

Towards low energy homes: Intermediaries supporting the market for energy efficiency

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Summary



Significant improvements are needed in residential building energy efficiency if we are to meet decarbonisation and energy affordability goals. Progress to date in this sector has been incremental and piecemeal in nature. More ambitious and innovative approaches, such as 'deep retrofit' projects or zero carbon or nearly zero-energy new build, have remained niche activities in the UK.

Our research has found that in the absence of strong policy drivers, the personal commitment and enthusiasm of 'champions' is the main driver for more ambitious domestic energy efficiency projects. Without a stronger policy 'push' and 'pull' in both addressing new and existing buildings, however, these activities are likely to remain niche in the UK for the foreseeable future.

We have identified a number of areas where 'intermediaries' (go-betweens) are crucial to smoothing the pathway to delivering energy efficient housing projects. As the Government develops its proposals to build a market for energy efficiency, it must pay attention to these intermediary activities, ensuring that they are factored into new policy proposals and are properly resourced. Without them, policies may not be deliverable.

Our research has identified seven key intermediary activities in delivering 'deep' retrofit and low energy new build projects:

1. Providing impartial, trusted knowledge and advice that is tailored to the local context.
2. Connecting different actors through events and networks.

3. Promoting and facilitating the uptake of government programmes.
4. Developing robust project plans: choosing technically appropriate solutions and finding suitably skilled builders and installers.
5. Coordinating between different elements of a fragmented supply chain and providing a single point of contact for consumers.
6. Ensuring the smooth delivery of the project.
7. Raising the profile and representing the sector among the policy community.

Our research

This briefing is based on a three-year research project, 'Low Energy Housing Innovations and the role of Intermediaries' (LEHII), which examined the development of homes with improved energy efficiency in the UK. The project included six in-depth case studies of building projects in Brighton, UK (see Box 2),ⁱ a systematic review of European case studies of low energy building projects,ⁱⁱ over 30 expert interviews, an analysis of national policy development,ⁱⁱⁱ and a stakeholder workshop organised together with the Energy Saving Trust. For more information, go to www.goo.gl/kUxGyS.

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Context

It is well known that UK homes require significant energy efficiency improvements for the country to meet its carbon reduction targets, reduce fuel poverty and improve living standards. Energy use in homes makes up a significant proportion of the UK's greenhouse gas emissions, while almost 2.5 million households in England live in fuel poverty.^{iv} Improving the energy efficiency of a home can bring multiple benefits in better comfort and improved wellbeing, reduced energy bills and fuel poverty alleviation. In addition, on a broader scale, reducing energy demand has positive effects on energy security.

In order to reduce emissions from homes, it will be necessary to improve the energy performance of the existing housing stock as well as new build properties.

Existing housing stock

While there have been some substantial improvements in domestic energy efficiency in recent years (UK households now use around 30% less energy than they did in 1970^v), there is still significant scope for further reductions. Cost-effective investments could save around one quarter of the energy currently used in households by 2035.^{vi}

UK policies, such as supplier obligations and the Green Deal, have tended to result in a piecemeal approach to energy efficiency improvements, and have generally delivered single measures – such as loft insulation, efficient lightbulbs or more efficient boilers^{vii} – rather than encouraging homeowners to take a ‘whole house’ approach to their energy usage.

The ‘whole house’ or ‘deep’ retrofit approach takes a systematic view of the entire property and provides a combination of measures – including improved insulation, draught proofing, ventilation and/or heat recovery, and a more efficient and/or low-emission heating system – tailored to the particular building. Deep retrofits are sought to deliver substantial reductions in energy use. They involve a one-off package of improvements, designed to provide an optimal combination of measures. This approach can maximise energy performance and avoid problems such as condensation, mould growth, poor air quality or other unforeseen issues.

New housing stock

Homes built today will last for many decades to come. The Government hopes the house building market will deliver an average of 300,000 homes a year by the mid-2020s.^{viii} The Zero Carbon Homes policy was abolished in 2015, creating uncertainty for the future. If we are to meet carbon targets all new homes need to be built to a high level of energy efficiency and include low carbon heating systems and electricity microgeneration.

Policy measures

The UK Government's 2017 ‘Clean Growth Strategy’ was followed by a consultation to build a market for energy efficiency.^{ix} While the Government has signalled an increase in ambition (in the form of an aspiration to upgrade as many homes as possible to Energy Performance Certificate (EPC) Band C by 2035), at the time of writing, no new policies had been announced to drive forward improvements in either new or existing homes. We note, however, that some action has been taken by devolved administrations, for example Scotland's Energy Efficiency Programme (SEEP) and improvements to energy standards in Scottish building regulations.^x

Champions and intermediaries

Many solutions already exist to improve the energy and environmental performance of buildings. Yet, the UK's house building sector is largely locked into conservative building practices favouring incremental improvements. This, combined with an absence of policy drivers, has meant that innovative and ‘disruptive’ approaches, such as ‘Passivhaus’, zero carbon homes (or nearly zero-energy buildings) and deep retrofits have remained niche activities, not yet adopted into mainstream building practices, regulations or culture.^{xi}

Our research showed that where either deep retrofits had been carried out or new low energy homes constructed (that went beyond the minimum requirements stipulated by the local planning regime), the primary driver was often a personal commitment of the occupants and/or owners to live in a more environmentally sustainable way. Even these highly motivated consumers often struggled, or had to undergo extensive efforts, to find the correct measures for their homes. This highlights the need for intermediaries to

support consumers to effectively deliver a market for home energy efficiency.

In all of the cases we studied (see Box 2), we found that champions and intermediaries (see Box 1) had played significant roles in the successful delivery of the projects and at times stimulated demand.

Box 1: What are ‘champions’ and ‘intermediaries’?

A ‘champion’ is an individual who actively and enthusiastically promotes innovations from conception through to delivery of a project.

An ‘intermediary’ is an organisation or individual that can act as a ‘go-between’ and who can mediate and connect individuals, groups, resources and knowledge within and across sectors.

Examples of champions and intermediaries in the building sector that we encountered in our research include: architects, building managers, sector organisations/trade associations, social enterprises, builders, local authority officers, state agencies and community groups.

Box 2: Case studies

Our research focused on six case studies (three deep retrofits and three new builds), based in Brighton:

Retrofits:

- **Southampton Street:** a three-bedroom terraced home built in 1860.
- **The Nook:** a Victorian villa building.
- **Wichelo Place:** a four-bedroom terraced house.

New build:

- **Grantham Road:** a three-bedroom private home.
- **Hartington Road:** A two-bed terraced ‘eco’ self-build.
- **One Brighton:** A residential and community space building, consisting of two apartment buildings, with a total of 172 flats (of which 54 are affordable).

For more information about our case studies, visit www.cied.ac.uk

The role of intermediaries in stimulating deep retrofits and low energy new build

We identified seven key activities that intermediaries played in supporting the delivery of deep retrofits and low energy new build.

1. Providing impartial, trusted knowledge and advice that is tailored to the local context

As deep retrofits and low energy new build remain 'niche' activities in the UK, it can be hard to find reliable information and advice when developing new projects. Currently sufficient independent advice is not available. We observed a number of ways in which intermediaries helped to meet this need:

- Demonstrating the 'art of the possible' and providing inspiration for projects (for example, the Centre for Alternative Technology and Brighton's Eco Open Houses event).
- Conducting monitoring and evaluation activities, in order to provide robust evidence on energy consumption and building performance (for example, Good Homes Alliance and University College London formed an evaluation team in one case).
- Providing advice that is tailored to the local context. Projects need to consider, for example, the property type, local planning requirements and the occupant's preferences (for example, a sustainability officer of the Local Council did this in our case studies).

2. Connecting different actors through events and networks

Networks help to facilitate the spread of knowledge and learning. In particular, networks at a local level can help to share information that is appropriate to the local conditions (for example, tailored to the local housing stock types, weather conditions and planning rules). Intermediaries that share knowledge from completed projects with others interested in undertaking similar projects are vital.

Our case studies showed that networks connecting homeowners, architects, project developers and builders did arise in an organic way through each project. However, there was no one intermediary in a position to facilitate network building in a more systematic way, while Brighton's Eco Open Houses events assisted in informal network building.

3. Promoting and facilitating the uptake of government programmes

Often multiple policies exist to promote residential energy efficiency (although in the UK the number has reduced in recent years) and some of the specific schemes (such as the Green Deal) can be too difficult for their target groups (for example, homeowners, builders) to understand. Intermediary actors and organisations can help consumers navigate and access the range of government funding initiatives and other government initiatives, and make sense of planning requirements.

In our case studies, the Green Deal Pioneering Places and Retrofit for the Future programmes both required applicants to understand the eligibility requirements, rules, timelines and reporting requirements. Intermediaries played an important role first informing households about the availability of these instruments and handling much of the administrative requirements on their behalf. In one of our case studies, a local co-operative of several companies (Green Building Partnership) provided this service, selecting suitable properties for the scheme and working directly with householders coordinating project delivery.

4. Developing robust project plans: choosing technically appropriate solutions and finding suitably skilled builders and installers

Low energy new build and deep retrofits are complex projects, involving a combination of materials and solutions that need to be tailored to the type of building. It is also necessary to identify tradespeople with the right knowledge and skills, particularly where projects involve novel and innovative technologies. For the novice, this represents a very time-consuming and knowledge-intensive effort.

Intermediary actors are, therefore, crucial in aiding the project planning process. Local events, trusted advisors and energy service companies are needed to speed up the process, making sure that the designs are compliant with building regulations and other policy requirements.

In our case studies, a number of different actors delivered these roles, including Eco Open House events (which had a significant role in spreading information

about architects, builders and technical solutions), architects themselves, consultants and the Green Building Partnership.

5. Coordinating between different elements of a fragmented supply chain and providing a single point of contact

Consumers contemplating deep retrofits or low energy new build projects must navigate a fragmented supply chain, bring together the appropriate providers and coordinate their activities. This can include bringing together multiple installers (each specialists in installing specific technologies), finance providers, energy auditors, and advisors on regulatory and planning compliance issues and other specialist services.

Intermediaries can manage the supply chain and provide the main point of contact for the household through project management. The intermediary may design the contracts to aggregate multiple installers and stand behind the customer in the event of malpractice or a dispute. Thus, intermediaries can help to coordinate an otherwise fragmented supply chain, help to create an integrated offering to the customer and simplify the customer's overall experience.

While examples of dedicated intermediaries, such as the RE: NEW scheme in London and Nottingham Energy partnership (NEP), can be found in the UK,^{xii} such examples were not presented in our Brighton case studies.

6. Ensuring the smooth delivery of the project

Project management skills are vital in delivering these types of schemes. It may also be necessary to have oversight of individual components to make sure that solutions are implemented correctly and that wider goals (such as sustainability criteria) are adhered to by all of the parties involved in delivering a project. In the absence of an external single point of contact for building or retrofit projects, intermediaries ensuring a smooth delivery in practice are needed.

In one of our case studies, the project architect performed these roles. In the case of the large One Brighton development, a Sustainability Integrator

was employed to ensure sustainability criteria were met throughout the construction process.

7. Raising the profile and representing the sector among the policy community

As the sector is still very much a 'niche', it may easily be overlooked by policymakers, where the larger, more vocal incumbents have more direct routes to those in power. Championing intermediaries have an important role to play in raising the profile of the sector and highlighting areas where policy might need to change in order to facilitate greater growth of the sector. Multiple organisations, such as the Green Building Council, Good Homes Alliance and the Association for the Conservation for Energy have played such an intermediary role in the UK low energy homes sector.^{xiii}

References

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ⁱⁱ Kivimaa, P; Martiskainen, M (2018). Innovation, low-energy buildings and intermediaries in Europe: Systematic case study review. *Energy Efficiency* 11(1): 31-51.

ⁱⁱⁱ Kivimaa, P; Martiskainen, M (2018). Dynamics of policy change and intermediation: The arduous transition towards low-energy homes in the United Kingdom. *Energy Research and Social Science*, accepted.

^{iv} National Energy Action (NEA) website, accessed 28 March 2018, <https://goo.gl/b1GZeb>

^v Rosenow J, Eyre N, Sorrell S and Guertler P (2017) Unlocking Britain's First Fuel: The potential for energy savings in UK housing *UKERC/CIED Policy Briefing*

^{vi} *ibid*

^{vii} Brown, D (2018) Business models for residential retrofit in the UK: a critical assessment of five key archetype Energy Efficiency. In press.

^{viii} HM Treasury (2017) Autumn Budget 2017: Building the homes the country needs, available at www.goo.gl/3pxqNG

^{ix} HM Government (2017) The Clean Growth Strategy, October 2017, p.13

^x Scottish Government (2017) Scottish Energy Strategy: The future of energy in Scotland, December 2017

^{xi} Martiskainen, M; Kivimaa, P (2018). Creating innovative zero carbon homes in the United Kingdom – intermediaries and champions in building projects. *Environmental Innovation and Societal Transitions* 26: 15-31.

^{xii} Brown, D (2018) Business models for residential retrofit in the UK: a critical assessment of five key archetype Energy Efficiency. In press.

^{xiii} Kivimaa, P; Martiskainen, M (2018). Dynamics of policy change and intermediation: The arduous transition towards low-energy homes in the United Kingdom. *Energy Research and Social Science*, accepted.

Conclusions and recommendations

1. In the absence of strong policy drivers, intermediaries are crucial

In the absence of strong policy drivers to accelerate the uptake of innovations like deep retrofits or low energy new build, dedicated intermediaries on different levels are needed to maintain activity in this area. Projects improving home energy efficiency must overcome numerous barriers: identifying the appropriate technologies, navigating a complex policy and planning environment, and coordinating a fragmented supply chain to name a few. Given the complex nature of these projects, only individuals with a strong personal commitment to the project aims are likely to want to commit to such an undertaking.

If policy drivers are not forthcoming, it seems likely that deep retrofits and low energy new build will remain a niche activity for the foreseeable future.

2. Intermediary activities must be considered to ensure successful policy delivery

As central and local governments develop new policies to build a market for energy efficiency, they must think about: the intermediary activities that will be needed to deliver policies in practice; who is best placed to carry out these actions (for example, it could be builders, architects, estate agents, local authorities, government agencies, third sector organisations etc.); and what additional support might be required to allow these people and organisations to provide the role effectively.

The previous section set out seven key activities that policy makers must consider.

3. Include information about deep retrofits as well as individual measures in planned information hubs

The Information Hub and Data Warehouse that are being developed as part of the implementation of the Each Home Counts recommendations should help improve knowledge sharing for retrofit projects. The proposed Local Energy Hubs may also provide another route for information sharing. Both should include information and guidance about deep retrofits, as well as individual measures.

4. Local actors have a key role to play; additional support is necessary

One-size-fits all solutions do not usually work for deep retrofits, particularly when the building stock is varied in terms of age, materials and style. Other local factors, including weather conditions and planning rules will also play a part in the picture for both low energy new build and retrofit. Local knowledge and advice will have a crucial role to play if they are to be scaled up.

Further thinking is needed to consider how advice that is tailored to the local context might be delivered in order to support the growth of a market for energy efficiency. Our research shows that having supportive people in local planning departments is important, but maintaining such personnel has become increasingly difficult with growing pressure on local authority budgets.

Initiatives such as Brighton and Hove's Eco Open Houses event can be very successful in both providing inspiration and sharing information that is appropriate to local context (for example, ensuring compliance with local planning regulations or providing details of local providers and practitioners with skills and experience in the area). This approach could be replicated by Local Authorities in other areas.