Energy Management Strategy
2016-2022

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Document ref	Document Owner	Document Reviewer	Release date	Version
KE0002a	Elliot Jones	Huw Evans	21/10/2016	2.0
Changes from previous version: Updated to 2016-2022				
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Introduction

This Energy Management Strategy (EMS) seeks to build upon the University's first Energy Management Plan which covered the period from 2013 to 2015. The original plan broke new ground, acknowledging that an ad-hoc approach to energy management was no longer appropriate in the face of higher costs and an increasing legislative burden. The actions it delivered led directly to significant investment in energy efficiency projects and created a process behind which the first significant renewable energy capacity was installed on campus.

The purpose of this revised document is to build on that work and support the desire for Keele to be one of the most environmentally sustainable University's in the UK. The approach to energy management within the organisation is possibly the most directly important in this regards, as the vast majority of carbon emissions result from the use of electricity and gas within our academic, commercial and domestic properties.

This Strategy specifically serves to provide:

1. An appropriate and accurate energy baseline from which progress can be measured
2. Targets which are Specific, Measurable, Achievable, Realistic and Timely
3. An assessment of the resources required to meet the targets
4. A process detailing how progress against the target will be measured and reported
5. The approach to achieving the targets including an action plan
6. Details of the roles and responsibilities for those involved

Keele University's Sustainable Vision

At Keele University we aim to promote environmentally sustainable in all that we do. This involves consistently seeking to improve the way that we work to decrease the University's negative impacts on both the environment and the wider community. Through our teaching, research, spending power and commercial activities we can have a significant positive effect on society and help to deliver a sustainable community in which our staff and students live, work and study.

Drivers

As with every other Higher Education Institution in the UK, Keele University has a challenge. Affordable and reliable energy is an absolute requirement, enabling us to carry out our activities and remain competitive in a heavily contested sector. At the same time environmental sustainability is one of the core values at Keele, therefore the transition to an efficient campus driven by low carbon energy is not simply an aspiration, it is a goal to which we are completely committed.

Whilst the ambition to be one of the most environmentally sustainable Universities in the UK is the primary driver, motivation is also provided from several other sources:

Reputational

The environmental credentials of a University are now seen to be an important consideration for potential students, with 80% in a recent survey wanting institutions to embed

sustainability in their operations, therefore the more efficient the organisation can be the more students we can attract to the University. For this reason it is essential that we don't take for granted our reputation as one of the leading environmentally sustainable Universities in the UK. We need to continue to develop and improve our processes throughout the University to ensure that we remain at the top.

Economic

An important issue for the University is the regular spend of more than £3m on gas, water and electricity supplies each year. Despite relatively repressed commodity markets in the last few years, there is consensus that the only long term trend for energy costs is upwards. As much of the worlds primary energy resources are located in some of the most volatile regions of the world there is also a need to mitigate the potential impact of any dramatic changes to oil and gas prices.

Wholesale energy prices however now make up less than half of the delivered commodity costs. The rise of carbon based taxation has led to significant increased costs in the last decade and is projected to increase further in the near future. The National Government's recently enacted policy to address the 'energy trilemma' of lowering costs, decreasing carbon emissions and increasing capacity is also expected to increase electricity costs by as much as 10% by 2018.

We also need to consider that there are economic benefits to implementing on-site generation. The installation of solar panels for example not only reduces the costs from buying electricity from the national grid but also can provide significant opportunities to generate revenue from subsidies.

Legislative

The Climate Change Act 2008 commits the National Government to reduce UK carbon emissions by 80% by 2050 against 1990 levels and provides for five-year carbon budgets to determine a cost effective path to achieving this long term target. This has impacted on the University as much of the secondary legislation and carbon taxation are influenced by this targets set within the Act.

The University is a participant in the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), a scheme which requires some 2,000 or so of the largest organisations in the UK to record their annual emissions and report these to the National Government. A charge is then levied against each tonne of Carbon reported, costing the University more than £200k in 2014/15 alone.

The EU Energy Performance in Buildings Directive provides much of the compliance regulations against which the University has to fulfil. These include the provision of

- Display Energy Certificates (DECs) to detail the energy performance of many of our buildings in comparison to national benchmarks
- Energy Performance Certificates (EPCs) showing how efficient new developments and domestic housing are

- Air Conditioning Inspections which provide guides as to how cooling can be provided in more efficient ways.

In December 2015, the first truly global climate deal was agreed which committed nations to pursue efforts to limit warming of the globe to just 1.5C above pre-industrial levels. This includes a pledge to achieve a net zero emissions by the second half of this century. Keele University is of course not directly bound to these targets; however our reputation along with our role as a major energy user provides us with a moral obligation to make this our own ambition.

Our Approach

The University has implemented a clear and strong sustainable policy framework which provides the means to engage with stakeholders from all aspects of the campus and its business activities. The framework provides clear targets, actions and responsibilities for the individual sustainability themes, including energy, and specifies a clear reporting structure. This Strategy directly addresses the issues relating to Energy within the Estates & Operations strand.

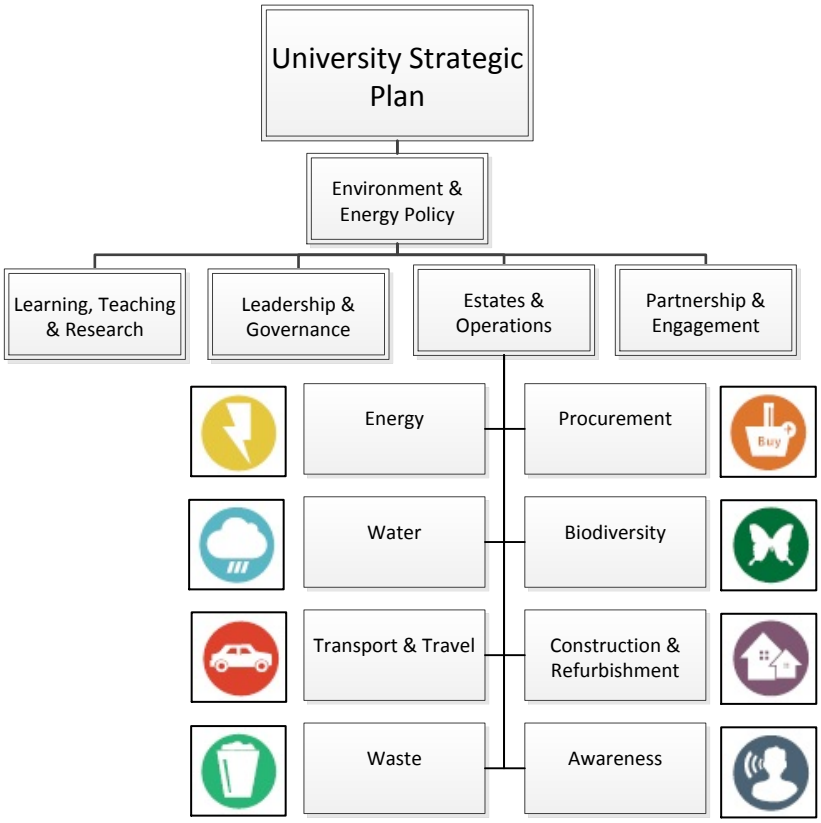

Figure 1 - The Keele University Sustainability Framework

Aims & Objectives

In February 2015, the University Council approved a Strategic Plan which determines the organisations aims over the five years to 2020. It is a measure of how serious the

University is about its environmental credentials that it declared as one of its six key aims that it will:

'Promote environmental sustainability in all that we do' – Strategic Aim 5

Building on this, in 2016 the University Executive Committee approved an updated Environment and Energy Policy, the key document which provides the detail as to how we will achieve the strategic aim. Within this, more than half of the sixteen objectives declared relate specifically to energy management and carbon reduction:

- Raise the environmental awareness of students, staff, visitors and all those we engage with along with the impacts of energy generation and consumption.
- Maintain a Carbon Management Plan and strive to achieve a 34% reduction in scope 1 and 2 carbon emissions by 2020 based on 1990 levels despite significant growth in student and staff numbers and an increase in its activities.
- Maximise the use of Renewable Energy and on site energy generation.
- Increase energy efficiency and establish a smart energy network.
- Ensure Environmental and Energy Best Practice is properly considered and appropriately applied within all new build and refurbishment projects.
- Comply with all applicable Environmental Legislation and other requirements by maintaining a legal register and undertaking effective monitoring and audits.
- Work to recognised environmental and energy standards such as 'ISO 50001' to continually improve processes and practices and set objectives and targets that are reviewed and updated annually.
- Develop a Purchasing Policy that promotes use of goods and services that have a lower energy, carbon, environmental and social impact.
- Publish an annual Environmental Report to include a summary of environmental and energy performance.

It must be noted that achieving these objectives could potentially be counterproductive to the University's other goals. For instance the aspiration to maximise the use of renewable sources of energy could both increase costs and decrease the resilience of the electricity and gas networks on campus. For this reason we recognise the following hierarchy when approaching energy conservation measures:

1. **Increase capacity** – Ensure sustainable supply by increasing the amount of energy generated on-site, our ability to store it and diversifying our energy demand.
2. **Decrease Environmental Impact** – Decrease carbon emissions by reducing energy usage, moving away from carbon intense fuels and focus on generation through low to zero carbon sources.
3. **Manage Costs** – Reduce costs by implementing demand side response programmes, shifting our energy usage to non-peak times and increasing revenues from energy generation schemes.

Scope, Baseline, Targets and Resources

Scope

This Strategy is applicable to the Keele University Campus in its entirety, including the operation of Keele Science Park, Keele Park Developments and Keele University Science and Business Park. It however only monitors consumption reported against the energy usage that results from either the commercial tenants (where a consumption based recharge is in place) or the domestic staff housing. As the consumption in these properties is not directly controllable by the University, they are not reported as part of the targets.

The Halls of Residence on campus are a notable exception as although consumption in these buildings is not fully controllable as the students are welcome to bring their own electrical equipment and use it as they wish, student housing represents a key function of any University therefore is included within the scope. This is significant to note as part of the future accommodation plans on campus could involve a third party providing this service. Should this come to fruition, the inclusion within the scope is dependent on whether or not the University is able to directly affect the consumption within the building, which may not be the case if the service was provided under a facilities management type arrangement. Regardless of the type of arrangement, the University will work closely with the provider to encourage energy reduction through both direct and indirect measures.

The off campus facilities at the University Hospital of North Staffordshire and the Royal Shrewsbury Hospital, where the energy provision is managed by the NHS Trust and supporting PFI Agreement, is also not included within the EnMS or the Energy Management Plan, although it is anticipated that best practice and working standards will be implemented in these areas.

The specific buildings which are included under this scope are detailed within document KE0004 showing those included, those excluded and those which may be just partially included if multi-tenanted. Documents KE0009e and KE0009f show the specific meter trees for gas and electricity, clearly showing those which are included as part of the EMS and those that are not.

Baseline

As metering and monitoring capability has improved markedly since the first iteration of the Energy Management Plan, the year 2015/16 is now introduced as the baseline year. The University has deployed significant numbers of high quality meters, many of which are automated and which deliver precise measurements of energy consumption both at fiscal meter points and through sub meters which are in place throughout the campus. There are now more than 200 sub meters connected to the BMS system providing a high level of monitoring and control. The baseline is displayed in more detail within document KE0016.

Absolute Energy Consumption

In the 2015/16 Academic year (August to July) the actual energy consumption by those buildings which are within the scope are as follows:

Grid Electricity	11,972,793 kWh
Grid Gas (minus CHP)	28,594,666 kWh
Biomass (Metered Heat)	40,983 kWh
Generated Electricity (CHP & Solar)	893,667 kWh
Generated Heat (CHP)	1,309,300 kWh
Total Energy	**42,811,409 kWh**

Table 1 - Total in-scope energy consumption

The input gas to the Combined Heat and Power (CHP) engine in Horwood Energy Centre is excluded from the baseline as the electricity and heat energy which it creates is more relevant to the energy used on campus.

Relative Energy Consumption

Monitoring absolute energy consumption is essential as this is one of the key factors that will show progress against the need for national and global emissions reduction. The University currently reports absolute energy consumption each year as part of its carbon Management Plan (CMP) and it is of course used to track budget performance from one year to another. It is clear however that targets which take into account changes to other variables which are likely to impact on energy consumption have more use in gauging how the energy efficiency of the University is changing over time.

Turnover as declared within the University's annual statement of accounts is seen as the most representative and reliable indicator as it accounts for all activities that take place on campus. This figure is inclusive of the Keele University Science & Business Park accounts.

The baseline is therefore set as below:

	Consumption	Turnover	**kWh/£1k turnover**
2015/16 Baseline	42,811,409kWh	£148,576,000	**288**

Table 2 - Energy baseline

For each subsequent year, the turnover as confirmed within the statement of accounts should be adjusted for inflation using the Bank of England inflation calculator currently available at:

http://www.bankofengland.co.uk/education/Pages/resources/inflationtools/calculator/index1.aspx

The kWh per Gross Internal Area (GIA) of campus buildings, a common metric to measure efficiency, is not currently used as not only is it not necessarily representative of changes in activity levels of long periods, but also the accuracy of such figures is difficult to determine with a high level of confidence. The kWh per numbers of students has been used in the past however differences between the energy intensity of a research student against an under graduate student can lead to discrepancies. Additionally, as the University continues to develop its commercial activities the number of students becomes less representative of the total activity on campus.

Energy from Low-Zero Carbon sources

The University currently has on campus 150kWp of solar Photovoltaic, a Combined Heat and Power engine generating 140kWp of electricity and 200kWp heat from natural gas and a 60kW biomass boiler.

	Commodity	Generation (kWh)
Solar PV	Electricity	119,276 kWh
CHP(e)	Electricity	774,391 kWh
CHP(h)	Heat	1,309,300 kWh
Biomass	Heat	40,983 kWh
	Total	**2,243,950 kWh**

Table 3 - Total energy generated from Low-Zero Carbon Sources

In 2015/16, energy generated from Low-Zero Carbon (LZC) sources represented **5.24%** of the total energy usage on site.

Targets

The University's primary environmental goal, referenced within both the Strategic Plan and Carbon Management Plan is to reduce scope 1 and 2 carbon emissions by 34% by 2020 against 1990 levels and to 80% by 2050. This target was developed as part of the Higher Education Funding Council for England (HEFCE) response to the Climate Change Act 2008 and the role that the University sector has to play in achieving the national targets.

Whilst this ambitious target has resulted in significant energy efficiency measures and initiatives on campus since 2010, the extensive growth which has been seen over that time makes it unlikely that the interim 2020 goal will be fulfilled within the few years remaining. Although the University will continue to strive to meet the target, this Strategy puts in place a specific and informed energy target for 2022.

Energy Efficiency Target

To ensure a challenging yet realistic target, an in-depth assessment has been carried out analysing factors that are likely to affect performance over the period. These include:

- Continued funding for energy and carbon saving projects each year
- Full utilisation of the available resources for energy conservation measures each year to the limits of their criteria for deployment
- Natural improvements from replacement of equipment (such as computers and white goods)
- Improvements to behavioural change, primarily against electricity usage

There are several large scale infrastructure projects that are currently at the feasibility stage that could significantly impact on energy consumption before 2022. The implementation of these has not been considered owing to the uncertainty over their implementation at this point.

As the target is to be based on a relative turnover metric to allow an understanding of the energy efficiency to be measured independently of growth, an estimate of the budget turnover in 2022 has been agreed with the support of the University Finance team. Attempting to project budget turnover six years in advance requires a considerable amount of estimation, although a forecast is already in place within the financial planning system up until 2018/19. For the years subsequent to this, a two percent growth rate was determined to be the most appropriate figure.

With the above considerations taken into account, the target is declared as:

Energy efficiency will increase by 28% by 2022 against the 2015/16 baseline.

This equates to a target of 206kWh of total energy per £1k of turnover.

Split by year to allow progress to the target to be monitored, the graph below shows the expected increase in efficiency assuming linear progression. More information around the actual energy consumption per medium is available from document KE0016.

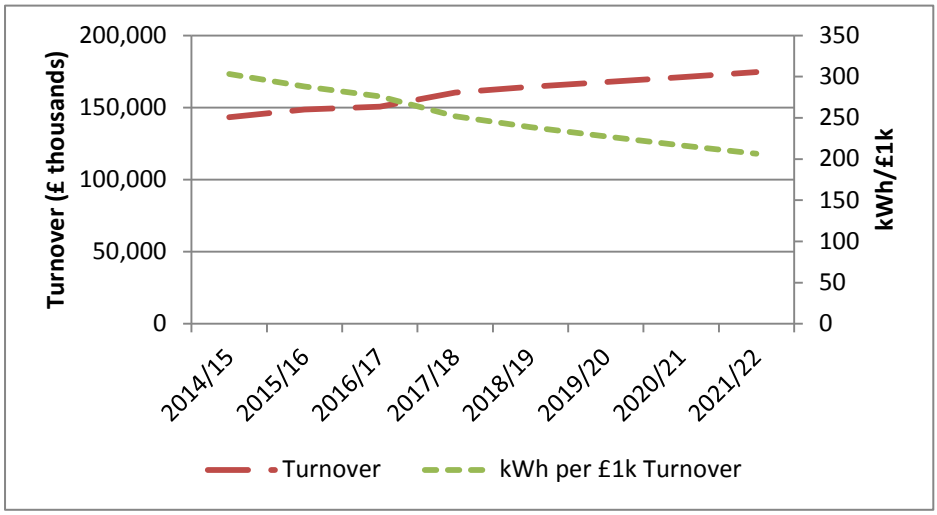

Figure 2 – Forecast turnover and targeted total energy/£1k to 2022

Along with the metric to ensure that the efficiency of the university is comparable to turnover, a calculation is required each year to ensure that performance compared to the baseline is not significantly impacted by weather. The calculations for this employ degree days (15.5C) for the region and normalises the reported annual consumption against the baseline. The calculations to be used to compile the annual figure and to factor in both weather and inflation are provided in annex A.

Generated Energy from Low-Zero Carbon sources

Whilst reducing energy usage on campus is a key goal, the University also sets itself a target to increase the proportion of energy consumption which is generated on site from Low-Zero Carbon (LZC) technologies. These technologies, which include Solar PV, Wind, Combined Heat & Power and Biomass amongst others, are of interest to the University due to the carbon emission savings that they present as well as the cost saving and revenue generation opportunities that they can provide.

The target has been created using three key factors:

- The expected increase in low carbon generation as part of new developments on campus. Keele sets itself high environmental standards when designing new buildings and often includes LZC systems within the specifications
- The implementation of significant projects such as the Smart Energy Network Demonstrator which has a considerable renewable energy element
- An assumption of a number of new schemes which would be commissioned as a result of projects identified through the energy management process

Taking these into account, the target is declared as:

Energy generated from Low-Zero Carbon Sources will increase to 25% of total campus energy use by 2022 against the 2015/16 baseline of 5.24%.

Current estimations of total energy demand for each year up to 2022 are shown below along with the estimated profile of rollout to meet the target.

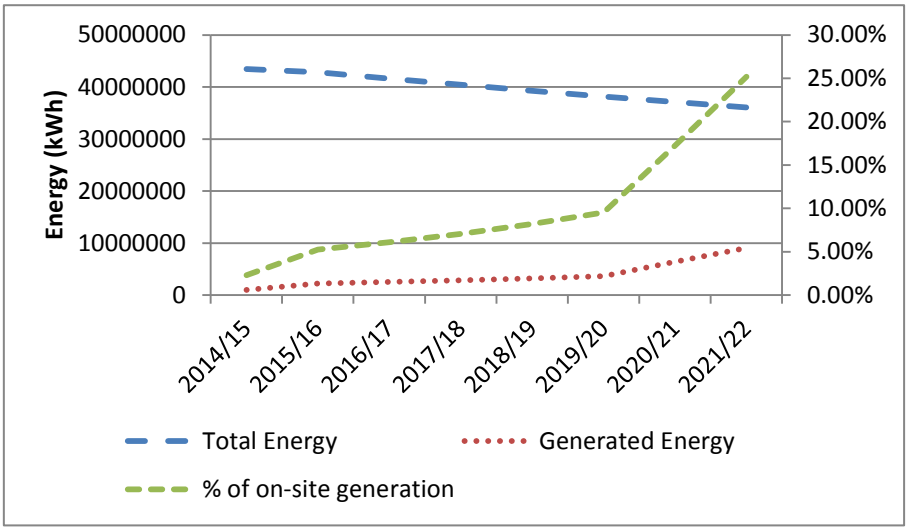

Figure 3 – Total annual energy projected to 2022

The majority of the LZC generation target is to be achieved through the implementation of the ERDF funded Smart Energy Network Demonstrator programme (SEND) which is due to be fully live in the 2021 calendar year. This five year project will see the first 'at scale' network capable of matching campus energy demand to generation using demand management and storage techniques to minimise demand from the National Grid. At the core of the programme is more than £5m of investment in low carbon on-site generation which will drive the network. The SEND programme is part-funded through the European Regional Development Fund (ERDF) as part of the England 2014 to 2020 European Structural and Investment Funds (ESIF) Growth Programme.

Resources

There is in place specific funding around delivery of both low carbon and energy efficiency projects within the Estates & Development Directorate. The criteria for use is stringent, with

schemes required to meet payback periods of no more than six years and carbon reduction projects have limits on the cost per tCO2 saved over the lifetime.

More information on the budgets available and the process for approval is found within document KE0014 and is updated at least annually.

In cases where projects are identified which require a large capital investment, the costs being outside the scope of those budgets already available, then these will be considered on a case-by-case basis with thorough feasibility proposals and business plans being submitted to senior management for consideration.

Achieving the Target

The University employs the basic planning principles detailed within ISO50001:2011 to define the specific requirements and processes that take place to monitor consumption, identify significant energy aspects and then identify opportunities to increase efficiency. The opportunities to improve are then appraised against the hierarchy shown in figure 4 to ensure that the resources available to increase energy efficiency are targeted against those solutions which can deliver the highest return on investment.

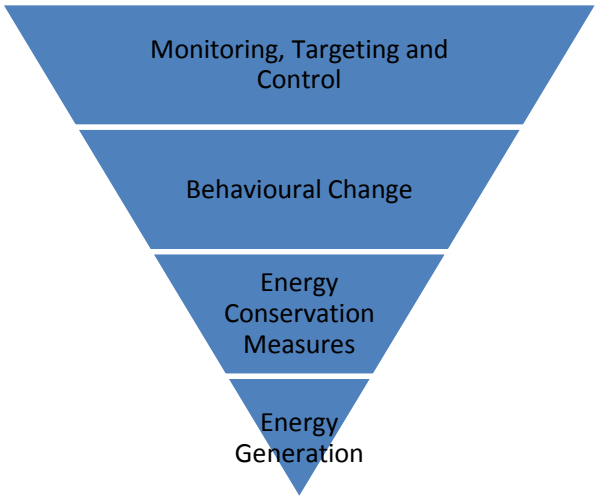

Figure 4 - The Keele energy hierarchy

An Action Plan is included as KE0002a which details how each area will be improved going forward and is subject to review annually. Each area has specific Energy Performance Indicators (EnPIs) which are detailed further within KE0016a including 2015/16 baselines.

Monitoring, Targeting & Control

The ability for the university to see where energy is actually being used is key to ensuring that efforts and resources are targeted at the areas that represent the best potential for energy savings. Whilst the installation of energy meters is important however, the ability to collect, process and display this data in meaningful ways is paramount.

With more than 1,000 fiscal and sub meters on campus, the quantity of data can quickly become overwhelming. For this reason a monitoring and targeting software package is employed to provide up to date and on demand consumption and exception reports and logging of data. This naturally leads to savings, and is particularly helpful in identifying erroneous consumption and billing which is often the result of equipment failure which may not have been detected otherwise. With this software package in place, the installation of further sub metering in appropriate places can actually lead to significant savings and cost avoidance.

Implementing control systems is one of the most effective ways to deliver resource efficiency, effectively automating the control of major pieces of plant equipment such as

boilers and air conditioning systems. The Building Management System which is employed on campus captures more than 90% of the campus energy demand and allows for active remote monitoring of internal and external conditions to reduce the operation of equipment to designated parameters. The continued improvement of this system will also allow the University to become more dynamic in respect to its energy demand, allowing the reduction of consumption during peak times leading to lower overall energy prices. A key opportunity for energy saving is to limit the running of heating systems outside of core hours. Where possible the University will aim to cohabitate out-of-hours services into one building to reduce the requirement for running

We will monitor our success in this area against the following EnPIs:

- Number of core sub meters which are reporting data automatically (AMR) (EnPI01)
- Percentage of core non-AMR meters which have been read at least twice a year (EnPI02)

Behaviour Change

The role that University staff and students have to play in managing energy consumption on site cannot be understated. This is just one of the reasons that the University has invested so much time increasing energy literacy on campus, including for example the integration of sustainability throughout the undergraduate curriculum, ensuring that those people that use our buildings know how to reduce their impact. This approach to behaviour change helps in making a significant impact on total consumption with comparatively low levels of investment.

To ensure that staff and students are engaged and aware of the impact that they have on our energy consumption and carbon emissions a Behavioural Change Strategy has been implemented. Focusing on specific actions which promote energy saving habits and behaviours, the strategy includes provision for an annually updated action plan and progress is reported separately to the Environmental Sustainability Steering Group.

The relationship between the Estates Team and the building users is incredibly important as staff that are employed specifically to reduce energy demand can only be in one place at a time. The easy flow of information back and forth is paramount to allow building users to feed back when opportunities for saving energy are missed and for the Estates Team to provide feedback information showing that actions are resulting in progress.

A portable electric heating statement is kept up to date and circulated to staff and students to discourage the use of this equipment which is both costly to run and potentially unsafe.

We will monitor continued improvement against the following ENPI:

- Number of student/staff suggestions received (EnPI03)
- Number of students/staff directly engaged in behavioural change programmes (EnPI04)

Energy Efficiency

Energy conservation measures are identified primarily through routine energy audits which are undertaken in every building on campus at least every three years. These projects can include energy conservation measures such as boiler replacements, lighting refurbishments and insulation improvements and are listed in order priority based on factors including payback period, maintenance benefits and improved aesthetics. Measures are also identified through routine engineer visits, staff/student suggestions or through the Advisory Reports provided as part of Display Energy Certificates and Energy Performance Certificates.

A list of all initiatives that could deliver energy savings is kept centrally on the automatic Monitoring & Targeting system, Digital Energy. Each proposal includes an estimate of the capital investment cost and the projected energy, cost and carbon savings.

Dedicated funds are provided for by the Estates & Development Directorate budget for projects that meet specific energy saving criteria and the performance of each project is formally monitored through a set measurement & verification procedure.

To ensure that all new building projects or refurbishments consider whole life energy costs and environmental best practice, the Energy Manager and Environmental Manager are key consultees at design stage. A specific design review code of practice is in place and a design statement has been created to specify the University's aspirations for all new developments that are under the direct ownership and operation of the University.

To become a truly sustainable and efficient University, we need to ensure that we consider the impacts of all of the activities on campus that have a significant direct and/or indirect impact on the overall energy consumption. The Energy Management Team will work with departments that could have a significant impact to support actions which will deliver against the targets set out in this document. These departments include:

- *Procurement* - The consideration of energy efficiency is an important process during the purchase of goods and services therefore a specific policy has been in place since 2014. This ensures that any procurement of services, products and equipment that has or can have an impact on significant energy use is evaluated at least in part on the basis of energy performance.
- *Information Technology* – The average electricity use of a University in the UK which is attributable to ICT is 27%[1]. Therefore reducing consumption in computing and ancillary devices on campus could be the difference between achieving and not achieving the efficiency target.
- *Catering* – Keele University has a number of refectories and catering facilities on campus. We need to improve our capability to measure energy used by these facilities and then deliver actions to both encourage good practice amongst staff and identify and replace inefficient equipment where possible.

[1] http://www.londonhigher.ac.uk/fileadmin/documents/GrILH/SusteIT_Tool_Master_Results_30_3_12_final_v2.pdf

We will monitor continued improvement against the following ENPI's:

- Number of feasible projects identified (EnPI05)
- Percentage of projects achieving or surpassing the expected savings (EnPI06)
- Percentage of buildings formally audited within the last three years (EnPI07)
- Percentage of Display Energy Certificates with Operational Ratings ratings better than 100. (EnPI08)
- Total energy usage by commodity:
    - Electricity (EnPI09)
    - Gas (EnPI10)

Energy Generation from Low-Zero carbon sources

The University has long held ambitions to become one of the most sustainable higher education establishments in the UK and has trialled and installed several LZC technologies to demonstrate this.

The building energy audits also consider the low carbon heating and renewable electricity generation which may be appropriate for each building/site. Each of these is then fed into the same project list as all energy conservation measures and funding is approved using the same criteria.

Improvement in this area will be monitored using the following ENPI's:

- Percentage of total generation delivered on-site. (EnPI11)
- Total generated on site by commodity including:
    - kWh of electricity from CHP (EnPI12)
    - kWh of heat from CHP (EnPI13)
    - kWh of electricity from Solar PV (EnPI14)
    - kWh of biomass (EnPI15)
    - kWh of additional LZC sources employed on site. (EnPI16)

Reporting

Monthly

A review of performance is provided each month to the Energy Management Team detailing the total energy consumption, spend and deviation from forecast. Trend analysis is provided to allow the comparison between preceding months and previous years to help identify anomalies and performance trends. The generation of energy from LZC sources is also detailed. This process is documented within KE0013 and a template is provided for each meeting within KE0013a.

Quarterly

Quarterly updates are provided to the Environmental Sustainability Steering Group (ESSG). The ESSG is the management reporting group which is chaired by the Vice Chancellor and is

the link between senior management and day to day operation of the energy management system.

Management Reviews are also held each quarter to analyse how the EMS is working within the University and to ensure that it remains relevant. Performance will typically be a standing item on the agenda for each meeting although at annual full reviews this is likely to be covered in more detail. This process is documented within KE0025.

Annual

Annual updates are provided as part of the University wide sustainability report which is typically provided bi-annually. This includes an overview of the energy performance for the preceding period including an overview of the EnPI's. In interim years, a more concise report is created highlighting performance against key items within this strategy, not necessarily all EnPI's but those that provide a high level understanding of progress over the period.

Review

This Strategy should be reviewed once per year under consultation with the ESSG as part of the reporting process. This will include an assessment of how appropriate the target remains, particularly on review of major projects which are in the pipeline.

Annex A

The calculations to derive and normalise the annual performance against the two targets are set out as below.

Energy Efficiency

To calculate energy efficiency the sum of all sources of energy on campus should be determined as detailed within the KE0016 baseline. These figures will typically be derived through the consumption detailed on fiscal bills or AMR data however should be validated for completeness. University turnover is typically provided from the annual statement of accounts. Where the figure is subject to audit this should be noted and updated following confirmation. To calculate:

Total Energy (kWh) / Turnover (£1k) = Energy Efficiency (kWh/£1k)

To normalise for weather against the baseline the above Energy Efficiency figure should then be divided by the number of heating degree days for that year (15.5C) as made available at http://www.enmanreg.org/freedd/uk-degree-day-data/. The calculation is shown as:

(Energy Efficiency (kWh/£1k) / Annual Degree Days) * Baseline Annual Degree Days (2,207) = Normalised Energy Efficiency (kWh/£1k)

To keep the annual turnover figure relevant, each year the turnover of subsequent years (including the baseline) need to be altered to account for inflation. This is done using the figures made available at:
http://www.bankofengland.co.uk/education/Pages/resources/inflationtools/calculator/index1.aspx

Generated Energy from Low-Zero Carbon sources

The calculation to determine the proportion of energy generated from LZC sources is simply to sum all qualifying generation and to divide this by the total qualifying consumption on campus:

Total LZC generation (kWh) / Total Generation (kWh) = Proportion of LZC generation (%)