June 2019

PEOPLE POWERED RETROFIT

A community led model for owner occupier retrofit

Project Report

01
EXECUTIVE SUMMARY

We believe a trusted Community Energy intermediary such as Carbon Co-op, aligned with the high-quality technical expertise of a design practice such as URBED, can create a compelling householder retrofit service and kick start the development of new local markets for energy efficiency.

The UK has struggled to develop sustainable business models for owner-occupier orientated retrofit services, with 'top down' approaches having failed to convince private householders or achieve high quality works. Our approach focuses on enabling householders to work towards deep or whole house retrofit. Past programmes (delivered via energy supplier obligations) have made progress delivering the 'low hanging fruit', simple measures such as loft insulation and cavity wall insulation, but this falls well short of the substantial carbon reductions required.

In contrast, we have shown that a 'bottom up' approach can build on assets that already exist at a neighbourhood scale, including local knowledge and relationships, quality workforce skills and supply chain networks, and local authority and community capital.

This report summarises the findings from the research and development phase of our People Powered Retrofit project and outlines the elements required to build a sustainable local retrofit market including engagement, marketing and recruitment, supply chain development and service design.

The next two years will see the service rolled out within Greater Manchester, testing, calibrating and generating real world client and contractor feedback on the effectiveness of the approach.

> "A bottom up approach can build on assets that already exist at a neighbourhood scale."

Key Learning

Complex householder motivations

There is a large, untapped demand for retrofit services, but householders are motivated by more than simple financial concerns or 'pay-back' figures. Instead they take into account complex, interlinked factors including quality, service provision, trust, environmental and health concerns as well as other less tangible issues such as peer influences, pride and quality of life.

Early adopters are crucial!

Just as no one home is the same no one householder is the same. The standard adoption curve for new, innovative services suggests 'Early Adopters' are the 10-15% of the population most motivated and likely jump first. The key to a new deep retrofit service is better understanding this audience and designing an offer that clearly meets their needs – only then can we move on to the mass market.

A Service Design challenge

Retrofit has been seen as a technical challenge or a procurement problem, but it is better understood as a value network with tangible and intangible outcomes for discerning householder clients. Creating a viable market requires a multi-disciplinary 'Service Design' approach to collaboratively design an offer with prospective clients. A retrofit market will not emerge without a service that works for clients.

Service delivery AND infrastructure development

The creation of a local retrofit market requires the development of new, client-facing services to support a variety of retrofit approaches and delivery models and, at the same time, neighbourhood-level infrastructure development to help the growth of the wider sector. One can't succeed without the other.

A neighbourhood scale

We have used profiling and mapping to better understand the householder clients likely to procure retrofit and to identify the neighbourhoods where they can be found. We have shown a market can become viable at a neighbourhood scale of around 30,000 homes, achieving a critical mass of suppliers and householders, and the use of community-based social marketing strategies to build networks of trust for the delivery of retrofit. At broader town, urban or city region scales, the benefits of these agglomerations are lost.

Using existing quality, small-scale contractors

Our experience has shown that whilst there isn't currently a ready-made 'Retrofit Contractor' workforce, there are quality RMI (Refurbishment, Maintenance and Improvement) contractors who can apply themselves to a given specification with the right support. There are thriving small-scale contractor networks already working within neighbourhoods around the UK generating work via reputation, recommendation and word of mouth. To meet the demand for whole house retrofit we will develop the infrastructure to enable this existing, high quality contractor base to turn their hand to retrofit, as well as supporting new entrants to the market.

Making the most of new online tools

Energy and data are increasingly interlinked. We have created a set of new online components that integrate into a system for service providers and clients. Publishing software in an open source format and using open standards ensures interoperability and replicability. It will also allow other Community Energy providers to contribute knowledge that benefits everyone.

Securing new income streams for Community Energy

To date, the Community Energy sector has focussed on delivering renewable generation projects. An energy efficiency service delivery focus offers groups new opportunities for income generation but to make the most of these they need a strategic approach to investing in new the professional skills and staff capacity necessary.

Recommendations

Recommendations for BEIS

- A local approach to retrofit, engaging with householders and existing supply chain networks, is an effective way to build a market for owner occupier domestic retrofit.
- It's not all about pay back! Client decision making is influenced by a number of interlinked issues such as quality, disruption, health, wider social values etc.
- Selling retrofit is not like selling a product. A community-based social marketing approach is needed to communicate the wider intangible benefits of retrofit.
- Retrofit in the owner-occupied sector is a complex service resistant to automation and purely technological approaches. It's about people and clients not housing archetypes.

Recommendations for Community Energy groups

- High levels of trust and a neighbourhood focus means Community Energy groups are ideally placed to engage householders in retrofit works, generating demand and a steady stream of householder clients.
- To take advantage of service-based income streams, groups need to invest in their own technical expertise and staff capacity rather than outsource services.
- As well trusted organisations, groups should facilitate householder clients to source, manage and use their home energy data to reduce domestic carbon emissions.
- The Community Energy sector should invest in shared, open source tools for the delivery of retrofit services.

Recommendations for Local Authorities

- With reduced delivery capacity and limited financial resources, Local Authorities should collaborate with Community Energy groups, to access specialist knowledge and expertise and meet challenging 'net zero' carbon reduction targets.
- Creating a local retrofit market requires an integrated, neighbourhood scale local economic development approach utilising existing networks.
- Historic forms of municipal lending should be repurposed to secure wider social value from new local retrofit markets.
- The relationship of retrofit to existing statutory functions related to buildings should be considered. Infrastructure should be developed for householders and contractors to engage effectively and constructively with planning and building control.

02
ABOUT PEOPLE POWERED RETROFIT

The challenge

Energy efficiency is a key part of decarbonisation efforts in the UK, but there is a lack of effective retrofit policies, business models or delivery mechanisms, especially for the 'able-to-pay' owner-occupier sector. Whilst new buildings can be built to exacting low carbon standards, poorly performing existing buildings will need to be retrofitted with energy saving measures such as insulation, triple-glazed windows, new heating systems, solar panels and smart energy devices.

Simple energy efficiency measures can be applied to a house one-by-one, but a multiple, whole house approach achieves far greater savings.

The BEIS (Department of Business, Energy and Industrial Strategy) 'Call for Evidence on Building a Market for Energy Efficiency' signalled a change in approach from government, highlighting small scale contractor networks, trusted community intermediaries and a localised approach to creating new markets.

BEIS is funding a series of pilot approaches to build learning on the effectiveness of such approaches[1]. Based in Greater Manchester, People Powered Retrofit is a partnership project between Carbon Co-op and URBED, involving a six-month research and development phase which ended in March 2019, followed by a two-year delivery phase from 2019 to 2021.

In this report, we outline the learning from the R&D phase, highlighting the barriers to developing localised retrofit markets in the UK and strategies for overcoming these.

Immature Market

In the private sector, Green Deal was designed to support insulation, heating systems and renewable technologies through a 'Pay-As-You-Save' model, with finance used to cover the cost of the installation attached to the property. Take-up of the scheme was very low for a variety of reasons including failing to take account of the complexity of retrofit and householder decision making – particularly when considering multiple measures.

In recent decades energy efficiency delivery in the social housing sector has been more coherent with programmes such as Affordable Warmth, CERT, CESP often being accessed by housing associations and local authorities.. Some public authorities have argued the same approach can be applied to owner occupiers. Our experience shows this is not the case. It has also shown that pre-conceived standardised approaches to marketing segmentation, promotion, sales, delivery and supply chains are not relevant or appropriate. Instead, the needs of householder clients must be front and centre and new forms of engagement and service delivery need to be used.

"We have delivered ground-breaking whole house and deep retrofit projects, at affordable costs and scale."

[1] https://www.gov.uk/government/publications/energy-efficiency-improvement-rates-local-supply-chain-demonstration-projects/local-supply-chain-demonstration-projects-summaries

About the project

About The partnership

People Powered Retrofit is a partnership between community energy society Carbon Co-op and the built environment research and design practice URBED.

During the R&D phase, Carbon Co-op oversaw client engagement, service design and social marketing, and URBED oversaw data analysis and mapping, supply chain development and quality assurance.

The project team was augmented by a set of multi-disciplinary partners including construction industry specialist Bill Taylor of arc4, charity Cumbria Action for Sustainability (CAFS), marketing studio Fieldwork, engineering and community energy consultancy Quantum Strategy & Technology, and delivery partners offering in-kind support: business support agency Green Growth, distribution network operator Electricity North West and the Ecology Building Society.

An advisory panel offered wider strategic support and challenge and included representation from: Kate de Selincourt, Great Places Houseing Association, Electricity North West, Salford Council, the Greater Manchester Business Growth Hub, Stockport Council Planning Department, KPMG and the Ecology Building Society.

Track record

Carbon Co-op is a unique, citizen-led organisation developing new, practical ways for people to work together to tackle climate change in their homes and communities. For nearly a decade, it has offered energy efficiency services co-produced with its householder members and delivered ground-breaking affordable whole house retrofit programmes.

URBED is an award-winning research and design practice with a national reputation for high quality, deep retrofit design and specification. URBED has extensive experience of work with contractors in specification, site inspection and quality assurance of retrofit works.

Under a collaborative partnership established in 2006, we have delivered ground-breaking affordable whole house and deep retrofit projects, at scale, creating new tools, products and services. Carbon Co-op has pioneered a unique community-based social marketing approach to engaging householders, establishing itself as a high profile, well trusted householder intermediary in energy efficiency and new smart energy systems.

In addition to householder advice and works, Carbon Co-op has created a range of open source ICT (Information and Communications Technologies) tools to support the delivery of energy services, including the Carbon Co-op Hub and My Home Energy Planner, an online household energy assessment and decision-making tool. Reports and publications from past projects can be found here:

https://carbon.coop/reports-and-publications/

"Energy efficiency is a key part of decarbonisation efforts in the UK."

03
BUILDING AN INFRASTRUCTURE FOR RETROFIT

Creating the conditions for a new domestic retrofit market requires targeted, strategic support for contractors and supply chain companies combined with broader infrastructural development and local economic planning.

During People Powered Retrofit, we investigated the geographical scale at which support interventions are most effective and concluded that interventions at a neighbourhood scale, ie at around 30,000 households, are likely to have most impact. At this scale a critical mass of active householders and supply chain companies can be achieved, and the effect of trusted networks and relationships realised.

Planning

We looked at how planning policies and processes could be used more effectively, scaling up retrofit whilst maintaining quality. This was done through a review of planning policies and a workshop with Greater Manchester-based planners. We found that whilst there is often a strong commitment to sustainability (particularly higher up the policy hierarchy), there is often a lack of specific domestic retrofit policies and practical information at a local level, what does exist is often not joined up with other policies (such as heritage and conservation) and guidance is scattered and at times incoherent. Ideas to be explored at the next stage include:

- Developing clearer and more detailed planning policy for the redevelopment of existing buildings, including Design Codes, Supplementary Planning Documents and householder guidance.
- Working with target area Local Planning Authorities to identify acceptable retrofit measures in particular locations, to enable permitted development.

Demand

Householder awareness raising and 'normalisation' via events, Community Champions, Green Open Homes etc.

Local Community Energy organisations and other community and voluntary sector groups active.

Trusted referral networks operate between friends and neighbours.

Community hub institutions and venues targeted for outreach and householder training.

Local public services mobilised and coordinated in an integrated manner.

Supply

Existing contractor networks mapped and identified.

Targeted training delivered on site, for specific skills gaps on local housing stock.

Planning and building control issues addressed through dialogue with local authority staff and potentially development of specific local policy and guidance.

Specialist, high quality technical expertise can be used.

Access offered to materials and suppliers via builders merchants and other channels.

"COMBINING TARGETED, STRATEGIC SUPPORT WITH BROADER INFRASTRUCTURAL DEVELOPMENT AND LOCAL ECONOMIC PLANNING"

04
MAPPING: FINDING RETROFIT HOUSEHOLDERS AND WHERE THEY LIVE

Traditional approaches see retrofit as a standard product or service. But its innovative nature and poor levels of consumer awareness means a retrofit service is best viewed as a 'value network' linking tangible outcomes (insulation and bricks) with intangible outcomes (comfort, sustainability, quality of life).

Profiling techniques generalise, using datasets compiled from individual consumer transaction records. In contrast, our approach has been to identify decision-making characteristics in deep retrofit that do not fit into traditional consumer categories.

We were not looking to identify the people themselves – with a relatively small dataset this would be difficult, and they appear to be highly varied and untypical of their contexts – but rather the kinds of places they tend to live in. We did this by identifying the geographic locations of those who we knew had already commissioned retrofit works. We looked for patterns in these neighbourhoods – mapping demographics, housing types, energy consumption and spatial and social connectivity.

We used this to deduce some of the common characteristics of these areas that made them different. This allowed us to create a set of criteria that describe neighbourhoods where Retrofit Early Adopters are likely to live. We then applied these criteria to the whole Greater Manchester area to induce a set of target neighbourhoods for the roll out of People Powered Retrofit.

Using this research, we created a map of target areas conforming to the criteria. The use of data informed decision-making was not the only consideration with local knowledge and qualitative factors also helping us select our shortlist of priority neighbourhoods for service delivery.

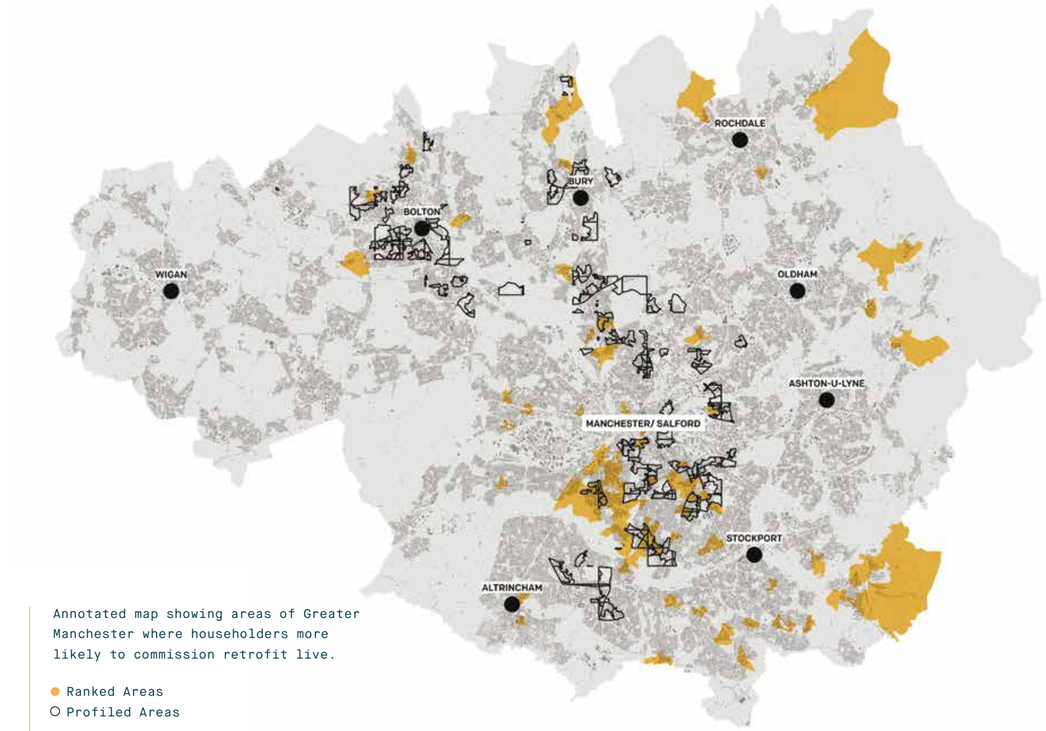
"Our approach has been to identify decision-making characteristics in deep retrofit that do not fit into traditional consumer categories."

Findings

People not house types

Given the under-developed state and scale of the retrofit market our strategy is to work with the pioneers and early adopters who make up the 'next million', supporting those who would like to carry out works but are currently stuck. This means focusing on people rather than housing archetypes. This is in contrast to the approach often taken in retrofit programmes, which has been on housing archetypes by age, construction type, or EPC rating - rather than the people in the houses.

Our mapping research supports this approach. We found that the type, age and size of housing present in the neighbourhoods where retrofit clients were located was hugely varied and without discernible pattern. Anecdotal evidence supports this – with whole house assessments and retrofit works having been undertaken by Carbon Co-op and its members in properties ranging from four-bedroom late 18th century solid masonry structures to 1990s purpose-built one-bedroom apartments and everything in between.



Annotated map showing areas of Greater Manchester where householders more likely to commission retrofit live.

- Ranked Areas
- Profiled Areas

We take this approach confident in the knowledge that technical solutions exist for a range of housing types and that almost all housing will require some form of retrofit to meet carbon reduction targets. In developing a retrofit service, the people who live in a home and their circumstances and priorities are far more important than the type of property they live in.

EPC patterns

Having said this, a pattern emerges in the EPC data – with the neighbourhoods in which retrofit clients are located skewing slightly towards the worse performing end of the scale – with a higher proportion of 'E' rated properties and a lower proportion of 'C' rated properties. It's unclear whether this is due to the innate characteristics of the properties, or due to a lower proportion of social housing – homes which are likely to have benefitted from energy efficiency programmes and interventions over the last decade.

We have found that the EPC data is often unreliable and inaccurate – and as an average, is less useful in identifying individual potential retrofit clients

So whilst we have used this as one of the criteria for identifying target neighbourhoods, it is not a criteria being used to identify individual retrofit clients.

Householder Characteristics

Using survey data drawn from existing retrofit clients, we found that profiled householders:

- Do not live in the most or least deprived areas for their regions.
- Tend to live in areas with younger and working-age populations but are slightly older and slightly better off than their neighbours.
- In the inner and outer suburbs, they tend to live in areas with mainly White British populations with relatively low levels of deprivation, and in which moderate numbers of households have post-16 qualifications as highest level achieved.
- In the inner suburbs they tend to live in more ethnically diverse areas where most households have under-graduate or post-graduate qualifications as the highest level achieved.
- Profiled individuals do not tend to live in areas where most households have no qualifications.

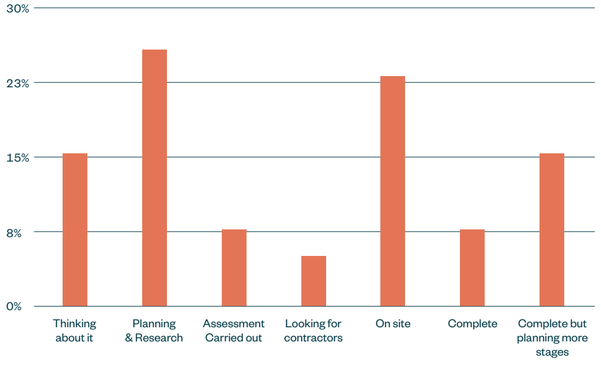
Neighbourhood Characteristics

The areas in which retrofit householders live are typically those with low geographic barriers to services. These might be thought of as traditional communities – places with shops, libraries, GP surgeries and other public services. They also tend to be areas that are well connected, at both local and city-region scale. House prices in the profiled areas appear to have increased broadly in line with the regional average in 2000-2006 and by a higher percentage than the regional average in 2006-20016.

05
UNDERSTANDING CLIENT PRIORITIES

Over the past decade, Carbon Co-op has been successful in creating a small market of a few hundred householders for deep retrofit services in Greater Manchester. To assist our service design we carried out survey and focus group research to better understand the size and nature of this market and key barriers facing householders.

We found financial imperatives and ‘pay back’ were not key barriers or driving factors for decision making - contradicting accepted thinking in this area. Instead, householders were influenced by a range of intangible motivations and drivers including quality of works, climate change concerns, quality of life, health, comfort and home environment and the attitudes of friends, neighbours and co-workers.



Householders at each retrofit project stage

“The problem is, it’s just all so technical, I don’t care, I just want the house to stay warm when I put the heating on.”

Householder quote, 2019

Retrofit journeys

We found householders at a variety of stages in their retrofit journey with a significant proportion (20%) with works currently on site.

Project budgets ranged from a few thousand pounds to over £200,000 but nearly half of respondents had budgets between £5,000 and £50,000. Budgets of this order bring deep, whole house retrofit within reach.

Householder budget for retrofit works

“The more face to face relational contact there can be the better. It can be quite traumatic, so the more contact with others the better.”

Householder quote, 2019

What householders want from a service

We asked householders which services would help progress their journeys, the most popular identified were:

- A People Powered Retrofit Adviser answering questions, offering basic help and signposting.
- My Home Energy Planner assessment with an overview of home measures and improvements (already offered by partnership but undergoing development).
- A detailed design advice service - providing standard written specifications with the potential for more detailed technical or bespoke specification where required.
- Shared specialist technical advisers carrying out detailed analysis of thermal bridging, moisture risks, ventilation etc.
- Carbon Co-op Retrofit Manager service to develop plans and procure contractors through local supply chain networks.
- A basic Quality Assurance framework, specifying photos for contractors to take during works and a simple tick box checklist for key measures.
- A complete retrofit design and build service with Carbon Co-op providing a trusted ‘single point of contact’ for all works including site inspections.

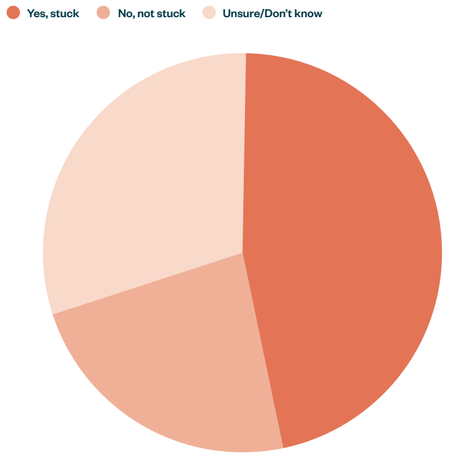
Carbon Co-op member social, 2019

Barriers – what’s blocking householders?

Just under half of respondents indicated that their retrofit projects were ‘stuck’, with interviews suggesting householders commissioned home assessments but often went no further.

Reasons for being stuck varied, but the most significant were:

- Being overwhelmed by the complexity and technical detail involved in retrofit.
- Difficulty in making key decisions with worries about risks and what could go wrong.
- Being confused by conflicting advice from different professionals within the sector.
- Problems finding contractors and problems with ensuring high quality works.



Householder Retrofit projects stuck,delayed or not currently moving forward

06
RAISING FUNDS FOR RETROFIT

We looked at options for householders seeking finance for home retrofit projects with our research concluding that financial barriers are not in fact as significant as had been previously assumed.

Despite this, we did find that small amounts of funds, ie 0-25% of project works budgets, could enable householders to go further in the scope and scale of works ie from single measures to multiple ones, or from advanced measures and phased approached to a full whole house retrofit undertaken in one step.

Finding the right product for retrofit

Finance products need to be tailored to specific householder circumstances – financial products suitable for an older couple with available equity are distinct from those for a young couple moving into their first home.

Finance is less of a barrier to retrofit because UK home owners are currently experiencing extremely favourable borrowing conditions with historically low interest rates and many lending options. Access to finance should not be an issue for the vast majority of UK home owners.

Neighbourhood scale finance

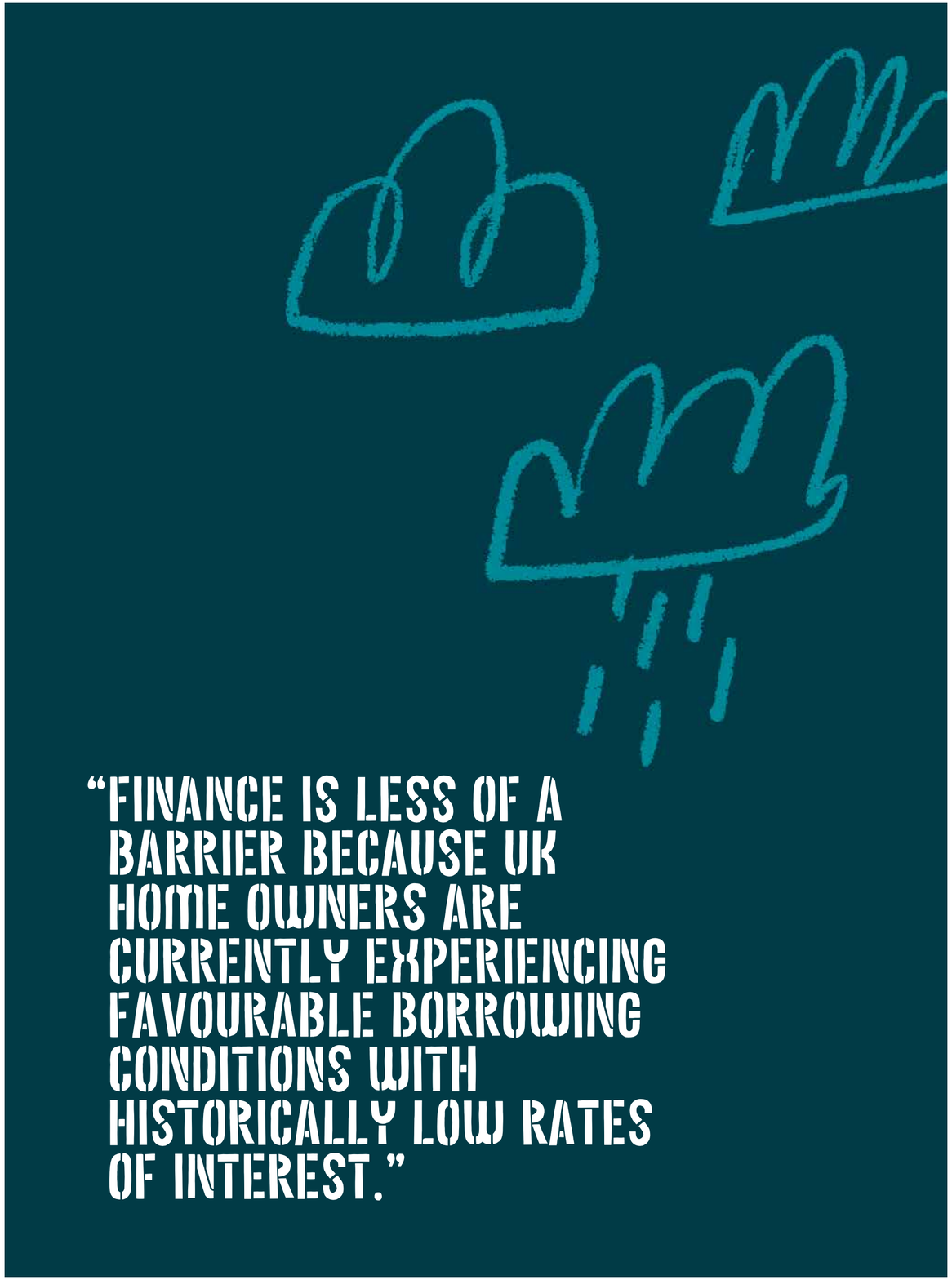
Moving away from individual solutions, local authorities are natural finance partners to enable a neighbourhood, area-based approach. With challenging carbon reduction targets, local authorities have political and policy motivations for finding ways to finance retrofit works that also achieve local economic, environmental, climate change and health benefits within a 'social value' framework.

Whilst local authorities increasingly lack housing and technical capacity, we found many have a legacy of financial products for housing improvement works. Currently dormant products can be repurposed to finance neighbourhood scale pilot projects with community energy organisations such as Carbon Co-op offering match funding and delivering much needed expertise and knowledge to assist engagement and delivery.

Retrofit Finance Case studies

The London Rebuilding Society (LRB) have designed a finance offer for a very specific group of householders: over-50s homeowners, with properties needing significant works but who struggle to access traditional finance. LRB work with lending partners to offer lifetime mortgages (not normally available on housing in a poor state of repair) and contract and oversee the extensive repairs process.

Hook Norton Low Carbon are an Oxfordshire based community energy group operating a £200,000 revolving retrofit loan pot (derived from a DECC funded scheme). Loans are typically £3,000-5,000 at 0-3% interest, which doesn't aim to cover the full cost of works but rather to provide an incentive for action. Founder member Tim Lunel believes the 'cheap finance' element is more important than the amount on offer, "It's essentially an appetiser, a way to get people thinking about what they might do."



"FINANCE IS LESS OF A BARRIER BECAUSE UK HOME OWNERS ARE CURRENTLY EXPERIENCING FAVOURABLE BORROWING CONDITIONS WITH HISTORICALLY LOW RATES OF INTEREST."

07
SOCIAL MARKETING: NEW WAYS TO ENGAGE AND RECRUIT CLIENTS

Inspiration and case studies

Low householder awareness and the fact that it is not seen as 'normal' to retrofit a home, has presented a challenge in marketing retrofit projects. The use of behavioural insights, social norming, diffusion tactics and community influencers, community based social marketing campaigns can overcome this and win 'hearts and minds' to create sustained change.

Social marketing strategies have proved cost effective ways to drive recruitment of socially beneficial activities in areas such as health and wellbeing. In the US, they have been used to promote retrofit. During our research we developed a social marketing strategy and toolkit and piloted our approach at two test sites identified in the mapping phase.

Social marketing development

Community Energy groups have traditionally been able to generate a steady stream of interested and engaged householders ready to commission services. As a membership organisation, Carbon Co-op has a track record of social marketing activity including member socials, Green Open Homes weekends, peer learning sessions and energy-related campaigns.

We have refined and developed our approach during this project, using social marketing specialists Fieldwork to run a day long design lab. Fieldwork also developed a set of branding materials to support social marketing activity.

Profiling retrofit clients

A key lesson from the failure of Green Deal was the need to segment retrofit audiences. The Rogers Innovation curve divides householders in to Innovators, Early Adopters, Early and Late Majority and Laggards. Our focus for People Powered Retrofit is Innovators and Early Adopters as they constitute a targeted but sizeable fraction of the population (around 15%) and are more motivated to commission work and tolerate disruption.

Informed by the work of Val Mitchel and Victoria Haines at Loughborough University, we developed a series of 'retrofit personas' to further breakdown target Early Adopter householders.

The most common and relevant personas from the Carbon Co-op member survey results are:

– Civic Minded Retirees
– Climate Pragmatists
– Climate Idealists

We believe these three persona types are the ones most likely to access the People Powered Retrofit service. Self-builders and Home Improvers also featured – self-builders are less stuck on the supply chain side, though want to access parts of the service to improve their knowledge on specific technical aspects etc, and there are fewer home improvers as most of the Carbon Co-op membership are very motivated by climate change concerns and so more neatly fitted into other categories. Interactions with local planning and building control may be a way to reach home improvers - and we intend to explore this further.

Tools and strategies

Home Energy Party

Inspired by similar events in the US, we ran a series of home energy parties for local people at members' homes around South Manchester.

Led by industry professional Diane Hubbard of Green Footsteps, attendees had the opportunity to get hands-on experience of using heat cameras, testing for air leakage and learning how to improve air tightness. Gamification techniques were introduced to offer a fun learning style and there were opportunities over food for discussion to address specific, detailed problems and make future plans. The events were very popular with sold out sessions.

Neighbourhood campaign

Informed by mapping work, the project tested marketing campaigns in two neighbourhood scale test sites: Longsight in South Manchester where Carbon Co-op already has a high profile and Halliwell, Bolton where it was relatively new.

A co-ordinated, approach, using multiple channels and working with trusted local institutions such as Levenshulme Inspire and A Small Good Thing amplified the campaign and increased participation.

Targeted use of social media

Carbon Co-op has previously used social media channels to increase awareness and sell training and other services. People Powered Retrofit saw the deployment of these social media channels within a social marketing context, targeted and informed by mapping and retrofit personas work.

Using a series of paid and free events and training workshops, the use of social media marketing was highly effective, with a far wider reach, higher conversion rates and extremely effective marketing spend to acquire attendees than past experience.

"Attendees had the opportunity to get hands-on experience of using heat cameras, testing for air leakage and learning how to improve air tightness."

08
DESIGNING A PEOPLE POWERED RETROFIT SERVICE

Service Design

An emerging, interdisciplinary approach, service design is a user-centred approach, focused on the needs and priorities of clients, using evidence and creative co-production techniques to build and test new fee earning services.

We utilised a range of Service Design techniques in this project, in particular Service Blueprint Mapping to analyse other approaches and build the new People Powered Retrofit Service. We also held a lab event to bring together a group of thirty, multi-disciplinary practitioners in a day long workshop.

Market research

We examined other approaches to retrofit service delivery.

KfW Energy Efficiency Programme, Germany
- Effective programme for meeting ambitious carbon reductions, financial subsidy is increased as greater energy savings are achieved.
- Professional support is mandatory with 50% of expert costs subsidised.
- Brought to a mainstream audience through the use of high-street banks and national communications campaigns.

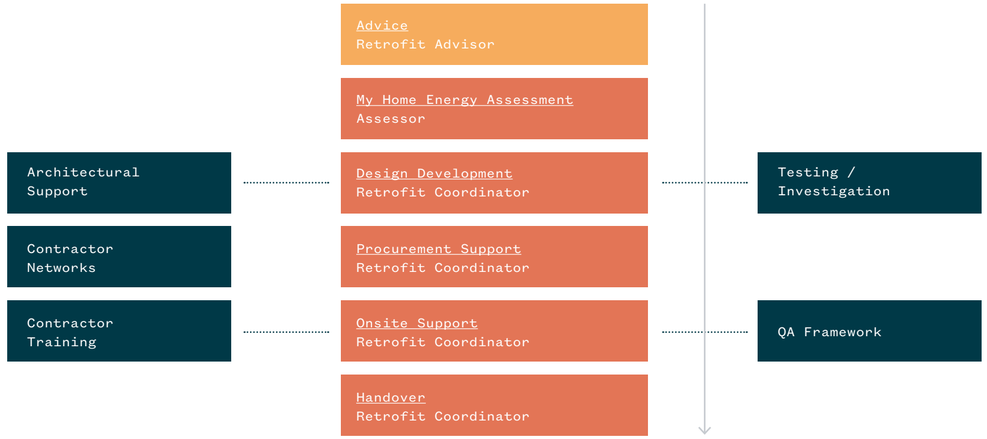
Fort Collins Efficiency Works, Colorado USA
- Area-based, with effective use of community-based social marketing eg yard signs, door hangers and open homes.
- Energy Advisor support available for householders from initial contact to project completion ensuring total focus on customer outcomes and satisfaction.
- Quality Assurance through contractor upload of photos of key works.

SuperHomes Ireland, Tipperary Energy Agency, Ireland
- Programme of single-stage whole house retrofit for both fuel poor and able-to-pay households.
- Targeted approach with filtering to identify those most likely to proceed with works – detailed assessment and design work focused on these households.
- Technical assessment includes detailed consideration of building services design to ensure appropriately sized heating systems and whole system design.
- Network of trusted contractors and work to help develop new entrants to market.
- Scaling up rapidly with financial support from government grants – up to 50% grant to owner-occupiers, 95% grant to fuel poor households.

State subsidy
We found that most successful schemes featured some element of state funding (or utility company funding in the US), either through direct support and/or via subsidising finance.

> "The end-to-end service offers support from early stage decision making to handover and monitoring."

Service design workshop, 2019



Service Design Lab

The one-day lab, attended by thirty retrofit practitioners, academics and contractors collaboratively developed our customer journey, examined features to test with householders and outlined further research.

We addressed questions such as:
- Who pays for the service, how much and when?
- How does the service operate within a very localised neighbourhood context?
- What systems does Carbon Co-op need to put in place to support the delivery?
- How can a smooth, continuous customer journey be maintained?

Thematic discussions centred on:
- Quality Assurance and accreditation
- Assessment and Householder Decision making
- Finance and Loans
- Community Based Social Marketing

Following the lab, we devised a People Powered Retrofit service blueprint and dummy marketing materials that were then tested with householders.

People Powered Retrofit in action

The end-to-end service we devised offers support from early stage decision making to handover and monitoring. It is flexible and can be scaled to householder needs dependent on the scope and scale of the project and householder priorities.

To be launched in 2019 it features:
- A simple, end-to-end service delivered by Carbon Co-op staff.
- Personal, one-to-one support from a People Powered Retrofit Adviser.
- Independent, trusted advice from retrofit experts.
- A phased service suitable for anything from basic works to whole house.
- Linking into established contractor networks established by People Powered Retrofit.
- A simple quality assurance framework.
- Fair and transparent charging based on a simple day rate.

The service will be rolled out on an area-by-area basis within Greater Manchester and we will offer neighbourhood scale infrastructural support around supply chain development with facilitated contractor networks and targeted training.

Quality Assurance

Ensuring high quality works is a key concern for householders. Though PAS2035 and the Trust Mark are welcome developments in achieving greater quality, these standards may be overly bureaucratic for small scale contractors just entering the market. At this stage we are seeking to harmonise our systems with these standards without requiring contractors to gain certification themselves to participate.

Instead we have built a bespoke QA framework featuring contractor completed checklists and a system for documenting and storing photos at key build stages for later inspection, combined with site inspections and on-site hands-on training and support from skilled practitioners. We have integrated a Local Contractor Database in to our ICT systems enabling us to document and track quality issues and other concerns along with a rating system to inform staff decisions, procurement and householder recommendations.

Service roles and responsibilities

People Powered Retrofit adviser
A first point of contact for householders interested in retrofit. Signposting to sources of help and information. Advising on key aspects of the retrofit service.

My Home Energy Planner assessor
A trained assessor who carries out whole house assessment and creates reports recommending packages of measures for householder consideration and decision making.

People Powered Retrofit Manager
Coordination and project management services for deep refurbishment. Assists householder decision making, involved in procurement, utilising contractor networks, also manages the quality assurance process. Similar to the PAS2035 Retrofit Coordinator role with a greater emphasis on client management and interaction.

Service Manager
Overall responsibility for service management, managing project workflow and coordinating roles.

Technical Support
Specialist consultants brought in for detailed technical specification and advice.

09
MAKING THE MOST OF TECHNICAL AND BACK END SYSTEMS

Energy and data are increasingly interlinked and a range of ICT (Information and Communications Technologies) and back-end systems are required to deliver end to end retrofit services. Data management requirements include qualitative information about householder motivations, expectations and briefs, assessment data relating to home construction and building materials and ongoing energy bill and home environmental data to baseline performance and track impact. Carbon Co-op has developed a team of in-house ICT staff to cover energy efficiency and other Smart Energy services.

Market research

We publish new ICT tools under open source licenses to ensure they are widely available for use by other Community Energy partners. Open source software is far more efficient to write, benefiting from many contributors, it offers transparency and accountability and the software created is less likely to become obsolescent. Though open source tools are license free there is a market in support services and the further development of new features.

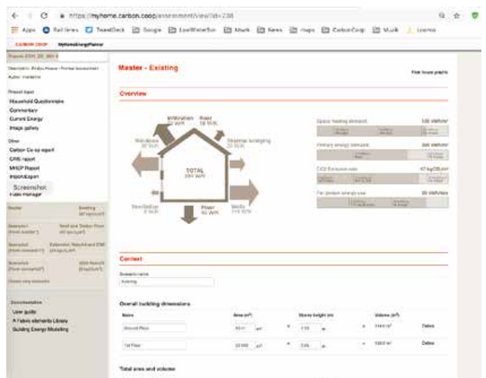
System components

Rather than a single, all-encompassing piece of software, we have built a series of web based, open source components that link together into an integrated system. System component tools include:

Customer Relationship Management (CRM): after specifying CRM requirements and assessing commercially available services, we made the decision to develop a bespoke CRM tool in house. We have incorporated the Contractor Database which holds aggregated information and Quality Assurance ratings on builders, suppliers, consultants and other construction sector professionals and is essential in the management of contractor networks.

My Home Energy Planner: our assessment service has been in operation since 2012 using an energy performance model based on full SAP and a series of building elements and measures libraries, plus a qualitative assessment of property condition and client brief and priorities. We use it to carry out home assessments and issue reports outlining packages of works. People Powered Retrofit has allowed us to make improvements improving flexibility and user experience.

Carbon Co-op Hub: the newly developed hub forms a centralised dashboard from which householders can access, store and aggregate data and information. As well as storing assessments, construction and procurement documents, it integrates with other services such as Carbon Co-op's Smart Energy and demand side response activities. From May 2019 we have integrated access to householders' smart meter data via the Smart Meter Data Communications Company.



My Home Energy Planner Assessment Tool

"OPEN SOURCE SOFTWARE IS MORE EFFICIENT TO WRITE, BENEFITING FROM MANY CONTRIBUTORS, IT OFFERS TRANSPARENCY AND ACCOUNTABILITY AND THE SOFTWARE CREATED IS LESS LIKELY TO BECOME OBSOLESCENT."

10
CONTRACTOR ENGAGEMENT AND SUPPLY CHAIN DEVELOPMENT

The contractor challenge

There are currently insufficient contractors to satisfy householder demand for retrofit in Greater Manchester. BEIS' 'Call for Evidence on Building a Market For Retrofit' and the original People Powered Retrofit proposal, highlighted the role of the RMI (Refurbishment, Maintenance and Improvement) contractor supply chain in meeting demand. The RMI is an estimated £27 billion a year sector, made up of sole traders and micro-enterprises already active carrying out domestic works including new extensions, kitchen refurbs, loft conversions etc.

This has resulted in a 'bottom up' and mass customisation approach to design and delivery, well suited to owner-occupied housing stock which in almost all cases has been adapted and changed over time and is far from mono-lithic. We have deliberately avoided a 'one size fits all' approach which we believe creates building physics risk, as superficially 'similar' houses can have differences that significantly affect retrofit planning and detailing.

Immature Market

We took a neighbourhood approach to mapping contractor networks, focussing on target locations identified in the mapping stage and examining the contractor capacity for retrofit. We spoke to householders, contractor networks such as Federation of Master Builders, Green Growth and AECB (Association for Environmentally Conscious Building) and held outreach events.

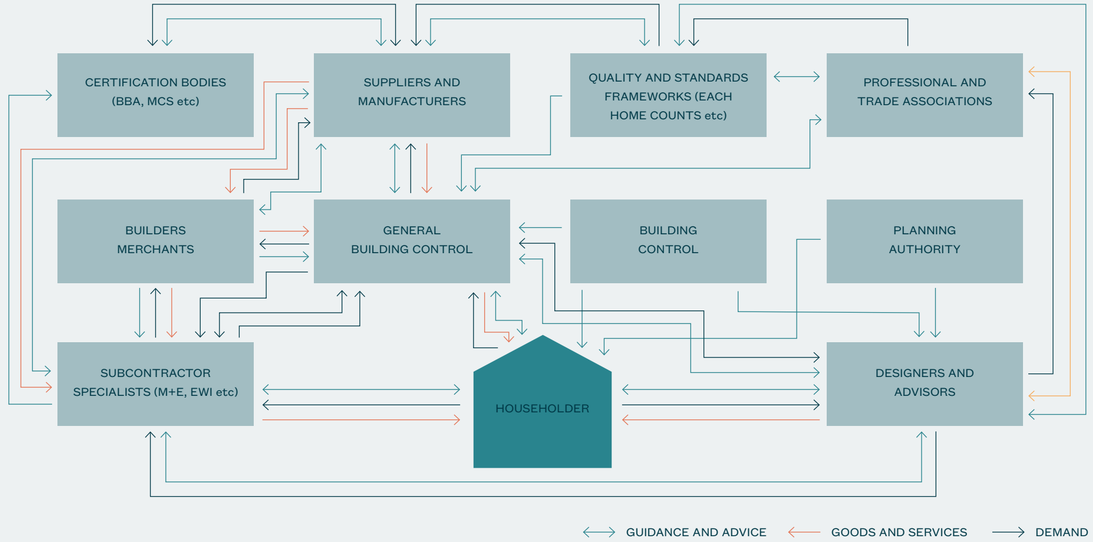
We found that the very few contractors that identified themselves as retrofit specialists were extremely busy and seeking to expand directly employed staff and sub-contractor networks to meet demand. At the same time, those contractors already active in the wider 'RMI' sector were often reluctant to expand into 'retrofit' works - which were seen as complicated and risky – as they were already able to make a reasonable living doing work that was more 'normal'. There are then also those contractors who have specialist skills or experience with products which have particular relevance to retrofit – such as ventilation systems – but currently have limited direct contact with householders. Other contractors we spoke to are just starting out in retrofit and looking for support and guidance on how to get into the market.

This research led us to develop the concept of contractor personas – mirroring the personas developed for householders. As with householders, different contractors have different motivations and face different barriers in being able to service the retrofit market. The RMI sector is highly varied and contractors here need different levels and types of support in order to provide the best service to householders.

> "Traditional classroom training is unpopular with busy contractors who prefer on-site training and hands on approaches."

Building a value network, and building trust

Commissioning a retrofit is too often thought of as a top-down and linear process - with the householder at the receiving end. In fact, in retrofit, as with most domestic construction work, the householder is the key decision-maker. They are surrounded by a network of suppliers, professionals and regulatory agencies that interact in a complex way.



Expanding the supply chain

We found traditional 'top down' approaches are unlikely to work in engaging RMI contractors and that municipal and support agency approaches are likely to face significant challenges. Reasons for this include:

- A distrust of formal programmes from contractors with past involvement in retrofit programmes such as Green Deal due to reputational damage, financial losses and the poor sub-contracting behaviour of larger Tier One construction firms.
- Companies on existing agency databases are not often involved in owner-occupied domestic retrofit work. Many are larger organisations, focused on business-to-business sales rather than small scale RMI contractors.
- RMI contractors gain work by reputation and word-of-mouth recommendations, from clients and other contractors - rarely using formal networking and memberships.
- Contractors need concrete evidence of demand before moving to meet it. Likewise, they need evidence that a new technology or approach works and is reliable before being comfortable recommending and installing it.
- With limited time and tight overheads, they are focused on work and cashflow, SME contractors rarely use email or attend meetings or formal trainings.
- Contractors tend to be wary of investing in training or accreditation to meet pre-set 'standards', not because they lack skills but because they are reluctant to spend money on 'getting a badge' when often owner occupier clients don't require it.

Training

Speaking to contractors, we found many don't aspire to become 'retrofit contractors' and that efforts to engage or train new 'retrofit contractors' would likely be unsuccessful. Traditional classroom training is unpopular with busy contractors who prefer to fill specific skills gaps with on-site training. 'Hands-on' approaches to training delivered by peers and fellow professionals proved more compelling, ideally carried out on site and within homes or as part of business networking activity.

A new approach

High quality RMI contractors are already busy at a neighbourhood scale, building a client base through recommendation and trusted networks. These contractors don't see a need to re-train as 'retrofit contractors' gaining costly qualifications and complex standards that require non-fee earning time off site and in a classroom.

Instead, they seek to meet new specifications and energy performance standards, using different techniques when these are presented to them by clients and architects. To assist these contractors, specific, targeted training is required, preferably on site, during live projects with skills disseminated via peer-learning networks and contractor champions.

Our training approach includes:

- Offering hands on learning and peer learning opportunities – this is popular and seems to work!
- Using the contractor database to log skills and make connections.
- Using Contractor Champions to build trust and recruit further SMEs.
- Facilitating a new contractor network to enable peer support sales, referrals and new subcontracting relationships to be established as well as sharing learning and skills.
- Using intermediaries such as wholesalers, merchants and yards to make further connections and provide advice and information.

11
NEXT STEPS AND REPLICATION

With the completion of the research and development phase, the roll out of People Powered Retrofit will start in Autumn 2019 in target neighbourhoods of Greater Manchester. Iterative user testing and further development will take place over the subsequent two years, with the benefit of government support to oversee market development and subsidise householder costs.

Replication

During the development phase there has been huge interest from the Community Energy groups in offering domestic retrofit work and the service has been designed and open source software developed, in a way to allow for simple replication.

However, Community Energy groups face challenges in developing staff capacity and technical expertise in order to deliver such services. In the past some Community Energy groups have outsourced key technical and construction industry activity - in the short term this avoids up-front investment, but in the long term key skills and sources of income generation are lost to the sector.

Community Energy groups need to find ways to collaboratively support the development of retrofit capacity and expertise, to assist the growth of the sector and realise new sources of value and income streams.

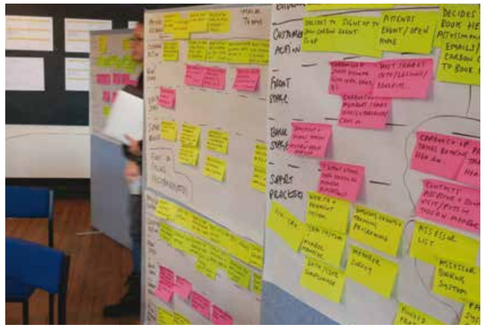
Social franchise

Franchising is a common form of replicating successful business models. A Social Franchise approach is used within not-for-profit sectors, with the service codified in a 'manual' and delivered under a single, trusted brand. Franchisees sell the service under license in defined geographical areas, generating income for themselves and buying into the franchise with upfront costs covering training and ICT tools set up.

Plans to launch a People Powered Retrofit social franchise are currently in development using a community benefit society model. The franchise will be owned collectively by delivery partners with ongoing costs contributing to the development, growth and maintenance of the service.

"Community Energy groups need to find ways to collaboratively support the development of retrofit capacity and expertise."





Published

June 2019

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"Delivering retrofit is a key part of decarbonisation efforts in the UK."

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