

City & County of Swansea's Energy Strategy



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Version 1**

EXECUTIVE SUMMARY

In order to achieve Swansea's vision '***to create a safer, greener, smarter, fairer, healthier and richer Swansea***', we must act to

- invest in renewable energy (solar, hydro, wind, tidal, biomass etc.);
- reduce our own rising electricity and gas costs and those of our communities;
- invest in energy saving and storage initiatives (LED; insulation; smart controls; batteries etc.)
- deliver targets on CO2 emissions (£% per annum savings) and reduce our Carbon Reduction Commitment Energy Efficiency Scheme (CRC) charges;
- meet energy efficiency standards e.g. BREEAM; and
- look at innovative energy generation and saving initiatives, which can create economic benefit, including employment and inward investment in Swansea, building on world class projects like the Tidal Lagoon.
- look to increase local energy security, becoming less reliant on imported fossil fuels and less exposed to higher energy prices in the future.

Energy Strategy Aim:

City & County of Swansea will contribute towards a sustainable low carbon economy by delivering an Energy Strategy that delivers real benefits to society, the economy and the environment and sets out our wider and long term aims for energy across Swansea the place, as well as the council within the context of national and international developments.

Energy Strategy Objectives:

Objective 1: To reduce energy consumption and improve the energy efficiency of City & County of Swansea's public building and housing stock portfolio

Objective 2: To invest in renewable technologies that will benefit the council and the wider community

Objective 3: To secure or facilitate community access to affordable low carbon/renewable energy

Objective 4: Explore and maximise commercial opportunities to benefit community wellbeing and/or financial gain

Objective 5: Ensure Energy Strategy and action plan are delivered in line with current legislation

Through implementation of the Energy Strategy action plan the City & County of Swansea will mitigate the:

- Effects of Climate change by reducing their carbon emissions
- Risks associated with Energy security by sourcing low carbon/renewable energy sources and eradicating fuel poverty
- Risks associated with increased energy costs

and define what an 'Energy Self-sufficient city means Swansea'

The Council's current activities include:

- on-going HRA investment in our housing stock (new boilers, insulation, cladding, replacement windows etc.) making our tenants homes warm and energy efficient
- the refit of street lamps with lower energy use LED
- a small sample of PV (solar) on schools
- a small number of biomass and CHP projects (schools and Leisure centre)
- mechanical and electrical works across buildings delivering greater energy efficiency
- the establishment of a community group (Swansea Community Energy & Enterprise Scheme, SCEES) to own and run renewable installations in the City & County of Swansea.
- Development of a district heat network for the city centre

All of these projects contribute to reducing the council's carbon footprint and energy costs as well as contributing towards the Corporate Priorities of;

1. Safeguarding vulnerable people
2. Improving pupil attainment
3. Creating a vibrant and viable city and economy
4. Tackling poverty
5. Building sustainable communities

What we propose and what more can we do:

- Support the roll out of Smart Meters in all domestic properties by 2020
- Set up the corporate governance and management structures to deliver our centralised energy strategy across departments. An internal team should take ownership of the energy strategy and meet regularly to drive forward the strategy
- Assess our entire schools' estate for biomass and solar feasibility to generate and provide cheaper energy
- Map our land based assets and assess feasibility for wind, solar and hydro potential
- Assess our buildings for energy saving initiatives and possible PV, biomass boilers, ground source heating etc.
- Explore options to develop heat networks across existing building stock and new developments in the City Centre and across the county
- Identify budgets for investment and access appropriate grants and subsidies
- Set out and timetable a list of potential projects that can be assessed through a small business cases for Council approval
- Look at energy technology capital investments as a driver to:
 - reduce fuel poverty
 - reduce our own energy costs and CO2 emissions across our estate
 - provide economic stimulus and significant jobs
 - build new industries, research and innovation in partnership with the public, private and third sector

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1.0 Introduction

Welsh Government's priority is to bring public sector buildings up to the energy efficiency standards of today. Wales' draft Energy Efficiency Strategy (2015) aims to *'contribute strongly to the well-being of future generations goals'* by

- Reducing greenhouse gases
- Reducing fuel poverty
- Creating jobs through investment in Green Growth
- Improving energy performance of buildings in Wales
- Regenerating communities in Wales
- Working towards a circular economy
- Enabling natural resource management

In 2011, the City & County of Swansea developed a Carbon Reduction Strategy and Action Plan with short, medium and long term actions to tackle the risks of Climate Change. One of the key targets within the CRC Action Plan was to develop a Micro-generation strategy but due to the unprecedented budget cuts and the need for the authority to explore other ways of generating income, a decision was made to develop an Energy Strategy instead which will align with Corporate Priorities and provide a framework that delivers real benefits to society, the economy and the environment and sets out our wider and long term aims for energy across Swansea the place, as well as the Council within the context of national and international developments.

It will enable Swansea to be an energy self-sufficient city exceeding our carbon targets, providing cheaper electricity to residents and achieving sustainable savings. It will identify the technologies and programmes available to enable the authority to prepare for future risks associated with securing an energy supply that is affordable and mitigates the risks associated with climate change, fuel poverty and energy security. The strategy will act as an overarching framework in relation to sustainable energy supply and use with the aim of working towards the eradication of fuel poverty, cutting emissions, maximising commercial opportunities and maintaining energy security to protect the most vulnerable members of society.

2.0 Background

The Welsh Government (WG) has long recognised that sustainability issues are key to the successful economic development of Wales, as encapsulated in their document “*One Wales – A Progressive Agenda for the Government of Wales*” (June 2007). In May 2009, WG published “*One Wales: One Planet – The Sustainable Development Scheme of the Welsh Assembly Government*”, which reconfirmed a commitment to establish a 3% year on year reduction in greenhouse gas emissions from 2011, in areas of devolved competence. More recently, ‘The Wellbeing of Future Generations Act (2015) has superseded the Welsh Government Sustainable Development Scheme, which commits the Welsh Public Sector to use resources efficiently and proportionately. Welsh Government has a statutory obligation to eradicate fuel poverty as far as is reasonably practicable, in all households in Wales by 2018. In addition, the 2008 Climate Change Act sets a legally binding target aim to reduce greenhouse gas emissions in the UK by at least 80% (from the 1990 baseline) by 2050.

The Council’s non domestic buildings make up 74% of the local Authority’s total emissions. Rising energy and fuel costs and the implications of the CRC mean that the financial incentives for reducing energy use are increasingly significant. The council has experienced an 80% increase in overall energy expenditure since 2003. With further increases being predicted and future tightening of fiscal measures related to carbon there is likely to be an increase in financial opportunities for projects associated with reducing energy consumption. Even with government (DECC) this year announcing and proposing significant renewable energy subsidy cuts in Feed in Tariffs (FiT’s), renewable technologies such as solar, hydro, biomass and wind will remain an area that the authority can explore to assist the authority to achieve these wider targets going forward.

This Strategy will have particular relevance to BREEAM driven projects, 21st century schools and will reflect the asset disposal programme. It will support the Authority’s ‘*Outcome Agreements*’ with a particular effect on the Sustainable theme of ‘*Growth & Sustainable Jobs*’, the outcome of which is creating a sustainable low carbon economy with a commitment to ‘*reduce Swansea’s impact on climate change*

through reducing carbon emissions'. Implementation of the Strategy will assist the Authority to reduce its energy usage, associated costs and carbon emissions, improving the built environment and ensuring a consistent and standard method for considering implementation of renewable energy systems across the authority's assets. As part of this strategy the Authority will also explore any commercial opportunities available as well as the roll out of community initiatives such as the Swansea Community Energy Enterprise Scheme (SCEES) and large infrastructure projects such as the Swansea City Centre District Heating Scheme.

3.0 Corporate Vision and Priorities

Energy efficiency is a very important element in achieving the well-being of future generations in Wales. In order to achieve Swansea's vision '**to create a safer, greener, smarter, fairer, healthier and richer Swansea**', we must act now to mitigate risks associated with the supply, affordability and carbon impact of energy consumption. This will not happen by having a '*make do*' attitude but rather by being a pro-active organisation and identifying what action is needed now ensure continued investment in energy efficiency to achieve our vision.

The Strategy reflects the Corporate Priorities of;

- 6. Safeguarding vulnerable people**
- 7. Improving pupil attainment**
- 8. Creating a vibrant and viable city and economy**
- 9. Tackling poverty**
- 10. Building sustainable communities**

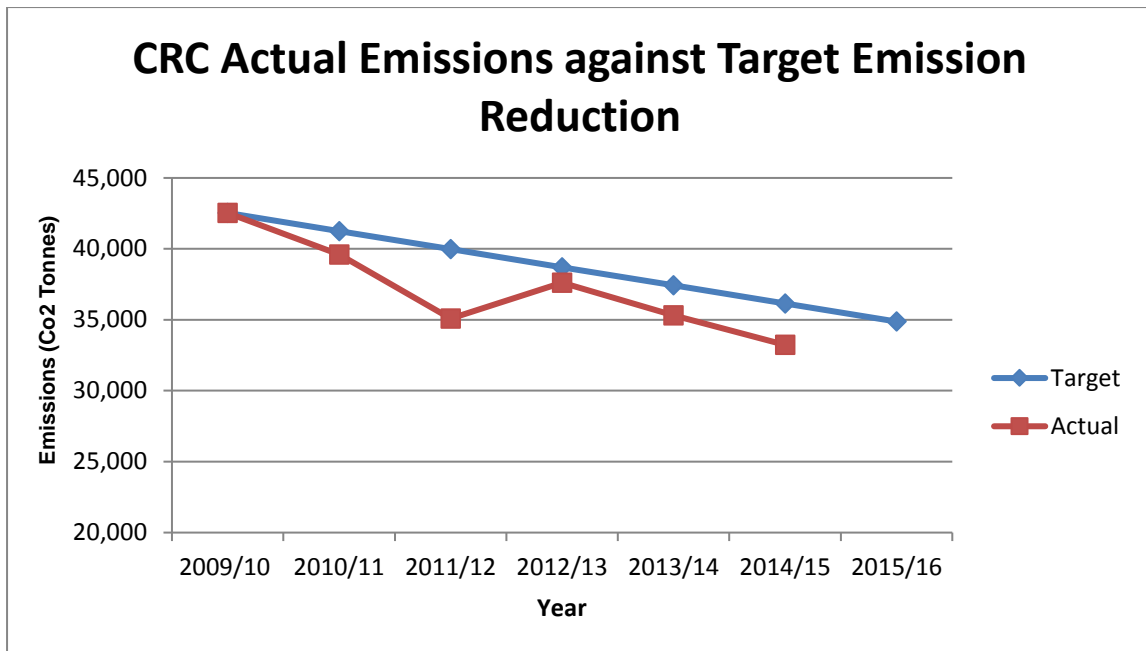
By;

- Providing low cost energy options
- Having an innovative approach to energy management
- Thinking and working differently to improve our ability to deliver and to meet the energy demands of the residents of Swansea
- Exploring commercial opportunities to generate income

- Identifying and investigating funding opportunities available and prioritise those which will bring about the greatest benefits and develop the most cost effective route to achieving the authority's targets
- Working collaboratively both internally and externally to maximise resources and knowledge to ensure we prioritise our resources and get the best for our communities.
- Raising energy awareness amongst employees, Swansea residents and the wider community
- Improving the lives of the people who live and work in Swansea by empowering local communities to meet their own energy needs in a sustainable way.

The City & County of Swansea is committed to implementing energy saving projects and achieving significant carbon savings across their building estate to enable it to meet its CO2 reduction target of 3% per annum by 2020 compared to baseline year 09/10. In addition to the ongoing energy conservation work currently being undertaken such as those initiatives in the Carbon reduction action plan, 21st Century Schools, BREEAM, Arbed and initiatives such as SCEES and District Heating Scheme, the council are keen to not only maintain current standards but to explore energy saving opportunities including renewable and low carbon energy technologies as well as financial opportunities such as the formation of its own energy company.

The Council will identify opportunities across all service areas to reduce reliance on natural resources and become self-sufficient leaders in energy management.



Graph 1 – Co2 emissions since CRC baseline year (09/10)

The strategy aims to inform all stakeholders how the Authority intends to mitigate the risks posed from energy supply, costs and carbon emissions. It will also provide links to best practice guidance for incorporating micro-generation technologies into the City & County of Swansea’s Asset portfolio.

3.1 Vision of an energy self-sufficient Swansea

Energy is a fundamental to keeping Swansea running on a daily basis. The benefits of Swansea being 100% self-sufficient in energy are significant and include:

- Generating income,
- Tackling fuel poverty,
- Energy security – if ‘off grid’ resilient against impacts from the national energy market.
- Contribute to the Welsh target of an 80% reduction in greenhouse gas emissions by 2050;
- High performing homes;
- Developing a strong local green economy
- Building economic resilience

There are therefore a number of definitions the Council could adopt; depending on the boundaries it wants to adopt (Council or County):

1. 'off grid' energy self-sufficient Council or County –activities are designed to save energy and are highly energy efficient. The Council /County produce enough energy from renewable sources to directly run its services and activities. Any surplus energy is stored or is sold to the grid.
2. An 'on grid energy self-sufficient Council/County – activities are designed to save energy and are highly energy efficient. The Council/Council exports at least as much energy to the grid as it imports, off-setting its usage.
3. A near carbon zero County – This model looks at carbon production rather than energy use and requires the County to be near zero carbon (zero net carbon emissions) i.e.:
 - a. All the Counties residents and industries are operating at zero carbon emissions either through energy savings and efficiencies and / or renewable energy generation and use / offset or a mixture of the three.
 - b. There are zero carbon travel emissions within the County – focusing on sustainable transport modes, green travel plans, low carbon vehicles,
 - c. There is zero waste – using the waste hierarchy, smart city living and better use of our environment for leisure, food growing and carbon storage.
 - d. The County has high levels of green and growing space and supports a low carbon local food industry to keep food miles down and support food security.

The City and County of Swansea already have a number of projects underway which would contribute to energy self-sufficiency including; SCEES (Swansea Community Energy and Enterprise Scheme), AREBED Sandfields Renewal Area, AREBED 2 Waun Wen, in addition we also have a wide range of projects which contribute to reducing carbon emissions including; reviewing greenhouse gas emissions, the Corporate Carbon Reduction Strategy, investigating opportunities to support electric vehicles both internally within the Council and externally for the public, making the Councils fleet eco-friendly, the development of a Green Infrastructure Strategy, improving facilities for walking and cycling in the city centre to name a few.

However moving forward the Council would need to set out a strategic approach, outlining how Swansea can hope to achieve its ambitions. A series of case studies are provided in Appendix 5, demonstrating how other areas in the UK have met this challenge.

4.0 Energy Hierarchy

City & County of Swansea’s Energy Strategy is written in line with the Energy Hierarchy. It is structured in this way to inform the reader of measures already implemented by the Authority, measures currently being considered and those measures the Authority intend to explore going forward. There are typically five stages to the Energy Hierarchy which are demonstrated in the diagram below;

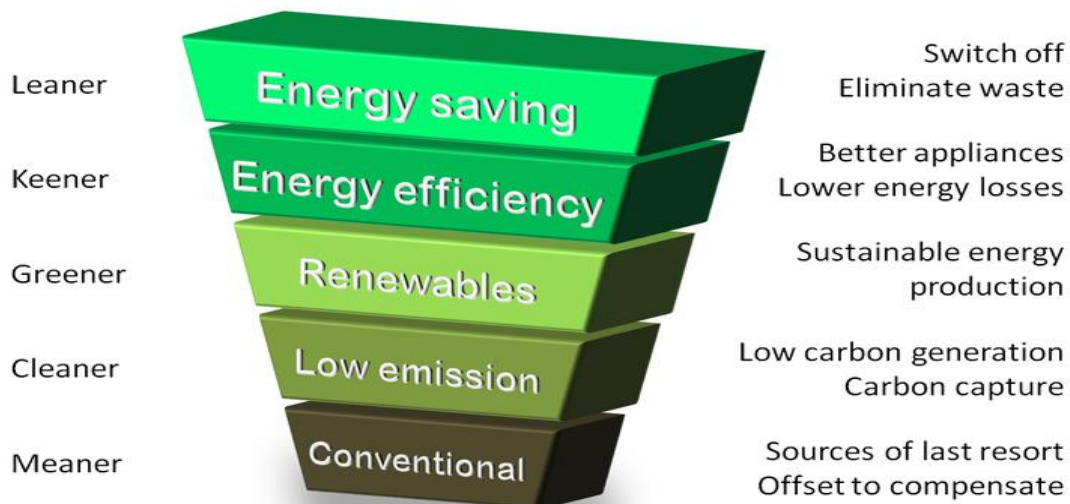


Figure 1 – Energy Hierarchy

Each stage of the Hierarchy will be discussed in turn in the section’s that follow with examples specific to the initiatives currently being implemented or considered by the City & County of Swansea.

The key elements that the Strategy will therefore focus on are illustrated below:

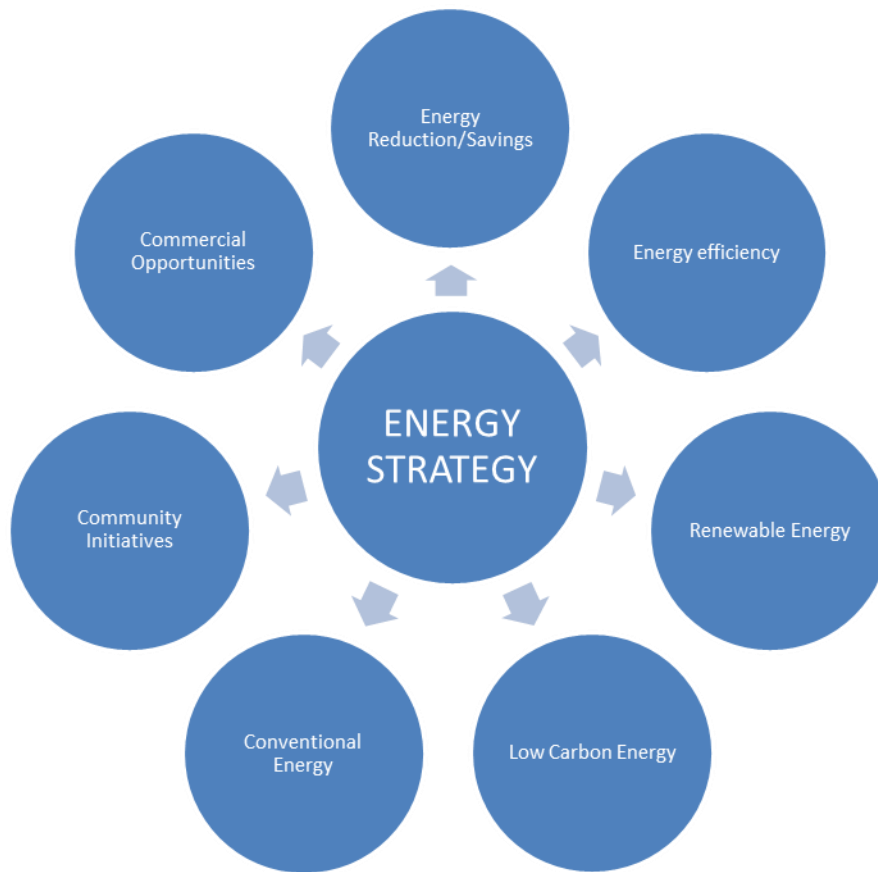


Figure 2 – Strategy Elements

4.1 Energy Reduction/Savings

The cost of energy for the Council in 2014/15 was £6.6M which included street lighting, non-domestic buildings and facilities but excluded transport related activities. In addition to the above direct energy costs, the Council is required to report on carbon emission and pay a price for every tonne of carbon emitted (relating to electricity and gas consumption) under the Carbon Reduction Commitment (CRC) scheme. Rising energy and fuel costs and the implications of CRC mean that the financial incentives for reducing energy use are increasingly significant.

Further to this, the UK's energy infrastructure is ageing and requires major investment over the next decade, the cost of which is likely to be reflected in energy prices. Energy management performance has also become increasingly visible to all interested parties by the introduction of Display Energy Certificates (DEC's) for

public buildings, the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) and “low carbon” building design for BREEAM accreditation.

City & County of Swansea developed a Carbon Reduction Strategy report and Action plan in 2011 with short, medium and long term actions. Two years in, and the Authority has all but completed the short and medium actions. Long term actions and any outstanding medium term actions will be addressed going forward within this Strategy Action Plan. Links to the Carbon Reduction Strategy report and Action Plan are given below should more detail be required. See Appendix 3 for the original Carbon Reduction Action Plan, including current status of actions.

http://staffnet.internal.swansea.gov.uk/media/pdf/r/4/Carbon_Reduction_Strategy_CRC_Scheme_Report_-_Nov_2011.pdf

http://staffnet.internal.swansea.gov.uk/media/pdf/j/0/Carbon_Reduction_Strategy_Action_Plan_-_Aug_2013.pdf

Some of the key actions addressed to date include carrying out energy audits, implementing e-billing, collating energy and carbon baseline data from TEAM software per service area and installation of AMR devices in non-domestic buildings. The Authority has successfully met its carbon reduction targets year on year since its baseline year 2009/10, achieving 21% reduction on the baseline year in 14/15 exceeding our annual 3% target.

4.2 Energy Efficiency

There are a number of initiatives that the City & County of Swansea are currently involved in to maximise the energy efficiency of their building stock, these include;

4.2.1 PAS2030

PAS 2030 (Publicly Available Specification) is published by the British Standards Institute (BSi) and is aimed at installers of Energy Efficiency Measures (EEM) for Green Deal and ECO projects – this could be anything from installing draught-

proofing to doors, windows and access hatches, to internal and external wall and loft insulation systems.

PAS 2030 certification sets out the minimum technical competencies you need to have to be able to install EEM for Green Deal and ECO customers. It also explains the requirements for companies or organisations who want to become installers of Green Deal and ECO measures.

Lead Contractors (those Green Deal installers who work directly with a Green Deal Provider) will need to operate a Quality Management System (QMS) in line with PAS2030.

The Authority's Corporate Building & Property Services department has PAS2030 accreditation for the following energy efficiency measures;

- Boiler installation
- Enveloping

The aforementioned efficiency measures will help support a number of key priorities, specifically Corporate Priorities 1, 4 and 5. The installation of boilers, enveloping and installation of loft insulation will help tackle fuel poverty and support a reduction in our overall carbon footprint. The properties will be more thermally efficient and comfortable to the individual tenant.

The pictures below show a typical enveloping scheme before, during and after completion of works. A typical enveloping scheme is expected to achieve carbon and cost savings as detailed in Table 1 below.

Table 1 - External Wall Insulation Savings

Measure.	Saving per year.	Total cost including installation.	Carbon Dioxide (CO2) saved per year.
External Wall Insulation	Around £490	£9,400 to £13,000	1.9 tonnes



Figure 3 – Typical Enveloping Scheme¹

4.2.2 BREEAM Standards

BREEAM is the world's foremost environmental assessment method and rating system for buildings. BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance. It encourages designers, clients and others to think about low carbon and low impact design, minimising the energy demands created by a building before considering energy efficiency and low carbon technologies.

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes. The City & County of Swansea have to achieve BREEAM Excellent/Very Good on any scheme where a Welsh Government Capital grant scheme is applied for. This links specifically to Corporate priorities 2, 3 and 5. The authority has achieved BREEAM Excellent on a number of schemes including;

¹ Accreditation to the PAS2030 standard has been successfully achieved by CB&PS for Boiler Installation and Enveloping.

- Morriston Comprehensive
- Penyrheol Comprehensive
- Cefn Hengoed Comprehensive
- St Thomas Primary
- Burlais Primary



Figure 4 – Morriston Comprehensive (BREEAM Excellent)²

4.2.3 21st Century schools and QEd programme

The 21st Century Schools Programme is a One Wales commitment and a unique collaboration between the Welsh Government (WG), the Welsh Local Government Association (WLGA) and local authorities. It is a major, long-term and strategic capital investment programme with the aim of creating a generation of 21st century schools in Wales. The programme focuses on establishing appropriate resources on the right schools in the right places, for early years through to post-16. Quality in Education 2020 (QEd 2020) is a Swansea specific priority programme within the Council's strategic portfolio aimed at achieving the 21st Century School Priorities. It builds on the considerable work that has been undertaken over a number of years and the achievements that have been delivered through, for example, the previous School Organisation Programme. The QEd 2020 programme is far broader than

² BREEAM Standard is followed for all Welsh Government funded Schemes as prescribed within the grant criteria

simply having "the right schools in the right places".

QEd 2020 aims to deliver a step change in the condition of school buildings and facilities and support wider educational strategies. This will allow us to continue to raise educational standards for all learners. It encompasses the progressive review and, where necessary, the rationalisation of schools, as part of a far wider and coherent strategy for education within Swansea. There is a clear link to Corporate Priority 2, Improving Pupil Attainment and Priority 5, Building Sustainable Communities.

Swansea has a QEd priority programme. They match fund capital investment from Welsh Government (50/50) and are currently in Band A of the programme which dependant on funding is due to be completed by 2020. Improvements that have been part of the QEd programme to date include Morrision Comprehensive Phase 1 & 2, Burlais Primary, Pentregraig Primary School and Gowerton Primary School. Future developments in the programme include two new primary schools in Lon Las and Gorseinon, with significant new construction/remodelling in Pentrehafod Comprehensive. ³

4.2.4 Welsh Housing Quality Standard Programme

The **One Wales** commitment states that good quality affordable homes are the foundation of thriving communities. The Welsh Housing Quality Standard (WHQS) is a standard the Assembly Government expects all social housing to meet.

WHQS aims to ensure tenants live in dwellings that are:

- In a good state of repair;
- Safe and secure;
- Adequately heated, fuel efficient and well insulated;
- Equipped with up-to-date kitchens and bathrooms;
- Well managed (for rented housing);
- Located in attractive and safe environments;

³ 21st Century schools and QEd programme currently progressing schemes within Band A

- As far as possible suited to the specific requirements of the household.

Local authorities are required to improve their housing stock to WHQS levels and to devise realistic programmes to achieve this. As this will require a significant financial investment, and because of the borrowing restrictions local authorities face under Treasury rules regulating public sector borrowing, some authorities have chosen to transfer their stock to new Registered Social Landlords (RSLs) to enable them to reach the WHQS. RSLs are in a position to secure additional investment funding without many of the restrictions faced by local authorities.

The Council has the key aim to improve the Council housing stock and estates up to the Welsh Housing Quality Standard by 2020. The programme will require investment of over £270m between now and 2020 to deliver the improvements. The work needed will vary as some properties may need more work than others to bring them up to the standard. Tenants will be notified individually in advance on what work is proposed for their home, including likely start dates and who the contractor will be.

Each year in February the Council sets the budget for the next financial year and determines what works will be undertaken as part of the annual Housing Capital Programme. A significant amount of money has already been invested in the properties. As part of the programme of improving properties up to the Welsh Housing Quality Standard, new kitchens and bathrooms are being installed in properties that need them. In the last 2 years, 377 properties have had new kitchens and bathrooms. A further 972 are scheduled for 2015 with increasing numbers in the years following.

Since April 2010, 2827 properties have received external improvements such as wall insulation, new roofs, new doors and new guttering. Works including recladding, roofing, replacement windows, improvements to communal areas, new kitchens and bathrooms has also been carried out to improve high rise blocks at Matthew Street, Clyne Court and Jeffrey's Court.

Gas boilers are renewed as part of a planned programme with the oldest systems treated as a priority. It is intended that all properties will have efficient combi boilers

with 8,629 installed so far. Another 855 are scheduled for replacement this year with around 800 per year after that.

Tenants are offered the option to switch heating fuels to either gas or oil if they have coal or electric. 20 properties have been converted to date.

Upgrades to heating systems are also offered. Tenants can request timer clocks, room thermostats or a radiator for a room if it doesn't already have one. 94 properties are on this year's scheme for an upgrade.

The Authority completed its window replacement contract in 2011 with all properties benefiting from double glazed units. The door renewal programme is also complete with 8497 properties having had new uPVC or fire safety doors installed since April 2010. A further 548 properties had new doors fitted in 2015. There was also a programme of loft insulation renewal that was carried out by British Gas on some of City & County of Swansea's housing stock which will be taken over by CB&PS with around 300 properties having their loft insulation replaced annually.⁴ There is a clear link with Corporate Priorities 1, 3, 4 and 5 from implementing these initiatives.

4.2.5 New Social Housing

A new European Directive (NZeb) is being introduced which requires all member states to ensure all new builds are zero energy/Passivhaus standard by 2020. In response Swansea council has launched the 'More Homes project', the purpose of which is to pilot a small scheme of new build Solcer/Passivhaus homes. There is an overwhelming need for more affordable homes to meet current and future needs. In a relatively short timescale and in doing so provide valuable information to help inform the longer term strategy. In addition to providing more homes, the objectives of the pilot is to test a number of issues which in turn will help inform the longer term strategy. These include:

- Overall financial viability of directly developing new Council housing:
- The practical, organisational and capability issues that will need to be addressed as part of the ongoing More Homes programme:

⁴ Welsh Housing Quality Standard Programme ongoing

- Specification options to balance the viability of the scheme with the affordability for the occupants and overall sustainability of the design

Possible pilot sites have been identified. The next stage will be to carry out detailed site investigations and surveys, and outline designs that will meet the specific needs in the chosen areas. The intention is for much of this work to be completed using in-house resources.⁵ There is a clear link with Priorities 1, 3, 4 and 5 from implementing these initiatives.

4.2.6 Home Energy Efficiency

The City & County of Swansea has been successful in using various sources of information to target area based Energy Efficiency works to both Social Housing and Private Sector properties. Such sources of information include the Welsh Index of Multiple Deprivation (WIMD), Energy Performance Certificate Data (EPC), Standard Assessment Performance Data (SAP) and House Condition Survey Data. As a result of this targeting we have been successful in obtaining funding from number of funding streams as detailed below resulting approximately £2.2m being brought into Swansea in 2015. This not only improved the thermal efficiency of properties in Swansea but also helping to secure many much needed jobs in the area via social benefits clauses in construction contracts.

Funding Streams utilised

- **Arbed** - the Welsh Government's energy efficiency funding programme designed to bring environmental, social and economic benefits to Wales and coordinated investment into the energy performance of Welsh homes. It is targeted at low income communities.
- **ECO** – Energy Company Obligation is a government scheme to help improve the energy efficiency of domestic premises in Britain funded via energy suppliers who liaise with occupiers and landlords in order to identify and implement suitable energy efficiency measures.
- **GDHIF** – Green Deal Home Improvement Fund is an incentive launched by the UK Government. Open to all households in England and Wales

⁵ New Social Housing – “More Homes” pilot project currently progressing

including landlords, it is a cash back scheme aimed to make homes more energy efficient.

- **CESP** – Community Energy Saving Programme was an obligation on UK energy companies to deliver energy saving measures to low income households, which was area based. The obligation came into force on 1 September 2009 and ran until 31 December 2012.
- **CERT** – The **Carbon Emission Reduction Target** (CERT) (formerly the Energy Efficiency Commitment) which ran in 3 phases required all electricity and gas suppliers to assist their customers to take energy-efficiency measures in their homes. Suppliers had to achieve at least half of their energy savings in households on income-related benefits and tax credits, superseded by ECO in 2013.

Schemes

Private Sector

- The Hafod Renewal Area - a private sector initiative in partnership with Scottish & Southern Electric and Scottish Power was able to obtain £580,000 via CESP to help install solid wall insulation and boilers to private sector homes and a further £714k from Arbed phase 1.
- Sandfields Renewal Area – Swansea’s new Renewal Area aiming to upgrade 1,000 properties from 2014-19, £1.8 million has been secured from Arbed 2 to help fund energy related measures.
- Gas Main and central heating installs in Glynteg & Brynymor - In areas both public and private sector properties benefited from subsidies from CERT and fuel switching vouchers amounting to approximately £30k. These projects facilitated bringing gas pipe lines into areas where they do not have gas pockets “off gas” areas that were deemed to be in fuel poverty. This work was done in partnership with Warm Wales.

Council Stock

- The Authority in partnership with Scottish Power and ‘Regen and Renew’ was able to replace approximately 1136 ‘G’ rated boilers with new efficient ‘A’ rated boilers in council stock via CESP amounting to 1.4 million.
- The Authority was also successful in obtaining a further 1 million of CESP funding for solid wall insulation and thermally efficient doors. ECO has now

replaced CESP and this subsidy is continued to be utilised to fund similar measures.

- Loft Programme - the Council recently came to the end of a very successful loft insulation programme in partnership with British Gas who jointly funded the project through CERT and ECO. The scheme insulated 2,500 homes significantly improving energy efficiency and giving the potential to save households around £100 a year on their fuel bills.

Arbed is a Welsh Government programme aimed at saving carbon and reducing fuel poverty for residents across all housing tenures.

It is focused on using Welsh businesses to manufacture, supply and install as many of the measures as possible to help boost the local economy.

Phase 1 of the Arbed programme saw over 500 households in Clydach, Pontardulais and the Hafod Renewal Area receive energy efficiency improvements.

Phase 2 of the Arbed programme started in May 2011 which included the installation of loft and external wall insulation and PV Panels. In 2011 City and County of Swansea secured funding for Phase 2 of the scheme for 229 properties in the Morriston area. ⁶ The implementation of this programme clearly links with Corporate Priorities 1, 3, 4 and 5.

4.2.7 Capital Maintenance Programme

Energy/Sustainability Investment/Carbon Reduction Commitment

The allocated budget allows good practice measures to reduce the Councils energy use and carbon emissions. The planned programme of works helps deliver on the Councils Carbon Reduction Strategy approved by Cabinet on the 17th November 2011 and help mitigate the Authority's financial obligation within the Carbon Reduction Commitment Energy Efficiency Scheme (CRC). It will also explore the opportunities linked to micro generation and in particular PV installations where it is cost effective to do so.

⁶ Arbed scheme funding has finished

Replacement of redundant Mechanical and Electrical systems

All projects within this area of the budget would have been selected as a result of nearing the end of their life expectancy and deemed at a Category D rating or below. They would need to be replaced as a result of issues of statutory compliance and business continuity concerns. In replacing such systems i.e. Electrical – replacement of inefficient lighting systems, Mechanical – redundant boilers and heat emitters etc., we will create more efficient buildings with less energy usage and an overall reduction in carbon which will in turn assist in maintaining a sustainable asset portfolio in line with the overarching asset management plan.⁷ The implementation of these programmes links with Corporate Priorities 1, 2, 3, 4 and 5.

4.3 Renewable Energy

Micro-generation is generally defined as any technology with a capacity to generate heat or electricity below about 50 kW.

There are references in Appendix 2 to the following renewable technologies

- Biomass heating
- Solar Thermal
- Solar Photovoltaic (PV)
- Wind turbines
- Hydro Energy

directing the reader to more information about the different technologies, including a review of their benefits/limitations, site suitability, general planning issues, likely budget costs, saving calculations and carbon savings. This will provide information to all Council stakeholders so informed decisions can be made on which renewable technology will be most beneficial for the proposed use. All council owned properties and land will be appraised to identify opportunities for utilising renewable and low carbon energy sources within the Council's corporate properties and the wider community of Swansea.

⁷ Capital Maintenance Programme progressing, demand based on compliance

A number of micro-generation projects have already been progressed via the Councils 21st Century /QED programme which include:

- Solar Photovoltaic Systems at YGG Llwynderw, St Thomas, Burlais & Gowerton Primary Schools and Penyrheol, Cefn Hengoed and Morryston Comprehensive Schools
- Solar Thermal Systems at Penyrheol Comprehensive School, Sketty & St Thomas Primary schools.
- A 45KW Solar PV array has also been installed on the recently refurbished Guildhall.



Storage vessels or calorifiers allow storage of domestic hot water from a solar source without the need of fossil fuel boilers.



Control and pumping arrangements take the solar heated hot water from the collectors and pass through the primary coils of the calorifiers. The pumps are temperature controlled and can call on the boilers to provide an extra boost if climatic conditions are not favourable



Solar Collectors, allowing direct transfer of solar energy to heat or preheat primary coils of water calorifiers.

Figure 5 – St Thomas Primary Solar Scheme

To date the Authority has not pursued Wind Energy due to the long planning lead in times and biomass has not been fully explored. The feasibility of both these technologies will be explored as part of this strategy's action plan. Opportunities for solar farms on council owned land that will benefit local communities and be financially beneficial to the local authority will also be explored.⁸

4.4 Low Carbon Energy

We promote the practical use of combined heat & power systems and other appropriate "low carbon" energy generating systems where feasible and cost beneficial.

There are links provided in Appendix 2 directing the reader to more information about the different low carbon technologies currently on the market such as;

- Absorption cooling
- Ground Source Heat Pumps (GSHP)
- Air Source Heat Pumps (ASHP)
- Water Source Heat Pumps (WSHP)
- Combined Heat & Power (CHP)

These links provide information on the benefits/limitations, site suitability, general planning issues, likely budget costs, saving calculations and carbon savings. This will provide information to all Council stakeholders so informed decisions can be made on which renewable technology will be most beneficial for the proposed use.

A number of low carbon technologies have already been implemented on a number of projects throughout the City & County of Swansea. These include; gas CHP in Swansea Leisure centre and Morrision Comprehensive school.

⁸ Renewable Energy – A number of measures have been implemented to date, but all options will be fully explored as part of this Energy Strategy Action Plan



Data Badge off unit one showing outputs and efficiency.

Reduction of co2 emissions and efficiency levels of 96% are achievable.



2 x SAV-Load tracker XRGI 20G combined heat and power units as installed in the new Morriston Comprehensive Energy centre.

Outputs of up to 20kw of electrical power and 40kw of thermal heating power per unit



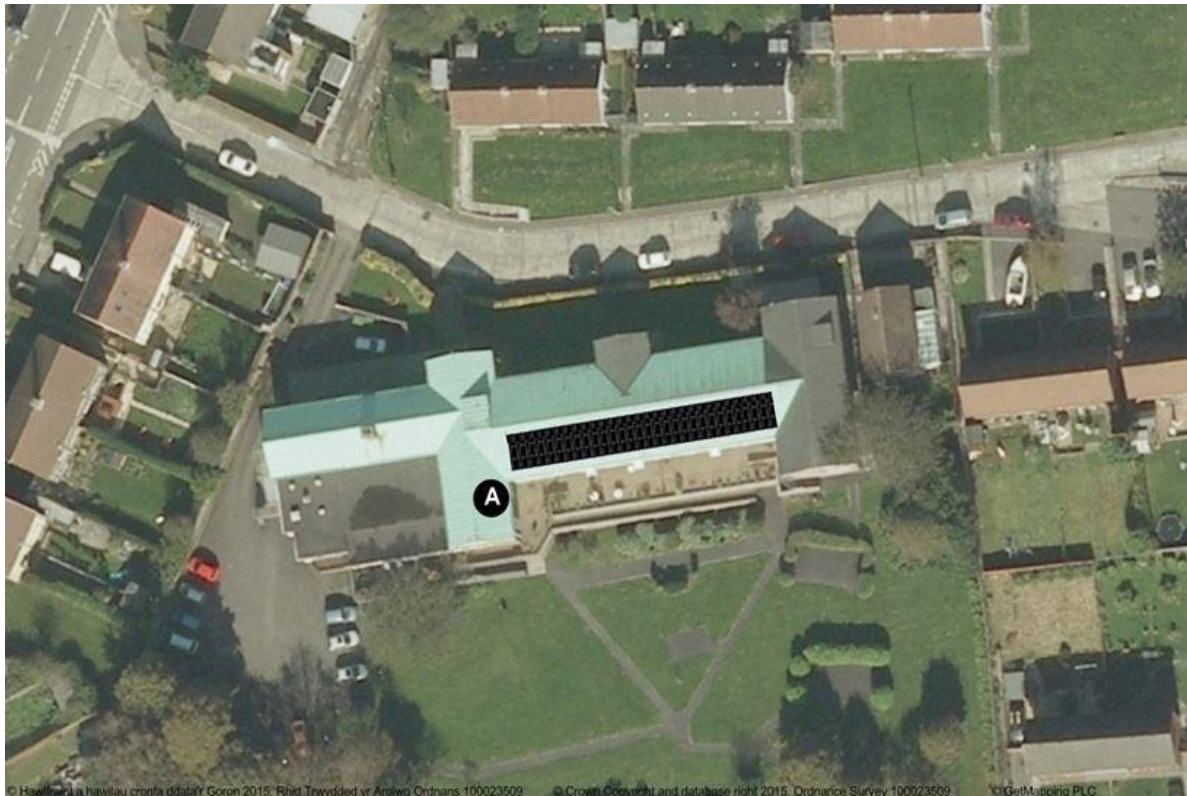
Buffer storage unit for storage of excess thermal power to enhance efficiency

Figure 6 - Morriston Comprehensive CHP Installation

4.4.1 District Energy

The City and County of Swansea have commissioned feasibility studies to explore the viability of introducing heat networks (district heating and district cooling) to existing and new development across the City. Heat networks supply heat to a number of buildings or dwellings from heat generated at a central source and supplied through a system of insulated pipes. Feasibility studies have concluded that a district heating network providing low carbon heat in Swansea is a viable option which would deliver key environmental, social and economic benefits. A number of heat clusters were identified based on the mapping of heat density across the authority. Further feasibility work, partly funded from UK Government’s Heat Network Delivery Unit (HNDU) will look at the phased development of a heat network with a start-up solution in the Maritime Quarter forming phase 1 of the network potentially connecting with two further clusters across the City Centre in phase 2. The authority is also exploring further opportunities outside of the City Centre and working in partnership with Neath Port Talbot County Borough Council to explore opportunities to utilise industrial heat as a source for the network in the long-term.





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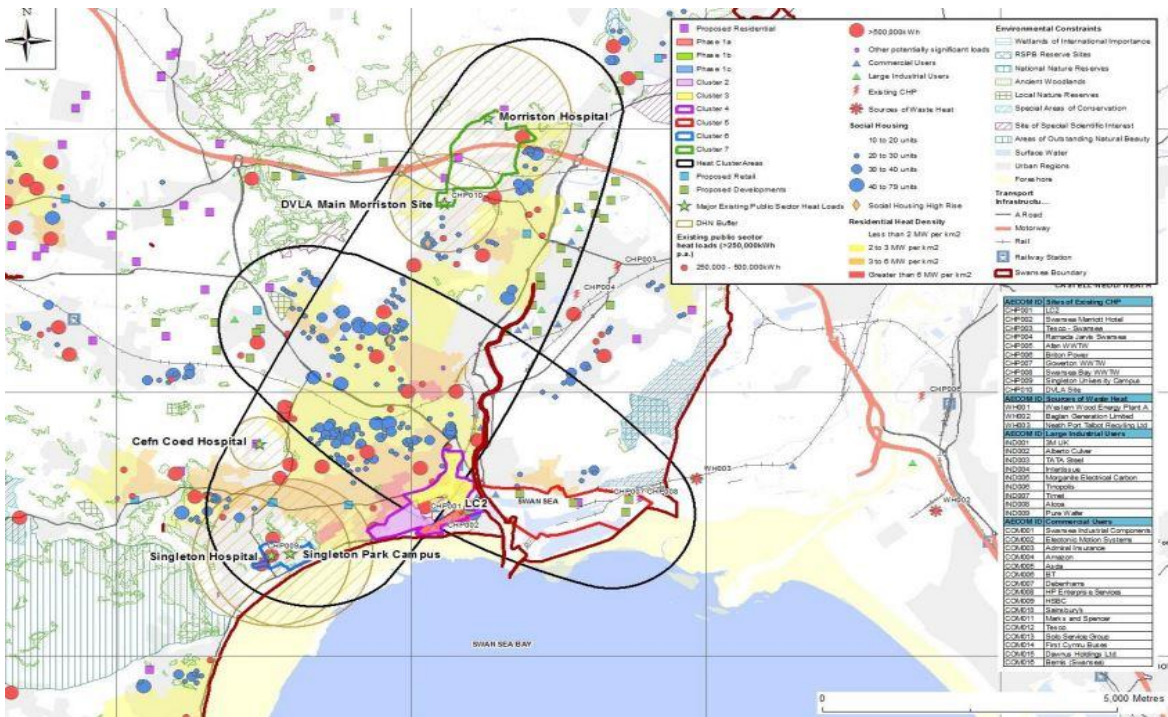


Figure 7 - District Heating Network short-medium term proposal

4.5 Conventional Energy

The conventional sources of energy are generally non-renewable sources of energy. Conventional energy sources include oil, gas and coal. These conventional sources are usually fossil fuels. Their use leads to increased greenhouse gas emissions and other environmental damage. These sources of energy have been used extensively over the years in such a way that their known reserves have been depleted to a great extent. At the same time it is becoming increasingly difficult to discover and exploit their new deposits. It is envisaged that known deposits of petroleum in our country will get exhausted in a few decades and coal reserves are expected to last for another hundred years. City & County of Swansea still uses conventional sources of energy for electricity and heating purposes but is pro-actively reducing their reliance on non-renewable sources of energy by rolling out their Carbon Reduction Action Plan and this Energy Strategy.

5.0 City Deal

The aim of the City Deal is to provide clarity of purpose, consistency of approach and focus on collective action over the next two decades. This approach will aim to tackle the structural challenges holding back our economy and reduce the gap between our performance and the rest of the UK in terms of wealth creation to the benefit of both.

The areas that the City Deal would like to develop are;

The Internet of Energy:

To create a smart and efficient “Future Energy System” that will integrate the region’s multi-billion asset base in renewable and conventional energy production and the testing and commercialising of integrated Future Energy Systems.

The Internet of Health and Wellbeing:

To advance health and wellbeing by delivering a network of health science “Media-parks”, Wellness Centres and other assets. Building on a new digital architecture we will transform the delivery of health and social care in the region and contribute to the advancement of genomic medicine in analytics and diagnostics in the UK via network based solutions; and

The Internet of Economic Acceleration:

To provide UK plc with the resilience of a new Swansea Bay international internet gateway between London and North America by developing infrastructure in partnership with the private sector that will simultaneously establish Swansea and its hinterland as a 'City of Innovation'.

In doing so, the aim is to create high technology jobs both through start-ups and by attracting inward investment in high growth areas.

Whilst the energy strategy is effectively a council strategy it is intended to encompass the wider City region and is fully aligned to its city region bid

6.0 Community Initiatives

Community-led action around issues relating to energy and climate change has grown in recent years, increasing levels of local ownership of energy generation; schemes which help neighbours reduce their energy use together and group buying of energy. This is typically financed by community investment and operated for the benefit of the local community. Over 5,000 community energy groups have been set up in the UK since 2008, with 150-300 actively developing renewable energy projects. This approach is supported by UK Government who launched a Community Energy Strategy in 2014 (updated March 2015).

The City and County of Swansea have been exploring options to promote community energy schemes which not only reduce carbon emissions but create a platform for local social and economic benefit. The Swansea Community Energy and Enterprise Scheme (SCEES) is a scheme exploring how local people in some of Swansea's most economically deprived areas can benefit from community renewable energy projects. In the first phase, the scheme aims to install solar PV on a number of schools which will lead to a reduction in carbon emissions. Surplus profits will be allocated to a community benefit fund to support the local community to develop skills, enterprise, economic growth and job creation. Whilst the scheme is still in development changes to legislation (the removal of preliminary accreditation, the

proposed reduction in Feed-in Tariff subsidies and the removal of tax reliefs on social investment) has affected the most suitable delivery option and led to uncertainty in the sector over how many schemes will be to be delivered. The scheme is aligned to the corporate plan objectives, notably tackling poverty, building sustainable communities and safeguarding vulnerable people.

7.0 Commercial Opportunities

7.1 Income generation

In spite of unprecedented budget cuts to date the local authority has taken advantage of government cash incentives for renewable energy projects (solar, and biomass) such as the Feed in Tariff (FiT) and the Renewable Heat Incentive (RHI). The Renewables Obligation (RO) is the main support mechanism for renewable electricity projects in the UK, and is available to any generator 50kWp and over in size. Smaller scale generation (Feed in Tariffs are available for anything from 0kWp to 5MWp) is mainly supported through the Feed-In Tariff scheme (FITs). Contracts for Difference (CfDs) support very large >5MW new investment in low-carbon generation (renewables, nuclear, CCS) and have been designed to provide efficient and cost-effective price stabilisation for new generation, by reducing exposure to the volatile wholesale electricity price. CfDs are contracts between the energy generator and a government-owned company (LCCC) which guarantees a set price for energy generation to stabilise revenues and reduce exposure to volatile energy prices. CFDs provide a variable top-up from the market price to a pre-agreed 'strike price'. At times where the market price exceeds the strike price the generator is required to pay back the difference thus protecting consumers from over-payment. Recently in 2015 significant changes have been made/proposed to government grants for renewable energy outlined above;

- ROC will end for all onshore wind and PV (solar) on 1 April 2016
- Pre-accreditation of projects will end on 01 October 2015 (that had allowed grants to be guaranteed for up to 12mths)
- Significant reductions are proposed for FITs for solar, hydro and wind from 01 April 2016 leading to potentially up to 87% cuts in grants in some areas or the potential cap on FIT grants to £75m /£100m pa and even a worse-case scenario of closure of the whole scheme

A number of Councils across the United Kingdom have either established their own energy companies (for example Nottingham and Bristol) or work with other partners to share risk (Sussex and Plymouth); both economic and social drivers have been key for Councils. Swansea council aim to explore the viability of developing Swansea's own energy company including the commercial and social benefits that may be derived from this activity. In addition, Swansea Council has been offered the possibility of hosting an electric charging point by one of the major manufacturers of electric vehicles – Tesla. This work seeks to understand the commercial model behind this offer and whether this adds value to Swansea's economic and environmental priorities and existing electric car charging infrastructure.

8.0 Other Carbon Reduction Initiatives

8.1 Fleet vehicles (Electric/hybrid vehicles)

CCoS has 11 electric cars in its corporate fleet, with 1 electric van on order. All are predominantly used as pool vehicles at key premises equipped with charge point infrastructure to support maximum use. Options appraisals of electric vehicles are currently being undertaken for consideration on other vehicle renewals scheduled for 2016, as well as the potential introduction of hybrid vehicles into main hub car pools to broaden the potential range of their use beyond county boundaries.

8.2 Waste to Energy/Anaerobic digestion

The Toward Zero Waste strategy document, published by Welsh Government, recommends that treating food waste by Anaerobic Digestion (AD) has significant potential to reduce greenhouse gas emissions. WG has funded a procurement programme which has aided local authorities to form regional Hubs and jointly procure contracts for the treatment of food waste at AD facilities. Swansea Council is a member of the South West Wales Hub. The Hub has procured an interim treatment contract and will procure a long-term contract to secure treatment of food waste by Anaerobic Digestion.

Swansea Council are participating in discussions with an expanded South West Wales Hub regarding the procurement of a regional Energy from Waste (EfW) treatment contract. Swansea will continue to pursue a regional treatment contract,

though should this not prove viable Swansea may have to procure a stand-alone EfW treatment contract.

8.3 Street Lighting

At the present time Swansea Council are replacing/upgrading our existing street lighting lanterns to LED'S on which is saving the Authority approximately £400K per year in energy whilst also providing CO2 savings. We will continue to upgrade our asset with energy saving street lights and continue to switch lighting back on which has previously been switched off. We are also planning to look at our illuminated signs/bollards and provide energy efficient lamps into our existing equipment and also remove illuminated street furniture which is no longer required.

9.0 External Funding Opportunities

There are a number of grant funding opportunities available to local government including;

- **Salix**, a not-for-profit organisation funded by the Department for Energy and Climate Change, the Department for Education, the Welsh Government, the Scottish Government and Higher Education Funding Council for England, removes this barrier by making this capital accessible to the public sector. Upfront capital is a common barrier for public sector organisations seeking solutions that cut their energy consumption. Salix enables public sector organisations across England, Scotland, Wales and Northern Ireland to take a lead in tackling climate change by increasing their energy efficiency. Salix provides 100% interest-free capital for the public sector to reduce their energy costs by enabling the installation of modern, energy efficient technologies and replacing dated, inefficient technologies. They have strict compliance tests of 5 year technical payback and lifetime cost of CO2 not less than £100/tonne. Therefore Solar thermal will not be an applicable technology. For further details visit www.salixfinance.co.uk.
- The **Invest to Save (I2S)** fund is a short-term pool of resources available to help public service organisations transform the way that they work. The fund supports the introduction of new or proven ways of working so that public services become more efficient and effective. The latest invest to save bidding

round for 2015-16 began 02 June 2015. Approximately £8m is available for distribution. Grants are made available interest free and offer payment holidays and flexible repayments terms up to 8 years. The fund will provide 75% of the capital required for a project, with the remaining 25% to be provided by the borrower.

- **European Investment Bank** - The European Investment Bank (EIB) is the European Union's bank. Its mission is to promote EU's objectives by providing long-term financing on favourable terms for projects that support EU objectives. EIB funds tend to be focused on large innovative projects linked to regeneration and jobs e.g. tidal lagoon
- **Green Investment Bank** - The UK Green Investment Bank was created by the UK Government, their sole Shareholder, who have committed to provide them with capital invest. They use this to back green projects, on commercial terms, across the UK and mobilise other private sector capital into the UK's green economy. Their investments help fund the creation of new, modern, green infrastructure across the UK and with that, new jobs in construction and operations. The loans are made on commercial terms and are focused on large projects.

10.0 Partnerships

APSE

APSE (Association for Public Service Excellence) is a not for profit local government body working with over 300 councils throughout the UK. Promoting excellence in public services, APSE is the foremost specialist in local authority front line services, hosting a network for front line service providers in areas such as energy, waste and refuse collection, parks and environmental services, leisure, school meals, cleaning, housing and building maintenance.

CLAW

CLAW is the Consortium of Local Authorities in Wales that supports the professional and technical interests of property management in local government in Wales.

CLAW was formed in 1962 and now works with representatives from the elected

members and officials of all Welsh local authorities together with a number of associate member organisations for the promotion of excellence in the management of property assets.

GREEN GROWTH WALES

Green Growth Wales is a suite of interventions to increase and accelerate green investment in Wales that will reduce carbon emissions, cover its own costs, create public sector saving/income over the longer term and create economic benefit including employment. It is a financial offering from Welsh Government to the public sector for investment for energy efficiency and renewable energy projects for businesses in Wales. Their vision is to see all communities and businesses using locally generated electricity and heat, from a range of renewable installations, to supply local demand and to minimise Wales' dependence on central generation.

11.0 Related Strategies and Policies

Health, Social Care & Wellbeing Strategy

Asset Management Strategy

Carbon Reduction Strategy

Commercialism Strategy

Planning Policy

Sustainable Development Policy

Local Housing Strategy

ICT Strategy

12.0 Communication, Monitoring & Review

This Energy Strategy sets out the Aims & Objectives of the City & County of Swansea. Leading on from this, an action plan will be developed, detailing the actions that the Authority will need to take to deliver their Energy Strategy. The Strategy will be reviewed annually to account for operational changes, new legislation and technology, amongst other things that may influence the roll out of this action plan. The action plan will be monitored on a monthly basis via

performance management meetings to ensure the evolving Energy strategy is driven forward and any risks/issues are mitigated as they occur.

Appendix 1 – Aims & Objectives

Energy Strategy Aim:

City & County of Swansea will contribute towards a sustainable low carbon economy by delivering an Energy Strategy that delivers real benefits to society, the economy and the environment and sets out our wider and long term aims for energy across Swansea the place, as well as the council within the context of national and international developments.

Energy Strategy Objectives:

Objective 1: To reduce energy consumption and improve the energy efficiency of City & County of Swansea’s public building and housing stock portfolio

Objective 2: To invest in renewable technologies that will benefit the council and the wider community

Objective 3: To secure or facilitate community access to affordable low carbon/renewable energy

Objective 4: Explore and maximise commercial opportunities to benefit community wellbeing and/or financial gain

Objective 5: Ensure Energy Strategy and action plan are delivered in line with current legislation

Through implementation of this action plan the City & County of Swansea will mitigate the:

- Effects of Climate change by reducing their carbon emissions
- Risks associated with Energy security by sourcing low carbon/renewable energy sources and eradicating fuel poverty
- Risks associated with increased energy costs

Benefits

- Economic Gain
- Climate Change Mitigation
- Eradication of Fuel Poverty
- Carbon reduction
- Community Engagement
- Reduced Energy Costs
- Secure & Sustainable Energy Supply

Quick Wins

- Feasibility of Wind, Hydro, Solar , Biomass on Council owned assets/land
- Feasibility of buying options (use of Frameworks)
- Feasibility of low carbon technologies on Council owned Assets such as LED lighting
- Partnerships/ Collaborative working with public sector organisations i.e. joint ventures, ESCOs, community ownership, private ownership, public sector ownership.

Risk Register

- Changes to subsidies (FITs, RHI, ROCs etc.,)
- Payback term
- Timescales
- Legislation changes
- Planning constraints
- Budgetary cuts (Swansea Council and Welsh Government)
- Lack of private sector interest
- Public Opposition
- Conflicting council priorities
- Access to capital
- Knowledge
- Ability to adapt to changes in legislation
- Energy security
- Energy prices
- Fines for missing targets
- Compliance with state-aid for seeking subsidies

Appendix 2 – Microgeneration Technologies

DECC - the department's policies on renewable energy.

<https://www.gov.uk/government/organisations/department-of-energy-climate-change>

The Carbon Trust - guidance on renewable energy FIT, ROC, RHI and CfD.

<https://www.ofgem.gov.uk/environmental-programmes>

Public funders - for energy saving initiatives (Salix, I2S, PWLB, Green Investment Bank etc.)

<http://salixfinance.co.uk/>

<http://www.greeninvestmentbank.com/>

<http://gov.wales/topics/improvingservices/invest-to-save/>

<http://www.dmo.gov.uk/index.aspx?page=PWLB/Introduction>

Ofgem - monitors FIT funding, deployment and caps, it also monitors RHI funding and deployment, Climate Change Levy etc.

<https://www.ofgem.gov.uk/environmental-programmes/feed-tariff-fit-scheme/feed-tariff-reports-and-statistics/feed-tariff-deployment-caps-reports>

Refit - the Welsh Governments subsidised energy saving refit programme.

<http://gov.wales/newsroom/environmentandcountryside/2016/160310-re-fit/?lang=en>

Resource Efficient Wales - provides support on energy, water and waste saving programmes.

<http://resourceefficient.gov.wales/?lang=en>

Welsh Government – energy policies are posted daily on the website

<http://gov.wales/topics/environmentcountryside/?lang=en>

Energy Companies – for connections, capacity constraints etc.

<https://www.westernpower.co.uk/>

http://www.spenergynetworks.co.uk/pages/getting_connected.asp

Appendix 4 (Proposed 27 August 2015 DECC subsidies, Wind, Solar and Hydro changes)

Proposed Generation Tariffs for Jan 2016 (p/kWh, Nominal prices)		Ofgem Tariffs for installations with an eligibility date on or after 1 October 2015 (p/kWh, 2015/16 values)	
Solar PV			
0 -10kW	1.63	<4kW	12.47
10 - 50kW	3.69	4-50kW	11.30
50 - 250kW	2.64	50-150kW	9.63
250-1000kW	2.28	150-250kW	9.21
> 1000kW	1.03	250-5000kW	5.94
Stand alone	1.03	Stand alone	4.28
Wind			
<50kW	8.61	0-100kW	13.73
50–1500kW	4.52	100–500kW	10.85
		500–1,500kW	5.89
>1500kW	0.00	>1500kW	2.49
Hydro			
<100kW	10.66	<15kW	15.45
		15-100kW	14.43
100-500 kW	9.78	100-500kW	11.40
500-2000kW	6.56	500-2000kW	8.91
>2000kW	2.18	>2000kW	2.43

DECC proposed move from RPI-linked tariffs to a CPI-link for new installations.

The removal of the generation tariff for new FIT applications from January 2016 if proposed cost control deployment caps are deemed unable to place the costs of the scheme on an affordable and sustainable trajectory or, alternatively, further reducing the size of the scheme's remaining budget available for the cap.

DECC do not propose to change policy around **micro CHP**, because there has been insufficient deployment to justify a review of this area and there is not therefore a sufficiently broad set of data on which to base tariff changes. We propose that the existing cap on installations remains in place, along with the trigger of 12,000 installations for a review of tariff and deployment levels.

[Consultation on the above proposed changes closed 23 October NO decision is yet announced.]

Appendix 5 – Energy Self Sufficiency case studies

Case Studies: Milton Keynes – Imagine MK 2050 Strategy

Vision - *'Milton Keynes will be a near zero carbon city with a high quality of life for all by 2050'*. The definition of 'near zero carbon' city is for near zero net carbon emissions.

Aim of the project – to gather ideas for low carbon cities and share the knowledge with project partner. The Council already had in place a Local Carbon Programme which included the Low Carbon Living Strategy and Action Plan developed in 2010 and 2012 respectively. The Imagine project used European funding to build on existing work and to share best practise across Europe.

Themes – The strategy has five themes:

1. Buildings and energy generation – zero carbon building standard for new builds, near zero carbon upgrade standard for existing buildings, energy efficiently and renewable energy use.
2. Travel – zero carbon emissions, encourage sustainable modes of transport, low carbon vehicles, technology to reduce travel need.
3. Waste and water – high recycling targets, energy form waste, zero carbon water treatment, reduce water usage per person.
4. Smart City and community – smart grid network data collection, encourage and support new technologies and partnerships, integration of services, encourage community led initiatives.
5. Greenspace and food – use of urban and rural green space for leisure, food, biomass fuel and carbon storage. Encourage local food production and low carbon diets.

The themes were chosen based on:

- Whether or not the activities directly affected carbon emissions and whether or not changes would influence a low carbon future,
- Whether or not the activities was currently being measured and if not was it measureable,
- Whether or not the activity directly affected quality of life,
- If the theme was raised by the stakeholder.

Success to date - Target to reduce carbon emission per person (i.e. across the borough) by 40% by 2020 for a 2005 baseline and to near zero carbon by 2050 or sooner. 2012 figures show that compared to the 2005 baseline per person emission has fallen by 23% (dropping from 7.8 total emission tonnes to 6.0) and that Milton Keynes is on track to meet the 2020 target. This success was achieved during the development of the 2050 Strategy and as a result of Low Carbon Living Strategy developed in 2010.

How will this be achieved –

- Develop and regularly update the Action Plan;
- Embedding carbon reduction and sustainability into all Council Plans and Strategies;
- Monitoring and auditing success;
- Promoting low carbon solutions;
- Cross Council and external partnership working and collaboration;
- Improved management and monitoring of data;
- Encouraging innovation with stakeholders;
- Linking to Economic Development Strategy;
- Focus on energy efficiency;
- Working with communities to support local projects and businesses.

Next Steps – Produce an Action Plan to deliver the strategy.

Case Studies: Haringey 40:20

Aim of Project – Target of reducing carbon emission in Haringey by 40% by 2020, improving well-being in the borough and encouraging prosperity through the development of a sustainable green economy.

Themes – The Carbon Management Plan includes the following activities all of which contribute to achieving the project aim:

- More efficient homes;
- Growing the local green economy;
- Renewables (solar);
- Research with Durham University;
- Community Energy Networks;
- Sustainable modes of transport;
- Waste minimisation (recycling).

Success to date– Since 2005 (baseline year) Haringey’s total estimated emission have fallen by 11%. This includes an over 13% reduction since 2005 in domestic emissions (i.e. energy consumption around the home), a nearly 18% reduction in transport emissions (i.e. freight and passenger transport for both private and business purposes) and a nearly 4% reduction in Business emissions (industrial and commercial electricity consumption).

Case Study: Nottingham City Council Energy Strategy 2010 – 2020

Vision – To make sure Nottingham is a future-proof city, including:

- A city insulated against high energy prices,
- Secure, low carbon energy supply and service available for business , public and domestic sector,
- A city prepared for climate change and peak oil,
- A city leading on growth in low carbon jobs, industries, services and training,
- A city exemplar of integrated low carbon heat, power and transport,
- An explore of neighbourhood community energy solutions,

- A smart city where energy flows are planned, mapped and monitored.

Aims –

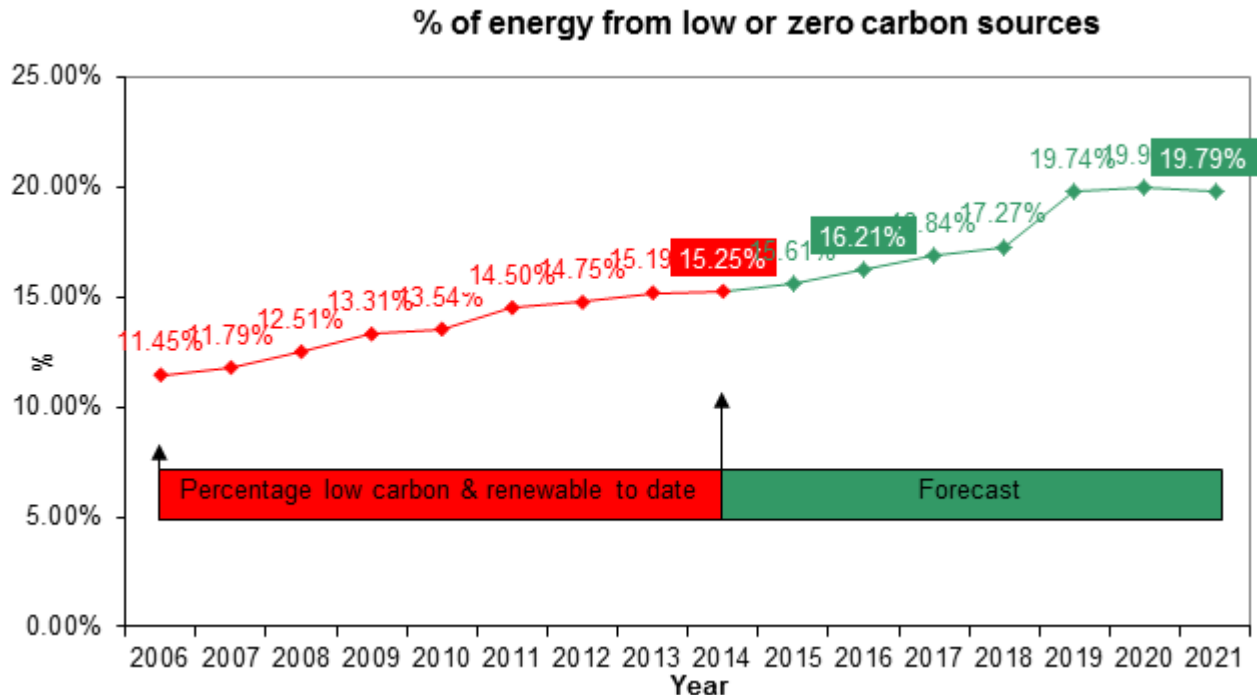
1. Reduce energy use in public sector infrastructure;
2. Reduce energy use in domestic properties and tackle fuel poverty;
3. Support increased energy efficiency in city businesses;
4. Develop alternative energy sources, supply chains and services;
5. Support low carbon transport infrastructure;
6. Create local jobs and opportunities in energy sector businesses;
7. Develop strong external and community partnerships;
8. Support local community energy initiatives.

There are SMART energy efficiently targets attached top these aims they are summarised in Table 1 on page 25 of the Energy Strategy which can be found here: <http://www.nottinghamcity.gov.uk/CHttpHandler.ashx?id=19119&p=0> The strategies principal aims by 2020 are:

- 26% reduction of carbon dioxide emissions against 2005 levels
- 20% of the City's own energy generated from low or zero carbon sources

Success to date – In the 2011 Energy Strategy Update Position Review published in 2013 shows a 21% reduction in carbon emission against 2005 levels. The report states that the Council is confident that the 2020 target of a 26% reduction will be met, predominantly through continued energy efficiency measures being installed to domestic properties.

On the 20% own energy generation target the report states that Nottingham started in a position of advantage by already generating 11.45% of our own energy from low or zero carbon. In 2011 the Nottingham was producing 14.55% of its own energy for low or zero carbon. More recent data shows that this figure rose to 15.25% in 2013. The Council states in the 2013 report that based on analysis, at present the forecasts show they will nearly meet this target (see figure below), but that the increases in the percentage of energy demand met through low and zero carbon energy will be achieved mainly through falling energy demand as opposed to a significant rise in low or zero carbon generation.



Source: Nottingham city Council, Energy Services Directorate.

Case Study – Anglesey Energy Island

The Energy Island Programme (EIP) is a partnership between public and private sector organisation which aims to use the energy to take a different approach to economic, social and environmental development which will put Anglesey at the forefront of energy research and development, production and servicing, bringing with it potentially huge economic rewards. The program focuses on:

1. Production – Investing in new low carbon energy production to help secure a stable energy future for Wales;
2. Demonstration – Establishing world-class facilities to place Anglesey as a leading location for low carbon energy innovation and demonstration;
3. Servicing – Ensuring that local companies and people benefit and take advantage of opportunities for new energy investments.

In delivering the vision it is the EIP's role to:

- Support low carbon energy developments
- Enhance employment growth
- Prepare local businesses
- Sustain communities

This will be achieved via Energy Island Framework:

Short term – Large and small scale biomass installations and supporting energy groups, energy efficiency measures, micro generation. Initial discussion and negotiation to maximise opportunities from Offshore wind Irish Sea round 3 Zone.

Medium to Long term – New build at Wylfa up to 3.2 GW, implementation of the tidal project at Skerris offshore wind base at Holyhead Port and the replanting of onshore wind farms.

Long term – Tidal power expansion and development of the hydrogen economy.

The employment benefits of the programme are estimated to have the potential to create up to 4500 construction jobs in Anglesey and North West Wales (including in the supply chain). These employment opportunities are supported by an apprenticeship programme run via Cwmni Prentis Menai and set up with the specific aim of equipping young local people with the engineering and construction skills they will need to maximise the transformational opportunities of Energy Island. The apprenticeship programme is supported by the Welsh Government.

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Welsh Government, Local Energy, Hydropower Module

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