Policy DP6:
Net zero construction

All development must be designed to minimise its impact on the environment and create high quality internal and external spaces for people to use. Proposals must demonstrate that all resources are used efficiently, as part of the construction and operation of a building.

All development must follow the principles of the energy hierarchy to ensure that the design of a building prioritises energy reduction through highly energy efficient fabric measures, lighting, ventilation, and orientation. Once energy demand is minimised and efficiency design measures are in place, renewable energy technologies will be used to meet residual energy demand.

All new buildings will be required to achieve net zero operational energy compliance and for residential buildings this should be in respect of both regulated and unregulated energy.

All new development should seek to minimise embodied carbon in respect of both upfront (emissions associated with raw materials, transportation, manufacturing and construction) and whole life carbon. For development of more than 50 dwellings, or in excess of 5,000m^2 non-residential floorspace, proposals must be accompanied by an embodied carbon assessment which demonstrate that upfront embodied carbon emissions do not exceed 750kg CO2e/m^2.

The retention of existing buildings will usually be given preference to their demolition. Retrofitting energy efficiency measures in existing buildings will be supported and significant weight will be given to the benefits of development resulting in considerable improvements to energy efficiency. All proposals must demonstrate high standards of insulation and Passivhaus Enerphit standards are encouraged.

Net zero operational energy: residential

In order to demonstrate compliance with the net zero operational energy requirement, all new residential buildings must demonstrate through an energy statement, that the following have been achieved:

- No on-site use of fossil fuels;
- Ultra low energy use, to be demonstrated through:
  - Space heating demand of less than 15-20kWh/m^2/year
  - Overall operational energy use of less than 35kWh/m^2/year; and
- On-site renewable energy generation is maximised, equivalent to at least the onsite energy demand.

Alternatively, compliance can be demonstrated through Passivhaus Plus Standard accreditation, using the Passivhaus Planning Package.

Net zero operational energy: non-residential

In order to demonstrate net zero operational energy, all new non-residential buildings must demonstrate through an energy statement, that all of the following have been achieved:

- No use of on-site fossil fuels;
- Energy use is minimised appropriate to the end use; and
- On-site renewable energy generation is maximised, equivalent to at least the onsite energy demand;

Alternatively, compliance can be demonstrated by using BREEAM Excellent level accreditation, with outstanding level for energy use (Credit Ene01). An alternative compliance route may be allowed with prior agreement.

Renewable Energy Offsetting

Residual energy demand should be met through the generation of onsite renewable energy, but if this is not technically feasible, the requirement may be met elsewhere by means of offsite renewable energy generation.

All residential development must demonstrate measures to minimise potable water use and will need to achieve a water consumption standard of no more than the optional requirement of 110 litres/per person/per day as set out in Building Regulations Approved Document Part G. All measures will optimise water use and may include water efficient fittings, rainwater harvesting and other mechanisms for recycling and reusing water on-site.

All development will need to demonstrate measures to reduce the risk of the building overheating.

Energy use intensity and space heating targets should be prioritised regardless of any district heating connection and all reasonable efforts should be made to meet these requirements prior to buildings connecting to a district heating network.

Justification

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 Climate Change Committee's (CCC) Sixth Carbon Budget report (2020) states that buildings account for 17% of greenhouse gas emissions in the UK. These emissions are mainly the result of burning fossil fuels for heating. Indirect emissions from electricity use (primarily from lighting and appliances) account for another 4% of UK emissions. The CCC report also says that in order to deliver net zero by 2050 as required by the Climate Change Act 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).

Net Zero Operational energy in this context refers to a building where no fossil fuels are used, all energy use has been minimised and it meets the total energy use target (measured in kWh/m^2/year) with all energy use generated on or off-site using renewable energy that demonstrates additionality. Additionality refers to the demonstration that renewable energy generation with associated carbon savings delivered by an offset payment, are clearly additional to what would have happened without the payment.

A building's energy use is now considered to the best measure for net zero compliance, whilst reducing emissions on-site is no longer the best measure of sustainable design. Total energy use and space heating metric targets are considered to be the best mechanism to model and monitor net zero compliance because the electricity grid is decarbonising. 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.

Space heating and total energy metric targets used to demonstrate net zero operational energy are based on the recommendations from both the Climate Change Committee (CCC) report 'UK housing – Fit for the Future?' (2019) and industry best practice (RIBA, CIBSE and LETI) and they align to Passivhaus certification standards. The CCC report highlights that we must build new buildings which are ultra-low carbon, energy, water and climate resilient, and getting design right from the outset is much more cost effective than needing to retrofit later. The CCC report recommends a space heating demand of 15-20kWh/m^2/year. The Low Energy Transformation Initiative (LETI) guidance on meeting net zero recommends a maximum total energy use of 35 kWh/m^2/year.

The alternative method of compliance for non-residential buildings is to demonstrate the BREEAM Excellent level accreditation, with outstanding level for energy use (Credit Ene01). Achieving the outstanding or exemplary level standard in the energy performance criteria (Ene01) will ensure that an equivalent net zero standard has been achieved.

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. The council has a renewable energy offset scheme. 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.

Bristol Water's Resources Management Plan (2024) states that Bristol Water have a long term target to achieve average per capita consumption of 110 litres/person/day by 2050, which aligns to the National Framework for Water Resources and Building Regulations Approved Document Part G. Residential development in the local plan period will still exist in 2050 and therefore the council expects new residential development to achieve 110 litres/person/day.

Embodied Carbon in this context refers to the greenhouse gas emissions produced at all phases of the development process. There is carbon embodied in the extraction, manufacture and transportation of building materials, construction, use, maintenance, repair, replacement, demolition, and eventual material disposal. The sum total of greenhouse gas emissions and removals over the entire lifecycle should be minimised, meeting local carbon targets (measured in kgCO2e/m^2).

The report for the West of England Authorities 'Embodied carbon of domestic and non-domestic buildings', (WSP 2021) demonstrates that significant reductions in embodied carbon can be achieved at no net additional cost. This can be achieved through better design (including durability to replacements), better onsite management (to avoid wastage), better choice of materials (with lower embodied carbon) and though the removal of unnecessary finishes.

A distinction is made between upfront embodied carbon, which relates to the emissions associated with raw materials, transportation, manufacturing and construction phases of a project and the whole life emissions which additionally include emissions associated with maintenance, repair, replacement, refurbishment, and the end of life stage including deconstruction/demolition, transportation, waste processing and disposal of building materials.

The approach in the Local Plan is that an embodied carbon assessment should be submitted alongside applications for developments of 50 or more dwellings and those in excess of 5,000m^2 to ensure the total carbon in respect of upfront emissions is at a level aligned with current construction industry practice, and that the target threshold has no adverse impact on overall viability. The WSP study for the West of England provides the justification for the local plan policy. The upfront emissions, expected to have a high proportion of embodied carbon emissions, are often considered as part of the early design process and existing tools are available for accurate measurement and assessment. In accordance with the WSP report recommendation, the assessment process should be aligned with the 'RICS professional standards and guidance – whole life carbon assessment for the built environment'.

A Supplementary Planning Document (SPD) will set out how the specific requirements of this policy should be implemented.