Connected Places Catapult

Homes fit for the future

Project Position Paper

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CATAPULT
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Contents

1. Introduction

To meet the target of net-zero carbon emissions by 2050, the UK needs to radically cut the emissions from our homes. This means dramatically improving the energy efficiency of 27 million existing properties. Connected Places Catapult is hosting a workshop to develop an industry wide roadmap for retrofitting our existing housing stock to zero carbon emissions.

There have been many studies and reports on the challenge of deep retrofit of existing homes. Here, as an introduction to the workshop, we summarise the commonly agreed themes of the need, barriers and benefits of deep retrofit.

2. The Need

Energy Consumption
Our homes consume about 30% of the UK's energy and produce 20% of its greenhouse gas emissions. Of that energy, 80% is for heating water and domestic space, mostly from gas.

Net Zero by 2050
In June 2019, the UK became the first major economy to pass laws to end its contribution to global warming by 2050. This will require the UK to bring all greenhouse emissions to net zero by 2050.

With a net-zero target for UK carbon emissions, it is vital that we minimise the energy required to heat water and domestic space using only zero-carbon sources for residual needs.

Housing Stock
The UK housing stock is old and inefficient, and the replacement rate is low. About 80% of the homes we will use in 2050 already exist.

Out of 24 million homes in England and Wales, 19 million have Energy Performance Certificates, with 63% having a rating of D or worse. Even A rated properties will need retrofitting to achieve net-zero carbon emissions.

We must upgrade our existing housing stock to be much more energy-efficient. This means improving the fabric of the buildings, thus transforming the existing housing stock into homes fit for the future.

Homes fit for the future
Homes fit for the future are:

- Low carbon
- Resilient to climate change
- Attractive and desirable places to live
- Adaptable to the changing needs of society

To upgrade 27 million homes by 2050, we need to deliver retrofits in volume, both quickly and cost-effectively and ensure that any upgrades installed will not require further improvements in the future.

3. The Barriers of Today

Demonstration projects have proved that it is technically possible to retrofit existing homes to a very high standard, but is not happening fast enough because:

There is a lack of demand from householders and landlords

- Retrofit for energy efficiency is not yet an attractive enough proposition for buyers.

There is a lack of clear and consistent Government policy direction

- Policy and guidance that demand delivery of the 2050 targets are currently absent.

High costs of retrofit and insufficient capability and capacity throughout the supply chain

- The cost of deep retrofit is currently too high.
- Buyers lack the knowledge, skills and capability to specify and procure deep retrofit.
- There is a limited supply of people who can design and deliver deep retrofit.

There is a lack of financing

- At current prices, deep retrofit provides a poor return on investment.
- Large-scale investors find investing in deep retrofit less attractive than other green technologies.
- Low-cost financing is not widely available for deep retrofit.

4. The Benefits of Deep Retrofit

Bringing the existing housing stock to near net-zero carbon emissions would:

- Save 46 $MtCO_2$, worth £600m per annum today, rising to a saving of £3.8bn in 2030.
- Reduce fuel costs - an estimated saving of £944m per annum at current prices.
- Reduce the direct and consequential costs of fuel poverty.
- Open up new export markets for energy-efficiency solutions worth £1.7bn, by 2050.
- Reduce costs and demand for health and social care, saving the NHS £1.4bn – £2bn per annum in the direct costs of dealing with the impacts of poor housing quality.
- Reduce the number of additional deaths from extreme weather: 30,000 deaths per annum from winter cold and 2,000 from summer heat.
- Create new economic activity through delivering 27 million upgrades by 2050.

5. Building a Roadmap to Deep Retrofit; *Housing Innovation Opportunities*

The project will consist of Connected Places Catapult conducting interviews and hosting a workshop bringing together industry experts to begin developing an industry-wide roadmap for the journey to net-zero for the existing housing stock. This will demonstrate practical routes to net-zero and will inform and support Government policy and innovation strategies.

Together, we will look for innovation needs in design, materials, processes, and business models that will bridge the gap between our current ability to deliver deep retrofit and what we will need to meet the challenge of transforming the housing stock into homes fit for the future.

The goal is a joint industry–government innovation programme that will drive down retrofit costs and increase take up – a programme of innovation activities that will unlock retrofit for our existing stock.

Would you like to contribute to our research?

Connected Places Catapult will be working with other partners and stakeholder groups to further explore the needs and opportunities with regards to bridging the gap between demand and supplier to scaling deep retrofit. To contribute your own thoughts and to find out what role you can play please email info-LDN@cp.catapult.org.uk.

6. References

There have been many studies and reports published on the challenge of deep retrofit. Here, we summarise these reports to provide a collective overview of the barriers the sector faces today helping us explore innovative solutions for scaling deep retrofit.

The Need	References
Domestic energy consumption - 30% UK energy 20% UK GHG emissions	1, 2, 3
Bring all UK emissions to net-zero by 2050	4, 5, 6
Minimise demand for heating water and domestic space	5, 6, 7, 8, 9
UK housing stock is old and inefficient	9, 10, 11
80% of homes we will use in 2050 have already been built	12
63% of current homes have an EPC rating of D or worse	11
Importance of improving the fabric of homes	9, 13, 14, 15, 16

The Barriers of Today	References
Lack of demand from householders and landlords • Lack of trust and low confidence in performance in use • Lack of a compelling consumer story • No financial incentives • Hassle factor • Split benefits challenge – landlord and tenant • Perceived risk • Other priorities for landlords	9, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 47,
Lack of clear and consistent Government policy direction • Current policy does not require deep retrofit of the existing stock • Lack of stability in the regulatory/policy environment • Other priorities for Local Authorities • Planning rules and policies can block progress • Incentive schemes are short term, incremental and subject to regular change • Cities do not have a clear mandate and process to invest in retrofit	9, 13, 16, 17, 18, 20, 23, 27, 28, 29, 30, 31
High costs of retrofit and insufficient capability and capacity throughout the supply chain Lack of demand results in high costs • Complexity of stock makes standardisation to reduce costs difficult • Methods for predicting and monitoring performance inadequate • Lack of appropriately skilled people among suppliers and buyers • Siloed buyer organisations – budget and objective confusion, and slow decision-making • Lack of UK manufacturing capacity • Lack of systems vision • Missing players – integrators and one-stop shops • Procurement standards are not adequate or not well understood	9, 13, 17, 18, 20, 21, 22, 25, 26, 27, 28, 31, 34, 35, 48,
Lack of financing • Under current models retrofit is a poor return on investment • Return is unreliable due to uncertainties in design and installation as well as rebound effects • Without incentive packages finance can be hard to obtain • Current scale of retrofit projects is too small to attract international finance • Lack of project 'developers' who can package and finance • Low awareness among LA's and RSL's regarding funding sources and options	5, 9, 13, 16, 18, 19, 20, 21, 25, 27, 28, 31, 47

The Benefits of Deep Retrofit	References
Save 46 $MtCO_2$, worth £600m per annum today, rising to a saving of £3.8bn in 2030	2, 36
Reduce fuel costs – an estimated saving of £944m per annum at current prices	37
Reduce the direct and consequential costs of fuel poverty	38, 39
Reduce costs and demand for health and social care, saving the NHS £1.4bn – £2bn per annum in the direct costs of dealing with the impacts of poor housing quality	38, 40, 41
Open up new export markets for energy-efficiency solutions worth £1.7bn by 2050	43, 44

Reduce the number of additional deaths from extreme weather. 30,000 deaths per annum from winter cold and 2,000 from summer heat	41, 42
Create new economic activity through delivering 27 million upgrades by 2050	9, 43, 44, 45

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Disclaimer

The information and views set out in this document are those drawn from a series of stakeholder engagements and published reports on the subject of deep retrofit to help provide context for the sole purpose of the workshop taking place on Wednesday 25th September. The authors have taken all reasonable care to ensure that the reported information reflects the industry position on deep retrofit at the time of writing. However, no warranty or representation is given by Connected Places Catapult, its partners or agents that the information contained in this report is free from errors or inaccuracies. To the extent permitted by applicable laws, Connected Places Catapult accepts no liability for any direct, indirect or consequential damages, however caused, resulting from reliance on the information contained in this report.

1 Sekforde Street
Clerkenwell
London
EC1R 0BE
Tel: 020 7952 5111

The Pinnacle
170 Midsummer Boulevard
Milton Keynes
MK9 1BP
Tel: 01908 359 999

CATAPULT
Connected Places