



University of
Chester



University of Chester Carbon Management Plan

Prepared with advice and support from The Green Consultancy



Contents

1.	Introduction to the Revised Carbon Management Plan	2
1.1	HEFCE requirements for mandatory carbon emissions reporting	
1.2	Relationship to the University of Chester's Sustainability Strategy	
1.3	People and Planet Green League carbon management reporting requirements	
1.4	Role of the University's Sustainability Unit	
<hr/>		
2.	Reporting Methodology	4
2.1	The Greenhouse Gas Protocol	
2.2	Accounting for Scope 3 supply chain and downstream carbon emissions	
<hr/>		
3.	UoC carbon foot print for 2013-14	7
<hr/>		
4.	UoC Carbon Reduction Action Plan	9
4.1	Scopes 1 & 2	
4.1.1	Thornton Science Park	
4.1.2	Other Campuses	
4.1.3	Monitoring and Targeting:	
4.2	Scope 3	
4.2.1	Measuring and Monitoring Scope 3 Emissions	
4.3	Progress and Projects	
<hr/>		
5.	Improvements to ongoing monitoring, reporting and target-setting	16
<hr/>		
	Appendix 1: Science Park Carbon Emissions Calculation	17

1. Introduction

1.1 HEFCE requirements for mandatory carbon emissions reporting

Every English university is required by the Higher Education Funding Council for England (HEFCE) to actively work towards reducing their annual carbon emissions so that the education sector as a whole can meet national reduction targets set out in the Climate Change Act (2008).

As a condition of capital funding each university must have a carbon management plan that sets out how carbon emissions will be reduced, and how performance will be monitored and measured. Carbon emissions reduction performance will “be a factor in future capital allocations.”

This makes the Senior Management Team directly responsible for achieving carbon emissions reduction, with the Chancellor and Vice Chancellor ultimately directly accountable for CMP performance.

For this reason, day-to-day accountability for specific actions to meet agreed emissions reduction targets is collectively shared across the university’s management and maintenance teams, supported by its academic staff. Collectively the university will need to encourage its student body to help implement and meet specific objectives within the CMP. This is why the CMP is an important strand of activity within the university’s wider Sustainability Strategy. Full details of objectives, actions and targets are given in Section 3 of this CMP.

1.2 Relationship to the University of Chester’s Sustainability Strategy

The University’s new Sustainability Strategy (<http://www.chester.ac.uk/about/social-responsibility/sustainability>) (<http://www.chester.ac.uk/sites/files/chester/Sustainability%20Strategy%202020%20PDF.pdf>) addresses the full scope of socio-economic and environmental aspects of working towards sustainable operations in a highly integrated way. This CMP is just one, but a critical activity nonetheless, in working towards operational sustainability. The specific requirement set out in the strategy is given below:

Objective	Actions and Related Documents to Provide Evidence
Carbon Management	Publicly available carbon management plan which meets the Carbon Trust and most current Capital Investment Framework requirements
Reduce our carbon footprint by 43% by 2020 (2005 baseline)	<ol style="list-style-type: none">1. Short term carbon reduction targets2. Scope 3 emissions included within the university carbon emissions baseline and carbon reduction target

1.3 People and Planet Green League carbon management reporting requirements

By providing a publicly available CMP with clear emissions reduction targets to be achieved by meeting SMART objectives, the UoC will also be fully compliant with the People and Planet Green League evidence requirements. CMP progress needs to be reported at the beginning of each academic year in October, and the CMP must set out the objectives and targets for the coming year.

1.4 The University’s Sustainability Unit

The University’s Corporate Plan ‘Delivering Our Future: Chester 2016’ states that ‘through all of its educational activities, the University is committed to promoting greater awareness and engagement in respect of environmental sustainability in order to improve the quality of life now and for future generations.’



Our vision is of a just and sustainable world for present and future generations

In keeping with our Christian foundation, we recognise our responsibility to function with due concern for the environment in which we live and work, in order to ensure our activities have a positive impact on that environment, create a healthy and resilient community and an ethical and diverse economy. We commit to ensuring that the University of Chester leads by example, putting sustainability at the heart of decision making and service delivery, and to promote awareness and positive transformation through all of our educational activities.

Our role is to help identify, co-ordinate and facilitate measures to enable the university to become a more sustainable institution.

We recognise our responsibility to function with due concern for the environment in which we live and work, and to minimize the impact of our activities on that environment and promote awareness through all of our educational activities.

We seek to continually improve our environmental performance by implementing policies and processes, through the EcoCampus Environmental Management System approach, and by setting targets and objectives to minimise our impact on the environment.

We want to promote awareness and engagement, in order to achieve social and environmental sustainability through all of our educational activities so in November 2012 we launched Green Chester.

Green Chester is our campaign to give staff and students driven by shared values the opportunity to transform the environmental impact of the way we work and learn together at the University of Chester. Find out about our goal and objectives on the Green Chester website.

Our goal is to embed sustainability throughout our campuses, community, cultures and curriculum.

By actively engaging with students, staff and the wider local community, and by means of this Carbon Management Plan and our Environmental Management System (EcoCampus), the University aims to embed sustainability in to all of its educational activities and services in order to help achieve our vision of a sustainable world for present and future generations.

THE FOUR Cs

Strategic implementation of our goal will be done via four integrated themes of activity across the institution. Under each of THE FOUR Cs (Campus, Community, Curriculum and Cultures) sits a series of objectives and targets, which meet our Estates Managements Statistics requirements, Hefce carbon reduction targets and our Environmental Management System (EcoCampus) requirements, while delivering the on the criteria set out by the People & Planet Green League.

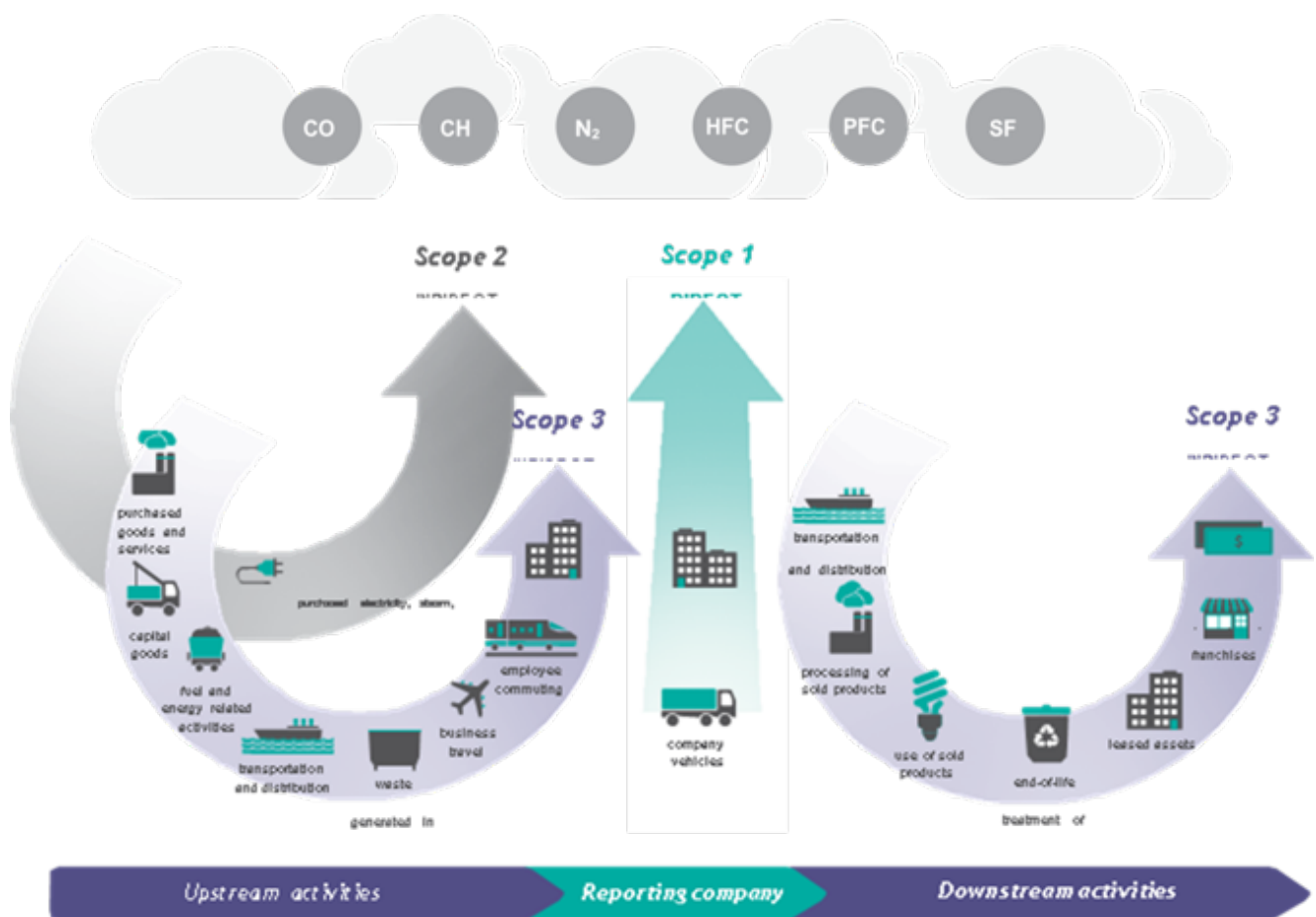
2. Reporting Methodology

2.1 The Green House Gas Protocol

Any CMP needs to report carbon emissions reduction in compliance with the Green House Gas (GHG) Protocol. The GHG Protocol, is a decade-long partnership between the World Resources Institute and the World Business Council for Sustainable Development. It is working with businesses, governments, and environmental groups around the world to build a new generation of credible and effective programs for tackling climate change.

The GHG Protocol is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. It provides the accounting framework for nearly every credible GHG standard and programme in the world - from the International Standards Organization to The Climate Registry - as well as hundreds of GHG inventories prepared by individual companies and research and funding institutions around the world, including HEFCE.

Figure 1: Overview of GHG Protocol scopes and emissions across the value chain



[Source: GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, 2011]

The definition of Scopes 1, 2 and 3 for GHG reporting purposes are:

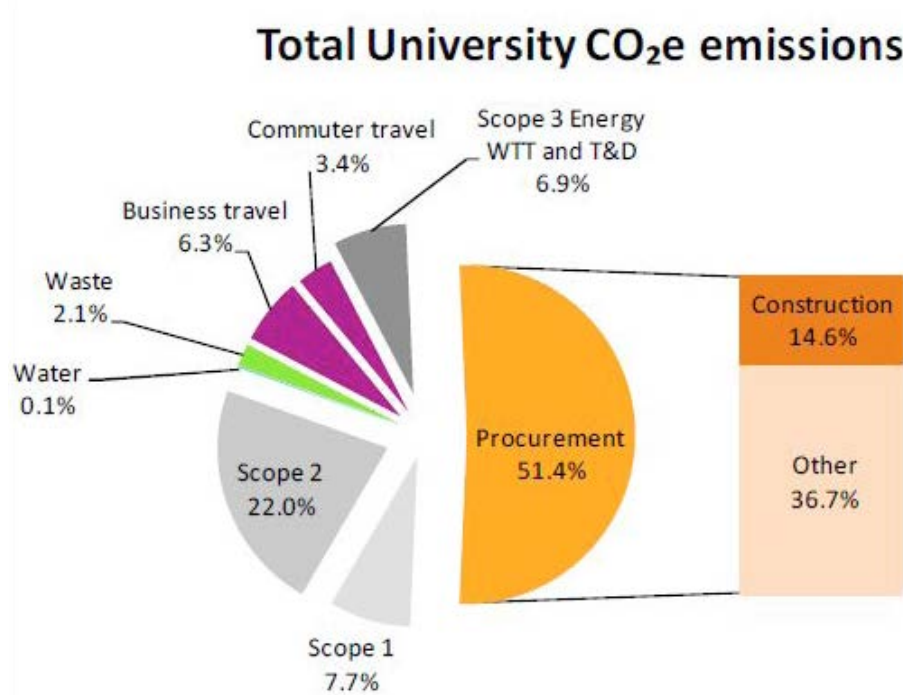
- Scope 1 emissions -** are direct GHG emissions from sources that are directly owned or controlled by the university. Scope 1 can include emissions from fossil fuels burned on site, e.g. natural gas for space heating and catering, emissions from entity-owned or entity-leased vehicles using petrol or diesel fuel, and other direct sources.
- Scope 2 emissions -** are indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated off site but purchased by the university, and the transmission and distribution (T&D) losses associated with some purchased utilities (e.g., chilled water, steam, and high temperature hot water).
- Scope 3 emissions -** are the indirect GHG emissions from sources not owned or directly controlled by the university but related to essential activities including employee travel and commuting, contracted solid waste disposal, and contracted wastewater treatment. Additional sources that are currently optional under HEFCE reporting requirements, but are required by the Green League reporting process are significant, including GHG emissions from leased space, vendor supply chains, outsourced activities, and site remediation activities.



2.2 Accounting for Scope 3 supply chain and downstream carbon emissions

According to research undertaken by the former Sustainable Development Commission, emissions from Scopes 1 and 2 are likely to account for around 40% at most of the university's total GHG or carbon foot-print. Emissions from Scope 3 will account for at least 60% of the university's total carbon foot print. This makes getting sustainable procurement right a critical focus for the Senior Management Team.

Figure 2: Example of a university total Scopes 1-3 footprint emissions



[Source: Cambridge University web site]

When considering major new construction projects this ratio of direct to embodied supply chain emissions changes to around 20:80 for the construction carbon foot-print of new buildings (WRAP, 2013). This means that further development and extension of the university's estate poses a major carbon emissions risk unless the considerable opportunities available, using sustainable design and smart procurement choices, are actively pursued.

Scope 3 carbon risks facing the UoC, and opportunities for reducing supply chain and waste emissions are addressed in Section 4 in more detail.

For details see <http://www.environment.admin.cam.ac.uk/resource-bank/cambridges-current-performance>



3. UoC Carbon Foot Print for 2013-14

Our reported emissions foot print to date comprises our total billed energy use converted to carbon emissions using Defra’s recommended conversion factors for the reporting year.

The baseline for carbon emissions for 2008 is a total of 7,973 tonnes broken down as shown in Table 1. Transport and water were the only non-building carbon emissions included.

Table 1: Baseline 2008 Carbon Emissions

	Buildings	Transport	Water	Total
CO2 Emissions (Tonnes)	7,813	111	50	7,973
%	98	1.4	0.6	100
Cost (£K)	1,270	49	172	1,492

By 2014 total emissions have increased significantly, mainly due to the acquisition of the Thornton Science Park. Total emissions are now approximately 13,902 tonnes CO₂e as shown in Table 2. However, for the reasons stated below, the contribution from buildings, could easily be seriously underestimated and the data for total mains water consumption also needs further investigation because it’s much lower than anticipated.

Table 2: 2014 Carbon Emissions

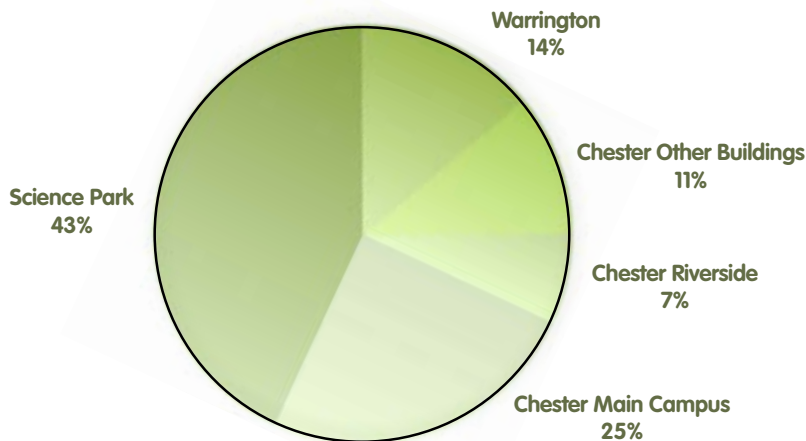
	Buildings	Transport	Water	Total
CO2 Emissions (Tonnes)	13,788	106	8	13,902
%	99	0.8	0.2	100
Cost (£K)	2,580			

The figures for buildings in Table 2 make a number of assumptions, as some data are incomplete or inaccurate, particularly for the Science Park, a more recent acquisition. For the Chester and Warrington sites the gas consumption figures are from DEC advisory reports and are somewhat out of date, but the electricity usage is from recent “half-hourly” data and invoiced figures and is relatively up-to-date. For the Science Park the figures are based on only three months of data, this including medium (17 Bar) and low pressure (6 Bar) steam and electricity. The figures are as provided by Shell and exclude the stated usage of building B301 which is tenanted. The use of three month’s data is problematic as it does not allow an accurate assessment of the buildings’ usage during the winter – all that can be said is that there is absolutely no relationship between the weather and the recorded steam use for the three months for which data are available. For both gas and electricity, the aggregate 3-months usage has therefore been multiplied by 4 to provide an indication of annual figures. However, it should be noted that cold-weather could significantly increase steam usage and that the figures used are therefore likely to be an underestimate. The Science Park figures utilised are given in Appendix 1.

The overall breakdown of building carbon emissions by campus is shown in Figure 2.

Figure 2: Carbon Emissions by Campus

Breakdown of Carbon Emissions
Total 13,788 Tonnes

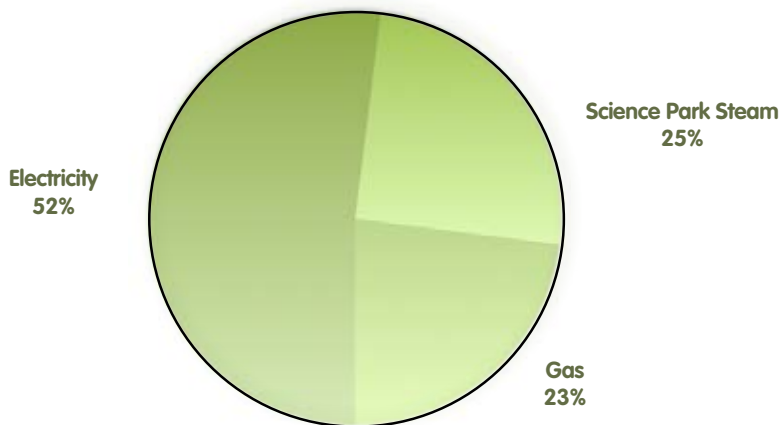


This shows that the Science Park has added emissions equivalent to the entire output of the Chester main campus and other buildings, which together account for 43% of the estate's emissions, with the Warrington site accounting for the remaining 14%.

It is important to note that electricity use throughout the estate is responsible for 52% of the entire carbon output, and the use of steam at the Science Park alone accounts for 25% of the estate's emissions, as shown in Figure 3.

Figure 3: Carbon Emissions by Source

Carbon Emissions Broken Down by Type



This analysis shows not only the increase in emissions due to the acquisition of the Science Park, but also the significance of its use of steam. It must also be borne in mind that the figure used is very conservative, and the out-turn after a cold winter could be very much greater. The Science Park, and in particular its steam infrastructure, must therefore be a very high priority for remedial works. This is likely to involve the replacement of the steam infrastructure with gas-fired boilers serving individual buildings. The existing steam infrastructure is not just intrinsically energy and carbon intensive, it is in very poor condition and extremely wasteful. In addition it is subject to the risk of interruption at short notice as the neighbouring site that supplies the steam could close – with serious implications for the university and its commercial tenants.



4. Carbon Reduction Action Plan

Active carbon emissions management is crucial for successfully meeting HEFCE funding criteria and in reducing operational risks over time from rising prices and materials scarcity caused by climate change impacts.

4.1 Scopes 1 & 2

The University's estate has expanded so total energy usage and associated carbon emissions have increased in spite of efforts to reduce them by improving energy efficiency. The correct identification of energy-saving opportunities by Investment Grade Energy Audits requires much better energy consumption data and this is being addressed by current metering projects. The resulting data must also be audited because misleading systematic errors and omissions can easily be introduced – and there are indications that this is happening.

4.1.1 Thornton Science Park

For the reasons given in Section 3 the Estates team is giving urgent consideration to commissioning an Energy Infrastructure Strategy Study and an Investment Grade Energy Audit of the site focusing on the 15-20 largest consuming buildings.

4.1.2 Other Campuses

An Investment Grade Energy Audit of one group of buildings with common plant (Price Tower, Thomas Building and Swimming Pool/Gymnasium) was completed earlier in 2014. This identified cost saving opportunities totalling £34,000 pa for an investment of £115,000 with an associated carbon saving of 182 tonnes pa, giving a good return on that investment of just over 4 years.

The audit also identified a major opportunity for energy/carbon reduction by better voltage management but this requires a university-wide voltage audit to properly evaluate the potential savings.

Once sufficient high quality energy consumption data are available the university plans to commission more Investment Grade Energy Audits focusing on those buildings consuming approximately 80% of the total energy and groups of buildings with common plant. These audits will also consider opportunities for renewable installations as these are generally better investments once energy management is firmly under control.

Once these audits are complete their outputs will be aggregated to produce a complete set of energy/carbon reduction plans and targets for the entire estate.

4.1.3 Monitoring and Targeting:

The next step is to continuously monitor building data from the new submeters to progressively drive down consumption by:

- applying a combination of forensic analysis and site knowledge to identify new low and no-cost opportunities to drive down costs
- preventing new sources of wastage and rectify lapses in control
- immediately identifying energy-wasting faults in equipment using automatic alarms
- displaying information to influence building users.

4.2 Scope 3

Measuring Scope 3 emissions can be especially complex, calling for close working relationships with Tier 1 service providers and suppliers to even begin scoping let alone measuring emissions. This means that the initial priority for the university is to fully scope and set up these important working relationships so that more meaningful data and improved sourcing and working practices can be evidenced. Until more accurate data are developed the assumption is that Scope emissions account for around 60% of the university's carbon foot print.

Working closely with suppliers to scope and account for emissions is critical to successfully identifying where the university's biggest supply chain carbon risks and impacts are. Establishing appropriate metrics and data collection with key 'high risk suppliers' will be essential for identifying how to effectively begin reducing these carbon risks.

Similarly, this approach will be equally important in establishing where the university is already sourcing from suppliers that are actively working to reduce their carbon emissions; these 'quick win' suppliers need to be identified as exemplary companies that can be used as case studies.

4.2.1 Measuring and Monitoring Scope 3 Emissions

The University's accounting system, procurement categories and expenditure codes have considerable potential for making scope 3 procurement emissions easier to estimate. As the accounting system is currently being reviewed for upgrading and improvement, this presents the ideal opportunity to build in emissions reporting capabilities by:

- Agreeing consistent coding for different categories and items of expenditure across the university's faculties and departments.
- Reducing and rationalising the number of deliveries to site, for example agreeing a weekly Lyreco stationary delivery with team administrators instead of allowing orders on an ad hoc basis. This will help to ensure full vehicles, fewer delivery trips and reduce transport emissions. Other major framework contract deliveries will also be reviewed with the aim of reducing trips and fuel usage to cut emissions.
- Enabling a running total of materials (per unit or by spend) from suppliers within each category so that emissions per tonne or by expenditure can be ultimately be developed through the proposed supplier engagement programme.

4.3 Progress and Projects

The following table summarises current in-progress and recommended projects and initiatives to meet carbon reporting requirements for Scopes 1 to 3 over the academic year 2014-15.

Scopes 1 and 2

Objectives	Tasks/Activities and KPIs	Responsibility & timing
<p>Emissions from building energy consumption:</p> <ul style="list-style-type: none"> Improve data Reduce risks Identify opportunities Implement opportunities Monitor and target to drive down consumption 	<p>1. Complete the installation of metering and sub metering in all buildings to enable more effective energy and emissions management. (See 4.1 above)</p> <p>Project cost estimate: £100,000</p>	<p>Led by Phil Moran BEMS Engineer and the Sustainability Unit</p> <p>Project completion date:</p>
	<p>2. Thornton Science Park Energy - develop a long term energy and sustainability strategy capable of supporting the engagement of a long term strategic Energy Partner.</p> <p>Phase 1 Project cost estimate: £11,500</p>	<p>Urgent: to be commissioned by the Sustainability Unit on behalf of Estates</p>
	<p>3. On completion of new metering, undertake audit of data, Investment Grade Energy Audits of the buildings consuming approximately 80% of energy and a university-wide voltage management audit.</p> <p>Project cost estimate: £120,000</p>	<p>To be commissioned by the Sustainability Unit on behalf of Estates</p>
	<p>4. Implement recommendations for energy efficiency measures at the recently audited Price Tower, Thomas Building and the Swimming Pool.</p> <p>Carbon saving: 182 tonnes pa Cost saving: £34,000 pa Implementation cost: £115,000</p>	<p>Dir of Estates & Head of Sustainability</p>
	<p>5. Chester Weir Hydro project: recommission the Hydro Electric Station at Chester Weir.</p> <p>Carbon saving: TBC tonnes pa Cost saving: £ pa TBC Implementation cost: up to £3M (NB: at this cost it is unlikely to be a high priority)</p>	<p>Dir. of Estates and Head of Sustainability</p>
	<p>6. Identify all UoC owned or leased vehicles and equipment for which fossil fuel and electricity are purchased by the university to run them. Establish model, make and fuel usage per km/mile or hourly usage and calculate annual emissions for Scopes 1 and 2 as appropriate. Identify emissions for base year 2005 and calculate trajectory to 2014/15. Also Identify potential savings through driver training, improved logistics and through replacement with more fuel efficient vehicles and equipment:</p>	<p>Jackie Gaffney, Estates Team</p> <p>By end of October 2014 – have emissions inventory and actions confirmed, with estimated carbon savings possible by 2020.</p>
	<p>7. Identify post-holders with direct responsibility for Scopes 1 and 2 carbon management (including academic staff) and agree with HR how this reporting requirement will be made a formal aspect of their role and performance reporting.</p> <p>Cost estimate: £0</p>	<p>A. Elliott, Head of Sustainability, Karen Cregan, Assistant Director of HR and specific post-holders identified. By end of March 2015</p>
	<p>8. Develop a carbon reduction 'induction pack' or similar for new starters. This could be an on-line PowerPoint training presentation and/or short guidance leaflet.</p> <p>Cost estimate: £zero?</p>	<p>A. Elliott, Head of Sustainability, Karen Cregan, Assist Dir. HR By end of March 2015</p>
	<p>9. Develop a carbon reduction 'information pack' or similar for new students. This could be an on-line PowerPoint training presentation and/or short guidance leaflet.</p> <p>Cost Estimate: £Zero?</p>	<p>A. Elliott, Head of Sustainability, Karen Cregan, Assist. Dir. HR to agree approach Timing to be agreed</p>

Scope 3 emissions

Objectives	Tasks/Activities and KPIs	Responsibility & timing
<p>Emissions from Waste:</p> <ul style="list-style-type: none"> Waste reduction through smarter procurement Optimising re-use and recycling on-site Ensuring waste arisings are appropriately processed off site. 	<p>9. Confirm municipal waste off-site final destinations and emissions (transportation & processing offsite) with B&M per tonne of waste for specific waste arisings:</p> <ul style="list-style-type: none"> General residual waste Glass Paper Cardboard Kitchen/catering waste Recyclable plastics <p>Cost estimate: zero (within current contract, details to be supplied by B&M).</p>	<p>Jackie Gaffney, Estates Team, with support from the Sustainability Unit to confirm waste emissions figures with B&M by end of October</p>
	<p>10. Undertake a hand sorting exercise with B&M to determine more accurate emissions per tonne of waste on which to extrapolate estimated emissions from municipal waste – linked with a student project.</p> <p>Cost estimate: TBC by B&M as a one-off exercise within the existing contract.</p>	<p>Sustainability Unit to complete sorting exercise with B&M by December, linked to a student project. Images taken to be used in awareness-raising initiative.</p>
	<p>11. Recharge Students Union waste separation and collection to Estates contract, enabling collation of data and to streamline waste collections for increased efficiency.</p> <p>Cost estimate: £zero?</p>	<p>Jackie Gaffney, Estates Team – by end of December 2014 to agree revised approach for implementation during 2015.</p>
	<p>12. Establish types and destinations for all hazardous waste generated on-site (sanitary, electrical, clinical and chemical) by issuing a written request from Head of Estates for information to faculty Deans and Directors.</p> <p>(Zero cost)</p>	<p>Letter/email from Jared during October – for confirmation of waste treatments by end of December. Estimated emissions to be established by Spring 2015.</p>
	<p>13. Establish waste volume/weight and type of arisings for LA municipal collections for specific self-catered properties. It may prove possible to use B&M data as a reliable proxy if info not forthcoming from the council).</p>	<p>Estates (JG) to get details from Chester Waste Authority by end of November so enable calculating waste emissions from this source.</p>
	<p>14. Undertake a feasibility study to determine the whole life cost and carbon benefits of collecting catering and grounds maintenance 'greenwaste' for on-site treatment, either AD with biogas for use on site (similar to Harper Adams University case study), or composting for use on site and as a revenue stream, possibly sited on the Grosvenor Estate.</p> <p><i>[NB: catering teams regularly undertake food waste audits to ensure that waste arisings are kept to a minimum.]</i></p> <p>Cost estimate for feasibility study to be confirmed.</p>	<p>Sustainability Unit to scope out feasibility study with JG and Ian Wright, Director of Catering (supportive) and present the business case jointly to Head of Estates in early 2015. Study will determine capital cost and ROI to give net benefits including net emissions reduction.</p>
	<p>15. Develop a waste awareness campaign with staff and students that also canvasses measures such as fines for non-recycling and the development of 'resident agreements'. The campaign will make the link between smarter procurement to reduce waste arisings.</p> <p>Cost estimate to be confirmed.</p>	<p>Sustainability Unit to develop proposal and specific measures for consideration by SMT by end of 2014, for implementation during 2014/15, reviewed in July 2015.</p>

Scope 3 emissions

Objectives	Tasks/Activities and KPIs	Responsibility & timing
Scope 3 emissions from water procured off-site and for waste water treatment.	<p>16. Establish the volume of water used on site per annum and the emissions intensity per litre from the water company supplying to each campus. Part of the buildings audit for Scopes 1 and 2 should also be concerned with measuring water usage and ways to reduce this, to also reduce carbon emissions. The second part to measuring water consumption is to also establish emissions from waste water treatment generated by the university estate. Again, the company supplying this service should have figures available for waste water generated by the university.</p> <p>Cost estimate: TBC.</p>	JG, with support from the Sustainability Unit and Procurement, to approach the relevant water supply and waste water treatment company(ies) for their data on carbon intensity of water supplied and waste water treated.
Transport carbon emissions: <ul style="list-style-type: none"> • Estimating Staff and student commuting per annum • Estimating staff business travel per annum 	<p>17. Establish student transport emissions using home and term-time post code information. Details of travel mode to and from university and to and from home can be developed by asking these questions when students register at the beginning of each term. The information can be mapped and analysed using GIS as a student project.</p> <p>Cost estimate: zero?</p>	HR to work Admissions/Registry to set up a system to gather these data on a regular basis. Data collation and reporting to be agreed with the Sustainability Unit.
	<p>18. Establish new compulsory questions for staff – and students - to complete for the on-line parking approval system. Information needed is for vehicle model, make and date of registration, plus fuel consumption in litres/km. All necessary information should be available by the beginning of the 3rd term in 2015. The aim is to gather fuel consumption and mileage data to generate calculated emissions for staff and student commuting by car. The results could be mapped using GIS</p> <p>Cost estimate: zero</p>	JG, KC and AE to agree revised questions and data collation approach, Sustainability Unit to explore GIS mapping as a special student project. The aim will be to put in place an ongoing data gathering and reporting system.
	<p>19. The staff survey planned for March 2015 will include new questions on commuting patterns and on booking business travel. It could also ask questions about satisfaction with cycle parking and shower facilities, and incentives for using public transport. The aim will be to revise the current data collection system to improve efficiency and accuracy</p> <p>Cost estimate: zero</p>	Head of Sustainability to review and advise on questions by January 2015.
	<p>20. Delivery rationalisation for goods and services will help to reduce Scope 3 transport emissions. For corporate contracts a minimum threshold delivery frequency will be agreed to reduce transport emissions and improve general efficiencies.</p> <p>Cost estimate: zero</p>	

Scope 3 emissions

Objectives	Tasks/Activities and KPIs	Responsibility & timing
<p>All other supply chain – procurement emissions:</p> <ul style="list-style-type: none"> Analyse and understand current supply chain risks and opportunities Engage suppliers to actively reduce carbon risks Improve and refine procurement practices to reduce carbon emissions. Raise staff and student awareness about the issues and benefits of low carbon procurement. 	<p>21. Analyse the university's top 200 suppliers by spend and volume to determine which pose the highest carbon risks, those that are 'quick wins' for the university, and to determine where specific suppliers need to be asked more detailed questions about their operations and sourcing approach. Suppliers will be categorised according to service or product type as listed below – the exact categorisation will need to be aligned with the new accounting system. Because of the scale of spend and commissioning process construction & refurbishment contracts may be best dealt with separately:</p> <ul style="list-style-type: none"> ICT, telecoms and AV equipment – Vehicles and transport services Catering (with sub categories) Review purchasing, leasing and Clothing and related supplies Furniture, soft furnishings and fittings Office stationery, equipment and supplies Laboratory and similar specialist supplies Domestic supplies and services, e.g. maintenance and cleaning contracts. Energy procurement Toiletries and sanitary products <p>Cost estimate: £TBC</p>	<p>Procurement Team and Sustainability Unit with external support.</p>
	<p>22. Review and revise UoC procurement policy and strategy to better explain VfM in relation to whole life costing to achieve built assets that are lower cost to run and maintain well into the future. Placing a greater emphasis on VfM in relation to carbon mitigation and climate resilience will also aid robust value chain development.</p> <p>Cost estimate: TBC</p>	<p>Procurement Manager, Sustainability Unit and external support as needed.</p> <p>Urgent – agree a revised draft for SMT sign off by end of May</p>
	<p>23. Construction & refurbishment</p> <p>Review current specification approach including brief to Capita as Project Management lead, and specification clauses used by Capita, refining these as appropriate to secure low to zero carbon construction projects and operational built assets. Adopting an improved approach to making the best use of BREEAM and the use of new best practice tools will result in a lower carbon estate. The ideal output could be an agreed UoC 'standard' or set of criteria for new build and refurbishment. This will need to directly align with UoC Scope 1 & 2 operational requirements.</p> <p>Cost estimate: £TBC</p>	<p>Dir. of Estates and Dir. of Procurement, with advice from the Sustainability Unit and external support as needed.</p> <p>Urgent – agree revised approach by the end of May</p>

Objectives	Tasks/Activities and KPIs	Responsibility & timing
	<p>24. Catering Because the majority of supplies are procured via TUCO and the NWUPP, more information is needed on both of these organisations' supplier selection processes. If the supplier selection process is not explicit enough in relation to sustainability and low carbon food and supplies, it may be necessary for UoC to develop its own (second stage) supplier selection and tendering process. This will need to include asking suppliers about their carbon foot print, the carbon intensity of their products, and their sourcing criteria. For example, it will be important to eradicate produce made with non-certified palm oil.</p> <p>Cost estimate: £TBC</p>	<p>External review of supplier selection process to be considered.</p>
	<p>25. Non TUCO and procurement via local suppliers can use the same approach as that advised for 23. above. Producing a 'low carbon guide' for local, non TUCO suppliers could also be used as a guide for catering staff and to raise student and staff awareness about the carbon risks in food and how to make better choices (linked to Health4all and the UoC Sustainability Strategy).</p> <p>Cost estimate: £TBC</p>	<p>Sustainability Unit and Catering to create a suppliers guide to low carbon food, with external support as necessary.</p>
	<p>26. Develop an initiative for strongly promoting the low carbon food guide to self-catering students as a People and Planet related initiative.</p> <p>Cost estimate: £zero?</p>	<p>Sustainability Unit</p>

5. Improvements to ongoing monitoring, reporting and target-setting

The University of Chester is committed to actively developing and extending its current approach to carbon emissions monitoring with the aim of securing much more substantive energy, cost and carbon savings for Scope 1, 2 and 3 emissions.

The programme of actions summarised in this latest revision to the Carbon Management Plan for University of Chester will be phased to realise 'quick wins' by prioritising carbon-smart procurement and more robust data collation. A critical priority will be to complete site metering and initiate the completion of detailed energy audits on each campus. This will provide a much more accurate baseline of current usage and fully identify the potential for further Scope 1 and 2 energy and carbon savings.

Importantly, the programme or Action Plan for 2014/15 requires the close co-operation of each administrative team, all academic faculties, staff and students across the university. In doing so it will be possible to fully integrate operational efforts for performance improvement. This will positively support the implementation of the University's broader strategy to embed sustainability across the University and vision of a just and sustainable world for present and future generations.

Taking the time and resources to set these measures in place will cover most of the coming year, but we will be in an excellent position at the start of academic year 2015/16 to reduce our carbon risks and considerably improve our 'triple bottom-line' (social, environmental and financial) sustainability performance.

It will be critical to ensure that the new financial accounting system being scoped will dovetail with Chester's non-financial strategic reporting to meet HEFCE and related performance management requirements. In this way, the University's corporate performance will match best corporate practice in other sectors and comply with government's new regulations for non-financial strategic reporting. We will then be in a position to begin carbon assurance auditing using an independent specialist verification body.

Our aim is that all of the measures listed in Section 4 of this report will be fully scoped and prioritised as costed businesses case for approval before the end of 2014. The University's developing evidence base for carbon emissions reduction will then be used to develop new, more stretching targets for 2015/16.



Appendix 1: Science Park Carbon Emissions Calculation

		April	May	Jun	3 Month Total	Year Total
Total Science Park						
Electricity	MWh	656	689	645	1,990	7,960
MP Steam	Tonnes	794	1,113	731	2,638	10,552
LP Steam	Tonnes	744	802	761	2,307	9,228
B301 (Tenant)						
Electricity	MWh	213	227	235	675	2,699
MP Steam	Tonnes	402	564	365	1,330	5,321
Net to University						
Electricity	MWh	443	462	410	1,315	5,261
MP Steam	Tonnes	392	549	366	1,308	5,231
LP Steam	Tonnes	744	802	761	2,307	9,228
Total Steam	Tonnes	1,136	1,351	1,127	3,615	14,459

In the calculation of carbon (CO₂) emissions it has been assumed that the total enthalpy of the steam is 2,797 kJ/kg at 17 Bar and 2,764 kJ/kg at 6 Bar. There is no return of condensate to the boiler room, and the dissipated energy has therefore been estimated at an average of 750 kWh/Tonne, for an annual total of 10,844 MWh. It is assumed that this energy is provided from boiler plant having an overall efficiency of 80%, and burns fuel with an average carbon content of 252 g/kWh, for a total of 3,416 tonnes of CO₂.



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