly identifying the cost and utility of conditioned space. We would then look to reduce this burden whilst enhancing the student experience through improved facilities and engagement.