Royal Institute of British Architects

House of Commons Environmental Audit Committee: Sustainability of the built environment
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The Royal Institute of British Architects is a global professional membership body driving excellence in architecture. We serve our members and society in order to deliver better buildings and places, stronger communities and a sustainable environment. Being inclusive, ethical, environmentally aware and collaborative underpins all that we do.

The Royal Institute of British Architects (RIBA) welcomes the opportunity to respond to this inquiry. Around 40% of global carbon emissions stem from buildings and architects have a significant role to play in reducing UK greenhouse gas emissions. The RIBA joined the global declaration calling an environment and climate emergency on 29 June 2019; just two days after the UK government passed a law stipulating the UK end its contribution to global warming by 2050, by bringing all greenhouse gas emissions to net zero.

In October 2019, the RIBA launched the 2030 Climate Challenge. The Challenge asks architects meet net zero (or better) whole life carbon for new buildings by 2030 by reducing operational energy, embodied carbon and potable water usage.

We believe that there are several areas that are critical to success in achieving the UK's net zero ambition, and with the right decisions, the UK can demonstrate global leadership and create a world-leading built environment sector.

To ensure the sustainability of the built environment the RIBA recommends the Government:

- Set operational energy and embodied carbon targets, in line with the RIBA's 2030 Climate Challenge
- Promote and undertake Post Occupancy Evaluation to help close the performance gap
- Introduce a National Retrofit Strategy – a long-term plan and investment programme for upgrading the energy efficiency of our housing stock
- Introduce a sliding scale of Stamp Duty, where the most energy efficient homes pay significantly less than the least
- Ensure sustainability is at the heart of the planning system
- Restrict Permitted Development Rights to create a level playing field that ensures that all homes and buildings meet the same scrutiny, sustainability, safety and quality standards

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- **To what extent have the Climate Change Committee's recommendations on decarbonising the structural fabric of new homes been met?**

The Climate Change Committee's 2019 Report, UK Housing Fit for the Future, makes several recommendations to Government on sustainable building, including incentivising the increased use of wood in construction and developing policies to minimise the whole life carbon impact of new buildings. Unfortunately, little progress has been made in these areas.

The Future Homes and Future Buildings Standard consultations make little reference to embodied carbon, a key contributor to carbon emissions from new homes and buildings. We must start regulating and setting embodied carbon targets, and these should be in line with the RIBA 2030 Climate Challenge.

- **How can materials be employed to reduce the carbon impact of new buildings, including efficient heating and cooling, and which materials are most effective at reducing embodied carbon?**

Materials have a key role to play in reducing the environmental impact of a new building. Every material has an embodied carbon 'footprint' – usually, but not always, the less processed the material the smaller the footprint. When designing and constructing a building, how each material can perform the required function whilst using the least embodied carbon, should be considered.

When looking to reduce the carbon impact of new buildings we must also consider whole life carbon. Whole life carbon refers to the embodied carbon that will be emitted from the materials used, but also the carbon emitted from the construction process itself, a buildings' operations and maintenance, refurbishment and end of life and disposal.

Whole life carbon should be considered from the outset of a project as it can help create significant carbon savings. For example, the embodied carbon burden of installing triple glazing rather than double can be greater than the operational benefit resulting from the additional pane.

- **What role can nature-based materials can play in achieving the Government's net zero ambition?**

Nature-based materials can play a useful role in achieving net zero. Natural materials will often, though not always, have a low amount of embodied carbon compared to a manufactured and processed equivalent. They are likely to be biodegradable and less likely to produce harmful toxins.

Many RIBA award winning buildings have utilised nature-based materials such as the Hauxley Wildlife Discovery Centre in Northumberland. The Centre used locally quarried stone in the structural gabions, clay from roadworks nearby was used to create the rammed earth flooring and straw bales from local farms were used for the walls. This has resulted in a zero concrete building that significantly reduces embodied carbon and provides a healthy internal environment.

The use of timber, however, is more complicated. The current ban on timber restricts the use of structural timber in the external wall, often used to limit carbon emissions, which will have a detrimental effect of innovation in structural timber as development and testing may now not be undertaken. The RIBA recommends that the ban should not include the building's primary structure. The primary structure should have adequate fire protection, as set out in Building Regulations.

Further research into the use of structural timber within external walls (such as cross laminated timber) should be undertaken to obtain relevant scientific data or experimental evidence to determine and quantify the performance of buildings constructed using structural timber when subject to real fire loads.

Finally, the RIBA promotes a performance-based approach to the use of materials. Architects have the skills and knowledge to design and choose the right materials to help reach net zero. By setting

ambitious embodied carbon targets for buildings, the Government can help the built environment reach their net zero goals.

- **What role can the planning system, permitted development and building regulations play in delivering a sustainable built environment? How can these policies incentivise developers to use low carbon materials and sustainable design?**

The Government has a key role to play in setting ambitious standards to ensure that we meet our climate commitments and preserve the planet for future generations. The RIBA welcomes the direction of travel signified by many of the measures proposed by Government in recent years to help the UK reach net zero. However, we believe that there is a need for greater ambition if we are to significantly improve the performance and reduce the environmental impact of the built environment.

Planning system

Taken as a whole, the Planning for the Future White Paper represents the biggest set of reforms to the rules governing land use since the 1948 Town and Country Planning Act. However, as notable as the proposals themselves are, one of the most significant features of the White Paper is the lack of detail about how the Government intends to deliver an urgent step change in sustainability that fundamentally addresses climate change.

Disappointingly, the White Paper lacks any mention of our global climate emergency. The planning reforms are a once-in-a-generation opportunity to embed sustainable development into the planning system and these must provide the industry with a clear pathway to net zero carbon. However, the current proposals do almost nothing to guarantee the delivery of affordable, well-designed, and sustainable homes.

Even the most sustainable new homes can be hugely damaging to the environment if they are built in the wrong places. Too many new developments in England lack an alternative to car usage – this must change. As land which had previously been used for industrial and commercial development comes forward, it is essential that the opportunity is seized to promote sustainable behaviour as well as development.

To avoid perpetuating low density zoned suburbia, sustainable development should be mixed use at a density close to existing public transport to support local amenities and walkable to avoid the continued reliance of personal car use, including electric vehicles. New developments should embed resilience to climate change impacts such as flooding and overheating and ensure that all developments significantly enhance local biodiversity.

The White Paper suggests the merging of the Environmental Impact Assessment with the Sustainability Appraisal. If we over-simplify these tests, we risk damaging environmental and ecological standards as opposed to enhancing them. If the Government does create a new single 'sustainable development test', it must be based on the UN Sustainable Development Goals – and be ambitious, flexible, and holistic.

The Planning White Paper pits the environment against other aspects of development by suggesting that local plans must 'strike the right balance between environment, social and economic objectives.' However, sustainability experts can help deliver local plans and improve social and economic objectives, while still being sustainable.

The White Paper focuses on new homes, but we will not meet our carbon reduction target by building new homes. 85 per cent of our existing housing stock will still be in use in 2050. Therefore, how the reformed planning system will work with our existing housing stock is essential. The Government must bring forward a National Retrofit Strategy and lay out a clear plan of how we will improve the energy efficiency of the millions of homes that require retrofitting across the country.

Permitted development rights

The extension of Permitted Development Rights (PDR) means that local authorities now have very little control over many aspects of change in their area, particularly in town centres. PDR allows for building owners to undertake certain types of work without the need to apply for planning permission. While a significant number of homes have been delivered, the lack of regulation has seen a substantial number of extremely poor-quality housing since the policy was introduced.

Removing the oversight of local authorities and the planning system from the process has led to a decline in standards. There are also no requirements relating to the quality, size or sustainability of new homes delivered through the conversion of offices and commercial premises to dwellings. It is vital that all new homes – including those undertaken via PDR are sustainable and energy efficient.

Homes must be sustainable, long-lasting, affordable and contribute to the health and happiness of the people that live in them. PDR is fundamentally changing our building stock without consideration to sustainability and space standards. This failure to take a holistic view of what constitutes good design will inevitably lead to the continued and accelerated development of sub-standard housing.

The Government's proposed amendments to the National Planning Policy Framework (NPPF) highlight the importance of sustainable development within the planning process; however, the expansion of PDR is in direct opposition to this and does not guarantee sustainable or energy efficient homes.

Permitted development must be restricted to create a level playing field that ensures that all homes and buildings meet the same scrutiny, sustainability, safety and quality standards.

Building Regulations

The recent consultations into the Future Homes and Future Buildings Standard, which suggest changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations, are not ambitious enough to ensure our new homes and buildings do not negatively impact the environment.

The Government has an important role to play in setting adequate standards to reach net zero and therefore, must:

Start regulating total energy consumption and not introduce primary energy

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.

Instead, we must start regulating the amount of energy used by a building. We suggest that operational energy becomes the key metric. The metric is already well known and understood within the sector as well as by building owners and occupiers. We must use operational energy from 2021 and not introduce primary energy as the principal performance metric.

Using operational energy as the key metric would also allow for benchmarking and minimum standards to be easily established based on building type, driving further innovation within the built environment.

Set actual energy performance targets for buildings

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.

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. Operational energy targets should be in line with the RIBA 2030 Climate Challenge.

Ensure new buildings are really on track for net zero carbon, with low energy demand and no fossil fuels

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.

Assess building performance better to close the performance gap

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.

There needs to be better enforcement of regulatory requirements. In addition, Post Occupancy Evaluation (POE) 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.

The Government should not only promote and endorse POE but require POE as a condition for all publicly funded buildings and housebuilders receiving Help to Buy payments. This is essential for transparency of how public money is spent, but also provides data that can be shared and learnt from, allowing for continuous improvement on energy efficiency within the built environment.

Introduce and regulate embodied carbon targets for buildings

The carbon emissions from a building's operational energy use make up only a portion of the carbon emitted across its entire lifecycle. There are significant carbon emissions embodied in the materials used to produce, operate and maintain buildings. However, the Future Buildings Standard consultation does not address this.

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, construction, refurbishment and disposal, and these should be regulated. Embodied carbon targets should be in line with the RIBA 2030 Climate Challenge.

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

Several different tools exist for measuring embodied carbon, which can lead to different results, depending on what tools has been used. The RIBA recommends the use of full Whole Life Carbon Assessments as set out by the Royal Institution of Chartered Surveyors (RICS), which we believe is the most comprehensive and consistent approach available to the industry.

- **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?**

Embodied carbon refers to the carbon emitted from the processes associated with sourcing materials, fabricating them into products and systems, transporting them to site and assembling them into a building. It also includes the emissions due to maintenance, repair and replacement, as well as final demolition and disposal.

To help address the levels of embodied carbon in new buildings, the UK should introduce embodied targets. Setting embodied carbon targets will increase the demand for low carbon materials – stimulating growth in low-emission manufacturing of traditional materials and promote new low carbon materials. Actively considering embodied carbon will also encourage the use of local materials, driving the built environment to source products from the UK where possible.

- **How well is green infrastructure being incorporated into building design and developments to achieve climate resilience and other benefits?**

Green infrastructure is difficult to incorporate solely into building design and often relies on being able to influence the design of a whole site, rather than simply the building. Including one green wall to part of a building acknowledges the importance of environmental design but unlikely to result in any significant whole life carbon savings or lowering of internal temperatures. However, green infrastructure can have positive impacts on wellbeing.

For projects that do have site wide green infrastructure embedded, they must consider how the changing climate may impact the project. For example, are plants drought resilient enough to cope with increasing dry and hot summers due to climate change? If these plants require heavy watering to be maintained the project may be less sustainable than originally thought. These questions must be considered from the outset.

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

As touched on above, the Planning for the Future White Paper focuses on new homes, but we will not meet our net zero target by building new homes. Therefore, we must prioritise the re-use and refurbishment of existing buildings. Retrofitting allows the embodied carbon in a building to be preserved and decreases the amount of the carbon emitted.

However, this must not be done at the expense of safety and quality. The extension of PDR means that, while a significant number of homes have been delivered, the lack of regulation has seen a substantial number of extremely poor-quality housing since the policy was introduced.

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

The cross-departmental nature of energy efficiency has meant that crucial elements of its policy have been lost between departmental remits, allowing departments to shift accountability amongst one another. For the built environment, this is especially acute as energy efficiency is led through the Department for Business, Energy and Industrial Strategy, but housing is led by the Ministry of Housing, Communities and Local Government.

To ensure that energy efficiency improvements receive adequate funding and long-term policies, we suggest that coordination across departments could be more effective through a HM Treasury led infrastructure approach.

The RIBA also suggests that improving the energy efficiency of England's building stock must become a national infrastructure priority. To date, buildings have not been seen as part of the nation's infrastructure and have therefore been on the receiving end of less funding on the basis that energy efficiency improvements have not been funded as part of the Government's infrastructure investments portfolio. Infrastructure projects by HM Treasury are valued more highly on the basis that they are deemed to have higher private sector multiplier effects, meaning they are seen to offer better returns on investment.

Previous Government policies, including the Green Deal, have not been successful at incentivising homeowners to improve their energy efficiency. This is for several reasons, including high interest rates and homeowners not being convinced to improve energy efficiency based on energy bill savings alone.

The start-stop nature of funding for energy efficiency improvements, which has been the norm to date, has also not helped the situation.

Therefore, we need a long-term plan and investment programme for upgrading the energy efficiency of our housing stock, a National Retrofit Strategy. Such a strategy would need to be based on substantial and sustained government funding. The RIBA is calling for the £9.2 billion pledged for retrofit in the Conservative manifesto to be brought forward over the next five years.

The National Retrofit Strategy must also address incentives. To help motivate the owner-occupier sector to retrofit their home, the tax system should be altered. The RIBA suggests a sliding scale of stamp duty, where the most efficient homes pay much less tax than the least. This could be capped at £25,000 to avoid large and potentially punitive increases on expensive homes. We also recommend a time-limited rebate period, to encourage homeowners to make their own energy efficient improvements.

Evidence shows that people are more likely to pursue energy efficiency improvements at certain trigger points or moments of change, such as moving home, since they are already prepared for disruption at these times. In 2017-18, there were 1.1 million residential transactions, so reforming stamp duty creates an opportunity to incentivise a large proportion of homes each year. However, a stamp duty differential is not a silver bullet. It must be implemented as part of a suite of measures, through a National Retrofit Strategy, that includes adequate funding and green finance options.

Further, council, inheritance and capital gains taxes could also be revised to encourage energy efficiency. Since far fewer homes are subject to inheritance and capital gains tax than stamp duty, amending these taxes would not be as effective as stamp duty reform. However, embedding energy efficiency across the tax system would send a strong message that the Government is serious about meeting net zero and energy efficiency improvements.