



# Retrofitting to decarbonise UK existing housing stock

RICS net zero policy position paper



# Contents

<b>Foreword</b> .....	3
<b>Executive Summary</b> .....	4
<b>Recommendations</b> .....	5
Sector Emissions Performance .....	8
Policy Drivers .....	9
Energy Efficiency Regulations .....	10
Energy Performance Certificate.....	12
Embodied Carbon .....	15
Industry Standards .....	15
Industry Specifications .....	16
Drivers to Retrofitting Homes .....	17
Taxation Levers.....	19
Variable Stamp Duty.....	19
Reduction on VAT for Home Improvement .....	20
Green Finance .....	21
<b>References</b> .....	23



**Dr Patrice Cairns MEng**  
UK Policy Manager



**Hew Edgar MCIPR**  
Head of UK Government  
Relations and City Strategy

## Foreword

**Achieving net zero carbon by 2050 is undoubtedly one of the greatest ambitions set by the UK Government in the drive to tackle climate change. While there are significant challenges across the built and natural environment to decarbonise, there are opportunities for industry and Government to work together, raising the bar of sustainability through standards, practice and effective policy.**

As a trusted professional body enforcing standards across the built and natural environment, we have an important role to play in shaping a more sustainable world. In response RICS are driving standards and developing tools across the sector, from low carbon and resilient infrastructure and built assets, to climate adaptative solutions through land management and green finance. While we have made progress, there is much to do, and we aim to play a leadership role in embedding sustainable business practice and implementing the UN's sustainable development goals (SDG's) within the surveying profession. Through our **Value the Planet campaign** we will support the built and natural environment sector in delivering lasting benefits to our planet, people, communities and markets.

The built environment sector contributes significantly to national energy use and carbon emissions, yet progress in the decarbonisation of buildings has been limited and the challenge going forward even greater. Given that new housing accounts for 1-2% of total building stock each year, addressing the energy efficiency of the UK's existing housing stock is one of the most cost-effective and crucial routes to achieving net zero ambitions. Retrofitting provides an opportunity to achieve both operational carbon and significant embodied carbon savings through re-use rather than re-build.

While the UK Government ambitions in decarbonising housing stock have been stated, the policy route is uncertain. A holistic approach to retrofitting is required, reviewing the existing myriad of Government policies and schemes that seek to address specific energy efficiency issues, and identifying both policy gaps and opportunities to enhance outcomes. This policy paper seeks to review the existing policy landscape across retrofitting and identify the opportunities that Government can take with industry expertise to boost energy efficiency through a package of regulatory measures, industry standards, fiscal levers and market insight.

Retrofitting of existing homes requires a significant step change to accelerate pace, driving not only a reduction in carbon emissions, but positive social benefits through enhancing wellbeing and skilled job creation. However the task is formidable, and the UK will need to take immediate action to close the widening gap.

Patrice Cairns

Hew Edgar

## Executive Summary

An overhaul to the energy performance of the UK's existing housing stock is a vital milestone on the Government's net zero pathway, both in operational and embodied carbon savings. While decarbonisation of the heat network ultimately remains one of the toughest challenges, an energy efficient building fabric is needed to be both effective in cost savings and emissions reductions.

The pace of retrofitting homes is lagging. The barriers to scaling up the uptake of energy efficient measures in domestic housing have been well documented by existing literature, and are reviewed within this paper, with the main barriers continuing to be an obstacle across the fields of regulation, finance, data, sector capacity and consumer drive. Underpinning these barriers is the lack of a Government policy roadmap providing clarity and certainty on the route to a net zero 2050.

This policy focused paper explores the current landscape of retrofitting policy drivers, regulations, technical processes and fiscal levers, identifying both gaps and opportunities, and aims to identify where industry standards and tools can overcome barriers and enhance the value of retrofitting in both achieving Government targets and in encouraging consumers to invest in their property.

The surveying profession is key to delivering fit for purpose retrofitting of homes, from undertaking property assessments and data management, to making project decisions that can maximise carbon savings. RICS is developing standards and practical tools that will enhance transparency and reduce risk, thereby increasing investment in carbon mitigation measures of buildings.

# Recommendations



## Strategic

Government have focused primarily on addressing low carbon new build, but must now prioritise cost-effective policy development to deliver decarbonisation of the UK's existing housing stock as a critical milestone on the net zero path to 2050.

Government must not delay in making strategic climate change policy decisions relating to the UK's existing housing stock, must commit to sustained funding and a package of financial incentive mechanisms for retrofitting, drive standards and regulation, and must support industry in delivering the robust pipeline of skills required to undertake this challenge.

Government should designate the energy efficiency of the UK's building stock a national infrastructure priority, with appropriate long-term investment and bring in line with the National Infrastructure Commission portfolio.

Government must publish a policy roadmap for delivery of decarbonised homes, align its suite of climate, energy and fuel poverty policies, and review/assess the impacts of existing policies on reaching the net zero targets.

Government must demonstrate support, incentives and financial packages for both low-income and vulnerable households, and the 'able to pay' market.



## Regulatory

Government must work closely with sector stakeholders and publish a defined road map, with quantitative targets, investment and implementation plans to achieve ambitions of a minimum EPC rating 'C' existing housing stock.

Government should monitor and ensure that Local Authorities are adequately resourced to manage and enforce across their portfolio of building control, minimum energy efficiency standards and EPC's.

Government should consider reviewing the impact of a minimum MEES at point of sale in the regulatory ambition and transition to bring all dwellings to a EPC rating of C by 2035.

Government should provide support to bring heritage buildings up to MEES requirements through financial incentives, and support industry in addressing the skills gaps in retrofitting heritage buildings.



## Data

Government should take forward the 'Every Home Counts' recommendation to create a data warehouse, and continue its steps in making EPC data more widely available; while ensuring that safeguards are in place to protect consumer privacy.

Government should adopt a more holistic approach to assessing the performance of a building, by continuing its review of EPC's, considering benefits of operational performance systems such as the Australian NABERS, and monitoring the evolution and outputs of the EU Building Passport framework.

RICS recommend that Government work in partnership with industry to explore the use of PropTech and data standards to address areas around data governance and privacy protection.

Government should further review the limitations of the SAP methodology, and consider the use of smart meter data to improve accuracy and reliability of EPCs, which would allow for more evidenced based building energy efficiency policies/targets.

To fully exploit the value of property-based data in helping achieve Government ambitions, RICS recommend that Government support industry in the growth and regulation of the PropTech sector, investing in a robust professional skills pipeline and adopting data standards.



### Skills

Government should support industry in addressing the skills gap by mandating that all construction and built environment related Apprenticeships and T-levels assess the apprentices understanding of sustainability and mitigation of environmental impact.

RICS recommend that all construction and built environment related Apprenticeships and T-levels embrace the knowledge of professional bodies and where possible lead directly to professional body membership.

Government must engage with industry to improve public awareness of standards and professional competency-based advice and training in regard to energy efficiency retrofits and wider home improvement works, especially for heritage buildings which are more complex and present a skills gap in the market.



### Standards and Tools

Government should adopt ICMS (2nd edition) as a global benchmarking tool to monitor performance and deliver a net zero carbon built environment by 2050.

Government should consider the need to address the embodied carbon attributable to built assets and undertake a review to introduce a regulatory measure, through a route such as Building Regulations and in line with RICS Whole Life Carbon Assessment for the Built Environment.

RICS recommends that Government promote and utilise the RICS Building Carbon Database as a tool in estimating and benchmarking whole life carbon emissions across the public project portfolio.

Government should promote industry adoption of the RICS Red Book and other relevant RICS standards such as the Home Survey Standard, each of which ensures that sustainability issues, including energy efficiency ratings, are considered by qualified professionals when reporting valuation and in building surveys.



### Fiscal

RICS recommends the UK Government provide a funding mechanism to encourage owner investment in existing property; for example, Help to Improve and Home Improvement ISA's.

RICS would recommend that Government undertake a general review of SDLT, as has been urged by RICS previously, and use the opportunity to consider the impacts of linking energy efficiency to a variable tax. Any review should include supporting research into the opportunities and costs to encourage retrofitting, distributional impacts on household profiles and tenure, and considerations of the impact on historic homes.

RICS recommends a uniform VAT rate of 5% for home improvement and repair to houses to enhance energy efficiency, and that are carried out by an accredited installer or contractor with a recognised quality mark. In addition to addressing consumer inertia, and instilling confidence in any lender, this would provide a welcome boost for the construction sector, particularly SMEs.

Government should review the impact of applying VAT to demolition works to encourage owners to upgrade where considered effective, and consider any positive impact that may encourage local authorities to seek alternate uses for older, derelict or abandoned stock.

RICS recommends that any home renovation fiscal mechanisms are provided alongside a package of appropriate funding and financing options aimed at every household.



## Green Finance

Government must create long term policy and regulatory energy efficiency roadmaps to bring confidence to the financial sector, in particular to encourage mortgage lenders to invest and develop products to support these ambitions.

Government should progress the launch of a Green Finance Education Charter, engaging with professional bodies across the financial and valuation sectors.

RICS recommends that Government should support and engage the sector on development of an evidence base reflecting the operational energy efficiency performance of individual measures, cost savings, and impact on property values; with scope taken for the potential impact regarding properties that are hard to improve, listed, and households that may be unable to access funding.

Government should pay heed to the emerging recommendations from the Coalition for the Energy Efficiency of Buildings (CEEB), on how to develop the market for financing net-zero carbon and climate-resilient buildings in the UK by accelerating the pace of financial innovation and scale-up.

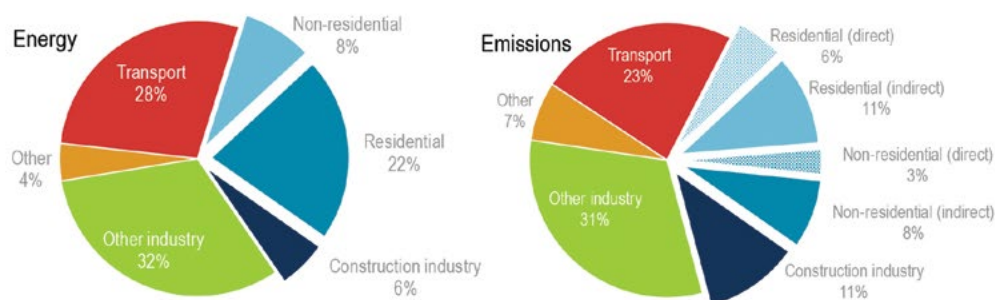
Government should monitor and consider outputs of industry and market-led initiatives, including the Energy efficient Mortgages Action Plan (EeMAP) exploring preferential capital treatment and standardised products, and definition of an Energy Efficient Mortgage.

## Sector emissions performance

The built environment sector contributes significantly to national energy use and carbon emissions, yet progress in the decarbonisation of buildings has been limited and the challenge going forward even greater. According to the 2019 **Global Status Report for Buildings and Construction** final energy demand in buildings in 2018 rose 1% from 2017, and 7% from 2010. To meet the Sustainable Development Goals (SDGs) the report states that efforts to decarbonise and enhance energy efficiency in buildings must take place at a rate of 3% a year to reverse the trend.

**Figure 1 – Global share of building and construction final energy and emissions, 2018**

[source: 2019 Global Status Report for Buildings and Construction, GlobalABC]



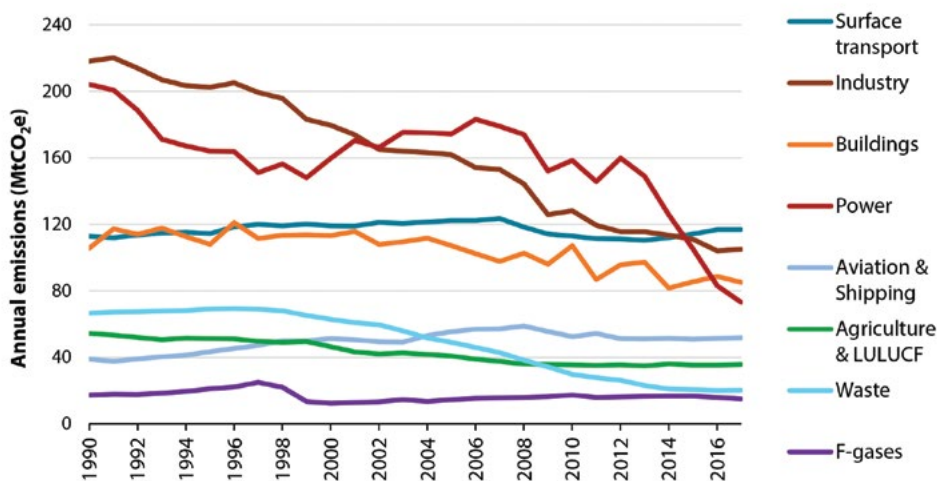
**Notes:** Construction industry is the portion (estimated) of overall industry devoted to manufacturing building construction materials such as steel, cement and glass. Indirect emissions are emissions from power generation for electricity and commercial heat.

**Sources:** Adapted from IEA [2019a], World Energy Statistics and Balances [database], [www.iea.org/statistics](http://www.iea.org/statistics) and IEA [2019b], Energy Technology Perspectives, buildings model, [www.iea.org/buildings](http://www.iea.org/buildings). 5 'Brexit: Big risk, little reward - The UK Referendum on Europe', BlackRock Investment Institute, February 2016

The average UK decarbonisation rates per person in the buildings sector was 0.8%/year over the period 2011-2016, while similar to the global average, it was outstripped by the EU achieving rates of decarbonisation of 1.6%/yr (CCC, 2019). In such the UK's building stock remains as one of the most inefficient and oldest in Europe (BRE, 2016)

**Figure 2 – Progress reducing emissions in the UK has been imbalanced**

[source: Net zero: The UK's contribution to stopping global warming, Committee on Climate Change, 2019]



**Sources:** BEIS [2019] Final UK greenhouse gas emissions national statistics 1990-2017; CCC analysis. LULUCF = land use, land use change and forestry.



An overhaul to the energy performance of the UK's housing stock is needed to effectively address this trend and aim towards net zero. Given that approximately 15% of the UK's total emissions come from heating homes alone, housing stock should be a focus of Government policy priorities. Whilst over three-quarters of household energy demand is for space and water heating, decarbonisation of the heat network ultimately remains one of the toughest challenges in climate policy. Less than 5% of energy used for heating homes and buildings derives from low-carbon sources (BEIS, 2020). Although a policy priority, low-carbon heat must be supplied in tandem with an energy efficient building fabric to be both effective in cost savings and emissions reductions.

While a number of policies seek to drive low carbon and energy efficient new builds, such as the recent 2025 Future Homes Standard, less than 1-2% of total building stock each year is new build, and it is estimated that 70% of total 2010 building stock will still be in use in 2050 (Retrofit, 2013). Enhancing the energy efficiency of the UK's existing housing stock through a range of retrofitting measures and policy instruments is therefore critical, and one of the most cost-effective ways to not only achieve net zero ambitions but to potentially optimise network infrastructure investment. As such there has been calls within the sector for Government to deliver energy efficiency improvements as a long-term infrastructure priority investment.

### Position:

- **Government have focused primarily on addressing low carbon newbuild, but must now prioritise cost-effective policy development to deliver decarbonisation of the UK's existing housing stock as a critical milestone on the net zero path to 2050**
- **Government must not delay in making strategic climate change policy decisions relating to the UK's existing housing stock, must commit to sustained funding and a package of financial incentive mechanisms for retrofitting, drive standards and regulation, and must support industry in delivering the robust pipeline of skills required to undertake this challenge**
- **Government should designate the energy efficiency of the UK's building stock a national infrastructure priority, with appropriate long-term investment and bring in line with the National Infrastructure Commission portfolio.**

## Policy drivers

According to the Committee on Climate Change (CCC) 2019 report, **Net zero: The UK's contribution to stopping global warming**, total sector emission reductions since 2008 is mainly attributed to the financial crisis reducing economic activity and consequently energy demand, and a reduction on the reliance of coal-fired power generation. While this success inevitably helped lower emissions in the building sector where electricity is consumed, more inherent progress is reflected largely through the impact of several Government policies including UK building regulations requiring efficient boilers to be installed, and the Carbon Emissions Reduction Target that required energy companies to install energy efficiency measures (scrapped in 2012). The proceeding Green Deal ultimately met its end in 2015 in the midst of low household uptake (however Green Deal finance can still be applied for through private investors), with the current Renewable Heat Incentive and Energy Companies Obligation (ECO) schemes continuing; the ECO as an intended support to lower-income and vulnerable households. According to BEIS, **Household Energy Efficiency Great Britain Data to August 2019**, approximately 2.7 million measures have been installed in around 2.1 million properties primarily through the ECO framework.

The roll-out of the Smart Meter Scheme, which aimed to help consumers understand and reduce their energy consumption, is set to end at the close of 2020, however Government have consulted on its potential extension. To date over 15 million smart and advanced meters have been installed under the scheme in homes and small businesses across Great Britain, through investment by energy suppliers (Smart Meter Statistics Report, 2019); however over a fifth are not operating in smart mode.

The Government have stated through the 2017 **Clean Growth Strategy** its long-term plan for meeting carbon budgets, featuring a number of policies aimed at improving the energy efficiency of domestic properties, with smart technologies and services continuing to play a key role in decarbonising the energy sector.

Inevitably without strengthened more effective policy drivers and action, progress on measures to reduce emissions from buildings has significantly slowed. The 2019 CCC report, **UK housing: Fit for the future?**, found that while emissions reductions from the UK's 29 million existing homes have effectively stalled, energy demand in homes increased between 2016 and 2017. Considering the socio-economic landscape, latest **2017 BEIS** statistics estimate the number of households living in fuel poverty at 2.53 million.

**Position:**

- **Government must publish a policy roadmap for delivery of decarbonised homes, align its suite of climate, energy and fuel poverty policies, and review/ assess the impacts of existing polices on reaching the net zero targets.**

### Energy efficiency regulations

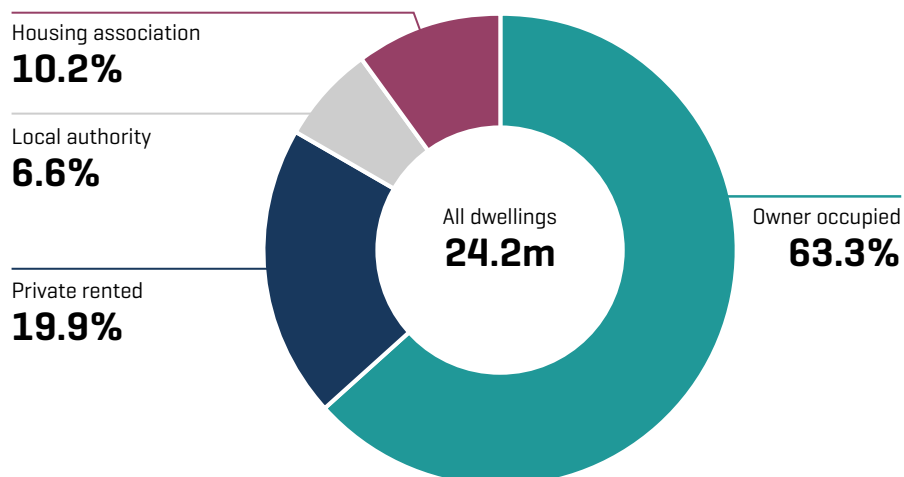
The Energy Act 2011 introduced the framework for the now defunct Green Deal in addition to legally binding minimum energy efficiency standards (MEES) in the private rented sector. From April 2018 it became unlawful for a landlord to grant a new tenancy of a property below the minimum Energy Performance Certificate (EPC) rating 'E', unless an exemption has been registered. Come the 1st April 2020 this provision will be extended to be unlawful to continue to let a below minimum EPC property.

The Clean Growth Strategy sets out Governments ambition to upgrade private rented homes to EPC rating 'C' by 2030, and for as many homes as possible, where 'practical, cost-effective and affordable', to reach a minimum EPC rating of 'C' by 2035. Given that the UK has some of the oldest domestic building stock in Europe (**UKGBC, 2018**), it will be a formidable task.

The **English Housing Survey Headline Report**, for 2018-19, estimates that there were 24.2 million dwellings in England, including both occupied and vacant homes. Of these, 15.3 million (63%) were owner occupied, 4.8 million (20%) were private rented, 1.6 million (7%) were local authority and 2.5 million (10%) were housing association homes. In terms of dwelling age, the private rented sector has the highest proportion of older dwellings with 33% built pre-1919, compared with 20% of owner-occupied homes, 4% of local authority and 9% of housing association homes.

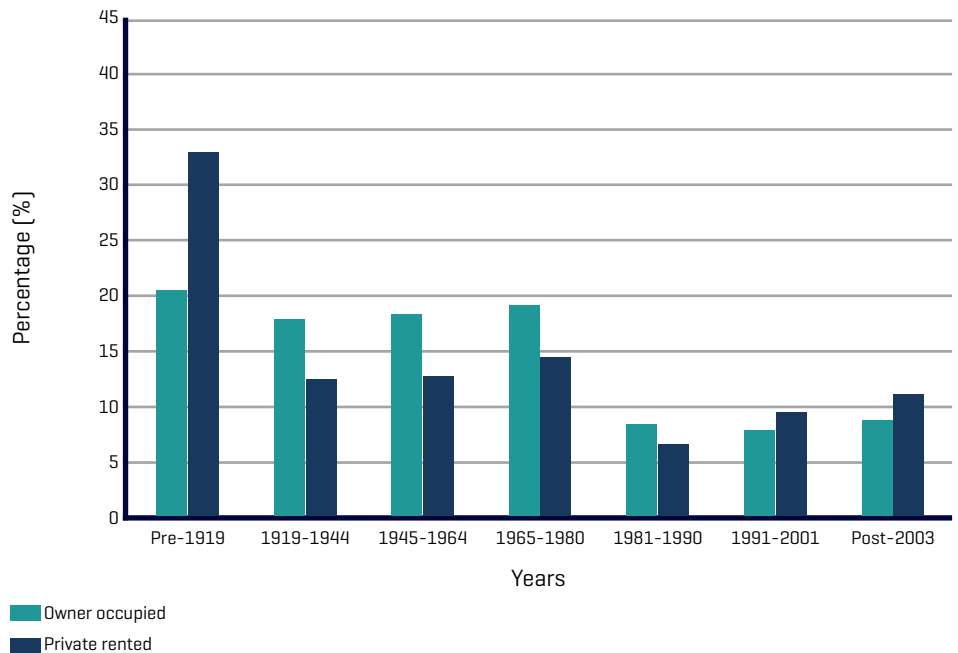
**Figure 3 – Dwellings by tenure, 2018**

[source: English Housing Survey Headline Report, 2018-19, MHCLG]



**Figure 4 – Dwellings by age, 2018**

[source: English Housing Survey Headline Report, 2018-19, MHCLG]



Domestic EPCs are produced using the Standard Assessment Procedure (SAP) which are based on standard assumptions about household occupancy. The English Housing Survey dwelling sample (total of 12,562 across all tenures) reflects that the average rating for both owner-occupied homes (52%) and private rented homes (48%) was 'D'.

Since 2008, nearly 21 million EPCs have been lodged in England and Wales with domestic properties accounting for 96%, the majority of which were for the sale or let of existing properties (MHCLG, 2019). Live [data tables](#) show that of the domestic properties in England and Wales which had an EPC survey carried out in 2019 almost one fifth reported still remain at an EPC band E and below. The recent English Housing Survey – Headline Report found that while the energy efficiency in domestic dwellings in England has 'increased considerably' over the previous two decades (reported EPC rating of E and below has declined from 35% in 2008 to 18% in 2019, MHCLG), the rate has slowed in recent years.

The BEIS Committee report [Energy efficiency: building towards net zero](#), 2019, stated that the current rate of renovation in the UK needs to increase by around 7 times to meet the 2030 target; in England the rate needs to increase by a factor of 9 in comparison to Scotland's rate of 2.5. Additionally, the report cited available evidence that approximately £1 billion of public funding per year will be required in order for homes to reach an EPC rating of 'C' by 2035.

In 2018 the Scottish Government proposed an [energy efficiency roadmap](#) which demonstrated at strategic level how various types of homes will be supported in reaching an EPC rating 'C' through a package of regulations, financial support and incentives. However no comparable policy and investment path has been presented for England and Wales.

Whilst there has been a reasonable amount of lead in time for owners to prepare for the current MEES regulatory policy, there have been no significant funding schemes or incentives available to assist bringing older, hard to treat or listed buildings up to the minimum required standard to rent. With over a fifth of England's residential stock over a century in age, there are over 5.1m pre-1919 dwellings in the UK (VOA, 2019). The exclusion of older traditional buildings from MEES can be ambiguous and available guidance remains open to interpretation, furthermore this applies only to those dwellings

that are listed or in a conservation area. Additionally, heritage buildings require specialist skills to ensure that retrofitting measures are not short sighted, and do not damage the unique built cultural heritage in the UK.

Historic England launched a report **There's No Place Like Old Homes – Re-Use And Recycle To Reduce Carbon**, 2020, for which RICS contributed as a member of the Steer Group, which sets out its recommendation for the development of a Life Cycle Assessment methodology that can be applied to refurbishment projects for historic buildings. The Carrig research commissioned identified large data constraints that limit the predictive capacity of life cycle assessment models, and furthermore that current methods used for carbon accounting hide the vast majority of carbon costs for construction and retrofit. The report calls for *'a platform that brings together professional and industry bodies, policy makers, regulators and academics'* to research and develop new innovative approaches.

Additional factors that could be viewed as restrictive in incentivising large scale retrofit across the residential stock include the current cap of £3,500 (including VAT) on works required to upgrade a private rented property to the MEES. Where large portfolio landlords may be more resilient in absorbing higher upfront costs, 'accidental' landlords may face difficulties and reluctance. Given that it has been estimated that an average of £1,200 is required to upgrade a dwelling to an EPC grade E (Which? 2019), a higher cap may not affect a significantly large proportion of homes. However looking ahead to the ambitions for an EPC rating of C, if any uplift in cap is to be considered there are additional sector challenges across both small landlords and large Buy-to-Let landlords that should be taken into account. Investor-owners would have to consider the risks of holding housing stock that is not 'future-proofed' and potentially non-compliant.

For the owner occupier tenure, there will undoubtedly be challenges. While access to funding support for lower income households, such as the ECO scheme, is currently available going forward, a thorough review will be needed to align current financial incentives, for both the low-income and 'able to pay' households, to long term ambitions.

### Position:

- **Government must work closely with sector stakeholders and publish a defined road map, with quantitative targets, investment and implementation plans to achieve ambitions of a minimum EPC rating 'C' existing housing stock**
- **Government should monitor and ensure that Local Authorities are adequately resourced to manage and enforce across their portfolio of building control, minimum energy efficiency standards and EPC's**
- **Government must demonstrate support, incentives and financial packages for both low-income and vulnerable households, and the 'able to pay' market**
- **Government should consider reviewing the impact of a minimum MEES at point of sale in the regulatory ambition and transition to bring all dwellings to a EPC rating of C by 2035**
- **Government should provide support to bring heritage buildings up to MEES requirements through financial incentives, and support industry in addressing the skills gaps in retrofitting heritage buildings.**

## Energy performance certificate

Energy Performance Certificates are based on EU regulations as a requirement when selling or buying a home and have currently been ingrained into UK regulations and standards. In the face of Brexit, questions have been raised in the sector on their continuance as regulatory driver, but nothing definitive has been stated by Government. However, in light of the added regulatory weight to EPCs through the MEES, BEIS launched a **Call for Evidence** (2018) to gain understanding of how EPCs are currently performing and how they might be further improved, extended or streamlined.

The EPC rating is based on a Standard Assessment Procedure (SAP) which is the methodology used by the Government to assess the energy performance of dwellings. SAP assesses how much energy a dwelling will consume based on the performance potential of the building fabric (i.e. makes use of several 'typical values') and its services, and hence is limited in modelling actual building physics. Not all buildings are used in the same way by occupants and EPCs are generated on standard assumptions, and in such may not reflect the actual energy use. Known as the performance gap, predicted energy performance may not reflect the degree of efficiencies that were actually achieved.

In response to Governments *Future Homes Standard: changes to Part L and Part F of the Building Regulations* for new dwellings consultation (**MHCLG, 2020**), RICS advocated that the relation to the actual operational performance of the building should be considered given that only 'regulated' energy use is predicted and reported through EPC's. Energy performance standards for individual buildings are required given that CO2 performance metrics can be misleading, including through national improvements to energy sources. RICS further highlighted that retaining a metric for the buildings fabric energy performance is important in any proposed regulations, otherwise there is risk of creating a greater retrofit problem for the future.

Rather than what can be viewed as compliance systems, there has been a drive for systems to focus on designing for operational performance. An international example would be the Australian NABERS (National Australian Built Environment Rating System) scheme, which is now common place in the market. NABERS measures the actual operational performance of existing buildings and tenancies; through calculation of a tenancy rating that includes only the energy or resources that the tenant controls.

The Energy Performance of Buildings Directive give rise to the feasibility of introducing an approach to the concept of a renovation passport, which in basic terms is considered a *'instrument that can stimulate cost-effective renovation in the form of a "long-term, step-by-step deep renovation roadmap for a specific building based on quality criteria, following an energy audit, and outlining relevant measures and renovations that could improve the energy performance'* (**EPBD, Feasibility study 19A**).

The renovation passport can be considered as part of a more comprehensive instrument, the building passport or property logbook, which can be described as digital platform to store and/or link to all the information related to a specific property. The Belgian region of Flanders has implemented the Woningpas scheme to equip every Flemish property with a building passport. RICS, as a founding member of the UN Global Alliance for Buildings & Construction (GABC) are currently part of work ongoing into the development of global guidelines for building passports. Information such as EPCs, Display Energy Certificate (DEC), and specific data (e.g. predicted energy consumption) have the potential to be more readily extracted by the passport. Smart meters and Building Management Systems can provide an opportunity for accurate and high-quality data to also be linked to the passport. Besides energy and sustainability-related data, a complete building passport scheme enables the gathering of all types of information about a property, and thus has the potential to facilitate and speed up valuation, due diligence and transactions processes.

The roll out of the UK Smart Meter Scheme and the focus of Government's Clean Growth Strategy on use of smart technologies, has inevitably led to considerations of the opportunity within the UK market to use smart meter data to improve accuracy of operational data measurements, energy efficiency assessments, and the impact of individual retrofitting measures tailored to homes.

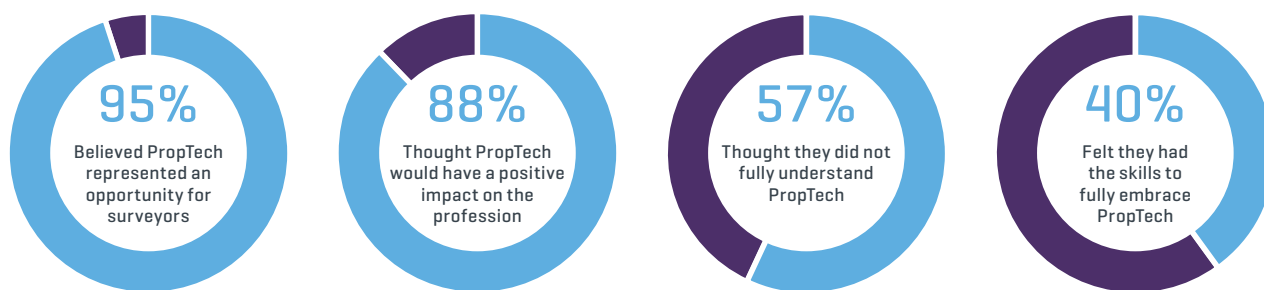
Through the Government commissioned independent review **'Each Home Counts'**, the resulting 2016 report considered issues relating to consumer advice, protection, standards and enforcement in relation to home energy efficiency and renewable energy measures in the UK. A recommendation of the report was to establish a data warehouse which holds relevant property-level data collated from existing sources, such as EPC information, where this data is freely available.

Whilst the PropTech sector is growing rapidly and providing a richer data set that is more analytical, it is currently unregulated. In cases where laws have come into force, such as General Data Protection Regulation (GDPR), the industry is still learning how to adapt. In response, RICS are developing a suite of data standards across the real estate lifecycle that will focus on both the technical aspects of data and ethics and compliance; encompassing property measurement, valuation, condition reports, construction and operational costs as well as the governance, and sharing of the data itself.

Research suggests however that property professionals lack confidence in their ability to fully exploit the latest digital innovations. In 2018 a questionnaire about the impact of PropTech on surveying carried out by RICS, Teesside University, tech company GoReport and surveying firm Trident found that 95% of respondents believed it represented an opportunity for surveyors, and 88% thought it would have a positive impact on the profession. However, 57% thought they did not fully understand PropTech and only 40% felt they had the skills to fully embrace it.

**Figure 5 – Impact of PropTech on Surveying Questionnaire Results, 2018**

[source: RICS, Teesside University, GoReport and Trident]



#### Position:

- **Government should take forward the ‘Every Home Counts’ recommendation to create a data warehouse, and continue its steps in making EPC data more widely available; while ensuring safeguards are in place to protect consumer privacy**
- **Government should adopt a more holistic approach to assessing the performance of a building, by continuing its review of EPC’s, considering benefits of operational performance systems such as the Australian NABERS, and monitoring the evolution and outputs of the EU Building Passport framework**
- **RICS recommend that Government work in partnership with industry to explore the use of PropTech and data standards to address areas around data governance and privacy protection**
- **Government should further review the limitations of the SAP methodology, and consider the use of smart meter data to improve accuracy and reliability of EPCs, which would allow for more evidenced based building energy efficiency policies/targets**
- **To fully exploit the value of property-based data in helping achieve Government ambitions, RICS recommend that Government support industry in the growth and regulation of the PropTech sector, investing in a robust professional skills pipeline and adopting data standards.**

## Embodied carbon

To fully decarbonise built assets and achieve net zero, both the operational carbon and embodied carbon over the whole life of the asset must be addressed. Embodied carbon is associated with all stages of a building from material manufacture, transport, construction methodology, maintenance and refurbishment, to demolition and disposal. The UK Green Building Council stated that *'reducing embodied carbon is important for many reasons; not only for reducing resources and associated costs but also alleviating longer term risks around resource availability'* (UKGBC, 2015).

The built environment sector through regulatory levers, namely building regulations, and planning requirements, has primarily focused on reducing operational emissions, with the embodied aspect of carbon emissions not being fully considered. Unlike operational carbon, reduction in embodied carbon is not subject to ongoing building user behavior, and in such can be more accurate and identifiable than predicted operational carbon reductions. Embodied carbon savings in new builds can be achieved at the front end of the design process, allowing for an immediate potential of carbon savings with more certainty than operational emissions. In existing buildings, re-use rather than rebuild provides for significant embodied carbon savings.

A whole life carbon approach identifies the overall best combined opportunities for reducing lifetime carbon and helps to avoid any unintended consequences of focusing on operational emissions alone. 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.

To facilitate this RICS developed the '**Whole Life Carbon Assessment for the Built Environment**, 1st edition (2017), this professional statement mandates a whole life approach to reducing carbon emissions and promotes the reliability of whole life carbon assessments by acting as a solid reference for industry. The professional statement can be applied to all types of built assets and is suitable for the assessment of both new and existing assets, as well as refurbishment, retrofit and fit-out projects. From the perspective of embodied carbon impacts, retrofitting and upgrading existing buildings can reduce the amount of new materials that have to be extracted, manufactured, transported and installed.

In 2019 RICS launched the whole life **Building Carbon Database**, an evolution of the Wrap Embodied Carbon Database which was commissioned by WRAP and the UK Green Building Council to capture embodied carbon data for whole buildings. The Carbon Database reinforces the RICS professional statement and allows users to identify where associated carbon emission reductions can be made, based on building type and during all stages of a building's life cycle. The database is user-led, and the validity and durability of the database relies on users to input data into the databank, which in turn allows users to estimate/benchmark whole life carbon emissions.

## Industry standards

Within the built environment industry standards are drivers in securing investment and building confidence. Many world bodies, governments and clients acknowledge that the financial management of construction requires improvement. International Construction Measurement Standards (ICMS) is a single, globally agreed construction cost classification framework that enables standardised cost reporting, benchmarking and comparison. Originally launched in July 2018, the standard aims to save public and private money, reducing investment risk and enabling built assets to be built more quickly. ICMS can be used by all construction-related and real-estate specialisms to analyse and compare historic, present and future costs of both new and retrofit or refurbishment projects.

The **second edition** (ICMS2), launched by the International Construction Measurement Standards Coalition, provides investors with more data to analyse their investments across the project's full life-cycle, helping manage the environmental impact, and reduce

carbon emissions both operational and embodied, of the built asset by aiding design decision making during the project. RICS are currently developing a Global Professional Statement in Cost Prediction to augment and implement ICMS.

ICMS will be further extended to include carbon metrics and work on this has now commenced. Interested stakeholders should contact the ICMS coalition at: [www.icms-coalition.org](http://www.icms-coalition.org)

## Industry specifications

The Government sponsored British Standards Institution (BSI) initiatives PAS 2030 and PAS 2035 (2019) aim to specify the requirement for a holistic approach to the retrofitting of dwellings and minimize the 'performance gap'.

The PAS 2030 and 2035 processes cover a wide range of retrofitting specifications including the assessment of dwellings for retrofit, requirements for providing advice to occupants appropriate to their homes, and the efficient use and maintenance of their retrofitted dwelling. The **PAS 2035:2019** *Retrofitting dwellings for improved energy efficiency – Specification and guidance*, states that the process is compatible with current EU schemes including Building Renovation Passports.

Whilst the development of such initiatives are beneficial in driving up retrofitting standards, particularly when they become mandatory under the ECO scheme in 2021, it is essential that there is an adequate skills base across the supply chain to ensure that these initiatives are effective. PAS 2035 makes reference to the adoption of principles set out in a specific RICS guidance note, and 'expects' retrofit designers to be of a listed professional body including RICS, which while demonstrating that for example Chartered Building Surveyors are trained with the professional skills to assess, manage and design retrofit projects, highlights the importance of addressing the skills gap and ensuring a robust professional pipeline.

Initiatives like PAS must further be underpinned by standards in a whole life cycle framework to address and support the net zero transition, including the RICS Whole Life Carbon Assessment and ICMS2 to ensure consistency in measurement approach and performance reporting.

### Position:

- **Government should support industry in addressing the skills gap by mandating that all construction and built environment related Apprenticeships and T-levels assess the apprentices understanding of sustainability and mitigation of environmental impact**
- **RICS recommend that all construction and built environment related Apprenticeships and T-levels embrace the knowledge of professional bodies and where possible lead directly to professional body membership**
- **Government must engage with industry to improve public awareness of standards and professional competency-based advice and training in regard to energy efficiency retrofits and wider home improvement works, especially for heritage buildings which are more complex and present a skills gap in the market**
- **Government should adopt ICMS (2nd edition) as a global benchmarking tool to monitor performance and deliver a net zero carbon built environment by 2050**
- **Government should consider the need to address the embodied carbon attributable to built assets and undertake a review to introduce a regulatory measure, through a route such as Building Regulations and in line with RICS Whole Life Carbon Assessment for the Built Environment**
- **RICS recommends that Government promote and utilise the RICS Building Carbon Database as a tool in estimating and benchmarking whole life carbon emissions across the public project portfolio.**



## Drivers to retrofitting homes

Retrofitting homes is fundamental to achieving Government's climate and fuel poverty policies. While it is accepted that it is cost-effective in various ways, from occupier savings to optimising infrastructure investment, it can also bring significant social value through enhancing well being and creating skilled jobs. RICS are currently developing an International Building Operations Standard (IBOS) which will build upon a suite of RICS standards to deliver a consistent approach to the management of built assets and to enable benchmarking not only for improved performance and efficiency, but for wellbeing and value delivery.

The energy efficiency and decarbonisation of homes can be improved in various ways, which can be incremental or a whole house retrofit. Measures range from enhancing the building fabric, upgrading to a more efficient heating system, and installing smart energy controls; which inherently can affect an occupier's energy use behaviour.

A 2019 report published by the Energy Efficiency Infrastructure Group (EEIG) '**The Net Zero Litmus Test**', stated that the number of home insulation measures has been reduced by 95% per/yr in the period from 2012-2017, with only 170,000 UK homes being significantly upgraded in energy efficiency in 2017/18. While it is accepted that large-scale retrofitting of the existing housing stock is required, it is clearly not happening fast enough. To further put the challenge of home retrofit in perspective, The Institution of Engineering and Technology (IET) 2018 report, '**Scaling Up Retrofit 2050**', advises that nearly every home in the UK needs to be upgraded with energy efficiency measures at a rate of more than 1.5 homes every minute to 2050; assuming a whole house retrofit and not incremental improvements.

**The English Housing Survey 2017-18 Energy Report**, stated that among households that had moved since 2008 only a quarter reported that the EPC had influenced their decision to buy or rent a dwelling. Interestingly households who found meeting heating costs 'easy' were more influenced by the EPC rating than households who found meeting costs 'difficult'. While this may reflect a general apathy towards EPCs as a deciding factor in a home move, tighter regulatory drivers have come into force for the private rented sector and energy efficiency has moved up in public awareness over the decade. This is reflected in RICS' December 2019 Residential Market Survey in which almost two thirds of the survey's respondents believe the willingness to pay for energy efficient homes will rise in the next three years.

The RICS insights paper, Minimum Energy Efficiency Standards (MEES) Impact on UK property management and valuation, March 2018, aimed to inform property owners, managers and valuers of the potential implications of MEES. The research suggests that even if there is no clear evidence of market value change, valuers due diligence should extend to accounting for any risks posed by MEES. RICS' most recent version of the **Red Book, Global Standards** effective from January 2020, now include a mandatory requirement on valuation professionals undertaking work in accordance with RICS Global Standards to consider sustainability issues when reporting valuation, supplementing previous requirements around inspection and investigation. While valuers should reflect markets, not lead them, they should be aware of sustainability features and the implications these could have on property values in the short, medium and longer term. An example of recommendations to valuers include -

- assess the extent to which the subject property meets sustainability criteria and arrive at an informed view on the likelihood of these impacting on value
- provide a statement of the valuer's opinion on the potential impact of these benefits and/or risks to relative property values over time

In regard to EPC's, the Red Book requires specifically that the energy-efficiency rating provided is to be considered, if available. Furthermore, the **RICS Home Survey Standard 1st edition**, launched in November 2019, includes recommendations for providing specific commentary on energy efficiency.

The European Commission's published study in 2013 "**Energy performance certificates in buildings and their impact on transaction prices and rents in selected EU countries**", in which the UK was included, analysed property transactions and listings from residential property markets for both sales and lettings, and reported that the data 'overwhelmingly points to energy efficiency being rewarded by the market'. Further research published in 2019 by RICS, *Energy efficiency and residential values: a changing European landscape*, concludes that 'evidence points towards energy efficiency beginning to impact on value', though this observation was small in comparison with traditional value drivers. The study indicated that policies and regulations introduced, aimed both at enhancing building renovations and overall occupier behaviours, will overtime change the supply/demand relationships between old and new stock, leading to value differentiation between efficient and non-efficient buildings.

The research did therefore consider that energy efficiency is likely to be of '*increasing importance in owner-occupier and investor-owner decisions including those relating to lending and mortgages*', and in such this will be reflected '*more clearly in reported property values*'. While the research supports regulation as a key driver to retrofitting, it considers in a regulatory landscape that the value of less efficient stock will increasingly lag behind, giving potential rise to both '*green premiums and brown discounts*'. The research reported a general consensus that '*better and more transparent data would help market transformation*', therefore a need remains for further robust data and evidence-based research into the impact of energy efficiency measures on the value of homes within the UK market.

A proportion of residential property owners, and in particular owner occupiers who currently do not have a regulatory drive under MEES to invest in a retrofit, will not qualify for support under ECO scheme which is aimed at fuel poor households. In 2017 BEIS launched a consultation '**Building a market for energy efficiency**', which focused primarily on driving energy efficiency investment through the 'able to pay' sector and provided proposals on a range of various measures and mechanisms to incentivise uptake. UK Government policy continues to be geared toward home ownership, as is evidenced by schemes such as Help to Buy. These schemes support the buying of property but, as we have already strongly advocated, more needs to be done to utilise and enhance existing stock. There still remains no similar driver such as '*Help to Improve*' to enhance the energy efficiency of existing properties.

Whilst the Government consultation proposed approaches, which included direct subsidies, zero/ low interest loans, home equity loans, that each have merit, there remains a need for research into the potential demand and impact across different tenures and households. In such a package of targeted policies and financial mechanisms could be tailored to achieve maximum uptake and piloted accordingly to test effectiveness of outcomes.

### Position:

- **Government should promote industry adoption of the RICS Red Book and other relevant RICS standards such as the Home Survey Standard, each of which ensures that sustainability issues, including energy efficiency ratings, are considered by qualified professionals when reporting valuation and in building surveys**
- **RICS recommends the UK Government provide a funding mechanism to encourage owner investment in existing property; for example, Help to Improve and Home Improvement ISA's.**

## Taxation levers

Research published by RICS (2019) which provided an overview of the impact of energy efficiency on the value of residential property in Europe, points out that regulation will be a key driver to support energy efficient upgrades. However the success of any mandatory measures which require investment in retrofitting improvements, will depend (in part) on being accompanied by an effective enforcement regime. The research alludes that under regulatory levers, the impact on value is more likely to be at risk for failure to comply than a reward for compliance.

The RICS January 2020 Residential Market Survey reflected that without strong market-driven incentives, regulation is considered by survey respondents to be the policy lever with the greatest potential to improve energy efficiency outcomes. Alternatively, respondents indicated that a tax policy could achieve a similar effect through a mix of stamp duty and a reduction of VAT on home improvements but in either case, government intervention is required to drive energy efficiency improvements.

## Variable stamp duty

The proposal to use a variable Stamp Duty based on the energy efficiency of a house at point of sale, whether based on EPC or directly on SAP, is by no means a novel idea. This fiscal approach has been particularly championed by the Green Task Force, of which RICS was a member, as a recommendation of their 2018 **Accelerating Green Finance report**. The **Affordable Warmth, Clean Growth** report published by Frontier Economics in 2017, found that if implemented across the UK, a variable Stamp Duty scheme could incentivise around 16 million homes to make energy efficiency improvements by 2035. To date however the Government have shown little appetite even when the measure has been presented as revenue neutral.

In terms of 'trigger points' to undertake any upgrades to a dwelling, selling a home tends to focus homeowners on 'saleability'. The case for investment must be robust as ultimately the beneficiary is the buyer. In particular homeowners wishing to sell in housing hot spots - or where demand outstrips supply - may not require the additional 'saleability' factor. Energy efficiency may then tend to get pushed down the buyers agenda and so the seller may lack incentive. Considering then where supply is good and demand is low, some inefficient properties could become a stranded asset risk which would be a 'loss aversion' lever to incentivise a seller to retrofit. These issues could in part be addressed if clear evidence showed that the market reflected energy efficiency as a value increase, which would be a driver for sellers to invest in retrofitting measures. This would require a robust and well-informed case on what retrofitting measures undertaken would achieve the required energy efficiency value increase, particularly with consideration to the impacts on historic or 'hard to treat' homes.

Additionally, as stated previously in this paper, while there is merit in these fiscal measures, they would have to be considered alongside other incentives and financial mechanisms targeted at different housing tenures and households; considering distributional impacts.

### Position:

- **RICS would recommend that Government undertake a general review of SDLT, as has been urged by RICS previously, and use the opportunity to consider the impacts of linking energy efficiency to a variable tax**
- **Any review should include supporting research into the opportunities and costs to encourage retrofitting, distributional impacts on household profiles and tenure, and considerations of the impact on historic homes.**

## Reduction on VAT for home improvement

Home improvement and repairs have not typically been a policy focus in driving energy efficiency, with resulting Government schemes instead tending to focus on sole measures. Yet in a 2013 study from The UK Energy Research Centre (UKERC) **Understanding Homeowners' Renovation Decisions**, amongst homeowners considering renovation of some kind, 35% were considering a mixed project of amenity measures and energy efficiency, compared to just 11% who were considering energy efficiency-only projects. Homeowners typically see value in installations such as double glazing as it provides better comfort, or enhancements in aesthetics as they are pleasing. This suggests that motivations to enhance energy efficiency may be better realised through a financial mechanism focused on the wider home improvement and repair market.

VAT on home improvement and repair to existing buildings is levied in general at 20%, when compared to zero VAT on new builds, giving rise to a view of the tax hampering consumers' interest to invest in their property. While the current regime for home renovation and repair does include a number of measures that attract a lower rate of VAT and aim to enhance energy efficiency, they are limited by siloed specificity and the process of exemption viewed as complex and inconsistent. By considering a uniform reduction to 5% across the regime, the Government could provide a much needed boost in the adoption of retrofitting measures being taken in tandem with home improvement upgrades.

This has been a policy of RICS for a number of years and is shared by many other sector stakeholders which led to the formation of the cross-industry '*Cut the Vat coalition*' of over 60 charities, trade associations, business groups and financial institutions. **Independent research** commissioned in 2015 (Experian) estimated of the effects of a reduction in the rate of VAT on housing renovation and repair work over the period 2015 to 2020. The report concluded that VAT reduction on housing renovation and repair could provide an economic stimulus of more than £15 billion and could help up to 92,000 homes benefit from retrofitting.

A uniform reduction in VAT could generate other benefits including: support for the SME sector, reduced tax avoidance through a reduction in cash in hand transactions, less risk of homeowners using "cowboy builders", increasing the supply of homes, and supporting higher-quality homes.

As carbon emissions are attributable not only to the operational use of built assets, but also through their construction, retrofitting provides an opportunity to achieve significant embodied carbon savings through re-use rather than re-build, further allowing for considerations to be taken of embodied carbon savings when choosing retrofitting options.

Demolishing housing, clearing the site, disposing of materials, and preparing for a new build involves high embodied energy processes. Refurbishing therefore offers the most potential in making the existing building stock holistically energy efficient.

Demolition work is currently zero-rated for VAT if undertaken to facilitate the construction of a new dwelling, while home improvement and repair remains at 20%. In 2012/13, there were 12,000 demolitions in England alone. In considering the cost to demolish a small detached dwelling (80-120m<sup>2</sup>) lies in the region of £6,000-£8,000, the UK Government potentially missed out on a minimum of £14.4m through potential VAT receipts over this period which could be channeled into facilitating the reduction of the home improvement VAT rate. Mitigating factors however, such as the existing dwellings being considered beyond economic repair or improvement based on professional competency and advice, would have to be considered in any review.

### Position:

- **RICS recommends a uniform VAT rate of 5% for home improvement and repair to enhance energy efficiency, and that are carried out by an accredited installer or contractor with a recognised quality mark. In addition to addressing consumer inertia, and instilling confidence in any lender, this would provide a welcome boost for the construction sector, particularly SMEs**
- **Government should review the impact of applying VAT to demolition works to encourage owners to upgrade where considered effective, and consider any positive impact that may encourage local authorities to seek alternate uses for older, derelict or abandoned stock**
- **RICS recommends that any home renovation fiscal mechanisms are provided alongside a package of appropriate funding and financing options aimed at every household.**

## Green finance

A key policy set out within the Governments Clean Growth Strategy is to 'Develop world leading Green Finance capabilities', a proposal of which is to '*work with mortgage lenders to develop green mortgage products that take account of the lower lending risk and enhanced repayment associated with more energy efficient properties*'. An outcome being mortgage lenders considering the energy efficiency of a dwelling in affordability assessments for prospective homeowners, ultimately making energy efficient properties more attractive in the market. For lenders this incentive would be on the premise that as energy efficient homes are more cost effective, owners should be more able to cover mortgage repayments. In response, several industry-based projects have aimed to assess this validity of this link.

Through the LENDERS Project (Levering Economics for New Drivers to Energy Reduction & Sustainability), a consortium of eight cross-sector partners, the interaction between energy costs, mortgage affordability and borrowing was appraised. The project created a tool that allows for estimation of a homeowner's energy costs using the dwellings EPC and based on occupancy. Results in 2017 suggested that prospective homeowners could be able to access additional borrowing on more efficient properties. The project concluded that the benefit of this knowledge being made available at the right point in the mortgage process 'might have a behavioural impact and influence homebuyers' perception of value' (RICS, 2019).

RICS is a partner of the Energy efficient Mortgages Action Plan (EeMAP) consortium and market-led initiative which aims to develop a standardised energy efficient mortgage for the EU according to which 'building owners are incentivised to improve the energy efficiency of their buildings or acquire an already energy efficient property by way of preferential financing conditions linked to the mortgage'. The basis being that appropriate refurbishment work, which includes energy efficiency measures, should decrease default risk (RICS, 2019). As a partner RICS has developed an **EEMI Valuation Checklist**, which enables valuers to form a judgement as to whether building characteristics that impact on energy efficiency present a risk reduction or increase the security of the asset for the loan. An Energy Efficiency Mortgages pilot scheme is currently being undertaken, with 49 lending institutions committed to test the implementation of the final energy efficient mortgages framework into their existing product lines and processes.

The Green Finance Institute, an independent organisation formed in 2019, announced the formation of the Coalition for the Energy Efficiency of Buildings (CEEB) to which RICS is a founding partner. The coalition aims to develop the market '*to accelerate capital flows towards retrofitting and developing UK homes to net-zero carbon, resilient standards*', and will focus on launching a series of financial products demonstration projects that appeal across all residential building tenures. This work is currently on-going.

The Government's announcement of a £5 million Green Home Finance Innovation Fund, through its 2019 **Green Finance Strategy**, available to the private sector to pilot products such as green mortgages signals its desire to continue to drive such initiatives within the UK. However whether this level of funding will have the scaled effect that is required will remain to be seen.

#### **Position:**

- **Government must create long term policy and regulatory energy efficiency roadmaps to bring confidence to the financial sector, in particular to encourage mortgage lenders to invest and develop products to support these ambitions**
- **Government should progress the launch of a Green Finance Education Charter, engaging with professional bodies across the financial and valuation sectors**
- **RICS recommends that Government should support and engage the sector on development of an evidence base reflecting the operational energy efficiency performance of individual measures, cost savings, and impact on property values; with scope taken for the potential impact regarding properties that are hard to improve, listed, and households that may be unable to access funding**
- **Government should pay heed to the emerging recommendations from the Coalition for the Energy Efficiency of Buildings (CEEB), on how to develop the market for financing net-zero carbon and climate-resilient buildings in the UK by accelerating the pace of financial innovation and scale-up**
- **Government should monitor and consider outputs of industry and market-led initiatives, including the Energy efficient Mortgages Action Plan (EeMAP) exploring preferential capital treatment and standardised products, and definition of an Energy Efficient Mortgage.**

# References

- 2019 Global Status Report for Buildings and Construction*, Global Alliance for Buildings and Construction (GABC), published by UN Environment and the International Energy Agency, December 2019. <https://www.worldgbc.org/sites/default/files/2019%20Global%20Status%20Report%20for%20Buildings%20and%20Construction.pdf>
- Net zero: The UK's contribution to stopping global warming*, Committee on Climate Change, May 2019. <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>
- The cost of poor housing in the European Union*, Simon Nicol, Mike Roys, David Ormandy and Veronique Ezratty, BRE, 2016
- New protections for thousands of consumers on heat networks, Press Release, Department for Business, Energy and Industrial Strategy, 6th February 2020. <https://www.gov.uk/government/news/new-protections-for-thousands-of-consumers-on-heat-networks>
- Retrofit City Futures: Visions for Urban Sustainability*, Retrofit 2050, May 2013. [retrofit2050/wp-content/uploads/sites/18/2018/07/retrofit2050-visions-report-green.pdf](https://www.retrofit2050.com/wp-content/uploads/sites/18/2018/07/retrofit2050-visions-report-green.pdf)
- Annual Fuel Poverty Statistics in England, 2019* (2017 data), Department for Business, Energy and Industrial Strategy, June 2019. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/839901/Headline\\_Release\\_-\\_HEE\\_stats\\_17\\_Oct\\_2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/839901/Headline_Release_-_HEE_stats_17_Oct_2019.pdf)
- Smart Meter Statistics in Great Britain: Quarterly Report to end September 2019*, Department for Business, Energy and Industrial Strategy, November 2019. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/848325/2019\\_Q3\\_Smart\\_Meters\\_Statistics\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/848325/2019_Q3_Smart_Meters_Statistics_Report.pdf)
- The Clean Growth Strategy, Leading the way to a low carbon future, Department for Business, Energy & Industrial Strategy, October 2017. <https://www.gov.uk/government/publications/clean-growth-strategy>
- UK housing: Fit for the future?*, Committee on Climate Change (CCC), February 2019. <https://www.theccc.org.uk/wp-content/uploads/2019/02/UK-housing-Fit-for-the-future-CCC-2019.pdf>
- Creating an Energy Efficient Mortgage for Europe Building Assessment Briefing: United Kingdom*, UKGBC, February 2018
- English Housing Survey Headline Report, 2018-2019*, MHCLG, 2019. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/860076/2018-19\\_EHS\\_Headline\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860076/2018-19_EHS_Headline_Report.pdf)
- Energy Performance of Buildings Certificates Statistical Release: Q3 2019: England and Wales*, MHCLG, 2019. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/843215/EPB\\_Cert\\_Statistics\\_Release\\_Q3\\_2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/843215/EPB_Cert_Statistics_Release_Q3_2019.pdf)
- EB1: Number of Existing Dwelling Energy Performance Certificates lodged on the Register in England & Wales by Energy Efficiency Rating* (dataset), MHCLG. <https://www.gov.uk/government/statistical-data-sets/live-tables-on-energy-performance-of-buildings-certificates>
- Energy efficiency: building towards net zero, Twenty-First Report of Session 2017-19*, House of Commons Business, Energy and Industrial Strategy Committee, July 2019. <https://publications.parliament.uk/pa/cm201719/cmselect/cmbeis/1730/1730.pdf>
- Energy Efficient Scotland: route map*, Energy and Climate Change Directorate, May 2018. <https://www.gov.scot/publications/energy-efficient-scotland-route-map/>
- Council Tax: stock of properties 2019*, Valuation Office Agency, September 2019. <https://www.gov.uk/government/statistics/council-tax-stock-of-properties-2019>
- There's No Place Like Old Homes – Re-Use and Recycle To Reduce Carbon*, Historic England, February 2020. <https://historicengland.org.uk/content/heritage-counts/pub/2019/hc2019-re-use-recycle-to-reduce-carbon/>
- <https://www.which.co.uk/news/2019/04/new-epc-rules-mean-buy-to-let-landlords-could-face-costs-of-8500-/--Which?>
- Energy Performance Certificates in buildings: call for evidence*, Department for Business, Energy & Industrial Strategy, July 2018. <https://www.gov.uk/government/consultations/energy-performance-certificates-in-buildings-call-for-evidence>
- Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings consultation*, Ministry of Housing, Communities and Local Government, October 2019. <https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings>
- Energy Performance of Buildings Directive, 2018/844/EU*, Feasibility Study 19a. <https://www.epbd19a.eu/>
- Whole life carbon assessment for the built environment*, RICS, 1st edition, November 2017. <https://www.rics.org/uk/upholding-professional-standards/sector-standards/building-surveying/whole-life-carbon-assessment-for-the-built-environment/>
- Each Home Counts: Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy*, Independent Review, BEIS & DCLG, December 2016. <https://www.gov.uk/government/publications/each-home-counts-review-of-consumer-advice-protection-standards-and-enforcement-for-energy-efficiency-and-renewable-energy>
- International Construction Measurement Standards: Global Consistency in Presenting Construction Costs*, 1st Edition, ICMS Coalition, July 2017. <https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/construction/icms-standard-rics.pdf>
- International Construction Measurement Standards: Global Consistency in Presenting Construction and Other Life Cycle Costs*, 2nd edition, ICMS Coalition, September 2019. <https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/construction/international-construction-measurement-standards-2nd-edition-rics.pdf>
- PAS 2030:2019 Specification for the installation of energy efficiency measures in existing dwellings and insulation in residential park homes*, The British Standards Institution, 2019
- PAS 2035:2019 Retrofitting dwellings for improved energy efficiency – Specification and guidance*, The British Standards Institution, 2019. <https://pas2030.bsigroup.com/auth/SWR5MJB9WVYU/pas20352019/AuthHome/Contents>
- The Net Zero Litmus Test: Making energy efficiency a public and private infrastructure investment priority*, Energy Efficiency Infrastructure Group (EiIG), October 2019. <https://www.theeiig.co.uk/news/the-net-zero-litmus-test/>
- Scaling Up Retrofit 2050*, Institution of Engineering and Technology (IET), December 2018. <https://www.theiet.org/impact-society/factfiles/built-environment-factfiles/retrofit-2050/>
- Accelerating Green Finance, A report to Government by the Green Finance Taskforce, March 2018. <https://www.gov.uk/government/publications/accelerating-green-finance-green-finance-taskforce-report>
- Tackling embodied carbon in buildings*, UK Green Building Council (UKGBC), February 2015. <https://www.ukgbc.org/sites/default/files/Tackling%20embodied%20carbon%20in%20buildings.pdf>
- The English Housing Survey 2017-18 Energy Report*, Ministry of Housing, Communities & Local Government, 2019. <https://www.gov.uk/government/statistics/english-housing-survey-2017-to-2018-energy>
- Minimum Energy Efficiency Standards (MEES) Impact on UK property management and valuation*, RICS, March 2018. <https://www.rics.org/uk/news-insight/research/insights/minimum-energy-efficiency-standards-mees-impact-on-uk-property-management-and-valuation/>
- RICS Red Book, Global Standards*, RICS, January 2020. <https://www.rics.org/uk/upholding-professional-standards/sector-standards/valuation/red-book/red-book-global/>
- RICS Home Survey Standard*, 1st Edition, RICS, November 2019. <https://www.rics.org/uk/upholding-professional-standards/sector-standards/building-surveying/home-surveys/home-survey-standards/>
- Energy performance certificates in buildings and their impact on transaction prices and rents in selected EU countries*, European Commission, April 2013. [https://ec.europa.eu/energy/studies/energy-performance-certificates-buildings-and-their-impact-transaction-prices-and-rents\\_en?redir=1](https://ec.europa.eu/energy/studies/energy-performance-certificates-buildings-and-their-impact-transaction-prices-and-rents_en?redir=1)
- Energy efficiency and residential values: a changing European landscape*, RICS, March 2019. <https://www.rics.org/globalassets/rics-website/media/knowledge/research/insights/energy-efficiency-and-residential-values.pdf>
- Call for Evidence: Building a Market for Energy Efficiency*, Department for Business, Energy and Industrial Strategy, October 2017. <https://www.gov.uk/government/consultations/building-a-market-for-energy-efficiency-call-for-evidence>
- Affordable Warmth Clean Growth*, Frontier Economics, September 2017. <https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i4324-affordable-warmth-clean-growth/>
- Understanding Homeowners' Renovation Decisions: Findings of the VERD Project*, UK Energy Research Centre, October 2013. [https://ukerc.rl.ac.uk/UCAT/PUBLICATIONS/Understanding\\_Homeowners\\_Renovation\\_Decisions\\_Findings\\_of\\_the\\_VERD\\_Project.pdf](https://ukerc.rl.ac.uk/UCAT/PUBLICATIONS/Understanding_Homeowners_Renovation_Decisions_Findings_of_the_VERD_Project.pdf)
- An estimate of the effects of a reduction in the rate of VAT on housing renovation and repair work: 2015 to 2020*, Experian, 2015. <https://www.fmb.org.uk/media/10357/vatresearchfinal.pdf>
- EEMl Valuation Checklist Background Explanation and Guidance*, EeMAP, March 2019. <https://eemap.energyefficientmortgages.eu/wp-content/uploads/2018/11/Valuation-and-Energy-Efficiency-Checklist.pdf>
- Green Finance Strategy; Transforming Finance for a Greener Future*, HM Treasury and Department for Business, Energy & Industrial Strategy, July 2019. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/820284/190716\\_BEIS\\_Green\\_Finance\\_Strategy\\_Accessible\\_Final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/820284/190716_BEIS_Green_Finance_Strategy_Accessible_Final.pdf)

# Delivering confidence

We are RICS. Everything we do is designed to effect positive change in the built and natural environments. Through our respected global standards, leading professional progression and our trusted data and insight, we promote and enforce the highest professional standards in the development and management of land, real estate, construction and infrastructure. Our work with others provides a foundation for confident markets, pioneers better places to live and work and is a force for positive social impact.

## Americas

---

### **Latin America**

[ricsamericalatina@rics.org](mailto:ricsamericalatina@rics.org)

### **North America**

[ricsamericas@rics.org](mailto:ricsamericas@rics.org)

## Asia Pacific

---

### **Australasia**

[australasia@rics.org](mailto:australasia@rics.org)

### **Greater China (Hong Kong)**

[ricshk@rics.org](mailto:ricshk@rics.org)

### **Greater China (Shanghai)**

[ricschina@rics.org](mailto:ricschina@rics.org)

### **Japan**

[ricsjapan@rics.org](mailto:ricsjapan@rics.org)

### **South Asia**

[ricsindia@rics.org](mailto:ricsindia@rics.org)

### **Southeast Asia**

[sea@rics.org](mailto:sea@rics.org)

## EMEA

---

### **Africa**

[ricsafrica@rics.org](mailto:ricsafrica@rics.org)

### **Europe**

[ricseurope@rics.org](mailto:ricseurope@rics.org)

### **Ireland**

[ricsireland@rics.org](mailto:ricsireland@rics.org)

### **Middle East**

[ricsmiddleeast@rics.org](mailto:ricsmiddleeast@rics.org)

### **United Kingdom RICS HQ**

[contactrics@rics.org](mailto:contactrics@rics.org)



[rics.org](https://www.rics.org)