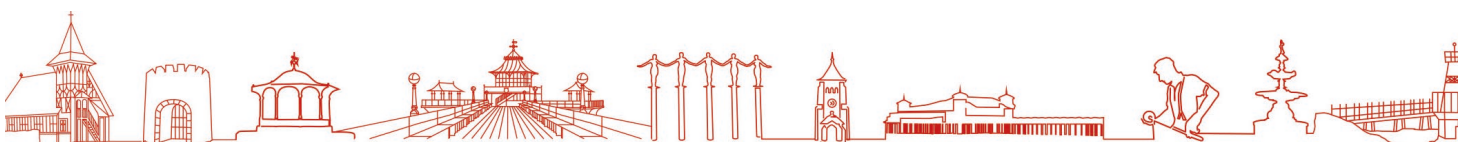




## North Somerset Local Plan 2039

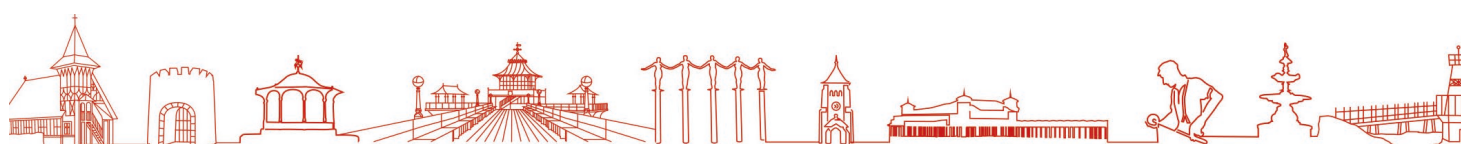
# Summary of evidence to support net zero construction and renewable energy policies

September 2023

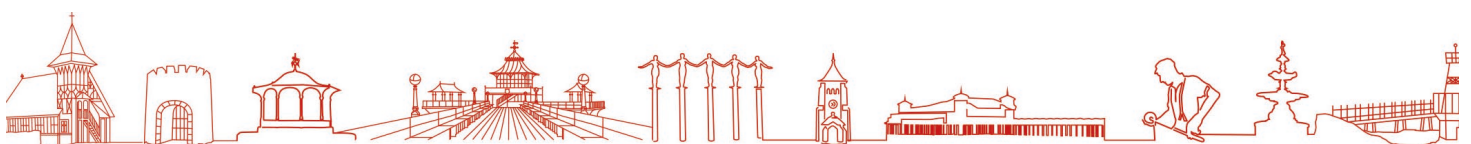


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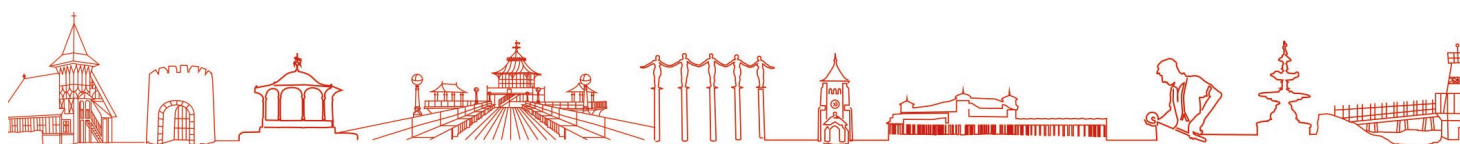
## 1. Introduction

- 1.1 Policies DP6: 'Net Zero construction' and policy DP7: 'large scale renewable and low carbon energy generation' along with a range of other policies contained in the Local Plan, seek to address to the Council's climate emergency declaration with the ambition of achieving carbon neutrality by 2030.
- 1.2 Reducing greenhouse gas emissions from the built environment is essential to contribute to North Somerset's Climate Emergency ambition of carbon neutrality by 2030. The government's Heat and Buildings strategy<sup>1</sup> notes that the 30 million buildings in the UK were responsible for around 30% of the country's emissions in 2019. These emissions are mainly the result of burning fossil fuels for heating and indirect emissions from electricity use (primarily from lighting and appliances). The Climate Change Committee Sixth Carbon Budget report<sup>2</sup> says that in order to deliver net zero by 2050, all UK emissions must be tackled, without reliance on offsets from elsewhere. It is not sufficient to simply reduce emissions – where zero carbon options exist these must be deployed (for example, in homes and manufacturing).
- 1.3 Policy DP6 Net Zero Construction, sets out the councils required sustainable construction standards through defined energy use thresholds. These are used to demonstrate net zero operational (in use) energy for both regulated (fixed services) and unregulated (appliances etc) emissions. The policy also includes an embodied carbon threshold. This will account for the total greenhouse gas emissions and removals associated with all materials and construction processes – this is specified for larger scale developments. This policy will necessitate onsite renewable energy generation.
- 1.4 Policy DP7 Large scale renewable and low carbon energy generation, outlines the criteria for assessing large scale renewable and low carbon

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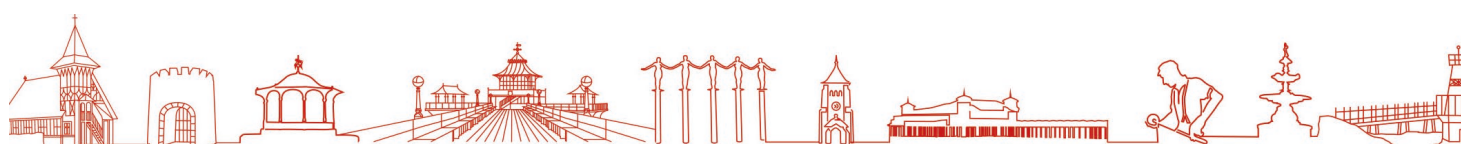
<sup>1</sup> HM Government, 'Heat and Buildings Strategy', October 2021, p.2, [HM Government – Heat and Buildings Strategy \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)

<sup>2</sup> Climate Change Committee 'The Sixth Carbon Budget – UK's path to Net Zero', December 2020, p.37, <https://www.theccc.org.uk/publication/sixth-carbon-budget/>



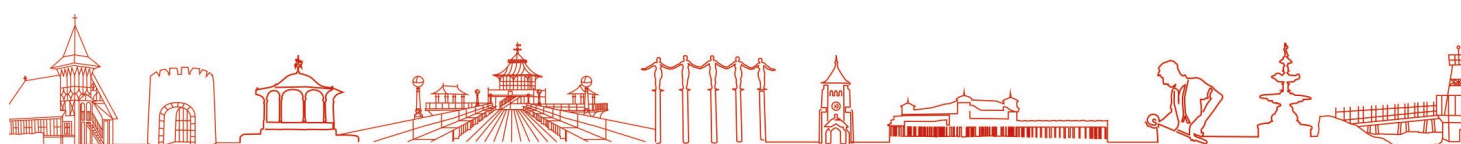
energy proposals. A Renewable Energy Resource Assessment was produced in 2021, this provides guidance for policy formulation.

- 1.5 The West of England (WoE) Local Authorities (Bath and North East Somerset, Bristol City Council, South Gloucestershire and North Somerset Council's) jointly commissioned evidence to inform revised climate change policies for new Local Plan's. The evidence was commissioned jointly with the aim of providing consistency across policies and to share the evidence with other Local Authorities across the country. The below table lists the study reports that have been produced.



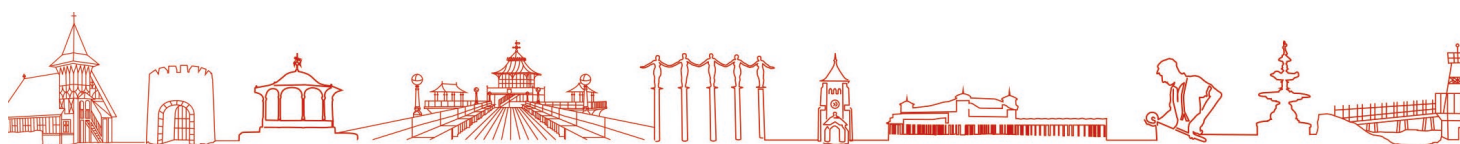
## 2. Overview of the evidence produced

Document title	Produced by	Dated
<ul style="list-style-type: none"><li>• Net Zero Buildings – Evidence and guidance to inform planning policy</li></ul>	South West Net zero Hub	December 2021
<ul style="list-style-type: none"><li>• West of England Net Zero buildings policy - operational carbon for non-domestic buildings</li></ul>	WSP	July 2021
<ul style="list-style-type: none"><li>• West of England Net Zero buildings policy - embodied carbon of domestic and non-domestic buildings</li></ul>	WSP	August 2021
<ul style="list-style-type: none"><li>• Carbon offsetting report – carbon offsetting within an energy intensity policy framing</li></ul>	Centre for Sustainable Energy (CSE)	November 2021
<ul style="list-style-type: none"><li>• Renewable Energy Resource Assessment Study</li></ul>	AECOM	November 2021
<ul style="list-style-type: none"><li>• Landscape sensitivity Assessment for solar PV and wind energy development</li></ul>	LUC	September 2021



### 3. What is net zero in the context of the Local Plan?

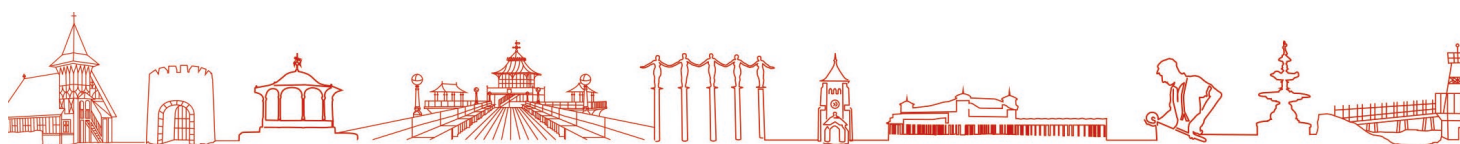
- 3.1 Setting a policy requirement for net zero construction by 2030 is a very important part of the Council's ambition to tackle the climate emergency, with overarching goal of carbon neutrality by 2030.
- 3.2 In 2019, government set out its intentions for a Future Homes Standard and Future Building Standard's. It is anticipated that these will deliver highly efficient buildings which use low-carbon heat, ensuring they are better for the environment and fit for the future. However, the Future Homes Standard will not come into force until 2025 at the earliest and it will not set any requirements to meet net zero construction standards by 2030. It is therefore considered that a locally set zero construction policy is required.
- 3.3 There has been a lot of uncertainty about whether local planning authorities can set planning policies for energy performance for buildings which exceed the levels stipulated in the national Building Regulations. The Department for Levelling Up, Housing and Communities confirmed that local authorities can set policies which exceed national requirements in a [Local Plan Examination note](#) for Bath and North East Somerset Council in 2021.
- 3.4 A building's energy use is now considered to be the best measure for net zero compliance, rather than on-site carbon emission reduction. This is largely because the electricity grid is decarbonising. Predicting carbon emissions accurately is becoming hard as grid electricity becomes increasingly supplied by renewables. Total energy use with space heating metrics are considered to be the best mechanisms to model and monitor net zero compliance. One of the key advantages is that these metrics can be checked once the building is occupied without requiring further modelling or analysis. The net zero operational energy approach follows the principles of the energy hierarchy, which is widely recognised as the best approach to achieve sustainable construction.
- 3.5 The introduction of energy performance targets for net zero policy draws on evidence from a range of industry best practice, with a wide range of professional membership bodies within each organisation. This includes:
- [UK Green Building Council](#) (UKGBC) – *Net Zero Carbon Buildings: A Framework Definition/ Advancing net zero.*



- [Low Energy Transformation Initiative](#) (LETI) – Climate emergency design guide, [Net Zero 1-pager](#) and [Embodied Carbon Primer](#).
- [Royal Institute of British Architects](#) (RIBA) – 2030 climate challenge.
- [Royal Institute of Chartered Surveyors](#) (RICS) – Whole life carbon assessment for the built environment.
- [Government Property Agency](#) - Sustainability and Net Zero Design Guide

3.6 The net zero construction requirement will mean that energy use in new buildings is minimised to the lowest levels, with residual energy use capable of being met through onsite renewable energy generation. If it is demonstrated that this is not technically achievable through onsite measures, then equivalent offsite renewable energy generation may be considered.

3.7 Renewable energy offsetting must only be used where it is demonstrated as not technically viable to meet the residual energy demands through onsite renewable energy generation. This is to ensure that new buildings are as energy efficient as possible and will not need retrofitting in the future. Renewable energy credits will be purchased in order to achieve the net zero energy balance. This will be an agreed cost per kWp or per kWh generated, to meet the net annual energy demand for a scheme (after on-site renewable energy is maximised). The price per kWh generation shortfall will be agreed at planning application stage.





## 4. Updated evidence for net zero buildings

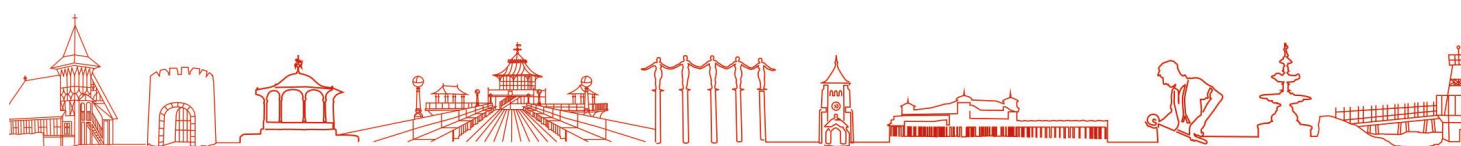
4.1 The net zero and carbon offsetting reports listed in section two provide an update to previous evidence produced by Currie & Brown and the Centre for Sustainable Energy (CSE) in 2018/2019. [Cost of carbon reduction in new buildings](#) and [Carbon offsetting in the West of England](#). This update was needed because the understanding of net zero has progressed considerably since these reports were produced. The main changes are:

- A greater understanding of the contribution of embodied carbon associated with construction. Accounting for the embodied carbon (or energy) associated with development will be required in order to achieve net zero construction. This becomes increasingly important as electricity grid decarbonisation reduces the operational (in use) emissions associated with new development.
- It addresses the fact that national policy has changed through updates to Building Regulations: Part L Conservation of Fuel and Power. This update changes the baseline of the original study and necessitates a fundamental shift in the local policy approach.
- The reports provide an assessment of an approach to net zero and draws on the growing body of work by national organisations and other local authorities.

4.2 The introduction of energy performance targets for net zero policy draws on evidence from the [UK Green Building Council](#) (UKGBC), [London Energy Transformation Initiative](#) (LETI), [RIBA](#), and the [Government Property Agency](#), as outlined above.

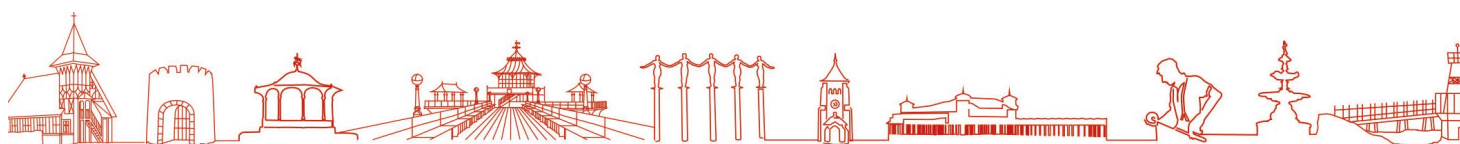
4.3 The West of England Authorities, including North Somerset worked with the South West Net Zero Hub on policy development. Using their expertise and involvement in parallel projects for other local authorities, to maximise the transparency and transferability of various study outputs and to share this with other Authorities across the country.

4.4 The Net Zero Hub formalised their recommendations on net zero buildings policy through their guidance report in 2021. This report sets out the national regulation and policy position with the legal background to climate change policy implementation. The report then sets out the rationale for the recommended approach to setting net



zero targets in local policy. The recommended approach draws on the findings from the WSP net zero studies. This includes those for residential and non-residential buildings both for net zero operational targets, and thresholds for embodied carbon. It also draws on the CSE study on offsetting and provides recommendations on an approach to offsetting as part of the net zero policy requirement.

- 4.5 The numerical targets for space heating and overall energy use expressed in policy DP6 uses evidence provided by the [Committee on Climate Change](#), [Cornwall County Council](#), [Bath and North East Somerset](#) and the [Greater Cambridge authorities](#).



## 5. Updated evidence for renewable energy policy

5.1 A Renewable Energy Resource Assessment Study (RERAS) was commissioned by South Gloucestershire, Bath and North East Somerset and North Somerset Council's in 2021. The purpose of this evidence is to provide an assessment of the potential for renewable energy generation across North Somerset. The technologies considered include Solar PV, wind turbines, biomass, and sites for anaerobic digestion. The RERAS consists of a bottom-up assessment of the potential for different scales of renewable, low and zero carbon energy generation in different locations.

5.2 The RERAS report provides evidence which includes the following objectives:

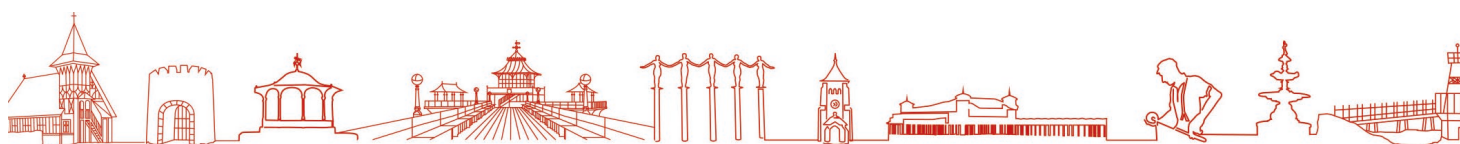
- Identification and promotion of potential sites for renewable energy generation (not necessarily linked to new buildings).
- Identification of those sites with the greatest potential for sustainable energy and carbon reduction or identifying sites that potentially could preclude renewable energy developments (for example, by sterilising good wind power sites).

5.3 Key findings from the Renewable Energy Resource Assessment

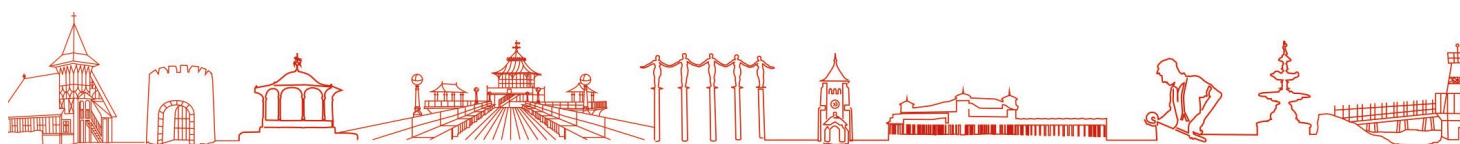
5.4 A series of maps have been provided which identify suitable 'Search Areas' for a range of renewable energy and low carbon technologies. The areas identified for solar PV farms and wind turbines are available on the NSC website. High resolution maps are available on request.

5.5 The RERAS report also sets out different scenarios for different levels of renewable energy generation capacity that can be considered in order to meet the ambition of carbon neutrality by 2030:

- 1) Energy generation from renewables is equivalent to North Somerset's share of grid renewable electricity in 2050 to meet zero carbon, ensuring the share of grid electricity is from renewable sources by 2030. This share is identified through delivery of the [Consumer Transformation Future Energy Scenario](#). This is the National Grid projection for how the energy system will change within the UK. This scenario will require consumers to adopt new technologies rapidly, with a mass uptake of air source heat pumps and switch to electric vehicles. It is recognised that this will require broader policy interventions than those contained within the Local Plan.



- 2) Meet 33% of energy demand by 2030 through renewable energy generation, with an ambition to meet 66% by 2040 and then to ensure that 100% of demand is met by 2050. Achieved by installing additional wind and solar developments.
  - 3) Meet the 2030 electricity demand from generation located in North Somerset. This could be met through a varying combination of wind and solar development, promoted through Local Plan policies.
- 5.6 The overarching recommendation is to maximise the potential for generation and supply of renewable, low and zero carbon electricity and heat.
- 5.7 The RERAS report calculates energy consumption figures in 2020 and shows that there was enough installed electricity capacity to meet the equivalent of 12.4% of local demand, but only enough installed heat capacity to meet 1.6% of local demand in 2020.
- 5.8 The RERAS report then calculates projected future energy consumption in 2030. Future energy consumption is projected to be lower than current levels, due to efficiency improvements of electric systems and energy efficiency improvements to homes. It calculates what proportion of this future energy demand could be met through locally generated renewable and low carbon energy systems, if the potential renewable energy resources use is maximised.
- 5.9 The maximum theoretical stand-alone renewable electricity generation in North Somerset was calculated to be:
- Large scale wind = 379.4 Megawatt electrical (MWe)
  - Solar PV farms = 5,940.4 MWe
- 5.10 The maximum theoretical energy from anaerobic digestion was calculated to be 14.45 Gigawatt heat.
- 5.11 The maximum theoretical potential generation from building connected and non-domestic renewable technologies was calculated to be 107.79 Megawatts electrical (from domestic wind turbines, solar PV commercial and domestic rooftop) and 0.14 Megawatt thermal (from domestic solar thermal).



## 6. Key policy recommendations

From SW Net Zero Energy Hub:

### 6.1 Operational energy:

**B1** Implementing a policy with a four-principle approach – no fossil fuels, space heating targets, energy use intensity targets and onsite renewable energy generation to (at least) match residual energy demand.

**B2** Target the Committee on Climate Change recommendations of 15-20kWh/m<sup>2</sup>/year limit for space heating by 2025 at the latest.

**B2** Target LETI/ RIBA Energy Use Intensity (EUI) targets by building type. Undertake local viability testing where transitional targets are required prior to 2025.

**B3** Where non-standard non-residential buildings cannot meet Total Energy Use targets, require compliance with agreed alternative accreditation schemes suited to these typologies.

**B4** Where BREEAM is used as a policy tool, consider targeting exemplary (unregulated energy and monitoring) Ene01 credits to drive performance gap reductions. BREEAM should not be used as a replacement for net zero policy since it does not have net zero carbon emissions as the primary aim. Therefore, it should be considered alongside but separately to any net zero building policy.

### 6.2 Embodied energy:

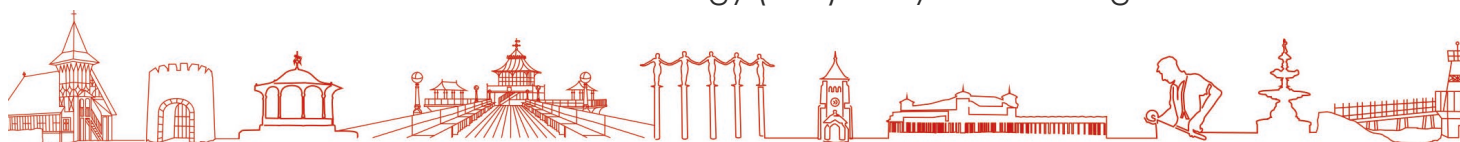
**D1** Require an embodied carbon assessment using a RICS recognised tool (limited to a 'one one-click' tool for minor developments) and reporting against industry benchmarks.

**D2** Consider the introduction of embodied emissions targets for major developments (at costed levels or as a cost neutral back stop), setting out how and when future targets will increase in scope.

**D3** Use data gathered through embodied carbon assessments to inform industry development of robust targets.

### 6.3 Offsetting:

The SW Net zero hub guidance report summarises the evidence from the Centre for Sustainable Energy (CSE) study on offsetting and



considers the role of both energy and carbon offsetting in setting local policy requirements.

**F1** All efforts should be made to reduce onsite and embodied emissions prior to the consideration of offsetting. Offsetting should only be used to meet an energy generation shortfall after onsite renewables have been maximised; it should not be used as a mechanism to avoid energy use targets.

**F2** Offsetting should only be permitted where it can provide credible additionality. The UK has a finite resource of cost viable renewable generation; using low hanging fruit to offset new development detracts from the ability to decarbonise harder to treat sectors.

**F3** Offsetting schemes must ensure that the rate of savings equal the rate of emissions; delayed savings must account for balancing any accrued emissions prior to delivery of the offsetting project.

**F4** Offsetting schemes should focus on either developer procured renewable energy supply at the point of planning and/or council collected payments with robust, transparent, and accountable expenditure plans.

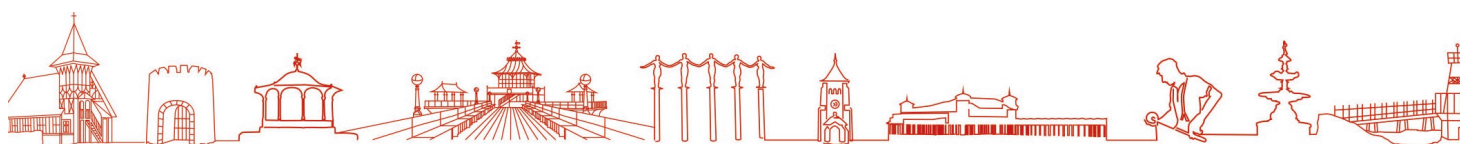
#### 6.4 Existing buildings:

- Consider policy appetite to increase fabric requirements above and beyond the proposed interim update to Part L.
- Assess how current policy uplifts for existing buildings compare to the proposed standards laid out in the FBS and EUI and heat demand metrics being considered for new build. Ensure policy alignment with new metrics.
- If amending policy, consider alignment with the consequential improvements requirements of Welsh Building Regulations, seeking legal guidance on powers for delivering such measures through Local Plans.

From the RERAS report:

#### 6.5 Overall target for renewable energy:

The report says that it is not considered useful to set a specific maximum target for renewable energy generation. It recommends retaining some



flexibility in defining carbon neutral and specifying how much renewable energy should be targeted. It is also recommended that:

- North Somerset aims to maximise the potential for the generation and supply of renewable and low and zero carbon electricity and heat.
- Search Areas identified through the report are further refined and safeguarded through the Local Plan process, taking account of other considerations and constraints.

#### 6.6 Proposals for wind turbines in Search Areas:

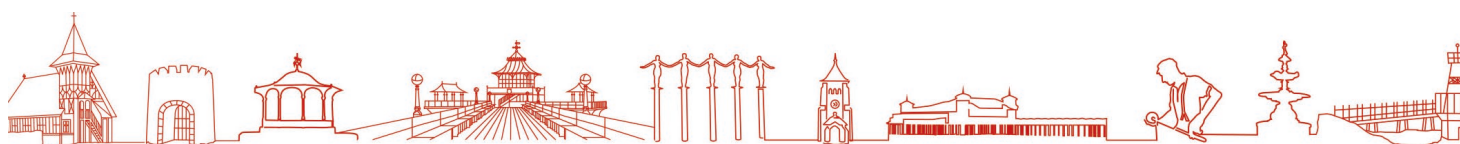
- Proposals of the appropriate number and size should be encouraged and permitted when located within the Search Areas.
- Proposals for turbines of greater than 2.5MW will be considered subject to the primary constraints (noise, topple distance) and consideration of other site-specific issues and constraints.
- Policy measures are put in place to ensure that areas identified for wind development are not sterilised by non-wind development.
- Proposals for 1MW and 2.5MW should maximise the potential resources.
- Proposals for re-powering wind farms at end-of-life should be encouraged and permitted, subject to compliance with identified constraints and other policy considerations.

#### 6.7 Proposals for wind turbines outside of the Search Areas:

- Proposals should be considered positively, providing they are compliant with relevant policy and site-specific issues and constraints can be mitigated to the satisfaction of the Council.

#### 6.8 Proposals for Solar PV farms in Search Areas:

- Search Areas should be further refined through the Local Plan process, taking account of other considerations and constraints. As part of this, take account of clustering and the potential need to manage cumulative impact should be considered.
- Should be encouraged and permitted, subject to the mitigation of any site specific or other constraints.
- Proposals for re-powering at end of life of equal or increased capacity should be encouraged and permitted, subject to compliance with primary and site-specific constraints, and other policy considerations.



#### 6.9 Proposals for solar PV farms outside of Search Areas:

- Should be considered positively, providing it can demonstrate that proposals are compliant with relevant policy and site-specific issues and constraints and can be mitigated.

#### 6.10 Proposals for Energy Storage:

- Policy should encourage applicants of schemes greater than 1MW should consider storage as part of the proposal.
- Applications for renewable electricity of greater than 1MW located within 1km of an industrial cluster identified as having potential for hydrogen should consider utilising outputs (via private wire) for such purposes.
- Applications for new industrial development that may have use for green hydrogen should be guided towards locations near hydrogen clusters where practical.
- Applications for electricity generation or development that is energy intensive, likely to have surplus of heat within 1km of a site with potential for energy storage should consider utilising this.

#### 6.11 Proposals for District Heating Networks:

Development proposals located within 0.5km of existing renewable electricity or heat resource should consider utilising this.

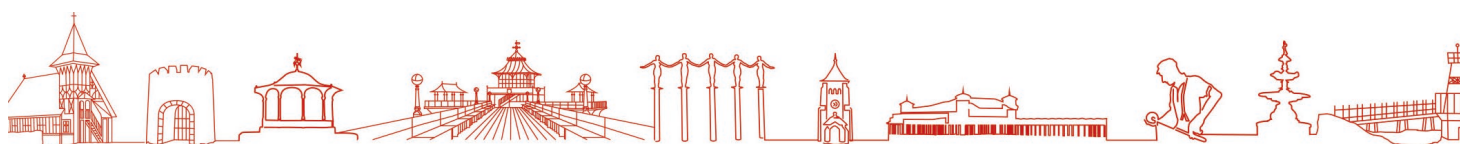
Proposals for development that host heat intensive activities and are likely to generate excess heat should consider:

- Potential to be located within 0.5km of heat demand cluster in the Heat Opportunities Map
- Enabling heat/power offtake for supply of other/ nearby uses and provide evidence of discussions with potential off takers of heat.
- Proposals within 0.5km of existing heat network from a non-fossil fuel sources will be expected to connect where feasible and viable.
- Consider safeguarding Search areas for wind and solar within 0.5km of an identified heat cluster in order to provide electricity for heat pumps as part of a private wire/ district heat network.

#### 6.12 Proposals for Biomass:

Recommended that proposals are looked upon favourably where:

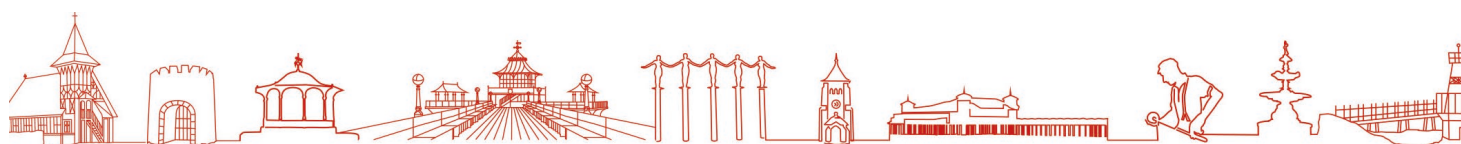
- Whole life carbon benefit can be evidenced.





- Development is located away from urban areas.

Recommended that proposals for stand-alone electricity generation using biomass should use a BECCS system and a whole life carbon benefit can be evidenced.



## 7. Costs associated with policy requirements

### 7.1 Cost of achieving net zero operational energy in domestic buildings

The South West Net Zero Hub guidance details the findings from a study commissioned by Cornwall County Council (by Etude and Currie and Brown) to support their planning policy. This details the cost of achieving net zero construction for a range of building typologies. The evidence demonstrated that net zero operational buildings can be delivered with an average cost uplift of 2-4%. This low cost has driven the market to start to deliver net zero construction in the absence of policy. However, policy is needed to set a consistent requirement across all built development.

### 7.2 Cost of renewable energy offsetting

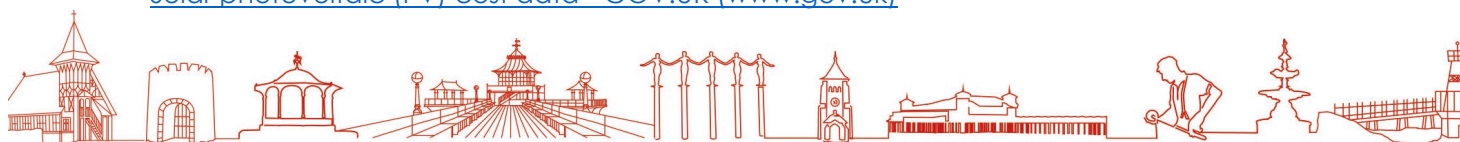
The CSE study recommends that the cost is tied to the cost of installing additional solar PV on small scale residential development since this would be genuinely additional. This should be delivered on low-income housing where the occupier would be very unlikely to install them themselves. The charge should be applied over a period of 30 years and would include an administrative charge. The proposed charge is £99/MWh. This is tied to the most recent Department for Energy Security and Net Zero solar PV cost data for small scale solar PV, and includes a 15% administrative charge.<sup>3</sup> The CSE study used data from a local solar PV installation project to inform their recommended cost (which was £90/MWh based on 2021 prices). Tying the price to national published figures is more transparent and more straightforward to update in the future, as costs change. The costs are also very similar when inflation since 2021 is taken into account. Financial contributions will be secured by S106 agreement. The detail will be set out within a Development Contributions Supplementary Planning Document.

### 7.3 Cost of achieving the embodied carbon threshold

The WSP study report 'Embodied carbon of domestic and non-domestic buildings' presents a range of cost uplifts for implementing a range of lower embodied carbon building fabric elements. These costs vary by building type and end use of a building.

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<sup>3</sup> [Solar photovoltaic \(PV\) cost data - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/solar-photovoltaic-pv-cost-data)



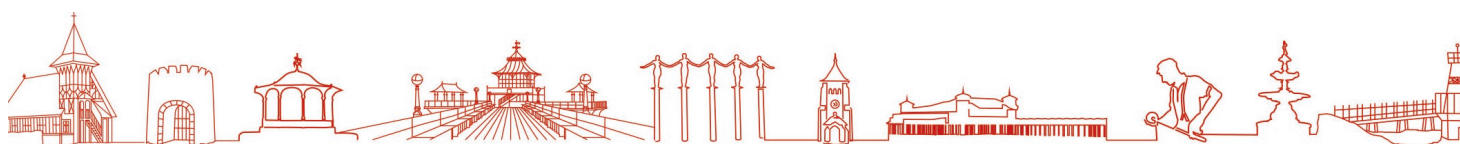
The study concluded that an embodied carbon rating C (assessed as a building of good design), can be achieved with zero cost uplift for all four building typologies studied (office, school, apartment block and semi-detached house). However, the study highlights that the findings do not include all lifecycle processes within the RICS 'Embodied Carbon Target Alignment.' If all building elements were accounted for, then the embodied carbon rating achieved is likely to be lower (D-E – which represent average building design). The embodied carbon rating C threshold is 500kg/CO<sub>2</sub>e/m<sup>2</sup>. For larger scale developments, a threshold of 900kg/CO<sub>2</sub>e/m<sup>2</sup> has been used in policy which represents a cost neutral position.

#### 7.4 Cost of achieving net zero operational energy in non-domestic buildings

The WSP study 'Operational carbon for non-domestic buildings' provides indicative costings that would enable net zero regulated carbon in non-domestic buildings. This focuses on regulated emissions since unregulated emissions vary very widely depending on building type and use. It is acknowledged that cost modelling for non-domestic buildings is difficult due to the diversity of buildings type and use.

##### BREEAM

BREEAM accreditation is an alternative compliance route to net zero operational energy for non-domestic buildings. The WSP report states that additional indicative cost of achieving BREEAM Excellent is likely to be in the range of a 1-2% cost uplift. This cost uplift is higher for healthcare facilities, in the range of 3 – 5% above base cost.



## 8. Monitoring

- 8.1 Sustainability and/or Energy Statements will need to be submitted alongside all planning applications. This will need to demonstrate that the specific thresholds set out within policy DM6 have been met. A post occupancy reporting scheme will be considered. This will include a mechanism to report the findings for operational carbon in both domestic and non-domestic buildings.
- 8.2 Passivhaus Plus accreditation can be used as an alternative compliance method. The Passivhaus Planning Package should be used.
- 8.3 For developments of 50 or more dwellings or greater than 5,000m<sup>2</sup> for non-domestic buildings, an embodied carbon assessment should be submitted. This should demonstrate that a threshold of 900kgCO<sub>e</sub>/m<sup>2</sup> for upfront emissions has not been exceeded.
- 8.4 BREEAM Excellent level accreditation can be used as an alternative compliance method for non-domestic buildings. Full BREEAM reports will need to be submitted by a qualified BREEAM assessor for both pre and post construction phases.
- 8.5 Detailed guidance on the mechanism to demonstrate compliance will be provided through Supplementary Planning guidance.

