

# **Building for the future**

## **A Roadmap to Sustainable Development**



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# Foreword



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In the UK, the building landscape is in the initial stages of a period that will see unprecedented changes and challenges.

Over the last decade, innovative businesses have embraced groundbreaking new practices in building design and construction methods to create modern and sustainable spaces. These methods have slowly been embedded into wider industry practices giving way to a greener, more resilient built environment, which can adapt to people's post-pandemic needs and the demands of the future. But government regulation is yet to catch up at a time when we must all recognise the need to make what we build today fit for the different and evolving needs of future generations.

An unparalleled confluence of factors has the potential to challenge traditional approaches to housing and building policy and accelerate further changes across the industry. Corporate social responsibility and shareholder accountability have driven the business community's commitment to net zero, unlocking greater investment in sustainability and delivering innovation. Historic energy price increases as well as the decarbonisation targets set out in the Paris Agreement have prompted Government to set out long-term plans for action. At the same time, the cost-of-living crisis is forcing consumers and businesses to focus on taking back control of their energy costs, while younger generations are challenging industry and Government to go further on the green agenda.

Taken together, these factors should revolutionise the future of the UK's building stock and compel the new Government to place sustainability and resilience at the heart of its plans. As a leading insurer, AXA UK is committed to helping people, businesses, and Government to mitigate the risks we face now and in the future. We take a keen interest in the evolution of the built environment sector which extends far beyond the need to see safer, greener, and future-proofed stock. It now plays a vital role in supporting the nation's energy security and resilience to emerging risks driven by climate change such

as flooding, and extreme weather.

Our goal in convening a roundtable of experts was to understand the challenges and opportunities associated with building sustainably and to develop a set of practical recommendations for Government and industry to achieve net zero targets without compromising on building safety and resilience. Our discussion highlighted the many ways in which sustainable and adaptable buildings can deliver real benefits for everyone, from central government to businesses and consumers. But for these benefits to be realised we must adopt a longer-term, forward-looking approach to policymaking that will take a view over decades, not just years.

The policy recommendations set out in this report are AXA UK's, but they are informed by the many expert views we heard during our roundtable discussion. The time for action is now. We must capitalise on the current momentum to implement a long-term strategy for more sustainable, resilient buildings and we hope the recommendations set out in this report can make a real and lasting contribution to future policy proposals.

# Context

Working with our roundtable experts, our objective was to draw on their insights and develop practical recommendations for Government and industry to achieve net zero targets without compromising on building safety and insurability. Roundtable participants reflected on the implications of changing building methods and renewable energy on building safety, the wider challenges associated with sustainable development, as well as the impact of the COVID-19 pandemic, hybrid working, and spiralling energy costs on the future of the built environment. Participants included engineers, designers, housebuilders, lawyers, property developers and insurance experts.

The built environment plays a huge role in our day-to-day lives, shaping how people live, work, and socialise. It is central to addressing our current societal challenges which are wide and varied, ranging from the transition to net zero to the cost-of-living crisis. The industry has become increasingly cog-

nisant of its potential to support the shortage of affordable, sustainable housing and its willingness to invest is fundamental to UK-wide economic growth.

Buildings account for approximately 40% of global carbon emissions across their entire lifecycle.<sup>1</sup> Over the last decade, forward-thinking businesses across the sector have revolutionised their working practices and embraced innovations in technology and building materials in a bid to reduce emissions. These businesses have recognised the urgency of the climate change crisis and committed to ambitious net zero targets. Last year, a range of stakeholders across the building and construction sector called on the Government to introduce further regulation and new targets for embodied carbon performance to accelerate the decarbonisation of the built environment.<sup>2</sup> Some organisations have also shown unprecedented adaptability to new consumer and business needs following the COVID-19 pandemic, linking the sustainability agenda with the creation of multi-purpose, adaptable buildings which can serve a range of needs – from office spaces to homes and retail units.

As leading businesses race ahead, the Government is lagging behind. The lack of emphasis on sustainability in recent

announcements is a missed opportunity to leverage the potential of a sustainable built environment to improve community and environmental outcomes, boost productivity, and support households through the cost-of-living crisis. While new standards have been introduced to encourage the development of more sustainable buildings, these standards have failed to keep pace with the rate of change. The Future Homes Standard, which sets out requirements for new build homes to be equipped with low carbon heating and energy efficiency measures from 2025, falls short of identifying and addressing the disruptive trends which will radically change our homes as well as the nature of future building regulations. The ensuing Future Buildings Standard, which was consulted on in 2021, is unlikely to introduce embodied carbon targets for commercial properties, despite repeated calls from industry. The Government must reform traditional approaches to housing and building policy to better support industry as it looks to build more sustainably, and to help communities reap the benefits associated with a well-planned, adaptable, efficient, and resilient built environment.

<sup>1</sup> UN Sustainable Buildings  
<sup>2</sup> Part Z



# Key Recommendations



## DEFINING SUSTAINABLE BUILDINGS

- Policymakers must develop a comprehensive definition for sustainable buildings which promotes durability, adaptability, and purpose as a point of departure for future building regulations and industry targets.



## TACKLING THE AFFORDABILITY OF SUSTAINABILITY

- Financial incentives, such as green mortgages and stamp duty discounts, should be introduced to help consumers with the upfront investment required to purchase a sustainable home.
- New build-specific grants or financial support schemes should be introduced to incentivise industry to better insulate and improve energy efficiency across residential and commercial developments, to avoid the need for future retrofitting.



## CREATING LIVING, LEARNING BUILDINGS

- A new Smart Building Kitemark should be introduced to equip homes and businesses with the most effective smart technologies to drive improvements to building performance and energy efficiency.
- A publicly available and transparent online database should be established to give households, businesses, local authorities and Government a better understanding of building performance and resilience across the UK and promote a culture of data-driven decision-making.



## CREATING A RESILIENCE-BASED REGULATORY FRAMEWORK

- Government should introduce a robust testing regime, whereby any data collected is fed into a publicly accessible online database to provide an early warning system on any safety concerns which emerge from new building materials and practices.
- Provisions to protect flood risk areas from future developments should be included in the Planning Bill. In addition, Government must introduce measures to help vulnerable local authorities and communities access flood resilience solutions.
- Introducing retrofitting targets, or voluntary property benchmarking programmes, could help accelerate the decarbonisation of the built environment and encourage a more holistic approach to sustainability across the sector.



## IMPROVING EDUCATION AND TRAINING

- A Sustainable Buildings taskforce should be established to place safety and resilience at the heart of building and housing policy and promote a culture of continuous learning across the sector.
- Government should develop a comprehensive green skills strategy to ensure there is the expert capacity necessary within the built environment sector to create safe, sustainable and insurable buildings.
- Industry should consider developing a joint charter to define best practice for consumer education at point of sale to empower consumers to participate in the upkeep of our building stock.

# Defining Sustainable Buildings

To build sustainably requires a shift towards designing significantly more resilient, multi-purpose building structures which can be refitted with minimal intervention as their usage and purpose inevitably evolves. The built environment sector is leading the way in adopting this model across new and refurbished developments, phasing out the traditional blueprint of building separate structures for people to live, work, and play. Modern developments boast a blend of spaces, including living and dining areas, offices, communal meeting rooms, as well as leisure and retail units. Yet our conceptualisation and codification of the built environment remains largely unchanged. If multi-purpose buildings are the way forward, we

must consider the potential merits of creating an overarching definition which encompasses all elements of a modern, sustainable building, rather than distinguishing homes from offices and retail spaces.

Developing a comprehensive definition for sustainable buildings would help ensure Government and industry share a mutual understanding of what it means to decarbonise the built environment and support greater alignment between future building regulations and industry practices. This definition should promote the importance of durability and adaptability, set a minimum standard for energy-efficiency, while remaining loosely prescriptive on building type and purpose, energy source and material composition due to the context-specific and evolving nature of these factors.

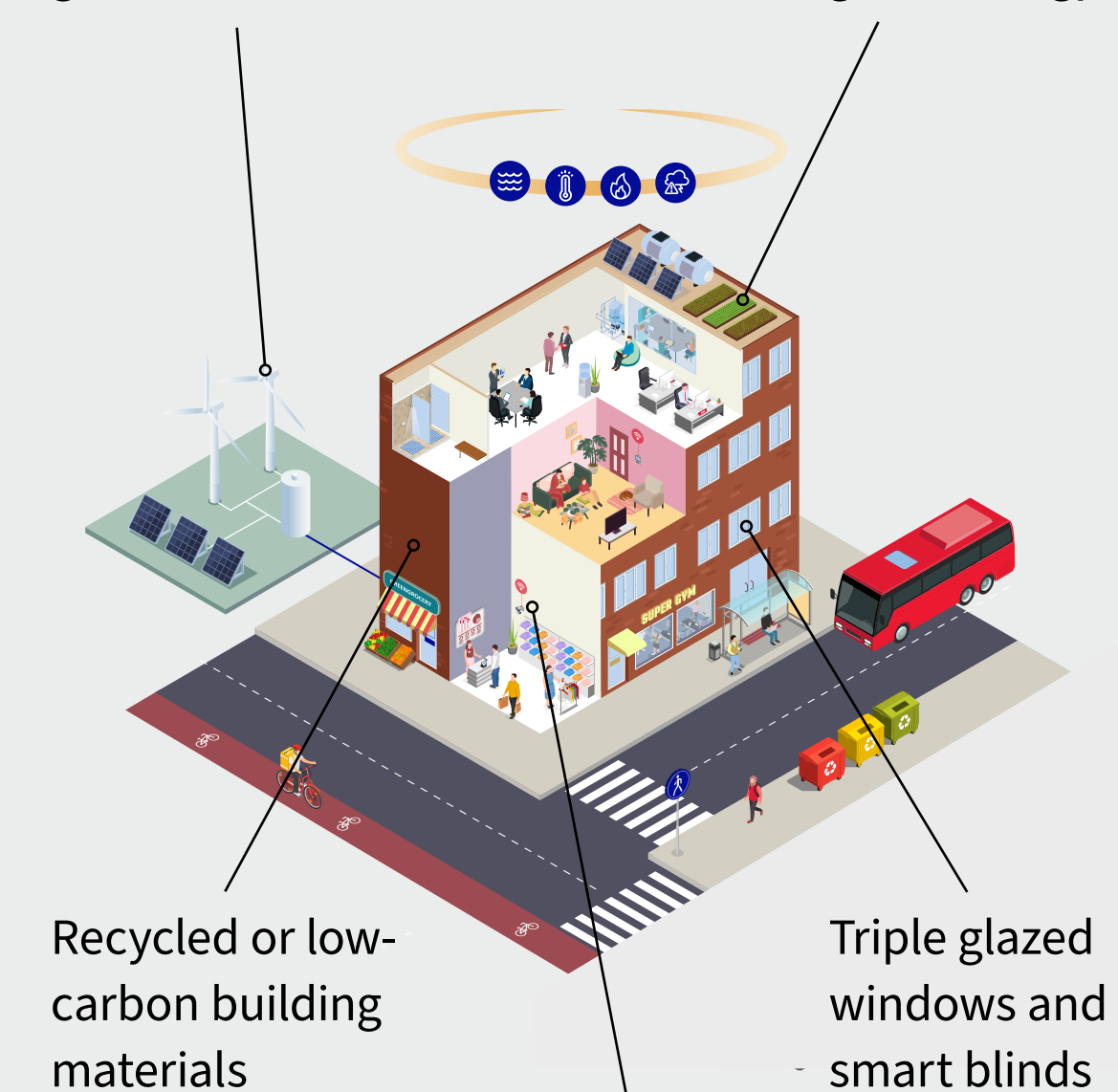
A sustainable building is one made with locally-sourced, low-carbon, and, where possible, recycled materials. Its structure is resilient to risks including fire, flooding and extreme weather and its fabrics and fittings are adaptable to future potential uses. The energy it uses is either generated on site (e.g., solar panels, heat pumps, etc.) or purchased from renewable suppliers. A sustainable building is equipped with smart technologies and sensors to ensure optimal building performance and safety. It must also serve a range of uses, promote wellbeing, and have good access to public transport links as well as active travel opportunities.

## SUSTAINABLE BUILDING



Building-specific renewable energy generation

Flood detection devices and rain harvesting technology



Recycled or low-carbon building materials

Triple glazed windows and smart blinds

LED lighting and motion sensors



## BEDZED – THE UK’S FIRST MAJOR ZERO-CARBON COMMUNITY

Completed in 2002, BedZED is the UK’s first large-scale, mixed-use sustainable community initiated by Bioregional and developed by Peabody Trust in partnership with Bioregional and ZEDfactory architects. The development comprises 100 homes, office space, abundant green spaces, a college, and community facilities. It has been an inspiration for low-carbon, environmentally-friendly developments around the world.

### Key facts

- **Greener construction with local materials and reclaimed products:** 52% of the construction materials were sourced within 35 miles of the development – closer than is typical for the construction industry. In addition, 15% were reclaimed or recycled products.
- **Water-saving appliances:** Dual-flush toilets, aerated flow taps and shower heads and water-efficient washing machines means BedZED homes use almost 40% less water than average metered homes in the area.
- **Comfortable and cheaper-to-run homes:** Most of the development’s homes are heated by the warmth of the sun and are highly insulated. Estimated total annual savings in transport, water and energy bills stand at £1,391 a year compared to a standard London household with its own car.



Defining sustainable buildings along these lines would help Government adopt a two-pronged approach to the decarbonisation of the built environment, transitioning away from its current singular focus on new builds. It would also compel the Government to support industry to repurpose and renovate the UK’s existing building stock. Retrofitting can sometimes be a more sustainable – albeit potentially more costly and labour intensive – alternative to new builds, saving up to 60% embodied carbon emissions through the re-use of existing materials.<sup>3</sup> Yet neither option is inherently ‘better’ – both will be required to improve the future sustainability of the built environment.





# Affordability

The decarbonisation of the built environment has been driven by a range of factors and stakeholders, including corporate social responsibility (large businesses), shareholder accountability (investors), the working-from-home revolution (consumers and businesses), as well as the potential for long-term savings (consumers and businesses). However, the upfront investment required to build or retrofit sustainably constitutes a threat to the UK's net zero ambitions, particularly against a backdrop of global supply chain issues and the cost-of-living crisis. Our contributors welcomed the Government's ambition to increase the UK's low carbon electricity generation by 2030 to alleviate pressures on the short- to medium-term affordability of energy supply. The Government's energy support packages for households and businesses are of course also welcome. But to support the UK's energy security and improve energy efficiency over the long term, the Government must also increase its focus on the installation of affordable building-specific renewable energy generation and storage.

4 Sustainable construction costs | British Assessment Bureau ([british-assessment.co.uk](https://british-assessment.co.uk))  
5 Demand for sustainable homes 'massively underestimated' says survey ([marmox.co.uk](https://marmox.co.uk))  
6 Rising Gas Prices: The True Cost of Going Electric ([yahoo.com](https://yahoo.com))  
7 Air Source Heat Pump Installation - Complete Guide | GreenMatch

## FUTURE HOMES AND BUILDINGS

Introducing new measures, such as green mortgages and stamp duty discounts, could help consumers bridge the gap between the investment required to purchase a sustainable home and the long-term savings incurred by reduced running costs. On average, sustainable homes are 14% less costly to run than their traditional counterparts due to improved energy efficiency and insulation.<sup>4</sup> In addition, greater direct government support is needed to address the affordability of home-based renewable energy generation. A recent survey undertaken by Redrow found prospective buyers rank lower energy bills as more important than many other property features including parking spaces, amenities, fittings, and appliances when deciding to purchase a home.<sup>5</sup> At the time of writing, electricity cost 3 to 4 times more than gas per unit, thereby disincentivising developers from pursuing building-specific energy generation in new developments to make their properties less costly and more attractive for future tenants.<sup>6</sup>

While households and businesses are currently experiencing short- to medium-term issues surrounding the affordability of electricity and gas supply, the real, long-term issue is the affordability of office or home-based renewable electricity generation. Installing an air source heat pump, for example, can cost anywhere between £8,000 to £18,000.<sup>7</sup>

This is considerably higher than the £5,000 grant currently being offered by the Government to help households replace gas boilers with heat pumps. The Government grant is also limited to homes and retrofitting projects, rather than businesses and new developments.



Improving energy efficiency is also key. Government research shows improving the efficiency of our homes could reduce heating bills by approximately 20% and reduce the UK's dependency on foreign gas. New build-specific grants or financial support schemes should be introduced to incentivise industry to build well-insulated, energy-efficient residential and commercial developments and equip them with building-specific energy generation to avoid the need for future retrofitting.

## KINGSTON HEIGHTS – COMMUNITY HEAT PUMP SCHEME

Kingston Heights, an eco-friendly mixed-use development in Kingston, London, gets the energy for its heating and hot water directly from the Thames through a community heat pump scheme, saving 500 tonnes of carbon every year since 2013. The scheme takes renewable heat from the sun, stored in the river water and boosts it to the temperature required for underfloor heating and hot water. The river water is then immediately transferred back into the river, untreated in any way. The system is exceptionally energy efficient and generates 2.3 MW of heat output. It currently powers 160 flats and a large hotel.

## RETROFITTING

Given 80% of the UK's current building stock will still be in use by 2050, low-carbon retrofitting will play a vital role in the decarbonisation of the built environment.<sup>8</sup> The industry welcomes the Government's commitment to help people power their homes and businesses with clean energy by introducing financial support measures and incentives. Roundtable participants stressed that upfront costs remain a major barrier, even where consumers are highly motivated to make the transition to renewable energy.

The impact and uptake of government support measures have been limited. Introduced in 2020, the Government's Green Homes Grant aimed to incentivise improvements such as draught proofing and insulation across 600,000 homes in England, yet only 60,000 homes came forward to make a claim by 2021. To date, incentives have historically targeted consumers, rather than industry, and failed to address the complexities associated with decarbonising buildings. This approach, while successful in the motor and transport space, is inappropriate for the built environment. Replacing a gas boiler with an air source heat pump cannot be equated to purchasing an electric car. It calls for wider fabric adjustments, particularly in residential settings, and therefore requires additional consumer expenses, insurance considerations, and expert support. Future incentives must account for these challenges and focus on supporting consumers, businesses, and industry to buy into the sustainability agenda. Any new measures should also be developed in partnership with the built environment sector through a Sustainable Buildings taskforce to ensure they do not underestimate the complexities associated with building or retrofitting safe and sustainable buildings.

## NATIONAL GRID – LEADING THE TRANSITION TO HYDROGEN

Today, 85% of households rely on gas to heat their homes. The importance of gas networks to the UK's current energy supply means the sector needs to consider how to deliver low carbon energy reliably and safely to its customers. The industry has already made progress in exploring the potential of hydrogen to support a cost-effective transition to lower-carbon energy.

For example, National Grid recently launched FutureGrid,<sup>9</sup> a research and development project which aims to demonstrate how the national gas transmission network can be repurposed to convert to 100% hydrogen by 2050. National Grid has partnered with Northern Gas Networks and Cadent to develop East Coast Hydrogen, a 15-year programme which would see up to 39,000 businesses and 4 million homes converted to hydrogen across the Northern Powerhouse. The project has the potential to connect over 7GW of hydrogen production by 2030, alone exceeding the UK Government's 5GW by 2030 target in a single region.

<sup>8</sup> "80% of the buildings that will exist in 2050 already exist" – Bringing net zero to the masses | Online | Property Week  
<sup>9</sup> FutureGrid | National Grid Gas



# Living Buildings

Today's buildings are increasingly equipped with innovative technologies which can measure temperature, CO2 levels, humidity, and smoke presence in real time. The data generated by these sensors has the potential to revolutionise the way we design buildings and drive continuous improvements in energy efficiency and building sustainability.

A recent report found smart energy controls, for example, could cut energy use by 30% by optimising heating, ventilation and air conditioning settings based on room occupancy, temperature, and time of day.<sup>10</sup> A simple motion sensor has been proven to cut lighting costs by as much as 50%, and smart blinds can help regulate temperature to minimise unnecessary energy use.<sup>11</sup> Smart technologies are increasingly affordable and accessible to homes and businesses alike, with US-based research showing the average cost of a basic internet of things (IoT) sensor fell from US\$1.30 to US\$0.60 between 2004 and 2014.<sup>12</sup>



## IMPROVING ADOPTION OF SMART DEVICES

Not all buildings are equipped with performance-enhancing technologies. Only one in ten homes in the UK owns two or more smart home devices, such as smart lighting, security, and thermostats.<sup>13</sup> Smart meters are significantly more prevalent, having now been installed in 50% of homes and small businesses across the country.<sup>14</sup> More needs to be done to incentivise households and businesses to embrace these devices and leverage the data they collect to improve outcomes. One approach could be to introduce a new Kitemark to help people equip their homes and commercial properties with the most effective smart technologies for sustainability. This Kitemark should be specific to smart building devices and set out standards for improvements to building performance, energy efficiency, and data privacy to improve consumer trust and encourage take-up. Research shows over 90% of the UK adult population believes Kitemark products are safe and 88% have more trust in Kitemark products.<sup>15</sup>

## DATA AND DRIVING CONTINUOUS BUILDING PERFORMANCE

Embedding smart technologies into new and retrofitted developments must also become standard practice for industry. While the sector has made some headway in creating smarter buildings, it must fully leverage the role sensors, IoT devices and artificial intelligence can play in monitoring building performance and developing a collective consciousness for building health. Fully-connected, smart buildings can self-report fire risks and request repairs based on data from hundreds of sensors evaluated through artificial intelligence. Technologies such as smart rain gauges, for example, can help occupants and insurers better anticipate floods, minimising overall damage and cost. The data collected by these gauges should be accessible to tenants and insurers, but it should also be shared with local authorities to help them identify new flood risk areas and determine which neighbourhoods require greater flood resilience support. Other innovations such as leak detectors must also be more readily used by industry to mitigate water damage and ensure contractors can quickly identify the source of a given leak. In addition, wider data points, such as footfall and behavioural patterns, could also be used to ensure buildings continue to meet occupant needs and identify buildings where adjustments may need to be made.

The data collected by these technologies should feed into a publicly available and transparent online database to give households, businesses, local authorities and Government a better understanding of building performance and resilience across the UK.

10 Smart meters are now in half of UK homes and small businesses as consumers look to cut energy bills (inews.co.uk)  
 11 Smart Home Products For Your Energy Efficient Home – Smarthome  
 12 Goldman Sachs | Insights - What is the Internet of Things?  
 13 Almost a quarter of Britons now own one or more smart home devices | YouGov  
 14 Smart meters are now in half of UK homes and small businesses as consumers look to cut energy bills (inews.co.uk)  
 15 Why choose BSI Kitemark | BSI (bsigroup.com)



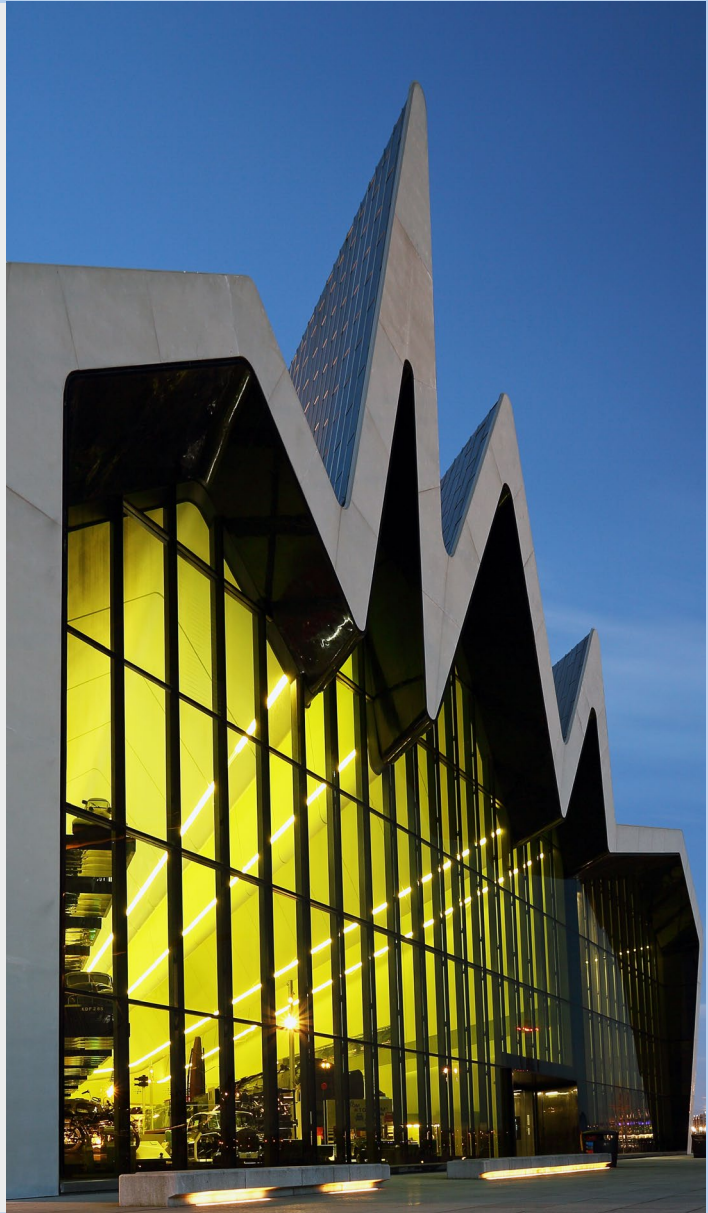
Government, regulators and industry should input additional information into the database to provide a comprehensive overview of local areas. This database could feed into a user-friendly app to ensure all stakeholders can visualise and update this information. Developing this would support Government to make informed decisions about suitable areas for future development, help planning authorities devise local plans and set house building targets. It would also empower estate agents to provide more comprehensive and meaningful information to prospective buyers, tenants, or occupants, and help consumers understand how their homes are performing.

### EMBEDDING A LEARNING CULTURE INTO THE BUILT ENVIRONMENT SECTOR

However, data sharing at industry level can only improve outcomes across the built environment sector if it is willing to adopt a more pervasive fail-and-learn culture. All participants must be encouraged to come forward when the data generated by smart buildings points towards a potential issue or performance deficiency. Where issues are identified, these must be communicated transparently and relevant stakeholders must work to rectify them as proactively and efficiently as possible. Industry must be empowered to learn from these failings and create a culture of continuous improvement, where prevention is prioritised, and mistakes are identified and addressed as soon as possible. This will be key to ensure smart data and technologies are leveraged to their full potential. The introduction of mandatory occurrence reporting and safety cases as part of the Building Safety Act marks a welcome step in the right direction. Industry and Government must work together to implement similar mechanisms outside the building safety regime to support the sustainability and resilience of the built environment.

### SMART BUILDING DEVICES

- ✓ **Smart thermostats and energy controls:** Optimise heating, ventilation and air conditioning settings based on room occupancy, temperature, and time of day to cut energy use by up to 30%.
- ✓ **Smart lighting:** Embed motion sensors and remote controls to prevent unnecessary lighting and cut lighting costs by as much as 50%.
- ✓ **Smart rain gauges:** Offer an early-warning system for floods and help local authorities identify and support new flood risk areas.
- ✓ **Leak detectors:** Minimise water damage and ensure contractors can identify the source of any given leak.
- ✓ **Neighbourhood database:** Ensure people can consult information about neighbourhood building performance, resilience, as well as energy use.



### SMART DUBLIN

Smart Dublin is an initiative which aims to future-proof the Dublin region by trialling and scaling innovative solutions to address a wide range of local challenges including flooding and traffic congestion. The initiative brings technology providers, academia, local government, and citizens together to enhance quality of life and improve resilience.

One of the successes of the Smart Dublin initiative has been the installation of low-cost rainfall sensors to alert specific neighbourhoods of flood risk. The sensors communicate data wirelessly to the City Council, enabling the council, businesses, and households to take necessary precautions ahead of a flood event. The sensors are now being used to map vulnerable areas across Dublin and inform the capital's future climate change strategy.





# Education and Training

The rapid evolution of sustainable building practices requires a greater commitment to cross-industry collaboration, workforce development and consumer education. One of the themes which emerged from our expert roundtable was that dedication to sustainability is running ahead of capability. Participants stressed there was a need to better educate stakeholders on what it means to design, build, and maintain safe and sustainable buildings. Continued education is central to move away from our historic pattern of prioritising building quantity over quality. This education must take place at three levels, specifically industry, workforce, and consumer.

## FACILITATING CROSS-INDUSTRY COLLABORATION AND EDUCATION

At industry level, creating a Sustainable Buildings' taskforce would help foster a more collaborative culture and support pedagogical sector exchanges on key topics such as innovation, skills, and insurability. Early-stage conversations between designers, fire engineers, developers and insurers have the potential to mitigate future safety concerns and educate stakeholders on instances where sustainability and insurability might be at odds with one another. Participants cited polystyrene as an example. BREEAM, the assessment method which sets out best practice standards for the environmental performance of buildings, considers polystyrene to be a sustainable material. Insurers, on the other hand, do not recommend the use of polystyrene due to its toxicity and flammability. This example demonstrates there is a balance to be struck to ensure the sector's commitment to sustainability does not come at the expense of insurability and vice versa. Understanding where this balance lies requires continuous industry collaboration, negotiation and education. To future-proof people's livelihoods as well as the buildings they occupy, the sector must therefore be supported to abandon siloed tendencies and embrace collaborative, long-term thinking.

## FUTURE-PROOFING THE WORKFORCE

At workforce level, the Government must ensure employers and individuals have access to relevant learning and development opportunities by developing a comprehensive skills strategy for the built environment sector.





The nature of the building materials we use and the construction methods we employ have evolved significantly over the last decade. Some modern buildings are also equipped with new sensors, appliances and technologies. These changes have had an impact on the makeup and skills profile of the built environment workforce. But education pathways have insufficiently addressed the sector's evolution. Our experts highlighted the need to develop a diverse range of training programmes to empower workers to understand the materials they are being asked to work with. This could help prevent the occurrence of unintended, yet significant safety issues associated with faulty sprinkler installations and other fire-stopping installations, for example. Our experts welcomed the Government's introduction of T-levels as well as its ambition to reform the apprenticeship levy later this year. These reforms should be underpinned by a comprehensive skills strategy to ensure there is the expert capacity necessary within the sector to create safe, sustainable, and insurable buildings.

### IMPROVING POINT OF SALE EXPERIENCE

Our expert roundtable also identified an opportunity for the industry's workforce to better inform and educate consumers at point of sale. Buildings are much more than four walls and a roof, yet consumers are too often unaware of how they work and how they should be maintained and made more sustainable. Electricians and engineers, for example, should be empowered to speak to their customers about the benefits of environmentally-friendly devices and building-specific energy generation such as smart thermostats or air source heat pumps.

Heating engineers, in particular, will need extensive support as they navigate the transition from gas boilers to solar and low carbon heat pumps. Replacing gas boilers with low carbon heat pumps is a complex process which can require building fabric adjustments and cause disruption and professionals will be under increased pressure to provide this type of information to consumers. Less than 2% of UK homes are currently equipped with some form of low-carbon heating, despite the Government's ambition to phase out gas boilers.<sup>16</sup> The Committee on Climate Change estimates 19 million heat pumps will need to be installed by 2050 to reach the Government's net zero targets. Yet heating engineers continue to install gas boilers in people's homes and businesses. Over 1.7 million gas boilers were installed in British homes in 2019.<sup>17</sup> The Government must therefore ensure heating engineers are supported to speak to consumers about low carbon heat pumps in order to achieve its ambition to phase out gas boilers from 2035.

Architects and estate agents can play a similar role in driving sustainable decision-making by having informed conversations with consumers about the importance of future-proofing and maintaining properties to improve re-sell value and attractiveness. A US-based study found that the installation of heat pumps in American households not only offers an energy-efficient source of electrified heating and cooling but also increases home values by US\$10,400 to US\$17,000 on average.<sup>18</sup> Research from JLL shows London-based commercial properties with an Outstanding/Excellent BREEAM rating have lower vacancy rates than those with a Very Good rating.<sup>19</sup>

Empowering industry to highlight these figures to consumers and investors at point of sale could influence the adoption of more sustainable practices, technologies and behaviours.

A potential solution would be for industry to develop a joint charter, which sets out best practice for consumer education and transparency at point of sale. This could improve industry accountability and empower consumers to be active participants in the upkeep and resilience of our national building stock.

<sup>16</sup> UK heating plan still means 120 gas boilers installed for every low-carbon system - Energy Post  
<sup>17</sup> Ibid.  
<sup>18</sup> URI researcher: Energy-efficient heat pump technology increases the value of homes in the U.S. - URI News  
<sup>19</sup> JLL - The impact of value on sustainability in central London :: 4 (yudu.com)



# Resilience Regulation

Regulation has not kept pace with evolving industry practices, emerging safety risks, and sustainability ambitions. Future regulation must move away from the primary focus on life safety and recognise wider factors such as structural integrity, risk resilience, building performance and testing, and sustainability. It must also implement a more collaborative process of sharing information about buildings, as recommended by the Hackitt Review in 2018.

## MOVING BEYOND LIFE SAFETY ASSURANCE

While regulatory emphasis on life safety assurance is crucial, focusing on life safety at the expense of structural integrity is inherently unsustainable. The Government must broaden its approach to ensure buildings are designed and fitted with the necessary safety precautions to withstand unforeseen events such as fires, flooding, and storms. Future regulations should focus on improving the structural resilience of the UK's building stock so that affected or damaged buildings can be fixed swiftly and at minimal cost to tenants and insurers.

## WATERTIGHT – EMBEDDING COST-EFFECTIVE FLOOD RESILIENCE MEASURES INTO PROPERTIES

Over 5.2 million properties in England are at risk from flooding, yet only a third of those potentially affected believe their property is at risk. The average cost of flooding stands at £32,000 for households and £83,000 for SMEs.

While flood defences, warnings and upper catchment measures can help, resilience must be built into individual properties to fully mitigate flood risk and future-proof our built environment. Resilience measures can be implemented throughout various stages of a property's lifecycle, including design (new build), refurbishment (retrofit), and after a flood event. Watertight, a property flood resilience management provider in the UK, has shown how measures such as installing 'flood doors' can better protect people from flooding.





Simple measures, such as mandating the installation of interlinked fire alarms or sprinklers in every room in a large block of flats can help better contain fires and prevent total building collapse. In Scotland, some of these measures have already been adopted. In February 2022, the Scottish Government changed the law on fire alarms to ensure all Scottish homes are equipped with interlinked fire and heat alarms in multiple rooms. Homes with carbon-fuelled appliances, such as boilers or heaters, must also have carbon monoxide detectors.<sup>20</sup>

### CREATING A ROBUST AND TRANSPARENT PERFORMANCE TESTING AND MONITORING REGIME

Future regulations must be underpinned by a more robust performance testing and monitoring regime. Industry must undertake independent testing to ensure new building materials and practices are not only sustainable, but also safe, and insurable. The information collated during testing should be included in a transparent and publicly accessible database to help Government, regulators, local authorities and consumers understand best practice on modern methods of construction and provide an early warning system of any safety concerns which emerge from new building materials and practices. A stronger testing and data collection regime would also tackle the consequences of excessive value engineering on building safety. In addition, our roundtable experts stressed there was an opportunity for future standards to promote a more continuous approach to testing

and monitoring – one which encourages designers and developers to assess building performance over the course of an entire life cycle. This could ensure buildings positively serve their occupants and identify situations where buildings might need to be adapted or repurposed. Finally, the Government could also envisage more rigorous promotion of companies receiving UKAS third-party accreditation.

### INCLUDING WIDER RISKS WITHIN THE BUILDING SAFETY DEBATE

Secondly, a number of our contributors felt that, while issues around fire safety are paramount in the aftermath of Grenfell, the broader debate around safety has at times become overlooked, with crucial aspects such as flood risk and escape-of-water not being considered to the same extent. There is a need to consider building insurability in the RIBA Plan of Works for the mitigation of the perils of fire, escape of water, and flood. Flooding and escape-of-water issues can displace entire families and incur substantial repair costs. Approximately 120,000 new homes have been built in flood-prone areas across England and Wales over the past decade, with disadvantaged communities bearing the brunt of this. To address the growing incidence of flooding, Government must protect flood risk areas from future developments. Households and businesses in at-risk areas should also be better supported to access flood resilience advice and solutions, particularly as the impact of climate change begins to increase the likelihood of flood risk in the UK.

### IMPOSING AMBITIOUS SUSTAINABILITY TARGETS

Finally, there is an opportunity for the UK’s regulatory framework to impose more ambitious sustainability targets and green energy transition requirements by moving beyond Energy Performance Certificates (EPC). We welcome the Government’s ambition to create a more accurate, reliable, and trusted EPC system given the central role it plays in supporting the targets and aspirations set out in the Clean Growth Strategy.<sup>21</sup> EPCs provide industry and consumers with a useful understanding of how much energy a property consumes, and a strong benchmark against which to measure positive change. However, other measures, such as retrofitting targets, information on average energy bills over the last five years, or voluntary property benchmarking programmes should be introduced to help accelerate the decarbonisation of the built environment and encourage a more comprehensive approach to sustainability across the sector. In France, the Government has set targets for industry to retrofit energy-efficiency measures in 500,000 existing homes every year.<sup>22</sup> In the United States, an independently certified ‘Energy Star’ label has been introduced which now applies to homes that are 15-30% more energy efficient than an average new home. The programme prevented 2.8 billion metric tons of greenhouse gas emissions between 1992 and 2015.<sup>23</sup> The UK Government should consider introducing similar measures to ensure regulation is keeping pace with its sustainability ambitions.

20 Fire and smoke alarms: changes to the law - gov.scot ([www.gov.scot](http://www.gov.scot))  
 21 Improving Energy Performance Certificates: action plan - progress report - GOV.UK ([www.gov.uk](http://www.gov.uk))  
 22 Energy renovation of buildings in the French recovery plan: an opportunity to be seized and pitfalls to be avoided | IDDRI  
 23 Why are household energy efficiency measures important for tackling climate change? - Grantham Research Institute on climate change and the environment ([lse.ac.uk](http://lse.ac.uk))



# Conclusion

We have set out the challenges facing Government and industry in this report and provided clear policy recommendations to improve the sustainability, safety and resilience of the built environment.

Our key recommendations include:



Defining sustainable buildings to provide a point of departure for future building regulations and industry targets.



Tackling the affordability challenge by introducing financial support measures to help consumers purchase sustainable homes and build energy-efficient, well-insulated residential and commercial developments with building-specific energy generation.



Leveraging the potential of data and technology to improve building performance and energy efficiency by establishing incentives for consumers and industry to equip homes and commercial properties with smart devices.



Focusing on education and training to bolster expert capacity to create safe, sustainable and insurable buildings and empower consumers to be active participants in the decarbonisation of the UK's building stock.



Reforming the regulatory framework to promote the importance of sustainability and resilience and consider the impact of emerging risks such as extreme weather events, flooding, and storms on the built environment in the future.

We look forward to discussing these recommendations with Government and industry to support the safe decarbonisation of our built environment.

We would like to thank our participants for their insights and support. We are especially grateful to our roundtable chair, Sarah Brodie, for facilitating a productive discussion on sustainable development. While heavily informed by the insights of our expert contributors, the analysis and recommendations made in this report represent AXA UK's views.





# Attendees



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