Creating Sustainable Buildings and Places in North Somerset:

Guidance for energy efficiency, renewable energy and the transition to zero carbon development

Supplementary Planning Document

The first homes with net zero carbon emissions in Portishead, North Somerset

Adopted March 2015

Sustainable Building Case Study:

‘Zero Carbon Homes’ (Code for Sustainable Homes Level 6) Portishead:

Built by Halsall Construction for Alliance Homes

Key features:

- High levels of air tightness and thermal efficiency.
- Mechanical ventilation with heat recovery to harness and recycle warmth from within the home (91% efficiency).
- Energy is generated onsite through renewable energy from solar photovoltaic (PV) panels for electricity production and solar thermal panels for hot water use.

Key benefits:

- Greatly lowered space and heating demand and therefore running costs, due to very high levels of fabric energy efficiency.
- Large triple glazed windows create a well lit and pleasant living space.
- Reduced water bills due to efficient internal water fittings and appliances.
- Energy display devices allowing occupants to monitor current and historic energy use and production.
- Enhanced sound insulation.

Lessons Learnt:

- Code 6 homes are achievable and at a reasonable cost.
- Marketing and executing strategy key to success.

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Section 1: Executive Summary

1.1 The purpose of aiming to achieve *sustainability* is to ensure that a better life for our generation does not mean worse lives for future generations. Sustainable development is therefore defined as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'* Creating sustainable buildings and places is an integral part of achieving sustainable development. It's about implementing sustainable development on local sites and at individual building scale. This may take various forms, which will include:

- *Considering the environmental, social and economic impacts of the construction process;*
- *Taking account of the resources used in construction;*
- *How a building is designed and will be used;*
- *Local energy generation;*
- *Protecting and enhancing biodiversity;*
- *Providing green infrastructure;*
- *Providing buildings and spaces that are healthy for occupiers and users;*
- *Ensuring sustainable sourcing of materials;*
- *Minimising waste.*

1.2 This Supplementary Planning Document (SPD) covers the measures required to achieve sustainable buildings and places in North Somerset. The SPD provides detailed guidance on the implementation of policies for energy efficiency in both new and existing buildings, renewable and low carbon energy generation, Sustainable Drainage Systems (SuDS) and on Building Research Establishment Environmental Assessment Method (BREEAM) Assessment. It also provides information on measures that can be taken for future proofing design in a changing climate and the transition to zero carbon development, as contained within national advice and local planning documents.

1.3 The national requirement for sustainable design and construction is set out in the National Planning Policy Framework (NPPF) (paras 93-96 and 99). This supports the requirements of the Climate Change Act 2008 to reduce greenhouse gas emissions through new development.

1.4 This guidance supports a number of the Government's 'core planning principles' set out within the NPPF, in particular these relate to:

- *Seeking to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings.*
- *Supporting the transition to the low carbon future in a changing climate, through encouraging the reuse of existing resources, including conversion of existing buildings and the use of renewable energy.*
- *Conserving heritage assets in a manner appropriate to their significance.*
- *Planning for new development in ways which reduce greenhouse gas emissions.*

- *Actively supporting energy efficiency improvements to existing buildings.*

1.5 Detail contained within this SPD supports Core Strategy policy CS1: *Addressing Climate Change and Carbon Reduction* and policy CS2: *Delivering Sustainable Design and Construction*, whilst also providing an update to CS2 policy following a change in national policy.

1.6 Following the national Housing Standards Review consultation in 2013, a written ministerial statement was released in April 2014.[1] This announced the government intention to consolidate the majority of housing standards, including many of the requirements of the Code for Sustainable Homes and Lifetime Homes Standards into a national framework centred on the Building Regulations. In light of this, the government is winding down the Code for Sustainable Homes to coincide with changes incorporating the new standards.

1.7 The Building Regulations currently set minimum standards in relation to energy efficiency and water consumption. Part L1A: Conservation of Fuel and Power sets the requirements for new dwellings, Part L1B for existing dwellings and Part L2B for existing buildings other than dwellings. Part G of Building Regulations seeks to limit the domestic use of water. The government has stated that Part L will be tightened in the transition to the 'zero carbon' requirement in residential properties.

1.8 This document will be particularly useful for developers who need to ensure that their developments comply with the required standards of sustainable construction, as set out in the amended Core Strategy Policy CS2: Delivering Sustainable Design and Construction. The detail of the documentation which must be submitted with different development types is provided in the Section 2 checklist.

1.9 Sustainability principles for new buildings and places will need to be established within applications from the outset of any proposed development. It is essential designers consider the guidance in this SPD not only at the inception of their development but during procurement and construction stages, setting clear targets for delivery. This will include due consideration of construction method and material use in the building operation. It is generally acknowledged that this can minimise any additional costs associated with these measures. Where an assessment of the sustainability of a development is required (such as BREEAM), we encourage developers to engage an assessor at the earliest opportunity, as this is likely to provide the best balance between maximising the sustainability potential of the development and minimising costs.

1.10 All domestic and commercial buildings in the UK available to buy or rent must now have an Energy Performance Certificate (EPC). This indicates the energy efficiency of that building on a scale of A to G, with the most efficient ones classified as band A. The certificate uses the same scale to

[1] Ministerial statement on the Housing Standards Review, April 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/340590/13_March_HSR_Written_Ministerial_Statement.pdf

define the impact a home has on the environment, through their carbon dioxide (CO_2) emissions. Improving the EPC of a property through energy efficiency measures, will not only have the advantage of improving the thermal efficiency, but will also have reduced CO_2 emissions and should have lower energy bills.

1.11 A report commissioned by the Department for Energy and Climate Change, published in 2013 '*An investigation of the effect of EPC ratings on House prices*' has shown that making energy saving improvements to a home could increase its value by 14 per cent on average. Improving the Energy Performance Certificate of an average home from band G to E or from band D to B could mean adding more than £16,000 to the sale price of the property. The report is thought to show that more people are conscious about the energy efficiency of their new homes and are willing to invest more in a property now if they know it will cost less to run in the future.

1.12 The following checklist sets out the correct procedure to follow to achieve sustainable development through buildings in North Somerset.

Viability:

The Council is committed to delivering high quality sustainable development but recognises that in some circumstances, for example for small and medium sized enterprises - viability considerations may constrain what can be delivered. The Council will implement the requirements of this SPD in a pragmatic proportionate way and developers are strongly encouraged to talk to their planning case officer at an early stage if there are any concerns about affordability. Where a lack of viability is shown, the Council will take this into account and will seek to ensure that the policy requirements do not act as a barrier to otherwise acceptable development from coming forward.

Section 2: Checklist for designing sustainable buildings and places across North Somerset

Topic/ Section	Type of development	Considerations	Policy requirement	Supporting information
Sustainable Design principles	Residential development between 1 – 9 dwellings Non-residential development above 500m^2 Residential Developments over 10 dwellings	Applications must consider: • Land use ecology • Siting and orientation • Passive design • Thermal mass • Surface water run-off • Water use • Energy use • Material use • Waste management	Core Strategy CS2: Clause 1 - require energy efficient designs to reduce energy demand.	Submit an Energy (or sustainability) statement. Applicants are advised to discuss proposals with the council at an early stage in the development process. Pre-application discussions may be appropriate. Submit a Design and Access Statement to include details on energy and sustainability. The design and access statement template can be used.
Renewable and low carbon energy generation	Residential development between 1 – 9 dwellings Non-residential development between 500m^2 and 1000m^2	Select applicable technologies: • Solar Photovoltaic (PV) • Heat pumps (ground, air or water) • Biomass burners/ boilers • Mechanical heat recovery systems • Domestic/micro combined heat and power systems	Core Strategy CS2: Clause 2 - **10%** predicted energy demand to be met through renewable/ low carbon sources.	Within the energy statement, state how the required % of predicted energy demand will be met through renewable and low carbon sources.

Topic/ Section	Type of development	Considerations	Policy requirement	Supporting information
Renewable and low carbon energy generation	Residential development of 10 or more dwellings Non-residential development over 1000m^2	Select applicable technologies: • Hydropower • Solar photovoltaic arrays • Combined Heat and Power systems • Wind turbines • District Heating schemes	Core Strategy CS2: Clause 2 - **15%** predicted energy demand met through renewable/low carbon sources:	Within the Design and Access Statement, state how the required % of predicted energy demand will be met through renewable and low carbon sources.
BREEAM assessment	Non-residential development between 500m^2 and 1000m^2	Minimise energy demand ahead of energy efficiency and renewable and low carbon technologies. Measures via assessment criteria: • Health and Wellbeing • Management • Energy, Transport • Water, Materials • Waste, Land Use and Ecology • Pollution	Core Strategy CS2: Clause 3 - Achieving a '**Very Good'** rating	A Pre-Assessment/Design-stage report is required with the planning application. Applicants are encouraged to submit a Post-Construction certificate.
	Non-residential developments over 1000m^2		Core Strategy CS2: Clause 3 - Achieving an **'Excellent'** rating	
Zero carbon policy (post 2016)	Residential Developments between 1 and 9	Exempt. Confirmed in planning statement released by DCLG in March 2015.	N/A	N/A

Topic/ Section	Type of development	Considerations	Policy requirement	Supporting information
Zero carbon policy (post 2016)	Residential developments of 10 or more dwellings	Will need to comply with: • Fabric Energy Efficiency Standard, • Carbon Compliance, and • Apply Allowable Solutions as required.	NPPF: Paragraph 95 – '*when setting any local requirement for a building's sustainability, do so in a way consistent with zero carbon buildings policy'*	The verification and certification of the *allowable solutions* method selected will be required.
Sustainable drainage systems	All new development	Principles to follow: • Plan SuDS from start • Replicate natural drainage • Prevention and source control • Design for easy maintenance and access	Core Strategy CS2: Clause 5 - require application of best practice in Sustainable Drainage systems.	Drainage design proposals for the site should be submitted; including maintenance plans and schedules which identify the SuDS system is maintained.
Retrofitting energy efficiency and renewable and low carbon technologies	Developments of 10 or more dwellings	Some measures are permitted development (PD) and some are PD with specific conditions. Some measures will not be applicable in heritage buildings.	NPPF: Paragraph 95: - *'actively support energy efficiency improvements to existing buildings.'*	
Climate change adaptation measures	All developments	Can demonstrate: • Flood resilience measures • Methods to avoid overheating • Measures to minimise the Urban Heat Island Effect	NPPF: Paragraph 99 – '*new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. Risks can be managed through suitable adaptation measures.'*	It should be noted that the typical design life of a new home is 60 years and for a new industrial building is 30 years. Information provided on the climate change adaptation measures taken would be looked on favourably.

Section 3: Policy context

3.1 The requirement for sustainable construction standards are set out in both national and local policy, with the requirement to achieve sustainable development as the overarching principle of all planning policy. This is part of the ambition to improve energy security and reduce greenhouse gas emissions as part of tackling climate change. In recognition of this, building industry standards have emerged to be applied to the design and construction of new buildings and have increasingly been integrated into planning policies.

The EU Renewable Energy Directive (2009):

3.2 Under the Directive, the UK is legally committed to meet a renewable energy target of 15% energy generation from renewable sources by 2020.

National Policy

The Climate Change Act (2008):

3.3 The UK's legally binding commitment to reduce greenhouse gas emissions by 34% by 2020 and 80% by 2050, from a 1990 baseline. The government expects each local authority to contribute to meeting the targets and reducing overall demand for energy. Around a half of all of the country's greenhouse gas emissions come from the energy used in constructing, occupying and operating buildings, so a high standard of construction is vital to achieving these statutory carbon emission reduction targets.

The National Planning Policy Framework (NPPF) (2012):

3.4 There are twelve core planning principles contained within the NPPF, which includes at Paragraph 17 that local authorities should *'always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings; and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources.'*

3.5 Section 10 of the NPPF details: '*Meeting the challenge of climate change, flooding and coastal change'*, includes at paragraphs 93 to 96 details on reducing greenhouse gas emissions, supporting the delivery of renewable and low carbon energy and actively supporting energy efficiency improvements to existing buildings. It also asks local authorities to be consistent with the government's zero carbon buildings policy to adopt nationally described standards and to expect new development to take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Local Policy:

3.6 This Supplementary Planning Document supports policy set out in both the Replacement Local Plan (2007) Policy GDP/3 Promoting Good Design and Sustainable Construction and the Core Strategy (2012)

Policy CS1: Addressing Climate Change and Carbon Reduction and CS2: Delivering Sustainable Design and Construction. It also provides clarification as to how Policy CS2 will be implemented given changes to the national policy position in relation to the Code for Sustainable Homes and the Lifetime Homes standard.

Replacement Local Plan Policy GDP/3: Promoting Good Design and Sustainable Construction (2007)

3.7 This guidance will support policy GDP/3, in particular Clause IX:

'Whether the proposal makes a positive contribution to a high level of energy saving, over and above that required by Building Regulations, through siting, orientation, built form, renewable energy technologies, design and materials.'

Core Strategy Policy CS2: Delivering Sustainable Design and Construction (2012)

3.8 The adopted Core Strategy Policy CS2 is as follows:

'New development both residential (including conversions) and non-residential should demonstrate a commitment to sustainable design and construction, increasing energy efficiency through design, and prioritising the use of sustainable low or zero carbon forms of renewable energy generation in order to increase the sustainability of the building stock across North Somerset.

The greatest potential for energy saving opportunities is likely to be at larger scale developments particularly at the Weston Villages and Weston town centre. In addition these areas are expected to demonstrate exemplar environmental standards contributing to the objectives of Policy CS1, and adding value to the local economy.

When considering proposals for development the council will:

1. Require designs that are energy efficient and designed to reduce their energy demands;

2. Require the use of on-site renewable energy sources or by linking with/contributing to available local off-site renewable energy sources to meet a minimum of 10% of predicted energy use for residential development proposals involving one to nine dwellings, and 15% for 10 or more dwellings; and 10% for non-residential developments over 500m² and 15% for 1000m² and above;

3. Require as a minimum Code for Sustainable Homes Level 3 for all new dwellings from October 2010, Level 4 from 2013, rising to Level 6 by 2016. Higher standards will be encouraged ahead of this trajectory where scheme viability specifically supports this. BREEAM 'Very Good' will be required on all non-residential developments over 500m² and 'Excellent' over 1000m²;

4. Require all developments of 10 or more new homes to incorporate 50% constructed to the Lifetime Homes standard up to 2013 and 100% from 2013 onwards;

5. Require the application of best practice in Sustainable Drainage Systems to reduce the impact of additional surface water run-off from new development. Such environmental infrastructure should be integrated into the design of the scheme and into landscaping features, and be easily maintained. In moving towards zero carbon development, applicants will ensure that sustainable principles are established in the new proposals from the outset.'

3.9 Since adoption of the Core Strategy in April 2012 changes in national policy direction following the Housing Standards Review mean that some of the requirements set out in Policy CS2 have become out of date and will no longer be applied. The primary change is the integration of many elements of the Code for Sustainable Homes and Lifetime Homes Standards into Building Regulations. The energy and water efficiency requirements of the Code will be integrated into part L and the requirements for accessibility set out in Lifetime Homes Standards will be met through Part M of Building Regulations. The government released a planning statement on 25 March 2015 to confirm this position.

3.10 The council accepts that part of clause 3) that applying to Code for Sustainable Homes and clause 4) of policy CS2 has become out of date upon release of this government planning statement and cannot be implemented in their adopted form. Instead the council's approach will be as follows:

Code for Sustainable Homes (see section 7)

3.11 In moving towards zero carbon development, applicants will be required to adhere to standards set out in national policy. With the introduction of national zero carbon standards (from 2016), where zero carbon standards cannot be met by on-site measures; applicants will need to invest in allowable solutions. It is for the applicant to decide the method of allowable solution, but this must be agreed with the council in advance of the development commencing.

BREEAM (see section 6)

3.12 BREEAM '*Very Good'* will be required on all non-residential developments, to include offices, schools and community schemes over 500m² and *'Excellent'* over 1000m²; a design stage certificate is required to confirm adherence with this.

Lifetime Homes

3.13 The council will encourage developments to support the principle of Lifetime Homes but will not insist on the standard being met on new developments.

Core Strategy Policy CS1: Addressing Climate Change and Carbon Reduction (2012):

3.14 There are clear links with this guidance and the policy intentions of Core Strategy Policy CS1: Addressing Climate Change and Carbon Reduction. Due to the reasons stated above with regards to CS2, clause 3) relating to the application of the Code for Sustainable Homes will no longer be applied.

Section 4: Sustainable Design Principles

Core Strategy CS2 policy requirement: Requires designs that are energy efficient and designed to reduce their energy demands.

4.1 Creating sustainable buildings is crucial in the transition towards zero carbon development, as part of tackling climate change. Designing buildings that are sustainable must also take into account the health and wellbeing of future occupants. At building design stage, factors such as day lighting levels and incorporation of natural ventilation will be crucial to future health and wellbeing, more details on sustainable construction principles are outlined below.

4.2 It should be noted that buildings use energy both during construction as well as during its use. The difference in the embodied impacts (the total energy consumed by resource extraction, transportation, manufacture and construction) and the whole life cost of building materials (the impacts on the environment during manufacture, use and at end of life of the material) should be recognised. This should be one of the factors taken into account by developers when deciding between different approaches to development. There is a strong argument for the retention of existing buildings due to the embodied energy within buildings, making their re-use often the most sustainable alternative.

4.3 There is a staged approach to achieving sustainable buildings. The first is to reduce the energy demand through energy conservation and through securing good energy efficient design. This may be through appropriate siting and orientation of buildings, for example to maximise natural day lighting and ventilation or using the thermal mass of properties or indeed by using energy efficient appliances, heating and lighting controls. The second stage is to provide sustainable alternatives to energy production during the operational lifetime of the building, through providing renewable or low carbon energy generation mechanisms. This two-stage approach is called the '*energy hierarchy'* and minimises the impact of the development on the environment through reduced energy use and consequent greenhouse gas emissions.

4.4 A major proportion, around 60% of energy consumption in residential dwellings is used to heat space. Reducing heat losses through the 'building envelope' (walls, windows, doors, roof and floor) will help reduce energy consumption whilst maintaining the thermal comfort of the space. The rate of heat loss is often calculated using U-values, which expresses how well parts of a building transfer heat. High U-values indicate poor thermal performance of the building envelope. More information on methods to reduce heat losses can be found in the retrofitting section.

4.5 Increasing the proportion of energy from renewable and low carbon sources is part of a sustainable energy strategy, which will be more effective if total energy demand can be reduced. This will further reduce the reliance on fossil fuels and therefore carbon emissions.

Sustainable construction principles:

4.6 *Land use ecology:*
Opportunities should be sought to enhance and create new habitats to support biodiversity. The retention of elements of pre-existing landscapes, such as rhynes, roads and hedgerows, can help to integrate new development into its physical surroundings. Native species should be used where new planting takes place to sustain and enhance distinctiveness and local biodiversity.

4.7 *Siting and orientation:*

- The energy requirements of a typical dwelling can be significantly reduced with appropriate siting and orientation. This is through using the ambient sources of energy created by passive solar gain of natural daylight into the building.

- The largest part of the roof's surface should face south or at least SSE/SSW, so that solar panels on a roof can have maximum access to the sun.

- It is advantageous to have south/southwest facing rear gardens to allow washing to be dried naturally outdoors, thereby reducing the need to use energy intensive tumble driers.

- Where applicable, kitchens should be at the front of the house overlooking the street. This will allow natural surveillance to improve the safety of children playing in the street, reduce crime and provide good neighbour relations reducing isolation.

4.8 *Passive design:*
This takes advantage of the natural characteristics in building materials and air to help reduce the additional energy needed for heating and cooling. It is important that passive design considers the potential for overheating in the summer, as well as reducing the need for heating in the winter. Passive measures include:

- Windows situated for maximum daylight and to provide natural ventilation.
- Natural stack ventilation through chimneys.
- Conservatories and sun spaces that can capture passive solar energy.
- Sun pipes can be used to distribute natural daylight to interior spaces.

4.9 *Thermal mass:*
Building materials that are heavyweight (e.g. brick, concrete) absorb and release heat in buildings to help moderate the temperature. Optimising thermal mass can help retain heat, or if exposed, lose heat to the cooler external environment. Designing out thermal bridges (gaps) will prevent heat loss through the building envelope.

4.10 *Surface water run-off:*
This is exacerbated where there are few permeable surfaces in the urban environment. This can be reduced by adding permeability, for example through adding green infrastructure, including green roofs and trees. Drains that cannot cope during heavy downpours of rain can add to the problem. It's important to incorporate sustainable drainage (SuDS) in all

developments to prevent an increased volume of surface water run-off during heavy rainfall. Simple, natural solutions can often be possible although for some, sites engineering options will need to be explored. See section 8 for more information on SuDS. Guttering and drainage systems can be designed with increased rainfall in mind as part of a climate change adaptation strategy see section 10. The use of trees to intercept heavy rainfall, retain moisture and return water to the atmosphere through evapotranspiration will be increasingly important as the climate changes.

4.11 *Water use:*
A large proportion of water used in homes does not need to be of drinking quality. Implementing measures to reduce water use will include rainwater harvesting through using a tank to collect water, or re-using water via greywater recycling. Groundwater may also be extracted for use, where possible and permitted by the Environment Agency.

4.12 Water butts should be used to collect grey water for reuse; this can be used for gardening purposes, or where plumbed-in can be used for toilet flushing.

4.13 *Energy use:*
Monitoring equipment should be incorporated which will include meters to collect information about energy use in the building. It is anticipated that this will lead to behavioural change in the way energy is used. Buildings should be built to perform to the highest possible efficiency and details of measures can be seen in section 9.

Renewable energy generation:
It is important for buildings which generate renewable energy to maximise efficiency by using this energy as it is being generated. This may require some behavioural change in the way energy is used in the home, for example, using appliances when solar PV generation is at its peak during the daytime. The same applies to the hot water heated by solar thermal panels, to likewise where possible use this during daytime hours.

4.14 *Materials use:*
Buildings should be designed to use materials as effectively as possible, starting with the materials used in construction. Using sustainable materials, such as those with recycled content e.g. old newspapers as insulation and renewable materials e.g. FSC (Forest Stewardship Council) timber for wood floors can minimise the negative impact of material use. The distance from which materials are sourced and therefore the impact of their transportation should also be taken into consideration in material choice. Locally sourced materials are the preference in most cases.

4.15 *Waste management:*
Building construction accounts for over a third of all waste created in the UK every year. Developers must consider the re-use of materials to create new buildings and should also consider how existing buildings on a site can be retained and adapted for re-use.

Developments must include suitable waste and recycling storage facilities. The Environmental Protection Act 1990 sets out the framework for waste management.

4.16 *Cycle Parking and Storage:*
New developments should include space to store cycles that is secure, weather-proof and accessible. Cycle stores should be provided at ground level and be of sufficient size to allow the requisite number of bicycles to be stored. For all cycle parking, it is required that both wheels can rest on the ground. If car parking space is used to store cycles, this must not create issues such as pavement parking. The council's Parking Standards SPD contains more details on the required cycle parking provision within new development.

Section 5: Renewable and Low Carbon Energy Generation

Core Strategy CS2 policy requirement: require the use of on-site decentralised, renewable and low or zero carbon energy sources or by linking with/contributing to available local off-site renewable energy sources to meet a minimum of 10% of predicted energy use for residential development proposals involving one to nine dwellings, and 15% for 10 or more dwellings; and 10% for non-residential developments over 500m² and 15% for 1000m² and above.

Local support for renewable and low carbon energy generation:

5.1 North Somerset Council is committed to the deployment of renewable and low carbon energy generation measures.

5.2 We aim to:

- Maximise the potential for local economic, environmental and social benefit in implementation of renewable and low carbon energy generation.
- Facilitate renewable and low carbon energy development that is appropriate in North Somerset.
- Encourage a high degree of community involvement, understanding the benefit from using energy more efficiently and developing North Somerset's renewable and low carbon energy resources.
- Enable North Somerset to play its part in reducing greenhouse gas emissions in line with local, regional, national and international targets.

5.3 We want to work with other local authorities, partner organisations and community interest groups across the district to fulfil these ambitions.

Which renewable and low carbon technologies are most suitable?

5.4 Using the renewable and low carbon energy generated on site is far more efficient than exporting to the national grid system. Currently approximately eight percent of the power generated in the UK is lost in transmission and distribution.[2] Therefore the shorter the distance electricity travels the better.

5.5 The council does not prescribe the type of renewable energy for individual applications to meet the policy requirement, but instead advocates that a range of technologies be explored. The developer should choose a technology that gives the best environmental performance, is cost effective and has no insurmountable impacts on the surrounding area. In each instance through the development of the design and feasibility, the available wind, solar and other resources should be considered[3].

5.6 The range of individual building scale technologies include:

[2] http://data.worldbank.org/indicator/EG.ELC.LOSS.ZS
[3] Regen SW resource assessment for wind and solar in North Somerset (2014) can be viewed at: www.n-somerset.gov.uk/renewables

- Solar photovoltaic and solar thermal panels.
- Heat pumps (air, water or ground).
- Biomass burners and boilers.
- Mechanical heat recovery systems.
- Domestic/micro Combined Heat and Power systems (CHP).

5.7 Technologies which may be suitable for larger scale developments:

- Hydropower.
- Solar photovoltaic (PV) arrays.
- Combined Heat and Power systems (CHP).
- Wind turbines.
- District heating schemes.

5.8 There are a range of issues to consider when selecting which technology to use:

5.9 **Solar Photovoltaic (electricity) or solar thermal (hot water) panels:**

- When installed will need to face roughly south and can be mounted on the ground as well as on roofs.
- Will need to be located in a shade free location and tilted to gain maximise output.
- For thermal systems, the pipe running to the hot water tank should be kept as short as possible.
- Thermal systems require a relatively large hot water storage tank (50 litres per metre of panels, so likely to be around 200 litre required).
- In Conservation Areas or on a Listed Building, it is inadvisable to propose siting panels on principal elevations where they can be seen from a public viewpoint such as roads.
- Solar tiles or slates should be used when panels are not considered appropriate.
- Solar PV schemes are currently eligible for Feed-in Tariff and solar thermal technologies are currently eligible for Renewable Heat Incentive.
- Both types of panels are most effective when electricity or hot water is used as it is generated, so some behaviour change may be required.

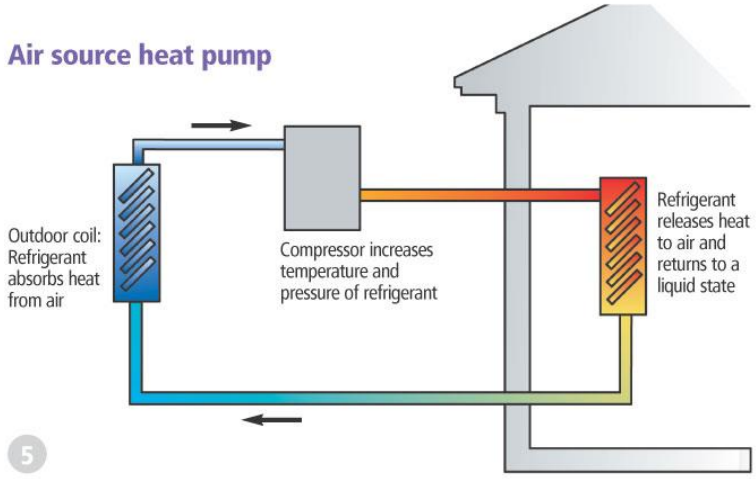
Anticipated energy demand from typical sized properties for solar thermal panel requirements:

Size of property	**Annual energy demand for Domestic Hot Water**
2 bedroom terraced house	2000 kWh
3 bedroom semi-detached house	2500 kWh
4 bedroom detached house	3000 kWh

5.10 **Heat pumps – Ground [GSHP] or Air [ASHP]:**

- A low carbon, rather than a renewable source of heat as it requires some electrical input.
- Can be located almost anywhere on a building, but pipe runs should be as short as possible.
- No need for an external flue or any ventilation.

- A well-insulated and relatively airtight property is required for an effective system, therefore not generally a suitable option for older traditional buildings.
- For GSHP, it is essential to ensure ground conditions are suitable and are best installed at building construction stage with sufficient land area to obtain available heat. The collector needs to be sized correctly to the pump size, or issues such as freezing ground can be experienced.
- Geothermal heat may be utilised where there is a smaller available space next to the property.
- For ASHP in most instances the heating requirement of the building can never be entirely dependent on the heat output from the pump.
- Careful consideration will need to be given when a building is in a Conservation Area.



5.11 **Biomass burner and boilers:**

- Can use logs, pellets or wood chips depending on requirements and supply.
- Burners typically generate around 6-12kW and boilers generate around 15 kW of heat.
- Existing fireplaces and chimneys are ideal for siting modern stoves, but may need to be upgraded.
- Systems can provide both space and water heating even in poorly insulated buildings, so this is a good option for traditionally built properties.
- A sustainable wood supply and storage area is required.
- Details of related emissions will be required with planning applications.

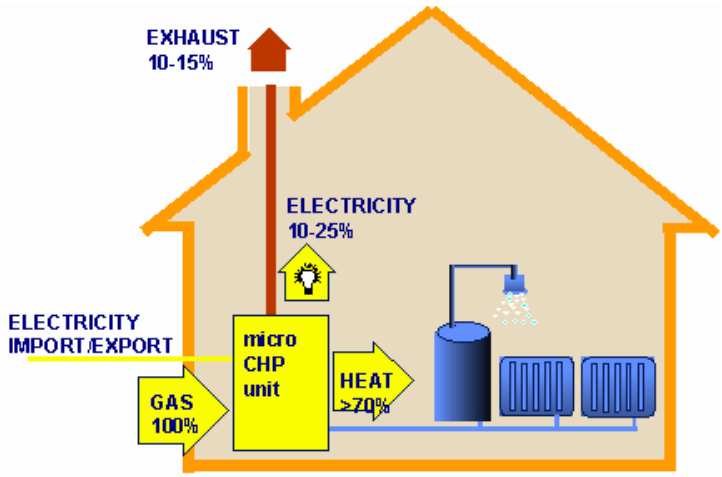
5.12 **Mechanical Heat Recovery systems:**

- A low carbon, rather than renewable source of heat.
- It uses electrical energy to operate, this is only likely to benefit in reducing the energy in larger homes.

5.13 **Micro Combined Heat and Power systems:**

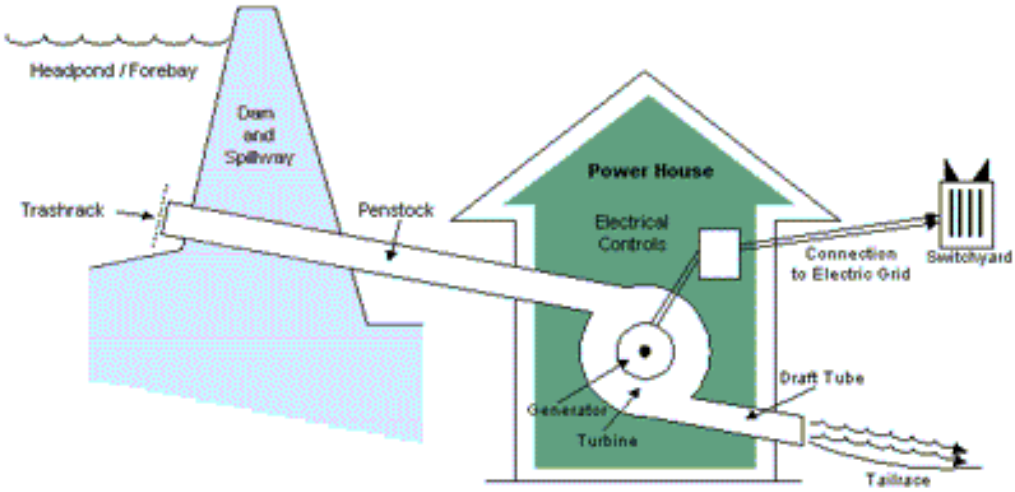
- A low carbon, rather than renewable source of energy.
- A gas boiler that generates electricity as well as providing space and water heating.
- Electricity generated can be eligible for Feed-in-Tariff.

- Can be noisy, so best situated in garage or utility area.



5.14 **Hydropower:**

- Not suitable for many locations, as requires a river or stream with a good flow rate.
- Can provide a reliable source of electricity all year round, though generation is usually higher in winter than in summer.
- Planning permission will normally be required if dams or sluices are to be used.
- Water abstraction licenses will need to be obtained from the Environment Agency.



5.15 **Solar PV arrays:**

A Supplementary Planning Document for solar PV arrays development has been produced which sets out the requirements for developments in North Somerset.

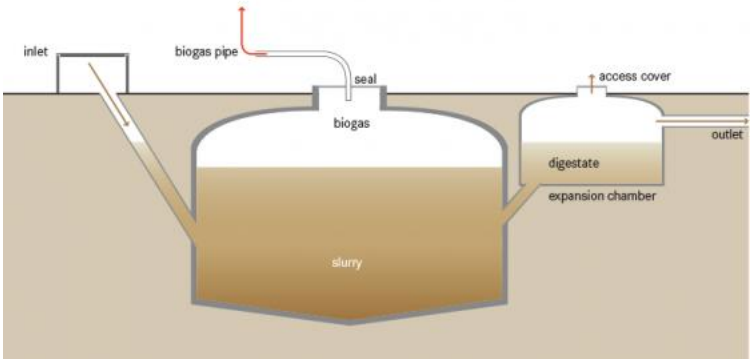
5.16 **Wind turbines:**

A Supplementary Planning Document for wind turbine development has been produced which sets out the requirements for developments in North Somerset.

5.17 **Anaerobic Digestion facilities:**

- The developer will need to consider emissions and nuisance issues such as bio-aerosols and odour.

- Outlets and environmental implications for digestate from residual treatment processes should be explored.



5.18 **Combined Heat and Power (CHP) systems:**

- These are best applied to schemes of at least 1MW electrical capacity and around 1,000 homes.
- Solid wood can be used where the steam drives a turbine to produce electricity – but this is only good for large industrial operations.
- Biodiesel CHP uses fuel from vegetable oil, but this has a higher maintenance and shorter life capacity.
- May utilise waste heat from industrial processes or burning solid waste.

5.19 **District Heating schemes:**

- To run efficiently, systems need to run for 13-14 hrs a day.
- Suited to mixed use developments with a relatively high density of buildings, as the majority of the heat needs to be used.
- 50 dwellings per hectare historically justified implementation, but zero carbon homes requirement likely to mean that will be applied at lower densities.
- Provides instant access to hot water with no need for cylinders which frees up extra space in the property.
- Once the network is installed, if not initially powered by renewable energy, should be fuel flexible, so that it can be used in the future.

5.20 If it is considered that achieving the stated percentage of renewable energy is unfeasible or unviable, evidence should be supplied demonstrating that the range of available technologies, including the above, has been explored. In these cases, where a sufficient case is put forward a reduced percentage may be negotiated. See section 11 viability assessments for more detail.

Section 6: BREEAM assessments

Core Strategy CS2 requirement: requires non-residential developments of over 1000m^2 to meet BREEAM 'excellent' standard and those over 500m^2 to achieve 'very good' standard. A design stage certificate is required to confirm adherence with this.

6.1 The Building Research Establishment Environmental Assessment Methodology (BREEAM) is used for assessing best practice in sustainable building design, construction and operation of non-residential buildings. It is used to improve, measure and certify the social, environmental and economic sustainability of these buildings. BREEAM is assessed using a system of credits in the following nine assessment categories:

- *Health and Wellbeing*
- *Management*
- *Energy*
- *Transport*
- *Water*
- *Materials*
- *Waste*
- *Land Use and Ecology*
- *Pollution*

6.2 The BREEAM assessment drives the priority measures towards minimising the energy demands of a building, before considering energy efficiency and renewable and low carbon technologies, using the principles of the energy hierarchy.

6.3 The Building Research Establishment (BRE) have produced a BREEAM New Construction technical manual 2014, which should be used at project inception to ensure that BREEAM certification is followed.

6.4 BREEAM certification not only applies to new construction, there are also standards for refurbishment and an overarching aspiration for large developments creating BREEAM certified new communities.

6.5 A Pre-Assessment or (design stage) report is required to be supplied with the planning application. Applicants are also encouraged to submit a Post Construction (PC) certificate. However, the costs of providing this documentation should not be at the expense of contributions to other elements/S106 items and/or other policy requirements where schemes are close to the margins of viability.

Section 7: Zero carbon policy

Principle: In moving towards zero carbon development, applicants will be required to adhere to standards set out in national policy. With the introduction of national zero carbon homes standards (from 2016), where zero carbon standards cannot be met by on-site measures; applicants will need to invest in allowable solutions. It is for the applicant to decide the method of allowable solution, but this must be agreed with us in advance of the development commencing.
N.B. National zero carbon policy implementation is yet to be finalised. Local policy will be in line with national policy when this is introduced.

7.1 Government continues to move towards increasingly more stringent standards of environmental sustainability, recognising the responsibility to deliver more sustainable development. Building design and reducing carbon emissions from new development is a key aspect of this. The government ambition is to make all new homes zero carbon from 2016 and non-domestic buildings zero carbon by 2019, as first set out in the Department of Communities and Local Government policy statement *'Building a Greener Future'* in 2007.

7.2 The zero carbon standard relates to carbon emissions which are classified as 'regulated emissions', those from the energy used to provide space heating and cooling, hot water and fixed lighting, as outlined in Part L1A of the Building Regulations. The zero carbon standards will not apply to unregulated emissions, which are those resulting from cooking and 'plug-in' appliances such as computers; these are not addressed in the zero carbon definition.

7.3 Developments of between 1 and 9 dwellings will be **exempt** from meeting the zero carbon standards. This was confirmed in a planning statement released by DCLG in March 2015.

Meeting the required zero carbon standard

The exact delivery mechanism of this will be confirmed, but will be based on the following:

7.4 To meet the current Zero Carbon Standard[4], carbon dioxide emissions from regulated energy use must be limited through a combination of three core requirements:

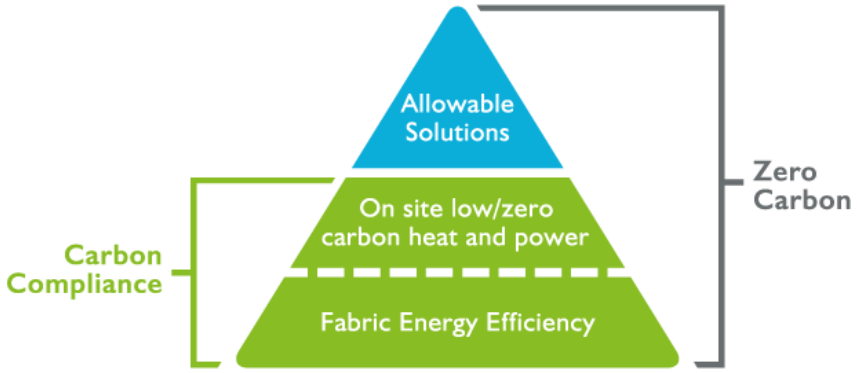
1. The fabric performance of a building must as a minimum, comply with the ***Fabric Energy Efficiency Standard*** (FEES). The FEES is the proposed maximum space heating and cooling energy demand for zero carbon homes. This is the amount of energy which would normally be needed to maintain comfortable internal temperatures in a dwelling. This is measured in kWh/m^2/year and is the first step to achieving carbon compliance.

2. The ***carbon compliance*** limit must be met. This is the maximum permitted amount of carbon emissions (plus other greenhouse gas

[4] The final standard will be determined by the Government for implementation in 2016

emissions) that remains after consideration of heating, cooling, lighting and ventilation and with the implementation of renewable and low carbon technologies. This is measured in $kgCO_2/m^2$/year.

3. The remaining carbon dioxide emissions (after requirements 1 and 2 have been met) must be reduced to zero, or met by investing in ***Allowable Solutions***.



Allowable solutions:

7.5 The exact detail for the allowable solutions mechanism will be developed through a detailed design model ahead of 2016. But the principle is that the carbon emissions which cannot be cost-effectively offset onsite, once carbon compliance has been achieved, will need to be met via four potential routes:

1. All carbon reduction measures are met on-site or through connected measures (e.g. a heat network).
2. Remaining carbon reduction requirements can by met off-site via carbon reduction action (e.g. retrofitting existing buildings).
3. A third party can deliver the carbon reduction measures.
4. A payment can be made into a fund, which then invests in carbon reduction projects.

7.6 Legislation will provide powers to enable the framework for allowable solutions to be established through Building Regulations. There will be a ceiling price for allowable solutions.

7.7 Verification and certification of the method selected will be required to be agreed with the council prior to commencement of any scheme.

7.8 There are a variety of approaches that can be taken to achieve zero carbon compliance, these include:

a. *Balanced approach:* fabric performance at *Fabric Energy Efficiency Standard* (FEES) level, focusing on renewable and low carbon technologies. This achieves overall emissions at or below the *carbon compliance* level. The remaining emissions are met through *allowable solutions*.

b. *Extreme fabric approach:* with fabric performance significantly higher than the FEES, high efficiency is achieved with little or no renewable

energy. This will have overall emissions at or below the *carbon compliance* level, again the remaining emissions are eliminated via allowable solutions. The Passivhaus standard[5] is an example of this.

c. *Extreme Low Carbon Technologies:* This approach uses only fabric and on-site energy solutions (no allowable solutions) it therefore relies on high fabric performance (considerably higher than FEES) and extensive use of sustainable technologies (to beyond the carbon compliance standard). This is a highly aspirational approach. This is likely to be a more costly approach and technically more difficult to achieve on some sites, compared with the other two approaches.

Costs of building to zero carbon homes standards:

7.9 A report commissioned by the Zero Carbon Hub in 2014 investigates the likely costs incurred with building to zero carbon homes standards. The report found that in many scenarios considered, the cost of building to the proposed zero carbon standard had roughly halved since cost estimates were published in 2011. The report indicated that at 2014 prices, the typical additional cost of building a semi-detached house to the zero carbon standard could be less than £5,000. It is impossible to estimate with absolute precision what the costs could be for every type of house in every scenario, but what was evidenced is a trend of significant cost reductions over time. Furthermore, projections suggest that costs may continue to fall between now and 2020.

7.10 Developers are advised to innovate and evolve in order to keep prices as low as possible.

[5] Passivhaus – where the heat losses of a building are reduced so much that minimal heating is required. Passive heat sources like the sun, occupants, household appliances and the heat from the extract air cover a large part of the heating demand.

Section 8: Sustainable Drainage Systems

Core Strategy CS2 policy requirement: Require the application of best practice Sustainable Drainage Systems to reduce the impact of additional surface water run-off from new development, in-line with the requirements of the forthcoming national standards for SuDS. Such environmental infrastructure should be integrated into the design of the scheme and into landscaping features and be easily maintained.

8.1 Flooding can threaten lives and cause substantial negative social and economic effects to people, property, infrastructure and agricultural land. Historical flooding within North Somerset has demonstrated these devastating effects. There have been a number of significant flooding incidents in North Somerset in 1968, 1989-90, 2008 and more recently in 2012 which was the second wettest year on record in the UK. Indeed, during 2012 it is estimated that approximately 340 properties flooded internally across North Somerset. As part of our strategy to manage flood risk we are using Sustainable Drainage systems.

Surface Water Flooding at Elm Tree Road in Locking (2012)

8.2 Core Strategy Policy CS2 (clause 6, outlined above) and CS3: *Environmental Impacts and Flood Risk Assessment*, require best practice in Sustainable Drainage Systems to reduce the impact of additional surface water run-off from new development.

8.3 Sustainable Drainage (SuDS) approach regards rainwater as a natural resource, whereas traditional approaches have always regarded rainwater as being waste with the aim of discharging water as quickly as possible. SuDS approaches aim to manage runoff from development, so that it not only delivers effective long-term site drainage, but it also minimises impacts on the receiving environment. SuDS philosophy and concepts are not new with many existing developments in North Somerset already taking this approach.

Example of SuDS attenuation ponds: Portishead

8.4 There are many benefits to communities met through SuDS, these can include:

- Health and wellbeing of the communities they serve.
- Increased biodiversity and habitat creation.
- Improving access to recreation in clean water environments.
- More aspirational development and places.

Example of SuDS swale: Long Ashton

8.5 The council welcomes pre-application discussions and will look for a proof of concept plan and drainage strategy or Masterplan, which is based on known drainage and flooding information on the site. Early pre-application discussion will allow time for integration of sustainable drainage into the design of a site and use the water as a resource and manage flows across the site. Consultations undertaken at this stage will reduce the time and cost of doing so in later stages. This approach to SuDS is set out in the councils joint guidance document *West of England Sustainable Drainage Developer Guide* (available soon) and *North Somerset's Sustainable Drainage Design Guidance* (available soon) which offers advice on the implementation of policies CS2 and CS3.

1. Plan SuDS from the start:

- Use a proof of concept plan to look at the opportunities and constraints on a site.

- Built up areas are designed to be outside of potential flood risk zones and flow routes, and open spaces can be designed to accommodate exceedance flow routes.

2. Replicate natural drainage:

- Runoff should be reduced to greenfield rates where possible.
- Designs should be integrated with the rhyne network in Internal Drainage Board areas.

3. Prevention and Source Control:

- Good site design should identify opportunities to make use of water as a resource through rainwater reuse and harvesting.
- Source control techniques should be used to infiltrate runoff into the ground where site conditions allow.

4. Integrated design:

- Sustainable drainage approaches should be integrated within the layout of the development. Drainage features can be integrated into green spaces, amenity and habitat areas.

5. Design for easy maintenance and access:

- Design should allow for undertaking future maintenance and plans should be prepared to define future responsibility for the system.
- Design should consider the whole life of the development.

6. Use the SuDS management train, which includes:

Prevention: At an individual property level water can be controlled by a simple water butt, green roof or by rainwater harvesting. The use of green roofs can contribute to the insulation of a property and provide a roof garden; rainwater harvesting can reduce water bills, in all cases surface water leaving the property is reduced.

Source Control: No space is too small; water can be infiltrated into the ground via green spaces, rainwater gardens or permeable paving so that the amount of water that goes beyond the property boundary is reduced. Bioretention provides small storage areas before water is infiltrated and can be connected to site control features.

Site Control: Where surface water needs to be conveyed over the site, above ground systems are recommended, with a network of swales and ponds which follow the natural drainage pattern of the site.

Regional Control: On larger sites and phased developments the downstream management of run-off for the whole site may be more appropriate with wetlands and ponds.

8.6 SuDS approaches are not a one size fits all type of system, due to topography, ground conditions and the size of the site; it may be that a combination of the above needs to be part of the solution.

8.7 The key to good SuDS design is to integrate water as part of the amenity space or habitat requirements and to use it to manage diffuse pollution. Susdrain[6] have shown in recent case studies that SuDS design can account for a 5% to 10% saving on capital costs compared with traditional systems. Long term maintenance of above ground systems is also shown to be less than traditional systems.

8.8 One of the biggest advantages for SuDS is that it can create a community space and reduce the surface water runoff helping to manage the risk of flooding to property and people downstream. Meeting sustainable drainage criteria as set out in the West of England Sustainable Drainage Developer Guide (available soon) and Section 2 of North Somerset's Sustainable Drainage Design Guidance (available soon) will fulfil these requirements.

8.9 Maintenance and access to the SuDS components is important over the lifetime of the development. Access for grass cutting and/or maintenance of a minimum of five metres will be required, as in many cases vehicle access will be required. Detailed maintenance plans and schedules which give clear guidance on how the system is maintained and details of the owners of the various elements are part of the planning requirements when submitting an application.

[6] Susdrain, delivered by the Construction Industry Research and Information Association: http://www.susdrain.org/

Section 9: Retrofitting energy efficiency, renewable and low carbon technologies

Principle: Renovation and retrofitting of buildings, including those of a traditionally constructed nature (solid wall buildings predating 1919), should provide an account of what energy efficiency measures can and will be achieved based on conservation principles.

9.1 Approximately 70% of existing buildings will still be in use in 2050 and around 45% of emissions in the UK derive from buildings, it is therefore vital that we make these homes as energy efficient as possible through low carbon retrofitting measures. The diversity of our housing stock in terms of age, use, material, build type and quality, thermal mass, location, orientation and occupancy, means that solutions need to be specifically tailored to the building or group of buildings in question. Investment made in energy efficiency, renewable and low carbon technologies becomes increasingly attractive as fossil fuel prices rise, and also as other issues such as energy supply, security and future-proofing become more important.

9.2 Some energy efficiency, renewable and low carbon measures are classed as permitted development through the General Permitted Development Order 1995, therefore do not require planning permission for their installation. However, most measures are subject to meeting specific criteria and conditions in order for development to classify as permitted development.

9.3 Permitted development **never applies** to any grade of Listed Buildings.

9.4 Retrofit measures that are permitted development with no specific conditions include:

- Draught proofing doors, windows and floors.
- Secondary glazing.
- Internal wall insulation.
- Cavity wall insulation.
- Loft insulation.
- Ground source heat pumps.
- Mechanical ventilation heat recovery systems.

9.5 Measures that are permitted development given specific circumstances and conditions being met include:

Measure	**To comply must:**
Rafter insulation	Have no external alteration, including changes in roof, chimney, flue or ventilation pipes.
Floor insulation	Check with building control will be required. Advice required on whether insulation is appropriate for building type, to avoid risk of condensation.

Fuel efficient or Biomass boiler and flue	The flue must not exceed roof height by more than 1 metre. If in a Conservation Area or AONB the flue must not be located on a wall or roof slope which fronts a highway and forms either a principal or side elevation of the dwelling.
Double or triple glazing	Materials must be of similar appearance to the rest of the property and the property must not be subject to an Article 4 Direction (which removes permitted development rights).
External wall insulation	Insulation must not exceed the roofline. If on the principal or side elevation, must not protrude beyond windowsills or surrounds. It must not necessitate the alteration of the roof or any chimney, flue or ventilation pipe and the finish must be of similar appearance to the materials used in the construction to the exterior of the rest of the property. Advice required on whether insulation is appropriate for building type, to avoid risk of condensation. If within a Conservation Area, or AONB the installation when applied to the side elevation must not project beyond any windowsills or surrounds on that elevation.
Roof or wall-mounted Solar PV and thermal panels	Panels must not protrude more than 200mm from the roof or wall surface; nor exceed the height of the highest part of the existing roof. Must be sited to minimise the effect on the external appearance of the dwelling and the amenity of the area. If the property is in a Conservation Area the panels must not front onto a highway.
Free-standing solar PV and thermal panels	Must not be any other arrays in the curtilage of the property. The array must not exceed 4 metres in height; must be at least 5 metres from the boundary of the curtilage. The panel area must be less than $9m^2$, or any one dimension of the array must not exceed 3 metres. If the property is in a Conservation Area the panels must not front onto a highway.
Air source heat pump	Mustn't be an existing air source heat pump within the building curtilage. No wind turbine can be installed at the property. The volume of the outdoor compressor unit must not exceed $0.6m^3$ and the pump must be more than 1 metre from the boundary. If installed on a flat roof, should not be within one metre on the external edge. If within a Conservation Area, it should not be installed on a wall or roof fronting a highway or between the main building and the highway. The pump should be sited so as to minimise its effect on the amenity of the area and the appearance of the building.

9.6 Measures that will require planning permission include:

Wind turbines exceeding 15 metres in height.

Specific retrofitting measures for traditional/heritage buildings

9.7 Traditionally constructed buildings (generally considered to be buildings built before 1919) account for about 20% of existing housing stock in North Somerset. Traditionally constructed buildings behave and perform differently from more modern properties, in some cases rendering new technologies incompatible.

9.8 There is a strong argument for the retention of old and historic buildings. Heritage buildings are inherently sustainable as they are likely to have been built by local craftsmen with locally sourced materials and their 'embodied energy' (the total energy consumed during the resource extraction, transportation and manufacture) over their long lifespan is good, although their energy efficiency is often perceived as poor. Historic buildings present unique challenges and technical issues when implementing energy efficiency and retrofitting renewable and low carbon energy generation measures.

9.9 There are a range of retrofit measures which are suitable for heritage buildings which will include:

Roof insulation (ceiling or rafter): Natural fibre materials (such as sheep wool or hemp fibre) should be used in traditionally constructed houses, as these do not hinder movement of moisture. Fibreglass and mineral wool should be avoided, as they have a tendency to hold moisture and increase the risk of damp and timber decay.

Breathable Renders: Lime renders (including for internal applications) can be used as an insulating material.

Floors Insulation: between the floorboards and carpet can be fitted. On ground floors *Limecrete* or similar can provide an insulating vapour permeable alternative to solid concrete and can be applied underneath traditional flagstones.

Secondary glazing: Secondary glazing is a fully independent window system, installed to the room side of existing windows. The original windows remain in position and in their original unaltered form. Fixed forms of secondary glazing can be used, which are designed to be removed in warmer months when the thermal benefits are not required.

9.10 Retrofit measures unlikely to be applicable to heritage buildings:

Internal/external solid wall insulation: wall insulation can be problematic for traditional buildings. Internal insulation reduces the size of the room and can affect traditional decorative features. External insulation can conceal the appearance of a building that gives it its character. In terraces or semi-detached buildings it can also make the building project out from the building line.

9.11 The Centre for Sustainable Energy has produced guidance for traditional home owners on the installation of appropriate energy efficiency measures. *'Love your Old Home, making your traditional home warmer and cheaper to run.'*

Section 10: Climate change adaptation measures

10.1 The typical design life of a new dwelling is 60 years and for a new industrial building is 30 years. Therefore, consideration should be given when designing buildings now, as to whether they will still be suitable for changing conditions which are likely to be experienced over this duration of time.

10.2 One of the key considerations is to the range of weather related changes projected with a changing climate over this time period, which could potentially have a detrimental impact on buildings. This may include:

- increased frequency and intensity of rainfall, leading to pressure on drainage systems and therefore increased risk from flooding;
- increased frequency of heat waves, leading to issues of overheating and the need for cooling systems;
- more prolonged periods of drought with adverse impacts on building materials and water shortages; and
- more frequent extreme weather events, including strong winds which could damage buildings.

10.3 Appropriate adaptation measures can be incorporated into new or existing buildings, which may include:

10.4 **Flood resilience measures:**

- raising floors above likely flood levels;
- avoiding fitted carpets on ground floor level;
- moving electrics to well above the likely flood level;
- use of solid floors rather than suspended floors;
- replacing mineral insulation within walls with closed cell insulation;
- replacing gypsum plaster with water resistant material, such as lime plaster;
- installing chemical damp-proof course below joist level;
- replacing wooden doors, windows, frames with water-resistant alternatives;
- replacing chipboard kitchen/bathroom units with plastic units;
- treating timber to resist water logging or use marine plywood for shelves and fittings;
- use of one-way auto seal valves on toilets;
- increased capacity guttering and drainage systems;
- Implementing methods to waterproof basements.

10.5 **Methods of avoiding overheating:**

- avoiding designing small south facing buildings;
- using materials with a high thermal mass;
- using green roofs/walls, keeping heat out and the building and its surroundings cool;
- using materials with highly reflective surfaces;
- locating spaces that need to be cool or that generate heat on the north side of development;

- using smaller windows on the south and western elevations with low u-value glazing;
- using carefully designed shading measures, including balconies, louvres, roof overhangs, internal or external blinds, shutters, trees and vegetation;
- designing the building and its internal layout to enable passive ventilation, including operable windows, a shallow floor plan, high floor to ceiling heights, a double façade;
- design-in vegetation, including water features for passive cooling;
- minimising internal heat gains by using low energy equipment, including energy efficient lighting and insulating hot water pipes;
- selecting the most efficient ventilation and cooling systems – avoiding traditional air conditioning systems, as will add to the energy use of the property;
- Utilising naturally ventilated conservatories to control solar gain.

10.6 **Measures to minimise the urban heat island effect[7]**

- sufficient space to be built in between buildings;
- adequate shading and buffering to be provided in buildings through layout and planting;
- providing orchards and allotment spaces;
- retaining existing street trees and plant additional trees where possible;
- using green spaces to allow cooling and provide external space for building occupiers;
- using living walls and green roofs to cool and shade buildings.

10.7 All buildings should be designed to be robust to withstand storms and high winds, and which can be easily maintained and repaired. No adaptation measures should increase energy use and so exacerbate climate change.

[7] UHIE: an urban area that's significantly warmer than the surrounding countryside, especially at night. This is due to the land surface in towns and cities, made of man-made materials which absorb and store heat. This coupled with concentrated energy use and less ventilation than in rural areas, creates a heating effect. Often up to 10 degrees Celsius hotter than surrounding countryside.

Section 11: Viability Assessments

Principle: The Council is committed to delivering high quality sustainable development but recognises that in some circumstances, for example for small and medium sized enterprises - viability considerations may constrain what can be delivered. The Council will implement the requirements of this SPD in a pragmatic proportionate way and developers are strongly encouraged to talk to their planning case officer at an early stage if there are any concerns about affordability. Where a lack of viability is shown, the Council will take this into account and will seek to ensure that the policy requirements do not act as a barrier to otherwise acceptable development from coming forward.

11.1 In all cases, viability and feasibility are key material considerations in meeting the policy requirements of both local and national policy. It is one of a range of factors that will influence the determination of a planning application and this is built into the planning policy framework.

11.2 However, where an applicant states that a policy requirement has an impact on the viability of a proposal, the applicant is required to provide a quantified justification to demonstrate this. It is not enough just to assert that the scheme is unviable without evidence. Applicants should use an agreed format for assessing viability in order to help all parties agree and efficiently determine the application. A financial appraisal should illustrate how the costs of achieving the required standards are unachievable and how these costs relate to other development costs associated with the development including any 'abnormal' costs to allow a broad assessment of the financial impact of the policy. For guidance, reference should be made to 'Financial Appraisal and Viability in the Planning Process'.

11.3 Assessing viability requires judgments which are informed by the relevant available facts. It requires a realistic understanding of the costs and the value of development in the local area and an understanding of the operation of the market.

When the required percentage of renewable and low carbon energy generation cannot be met:

11.4 In circumstances where all possible ranges of appropriate technologies have been explored and none are suitable, then this must be demonstrated at the earliest opportunity in the development management process, preferably at pre-application stage. A financial appraisal will be required, which should be supplemented by details illustrating the range of renewable and low carbon technologies explored, along with their associated costs. Grounds for this might include that the site and/or development proposed is such that the application of the requirements are not suitable for a given location.

11.5 In exceptional circumstances and where the development meets wider planning objectives, a reduced percentage may be negotiated. This will only be applicable when there is a demonstrable negative impact on development viability. These instances are likely to be very limited due to the range of potential applications.

When BREEAM requirements cannot be met:

11.6 In carrying out the financial appraisal, the costs of instructing professionals to carry out the BREEAM assessments/work associated with part compliance should be factored into the professional fees and form part of the gross development costs. These costs should be deducted from the gross development value and assumptions made around developer/landowner return to determine viability.

11.7 Where a successful case has been made demonstrating non-viability in meeting the required BREEAM standards, it may be permissible for applicants to apply a lower standard or potentially utilise alternative strategies. These will be assessed on their merits at the planning application stage.

Section 12 - The planning application

Pre-application discussions:

12.1 Developers are encouraged to engage in dialogue with North Somerset Council before submitting detailed proposals. The authority undertakes to provide an initial response to specific site enquiries, to indicate any sensitivity associated with the site and, if requested, to provide an opinion on whether an environmental screening report is required. There is a fee for pre-application advice; details of this can be found on the council website.

BREEAM assessment:

12.2 A Pre-Assessment (design stage) report is required with the planning application. Applicants are also encouraged to submit a Post-Construction (PC) certificate.

SuDS applications:

12.3 The council welcomes pre-application discussions and will look for a proof of concept plan and drainage strategy or Masterplan, which is based on known drainage and flooding information on the site. Early pre-application discussion will allow time for integration of the drainage into the design and use the water as a resource; managing the flow across the site. Consultations undertaken at this stage will reduce the time and cost of doing so in later stages.

Environmental Impact Assessment (EIA):

12.4 If a development potentially poses a significant effect on the environment, developers are advised to seek a **Screening Opinion** (to inform whether an EIA is required) at the initial stage of the planning process. The proposal will be assessed against the selection criteria in Schedule 3 of the EIA Regulations to enable a screening opinion to be issued. This will include the potential impact on environmental receptors including local ecology, archaeology, water resources, landscape character and visual impacts. The potential for cumulative effects with any existing or approved development will also be considered. Generally, an EIA is likely to be needed for Schedule 2 developments, if the development is in a particularly environmentally sensitive or vulnerable location and is likely to be required for larger scale developments.

Submitting a Planning Application:

12.5 The information to be submitted with any application is explained in more detail on the council website. Major development proposals must meet the minimum sustainability/energy standards outlined in this guidance and this should be clearly demonstrated within a design and access statement.

Section 13: Monitoring and Review

13.1 As a Local Planning Authority, we are required to publish an Annual Monitoring Report (AMR) to assess the effectiveness of policies and guidance that forms part of the local development plan. We will monitor the provision and delivery of sustainable design and construction standards as part of the AMR process and report accordingly. This guidance will be reviewed as and when necessary in light of all material information.

Sources of further information:

Financial Appraisal and Viability in the Planning Process' (Homes and Communities Agency,2012)
http://www.atlasplanning.com/lib/liDownload/511/T1.2.3%20Financial%20Appraisal%20updated.pdf?CFID=13913732&CFTOKEN=60849132

Cost Analysis: Meeting the Zero Carbon Standard (Feb 2014)
http://www.zerocarbonhub.org/sites/default/files/resources/reports/Cost_Analysis-Meeting_the_Zero_Carbon_Standard.pdf

Environmental Protection Act 1990:
http://www.legislation.gov.uk/ukpga/1990/43/contents

National Planning Policy Framework:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Community Energy Strategy DECC (Jan 2014)
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/275163/20140126Community_Energy_Strategy.pdf

Listed buildings and Conservation Areas Act 1990:
http://www.legislation.gov.uk/ukpga/1990/9/contents

The Town and Country Planning (General Permitted Development) Order 1995:
http://www.legislation.gov.uk/uksi/1995/418/contents/made

North Somerset Replacement Local Plan: http://www.n-somerset.gov.uk/Environment/Planning_policy_and-research/Documents/replacement%20local%20plan%20(pdf).pdf

The North Somerset Core Strategy: www.n-somerset.gov.uk/corestrategy

North Somerset Council Consultation Draft Sites and Policies Development Plan Document: www.n-somerset.gov.uk/sitesandpolicies

North Somerset Wind Turbine Supplementary Planning Document:
http://www.n-somerset.gov.uk/Environment/Planning_policy_and-research/Documents/Supplementary%20planning%20documents/wind%20turbines%20supplementary%20planning%20document%20(pdf).pdf

North Somerset Solar PV Arrays Supplementary Planning Document:
http://www.n-somerset.gov.uk/Environment/Planning_policy_and-research/Documents/Supplementary%20planning%20documents/solar%20PV%20array%20SPD%20adopted%20version%20(pdf).pdf

Environment Agency – services and information:
https://www.gov.uk/government/organisations/environment-agency/services-information

DCLG: Building a Greener Future 2007:
http://www.rbkc.gov.uk/PDF/80%20Building%20a%20Greener%20Future%20Policy%20Statement%20July%202007.pdf

Susdrain: http://www.susdrain.org/

Building Regulations 2010 Conservation of fuel and power L1A:
http://www.planningportal.gov.uk/uploads/br/BR_PDF_AD_L1A_2013.pdf

Building Regulations 2010 Conservation of fuel and power in existing buildings L1B: http://www.planningportal.gov.uk/uploads/br/AD_L1B_L2B_amendments_2013.pdf

Building Regulations 2010 Conservation of fuel and power in existing buildings other than dwellings: http://www.planningportal.gov.uk/uploads/br/BR_PDF_ADL2B_2010.pdf

North Somerset Council: Guidance on energy statements http://www.n-somerset.gov.uk/KBA/DM/Pages/Energy-statement.aspx

North Somerset Council Design and Access statement template: http://www.n-somerset.gov.uk/Environment/Planning_and_development_management/Documents/Advice%20and%20guidance%20notes/Design%20and%20Access%20Statement%20template%20(pdf).pdf

North Somerset Council design and access statement: http://www.n-somerset.gov.uk/KBA/DM/Pages/Design-and-Access-statement.aspx

DCLG: Code Addendum (2014) England: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/315504/250414__Code_Addedum_2014_Combined_Final_V10.pdf

North Somerset Council: what to submit with a planning application: http://www.n-somerset.gov.uk/Environment/Planning_and_development_management/Documents/NSC%20Local%20List%20of%20Planning%20Application%20Requirements%20-%20Adopted%2016%20December%202013.pdf

North Somerset Council pre-application advice: http://www.n-somerset.gov.uk/KBA/DM/Pages/Pre-application-advice.aspx

North Somerset Energy Statement: http://www.n-somerset.gov.uk/KBA/DM/Pages/Energy-statement.aspx

Department for Energy and Climate Change: An investigation of the effect of EPC ratings on house prices (2013): https://www.gov.uk/government/publications/an-investigation-of-the-effect-of-epc-ratings-on-house-prices

Centre for Sustainable Energy: Love Your Old Home: http://www.cse.org.uk/downloads/file/love_your_old_home_workbook_standard.pdf

Parking standards Supplementary Planning Document: http://www.n-somerset.gov.uk/Environment/Planning_policy_and-research/Documents/Supplementary%20planning%20documents/Parking%20standards%20SPD%20(pdf).pdf

BREEAM UK New Construction 2014, BRE technical manual: http://www.breeam.org/filelibrary/BREEAM%20UK%20NC%202014%20Resources/SD5076_DRAFT_BREEAM_UK_New_Construction_2014_Technical_Manual_ISSUE_0.1.pdf

Housing Standards Review: Technical consultation, September 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/354154/140911__HSR_CONSULTATION_DOCUMENT_-_FINAL.pdf

DCLG planning statement March 2015:
https://www.gov.uk/government/speeches/planning-update-march-2015

Glossary:

Allowable Solutions: Allowable Solutions is the term for the carbon offsetting process and the various measures which house builders may support to achieve the zero carbon standard from 2016.

Biodiversity: is a measure of the variety of organisms present in different ecosystems.

Embodied energy: the total energy consumed during resource extraction, transportation and manufacture.

Energy conservation: measures to reduce demand at source, such as roof and wall insulation to reduce heat loss. It leads to a reduction or elimination of unnecessary energy use. It can include behavioural change measures, such as switching appliances off when not in use.

Energy efficiency: using less energy to provide the same level of energy benefit, for example through the use of low energy light bulbs or mechanical heat recovery systems.

Energy security: the uninterrupted availability of energy sources at an affordable price

Fabric Energy Efficiency Standard: the proposed maximum space heating and cooling energy demand for zero carbon homes. This is the amount of energy that would normally be needed to maintain comfortable internal temperatures and in a dwelling.

Feed-in tariff: a payment made by government for eligible renewable electricity-generating schemes.

Green Infrastructure: a strategically planned and delivered network comprising the broadest range of high quality green spaces and other environmental features.

Greenhouse gas emissions: gases emitted into the atmosphere that absorbs and emits radiation within the thermal infrared range. These include carbon dioxide, methane and nitrous oxide of which carbon dioxide is the most prevalent.

Low carbon energy: energy derived from processes or technologies that produce power with substantially lower amounts of carbon dioxide emissions than is emitted from conventional fossil fuel power generation.

Natural stack ventilation: where air is driven through a building by vertical pressure differences developed by thermal buoyancy. Warm air inside a building is less dense than cooler air outside, and thus will try to escape from openings high up in the building envelope (such as chimneys); cooler denser air will enter openings lower down. The process will continue if the air entering the building is continuously heated, typically by casual or solar gains.

Passivhaus: a standard of building design, where the heat losses are reduced so much that minimal heating is required. Passive heat sources like the sun, occupants, household appliances and the heat from the extract air cover a large part of the heating demand.

Renewable energy: energy that comes from resources which are naturally replenished and are not depleted by being used, such as sunlight, wind, rain, tides, waves and geothermal heat.

Renewable heat incentive: a payment made by government to eligible renewable heat technologies.

Retrofitting: the addition of new technology or features to older systems.

Supplementary Planning Document: a document which provides additional information on planning policies in a development plan.

Sustainable Development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Urban Heat Island Effect: an urban area that's significantly warmer than the surrounding countryside, especially at night. This is due to the land surface in towns and cities, made of man-made materials which absorb and store heat. This coupled with concentrated energy use and less ventilation than in rural areas, creates a heating effect. Often up to 10 degrees Celsius hotter than surrounding countryside.

North Somerset COUNCIL

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