

Written evidence submitted by the Chartered Institute of Building

Introduction

1. The Chartered Institute of Building (CIOB) is the world's largest and most influential professional body for construction management and leadership. We have a Royal Charter to promote the science and practice of building and construction for the benefit of society, and we have been doing that since 1834.
2. Under the Climate Change Act 2008, the UK is committed to green gas emission reductions of 34% by 2020. Approximately 45% of the UK's total carbon emissions are a result of energy consumption in buildings. Eurostat data indicates the UK has one of the oldest housing stocks in Europe, with the smallest proportion of homes built after 1970 and the second highest proportion built before 1919.
3. The UK Green Building Council finds that the built environment constitutes around 40% of the UK's total carbon footprint. We reiterate the conclusion of the Climate Change Committee that the UK's building stock must be nearly completely decarbonised by 2050 to meet net zero, and that unless energy efficiency is addressed urgently, we will not meet our Fourth and Fifth Carbon Budgets. Carbon and resource efficiency have benefits far beyond compliance, and bring opportunities to win new business, reduce costs, improve quality and breed innovation.
4. Addressing the sustainability of the built environment will require coordinated, long-term action. Isolated activities and private market initiatives alone will not be enough to address the scale of the challenge, and a variety of mechanisms will be needed to bring about the culture shift to drive a greener built environment.

What can the Government do to incentivise more repair, maintenance and retrofit of existing buildings?

5. At least 70% of the buildings currently standing will be here in 2050, and with a current housing stock of around 29 million homes, the energy performance of the UK's existing housing stock must also be improved if we are to achieve our long-term emissions reductions target. Private housing RMI is a major sector for construction, accounting for more than £21 billion of industry activity in 2019. The private housing stock also has the highest concentration of buildings deemed below the Decent Homes Standard and are more likely to be rated below the EPC target Band C, thus representing one of the most significant challenges to reaching net zero.
6. On 18 November, the Prime Minister announced his Ten Point Plan for a Green Industrial Revolution, including a dedication to "greener buildings," and promises to "put our homes, workplaces, schools and hospitals at the heart of our green recovery," including measures to strengthen the energy efficiency of new and existing buildings.
7. CIOB welcomed the Prime Minister's Ten Point Plan for a Green Industrial Revolution and its emphasis on 'greener buildings', however we are concerned that the pace and scale of change is simply not enough to address the climate emergency. For example, despite the Chancellor's pledge to put green investment at the heart of the UK's economic recovery, his

most recent Budget Statement made no mention of the environmental impact of the built environment or strategies to decarbonise it, including retrofit.

8. Historically, a lack of confidence in long-term policy direction has impeded the built environment sector's ability to invest in low carbon technologies and skills, weakened the resilience of the construction supply chain and reinforced a lowest-cost procurement model which leaves no room for social value. This is being exacerbated by stop-start policy and eroded consumer and industry trust due to the failure of past initiatives such as the Green Deal and most recently, the Green Homes Grant.
9. There is a chronic shortage of skills in the retrofit sector, with the Construction Leadership Council (CLC) estimating that the existing workforce needs to be more than doubled, developing around 500,000 new professionals, to address this challenge. This will not be possible without a long-term roadmap which gives the industry certainty in the future direction of travel and confidence that there will be an ongoing market for retrofit.
10. A wide range of financial support must be made available and the private sector encouraged, to provide green financial products if we homeowners are to be able to afford energy efficiency upgrades. The Government's ambition to install 600,000 heat pumps a year by 2028, for example, does not address how to incentivise owner-occupiers to meet the £10,000 cost of installation, nor the increased electricity costs. Encouraging households to invest in expensive retrofit measures will only be made more difficult as household budgets come under pressure from the economic impacts of the pandemic.
11. To address these challenges, CIOB recommends that the Government:
 - a. **Publish the Heat and Buildings Strategy as a matter of urgency**, to set out a long-term plan to decarbonise the built environment and give industry the certainty it needs to invest in low-carbon skills and an appropriate amount of time to upskill.
 - b. **Work with the built environment sector to implement the CLC's National Retrofit Strategy plan**. This plan is designed to provide a long-term policy framework that will help the industry to scale up systematically to meet the volume of work required to retrofit the existing housing stock. The CIOB is a member of the CLC's Domestic RMI Working Group, responsible for creating this proposal, as well as the CLC Advisory Group.
 - c. The strategy has been modelled over a programme period from 2021 to 2024, and cycles through four phases – firstly underpinning capability, then educating households and training industry, before an intensive period of work, and then a ramp down of pace to focus on hard-to-treat properties and the phased redeployment of resources to other sectors.
 - d. Key proposals include:
 - e. **The creation of a central Retrofit Delivery Agency** to provide oversight, drive standards and facilitate learning and knowledge sharing for the purpose of

continuous improvement. This agency would ensure alignment across client groups and leadership to support locally delivered area-based programmes.

- f. **The implementation of 'fabric-first' performance standards**, similar to the EnerPHit standard developed by Passive House. These standards will require verification of attainment rather than installer self-certification and should cover technical issues in an integrated way to make sure that necessary fabric improvements are made before heat solutions are applied, in accordance with the EAC's observation that "energy efficiency is an important precursor to low carbon heating." They should be closely aligned with occupational standards for the workforce, and wider building safety standards.
- g. **A variety of private and public sector funding initiatives** to suit different ownership profiles, including a stamp duty rebate for energy efficient properties; reduced VAT on 'retrofit-led' renovation; Government grants for low-income households; low cost loans and green mortgages. CIOB's 'Help to Fix' loan scheme proposal has been adopted within the strategy as a financial incentive. This scheme would see the provision of low-cost Government backed loans to households, to be repaid at point of sale. They would allow home owners to improve the general state of repair of their homes through a range of measures, however predicated on a requirement that the energy efficiency of the homes would be improved simultaneously.
- h. **Training and Accreditation support** to create the additional 500,000 trade positions and 50,000 Retrofit Coordinators needed to reach EPC C by 2030. Development of this recruitment campaign should be led by a Retrofit Delivery Agency in conjunction with local Skills Advisory Panels, to account to the variety of skilled and unskilled pathways into construction. Offering subsidies for individual trainees will not be enough to support the supply chain at the scale necessary, and the Strategy recommends a long-term commitment to a national retrofit programme; an apprenticeship subsidy through the existing CITB/UK Apprenticeship Levy system; training requirements; a route to work for trainees to incentivise firms to commit to taking on apprentices; and developing trainers to provide site-based learning.

- 12. **Implement a long-term retrofit strategy as a key national infrastructure priority** to allow the allocation of funding from the UK Infrastructure Bank and demonstrate global leadership ahead of COP26. This will provide a clear direction of travel for the construction industry and the certainty that businesses need to create stable, green jobs.

What role can the planning system, permitted development and building regulations play in delivering a sustainable built environment?

- 13. The Building Regulations suggest a reduction in performance relative to a prescribed notional building. The notional building does not reward efficient building form and orientation.

14. We reiterate our [response](#) to the Future Buildings Standard consultation, and believe that we must move towards setting actual energy consumption requirements, measured in energy use intensity (EUI), in kWh/m²/yr. This would encourage architects, engineers, developers and building owners to work together, be innovative and reward good design based on form, orientation and fabric performance.
15. The Future Buildings Standard consultation states that new buildings should be “zero carbon ready”. However, to help address the climate emergency we must ensure we are constructing “net zero carbon buildings”. Net zero carbon buildings seek to balance operational energy consumption with the UK grid renewable energy capacity. This means they should minimise their energy demand, including all energy uses. Government must set adequate energy targets to ensure both energy demand and energy consumption are reduced.
16. We believe that we must start regulating the amount of energy used by a building and suggest that operational energy becomes the key metric from 2021. The Future Buildings Standard proposes using primary energy as the principal performance metric in the Building Regulations and we do not believe this is the appropriate approach. Primary energy is a complex metric with factors that change over time. Primary energy will become less relevant as the electricity grid decarbonises. Primary energy also favours gas over electricity, going against heat decarbonisation objectives. Conversely, operational energy is already known within the industry and by building owners and occupiers. This would allow for benchmarking and minimum standards to be established based on building type, driving further innovation within the built environment.
17. We have known for many years there is a gap between anticipated and actual performance of buildings. The current tools used to assess a building’s compliance, such as Simplified Building Energy Model (SBEM) and Standard Assessment Procedure (SAP), do not accurately predict actual operational energy or carbon performance. Therefore, they are an inappropriate methodology to reduce the climate impact of the built environment.
18. There needs to be better enforcement of regulatory requirements. In addition, Post Occupancy Evaluation methods associated with regulated predicted performance requirements must be used to improve predictive energy modelling through verification and comparison in use. Without checking how buildings actually perform, the industry is relying on unverified predictions of performance

What methods account for embodied carbon in buildings and how can this be consistently applied across the sector?

19. There are now well-established methodologies and tools for calculating embodied carbon, including the Royal Institution of Chartered Surveyors’ (RICS) Whole Life Carbon Assessment, published in 2017, and the BEEAM embodied carbon footprint credits introduced in 2018. Other commonly used tools include eTool and One Click LCA.
20. While calculations to determine embodied carbon are relatively straightforward, challenges are posed by data quality and uncertainties. For example, calculations are typically made at RIBA Work Stage 2 for high-level decisions, and Stage 4 for more detailed decisions. At Stage 2 the project is still subject to considerable change, and a balance must be struck between

assessing embodied carbon at a point far enough along in the design process to determine meaningful results, and early enough to base design decisions on the embodied carbon impact. Tools that allow carbon to be assessed prior to the determination of design and material quantities will go some way towards addressing this tension.

21. While the various tools available are typically populated with generic life-cycle assessment data, in some cases manufacturers have invested in Environmental Product Declarations (EPDs), which are independently certified calculations of the lifetime impact of a material or product. EPDs are currently voluntary, with a limited number of manufacturers requesting them. The inclusion of embodied carbon limits within product performance specifications could increase demand for EPDs, resulting in more specific data and more accurate embodied carbon assessments.

How should re-use and refurbishment of buildings be balanced with new developments?

22. In terms of reducing embodied carbon, using lower carbon materials to construct new buildings is less effective than reusing or repurposing existing buildings. We therefore believe that any attempt to decarbonise the building stock must incorporate the repair, maintenance and improvement of the existing building stock, 70% of which will still be standing in 2050.
23. Buildings should therefore be designed with flexibility in mind, to allow for future conversion or expansion to extend their overall lifespan. If this is not possible then reusing components is the next best alternative, however while a 'design for dismantling' approach is often spoken about, it is rarely carried out, and would require an industry shift towards design for manufacture.

Should the embodied carbon impact of alternative building materials take into account the carbon cost of manufacture and delivery to site, enabling customers to assess the relative impact of imported versus domestically sourced materials?

24. Yes. The decarbonisation of the UK's energy grid has only served to make embodied carbon emissions from the built environment more salient. The carbon emissions from a building's operational energy use make up only a portion of the carbon emitted across its entire lifecycle, and the emissions embodied in the materials used to produce, operate, maintain and demolish buildings can account for anything between 30% to 70% of a building's lifetime carbon.
25. The Government must phase in requirements for the consistent assessment and reporting of whole life carbon and set targets for embodied carbon, which is the emissions associated with materials manufacture and delivery, construction, refurbishment and disposal, and these should be regulated.

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