

Net Zero Operational Carbon

Ten key requirements for new buildings

By 2030 all new buildings must operate at net zero to meet our climate change targets. This means that by 2025 all new buildings will need to be designed to meet these targets. This page sets out the approach to operational carbon that will be necessary to deliver zero carbon buildings. For more information about any of these requirements and how to meet them, please refer to the: UKGBC - Net Zero Carbon Buildings Framework; BBP - Design for Performance initiative; RIBA - 2030 Climate Challenge; GHA - Net Zero Housing Project Map; CIBSE - Climate Action Plan; and, LETI - Climate Emergency Design Guide.

Low energy use

- 1** Total Energy Use Intensity (EUI) - Energy use measured at the meter should be equal to or less than:

 - **35 kWh/m²/yr** (GIA) for residential¹

For non-domestic buildings a minimum DEC B (40) rating should be achieved and/or an EUI equal or less than:

 - **65 kWh/m²/yr** (GIA) for schools¹
 - **70 kWh/m²/yr** (NLA) or **55 kWh/m²/yr** (GIA) for commercial offices^{1,2}

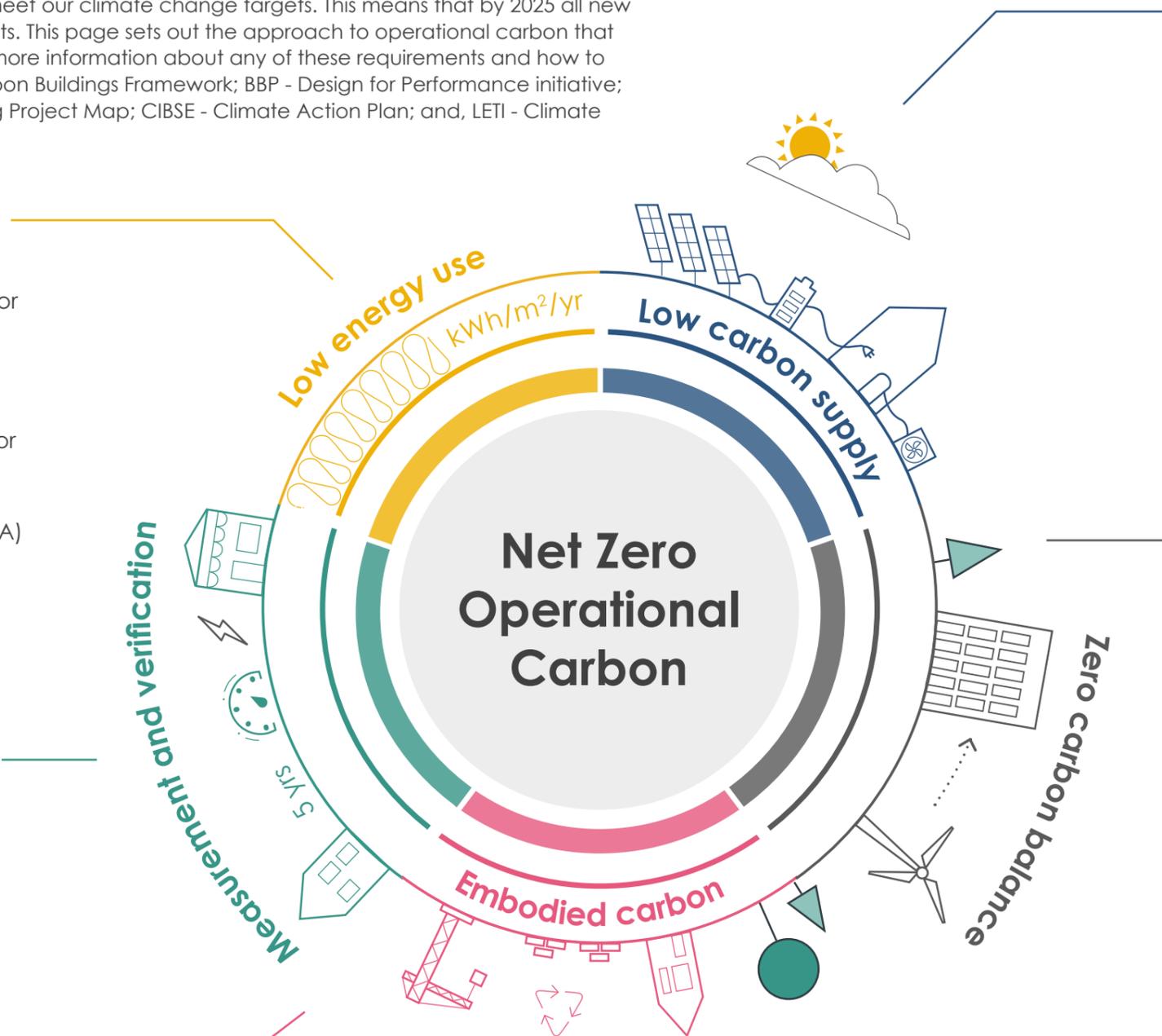
- 2** Building fabric is very important therefore space heating demand should be less than **15 kWh/m²/yr** for all building types.

Measurement and verification

- 3** Annual energy use and renewable energy generation on-site must be reported and independently verified in-use each year for the first 5 years. This can be done on an aggregated and anonymised basis for residential buildings.

Reducing construction impacts

- 4** Embodied carbon should be assessed, reduced and verified post-construction.³



Low carbon energy supply

- 5** Heating and hot water should not be generated using fossil fuels.
- 6** The average annual carbon content of the heat supplied (gCO₂/kWh) should be reported.
- 7** On-site renewable electricity should be maximised.
- 8** Energy demand response and storage measures should be incorporated and the building annual peak energy demand should be reported.

Zero carbon balance

- 9** A carbon balance calculation (on an annual basis) should be undertaken and it should be demonstrated that the building achieves a net zero carbon balance.
- 10** Any energy use not met by on-site renewables should be met by an investment into additional renewable energy capacity off-site OR a minimum 15 year renewable energy power purchase agreement (PPA). A green tariff is not robust enough and does not provide 'additional' renewables.

Notes:

Note 1 – Energy use intensity (EUI) targets

The above targets include all energy uses in the building (regulated and unregulated) as measured at the meter and exclude on-site generation. They have been derived from: predicted energy use modelling for best practice; a review of the best performing buildings in the UK; and a preliminary assessment of the renewable energy supply for UK buildings. They are likely to be revised as more knowledge is available in these three fields. As heating and hot water is not generated by fossil fuels, this assumes an all electric building until other zero carbon fuels exist, (kWh targets are the same as kWh_{elec-co₂}). Once other zero carbon heating fuels are available this metric will be adapted.

Note 2 – Commercial offices

With a typical net to gross ratio, 70 kWh/m² NLA/yr is equivalent to 55 kWh/m² GIA/yr. Building owners and developers are recommended to target a base building rating of 6 stars using the BBP's Design for Performance process based on NABERS.

Note 3 – Whole life carbon

It is recognised that operational emissions represent only one aspect of net zero carbon in new buildings. Reducing whole life carbon is crucial and will be covered in separate guidance.

Note 4 – Adaptation to climate change

Net zero carbon buildings should also be adapted to climate change. It is essential that the risk of overheating is managed and that cooling is minimised.

Developed in collaboration with:



Supported by:

