

Neath Town Centre Redevelopment

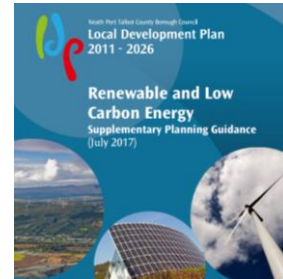
Energy Assessment

April 2020.

Phase 3: Retail & Leisure.



This Energy Assessment has been undertaken to address Local Development Plan Policy SP18 and RE2 of the Neath Port Talbot Local Plan, and Supplementary Planning Guidance



Policy SP18 Renewable and Low Carbon Energy

A proportionate contribution to meeting national renewable energy targets and energy efficiency targets will be made while balancing the impact of development on the environment and communities. This will be achieved by:

1. Encouraging where appropriate, all forms of renewable energy and low carbon technology development;
2. Encouraging energy conservation and efficiency measures in all new major development proposals;
3. Ensuring that development will not have an unacceptable impact on the environment and amenity of local residents.

As a result of increasing concern regarding the production of greenhouse gases and the implications for climate change together with the availability of energy resources, the production of energy from renewable resources and the need to make efficient use of energy has become increasingly important. In accordance with national guidance therefore, the strategy seeks to deliver a proportionate contribution to meeting Wales' national renewable energy targets and energy efficiency targets.

Renewable and low carbon energy development can include schemes such as on-shore Wind Farms, Energy from Waste (EfW), Combined Heat and Power (CHP), Biomass, Hydro-Power and Solar technologies. Whilst developments will be encouraged in principle, as a result of the significant potential in Neath Port Talbot

for wind farm development, the LDP seeks to regulate the exploitation of renewable energy while achieving an acceptable and sustainable balance with protecting the environment and the amenity of local communities. The LDP provides clear criteria against which all future proposals will be assessed.

In order to reduce the overall need to generate electricity, energy conservation and efficiency measures will be encouraged in all new development.

Policy RE2 Renewable and Low Carbon Energy in New Development

Schemes that connect to existing sources of renewable energy, district heating networks and incorporate on-site zero / low carbon technology (including microgeneration technologies) will be encouraged.

The following proposals will be required to submit an Energy Assessment to determine the feasibility of incorporating such a scheme and where viable, would be required to implement the scheme:

(a) Residential development for 100 or more dwellings;

(b) Development with a total floorspace of 1,000 sqm or more.

Development proposals which incorporate schemes that generate renewable and low carbon energy will be encouraged. The Authority has completed a 'Renewable Energy Assessment' which evaluates the potential within Neath Port Talbot to generate electricity and heat through various renewable energy technologies.

Where appropriate, development applications will need to be accompanied by an 'Energy Assessment' which investigates the potential to incorporate on-site zero and low carbon equipment and establish connections to existing sources of renewable energy. Opportunities for linking with district heating networks and where appropriate sharing renewable energy with the wider public should also be explored.

The assessment will be required to set out how the proposal can make a contribution towards increased levels of energy generation from renewable and low carbon sources. Due to their scale and potential access to waste heat, development proposals at Harbourside and Baglan Bay in Port Talbot could present significant opportunities to develop such schemes.

Further details of these requirements will be set out in “Renewable and Low Carbon Energy” Supplementary Planning Guidance, which was adopted by the Authority in July 2017.

The Supplementary Planning Guidance : Renewable & Low Carbon Energy, states that;

Policy RE2 seeks to encourage the use of renewable or low carbon energy, including the connection to existing supplies, the provision and use of district heating networks and the use of on-site renewable / low carbon technology.

The Council is generally supportive of small scale proposals such as domestic solar panel installations or proposals to install renewable energy technologies in existing buildings.

Some types of renewable / low carbon energy installation may not be appropriate for sensitive buildings, sites or areas (e.g. Listed Buildings or Conservation Areas) and in all cases, careful consideration should be given to the design of installations and their effects on the appearance of a building or area.

Schemes that are shown by the assessment to be viable will be required to be implemented as part of the development. In order to meet the requirements of Policy RE2, an Energy Assessment will need to address the matters set out below.

Energy Assessments, as required by Policy RE2 for larger scale developments, will be expected to investigate fully the feasibility of incorporating any type of renewable or low carbon energy into new development schemes. An assessment will be expected to include the following information:

- **The likely energy demand of the development;**
- **The potential for renewable / low carbon energy generation on the site;**
- **The availability and potential to connect to existing sources of renewable / low carbon energy;**
- **The potential for incorporating or being part of a District Heating System; an**
- **The potential to share renewable / low carbon energy generated on the site.**

Development Proposals.



The development includes a new swimming pool with associated leisure facilities, including a café and first floor gym. Six ground floor units, that would allow for a mix of A1 (Retail) A3 (Restaurant) and D1 uses together with a first floor library facility.

In total the development will provide 5,375 m2 of ground floor space, with an additional 1,707m2 of first floor space, together with service yard, and public realm

Based on the previous hybrid planning permission, and the subsequent Phase 2 development (with full planning), the commercial floor space approximately equates to;

Approx sq.m	Hybrid Application Totals	Phase 1	Phase 2	Proposed Development Retail & Leisure
Total Floor space	12,711sq.m	2,409 sq.m	312 sq.m	7,082.2 m2
Ground floor	8,926 sq.m	2,409 sq.m	312sq.m	5,375 m2
Remaining floor space		10,302sq.m	9,990sq.m	2,907.8 m2



Uses and quantum of development.

The current application seek permission for a leisure centre, and 6 ground floor commercial units, plus a first floor library. The commercial units are provided in differing sizes to accommodate a range of retailers/uses and occupiers suited to the town centre.

Unit Number	sqm	sqft	Use class
1	338sq m	3638.2 sqft	A1/D1
2	292sq m	3143.06 sqft	A1/D1
3	217sq m	2335.77 sqft	A1
4	193sq m	2077.43 sqft	A1
5	169sq m	1819.1 sqft	A1/D1
6	145sq m	1560.77 sqft	A1/D1
Total	1,354 sq m	14574.33 sqft	

At first floor the development proposes an additional 1,707m² (18374 sqft) of floor space (First floor Gym within the leisure centre, and library over Units 3-6) with separate access onto the main Water Street frontage to Unit 7 serving the library.

The likely energy demand of the development;

“On average, three quarters of the total energy demand of a sales outlet account for power consumption. The electricity is mainly used for lighting, air conditioning and food refrigeration. Add to this the energy required for heating the sales floor and for water heating.

Lighting

Good store design and attractive presentation of merchandise are increasingly becoming factors in competitiveness. How lighting is used in a shop can play a decisive role, in particular in the textile and furniture sectors. Moreover, legislation concerning the lighting of retail areas must be observed to prevent accidents to customers and employees.

Ventilation systems

Nearly all retail locations use ventilation systems to ensure air exchange which is mainly required for hygienic reasons. The ventilation systems that provide for a continuous inflow of fresh air are driven by powerful electric motors. On average, these systems can run for over 2,000 hours per year. Owing to the store opening times, which vary considerably across the European retail sector, the corresponding power consumption shows regional variations. But the continued trend towards longer opening hours and increased number of opening days lead us to expect that average operating hours will continue to rise across Europe.

Heating/air conditioning

Today's customers take it for granted that store environments will have a comfortable temperature. In addition to energy consumption for heating during winter time the rising average temperatures in Europe also result in increased operating hours for air conditioning systems. Here, too, regional differences have to be taken into account. Customer expectations regarding a pleasant shopping atmosphere may vary substantially from one country to the next.

Food cooling and refrigeration

The stringent requirements of European food law and the rising customer demand for convenience and fresh products call for extensive food refrigeration. The refrigeration of fresh and frozen products accounts for up to 50 percent of the energy consumption of a shop which deals mainly in food. Irrespective of whether the stores are equipped with stand-alone refrigeration units or refrigeration systems, maintaining the cooling chain and thus the product quality 365 days per year, 24 hours a day, always involves high power consumption.

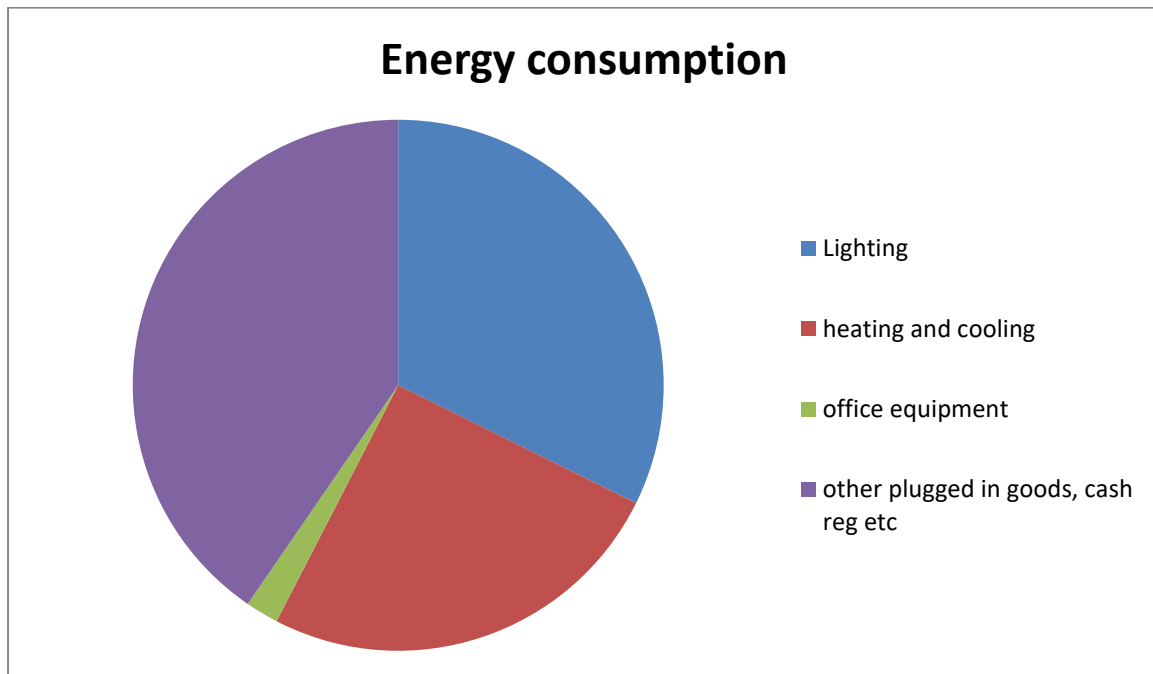
The energy consumption of a retail outlet may vary considerably depending on the format and segment. Food retailing accounts for the highest specific consumption owing to the high power consumption for food refrigeration and merchandise presentation in the fresh produce area.

Given the smaller size of cooled areas and the slightly less sophisticated shop lighting, wholesale formats with a focus on food require somewhat less power than comparable retail formats. The lowest power consumption is found in non-food formats such as DIY and furniture stores. Improving energy efficiency, especially in the field of building and technical services, would appear to be particularly reasonable for retailers in view of the high share of power consumption.

Also the internal distribution of the energy demand varies strongly among different store formats."

(Source: EuroCommerce: Retail Forum on Sustainability Issue paper on the energy efficiency of stores)

The pie chart below provide a rough outline of the main energy rubrics for non-food driven retailers.



Leisure Centre energy demands and pressures

Ventilation and air conditioning

Wet and dry leisure centres rely on efficient air conditioning (A/C) and ventilation to regulate air temperature, which is often higher than usual due to the heat gains from staff, customers, electrical equipment and lighting. This is particularly true of wet centres, where an air conditioning system is vital in ensuring the optimum temperature of the pool hall and changing facilities.

According to a recent [Carbon Trust report](#), A/C and ventilation accounts for 39% of energy costs for a typical leisure centre with a pool, so it's important to take advantage of any opportunities to save on A/C costs. Here are a few ideas on how to reduce the amount of energy used by A/C and ventilation systems.

- **Use natural ventilation where possible** — By using natural ventilation from doors and windows, the need for mechanical air circulation is reduced — ultimately saving money. Natural ventilation works best when air is able to flow between two entry points, helping cool the air throughout the space. Of course,

you should always consider the health and safety implications before opening windows and doors.

- **Close windows and doors when using A/C** — If warm, wet air is allowed into a cooled space, most A/C units will automatically switch on to re-cool the air, leading to wasted energy. To maintain a constant temperature and prevent the A/C from switching on unnecessarily, keep doors and windows closed where possible, and promote this rule among members of staff.
- **Implement a temperature ‘dead band’ on the thermostat** — Heating and air conditioning should never be used simultaneously, and this is something which is simple to avoid by implementing a temperature ‘dead band’. This is essentially a predetermined gap between when the heater and the A/C unit are able to switch on. For instance, a heater will switch off when 20°C is reached, while the A/C won’t switch on until the temperature hits 24-25°C.
- **Maintain the equipment** — For A/C and ventilation systems to work at their optimum, they need to be properly maintained. If maintenance isn’t carried out on a regular basis, an A/C unit is liable to use up to 60% more energy than a well-maintained machine.
- **Try night cooling** — Ventilation fans are a great way to cool a leisure centre with natural air, without relying on an A/C unit. Often, these can be left on overnight, resulting in ‘night cooling’. Night cooling delays the A/C from switching on the following day, helping to save a lot of energy.

Heating

Statistics from the Carbon Trust reveal that heating accounts for around 17% of energy consumed by leisure centres — a significant annual cost. Many leisure and recreation centres believe that to keep both customers and staff happy, heating must be switched on at all times, but this isn’t always the case, and often the heating system can be completely shut down without any complaints from centre patrons.

The trick to saving on heating bills is to understand the temperatures which are appropriate for different zones within the leisure centre. For instance, a sports hall, where lots of physical activity takes place, should be considerably cooler than the reception area or seating areas. Below, we provide a guide to some of the recommended heating temperatures for different zones in sports and leisure facilities.

Heating zone	Temperature (°C)
Multi-purpose sports hall	12-18 (depending on the activity)
Pool hall	25-30 (depending on pool temperature)

Gym and fitness area	16-18
Weight training suite	12-14
Squash courts	16-18
Secondary sports halls	12-21 (19-21 for non-sport activities)
Changing areas	20-25
Reception and offices	16-20
Crèche	21
Refreshment areas	18-20

*Source — The Carbon Trust

The potential for renewable / low carbon energy generation on the site.

The development provides the next phase of a wider regeneration initiative within the existing town centre, and partly replaces retail floor space and parking previously demolished,. It therefore lies within an established town centre site, with the usual constraints including the need to ensure surrounding development disruption is minimised during the construction phase.

The development is being undertaken by the Local Authority and is speculative in nature, and there are elements of the development that will be fitted out by the end user. As such whilst the physical structure of the development is a known, specific elements including the internal fit out are to be undertaken by the occupiers themselves.

Development Proposals.



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Building Fabric.

The shell and core of the development would be undertaken initially by the appointed contractor, in this case Kier. This will have to achieve current Building Regulation standards, and can be signed off at that stage.

Fit out and co2 emissions and energy efficiency of services heating etc.

An additional SBEM sign off will also be necessary for the fit out including the heating,

SBEM is a software tool developed by BRE that provides an analysis of a building's energy consumption. **SBEM** is used for non domestic buildings in support of the National **Calculation** Methodology (NCM), the Energy Performance of Buildings Directive (EPBD) and the Green Deal.

The tool is currently used to determine CO₂ emission rates for new buildings in compliance with Part L of the Building Regulations (England and Wales) and equivalent Regulations in Scotland, Northern Ireland, the Republic of Ireland and Jersey. It is also used to generate Energy Performance Certificates for non-domestic buildings on construction and at the point of sale or rent. SBEM was developed by BRE for the Department for Communities and Local Government.

The SBEM Calculation measure four specific criteria;

- Making sure the Building Emission Rate (BER) does not exceed the Target Emission Rate (TER).
- Assessing building fabric and the HVAC systems (heating, cooling and ventilation), hot water and fixed lighting systems to make sure they achieve reasonable overall standards of energy efficiency.
- Demonstrating appropriate passive control measures to limit solar gains during summer months, in order to reduce the need for air conditioning systems.
- Making sure there are the necessary provisions for enabling the energy efficient operation of the building put in place.

Renewable energy generation opportunities

Wind Energy

The application site is with a dense town centre and in proximity to residential development. Wind installations are usually situated in rural settings away from residential development and where the wind resource is least constrained.

TAN 19 sets a 500m buffer zone from residential areas in order to protect residents from noise. This is not achievable on the site. In addition to noise there is the visual effect of a large structure close to residential dwellings. In this case it is considered that even a small turbine would appear overwhelming in scale due to its close proximity to other development at this constrained site.

The above factors dictate that the site is not suitable for wind generation.

Anaerobic Digestion

Anaerobic digestion (AD) takes our pre-sorted food waste, digests it, and turns it into energy. Methane gas can be used to power electricity generators (CHP plants). Such plants are considered to be best located within large industrial site away from sensitive receptors. The development site is not suitable to locate this type of facility, which would usually be provide on a more strategic scale.

Biomass

Section 4.4: Biomass Energy Resource of the NPTCBC LDP REA (2012)

Biomass generation is possible at various scale depending on the required output. Biomass production is possible at a domestic scale but space must be available for the plant required and fuel storage. In this case it is considered that the proposals could not accommodate the fuel storage and access for large delivery vehicles that would be required for a small/medium scale biomass energy heat generating plant.

Hydropower

Section 4.7: Hydropower Energy Resource of the NPTCBC LDP REA (2012) lists hydropower resource opportunities that have been identified by Natural Resources Wales through their report 'Opportunities and Environmental Sensitivity Mapping for Hydropower in England and Wales (February 2010)'.

The nearest water sources to the proposed site are the river Neath. Hydro power would only be achievable with the use of a barrage and is therefore considered unfeasible.

Energy from Waste:

Energy from waste is the burning of pre-sorted waste in a controlled environment. Energy is recovered during the incineration process by using the heat produced to generate steam. The steam then powers a turbine that can generate electricity for local homes and businesses. Energy from waste plants can also be used to supply hot water for domestic and commercial heating. This type of facility is known as Combined Heat & Power (CHP) plant, because of the two types of energy it produces. Again this type of development requires a more strategic location, and one that cannot be accommodated within a confined town centre location.

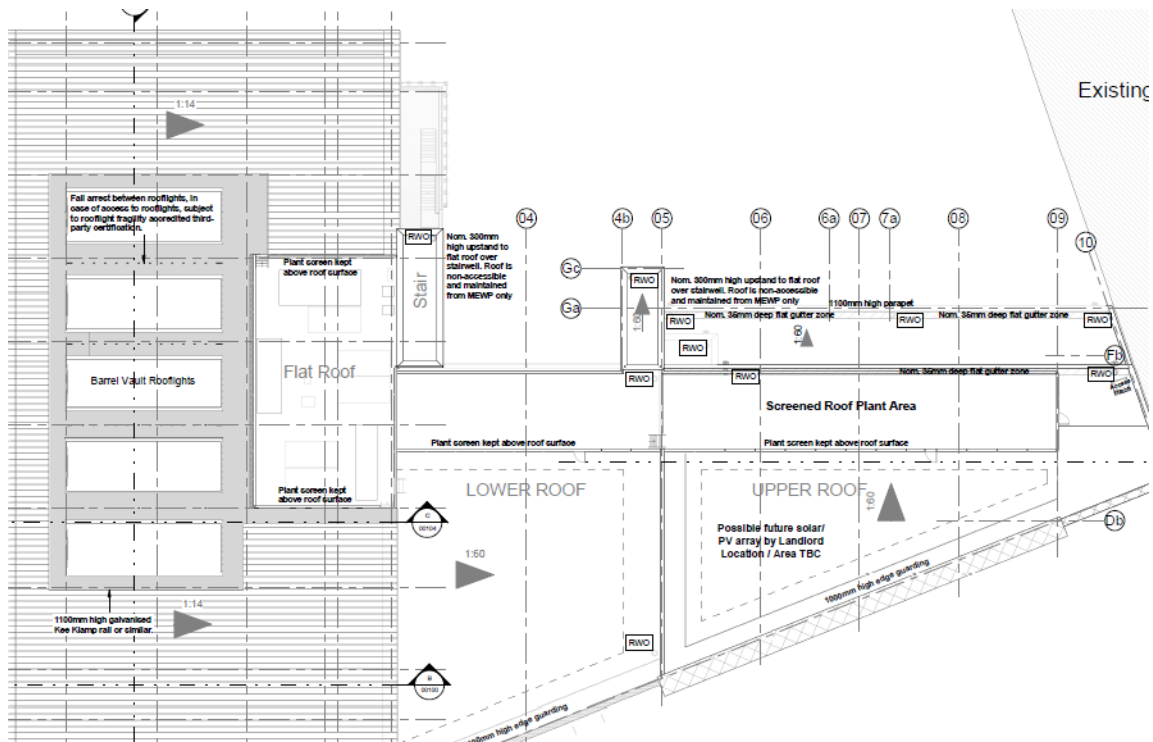
Building Integrated Renewables

Planning Policy Wales has an overarching requirement for sourcing 15% of its energy from renewable sources by 2020. Section 5.02: Building Integrated Renewables (BIR) from the NPTCBC LDP REA (2012) predicts that there is likely to be an increasing emphasis on the uptake of microgeneration and BIR technologies, and that microgeneration in NPT could play an important part in any area-wide renewable energy assessment.

Section 5.07: Modelling BIR Uptake – An Overview of the NPTCBC LDP REA (2012) acknowledges the key factors affecting uptake of BIR and microgeneration technologies are likely to be a combination of technical viability, carbon savings and the level of capital cost to a developer.

In terms of the options available there are large areas of flat roof construction clear of plant, together with areas of ridged roof that have the potential to provide approximately 1700 sqm of solar array.

These areas are indicated on the proposed roof plan.



There is the added potential of either utilising this energy within the existing building or to connect to existing development within the town centre, including the existing civic centre which lies adjacent to this site.

The availability and potential to connect to existing sources of renewable / low carbon energy;

At this time there are no existing opportunities within the immediate area to connect to any existing sources of renewable energy. However, the potential does exist for future connectivity between the civic centre and this development which both have potential for future PV installations.

The potential for incorporating or being part of a District Heating System

The site is located within an existing town centre, which is well established. The constraints surrounding the site in terms of services, and operational servicing of other retail units and uses within this predominantly pedestrianised centre, precludes a district heating proposal. In addition the viability in the short term to allow this purely speculative development to be constructed, would not extend to this type of installation.

The potential to share renewable / low carbon energy generated on the site.

As stated, there are potential opportunities to share renewable energy with adjoining development, including the civic centre, and other commercial activities with the centre, including the police station, and other larger units within the area that could combine PV installations to create a larger more integrated scheme.

Conclusion.

It is considered that the forgoing assessment provides an assessment of the opportunities and constraints of the proposed site and development, and clarifies in more details the opportunities available to achieve renewable energy opportunities within the development, through the provision of solar array to the large roof area, that can form part of a larger town centre provision, and/or supply renewable energy to this or other buildings within the immediate area.

Through the inclusion of defined areas on the submitted plans for PV. Installation, this also negates the requirement for further applications once these are installed.

As such it is considered that the proposals would accord with the principles and aspirations of Policies SP18 and RE2 of the Neath Port Talbot Local Development Plan.