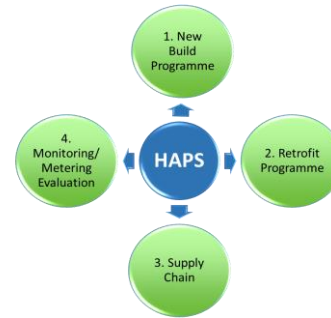


Neath Port Talbot County Borough Council Energy/Carbon & Water Management Performance Report 2017/18

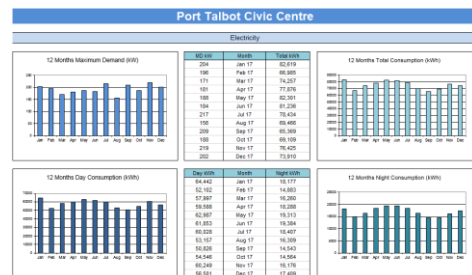
Gnoll Primary – Lighting Scheme



Homes As Power Stations



Site Specific Energy Analysis



Ysgol Bae Baglan 250kW PV



NPTCBC Energy / Carbon & Water Efficiency

1.0 Report Overview

This report outlines and quantifies the impact of energy, carbon and water consumption and the consequential costs within the Authority's operational building portfolio. It lists the core principles and objectives for their effective management and provides detail on progress over the last 12 to 18 months, current work activities and long term projects/work activities to ensure reduction/stabilisation in current and future energy/water consumption and costs.

The report is structured into the following core elements:

- Report Overview
- Energy Background - Core Principles & Objectives
- Energy/Carbon & Water Consumption & Costs
- Progress – 2017/18
- Current priorities – 2018/19
 - Main Project/Activities
 - Day To Day Activities
- Long Term Aims/Priorities (Projects/Activities)
- Appendix: Structured Approach
 - Energy/Carbon & Water Management – Delivery Areas

2.0 Energy Background - Core Objectives/Principles

The main core energy/carbon and water management delivery objectives/principles are:

1. Reduce energy and water consumption and costs within the operational building portfolio



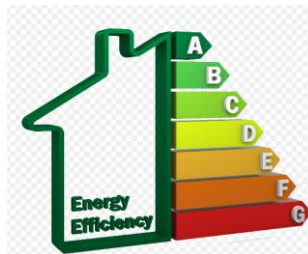
2. Alleviate Fuel Poverty within the Authority



3. Increase the number renewable technologies installed throughout the operational building portfolio



4. Ensure regulative and legislative energy/carbon compliance



The Energy Team's core activities and programmes of work assist to deliver key priorities and objectives of the Council's Corporate Improvement plan (2018-22) and Well-being of Future Generations (Wales) Act 2016.

The Energy Team

The Energy Team undertakes a significant role, with responsibility for corporate management and delivery of energy/carbon and water efficiency for the Authority's 250 sites within its' operational building portfolio. This includes implementation of energy and water management protocols and procedures to enhance and improve energy efficiency and performance throughout the portfolio.

The Energy Team consists of 2 officers (Energy Manager and Energy Officer) located within the Strategic Property and Valuation Team of the Property and Regeneration Department of the Authority.

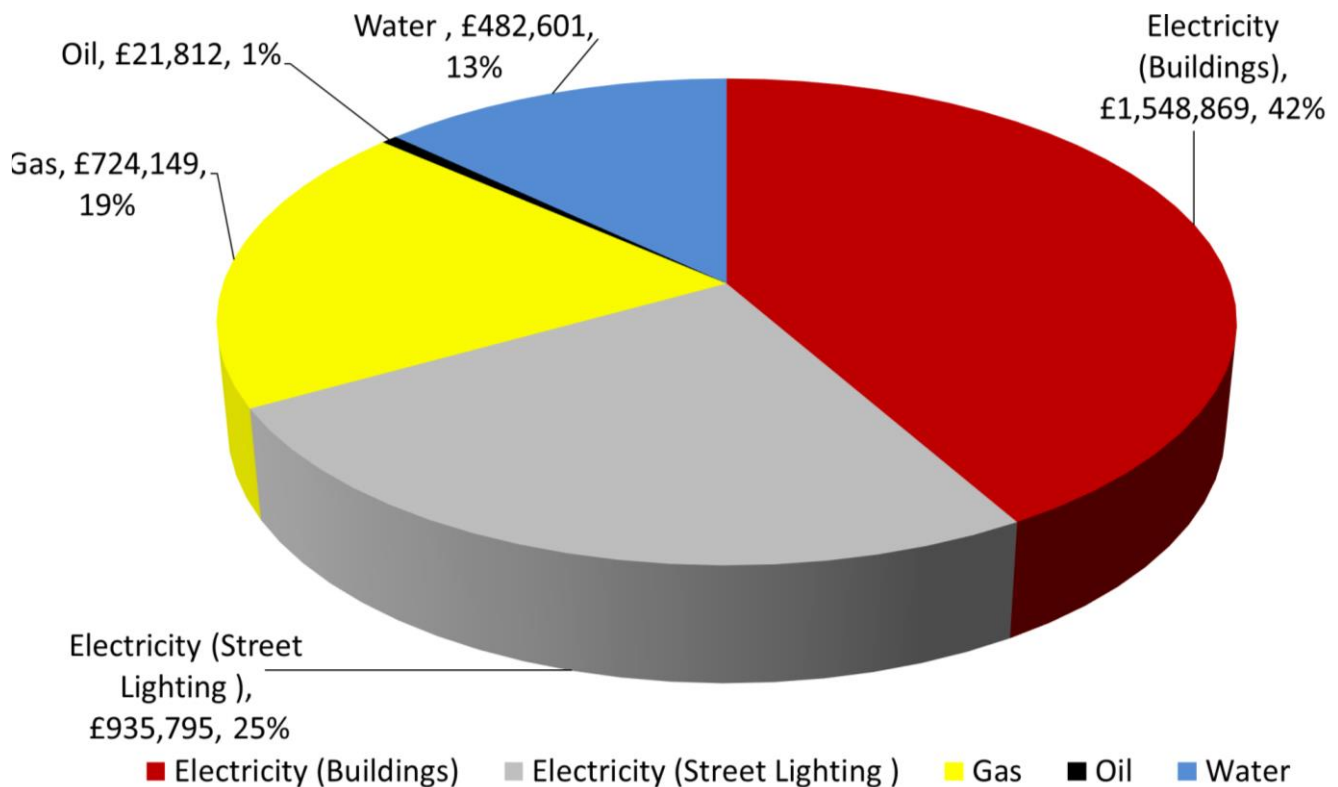
3.0 Energy/Carbon & Water Consumption & Costs

Energy/Carbon & Water Costs

The Authority has 250 sites within its operational building portfolio located throughout the County Borough served by 308 electricity, 222 gas and 8 oil supplies.

In 2016/17 the Authority spent £2.3m on energy supplies over the portfolio together with just under £0.5m on water and sewerage. A further £0.94m was spent on public street lighting throughout the County Borough.

The following pie chart provides a breakdown of these costs per utility supply:



The table and pie chart listed below:

Utility	2015 / 2016	2016 / 2017
Electricity	£1.60m	£1.55m
Gas	£0.90m	£0.72m
Oil	£0.03m	£0.02m
Water & Sewerage	£0.50m	£0.48m
TOTAL:	£3.03m	£2.77m

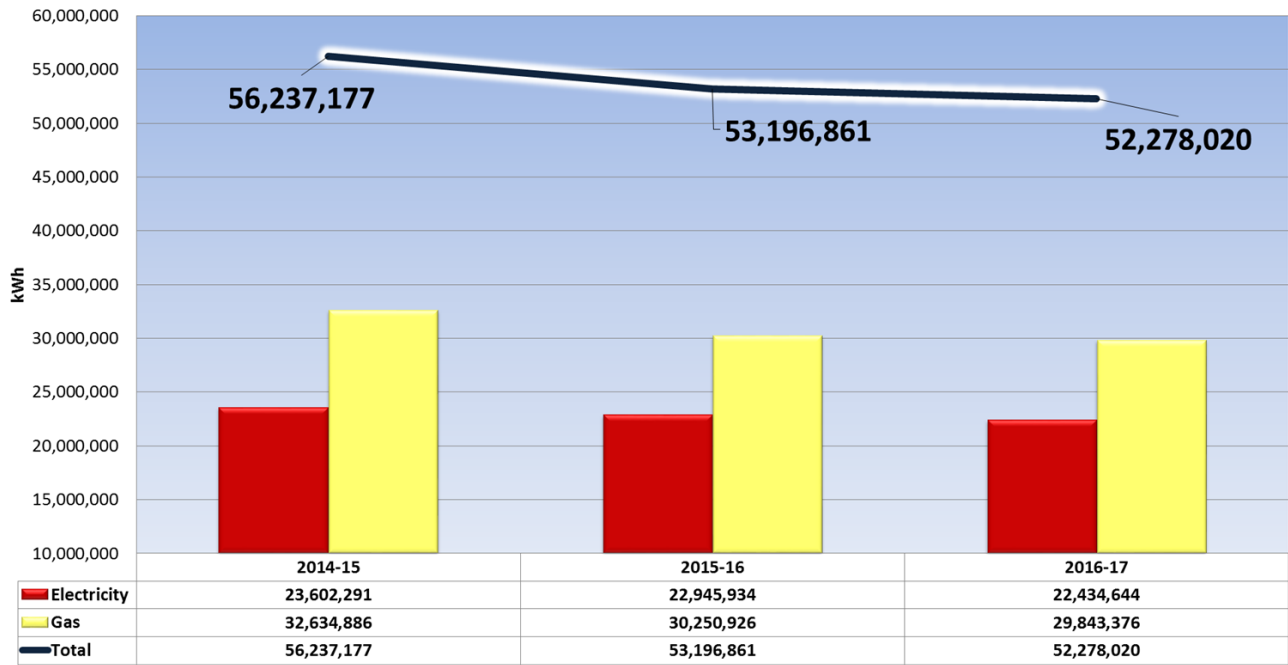
Figures generated from the Authority's financial accounting system.

This equates to a reduction of £260,000 over the financial years 15/16 to 16/17.

Annual Energy Performance

The table and chart below shows the trends in energy consumption for the portfolio over the last 3 years. There has been improvement in performance throughout this period as a result of improvements flowing from energy management initiatives and audits and the overall reduction in the number of buildings within the operational portfolio.

NPT Annual Energy Consumption (kWh)



- Energy consumption has reduced by 7% from 2014/15 to 2016/17 a total reduction of 3,959,157kWh.
- Percentage reduction of 1.73% between 2015/16 to 2016/17 a reduction of 918,841kWh.

Display Energy Certificates (DECS)

The Authority has a statutory obligation to provide and Display Energy Certificates (DEC) for qualifying Authority buildings regularly visited by members of the public. The average DEC rating across the Authority’s qualifying buildings over 1,000m2 for 2017/18 recorded a rating of 78.3 and Grade D. Although the average rating performance has reduced from 75.1 in 2016/17 to 78.3 in 2017/18. The Authority’s average rating is still performing well, recording a value 21% under the national typical rating value of 100. The specific buildings with increased DEC ratings will be investigated to determine the cause of the reduced efficiency with the formulation and implementation of improvement action plans to enhance performance.

4.0 Progress – 2017/18

The following table provides the level of progression that the Energy Team has achieved in 2017/18 with regard to projects and activity reported in the previous 2016/17 energy performance report.

Work Programme - Progress

Key activities programmed for completion reported in 2016/17 – Status Position:

1.	<p>Undertake LED lighting projects to the value of £38k using Welsh Government funding.</p> <p>Update: Completed LED lighting projects at the following sites:</p> <ul style="list-style-type: none"> • Tregelles Court (Workshops) • Blaenhonddan Primary School (Hall)
2.	<p>Develop and formulate an annual energy/carbon and water report for the Authority's operational building portfolio.</p> <p>Update: A Draft 2016/17 annual energy/carbon and water report has been produced for the Authority's operational building portfolio, to be consulted upon prior to formal publication.</p>
3.	<p>Datacentre cooling systems investigation into low energy cooling solution for the computer data centre at The Quays.</p> <p>Update: Completed investigation on low energy cooling solutions for the computer data centre implemented low cost measures.</p>
4.	<p>Management and production of Display Energy Certificates (DECS) for qualifying buildings within the Authority ensuring statutory compliance avoiding financial penalties.</p> <p>Update: Completed the provision of Display Energy Certificates (DECS) for 2017/18.</p>
5.	<p>Submitted annual Welsh Government Energy Performance indicators (percentage change in the average Display Energy Certificate (DEC) score within local authority public buildings over 1,000m²).</p> <p>Update: Completed the submission of the Welsh Government Display Energy Certificate Performance indicator for 2017/18.</p>
6.	<p>Completed the renewal of Electricity and Gas Automated Meter Reading Contract for 2016/17.</p> <p>Update: Successfully completed contract renewal for 2016/17.</p>
7.	<p>Develop the next step action plan based on the findings of the District Heating Network feasibility report - A project summary (overview) report will be written outlining key actions and identifying the next steps required to further evaluate and determine the</p>

practicality and viability of district heating within the specific areas of the Authority.

Update: Completed District Heating feasibility report for the Authority. Due to a lack of buildings with significant heat demand the progression of this project has been deferred until an inward invest opportunity occurs.

8. Undertake a building energy assessment of Margam Crematorium.

Update: Completed building energy assessment of Margam Crematorium supported by the Carbon Trust, due to work load pressures mainly the City Deal work there has a been a delay in the issue of the report. Therefore the assessment will have to renewed and the report updated.

9. Provide assistance on a number of City Deal project proposals under the Internet of Energy stream.

Update: Supported the development process of the project list for the Swansea Bay City Deal’s Internet of Energy theme in conjunction with the programme’s appointed specialist advisor. Assisted the development of project proposals under the Internet of Energy (IOE) stream under the Swansea Bay City Region City Deal application process. Currently working on the following project proposals which have been approved by central and regional Governments pending the submission of five case business model applications:

- i. Homes as Power Stations (NPTCBC Lead Authority)
- ii. Swansea Bay Technology Centre

Part of the NPT project team who formulated and submitted the project proposal application documents to Central and Welsh Government.



10. Write draft Energy/Carbon and Water Management Policy, Strategy & Programme.

Update: Due to workload the provision of a draft Energy/Carbon and Water Management Policy, Strategy & Programme will be progressed in the longer term.

11.	<p>Compliance to Carbon Reduction Commitment/ Energy Efficiency Scheme (CRC/EES). Update: Successfully ensured compliance to Carbon Reduction Commitment/ Energy Efficiency Scheme (CRC/EES). By undertaking a number of key actions the Authority did not qualify for phase two of the CRC/EES Scheme. As a result the Authority has not incurred the following financial penalties:</p> <ul style="list-style-type: none"> o 2014/15 - £319,000 o 2015/16 - £319,000 o 2016/17 - £319,000 o 2017/18 - £319,000 <p>Total savings to date of £1,276,000</p> <p><i>(Figures do not account for RPI which will commence from 2015/16 onwards).</i></p>
12.	<p>Develop methodology for analysing electricity and gas data generated from the Automatic Meter Reading (AMR) devices, develop, and implement a procedure for assisting building managers to eradicate electricity and gas wastage thereby reducing costs and improving the energy performance throughout the portfolio.</p> <p>Update: Due to the cancellation of their British Gas utility contract due to lack of service delivery this subsequently resulted in the Council's AMR contract being terminated. The Energy Team will look at suitable replacement solution.</p>
13.	<p>To liaise and engage with Welsh Government to maximise resource and funding under their energy efficiency and renewable energy support programmes which consist of :</p> <ul style="list-style-type: none"> a) Green Growth Wales - Local Partnerships / Refit b) Carbon Trust/ Resource Efficient Wales c) Welsh Government funding <p>Update: Ongoing engagement and liaison with Welsh Government and relevant Government support organisations.</p>
14.	<p>Develop Energy, Carbon and Water Management Strategy specifically for schools, commencing with a pilot cluster of 2/3 schools.</p> <p>Update: Due to workload priority and resource limitations the development of the Energy, Carbon and Water Management Strategy specifically for schools has been reallocated to 2018/19 work programme.</p>
15.	<p>Implement a heating control system audit programme of all buildings within the portfolio, ascertaining set points etc., then re-commissioning systems and identifying a list of remedial works where required.</p> <p>Update: Commenced the implementation of a heating control system audit programme of all buildings but due to workload this has been deferred until 2018/19 work programme.</p>

16. Investigate the potential for computer energy management software within the main Civic Buildings (i.e. optimise energy performance of PCs)
Update: Commenced the investigation of the potential for computer energy management software within the main Civic Buildings (i.e. optimise energy performance of PCs) but as a consequence of other work load prioritises this has been programmed into 2018/19.

17. Develop and deliver the Energy, Carbon and Water “Invest to Save” Programme for the Authority’s operational building portfolio.
Update: Due to workload the develop and deliver the Energy, Carbon and Water “Invest to Save” Programme for the Authority’s operational building portfolio has been deferred to long term priorities.

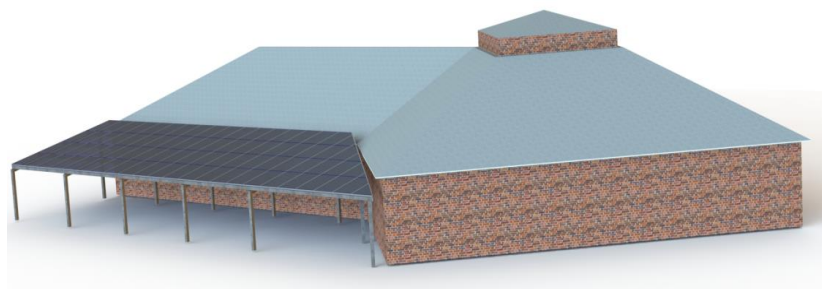
18. Develop site-specific Energy, Carbon and Water action plans for all Civic buildings under the aforementioned “Invest to Save” Programme.
Update: As a consequence of other work load priorities the develop of site-specific Energy, Carbon and Water action plans for all Civic buildings will be programmed in 2019/20.

Renewable Themed Projects

The following renewable activities/projects will be developed/progressed:

19. To review and carryout new assessment on the previous building integrated solar PV 2015 study proposal.
Update: As a consequence of the reduction of the Feed In Tariff rates the viability and payback period of solar PV systems have diminished, Energy Team intend to review the sites identified within the feasibility study previously undertaken by the Council supported by The BRE. Due to resource limitations and involvement within corporate schemes this project has been deferred into the 2018/19 work programme.

20. Assist Parks & Cemeteries develop and implement solar PV system on the Visitor Centre at Gnoll Estate Country Park.
Update: Supported Parks & Cemeteries carryout feasibility, write project proposal and board report for the installation of 21kW solar PV system and canopy system at the Visitor Centre at Gnoll Estate Country Park, installation programme for 2018/19. Illustration of the Solar PV canopy installation shown on the next page.



21.	<p>Develop (PV) 'solar farm' proposal at Giants Grave landfill site.</p> <p>Update: Supported Waste and Financial Sections to produce a solar PV farm feasibility report for Giants Grave Landfill site in conjunction with Local Partnerships, Welsh Government's approved support service for large scale infrastructure projects.</p>
22.	<p>Carryout feasibility study on a potential hydro/tidal scheme at Brunel Dock.</p> <p>Update: Due to other workload priorities this feasibility will be programmed for 2018/19.</p>
23.	<p>Provide technical support on the Hydroelectric power element of the Margam Park Turbine House refurbishment project.</p> <p>Update: Currently providing technical support on the hydroelectric power element of the Margam Park Turbine House refurbishment project. Support consists of developing the project proposal and the implementation plan, installation programmed for 2018/19.</p>
24.	<p>Carryout feasibility studies on the potential solar PV system Carport systems at the following sites:</p> <ul style="list-style-type: none"> • Neath MSCP • Port Talbot MSCP • Quays/SRC <p>Update: Due to other workload priorities this feasibility will be programmed for 2018/19.</p>

	Denotes that the project/work has been completed
	Denotes that the project/work is in progress or has been deferred.

Additional Projects Completed - 2017/18

The following projects were completed in addition to the original project/priority list reported in the 2016/17 report: and lists work/projects completed in addition to 2017/18 targets:

1. Installation solar control film at the Quays/SRC in conjunction with Facility Management.
2. Authority achieved a utility cost reduction of £260,000 between 15/16 and 16/17 across the operational building portfolio.
3. Upgraded LED lights within the main circulation/communal areas at the Quays and Tregelles Court Offices.

4. Provided assistance to the Flexis University research programme to define their demonstration zone within NPTCBC, centre around Port Talbot and TATA Steel.



The Energy Team in conjunction with Senior Management will undertake further engagement with the research programme to maximise the benefits to the Authority. Next steps consist of formulating a scoping paper to define Flexis activity aligned to core energy related aims and objectives of the Council.

5. Boiler and hot water upgrade scheme at PT Civic Centre, project managed by the Mechanical & Electrical Section.
6. Upgrade of the Building Management System (BMS) at Neath Civic Centre, project managed by the Mechanical & Electrical Section.
7. Resolved erroneous billing issue on the electricity supply to Cae Garw Gypsy site, a £71k electricity bill was generated as a consequence of a meter failure and significant billing error. Investigation subsequently carried out by the Energy Team with the costs reduced down to £28k per annum.

5.0 Current Priorities – 2018/19

Current work activities have been categorised into main and day to day:

Main Project/Activities:

1. City Deal: Currently finalising the five case business model for the homes as power stations project with the following project elements to programmed for completion in 2018/19:
 - Submission of the five case business model
 - Write development and implementation plan
 - Develop flexible design approach
 - Define health and wellbeing benefits of the HAPS programme
 - Progress the evaluation and monitoring element of the programme
2. To undertake £71k LED lighting system upgrade project at Gnoll Primary school

Old lighting system



New lighting system



3. Programmed £60k LED lighting upgrade to external car park and depot public lighting system at The Quays and SRC, incorporating intelligent control. Project managed by Public Lighting and Facilities Management.
4. Develop Energy, Carbon and Water Management Strategy specifically for schools, commencing with a pilot cluster of 2/3 schools.
5. Currently formulating an annual energy/carbon and water report for the Authority's operational building portfolio – 2017/18.
6. Carryout renewal of Electricity and Gas Automated Meter Reading Contract.
7. Upgrade Building management System (BMS) at PT Civic – Project Managed by M&E Section.
8. Smart low carbon report - Phase one of the feasibility study has been completed which investigated how the Authority will be able to move towards a low carbon smart region, analysing potential smart technological developments and their application to low carbon renewable installations. Secured £36k of funding from the Welsh Government to carry out the report. Additional funding of £30k has been successfully secured from Welsh Government to carry out phase two of the smart low carbon study.

The key aim of the study at the end of the phase 2 will be to understand what smart technology actually means to the Authority from an energy/low carbon perspective via the delivery of the finalised projects.

9. The Energy Team will formulate an implementation strategy for low emission vehicles/electric vehicle charging within the Authority supported by the relevant internal departments.
10. Commissioned FRESH (Foundation data for Robust Energy Strategies for Housing) study within NPTCBC. The main purpose of FRESH is to identify areas in most need of action within Local Authority neighbourhoods from a fuel poverty perspective. The mapped data analysis will inform the deployment of resources and will act as an enabling tool to co-ordinate existing resource and programmes.



NPTCBC - FRESH EPC Data Report

11. Carried an investigation into electrical baseload at the four main Civic buildings:

- PT Civic Centre
- The Quays
- Neath Civic Centre
- Tregelles Court

The Energy Team will formulate an improvement plan from the findings of the study.

12. Carryout energy survey review of the Innovation Centre identifying opportunities to improve the energy/water performance of the site.

13. Carryout feasibility studies on the potential solar PV system Carport systems at the following sites:

- Neath MSCP
- Port Talbot MSCP
- Quays/SRC

Day to Day Activities:

14. Carryout monthly monitoring of electricity and gas of operational buildings for the whole operational building portfolio.

15. Conduct investigations into billing anomalies/disputes.

16. Identify poor performing sites and carryout investigations into increases in energy and water consumption, compiling, writing and issuing reports where necessary. Identifying reasons for poor performance and negotiating rebates where required.

17. Respond to queries from the general public on domestic energy related issues.

18. Development and enhancement of the energy & water management database.

19. Provide responses to energy/carbon and water related Freedom of Information Act requests.

20. Respond to various Authority departments on energy/carbon and water related information request for example:

- a) Planning: Information and guidance on energy/carbon and renewable related matters
- b) Education: School energy and carbon figures for 21st Century schools
- c) Corporate: Provide assistance on the Well-being of Future Generations Act etc.

6.0 Long Term Aims/Priorities (Projects/Activities)

1. Over the next 12 to 18 months a Strategic Energy, Carbon and Water Policy will be developed for formal adoption by the Authority.

The intention is to develop and implement the Policy in two stages as follows:

- i. Publish Policy Statement & Policy Document
(Completion target December 2018)
- ii. Develop and Implement Energy, Carbon & Water Management Strategy Programme report 2018 to 2023

The following output documents will be generated:

- Energy, Carbon and Water Policy Statement
 - Energy, Carbon and Water Policy Document
 - Energy, Carbon and Water Management Strategy Programme 2018 to 2023
2. In conjunction with the Estates Section assess the impact of the Minimum Energy Efficiency Scheme on the leasing of buildings, formulating an effective implementation plan.
 3. Develop Energy, Carbon and Water “Invest to Save” Programme for the Authority’s operational building portfolio.
 4. Develop a website page, focused on the dissemination of energy good housekeeping practices in non-domestic buildings, aimed at staff.
 5. Develop and implement utility bill validation procedure for use by all financial/certifying officers responsible for signing off utility invoices.
 6. Develop site-specific Energy, Carbon and Water action plans for all Civic buildings under the aforementioned “Invest to Save” Programme.
 7. Implement a heating control system audit programme of all buildings within the portfolio, ascertaining set points etc, then re-commissioning systems and identifying a list of remedial works where required.
 8. To carry out feasibility studies on the following:
 - Battery storage aligned to solar PV systems within key buildings
 - Undertake Authority wide hydro resource study

9. Assist undertake feasibility on the Metal Box site to carryout high level options appraisal to identify renewable and energy generation opportunities to develop into business case proposals.
10. Submit business case for additional staff to implement energy/carbon invest to save programme.
11. Implement Corporate protocols to ensure capture of all water billing data, to include a review of how best to capture the data.

7.0 Appendix: Structured Approach

Energy Management - Structured Approach

The continued drive to reduce both the consumption of energy and water resources, and the Council's carbon emissions will be achieved by the following core aims:

- Implementation of effective energy management practices throughout the Authority's operational building portfolio.
- Building rationalisation programme, consolidation and reduction of operational buildings, and overall floor space, from which the Council operates by improving space utilisation and building efficiency.
- Making the remaining building stock as energy efficient as possible, also installing renewable low carbon technology where practicable and viable.
- Ensuring that 'Energy efficient, environmental and sustainable design' is a key consideration in all new build projects.

The Energy Team adopted the structure and core elements of the approved ISO 50,001 Energy Management System (recognised as industry standard system) to assess and achieve effective levels of energy management.

The chart below sets out the key elements of the system:



Energy Team's - Main Responsibilities

The principle drivers for effective corporate energy/carbon management within the Authority are:

1. To reduce the Authority's energy and water costs within the operational building portfolio (circa £3.0M Buildings and £0.9M Street Lighting).
2. To protect the Authority against volatile energy price increases that could potentially affect service delivery.
3. Minimise the financial impacts of the Carbon Reduction Commitment/Energy Efficiency Scheme.
4. To reduce energy and water consumption to minimise CO₂ emissions.
5. The Welsh Government has set a non-mandatory target of 3% annual reduction in CO₂ emissions for devolved public sector bodies under the nationally adopted Climate Change Strategy.
6. The management and operation of the Energy/carbon & Water Management Database.
7. Monitoring & targeting of energy performance.
8. To ensure compliance of energy (Building) related legislation.
9. The management of and provision of Display Energy Certificates for the Authority.
10. The provision of water management services, guidance and advice.
11. Engagement with University energy/carbon and smart research programmes.

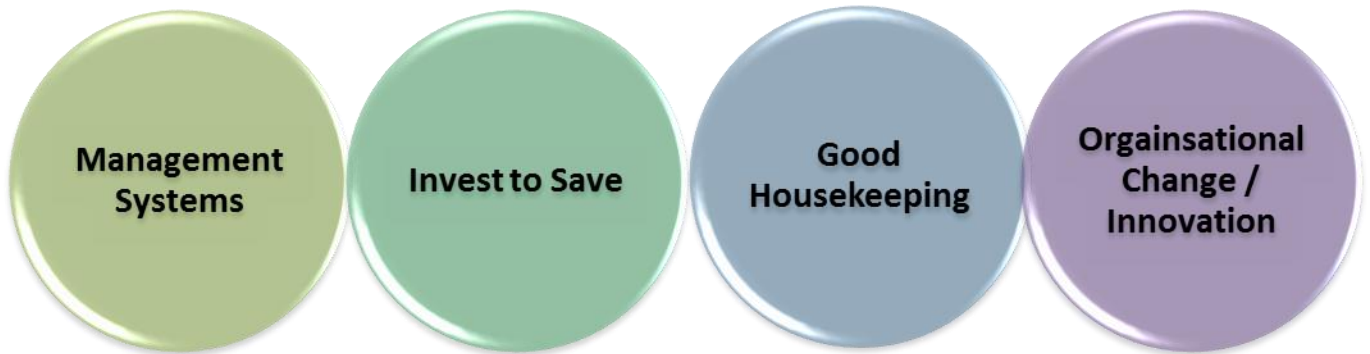
Delivery Areas

The following four distinct energy/carbon and water management delivery areas have been identified where there is potential for improved efficiency and cost savings across the portfolio. These areas of opportunity and consequential energy and carbon saving percentages are taken and derived from guidance issued from the Carbon Trust, which were calculated and formulated from their carbon management programme.

The four main energy / carbon management delivery areas are as follows:

- Management systems/practices (10%)
- Invest to save (20%)
- Good housekeeping (10%)
- Organisational Change & Innovation (Unknown at this stage)

The diagram below explains the process and actions/measures required to achieve improved efficiency and costs savings within each delivery area:



Management Systems (10%)	Improvement programmes (20%)	Good housekeeping (10%)	Organisational Change / Innovation (?%)*
<ul style="list-style-type: none"> • Energy database • Monitoring & targeting • Periodic reporting • Property rationalisation • Procurement – Energy • Energy surveys & audits • Energy policy & strategy plan • DECs 	<ul style="list-style-type: none"> • Invest to save • Lighting & controls • Heating systems • Heating controls • Insulation • BMS Upgrades • Draught proofing • ICT energy applications 	<ul style="list-style-type: none"> • Building Performance reporting • Implement an awareness campaign • Good housekeeping guidance 	<ul style="list-style-type: none"> • Policy change • Process review • Renewables • Assess unproven technology • Set departmental energy reduction targets within service plans • Implement maximum temperature policy

* Further Study needs to be carried out to determine the level of potential savings within this delivery area.

Whilst clearly there is potential for significant improvements and savings across the portfolio this will take time to fully implement and realise the maximum benefits/savings and to achieve this will require Corporate/Authority wide support, input and cooperation.