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# Greening Our Existing Homes

## National retrofit strategy

A consultative document

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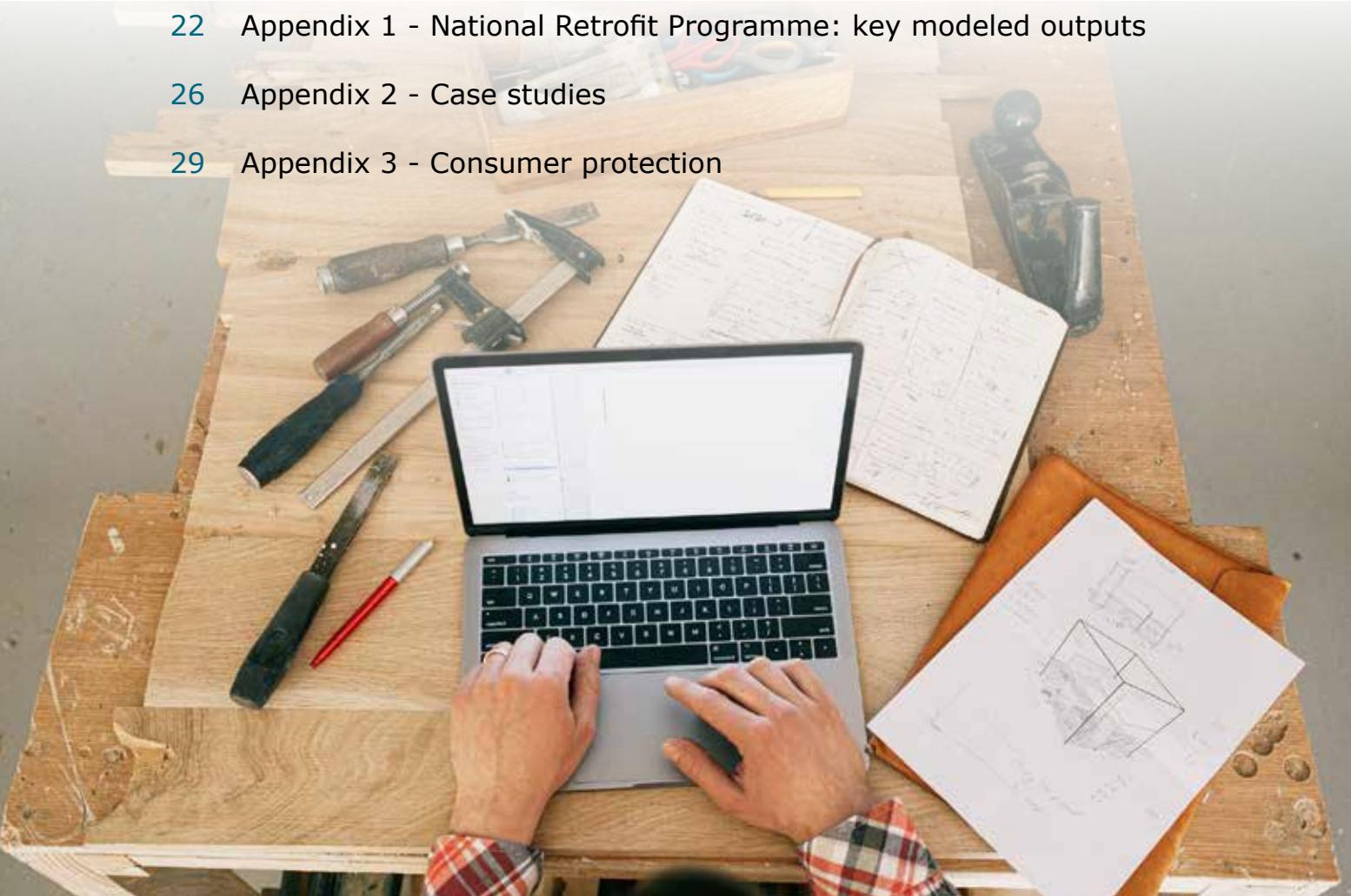
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'Alskea Ltd'

# Executive summary

## Proposal

This paper sets out the case for the UK Government, working in partnership with industry, finance, and other community based bodies to introduce a national retrofit strategy to make our existing homes greener and more energy and water efficient. Without a long-term plan, the UK cannot meet its targets of achieving net zero carbon emissions by 2050.

The industry will be able to deliver this strategy, but there are critical elements that can only be delivered by the Government. While industry can mobilise the majority of the capital that is needed, the Government must also invest to instill confidence in the sector.

### What is retrofit?

Retrofit is an integrated approach to transforming the energy and water needs and technical systems in our homes which requires quality in design, installation and customer care.

### Why is retrofit needed?

Our homes use 35% of all the energy in the UK and emit 20% of the carbon dioxide emissions. If the UK Government is to deliver its targets of a 78% emissions reduction by 2035, and net zero by 2050, household emissions need to be addressed. Water use in the home accounts for almost ten-times more greenhouse gas emissions than the entire operations of the UK water industry. Heating water accounts for 17% of home energy use. The UK has some 28 million homes, the vast majority of which need improving by having retrofit work carried out. A national retrofit strategy will also improve the UK's energy security as well as resilience of water suppliers.

Retrofit should be carried out alongside all other improvements, like loft conversions or new kitchens. When typical home improvement works are undertaken, these represent opportunities to trigger measures to help us along the path to net zero.



**“ Our homes use 35% of all the energy in the UK and emit 20% of the carbon dioxide emissions ”**



# Executive summary



## What are the benefits of retrofit?

Improving the energy performance of our existing homes brings a wide range of benefits:

**Economic** – the Repair, Maintenance and Improvement (RMI) sector, which this strategy argues would be the main deliverer of retrofit improvements, represents one third of all construction output. Retrofit has the potential to create new and higher skilled jobs in every region and community and boost existing firms (especially SMEs and their supply chains). Economy-wide, retrofit also has the potential to develop and extend a labour force with a full range of high value roles which will sustain the economy at a time when it needs additional support. This speaks directly to the Government's jobs, skills, and 'levelling-up' agendas.



**Social** – for individual households, additional disposable income from lower energy bills, the health benefits from improved air quality, lighting, acoustics, safety, and a more comfortable home – as well as improved value of their major asset – are all important factors.<sup>1</sup> There were 8,500 excess deaths in England and Wales in the winter of 2019/20 due to cold homes.<sup>2</sup> Indeed spending £10 billion on poor quality housing in England alone would save the NHS around £1.4 billion per year.<sup>3</sup> Heating water for use in the kitchen and bathroom accounts for 10% of energy bills. Retrofit measures will help the Government to meet their progress against statutory fuel poverty targets.

**Environmental** – reduced carbon emissions from our homes which will help create a low carbon built environment and position the UK as a global leader in the low carbon economy ahead of the United Nations Climate Change Conference (COP26) in November 2021.

The UN Secretary General has proposed six climate positive actions for Governments to take to rebuild after the COVID pandemic.<sup>4</sup> This includes investing in a green transition and creating green jobs. A National Retrofit Strategy is the answer to this.

<sup>1</sup><https://healthyhomesbuildings.org.uk/wp-content/uploads/2019/04/HHB-APPG-White-Paper-V2.pdf>

<sup>2</sup><https://www.nea.org.uk/news/271120-01/>

<sup>3</sup>CCC 2016. Next steps for UK heat policy - Committee on Climate Change - October 2016

<sup>4</sup><https://www.un.org/sustainabledevelopment/climate-change/>

# Executive summary

## How will retrofit be implemented?

Without a plan, the existing workforce cannot deliver the ambitious programme which could transform both our building stock and the construction industry. A systematic scaling up approach is needed to meet the volume of work needed. This has been modelled as a 's-curve' over the programme period from 2021 until 2040 and includes three distinct phases:

- **Phase 1** - underpin capability, including an endorsement by the Government of this strategy.
- **Phase 2** - a slower start focussing on the education of householders and the wider industry through a clear communications campaign as well as an intensive training programme for new entrants to the industry. Piloting and field trials would also be taking place.
- **Phase 3** – a 'quick' middle period based on a mature supply chain eco-system and strong customer protection.
- **Phase 4** - a ramp down of pace towards the end focussing on hard to treat properties, and also a phased redeployment of resources to alternate sectors.



*Nottingham City Homes:  
Energiesprong Retrofit, Melius Homes*

**“ The industry needs around **500,000** new professionals and trades to tackle this challenge ,”**

**In partnership with industry, the Government is asked to invest and create a long term policy framework which will meet its statutory carbon targets and trigger wider confidence to unlock private investment from property owners and financial institutions.**

The industry needs around 500,000 new professionals and trades to tackle this challenge. We also need to upskill our existing workforce. The Government has supported the development of new training standards for Retrofit Coordinator and Retrofit Installer, which can form the basis of the programme in terms of training and quality assurance. Clarity on standards, process requirements and audit will provide a firm foundation for both training and market transformation.

The strategy has been developed with the private market in mind. However, its principles can and must be extended to the social sector as well. We are aware of significant work being undertaken by local authorities and the housing association sector to improve the energy efficiency of their housing stock. We are also aware of the progress being made in this historic building sector, and that insight can be brought from their findings.

We hope that 2021, the year when the UK hosts the United Nations Climate Change Conference, will be the ideal moment for all these bodies to unite behind the principle of a national retrofit strategy, and take the bold action needed to reduce carbon emissions before it is too late.

# Background to the report

The Construction Leadership Council (CLC) provides sector leadership to the construction industry. The CLC has twelve workstreams that work collaboratively to address the biggest issues facing the industry, including skills, building safety and the reduction in carbon emissions business models across all sectors of the industry. The National Retrofit Strategy is part of the CLC's Co2nstruct Zero 9 Point Plan.

The CLC also convenes the industry response to urgent issues such as the COVID-19 pandemic, which led to the development of the Industry Recovery Plan. The Plan addresses the opportunities and challenges for all parts of the industry and sets out collaborative solutions for recovery.

The Domestic Repair, Maintenance and Improvement (RMI) Workstream is chaired by Brian Berry, Chief Executive of the Federation of Master Builders (FMB). The Workstream seeks to support measures that ensure the safe undertaking of work inside people's homes. It also seeks to build confidence among homeowners about conducting building works. The Workstream considers and discusses demand-side stimulus for the purposes of skills retention, job creation, improved industry standards and social benefit.

The Domestic RMI Workstream has developed the national retrofit strategy to achieve these objectives.

The CLC's COVID-19 recovery work is co-chaired by Andy Mitchell, CEO of Tideway and Mark Reynolds, Group CEO of Mace.

“ The Construction Leadership Council (CLC) provides leadership to the construction industry ,”



# Introduction

Our homes use 35% of all the energy in the UK and emit 20% of carbon dioxide emissions. We must tackle this significant area of emissions if we are to be successful at mitigating climate change and meeting our net zero targets. Retrofitting those homes requires more than just one or two insulation measures; it will require an integrated approach to transforming the energy and water needs and technical systems in homes, requiring quality in design, installation and customer care.

The key opportunities for retrofit are in the existing market for repair, maintenance and improvement (RMI), which is worth £25-30 billion per year. Existing RMI represents around one-third of construction sector output but improvements to existing homes are not generally addressing energy efficiency and decarbonised systems in a coherent way. While we must seize every opportunity to green our existing homes, including as part of typical home improvement works, the National Retrofit Strategy redirects and secures employment in the existing sector, and offers the opportunity to grow the sector in a sustainable way through broadening and deepening activity, achieving significant policy goals as a result.

**Retrofit brings economic, social and environmental benefits:** Improving the performance of a home does not just benefit the climate. It has the potential to create decent jobs in every region and community, and boosts existing firms (especially SMEs and their supply chains) in construction, speaking directly to the Government's 'levelling-up' agenda. Economy-wide, the potential to develop and extend a labour

force with a full range of high value skills will sustain the economy at a time when it needs additional support and urgent job creation.<sup>5</sup> For individual households there are a number of important drivers, including additional disposable income from lower energy bills, the health benefits from improved air quality, a more comfortable home, and improvements to the value of the house. For landlords and asset managers, long term resilience and tenant satisfaction increase asset value. Old and inefficient housing leads to an estimated 11,500 early winter deaths and 4,000 early deaths from overheating per year, and adds around £2 billion to annual NHS costs through negative health impacts.<sup>6, 7</sup> By 2050 there will be a structural deficit of 8.2 billion litres of water per day, if adaptations aren't made.



“ Retrofit has the potential to create decent jobs in every region and community ,”

<sup>5</sup>A Green Stimulus For Housing, - The macroeconomic impacts of a UK whole house retrofit programme; New Economics Foundation, Leeds University, Parity Projects, July 2020.

<sup>6</sup>Washan, P., Stenning, J., Goodman, M., 2014. Building the Future: The economic and fiscal impacts of making homes energy efficient

<sup>7</sup>CCC 2016. Next steps for UK heat policy - Committee on Climate Change - October 2016

# Introduction

**The ambition:** The UK has some 28 million homes, the vast majority of which need retrofit work and bringing up to a better state of repair. Our goal is to tackle the challenge systematically and pragmatically, establishing firm foundations for scaling up to meet the volume of work needed. For the construction industry, retrofit means improving quality and providing quality assurance. Firms and trade bodies share an ambition to transform the sector to deliver on the multiple policy objectives of retrofit. The sector needs clear, consistent and long-term policy context that supports this ambition. In this way a modern, low carbon industry founded on proud professionalism can be established. In partnership with industry, the Government will need to invest early alongside creating a long term policy framework which meets its statutory carbon targets and delivers on creating quality employment. This action will trigger wider confidence, unlocking private investment from property owners and financial institutions combining to a 20-year programme of circa £525 billion. A comprehensive approach to digitisation, alongside a step-change in trade skills, will also unlock potential for local energy networks, storage and innovation management and tariffs. It will also lead to the development of optimized packages including economies of scale in delivery, costs and value propositions.

The existing industry workforce needs, ultimately, to be more than doubled, with the development of around 500,000 new professionals and tradespeople to tackle this challenge. Government has supported the development of new training standards for Retrofit Coordinator and Retrofit Installer, which can form the basis of the programme in terms of training and quality assurance. Clarity on standards, process requirements and audit will provide a firm foundation for both training and market transformation. Accreditation and/or minimum competencies for the supply chain could also be included to prevent issues. We are proposing programme components that have worked well internationally already, in particular a move away from individual products and services, to the home and its occupants as a complete energy-using system.<sup>8</sup> This work will build on the programmes already underway in the devolved nations, and across many local authorities in England.<sup>9, 10</sup>



“ The UK has some 28 million homes, the vast majority of which need retrofit work ,”

<sup>8</sup>Gillich, A, Sunikka-Blank, M and Ford, A (2017). Designing an ‘optimal’ domestic retrofit programme

<sup>9</sup><https://www.gov.scot/publications/energy-efficient-scotland-route-map>

<sup>10</sup><https://gov.wales/written-statement-optimised-retrofit-programme-2020-21>

# National retrofit strategy

## The deliverables:

**1. Building renovation plans.** Deploying digital techniques to an agreed standard, an assessment based on survey, EPC input data, energy in-use data, and other relevant data such as location, occupancy, ownership etc., can deliver a building renovation plan or 'passport' for each residential unit or group of units, providing an evidence-based pathway to decarbonisation through fabric and water efficiency and zero carbon heating technologies, according to opportunity, ambition and budget. The industry will work with BEIS to improve the effectiveness of EPCs as part of their EPC Action Plan.<sup>11</sup>

Building renovation plans enable large-scale area-based and locally-managed programmes to be assembled and market opportunities opened up (including, for example, groups of properties suitable for off-site solutions e.g. Energiesprong). Through area-based programmes we can expect economies of scale to bring down the cost of optimised packages of energy efficiency and decarbonised heat. Combined with an end-to-end quality assurance system and post-retrofit evaluation of impact and energy outcome, this provides the conditions for low-risk institutional finance and increased consumer confidence. This would need to be founded on a centrally held property database that enables clarity and continuity on plans as ownership changes.

Examples of where this approach is starting to be adopted in the UK through local pilots can be used to inform a new standardised process and opportunities analysis. For example, learning from the BEIS supply chain pilots can be incorporated.<sup>12</sup>



**2. Skills training modules** will be informed by existing qualifications and the recently developed Retrofit Coordinator training standards (PAS 2035/2030). Building renovation planning involves the clustering of trades required for retrofit packages and - except for stand-alone measures such as loft insulation - demands co-ordination, and joint liability for outcomes, as well as adherence to standards for specific measures such as those laid out in PAS 2030. The definition of individual and coordinated packages will be an output for the 2020-2024 period to inform the development of new skills and qualifications.

**3. Delivery programmes** A series of area-based approaches build capacity in a locally relevant way from the bottom-up. Under a national umbrella of standards and expectations, each delivery programme is accountable for its impacts on employment, skills and carbon reduction. Every programme is made locally relevant by being based on the twin platforms of building plans and 'packages' of skills, which reflect the specifics of local housing stock. Delivery programmes can be initiated by local authorities, combined authorities, retrofit partnerships, local economic partnerships, community development groups, supply chain partners etc., to suit the condition, ownership profiles, financial and skills opportunities in diverse localities.

A retrofit partnership is a place-based franchisee of the powerful central brand consisting of advocates, designers, installers and supply chain firms.

**“ The cost of each plan will reduce as greater numbers are delivered ”**

<sup>11</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/922660/EPC\\_Action\\_Plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/922660/EPC_Action_Plan.pdf)

<sup>12</sup><https://www.gov.uk/government/publications/energy-efficiency-improvement-rates-local-supply-chain-demonstration-projects/local-supply-chain-demonstration-projects-summaries>

## National retrofit strategy(continued)

**The delivery system:** Successful delivery of the strategy requires a suite of interdependent modules and if any are left out, the whole ceases to function. Each are dealt with in turn below.

### 1 Leadership and Communications

An umbrella to tie diverse local programmes into a coherent whole: A Retrofit Delivery Authority akin to the stature of the Olympics Delivery Authority is needed to oversee and lead strategy delivery, ensuring that all stakeholders, in particular locally-based delivery consortia, are fully enfranchised and that standards are high.

### 2 Supported transition and a research and innovation culture

Provide a safe development environment for new entrants and existing organisations so that they grow to meet the new demands as well as extending in capability.

### 3 Performance Standards

Ensuring homes perform as promised.

### 4 Finance and Grants

Financial support and fiscal incentives in a variety of ways to suit the variety of ownership models.

### 5 Training and Accreditation

Building up an army of professionals and trades that can do the work fully and well. This involves developing the skills of the existing workforce and recruiting and training new entrants.

### 6 Materials and Equipment

Scaling up the supply of materials and equipment in line with demanding quality standards.

### 7 Creating Customer Demand

A comprehensive approach to giving every homeowner a vision of what their home needs, the belief that it is needed and a route to achieving the change.

### 8 Compliance and Quality regime

Creating an industry culture that ensures all jobs are done to high, enforced standards.

## National retrofit strategy (continued)

**Proposal for the partnership approach to funding the programme:** It is proposed that a partnership approach is adopted to funding the national retrofit strategy. The costs are outlined in the table below. Critically, the Government is being asked to invest £5.3 billion over the next four years.

2021 200,000 homes	2022 - 2024 855,000 homes
<p><b>£3.64bn*</b> programme</p> <p><b>36,000</b> direct jobs sustained (27,000 indirect)</p> <p><b>Government invests £1.16bn</b></p> <p><b>Govt revenue £2.69bn</b></p> <p>Tax benefit per £, <b>£1.36</b></p> <p>Private capital <b>£2.5bn</b></p> <p>Health benefits <b>£316m</b></p> <p>Additional GDP <b>£4.76bn</b></p>	<p><b>£16.8bn</b> programme</p> <p><b>100,000</b> direct jobs sustained (80,000 indirect)</p> <p><b>Government invests £5.3bn</b></p> <p><b>Govt revenue £12.4bn</b></p> <p>Tax benefit per £, <b>£1.84</b></p> <p>Private capital <b>£11.4bn</b></p> <p>Health benefits <b>£1.4bn</b></p> <p>Additional GDP <b>£21.9bn</b></p>
Avoided CO2 emissions: 0.532Mt	Avoided CO2 emissions: 2.53Mt
<p><b>By 2030 12,300,000 homes</b></p> <p><b>£235.7bn</b> programme</p> <p><b>500,000</b> direct jobs sustained (390,000 indirect)</p> <p><b>Government invests £75.4bn</b></p> <p><b>Govt revenue £174.4bn</b></p> <p>Tax benefit per £, <b>£1.58</b></p> <p>Private capital <b>£160.2bn</b></p> <p>Health benefits <b>£22.1bn</b></p> <p>Additional GDP <b>£308.7bn</b></p>	<p><b>Net Zero homes from 2040 27,300,000 homes</b></p> <p><b>£523.7bn</b> programme</p> <p>Jobs sustained down to <b>70,000</b> (40,000 indirect)</p> <p><b>Government invests £167.6bn</b></p> <p><b>Govt revenue £387.6bn</b></p> <p>Tax benefit per £, <b>£1.84</b></p> <p>Private capital <b>£356.1bn</b></p> <p>Health benefits <b>£55.9bn</b></p> <p>Additional GDP <b>£686.1bn</b></p>
Avoided CO2 emissions: 46.8Mt	Avoided CO2 emissions: 84.9Mt

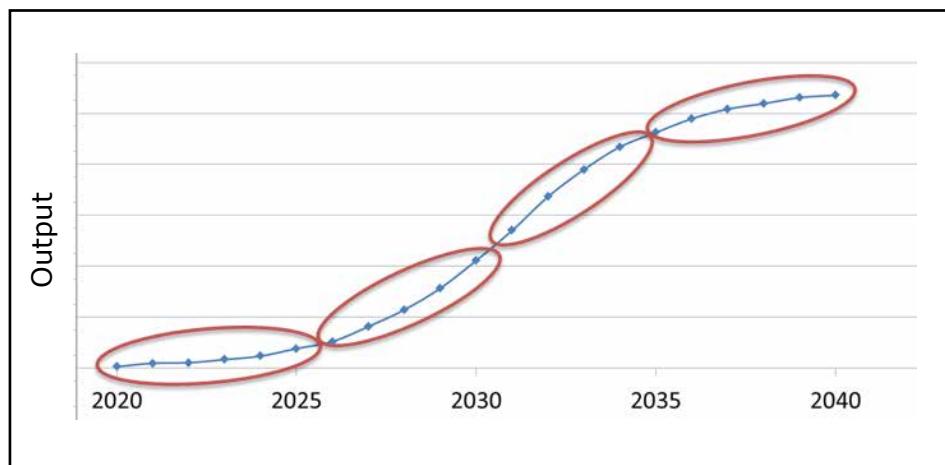
### Other benefits:

- **£436** energy bill saving per home on average per year
- Can be regionally focused targeting the **greatest need**.
- **6,000** avoided deaths p.a.
- **500,000** jobs (retrofit and related)
- Household disposable incomes **2%** higher
- For every **£1** invested - **£2** back in economy



## National retrofit strategy (continued)

All modelling projections can be seen in Appendix 1 below.



- Phase 1**  
Underpin capability
- Phase 2**  
Build output
- Phase 3**  
Maximum speed
- Phase 4**  
Final push

## The delivery system (continued):

### Leadership and Communications

Any initiative at this scale needs strong, inspirational and clear leadership. A central Retrofit Delivery Agency will be needed to provide oversight, a drive for continual improvement, and emphasis on social value, the opportunity for learning between areas, and to ensure that all stakeholders are fully enfranchised. Feedback and knowledge sharing will be needed to ensure continuous improvement. It would also facilitate the showcasing of successes at a local level to create further consumer demand.

A 'Great British Homes' programme or similar should be positioned as aspirational, linked to themes of keeping our families healthy and safe at home, British pride in our homes and neighbourhoods, increasing asset value, and being in control of our own environment and futures. This requires a meticulously planned communications campaign that involves and engages all stakeholders: MPs and policy makers, local authorities and housing associations, community groups, local advocates, green finance and funding experts, industry bodies and regulators, private sector partners, and existing retrofit customers.

The Retrofit Delivery Agency's leadership would enable alignment across client groups such as combined authorities, local authorities, social landlords, energy providers and more. Clarity of leadership would pave the way for locally delivered area-based programmes drawing on the expertise of locally advocacy organisations.



### Performance standards

Retrofit needs challenging but realistic 'fabric-first' standards similar to the approach taken by the EnerPhit standard, developed by the Passive House Institute. Such performance standards require verification of attainment, and checking performance in use, not simply installer self-certification. The standards need to cover technical issues in an integrated way to overcome problems, for example, with the UK's poor experience where heat pumps were installed in higher risk buildings where the necessary fabric improvements had not been made. These performance standards will mitigate the risk to consumers of poor quality building works. The technical standards need to be developed in those areas where they are currently absent (eg. insulation measures) and must be linked, through the renovation plan process, with optimal combinations of fabric and systems. Fabric first approach is a 'no regrets' one; reducing the demand for heat, improving the ability to heat the poorest performing homes whilst allowing more time to consider methods available to heat those homes as the decarbonisation of the electricity supply grid continues. This satisfies fuel poverty eradication as well as zero carbon ambitions.

The technical building standards need to be closely aligned with occupational standards for the workforce, building on the welcome introduction the Retrofit Coordinator and Installer standards. These need to tie in with accreditation schemes and a resourced compliance-checking regime at a local level. Support for existing useful policy levers would go together with this approach, such as providing impetus to the Minimum Energy Efficiency Standard (MEES) so that it can drive change in the trickiest area of private rented housing as reinforced by the most recent Private Rented Sector Consultation by BEIS.<sup>13</sup>

A requirement for water efficiency product labels, such as the Unified Water Label, for all bathroom fittings and kitchen appliances must be brought forward. This is an effective way of reducing usage and costs by providing homeowners with water usage information. Water labelling would also support reforms to Part G of the Building Regulations, to make it easier to meet tighter water efficiency standards by fitting only the best rated fittings and appliances.

Further digitisation of refurbishment processes would help to address quality issues and improve productivity. Developing techniques to scan, assess and plan, and deliver retrofit with greater speed and accuracy can be fully supported within the innovation element of this overall retrofit programme to empower all sizes of company across the country. The performance standards should include both quantitative evaluation metrics and qualitative aspects so that householders can feed back on comfort and usability of technologies. This approach also allows industry to create a 'golden thread' of asset knowledge needed in the event of concerns about changing standards or safety. All of these techniques are already being applied in the UK (see 'Case studies'). This would further underpin the overall philosophy of ensuring all work is based on a thorough understanding of the performance of the whole building for the long term, not just immediate push for single measures.



“Householders can feed back on comfort and usability of technologies”

<sup>13</sup>Department for Business, Energy and Industrial Strategy, 2020, <https://www.gov.uk/government/consultations/improving-the-energy-performance-of-privately-rented-homes>

## National retrofit strategy (continued)

### Finance and Grants

Financial support is available in a variety of ways to suit the ownership profile. Some, particularly those in fuel poverty, will at first need grant aid to make changes before innovative financial mechanisms will allow such homes to upgrade without direct government support. ‘Pump-priming’ the able-to-pay market is needed to help industry to build capacity and to experience economies of scale. Members of UK Finance have indicated that programme-level finance is available, but currently constrained by the risks of policy uncertainty and unenforced technical standards.<sup>14</sup> Institutions need to have confidence in the quality of the delivery mechanism and its ability to systematically attract customers to fully de-risk their investment.

A range of financial incentives will help to build this confidence:

**Stamp Duty Rebate** – A system of variable Stamp Duty rates would see house buyers receive a discount if a property is above a given energy efficiency standard, and an increased rate for properties that perform less well, designed to be fiscally neutral.

**Reduced VAT on ‘retrofit-led renovation’** – In order to stimulate demand for retrofit, the Government could extend a reduced 5% VAT rate to cover all general home improvement works (with some eligibility criteria), provided a certain EPC rating was achieved. Consequential improvements will reduce disruption to the household.

**Government grants for low-income households** – A fuel poverty approach (ECO), should be replaced by direct government grants for whole house retrofits, funded by general taxation.

**Low interest loans** – These loans should be of sufficient scope and scale to fund the full range of measures necessary for owner occupiers. Adopt a sliding scale of grant to loan ratios.

**Green mortgages** – The existing mortgage market should be expanded to incentivise increased lending for retrofit measures as well as reduced rates of interest for highly efficient properties. This will also help incentivise retrofit works at the point of sale, minimising disruption to the household.

**Help to Fix** – Low cost loans to households and potentially landlords, allowing them to improve the general state of repair of the home, but predicated on a requirement for the energy efficiency of the home to be improved.

**Council Tax** – one off rebates on properties that undergo energy efficiency retrofit, paid for by central Government.

### Supply chains and partnerships

The scale of change required means that multiple interests will need to align in different ways, depending on each local partnership.<sup>15</sup> Each retrofit partnership would be a place-based franchisee of the powerful central brand consisting of advocates, designers, installers and supply chain firms. Supply chain partners are vital and could be supported by local information hubs that link available retrofit installers, finance solutions, and access to data. These would also be reviewed and updated regularly to serve local need. Identifying, manufacturing and supplying the materials and equipment needed to achieve the retrofit potential of every home in the UK is a huge economic challenge. Merchants and wholesalers provide vital routes to connect manufacturing innovation with local delivery programmes.<sup>16</sup> Innovate UK and the Energy Catapult have the potential to support focussed, near market product and process development through refining existing programmes and supporting area-based innovation.<sup>17</sup>

<sup>14</sup>Robins, N., Tickell, S., Irwin, W., and Sudmant, A. "Financing climate action with positive social impact: How banking can support a just transition in the UK" LSE Grantham Institute, July 2020

<sup>15</sup>Killip G, Owen A, Morgan E, Topouzi M. 2018. A co-evolutionary approach to understanding construction industry innovation in renovation practices for low-carbon outcomes. International Journal of Entrepreneurship and Innovation. 19(1), pp. 9-20

<sup>16</sup>Killip G, Owen A, Topouzi M. 2020. Exploring the practices and roles of UK construction manufacturers and merchants in relation to housing energy retrofit. Journal of Cleaner Production. 251

<sup>17</sup><https://www.ukri.org/innovation/industrial-strategy-challenge-fund/prospering-from-the-energy-revolution/>

### Training and Accreditation

An additional 500,000 trade positions, more than double the existing workforce, are needed to meet even a minimum EPC 'C' target by 2030, as well as 50,000 Retrofit Coordinators. The strategy for creating this 'retrofit army' will need to account for the variety of pathways in the construction industry, both skilled and unskilled, and the range of employment opportunities that they could match to. Developing this strategy and recruitment campaign would be a function for the Retrofit Delivery Agency. The Agency would work strategically with Skills Advisory Panels (SAPs) led by local authorities. These are local partnerships that work together to establish local skills needs by bringing together employers and skills providers, including training providers, colleges and universities to determine the action needed in local areas to address skills needs. This will be informed by the work of the Government's Green Jobs Taskforce and the CITB's report *Building Skills for Net Zero* as well as the CITB's forthcoming assessment of the skills and qualifications needed to deliver the NRS.



Additional measures will be needed to help the installation supply chain grow to meet this demand. Offering support for individual trainees to be trained will not be enough. Developing the skills of Building Control professionals to ensure the deliverer of retrofit is held accountable.

**Long term commitment** – a National Retrofit Programme would give employers the confidence to invest, but they also need a 'safe space' in which to innovate.

**Apprenticeship subsidy** – working with the existing CITB and UK Apprenticeship Levy system, firms must be supported to take on new apprentices. Colleges must be engaged in the local retrofit partnership and be responsive to the skills demands of industry.

**Training requirements** – the beauty of this sector is that a wide range of skilled people is required, some of which require a longer period at college on apprenticeships. Others have transferable skills that need honing and deploying very quickly. The proposed s-curve deployment of this programme suits entrants of all backgrounds. This includes the arrival of Retrofit Coordinators.

**'Route to Work' for trainees** – ideally this would be cost-neutral for the recently unemployed. The new apprenticeship standards launched from August 2020 allow us to adapt programmes to suit the prior learning. This can be aligned with incentives for firms to commit to taking on apprentices.

**Developing trainers** – training to support effective retrofit activity is not a classroom activity, although full involvement of Further Education colleges will be important for local delivering programmes. Training and continuous development to match continuous improvement will need to be integrated into everyday site activities. Place-based networks of site-based learning would drive individual commitment, based on evidence that construction trades like to work 'on the job'.<sup>18, 19</sup>

**Upskilling** – it will also be important to upskill the existing workforce so that they are equipped with the knowledge and the latest techniques they need to deliver retrofit. This includes knowledge of build physics and whole building design.

<sup>18</sup>Simpson K, Janda KB, Owen A. 2020. Preparing 'middle actors' to deliver zero-carbon building transitions. *Buildings and Cities*. 1(1), pp. 610-624

<sup>19</sup>Simpson K, Owen A. 2020. Reflections From Engaging a Network of Local Stakeholders in Discussing Training Needs for Sustainable Renovation. *Frontiers in Built Environment*. 6

### Creating Customer Demand

It is critical to establish a central campaign vision. Please see communications section.

**Informing and educating** - the recent Climate Assembly was made-up of 108 members of the public from all walks of life, commissioned by six House of Commons Select Committees, to assist in their scrutiny of the Government. Top of the priority list for assembly members when they voted on the principles that should underpin the UK's path to net zero was 'informing and educating everyone' (the public, industry, individuals and government). Assembly members also emphasised the need to protect consumer choice to promote competition and speed up innovation. This would be a core activity of the Retrofit Delivery Agency, which would increase understanding of retrofit while not diluting the complexity of the works involved. Consumers will need access to good quality information beyond what retrofit coordinators can offer. Consumers need open tools that they can use to evaluate their homes, learn from others' experiences, and explore the detail of installation, costs and disruption of each solution. In its consumer comms, the Delivery Agency should work with industry partners including competency or accreditation schemes with a trusted brand.

**'A plan for every home'** - a clear plan, tailored to the needs of every home, getting the housing stock ready for net zero, would include several possible pathways (e.g. 'all at once' and 'room by room'), reflecting the opportunities and triggers in local markets for RMI. Most of the country can have access to a plan by April 2021 using a digital twin approach supported by in-home surveys when action is instigated. The plan would cover all aspects of retrofit, including energy and water sustainability measures. Households should be provided with independent advice.

**Policing fraud and scammers** - we propose that a network of well-resourced teams be part of the programme to ensure that fraudsters and scammers are controlled. This could be to bolster Trading Standards or Citizens Advice provision. (See Appendix 3 for more detail).

**Ongoing customer research and feedback** - the Retrofit Delivery Agency should have a role in generating confidence for a range of ownership models through a retrofit plan process which offers owners different pathways, packages, and finance options as well as accessing the scheme data to understand customer view. It is important that if consumers have declined offers, we must be able to understand why.

**Materials and equipment** - Appendix 1 estimates the number of energy efficiency measures needed to get the UK to net zero. The analysis does not include the remedial work or other refurbishment work that will be needed alongside such energy efficiency measures. Whilst the UK supply chain appears optimistic about meeting the demand with the supply of products, if we are able to streamline packages and training/accreditations, this optimism can be translated into actual delivery. We propose a stream of the Retrofit Delivery Agency that works with manufacturers and distributors to understand demand, project material needs and guarantee the capacity to scale up once there is a strong policy commitment to the programme.

### How much do you agree or disagree that each of the following policy options should be part of how the UK gets to net zero? (%)



Figure 7, Pg 208, Climate Assembly UK, Final Report, 2020 reference [www.climateassembly.uk/report/](http://www.climateassembly.uk/report/)

### Compliance and Quality Regime

It is critical that we create an industry culture that ensures all jobs are done to the set standards. This requires all industry processes to be integrated with the proposed data services at all stages. This is non-trivial, but essential given the speed and accuracy of the transformation required and aligns with the existing TrustMark regime and its drive for additional requirements for post-occupancy evaluation including energy monitoring. It is also essential in mitigating the risk to consumers of poor quality building works. The PAS 2035 standard and the role of Retrofit Coordinators should also embed this. We would urge the development of clear and freely available technical standards for all of the energy efficiency measures to underpin the auditing regimes that are now in place. Continuous improvement from the programme will include links with the newly formed *BSI Technical Committee CB/401 Retrofitting Energy Efficiency Measures* so that learnings are fed back to ensure continuous improvements.

### Supported transition; Research and Innovation

The programme should provide a safe development environment for new business models to be developed and streamlined:

- The Retrofit Delivery Agency to develop protocols, coordinate learning, and provide technical support. Innovation is most critically about process development and not just tools or materials.
- Set up 20 trial areas in England, representing a cross-section of different regional economies and local housing markets. Each area would represent enough homes to support a self-sustaining retrofit market once established. New planning mechanisms such as Retrofitting Local Development Orders could be introduced to set up these projects.
- Establish retrofit partnerships in each trial area, bringing together local construction firms, construction supply chains, local authorities and housing associations, research institutions, property owners, mirroring and working with the Optimised Retrofit Programme in Wales.<sup>20</sup>
- Task each retrofit partnership to carry out the first phase. This involves carrying out 10 substantial renovation projects starting in year one monitor and evaluate results in line with local policy contexts and national protocols.
- Coordinate and share learning across all the retrofit partnerships through a national conference and the publication of evaluation reports by the Retrofit Delivery Agency.
- Design phase 2 of the trial, based on the learning from phase 1.
- Task each retrofit partnership to carry out phase 2: carry out 100 renovation projects, monitor and evaluate results in line with national protocols.
- Continue the process of trials, monitoring and evaluation, coordination, and shared learning.
- Scale up the size of each phase as appropriate.
- Councils should enable automatic planning permission for specific retrofitting works.
- Establish an academic research network that collates evidence and evaluation on retrofit, from multiple disciplines and approaches sharing insight collectively and openly.

<sup>20</sup> <https://www.cewales.org.uk/latest-news/consortium-wins-welsh-government-funding-retrofit-1300-welsh-homes/>

## National retrofit strategy (continued)

### Risks to be mitigated

The Retrofit Delivery Agency would work with the Government and industry to identify key risks to this programme and seek to build in mitigations from day one. Key areas of concern would be:

<b>Leadership from the Retrofit Delivery Agency</b>	This has to be strong, impartial and covering all aspects of the programme. Alternatives to this proposal should be developed in the event that it might be politically unwelcome. Any unknown risks that come up in the future will be effectively addressed through communication, in-use monitoring and feedback - all functions of the agency.
<b>Mis-selling / Scams / Fraud</b>	Appropriate levels of funding from the overall programme (not necessarily government) to ensure that customers have sufficient confidence and routes to redress to step out of their comfort zone.
<b>Badly designed approaches</b>	Unequivocal support for the PAS2035 whole house approach to retrofit would underpin the long term vision for all homes, whilst also supporting the immediate drive for work volume to support an employment drive. Futureproofing for all work. Poor quality installations will be minimized through local partnerships requiring clear commitment against clear standards and verification of completed work; and a sanctions regime.
<b>Poor quality installations</b>	The application of due process founded on PAS2030, Building Regulations and greater scrutiny brought by Retrofit Coordinators via PAS2035 would address this. This would all be supported by a national programme of upskilling and training new entrants. The ingredients are in place; they need momentum.
<b>Policy instability leading to private sector finance staying wary (i.e. finance is not de-risked enough)</b>	The cross-sectorial nature of the Retrofit Delivery Agency working closely with the finance sector that is demonstrably keen to make a success of this programme ought to ensure that a long term vision is established and underpinned by clear standards for installation.
<b>Materials and equipment</b>	Products and data on products that fail to meet standards must be shared widely and rapidly with building supply merchants and others.
<b>Health and safety</b>	Health and safety best practice must be ensured while carrying out retrofit works.



# Supporters



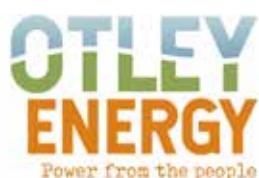
**SURE Insulation**



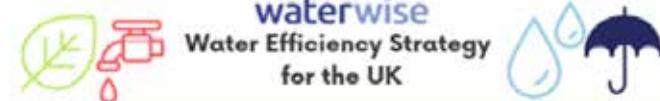
# Supporters



Glass and Glazing Federation



# Supporters



## Contributors

The CLC would like to thank the following contributors:

**Parity Projects, Leeds University, Oxford University** and the **Green Construction Board**.

# Appendices

## Appendix 1 – National Retrofit Programme - key modelled outputs

### The 's-curve' of output intensity

The intensity of the programme's work has been modelled as an s-curve over the programme period.

Key aspects of this are as follows:

- A.** A slower start helps to focus on:
  - 1. Education of householders and the wider industry through a clear and unambiguous campaign.
  - 2. Intensive training programme for new entrants to the industry to keep up with the gathering pace.
- B.** A 'quick' middle period would be based on a mature supply chain eco-system and strong customer protections.
- C.** A ramp down of pace toward then end:
  - 1. The very-hard-to-treat properties may be left to the end; hard to plan, tough to gain permission for and will be the stock that needs work but more care and thus less resource intensity. However, if vulnerable consumers are living in difficult to treat houses, the programme must be adaptable enough to ensure these can be prioritised.
  - 2. A signalled ramp down helps the skilled workforce to shift to other sectors without a sudden shock. This also means we must train them with more rounded skills that suit a number of sectors.

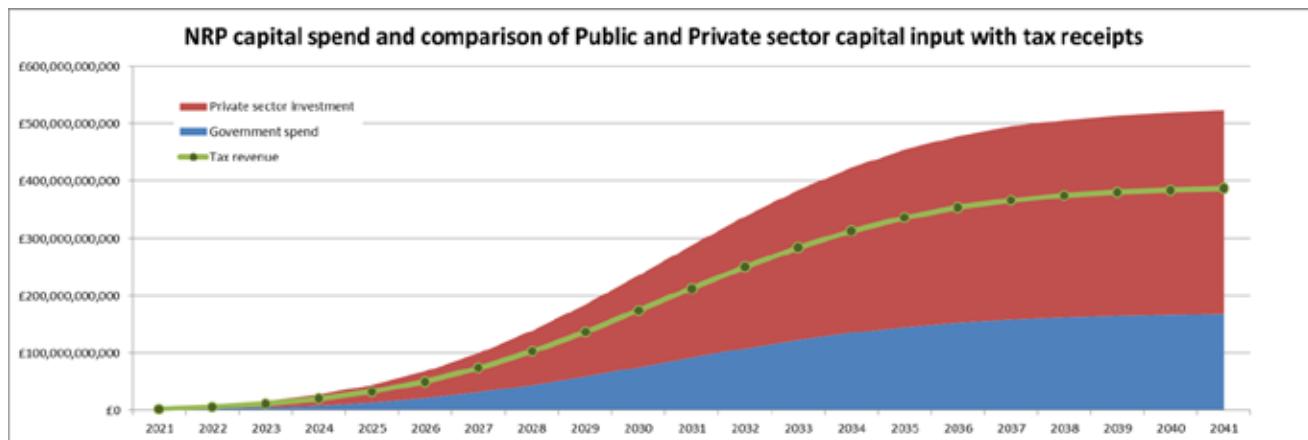
### Clarifications and assumptions:

1. The analysis is based on the application of over 2,400 individual possible measures to each home in the English Housing Stock Condition Survey to seek the most cost effective measures to reach as close to net zero as possible.
2. Any focus on a particular technology or approach for a specific period has not been taken account of at this time. Such considerations will need to be developed alongside industry, for instance, there may be a moratorium on the installation of the new gas boilers from a fixed future date which would change these outputs. The modelling at this time assumes all new heating installations are heat pumps. We recognise that other technologies or innovations such as district heating, hydrogen boilers, or direct electrical heating may also pose solutions.
3. We have not taken account at this time of the process efficiencies and installation technologies that will emerge over time and the subsequent reduction in personnel that may result.
4. The Climate Change Committee launched its 6th Carbon Budget on 9 December 2020, setting out trajectories to the achievement of net zero carbon performance of buildings. Their analysis differs mainly on our assumption of greater reliance on fabric first measures. As a consequence the number of personnel and the costs to achieve net zero in the housing stock are higher in our work. In both cases, tackling the fabric requirements is an immediate need, as of course is the industry and finance infrastructure to cope.

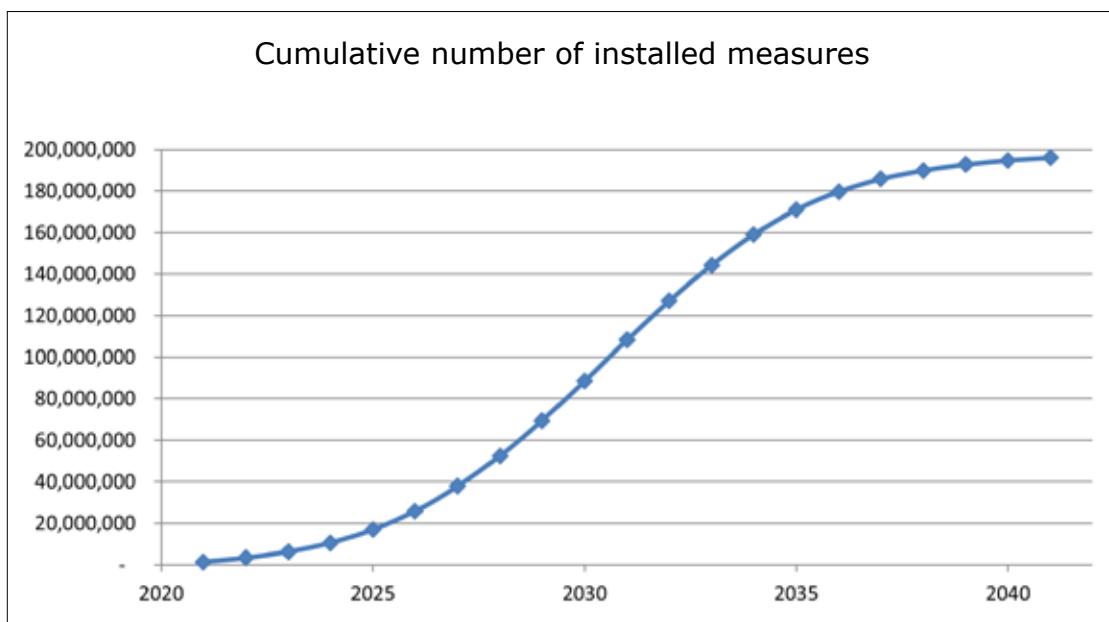
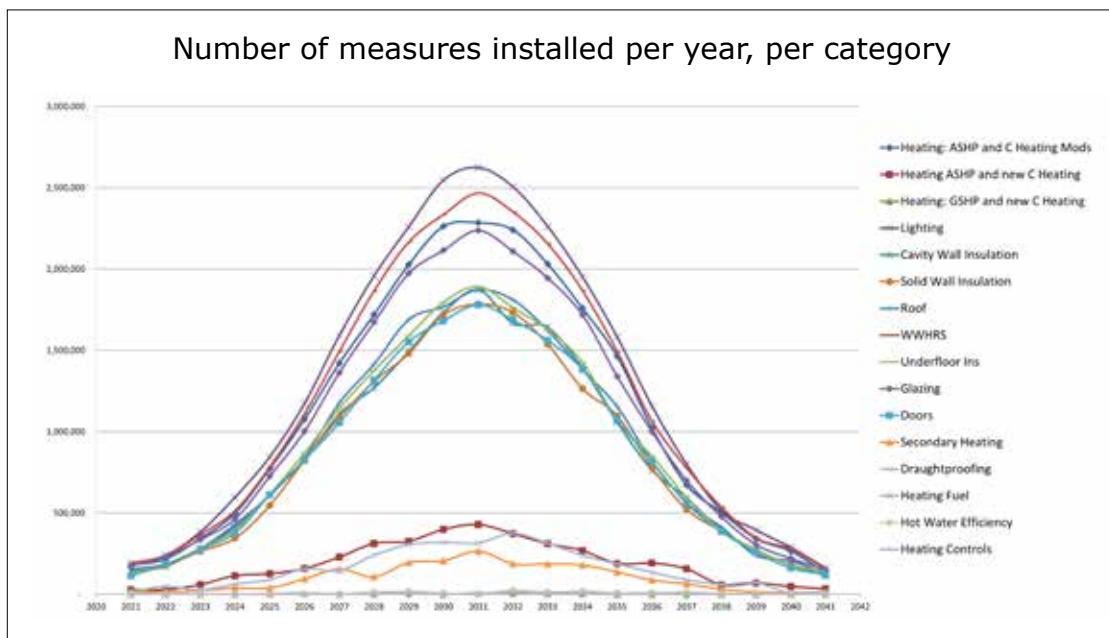


## Appendices (continued)

### Financials



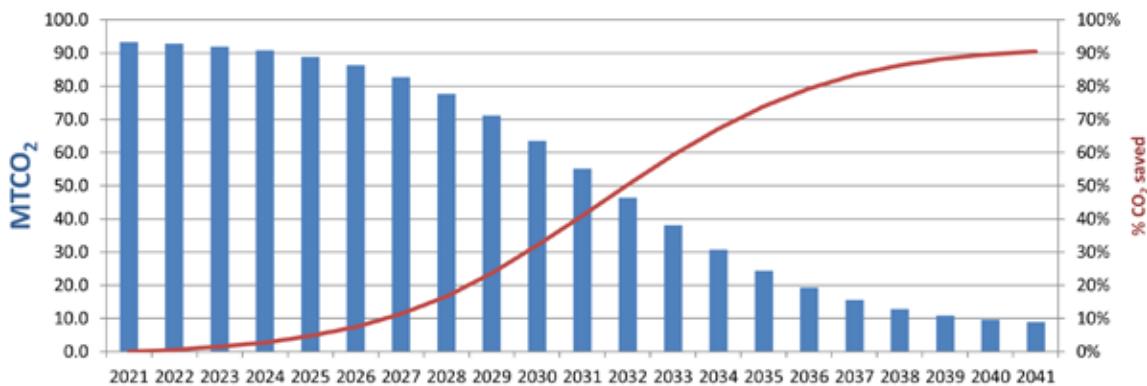
### Detail of measures



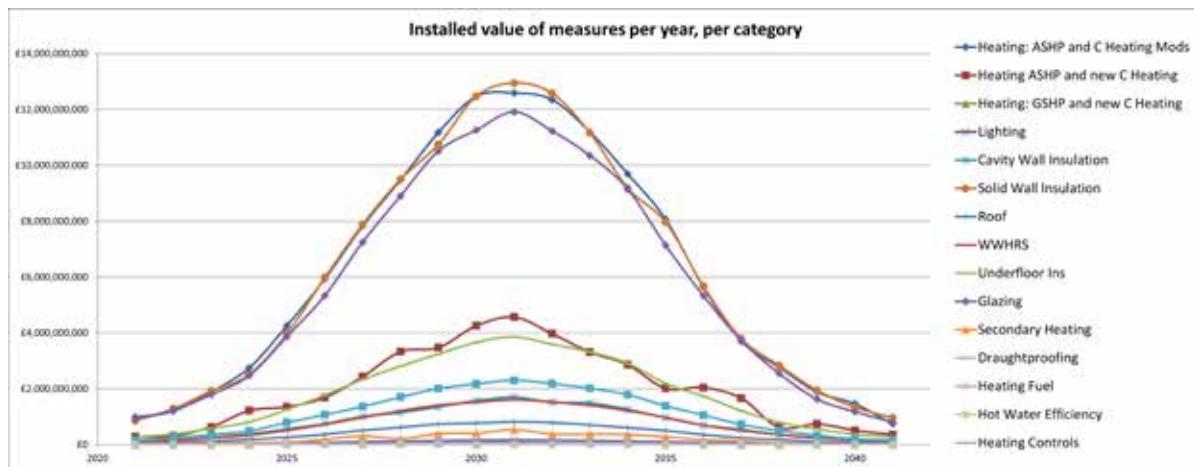
## Appendices (continued)

### CO<sub>2</sub> trajectory

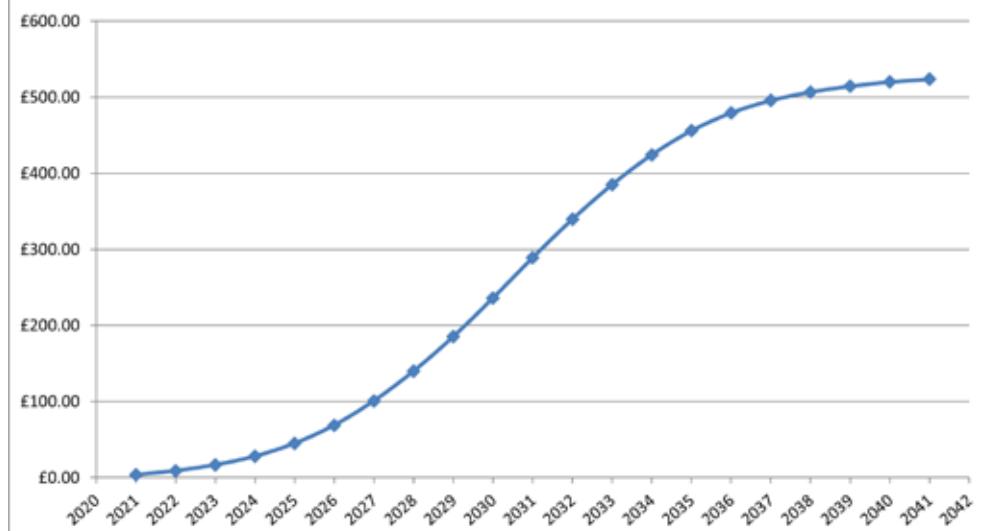
Annual CO<sub>2</sub> emissions in existing UK housing as NRP is implemented using 2038 carbon factors



### Programme value

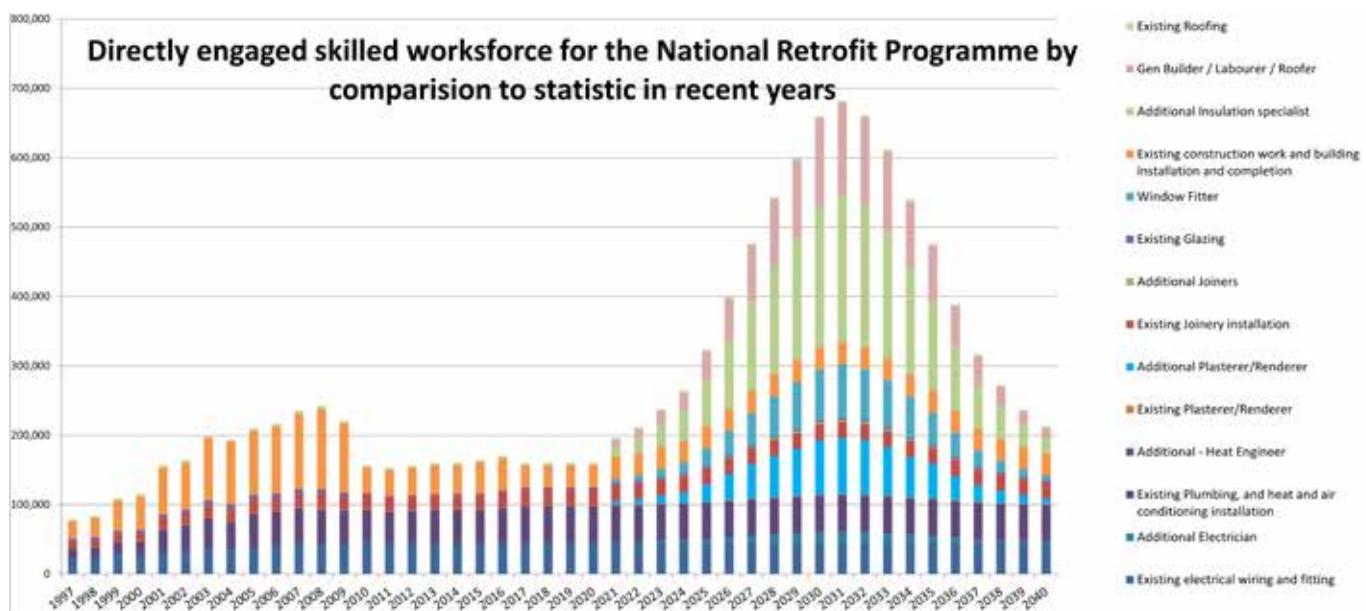


Cumulative programme value (bn)



## Appendices (continued)

### Jobs



## Appendices (continued)

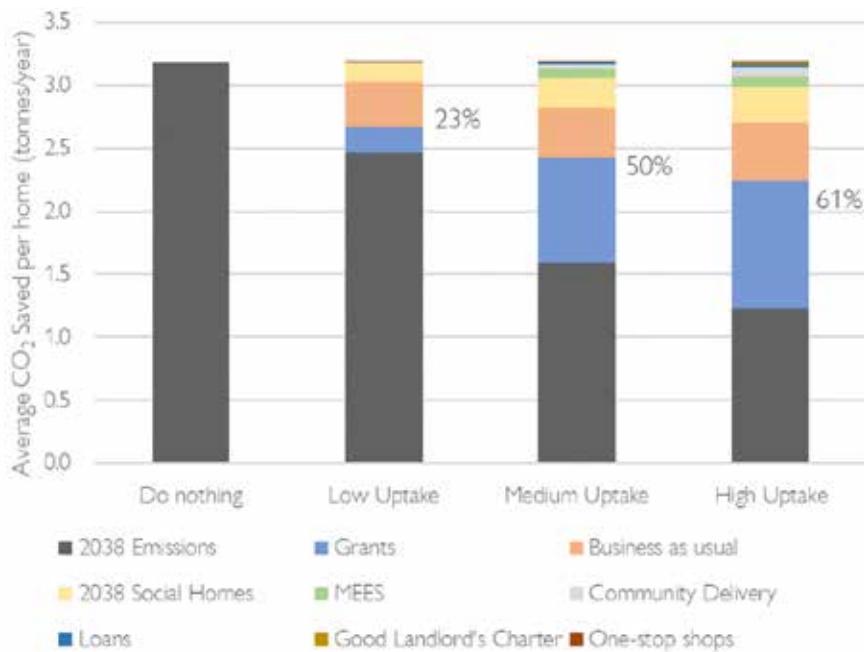
## **Appendix 2 – Case studies**

Case study 1 - Greater Manchester Combined Authority

Parity Projects worked with Greater Manchester Combined Authority to produce pathways to healthy net zero housing by 2038. An energy model was built for every home in Greater Manchester. The analysis had two stages, and reflects what will be needed in all local delivery areas of the UK:

1. Destination scenarios were modelled that described the impact of a wide range of outcomes for the housing stock. The costs of these were considered against the cost of abatement (per kg of CO<sub>2</sub> saved). The optimal destination allowed only a subset of cost-effective fabric measures to be installed alongside heat pumps. Defining cost-effective measures needs to take account of the savings in terms of energy generation, network reinforcement costs and the co-benefits for householders.
  2. A range of policy interventions were modelled. These ranged from grant schemes, based on the current Green Homes Grant to changes to regulation like higher energy standards for private landlords. Scenarios were modelled under low, medium and high uptake assumptions. This showed that there was a reasonable chance for cutting emissions in half with significant policy intervention from the Combined Authority, but also significant investment to be successful.

Greater Manchester Combined Authority modelled various policy scenarios and their impact on cutting emissions.



Identifying the changes possible at an address level.

Scenario / Pathway Selection		£708,820,000	£6,000
		Total Investment	Average Investment
		118,871	118,753
		Number considered	Number affected
		118,753	118,753
		Number missing target	Number missing target
GMCA Grant H		70.04	5.17
GMCA Grant L		SAP saving	Average kgCO2
GMCA Grant M		73.49	1,117
GMCA Loan H		El saving	2,008
GMCA Loan L		£779	Average kWh
GMCA Loan M		Fuel saving	kgCO2 saving
GMCA Low CO2 Heat		Average Fuel	kWh saving
GMCA MEES H			
GMCA MEES L			
GMCA MEES M			
GMCA SAP			
	Apply		

## Appendices (continued)

### Appendix 2 – Case studies

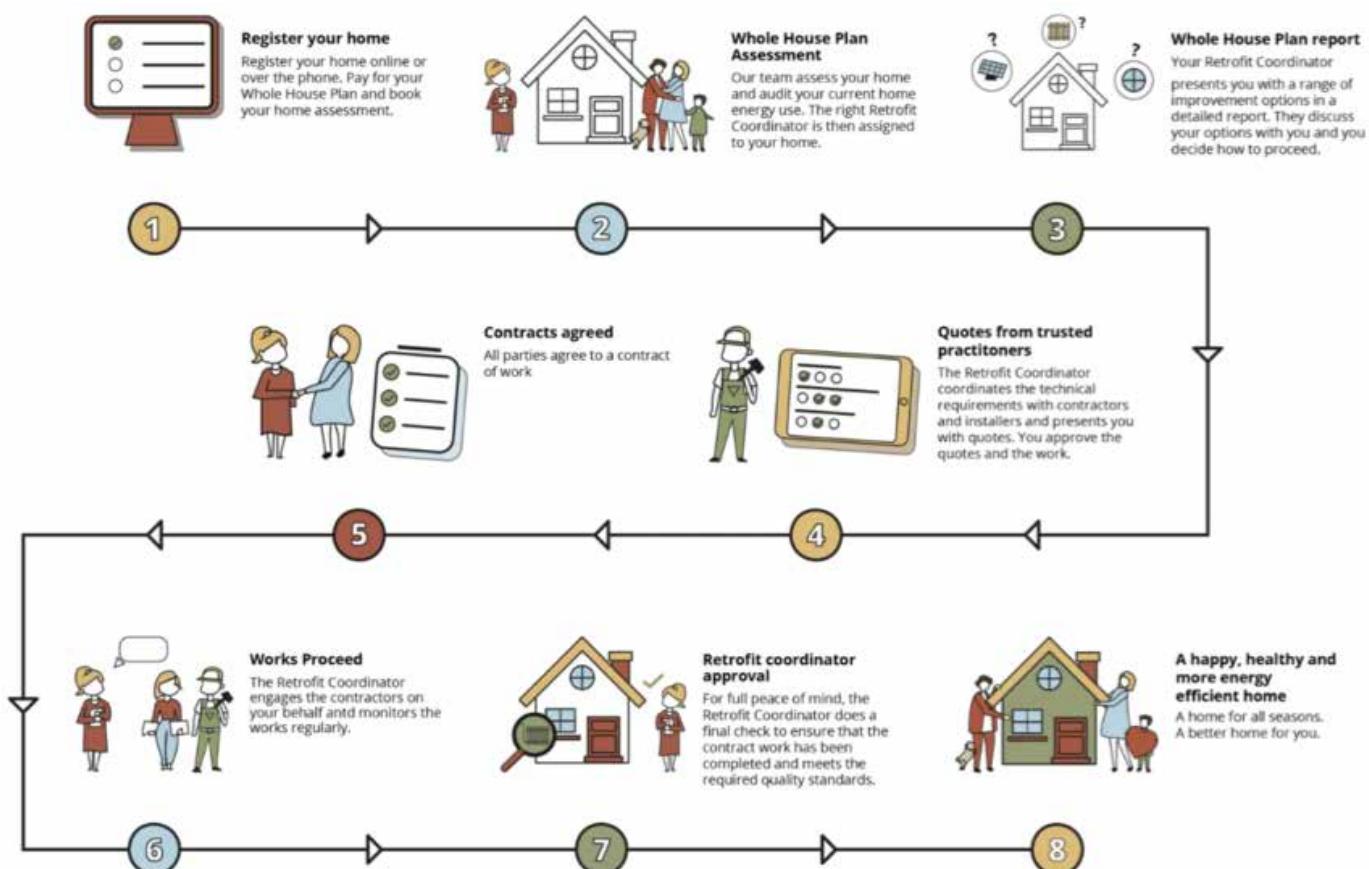
#### Case study 2 - Cosy Homes Oxfordshire

Cosy Homes Oxfordshire was set up in 2019 to offer householders in the area a one-stop-shop for taking them from advice to strategic design, detailed design and tendering with local companies, to oversight of the installation.

The project has embraced digital technology. To inform marketing, strategic modelling was carried out based on analysis of every dwelling in the county; what homes, what measures, likely cost. This helped to formulate the design of the scheme and how to engage with the local supply chain. 20 community-based organisations coordinated by Low Carbon Hub in Oxford have attracted around 80% of the customers to the scheme. Any interested customer can use a free-to-access, pre-prepared energy model of their home online to help them understand what measures are appropriate, then access the service via a Whole House Plan delivered by an impartial Retrofit Coordinators who stays with them for the duration of the project.

As work is carried out, the building database is updated so that the scheme and the householder can see the envisaged improvement in the building.

This project was supported with funding from BEIS and has generated a significant number of paying customers. The challenge has been in creating a reliable local supply chain.



Cosy Homes Oxfordshire whole house retrofit pathway.

## Appendices (continued)

### Appendix 2 – Case studies

These case studies are demonstrations of retrofit being carried out alongside other improvements to single properties, to improve the general state of repair of the properties as well as installing measures to help the progress to net zero.

#### Case study 3 - Eco Tiffin Ltd



Eco Tiffin Ltd is a Hertfordshire-based renovation and improvement company with 320 years' experience in the industry. Director Robert Tiffin specialises in the defect repair and modernisation to old, historic and listed buildings. This often involves improving the energy efficiency performance of buildings and their EPC rating.



Eco Tiffin was contacted by a client who wanted to improve the comfort of their grade II listed home in Hertfordshire. Robert conducted a thorough survey to detect any issues like penetrating rain and damp. A thermal imaging camera was also used, which is a non-invasive way of identifying where the property is losing heat.



All suggested improvements would help the client to have a warmer, draught-free home and lower energy bills.

It was concluded that the house needed a roof renovation, after it was found to be structurally unsound. Improvements to the insulation were also needed and extensive damp-related defects, as well as improved ventilation and repairs to the joinery and brickwork. All these measures would help to improve the overall performance of the home, in accordance with a 'whole house approach' to retrofit.

As the property was a listed building, Robert liaised consistently with the local Conservation Officer to ensure that all the repairs were completed in line with regulations. This required original features, such as the existing timbers, to be preserved.

The renovated roof, and fresh tiling, greatly improved the appearance of the property and made an important contribution to heat retention in the property. This meant that when the client turned the heating on, it kept the house warmer for longer.

The project took many months to complete, daily supervision and records were essential to ensuring that the project was completed successfully.

The client said: "The house was substantially improved that made it very warm and comfy. Lots of people have commented on how wonderful it looks now."

#### Case study 4 – Energystore Ltd



Energystore Ltd is a UK-wide company based in County Down, Northern Ireland. They are the longest-established manufacturer of bonded bead cavity wall insulation in Northern Ireland.

Energystore completed a partial fill retrofit in Belfast. The homeowner found their property difficult to heat and were conscious of the environmental impact of their home, so they decided to investigate the insulation solutions available to them.

Following a survey, it was found that there was some existing insulation but it was sparse, so topping up existing measures were recommended to make it more energy-efficient. Energystore carried out a partial fill insulation installation on the property. The result was that the house retained heat much more effectively than it previously did.

The household also reported a 21% reduction in their gas bill, and was brought up to EPC C rating.

The client said: 'We were thrilled to see a reduction in the fuel bill. We limit our carbon footprint so being able to cut down on the fuel we use at home has been great. And it's saved us money.'

## Case study 5 – Energiesprong

Energiesprong is an approach to delivering net zero energy retrofit of homes, financed by savings and with performance guaranteed. Dutch for 'Energy Leap', it was developed by the Dutch Government with their housing and construction industries. Over 12,000 net-zero energy homes have been delivered in the Netherlands so far as part of a 100,000 home long-term contract between social landlords and construction companies. Energiesprong UK is adapting the approach to the UK with support of the EU, UK Government and the Mayor of London.

Since completing the UK's first 10 Energiesprong retrofits in Nottingham in 2018, 14 UK social landlords are now delivering a pipeline of over 1,000 homes, working closely with a growing supply chain. Two UK projects are demonstrating the Energiesprong approach applied to new build.

A new £10bn public procurement mechanism, the **Retrofit Accelerator Homes 'Innovation Partnership'**, developed by the Mayor of London and open to all UK social landlords, will appoint a panel of up to 10 Solution Providers in Spring 2021. The Innovation Partnership aggregates demand to unlock supply chain investment, innovation and cost reduction. This fits with the *Retrofit Strategy principle: Research and innovation culture*.

The key principles of the Energiesprong approach are:

- net zero in one go: whole house, super-efficient thermal wrap with renewable energy generation, storage and heating;
- guaranteed actual performance: annual net zero energy, comfort every day and affordable bills; (*Retrofit strategy principle: Performance Standards*)
- offsite manufacturing: industrialisation for quality, cost reduction and minimal onsite disruption; (*Retrofit strategy principles: Compliance and Quality regime, Materials and Equipment*)
- retrofit cost financed by guaranteed long term energy and maintenance savings; (*Retrofit strategy principle: Finance and Grants*)
- affordable, grid friendly electrification: 90% carbon reduction now, zero carbon as the grid decarbonises.

Typically, wall and roof panel cassettes are manufactured off-site and transported to site for quick, 'wrap-around' installation. Heating, hot water, ventilation, and monitoring equipment is integrated into a single easy to install and maintain module. PV generation is integrated into the roof system. The structure of the contract incentivises inclusion of further energy reduction technologies, such as ventilation & heat recovery, smart controls, low energy appliances, thermal and electrical storage etc.

Moat Homes delivered the second UK Energiesprong pilot in Maldon, Essex, with 5 homes retrofitted during 2019 by Engie. The retrofit included off-site manufactured insulated wall panels, a new roof with 4.8 kW solar PV, and an external Factory Zero energy pod to provide heat and hot water via the existing central heating system plus a ventilation system and battery. Engie have been contracted to maintain the homes and report regularly on actual energy performance in line with the Energiesprong specification. The end result is EPC A-98, with over 90% carbon emission reduction today, reducing to zero as the grid decarbonises.



## Introduction

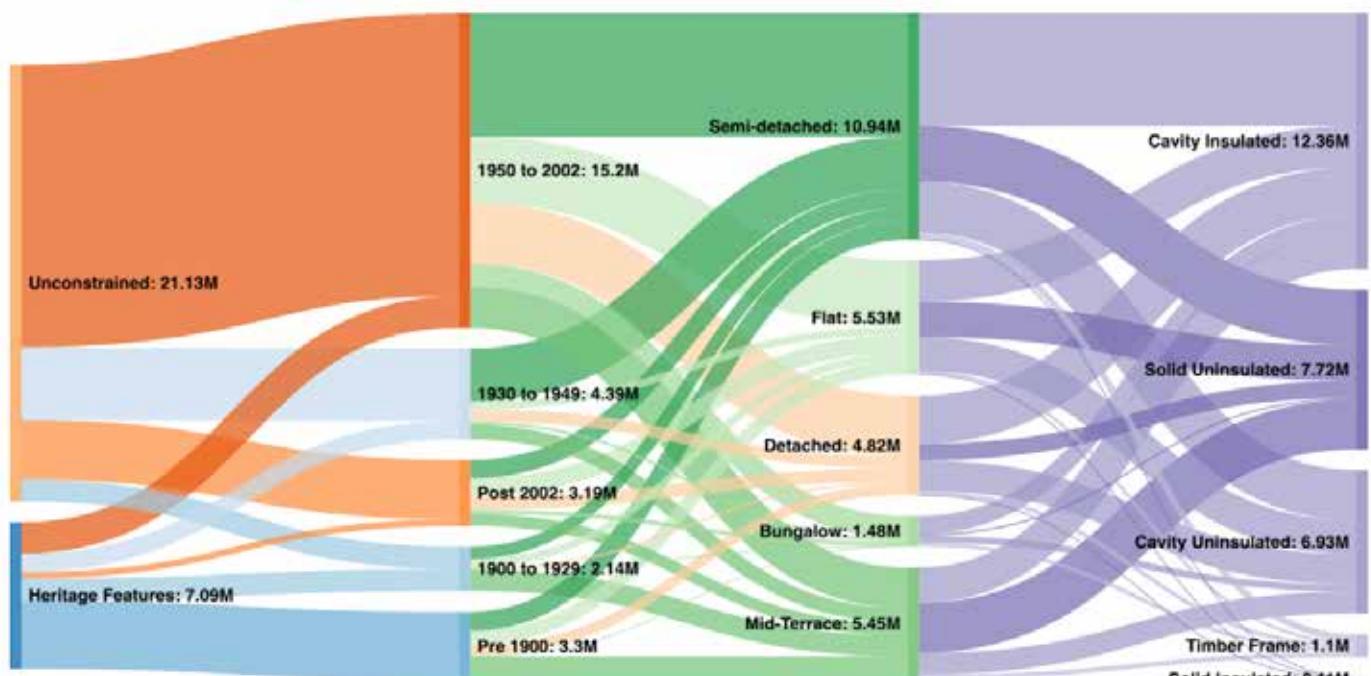
A group of several built environment organisations , facilitated by LETI, aim to better define 'climate emergency retrofit' for existing UK stock based on practical project experience; 140 volunteer retrofit practitioners are currently coordinating a forthcoming publication to address key questions:

### 1. How far should retrofit go? 2. Where are we now? 3. What does a good retrofit look like?

Firstly, although it might be said that all retrofits should go as far as possible, the group concludes this is likely to be prohibitively expensive and subject to decreasing returns. An alternative is to aim for a shallow retrofit which purely enables the property to use a heat pump and therefore allows it to benefit from a rapidly decarbonising grid. However, they recognise that shallow retrofits can be subject to unintended consequences, and do not address other important social impacts such as energy cost and national grid capacity. The forthcoming publication concludes that, at scale, significant energy demand reductions are needed to support our transition to a net zero built environment and that, whilst heat pumps will help greatly with decarbonisation, accompanying improvements in energy efficiency are essential for resilience.

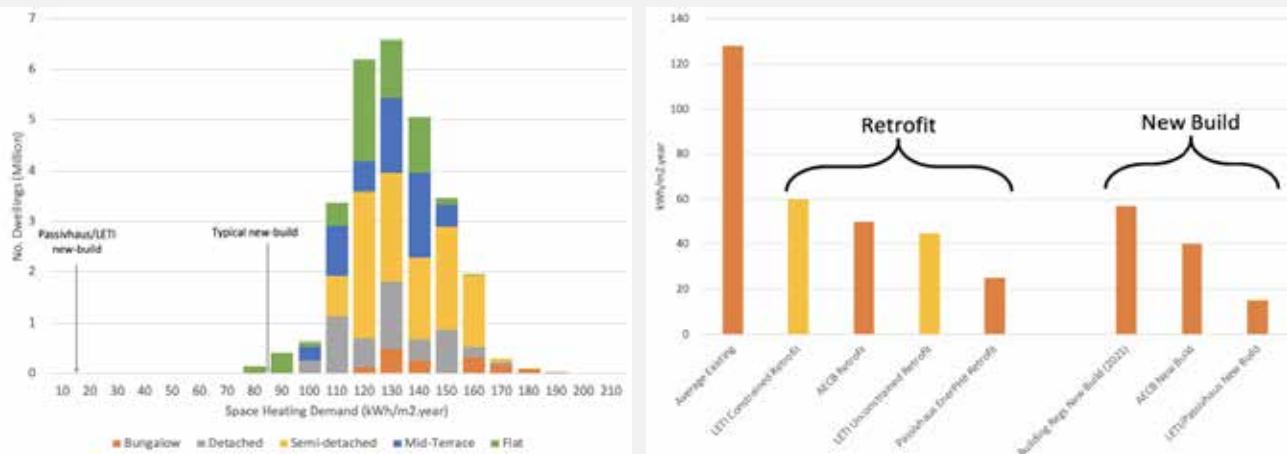


Secondly, the group determined the scope of the problem by analysing current housing stock, using typologies with case study examples, and extrapolated at scale to represent the UK's 28 million dwellings. The analysis revealed that there are perhaps not as many Victorian Terraces or solid walled properties as perhaps thought, and that there are many unconstrained (i.e. non-heritage) buildings and many semi-detached post-war dwellings that offer significant scope for retrofit. The case studies inform characterisation including space heating demand, derived using PHPP as a basis to evaluate each typology within the stock model (about 800). They also extrapolate typologies to reflect the mix of detached, terraced etc, as larger buildings without adjoining properties tend to be less efficient.



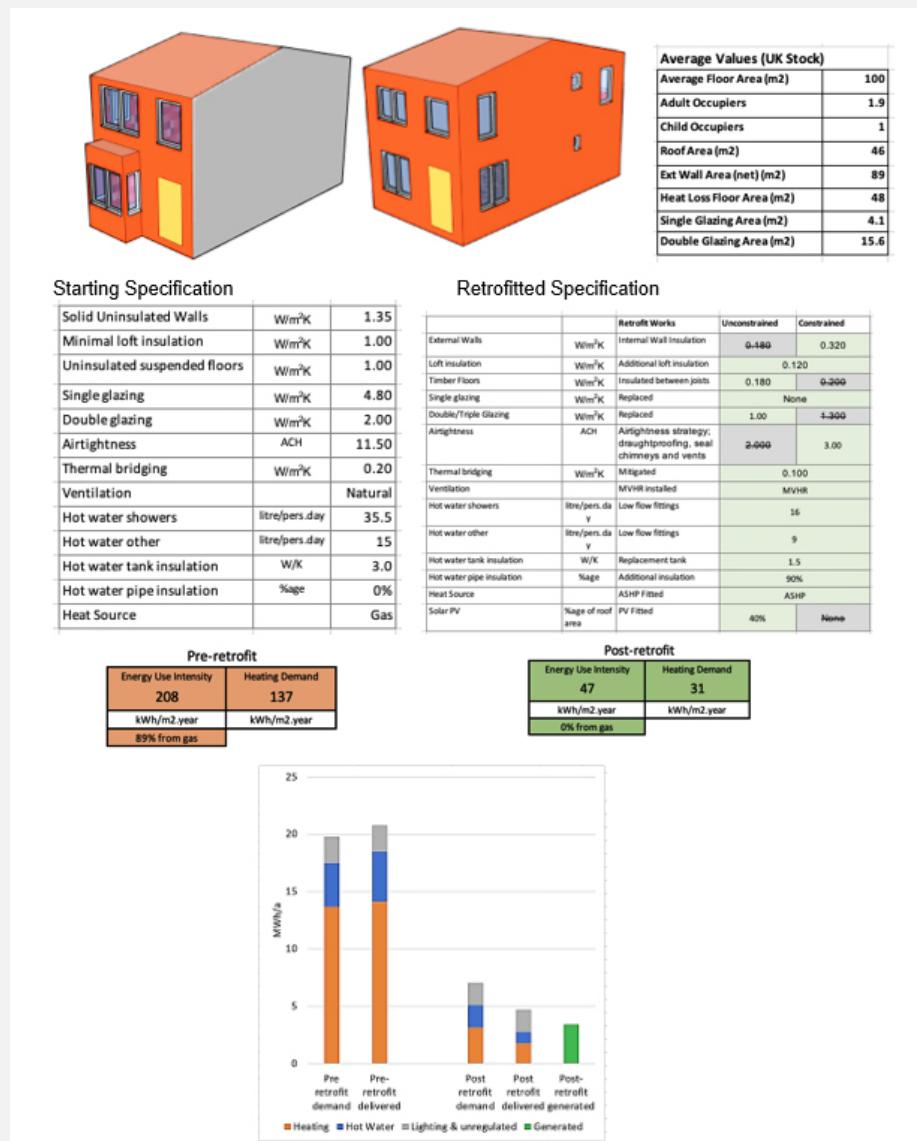
Organisations represented include: RIBA, CIBSE, Passivhaus Trust, AECB and ACAN

Their findings illustrate an average domestic space heating demand of around 130 kWh/m<sup>2</sup>/year which is at least double typical new-build properties and almost ten times worse than the Passivhaus standard.



Finally, they identify typical pragmatic, achievable and affordable fabric improvements across the typologies, taking into account 'constrained' retrofits (where heritage, appearance or internal space constraints are likely to limit the scope) and based on the practical experience of their 140 volunteers from all parts of the construction sector. The resulting packages showed a 55 to 85% reduction in space heating demand ranging from constrained retrofits through to unconstrained best practice case studies.

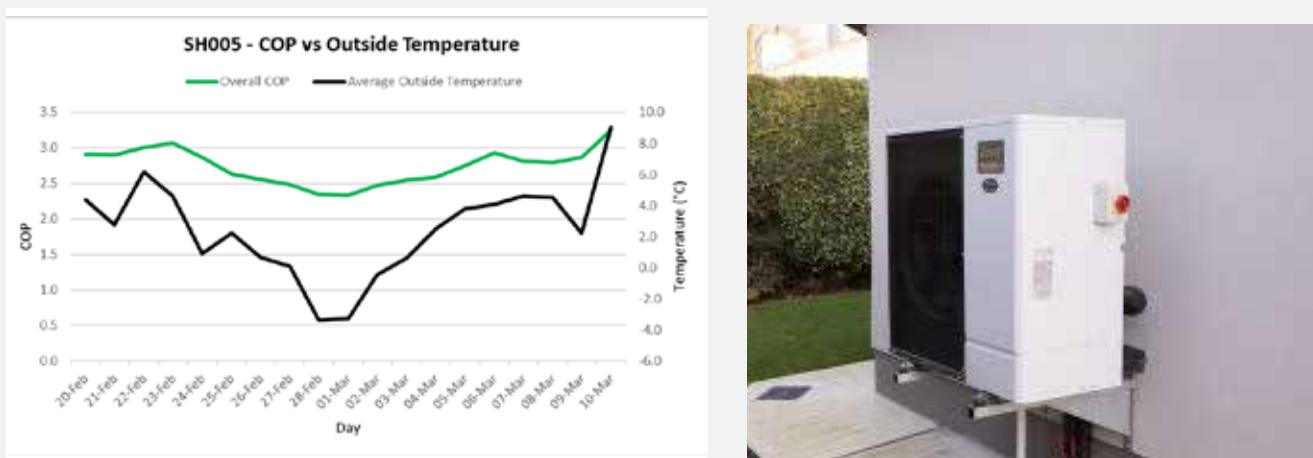
The forthcoming publication will conclude that a 'good average' retrofit should target a space heating demand of between 40 and 60 kWh/m<sup>2</sup>.year and the accompanying Retrofit Guidance will include illustrated case studies, with target u-values, and suggested build-ups for fabric elements aligned with recommended reductions.



Typical example: Typology characterization + Case Study ref

'SuperHomes' is an initiative of the Tipperary Energy Agency and has received EU funding as well as support from Sustainable Energy Authority of Ireland, and Electric Ireland. Towards the end of 2016 SEAI introduced the Deep Retrofit Pilot Scheme which offered significant grant funding for the type of retrofit that SuperHomes had been trialling for over a decade. Since the SuperHomes programme began in 2015, they have retrofitted over 300 homes across Ireland including 60 deep retrofits in the first full year of the scheme. In April 2017 SuperHomes v2.0 was launched in Limerick Institute of Technology, a 2-year research programme with the core aim of optimising air source heat pump technology in domestic retrofits. In 2018 the then CEO and founder Paul Kenny presented at the International Energy Agency Heat Pump Research Seminar in the BEIS Conference Centre in London about the Superhomes programme, and performance of heat pumps in Ireland during cold weather and data from the pilot programme showing no need for back up heat. Paul Kenny now acts as Special Advisor to the Minister for Climate Action.

SuperHomes recently opened Applications for grant funding under the new National Home Retrofit Scheme. This scheme is a key part of the strategy to retrofit 500,000 Irish homes to BER B2 standard or above by 2030. Grants of up to 35% of eligible costs are available to the public through one-stop-shops such as SuperHomes, involving experienced professionals providing technical advice, specialist contractors, quality control, grant payment and finance advice, all in one carefully planned process. New projects under the scheme are beginning In January 2021 and continuing through to October, and must reach the required energy improvement standard.



The SuperHomes team includes engineers, programme managers, retrofit advisors, project coordinators and support team, working with approved contractors. The essential measures in a SuperHomes Retrofit are:

- Air to water heat pump as the primary heating system.
- Airtightness improvement (reducing draughts and heat loss)
- Advanced ventilation as demand control ventilation for healthy air quality.
- Insulation to a high standard

Depending on the project and grant targets, solar photovoltaic (PV) may also be included.

Grants vary from project-to-project and the actual grant percentage will depend on the energy measures selected. The following is an indication of costs from programmes to date:

- A SuperHomes retrofit starts from approximately €30,000. The average cost of a full scale deep retrofit in 2020 was €56,000. Larger retrofits include a combination of measures including a heatpump, wall and attic insulation, windows, external doors, air-tightness and ventilation.
- SuperHomes secured grant funding for 100% of customers in 2020, ranging from a minimum of €13,000 to a high of €22,000. The average grant was €17,300.
- The SuperHomes Energy Plan and Report (including full home survey) is charged at €475 (a surcharge applies for larger homes or where an extension is planned)
- SuperHomes professional fees of between €950 and €2750 depending on project scale.

The SuperHomes 2030 project aims to dramatically scale this service over 3 years, increasing completed retrofits from 100 houses in 2019 (€6M) to 500 houses in 2023 (€36M), resulting in 48 GWh savings (between 2020 and 2023) compared to a Business as Usual scenario of 27GWh. This ambition will be achieved through the development of

- 4 Regional SuperHome One Stop Shops which will engage 80 High Performance Contractors to deliver quality retrofits nationally.
- capacity building and training for homeowners/surveyors/contractors/technical staff (>200 people trained)
- attractive finance solutions independent of public finances, financing >€67m per annum by 2030
- optimisation of technical analysis and design systems and solutions.
- creation of open source energy performance data platforms which demonstrate the value of undertaking nZEB retrofits to the market

Superhomes2030 will facilitate a Deep Retrofit Community of Practice (CoP) across Europe where leading experts, practitioners and agencies involved in Deep Retrofit will share experience, knowledge and competency thus driving the retrofit agenda. Technical solutions using best practice standards will be developed which will be future proofed to include new innovations and technical solutions. Opportunities to expand the SuperHomes model outside of Ireland will also be explored, using linkages created through the European Heat Pump Association and FEDARENE.

If successful Superhomes2030 will implement 10% of all retrofits in Ireland by 2030 and a total investment of €657m from 2020 to 2030, supporting 13,000 FTE jobs in the construction and retrofitting sector, and saving 167 kilotonnes of CO<sub>2</sub>.

## Appendices (continued)

### Appendix 3 – Consumer protection

Fraud and scamming is a significant problem in the UK and a source of mistrust in the building industry. It must be tackled systematically and robustly if there is to be a move to upscale the retrofit of housing stock significantly over the next 20 years.

For the scheme to succeed, consumers will need to be well-informed, protected and confident. An ideal consumer protection model would consist of tradespeople being quality assured through a recognized scheme such as TrustMark and consumers should automatically receive a relevant, quality insurance-backed guarantee.

Also important is access to Chartered Trading Standards Institute approved Alternative Dispute Resolution, and a referral mechanism to Trading Standards Services where necessary. It is also important to protect the health and safety of consumers while building works are taking place.

- The National Audit Office (NAO) estimated that individuals lose £10 billion a year due to online fraud.<sup>21</sup>
- The Crime Survey for England and Wales (CSEW) estimated there were 3.8 million incidents of fraud for the year ending June 2019.<sup>22</sup>
- Citizens Advice research from 2017 found that:
  - Almost three-quarters (72%) of people have been targeted by scammers in the last two years, either via mail, phone calls, text messages, emails, online, and face-to-face.
  - Over a third (37%) of people have been targeted five times or more.
  - Almost half (45%) of people have taken no action to protect themselves against scams in the last 12 months, and two-thirds (65%) have taken no action to help protect friends or family.<sup>23</sup>
- 7 out of 10 (68%) of people targeted by a scam do not tell anyone about it.
- Most worryingly, the CSEW suggests that only 1 in 7 of incidents of fraud either come to the attention of the police or are reported by the victim to Action Fraud.<sup>24</sup>

**In addition, during the 2020 Climate Assembly, 92% of assembly members 'strongly agreed' or 'agreed' that 'simpler consumer protection measures' should be part of how the UK gets to net zero with nearly half (46%) strongly agreeing:**

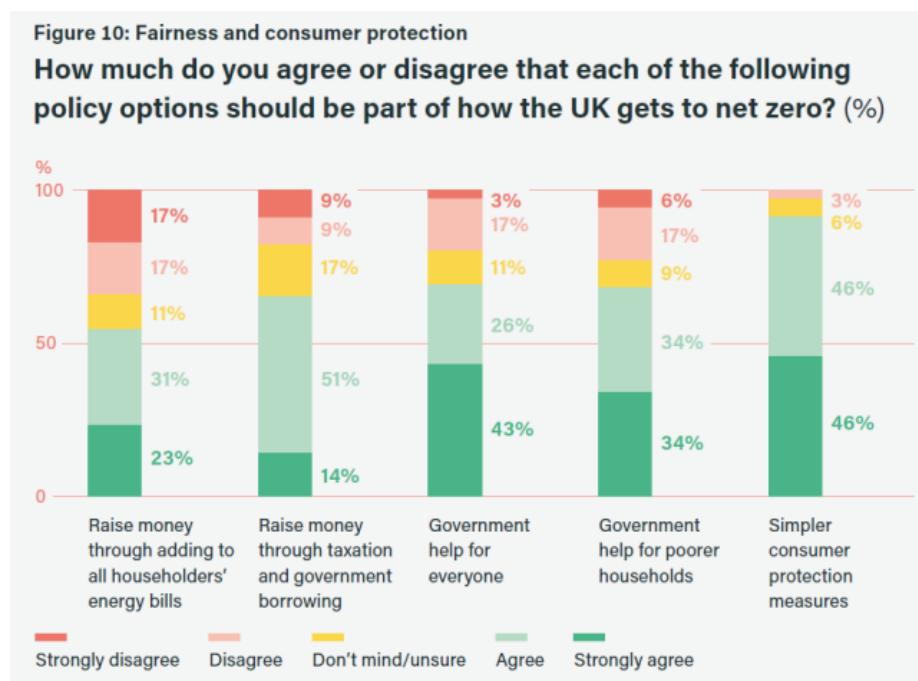


Figure 10, Pg 217, Climate Assembly UK, Final Report, 2020<sup>25</sup>

<sup>21</sup><https://www.nao.org.uk/wp-content/uploads/2017/06/Online-Fraud-Summary.pdf>

<sup>22</sup><https://www.ons.gov.uk/aboutus/transparencyandgovernance/freedomofinformationfoi/fraud>

<sup>23</sup><https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer publications/Scams report - final.pdf>

<sup>24</sup><https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/natureoffraudandcomputermisuseinenglandandwales/yearendingmarch2019>

<sup>25</sup><https://www.climateassembly.uk/report/read/>

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