

Annual Energy and Environment Report 2016/17: January 2018

The new University Strategy to 2021 reaffirms that one of our core values is a commitment to environmental best practice. Our Environmental Policy can be found at http://www.bath.ac.uk/estates/docs/Environmental_Policy_2016.pdf

This report is prepared on behalf of the Sustainability & Carbon Management Steering Group (S&CMSG) and reports on our progress to Council via the Executive Committee.

Summary

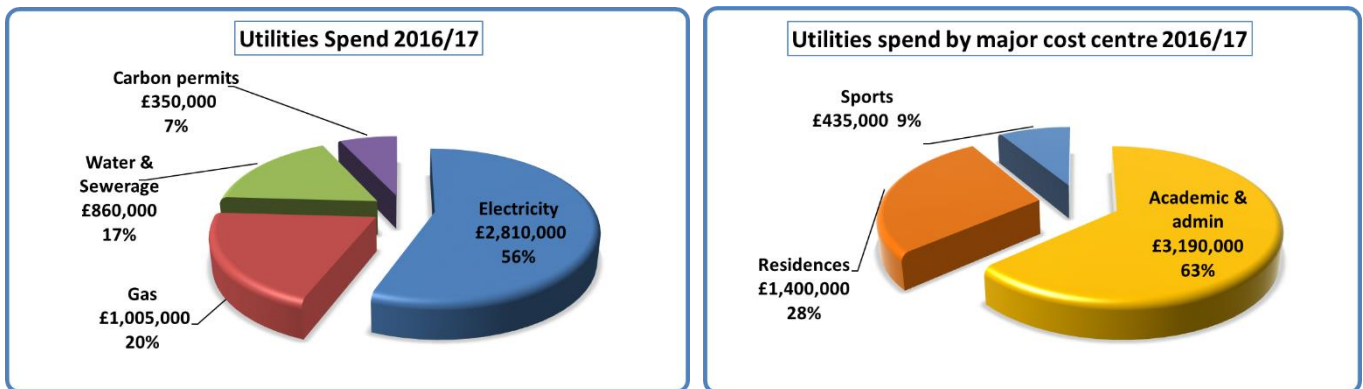
- Electricity consumed down 1% in the year despite two major new buildings being built (6% improvement in usage per unit building floor area).
- Water use 10% down on 2015/16
- Energy consumption and water usage lower than 10 years ago despite significant growth. When growth taken into account:
 - Electricity use per m² floor area 29% lower
 - Gas use per m² floor area 29% lower
 - Water use per m² floor area 40% lower
 - Saving £1.5m annually
- Carbon emissions down 17% since 2005, a period of significant growth in the University's student population and physical infrastructure. Emissions per m² building floor area are down 34%, per student 36%, and relative to financial turnover down 48%.
- New national HE and public sector carbon targets from government - currently in consultation.
- Self-generated electricity now accounts for 7% of our total use – our CHP (Combined Heat and Power) plants have generated 1.9 million units of electricity this year, enough to power 600 houses, and have recycled 2.5 million units of heat, a net saving of £120k.
- 36 tonnes of 'end of term' unwanted food, clothing, crockery and appliances collected and donated to charities instead of going to landfill.
- Overall recycling rate of 53%. First UK University to carry out coffee cup recycling, in conjunction with reusable cup/eco-container scheme.
- Accommodation and Hospitality Services maintained certification to the ISO 14001 Environmental Management standard, helped run the 'Leave No Trace', 'Student Switch Off' and 'Pack For Good' campaigns, and won a Sustainable Tourism award.
- Electricity costs to rise significantly; energy bills likely to increase by £2.5m over next 3 years due to price increases and planned University expansion.

- University now operating with 100% green renewable electricity supply, including off campus properties.
- We have been a 'Fairtrade University' since 2009, and were awarded Fairtrade Gold awards in 2015 and 2016

1.0 ENERGY AND WATER USE

1.1 Financial Impact

We spent around £5 million in 2016/17 on utilities. As can be seen this is dominated by our electricity costs. Our residential and sports spend is not insignificant, but the rest of the University again dominates the picture.



1.2 Consumptions (See Appendix 1 for graphs)

Comparing 2016/17 with the previous year:

- electricity imported (i.e. bought) down 0.7%
- electricity consumed down 1% despite the completion of two major new buildings
- electricity per unit building floor area down by 6%
- self-generated electricity was 7% of total University use (6.5% from combined heat & power and 0.5% from solar panels)
- gas use level but heavily weather-dependent
- weather-corrected gas use up 7%, but up 1.5% taking new build into account
- water use down by 10%
- water use per unit building floor area is currently 1,165 litres/m², down 15%

Electricity: Total electricity 'consumed' has been rising in recent years due to new buildings and growth in student numbers. Our increase in self-generation and energy efficiency savings have partially offset this. In 2016/17 we saw an absolute fall in electricity use, despite two major new buildings coming on line (4 East South and 10 West). Without this growth the underlying reduction is greater, a fall of almost 3% which equates to a year on year saving of £95k.

Gas: Heavily dependent on weather, we 'normalise' our data using statistical temperature records. Last year was the mildest winter for 10 years, and heating systems tend to be more efficient in colder weather, hence we have seen a slight increase of 1.5% in usage per m². The long-term trend is a reduction in gas use, even though we have delivered a significant expansion in the Estate. We have also budgeted for an increase in gas use as we increase our generation capacity through gas fired CHP. However, this rise is more than offset by the financial and carbon savings.

Water use was up in 2015/16 due to a major leak in the underground supply pipework, plant failure in two separate buildings, and refilling of the swimming pool after repairs. The most recent year, however, has seen a return to previous levels, with a consumption of 305,090 m³, down 10% on last year, equating to a saving of £88k.

Longer term trends:

Long term trends still tend downwards, with all utilities still below 2005/6 levels. The graphs in Appendix 1 also highlight the influence of recent new buildings on consumptions. Over the 10 year period the following buildings/facilities have been added (not all shown on graphs):

- 4 South Annexe
- Woodland Court
- 4 West
- 5 West server room
- East Building
- Student Centre
- 1 West phase 1 (extension)
- Chancellors' Building
- The Quads/Lime Tree
- The Edge
- Virgil Building
- 10 West
- 4 East South

We have reduced our annual usage of energy and water by around £0.5m-worth over this period, despite this significant growth. Factoring in this growth, whilst also allowing for any old buildings/facilities that have been discontinued, **we are spending about £1.5m less annually than we would have otherwise.**

Taking growth into account, consumption data per m² building floor area shows that while we have expanded we have increased the efficiency of our built estate:

- Electricity use per m² floor area 29% down in 10 years
- Gas use per m² floor area 29% down in 10 years (weather-corrected)
- Water use per m² floor area 40% down in 10 years

2.0 IMPROVEMENTS MADE

2.1 Technical improvements

A number of improvements have been implemented since the last report. These include:

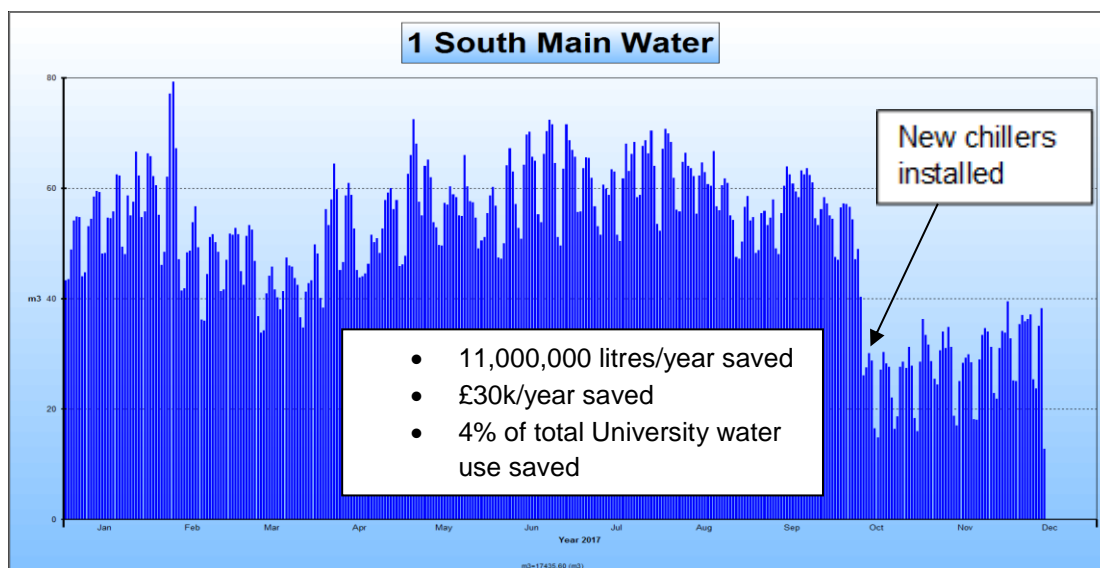
Lighting upgrades to deploy the latest LED fittings with automatic controls and daylight dimming. Areas addressed include: Library level 3, corridors in 3 South, 7 West, 3WN and Wessex House. As part of general refurbishments to buildings we have also upgraded lighting to LED fittings in Cotswold, Derhill, Wolfson and Woodland Court residences, laboratories in 8 East and 4 South, and a further 15 lecture theatres. The Library has now had all 4 upper floors upgraded – the lighting costs to this building have been cut by 70%, saving £35k a year and 100 tonnes CO₂, lowering maintenance costs and transforming the appearance of the area.

LED fittings have an added benefit of a longer life and lower maintenance cost compared to standard lamps. Critically, these works improve the appearance of the refurbished areas, enhancing the teaching and learning environment. We have invested well over £1m in lighting projects over the last 12 months, saving over £150k/year in energy and maintenance. We are now working to develop a further phase of works.

IT projects – our Computing Services department has completed implementing auto-powerdown software on all 1,700 public access PCs. A process of server ‘virtualisation’ also continues with 44 new servers virtualised, and 6 old server systems discontinued.

Main boiler house – a major £7m project is underway to upgrade our district heating system that feeds the main Parade buildings. The boilers are being replaced by high efficiency units with improved controls. The whole network will become a more flexible, reliable and effective method of heating these core buildings. Phase 1 was successfully completed in summer 2017, the remaining main works are due for completion in summer 2018.

In **1 South** a major water reduction has been made, working with academics and technicians. New chillers for several Chemistry ‘gloveboxes’ were bought; a £24k investment has led to the following savings, as highlighted in the below graph:



Other recent technical improvements in other areas include:

- Chancellors’ Building controls optimisation – saved £8.5k/year
- STV CHP – improved operation saving additional £20k/year
- All fiscal water meters had automated leak monitoring equipment upgraded
- 1 South controls upgrade - £10k/year saving
- 3 West annexe (nanofabrication) ventilation fan upgrade - £10k investment, 4 year payback

2.2 Student Switch Off

The award-winning student residences energy-saving competition ‘[Student Switch Off](http://www.studentswitchoff.org)’ has run for an 11th year and continues to deliver savings and raise awareness with new students. Last year we had over 1,800 first year students signed up and pledging to behave in an energy efficient way. This year we are on track to exceed this record number. Students are provided with top tips on the web, competitions, quizzes, training, and regular updates including how much electricity they have been using. A ‘Beer & Curry’ prize is awarded to the winning hall, and there are a number of other prizes given away during the competition.



This campaign runs at over 40 universities in the UK, and we continue to be a leader amongst these in our implementation. Thanks to a combined effort between Estates, AHS staff, the SU, and student volunteers, we get higher levels of engagement than most other institutes. Last year we recruited and trained 50 student ‘ambassadors’ to undertake peer-to-peer promotions, and this year we have linked this scheme with the SU’s Bath Award scheme. We were also part of a select group to access EU funds to add live data feedback to our competition. A web-based dashboard utilises live data from our metering system to give students feedback on their consumption.



2.3 Metering

We now have close to 2,000 ‘smart’ sub meters continuously monitoring gas, electricity, water and heat usage across campus. Consumption data feeds back every half hour, creating a powerful information system collecting half a million data points every week. This data source is vital to allow our energy use to be managed in a targeted manner. Analysis of the data highlights energy wastage, allows prioritisation of areas for improvement, and measures the impact of energy efficiency projects. It can also be used to flag up problems with buildings and plant, or with supplies (such as underground water leaks), and allow these to be fixed before they affect building users.

The number of meters continues to increase as the system is developed, and as new buildings are added – 4 East South has 43 new meters, and 10 West has 62. We have also made substantial investment to improve resilience and future capacity in the network, and are now preparing our future strategy for the infrastructure and software.

2.4 Self-generation

Renewables

Four blocks of the Westwood residences, Woodland Court and 4 West all benefit from solar thermal systems. Used to generate hot water they produce around 22,000kWh of heat each year.

Our solar photovoltaic (PV) generation capacity continues to grow with systems in place on:

- East building - 24kW peak generation
- Chancellors’ Building - 50kW
- 10 West - 22kW
- 4 East South - 36kW

These systems generated 93,000 units of electricity (~£12k worth) in 2016/17 (see http://www.bath.ac.uk/estates/docs/Chancellors_PV.pdf for more details).

Combined Heat & Power (CHP)

Gas-powered CHP is a particularly efficient form of generating electricity as it allows the waste heat to be ‘recycled’ locally on site. We have two CHP engines:

- CHP for Chancellors’ Building and The Quads: installed 2013, with waste heat going to provide heating and hot water to both buildings, saving £85k and 350 tonnes CO₂ each year.

- CHP in Sports Training Village: installed in 1997, with waste heat going to heat the swimming pool. This typically saves £35k and 90 tCO₂ each year.

These systems have generated 1.9 million units of electricity in 2016/17, enough to power 600 houses and a financial value of around £250k. They also generated around 2.5 million units of heat that was captured and used on campus; this heat would have otherwise been wasted through conventional generation at a power station.

(For more info see http://www.bath.ac.uk/estates/energy-sustainability-environment/The_University_Power_Stations.html)

2.5 New buildings

We have used BREEAM (Building Research Establishment Environmental Assessment Methodology) as an 'eco-design' process for new buildings for many years. We do not always formally implement BREEAM on new builds, but use the method in a pragmatic way, and have enhanced this with specific targets for energy and carbon efficiency. We are also implementing much of the industry best practice 'Soft Landings' approach to new and refurbished buildings. We are using a similar approach on the Milner Centre and Polden student residences, and are planning our approach for the new School of Management and IAAPS.

The Milner and Polden projects are being designed with enhanced insulation, excellent airtightness, sophisticated lighting and controls, and natural ventilation where possible. Polden will have an intelligent heating control system that allows user control and automatic set back when rooms are empty, combined with CHP to provide hot water.

3.0 UTILITY FINANCIALS

3.1 Procurement

We purchase electricity and gas via flexible energy procurement contracts rather than the traditional fixed price, fixed term contracts. These allow any market falls to be captured, while defending against market rises. The key advantage is to allow a budget figure to be better 'defended' and the risk to be spread across several separate purchasing decisions. The supplier 'risk margin' is also lower, and in a falling market the savings can be locked in. In a rising market a variety of trigger mechanisms and a risk framework minimise our exposure. This 'hedging' approach allows us to purchase up to 18 months in advance and respond rapidly to changing market conditions.

We collaborate with around 40 universities and other public sector bodies through a consortium which operates a framework contract and trading 'basket'. This year we have achieved a saving of £716k through this method (£141k cashable, £61k cost avoidance, and £514k traded). This has been partly through trading strategy and through aggregation with other universities in the trading 'basket'.

We have always bought as high a proportion as possible of our electricity on a 'green' renewables tariff; changes to the rules governing renewables and the Climate Change Levy have allowed us to now make this apply to 100% of the campus electricity supply. We have recently changed contracts for all our off-campus supplies to 100% green tariffs too.

3.2 Longer term costs

Gas and power costs are subject to global markets and are heavily influenced by the international oil price. This commodity cost is only a proportion of the overall electricity price; non-commodity charges (Climate Change Levy, Renewables Obligation, distribution and

transmission charges etc.) now make up over 60% of the price of electricity and are increasing significantly. This rise is in part to pay for UK investment in renewables, infrastructure, and other new generating plant (e.g. Hinkley Point C). These charges are set by government, OFGEM and the distribution companies and are set to increase significantly over the next few years. The impact of these are such that **we are predicting a ~40% cost increase by 2020 i.e. an extra £1.5m annual cost to the University, even without any growth in the Estate. Estate growth** (Milner building, Polden residences, School of Management, IAAPS) **is expected to add ~£1m more.**

We are also subject to stringent peak electricity charges: a unit of electricity during the winter weekday peak hours of 5-7pm costs over twice that of a normal unit. This peak period premium is set to continue to increase as a reflection of the national 'supply gap'. As well as reducing demand during this time, self-generation can be used to offset these costs, hence another significant benefit of CHP – our CHP systems are designed to run during this period every day, and we continue to investigate other ways of minimising these costs, e.g. the use of battery storage, and other demand side response approaches.

Competition in the commercial water market for commercial customers has recently been introduced via OFWAT, but so far this has had only a marginal effect on the market, with no tangible benefit to the University. This will be kept under review.

3.3 Funds for investment

In 2015 we successfully bid for £600k from a new HEFCE/SALIX Revolving Green Fund for investment in efficiency projects. This has been fully spent on lighting projects, and adds to our existing £250k fund. These are both 'revolving' funds whereby energy savings are fed back into the fund for future use and hence are self-replenishing until no further suitable projects can be found. As well as investing these funds we continue to look for opportunities to apply for further external funding.

4.0 CARBON

4.1 Carbon Management Plan (CMP) and progress against targets

For 2016/17 our carbon emissions were

- 20,451 tCO₂, down 0.9% on last year
- 78.1 tCO₂/m² floor area, down 6.2% on last year

We are continuing to make substantial progress but our original carbon targets are increasingly challenging given the scale of recent and planned campus growth, and hence a review of these targets is underway. In April 2011 the University produced a Carbon Management Plan (CMP) including the following targets for reducing emissions:

- To reduce emissions by 19% by 2014/15 against a 2008/9 baseline target (the period of the plan)
- To reduce our Scope 1 and 2 CO₂ emissions by 43% by 2020 from a 2005 baseline

These targets were absolute targets i.e. any growth will clearly make the targets even harder to achieve. The targets were set before the major changes in funding in the UK HE sector, and while they allowed for a degree of growth in the University, the actual growth has been much greater than anticipated. We have previously reported against the shorter-term target – we achieved a 5% reduction in absolute emissions whilst growing significantly. Against the longer term 2020 target we have so far achieved a 17% reduction. We are performing better than the sector average with 59% of universities projected to not meet their original 2020 emissions targets.

In terms of relative carbon emissions:

- CO₂ per m² building floor area - 20% down over the period of the CMP; 34% down in last 10 years
- CO₂ per student – 21% down during CMP; 36% down in 10 years
- CO₂ per £ financial turnover – 31% down during CMP; 48% down in 10 years

As well as the weather, a factor outside our control that has an effect on our carbon figures is the assumed conversion rate from kWh of electricity to CO₂. These are set each year by government (DEFRA) and are calculated according to the changing UK electricity generation mix. These have been falling generally in recent years but can fluctuate e.g. the 'dash for coal' increased the grid factor by 11% in 2014. It is expected that the factor will fall significantly over coming years as the greater low carbon generation is used. There are also a number of differing interpretations of how carbon emissions should be reported. The assumption made is that we will continue to report actual energy use as well as carbon emissions, and to follow DEFRA guidelines and use the most up to date annual grid conversion factors, but also to be open and clear about our assumptions.

4.2 Carbon legislation

Carbon Reduction Commitment (CRC)

This legislation commenced in 2010 as an emissions trading scheme whereby all organisations of a certain scale are required to purchase annual emissions permits, at an initial fixed price of £12/tonne CO₂. In effect this is now a simple carbon tax – the price per tonne has since risen to £16.50, with an annual cost of around £350k to the University. This legislation is to be replaced by a simpler carbon levy, but with similar (and rising) costs. Under this legislation our emissions were 20,966 tCO₂ in the year to April 2017, a reduction of 4% on last year.

Display Energy Certificates (DECs)

This legislation requires all public-sector buildings to display a certificate showing the energy performance of a building based on actual consumption, and must be updated annually. It shows an 'A to G' rating based on a comparison with a theoretical benchmark building with a performance typical of its type, where A is the lowest CO₂ emissions (best) and G is the highest emissions (worst). Also shown on a DEC are the ratings for the previous two years; this provides information on whether the energy performance of the building is improving or not.

Including off-site residences, the University now has to provide 68 DECs. We have a significant number of poorly rated science/laboratory buildings due to the simplistic benchmark for laboratories, and due to the energy-intensive research equipment in the buildings concerned. We have improved our ratings in all categories, with an overall improvement of 29% for the campus since 2009. We have an interactive website showing all our DECs – see <http://bathuni.energyprojects.net/>

4.3 Future legislation/targets

The new UK government Clean Growth Strategy was launched by BEIS (Dept. for Business, Energy & Industrial Strategy) in October 2017

(see <https://www.gov.uk/government/publications/clean-growth-strategy>)

This sets out the approach to implementing the next phase of UK strategy under the Climate Change Act (2008), across areas such as power generation, industrial efficiency, green finance, domestic efficiency, and transport. There are significant impacts for the University, including:

- Carbon targets for public sector (inc. HE) of 30% by 2020/21 against 2009/10 levels
- Mandatory reporting
- Possible extra funding available for efficiency improvements

A consultation process is currently underway.

5.0 WASTE AND RECYCLING

The recycling rate for 2016/17 was 53% for the University, maintaining the level for last year. Some of the key operational improvements this year have included:

- Cartons (Tetrapaks) – the introduction of the carton recycling scheme in Halls of Residence and the Lime Tree has been very successful with 762kg of cartons being collected. The cartons are diverted from landfill and sent to the only UK recycling plant.
- Hard plastics – a new recycling outlet for hard plastics has been found allowing items such as broken bins and crates to be recycled rather than being sent to landfill. 3.4 tonnes of hard plastics were recycled in 2016/17.
- Books – over 52 tonnes of books have been recycled, journals which the Library no longer required due to upgrading to online facilities. Additionally, 1.5 tonnes of text books were sent for reuse.
- Coffee cups – 4.4 tonnes of coffee cups have been recycled through the new cup recycling scheme. We were the first UK University to recycle coffee cups across campus. We have also reduced the number of disposable cups used significantly through the reusable cup discounted scheme.
- Coffee grounds – 7.3 tonnes of coffee grounds produced in Hospitality outlets have been composted on site by our Landscape team.
- Food waste – all staff kitchens in the Virgil Building have been given a food waste bin to allow staff access to the most comprehensive recycling available. Most AHS staff kitchens on campus have also introduced food waste bins in their staff kitchens. All 4,000+ student residences have had access to food waste recycling facilities for a number of years, and the food waste is sent to an anaerobic digestion facility to generate renewable energy and biofertiliser.

Some of the key campaigns have been:

- The Accommodation end of term waste campaign, part of Leave No Trace, has been even more successful this year. In total over 36 tonnes of items were donated to numerous local charities. Over 36 crates of opened food, such as pasta, tea bags and spices, have been donated to local cooking groups and charities; in the past these would have been disposed of as landfill. An “open house” was also held so local charities and community groups could collect kitchen items such as pots, pans, cutlery and crockery. An additional British Heart Foundation bin has been located on campus bringing the total to 4, and another temporary bank was used during the end of term.
- The Hospitality Leave no Trace campaign has been very successful at encouraging students and staff to use their own containers rather than disposables. Over the first 11 months of the campaign a total of 60,094, 20p discounts have been issued. In September 2017 we also introduced branded reusable Eco Containers to be used in food outlets; all Freshers were supplied with one in their welcome pack.
- Less Landfill=More Planet is a campaign which the Accommodation Department has run for the last couple of years, in kitchen groups students are challenged to live waste free for a fortnight. Kitchen groups compete with each other to show the biggest improvement in recycling rates and also those producing the least amount of waste. This year approximately 1,000 students took part in the competition in Halls of Residence across campus.

In 2018 the University's waste compound will be upgraded. A canopy will be built to house the cardboard baler and two new waste compactors, plus a welfare facility for the Outside Waste Team. Using waste compactors on site will reduce the general waste costs significantly, give

the Portering team more control of the waste, reduce large vehicle movement across campus and increase capacity to allow for the growing campus.

6.0 TRANSPORT

Our Environmental Policy includes a specific objective to minimise carbon emissions from regular commuting to and from campus by encouraging the use of car sharing, public transport, cycling or walking. The University monitors emissions associated with commuting travel using the biennial travel surveys and will, once baseline data has been established, calculate the same for business travel. The last travel survey was undertaken in 2014 and the emissions per annum for staff and student commuting (based on 2016/2017 staff and student numbers) are:

- Staff 2,096 tCO₂ equivalent
- Student 2,055 tCO₂ equivalent
- 0.259 tCO₂ per FTE staff/student

The University has operated a travel plan for the campus since 2002, implementing a number of transport improvements in recent years.

- In 2016 the University updated its Travel Plan which included targets to reduce car trips to the Claverton Campus per staff/student head by 1% per annum for the next five years and provide 2,219 car parking spaces on campus by 2017, holding the number of spaces more or less stable compared with our 2209 spaces in 2003.
- The University Travel Plan was reaccredited with a Gold Award by Travelwest
- A number of promotional activities have taken place, including the Travelwest Roadshow, Bike Doctor and Bike To Work free breakfasts.
- The University continues to run a carshare scheme, cycle purchase scheme, trial electric bike scheme, walking network, and provides interest-free loans for public transport season tickets.
- Further electric car charging points have been installed, taking the total to 9 on campus, plus 5 charging points for Estates electric vehicles. Additionally, the Virgil Building has also had an electric charging point installed.
- First Bus has upgraded its fleet to the University with new lower emissions vehicles.
- In 2017 the University installed a new bus stop and layby adjacent to the STV

It should also be noted that, under a S106 agreement with BANES which ended in 2013, the University made an annual contribution to the Council which was used to subsidise the 20A/C bus that serves the University but also provides many other benefits to the wider community. The University has committed to an additional £400,000 (index linked) to be drawn down by the Council as required to continue to subsidise the provision of the 20A/C service up to 2027.

Set against the staff and student population increasing by around 39% between 2007 and 2016, the Annual transport surveys indicate that in this period:

- Daily vehicle flows have only slightly increased by 2%
- Car trips per FTE staff/student head have fallen 27%
- Bus trips per FTE staff/student head have risen 43%
- Cycle/Walk trips per FTE staff/student head have risen 78%

7.0 BIODIVERSITY

The University is responsible for the woodlands and parkland areas of the campus. It operates a LEMP (Landscape and Ecological Management Plan). The following recent improvements have been made:

- Work has continued to improve pathways through the wooded areas on campus; this improves the social amenity as well as actively supporting bat life on campus by providing suitable flight routes.
- Ongoing work has been undertaken to remove non-native flora from woodland areas and to replace with native wildflower species.
- The Natural Pond created in 2014 is reported as having become well established.
- We are collecting in the region of 350 tonnes of fallen leaves each year, which after three years composting will be used to help grass and planting schemes.
- We continue to compost the waste from all coffee outlets on campus; coffee grounds are mixed with leaf mulch to go back on flower borders and grassed areas.
- We are also looking at reducing the formal grassed areas with a view to strategic wild planting.

A number of trees have been removed as a result of campus developments; in accordance with our tree strategy, each tree has been replaced with one or more saplings. In Limekiln Woodlands 90 native trees including silver birch, beech, hornbeam, mulberry, mountain ash and elm were planted to replace the trees lost in developing 4 East South building. Planting around our recent new builds is complete; the 10 West Planting Project used trees and plants of value for wildlife particularly bees and birds.

8.0 SUSTAINABLE PROCUREMENT

In 2014 a new Sustainable Procurement Policy and Action Plan were approved. (<http://www.bath.ac.uk/purchasing/sustainability.bho/index.html>). All major procurements across all categories of expenditure continue to be assessed for sustainability impact and appropriate criteria during the supplier selection process. Some recent examples include:

- The procurement of hospitality disposables (cups, etc.) where a 30% weighting was allocated to sustainability within the evaluation criteria. The selected supplier will help deliver a reduction in the use of disposables and an increase in recyclable elements within them.
- A variety of other food and drink requirements have also been given a significant weighting to sustainability-related evaluation criteria e.g. Soft Drinks with 20% for ISO14001 and reduction of carbon footprint; sandwiches with 10% for sustainable packaging and carbon footprint; and Organic Milk which is now being sourced from a local supplier based in the Cotswolds.
- The new Managed Print contract that is now in operation has resulted in a reduction in the number of devices deployed across the University and a rationalisation of the models used thus saving on materials and logistical management of the devices. The new models also offer the lowest power consumption and noise ratings for those type of devices currently available on the market and the manufacturer has been commended under the Energy Star programme. The manufacturer has also made advances in the toner technology, including making their cartridges smaller, lighter and with less packaging.
- In a similar way, the procurement for the supply and service of a new Production Copier included 11% within the evaluation criteria for sustainability. The successful contractor is providing benefits under the contract such as committing 0% to landfill and rationalising collections of toner bottles and cartridges.

- The procurement of Feminine Hygiene products included 5% within the evaluation criteria for environmental impacts. The successful supplier uses recyclable materials in the vast majority of products, with approximately 95% of them manufactured in the UK in order to reduce their carbon footprint.

Looking ahead, we will continue to collaborate with other local public-sector organisations to develop a business case for establishing a framework from which Fruit, Vegetables and Meat can be procured locally.

The Fairtrade Foundation awarded the University of Bath Fairtrade Status in 2009. In March 2015, we won a Fairtrade Gold Award in recognition of our continued commitment to Fairtrade products, promotions and events, as well as our efforts over Fairtrade Fortnight. We won the award again in 2016. The University promotes the awareness and sale of Fairtrade products through:



- promotional events during Fairtrade Fortnight each March
- a range of Fairtrade products in our eateries, including all tea and coffee
- information about Fairtrade products displayed in commercial outlets and online
- Fairtrade products will be clearly marked on menus in the future

In 2016/17 the regional purchasing consortium has estimated our indirect (Scope 3) carbon emissions due to our purchasing spend to be around 39,000 tonnes CO₂, with the following breakdown:

- | | |
|-------------------------------|--------------|
| • Construction | 18,600 (47%) |
| • Misc. manufactured products | 6,250 (16%) |
| • Food and drink | 5,500 (14%) |
| • IT | 2,900 (7%) |
| • Business services | 2,900 (7%) |
| • Paper products | 1,500 (4%) |
| • Waste and water | 700 (2%) |

9.0 CURRICULUM

A sub-group reporting to the Sustainability & Carbon Management Steering Group (S&CMSG) was set up initially to look at sustainability within our teaching across the University. Previous work had identified that 16% of all units and 7% of core units of existing teaching modules within the University included some explicit aspect of sustainability, and that about 27% of academic staff at Bath teach or research sustainability-related issues.

National research by the NUS also shows that 80% of students consistently believe that Sustainable Development (SD) should be actively incorporated in teaching and promoted by universities. Over two thirds further believe that SD should be incorporated into all University courses. Studies at Bath have backed up this picture locally. A Teaching Development Fund bid was used to develop a central resource and best practice guidance on teaching sustainability within the curriculum – see [here](#).

The Students' Union Top 10 has highlighted the desire for better integration of SD in the curriculum in a coordinated way, and has identified the NUS Responsible Futures accreditation as way of ensuring this, and the University is investigating this as part of the general curriculum reform process. The School of Management has signed up to the Principles for Responsible Management Education which covers their research, teaching and operations. In Oct 2017 the Department of Chemical Engineering launched a new MSc in Sustainable Chemical Engineering.

10.0 OTHER

10.1 Accommodation & Hospitality Services (AHS)

AHS continue to be highly active operating under an ISO 14001 Environmental Management system across all their operations. The department runs a number of initiatives under the 'Leave No Trace' campaign and supports initiatives such as 'Student Switch Off' and 'Less Landfill = More Planet'. This year the University's guest accommodation has been awarded silver in the Sustainable Tourism category at the 2017/18 Bristol, Bath and Somerset Tourism Awards.



There were hundreds of entries across the South West, with judges looking for evidence of excellent performance in each award category. Two members of the award panel visited the campus in September 2017. They viewed first-hand what AHS does to protect what matters and reduce the department's impact on the environment, during the guest accommodation period from June to September.

The panel were impressed with all the department's efforts and in particular the Leave No Trace campaign. Other highlights were the commitment to using ethically and locally sourced food where possible and triple certified, Fairtrade coffee. Also notable were the sustainable actions within the Lime Tree, which recycles more waste than it sends to landfill, and reduced energy usage in The Quads, with low flow showers, motion detecting lights and novel radiator controls.

10.2 Students' Union

Our students are increasingly aware of the environmental impacts of not only their own activities, but also the practices of the University, as evidenced by the [latest SU Top 10](#). This states that "when students graduate they want to be ethically concerned citizens alongside their academic achievements...We hope to work to a more sustainable University by examining our environmental practices and finding key initiatives that can be adopted to make a more green University...". Particular areas of focus are divestment from fossil fuels, and sustainability in the curriculum.

The SU, in conjunction with Estates, has run 'green week' events to promote environmental messages to students and staff, and this is now set to be a twice yearly event called 'Bath Be Green'. This has provided a platform for a number of student societies to run activities as well as for external organisations such as the local council energy/waste teams and local environmental organisations to run promotions. A very successful Farmers' Market has also been run using local ethical suppliers.

**THINK FORWARD.
BE GREEN. 
BE SUSTAINABLE.
LOVE YOUR
ENVIRONMENT.**



10.3 School of Management – Principles of Responsible Management Education (PRME)

The School of Management has recently been recognised for its commitment to sustainability and has signed up to [PRME](#), a United Nations-supported scheme founded in 2007. Its aim is to raise the profile of sustainability in business schools worldwide. As part of the process, institutions share information on progress reports every two years. PRME have formally recognised the University following our first submission. Reviewers assessed how we promote

sustainability and ethics through our courses and research. The School remains committed to sustainability, and will continue to work on improving sustainability-based teaching, increasing awareness of sustainability teaching, and furthering research in this area.



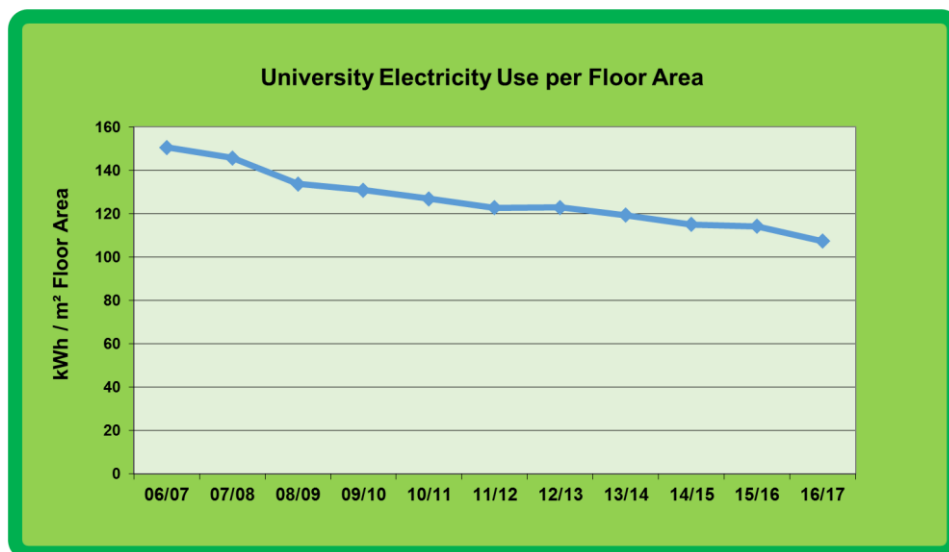
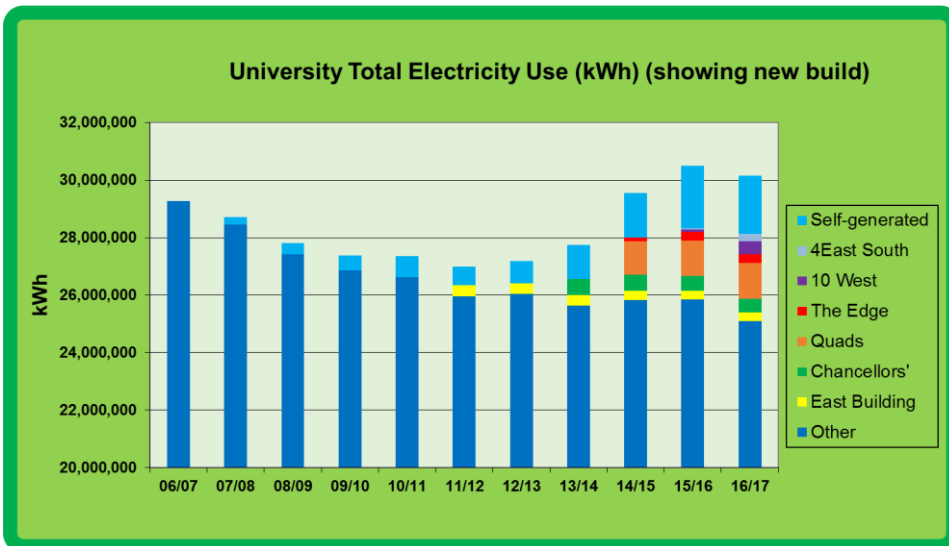
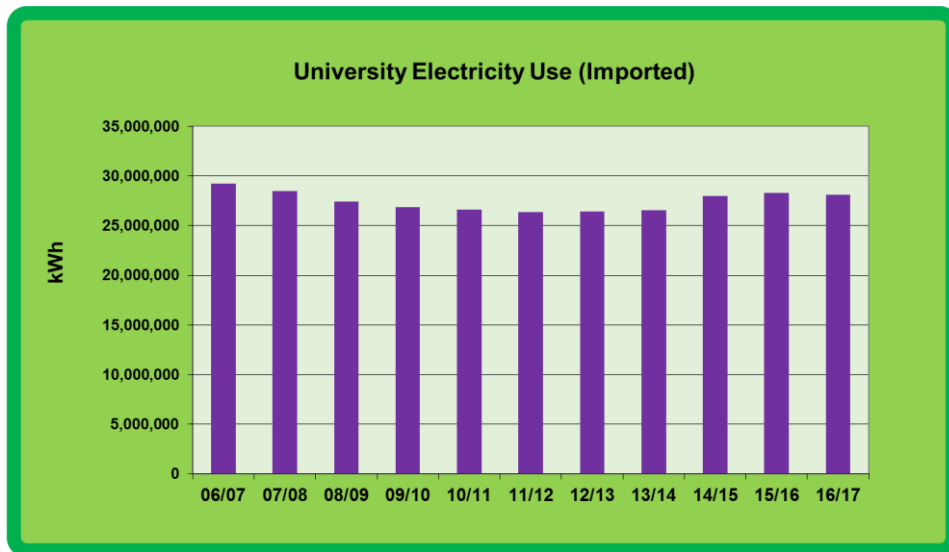
11.0 UNIVERSITY SUSTAINABILITY RESEARCH

Although this report is predominantly focussed on ‘operational’ sustainability matters for the University, it should be highlighted that much of the research the University carries out also has significant positive environmental impact. For more details of our sustainability research see <http://www.bath.ac.uk/research/> and <http://www.bath.ac.uk/i-see/>

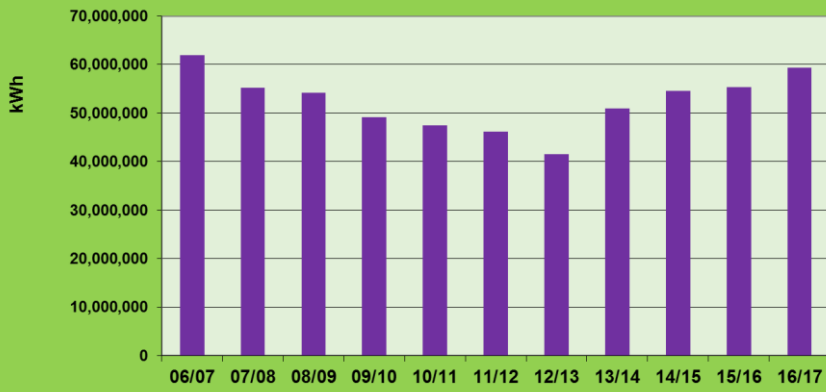
The Department of Estates also sponsors a Psychology PhD student looking at behavioural change in energy/water use, and collaborates with academic departments on a number of research and teaching activities.

Peter Phelps - Energy and Environment Manager, on behalf of the Sustainability & Carbon Management Steering Group (S&CMSG)

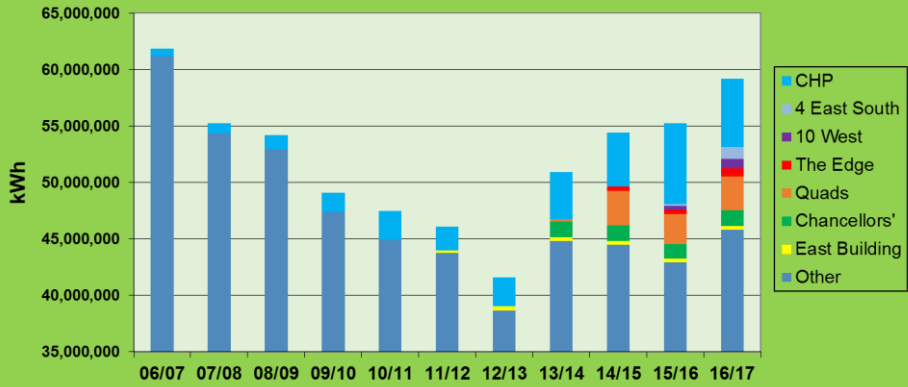
APPENDIX 1 – ENERGY AND CARBON GRAPHS



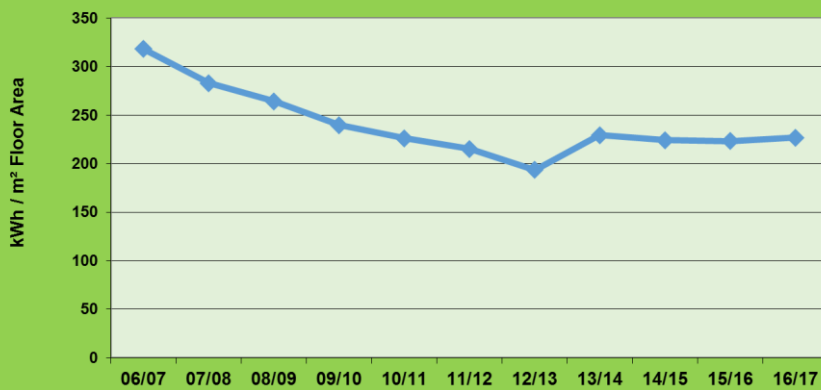
University Gas Use (weather-corrected)



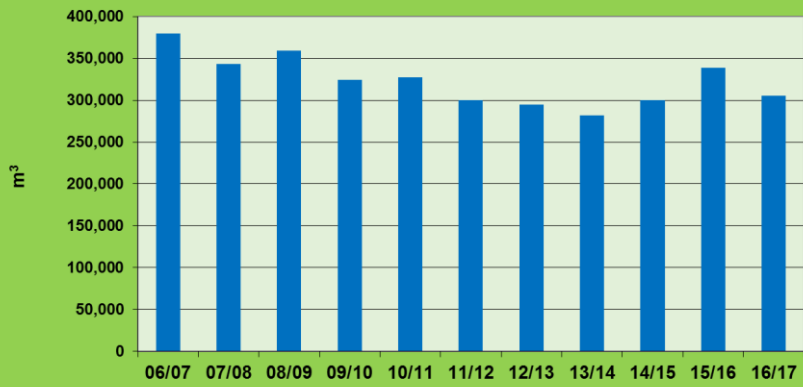
University Gas Use (kWh) - weather corrected



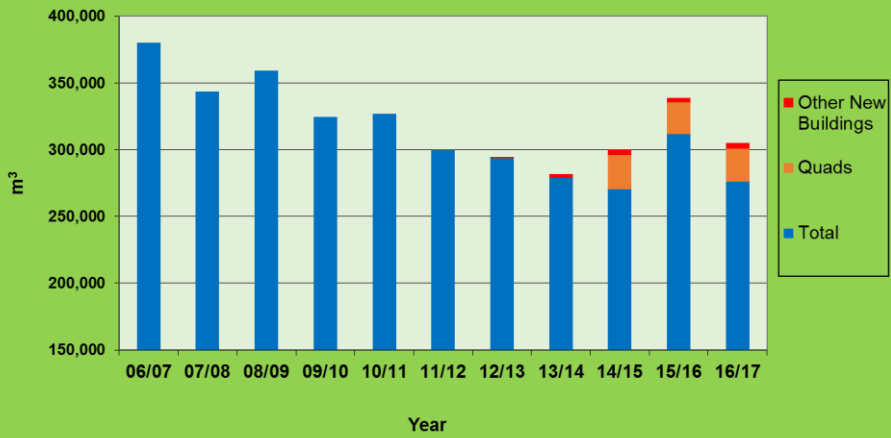
University Gas Use (weather corrected) per Floor Area



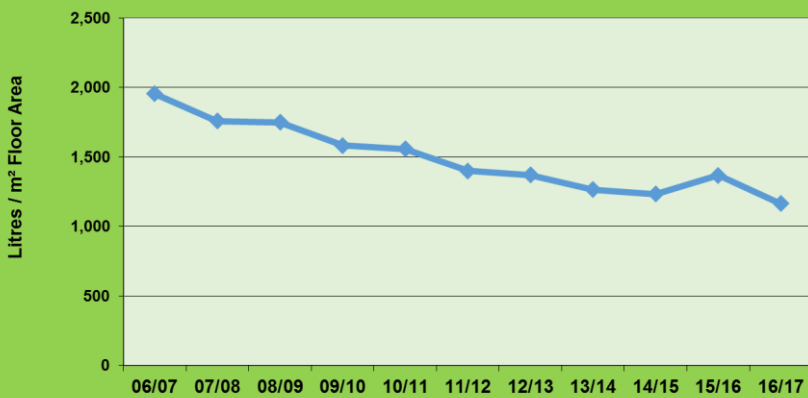
University Water Use



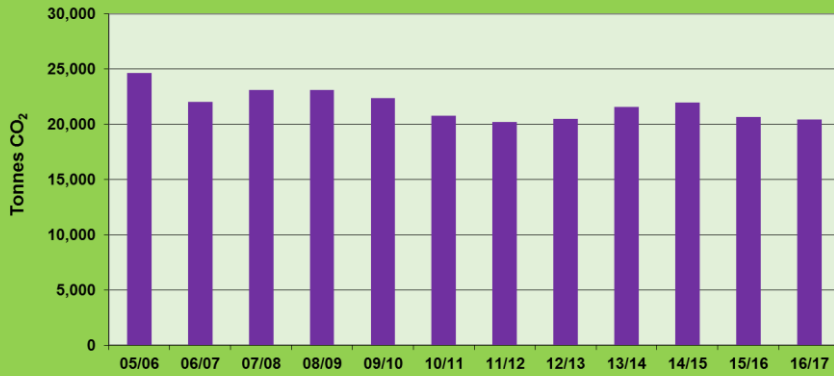
University Water Consumption



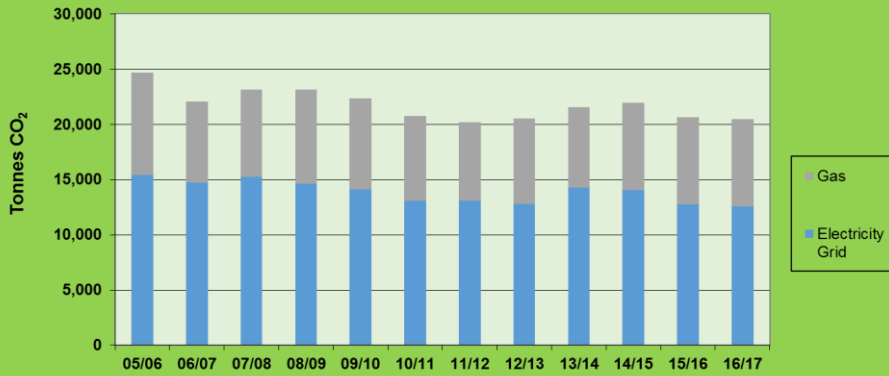
University Water Use per Floor Area



University Carbon Dioxide Emissions



University Carbon Dioxide Emissions by source



University Carbon Dioxide Emissions per Floor Area

