

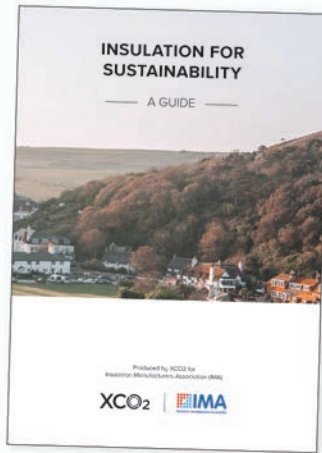
Fabric First: a Route to Zero Carbon

The UK government has set the world's most ambitious climate change target into law with its sixth carbon budget. It commits the UK to reducing greenhouse gas emissions by 78% by 2035, compared to 1990 levels. This will take the UK more than three quarters of the way to reaching net zero carbon by 2050. Such challenging targets will need a comprehensive programme of activity, coupled to the necessary legislative, financial and practicable frameworks to ensure these commitments are realised.

To play its part, the construction industry is examining how buildings can be made more energy-efficient and outlining the measures that must be taken to meet decarbonisation targets efficiently. The Insulation Manufacturers Association's recent publication, *Insulation for Sustainability*, produced by specialist low-carbon consultancy XCO2, explains how a well-designed, fully insulated building fabric is a key measure for reducing heat loss, improving energy consumption and cutting carbon emissions from buildings.

The fabric-first approach to energy efficiency emphasises the optimisation and performance of the building's elemental components and materials, as well as passive design strategies, before designating mechanical and/or active systems. This means achieving a high performance building envelope, through thermally efficient PIR insulation, improved detailing and the maximisation of airtightness, prior to introducing more expensive renewables.

The key to the success of the fabric-first approach is optimising build quality to ensure that the as-built performance matches the design performance. To ensure that buildings do not suffer with a performance gap, it is essential that regulations call for robust assurance regimes, incentives for better buildings and penalties for those that do not perform as predicted.



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The Passivhaus Trust report, *Passivhaus: the route to zero carbon (2019)*, indicates that it is the quality control assurance process of a Passivhaus that ensures that what is designed is built, meaning that Passivhaus buildings do not suffer from a performance gap.

Built-in sustainability

Fabric-first is essentially a fit and forget solution that occupiers will appreciate without even realising it, as the energy efficiency is built into the building fabric for the life of the building.

Methods for reducing the need for energy consumption via a fabric-first approach include enhanced insulation with low thermal conductivity, improved thermal bridging detailing, maximising airtightness, optimising solar gain and natural ventilation.

Concentrating on delivering a fabric-first solution is generally considered more sustainable than relying on energy saving technologies, or renewable energy strategies, as these latter solutions can be expensive, have a high embodied energy or not be utilised correctly by the occupants. However, it is reassuring that fabric enhancements are the most common retrofitting technique implemented in existing properties (including improvements to insulation and glazing efficiency).

Furthermore, the inclusion of a high-performance thermal building envelope reduces the final energy demand to be provided by low carbon/renewable systems.

Application of low-carbon strategies

Suitable for anyone looking to learn about the application of low-carbon strategies through a fabric-first approach, *Insulation for Sustainability*, highlights the issues associated with energy demand and the way enhanced insulation strategies play a crucial role in the built environment to help the UK meet its exacting targets.

Ultimately, the fabric-first approach will remain the most direct route to achieving the net zero target, as well as compliance with the energy performance requirements of Building Regulations. When a structure is built correctly in the first place, it will continue to perform as intended for many years to come. ■

Download the *Insulation for Sustainability* white paper here: <https://insulationmanufacturers.org.uk/wp-content/uploads/2018/09/IMAXCO2-Insulation-for-Sustainability-A-Guide-Final-web.pdf>

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