Department for
Business, Energy
& Industrial Strategy

Evaluation of the Supply Chain Demonstrator Project

Final evaluation report

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Executive summary

The Department of Business, Energy and Industrial Strategy (BEIS) commissioned six demonstration projects - each focused on a different specific region - to test different approaches for increasing the rates of energy efficiency improvements amongst able-to-pay owner occupiers, as part of the Local Supply Chain Demonstrators scheme. Projects received grant offer letters in November 2018, and ran until April 2021.

Each of the demonstration projects developed its own approach to meeting the project aims. However, across the individual projects, the outcomes aspired to for the scheme as a whole were:

- Coordination to improve the quality and consistency of retrofit work, while increasing the skills and knowledge of supply chain actors.
- Learning regarding the barriers to retrofit work, as well as successful engagement routes for different consumer groups and different parts of the supply chain.
- The development of sustainable business models for retrofit that could operate at scale. Projects raised revenue by charging for various services – e.g. training, home assessment, obtaining installer quotes, coordination of works – though their charging models differed.
- Retrofit projects, particularly multi-measure / whole-house retrofit, in project areas.

The aim of this evaluation was to assess the extent to which the Local Supply Chain Demonstrators achieved the intended outcomes. This report sets out the findings across the three years of the scheme, drawing in particular upon the latest (phase 3) evaluation activity conducted in early 2021. **Findings and conclusions reflect the position of the projects as of the end of March 2021.** Whilst the offers and customer journeys have differed, the successes, issues and learnings from across the six projects funded by the Retrofit Supply Chain Demonstrator Programme have been similar.

For context, the table below provides the per project numbers for completed retrofit projects and installation supply chain recruited, as of the end of March 2021:

Name of project (location)	Futureproof (Bristol)	Homeworks (Cornwall)	Ecofurb (London)	People-Powered Retrofit (Manchester)	Cosy Homes (Oxfordshire)	Warmer Sussex (Sussex)
Retrofit projects completed	150 measures[1]	0	1	9	6	2
Installation supply chain signed up to the scheme	75	9	36	228	106[2]	53

The numbers, especially completed retrofit projects, are considerably lower than the targets that each project agreed with BEIS for the closing stage of the funding programme. It was generally anticipated by the project teams that the third and final year of the programme (2020-21) would see a significant increase in activity, and more customers testing the different business models. Discussed throughout this report, a number of factors have made those intentions difficult to realise.

There have been two principal interdependent challenges for projects – customer retention and engaging the installer supply chain.

- On the customer side, through a range of methods (particularly promotion through local partners), most demonstration projects have stimulated good levels of initial household customer interest (albeit the suggestion from customer research is that projects may be benefitting somewhat from latent demand amongst 'early adopters'). However, **converting interest to on-site retrofit has been considerably more challenging;** whilst the demonstration projects have developed robust processes to filter lukewarm customer interest (and so minimise resource expended on customers unlikely to progress with works), the low conversion rates carry implications for the likelihood of uptake of the project offers at scale.

[1] Futureproof recorded measures installed rather than customers. These are measures installed by customers who were supported *to any degree* by Futureproof, as opposed to being handheld through the process from initial enquiry to QA of completed works. Only 4 measures were recorded as installed by Futureproof Associate Builder installers.
[2] Some double counting due to multiple-measure contractors.

- Yet whilst potential customers have dropped out of the customer journey because they do not want whole-house retrofit, and / or baulked at the costs of home assessment and measure installation, drop-out has also been caused by **delays to the customer journey due to a lack of installers**. It has been relatively straightforward for projects to engage firms installing specialist measures (renewables in particular). It has been much harder to engage the more generalist builders integral to the whole-house retrofit approach; many of those the demonstration project teams wish to engage have full order books and are not enthusiastic about (a) the increased complexity / risk in whole-house retrofit; (b) for some demonstration projects, having to accommodate a % fee in their quotes to cover project delivery costs e.g. project teams' retrofit coordination role.

These were of course the key challenges acknowledged at the outset of the scheme, and the demonstration projects were funded to develop and test methods of addressing them. However, scheme outcomes to date, and success in addressing the barriers to retrofit works, cannot be considered in isolation from the unfavourable combination of circumstances for the projects in 2020-21 in particular. COVID (and its associated restrictions) and the Green Homes Grant voucher scheme are two significant 'external' factors that have been largely detrimental to the progress of the demonstration projects, and achievement of intended outcomes, exacerbating the aforementioned issues of customer progression and engaging the installation supply chain.

Despite the challenges, and although the original quantitative installation targets for number of retrofit projects have not been met, the scheme has produced a number of positive outcomes:

- Significant numbers of retrofit supply chain firms have received training to better enable them to deliver retrofit to a higher standard; many are reporting enhanced skills (and some reporting increases in customers) through engaging with the projects.
- Household customer satisfaction with the support provided is high across the demonstration projects. Customers participating in the evaluation valued the thorough and tailored approach to home assessment, the subsequent reports on possible retrofit activity they could undertake, and (where accessed) the support to enable that.
- Across the demonstration projects, a range of marketing collateral, targeting both customers and the supply chain, have been developed. Projects have identified effective methods and channels for engaging their target audiences, in particular promotion through trusted local community organisations.
- Demonstration projects have also designed, tested, refined and launched online registration and home assessment platforms that make the early stages of the customer journey to installation more efficient and less resource-intensive.

Finally, and encompassing the aforementioned benefits, the demonstration projects have fulfilled their purpose in generating learning and insights. These are reflected throughout this report, but particularly in the penultimate chapter. The limited number of completed retrofits does commensurately limit learning on the planning and delivery of works, and the stages of the installation process beyond this. However, lack of progress, as long as there is understanding of the reasons for it, is valuable. Projects have generated substantial insights on

engaging customers, progressing them to action, engaging the supply chain, and benefits of participation to the supply chain.

In terms of generating deeper insight on the barriers to successful customer and supply chain engagement, as well as informing the assessment and design of future schemes and / or wider policy, the demonstration projects have been valuable. Through the experience of project design and delivery, the demonstration project teams and wider stakeholders have provided a number of ideas and recommendations for BEIS as to how the wider policy environment could be, and perhaps needs to be, adapted to better overcome public and supply chain indifference and realise the UK's domestic retrofit, and wider net zero, ambitions.

Introduction

Context

Scheme description

The Department of Business, Energy and Industrial Strategy (BEIS) commissioned six demonstration projects to test different approaches for increasing the rates of energy efficiency improvements amongst able to pay owner occupiers[3] as part of the Local Supply Chain Demonstrators scheme (the 'scheme'). The aim of the demonstration projects was to increase the uptake of retrofit work in target areas through:

- Providing funded support for local supply chain integration and project coordination
- Targeting able to pay owner occupiers and the private rented sector with attractive and more affordable opportunities for retrofit work.

The six demonstration projects operated in the following target areas: Bristol and Bath (a project called Futureproof), Cornwall (Homeworks), East/West Sussex (Warmer Sussex), Greater London (Ecofurb), Greater Manchester (People-Powered Retrofit), and Oxfordshire (Cosy Homes). Each project was delivered by a consortium; one organisation taking the 'lead' (the 'lead delivery partner' in this report), and a number of other organisations involved in delivery and decision making on the project (referred to as 'other delivery partners').

Each of the demonstration projects developed its own approach to meeting the project aims, taking into consideration factors unique to their geographic area such as:

- The level and skill of the existing supply chain
- Characteristics of the housing stock
- Existing information, tools and systems.

Despite differences across the individual projects, the intended outcomes for the scheme as a whole were:

- The coordination of different parts of the retrofit supply chain to improve the quality and consistency of retrofit work, while increasing the skills and knowledge of supply chain actors through training.
- The generation of further learning regarding the barriers to retrofit work as well as successful engagement routes for different consumer groups and different parts of the supply chain.

[3] Primarily, though across the projects a small number of domestic landlords have also been engaged.

- The development of sustainable and scalable business models for retrofit and partnerships that will continue beyond the project period. Projects raised revenue by charging for various services – e.g. training, home assessment, obtaining installer quotes, coordination of works – though their charging models differed.
- A (minor[4]) increase of retrofit projects, particularly multi-measure / whole-house retrofit, in project areas through the coordination of market players.

The following table provides a very high-level summary of the six funded projects and their team composition; more detailed description is provided in the six chapters below covering each of the projects:

Name and location	Description
Centre for Sustainable Energy's (CSE) *FutureProof* – West of England	Futureproof's main aim was to build awareness, trust and create a smooth customer journey through five elements: segmented marketing, home owner support, open homes demonstrations, supply chain skills improvement and quality assurance. The project was led by CSE with partners Bristol City Council, the Green Register and Greenhouse PR.
Carbon Co-op/ URBED's *People Powered Retrofit (PPR)* - Manchester	Carbon Co-op's approach was data driven, using a community-based social marketing model and inspired by case studies from the US Better Buildings programme. The project was led by Carbon Co-op / Urbed with support from partners Arc4 Limited, Quantum Strategy & Technology Ltd, Fieldwork Labs Ltd, Cumbria Action for Sustainability and ShortWork Limited.
BRE's *Homeworks* - Cornwall	The goal of the HomeWorks project was to enable SME builders who carry out the majority of repair, maintenance and improvement works to easily make referrals for energy efficiency retrofits to other tradespeople. HomeWorks aimed to do this by designing an app that tradespeople could use to manage referrals to other trusted installers and offer financial incentives to them for every referral made. The project was led by BRE with partners Trustmark, PLMR and E.ON.
RetrofitWorks' *Warmer Sussex* - Sussex	Warmer Sussex aimed to develop the 'RetrofitWorks' cooperative model of linking suppliers and key advocacy organisations in Sussex. The project was led by RetrofitWorks with partners Citizens Advice, Hastings Borough Council, Arun District Council, Brighton and Hove Energy Services Cooperative and Parity Projects.
Parity Projects' *Ecofurb* - London	Utilising the Retrofit Works model, marketing was targeted following analysis of the local housing stock and behavioural research. The

[4] Proportionate, given the scale of funding.

Name and location	Description
	project was led by Parity Projects with partners RetrofitWorks, Icaro and the Behaviouralist.
Low Carbon Hub's *Cosy Homes* - Oxfordshire	The approach was to build demand for energy efficiency retrofit by working with local community groups. Working in partnership, National Energy Foundation and Low Carbon Hub used the RetrofitWorks cooperative model to link community groups and owner occupiers to trained and trusted installers.

Projects were funded by way of a grant. Projects received their grant offer letters in November 2018, and ran until April 2021 across three financial years, with funding confirmed on an annual basis at the end of each financial year:

- Year 1: November 2018 – March 2019
- Year 2: April 2019 – March 2020
- Year 3: April 2020 – March 2021
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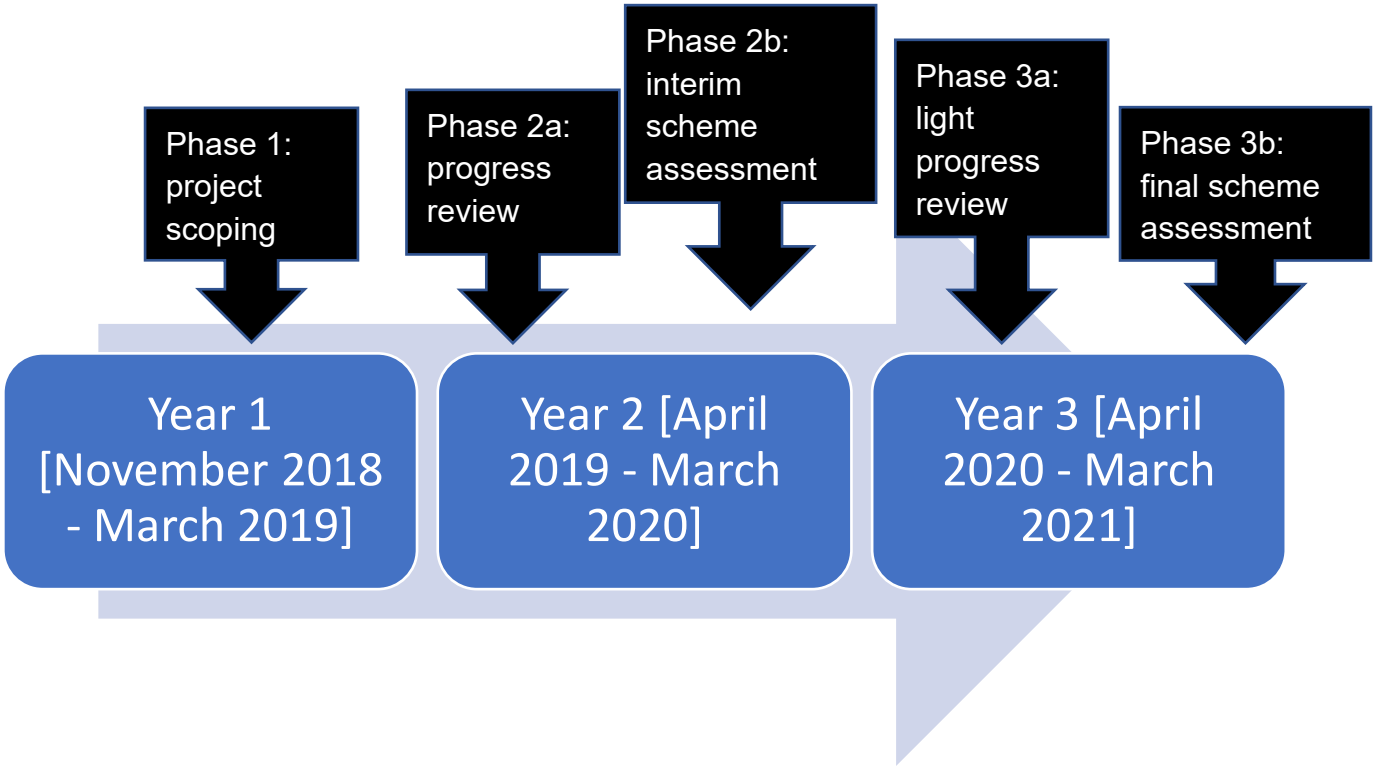
Evaluation description

BEIS commissioned evaluation to run concurrent to scheme delivery in phases:



The aim of the evaluation was to assess the extent to which the Local Supply Chain Demonstrators scheme achieved the intended outcomes. The evaluation considers the

outcomes generated by the different approaches adopted by the six different demonstration projects and assesses how those different approaches performed within their target areas and why.

The aim is not to produce a set of directly comparable findings, but to build the evidence base for future interventions on the supply chain and with the able to pay market and to produce a set of valuable learnings. The evaluation comprises two elements, as set out in Table 1.

Table 1: Evaluation elements

Process evaluation	• **Assess the experience of those retrofitting their homes via supported projects.** • **Review the experiences of those involved in delivering the project.** • **Identify the key characteristics of projects which generate successful outcomes and those which were less successful.**
Outcome evaluation	• Identify the effects of the projects on the local retrofit market. • Capture insight into other outcomes e.g. interest in the potential of the retrofit market, and the cost/barriers of retrofit.

The evaluation originally included an impact evaluation element, to measure project energy reduction impact where feasible. BEIS and the evaluator agreed to remove this element on the basis of lack of available data.

Linked to this, as described in the 'limitations' section below, there is limited evidence against those evaluation questions assessing the project / customer / supply chain experience of retrofit works on the ground, as only a relatively small number have been completed to date.

This report sets out the findings across the three years of the scheme, though drawing in particular upon the latest (phase 3) evaluation activity conducted in early 2021.

Summary methodology

Theory based approach

Theory-based evaluation approaches provide an overarching framework for understanding, systematically testing and refining the assumed connections (i.e. the theory) between an intervention and the anticipated impacts.

A detailed Theory of Change (ToC) was drafted at the outset of the evaluation, encapsulating our understanding of how the scheme was intended to work, the assumptions lying behind this and the social, cultural, economic and political factors that may affect outcomes. The ToC was generated via a ToC workshop with BEIS, a review of the existing BEIS ToC and interviews with programme stakeholders. Accompanying this overarching ToC were six project-level ToCs

setting out the intended customer journeys for each of the funded projects, and the assumptions underpinning them.

Each has been updated throughout the evaluation to reflect changing project delivery and priorities; for ease of reading, the final ToCs have been provided as separate annexes to this report. The final overarching ToC, and per project ToCs, are provided separately.

Evaluation activities

The following table summarises the activities undertaken across the evaluation. A fuller description of each element is set out in the Evaluation Plan, a separate working document updated after each evaluation phase.

The same broad evaluation methodology was deployed across the projects, with elements excluded, or varying in scale, for project-specific reasons (e.g. to reflect the number of customers engaged when fieldwork was conducted). Topic guide questions were tailored to explore issues of pertinence on each project.

The table below summarises the primary and secondary data collection activities across the three years of the evaluation:

Evaluation element	Summary of activity	Year 1	Year 2	Year 3
Interviews with project 'leads'	At the outset of each phase, interviews were conducted with each of the six lead delivery partners. These explored their perspective on project progress over the preceding months. Follow up discussions were also conducted with colleagues as necessary / recommended by the lead delivery partner, for further detail / insight.	6	Phase 2a: 6 Phase 2b: 6	Phase 3a: 6 Phase 3b: 6
Interviews with 'other' delivery partners	These interviews explored perspectives on project progress and provided an opportunity to discuss the partner's specific role and involvement in the project. In some cases the project lead deferred discussion of certain elements of project delivery to these 'other' delivery partners.		25	18

Evaluation element	Summary of activity	Year 1	Year 2	Year 3
Supply chain interviews	Discussions provided insight into their motivations for engaging with the project, expectations of benefits, and realisation of those to date.		25 installers, 18 retrofit coordinators 3 interviews with non-participant supply chain	31 installers, 9 retrofit coordinators
Customer interviews	Interviews were conducted with customers of each project (i.e. householders) from as wide a range of profiles as feasible, exploring their motivations and experiences.		46	60
Wider stakeholder interviews	Interviews with delivery partners identified a number of additional organisations ('wider stakeholders') that projects sub-contracted to, or had other arrangements with, outside of formal partnerships e.g. local government and community groups.		15	13
Observational research	Observation activity provided opportunity for the evaluation team to join and observe different events that the projects were running as part of their schemes e.g. governance meetings or supply chain training.		6 events attended	8 events attended
Key Performance Indicator (KPI) review	Projects provided data on KPIs / metrics to BEIS on a monthly basis. This data was collated and reviewed as part of the Year 2 and 3 evaluation activity.	N/A		

Evaluation element	Summary of activity	Year 1	Year 2	Year 3
Review of marketing materials	The evaluation team reviewed the marketing collateral of each project in terms of reach, engagement and conversion to participation in the project.	N/A		
Review of further relevant documentation	To help contextualise findings, and provide further insight on certain topics, the evaluation team reflected on existing evidence and learnings from related projects, studies and academic papers.	N/A		

Challenges / limitations

- **Project progress;** the evaluation comprised a lower level of primary research than had originally been envisaged. This was largely due to project progression being slower than anticipated; an issue explored throughout this report. This had particular effects:
    - Reduced supply chain interviewing – this element was still conducted to some degree from phase 2a, but the numbers and range of respondents was somewhat reduced from original expectations. This reflected the limited numbers overall (and within certain sectors) signed up to the projects.
    - Reduced customer interviewing – a large quantitative survey of customers had been planned for phases 2b and 3b of the evaluation. Based upon the number and status of customers engaged in the projects at each stage, this was not deemed feasible. Instead, a smaller, more qualitative approach was taken. In addition, almost all customers in project pipelines (and therefore provided for interview) were at the earlier stages of the projects' customer journey, meaning limited interactions with the supply chain and…
    - …Reduced insight on retrofit – across the projects there have been very few completed retrofits or commenced works, meaning very limited and potentially atypical insights into the project, customer and supply chain experience of it, as well as limited impact data to analyse.
- **Homeworks Cornwall;** in September 2020, the decision was taken by BEIS to discontinue funding BRE's Homeworks project in Cornwall. The rationale for this is detailed in the section of the report focusing on Homeworks. The effect of this decision upon evaluation activities was limited (BRE still participated in final phase interviews and shared contact details for customers and supply chain for the purposes of primary research). However, it did result in several months during which the project was not operating or generating outputs and insights.

- **Ad hoc re-design of project activities;** there is an inherent tension in the scheme objectives. On the one hand, the original delivery models chosen by each project would ideally stay unaltered, so their effectiveness could be properly tested across the three years. On the other hand, the projects were required to deliver outputs / outcomes, and are seeking to develop a sustainable model to carry forward post-funding. It is on this basis that the programme lifecycle has seen a number of adjustments to project delivery models, with further changes planned after the BEIS grant payments stop in March 2021. In particular, the projects have made changes to their activities to engage the supply chain and their customer offers, in an attempt to deliver outcomes. It is positive that the projects have shown themselves to be agile and adaptable, but with some changes being very recent, proper assessment of their effect was challenging, and their longer-term sustainability / replicability equally hard to assess. In addition, the evaluation becomes less able to objectively detect what aspects of a project are working or not, becoming more reliant on project leads' perspectives as to why they adapted approaches.
- **COVID;** as described throughout this report, the pandemic – and resultant restrictions on travel and social contact – have been a key factor in both project progress and adjustments to approaches. It has also limited some evaluation activity that may otherwise have been conducted in-person e.g. face-to-face interviews with key individuals, and visits to project events / meetings.
- **The changing policy environment**; perhaps inevitably, across the multi-year lifespan of the scheme, new policies and initiatives have been developed that have had – and are having – a profound effect upon the projects and achievement of outcomes. Many of these effects are explored throughout this report. In terms of limitations for this evaluation, the introduction of certain incentives schemes (some as a direct response to the COVID pandemic) at a local, regional and national level has created challenges in disaggregating the project activities and wider policy when assessing influence on householder and supply chain engagement.

Prior to discrete chapters discussing each funded project, the next section of the report provides an overview of some of the key themes, successes and challenges across the funded projects. This includes consideration of some of the key factors affecting all six projects across the programme lifespan, and policy considerations that the schemes, and wider literature has prompted.

Overarching themes across the programme

Final project numbers

The table provides per pilot figures against selected Key Performance Indicators (KPIs). The purpose is not to directly compare project performance[5], but to collect overall figures for the demonstrator programme in one place, whilst also providing context for the sections in the main body of the report, exploring each funded project in depth. As noted above, after September 2020 funding for the Homeworks project in Cornwall stopped; performance metrics were not sought for this project after this point.

Table: Headline per project KPIs as of March 2021

	Futureproof (Bristol)	Homeworks (Cornwall)	Ecofurb (London)	People-Powered Retrofit (Manchester)	Cosy Homes (Oxford-shire)	Warmer Sussex (Sussex)
Retrofit projects completed	150 measures[6]	0	1	9	6	2
Installation supply chain signed up to the scheme	75	9	36	228	106[7]	53

All projects agreed with BEIS a number of KPIs to measure performance across the three years; some qualitative (e.g. conducting market research), some quantitative (e.g. the number of installer supply chain firms signed up).

The numbers in the table, especially completed retrofits, are significantly lower than those expected at this closing stage of the funding programme, when measured against the targets that each project agreed with BEIS. At the outset of the programme, 760 retrofits per project

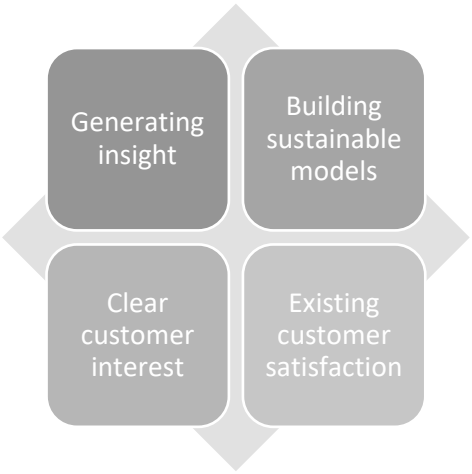
[5] As detailed in the footnotes, certain figures were not recorded in a consistent way.
[6] Futureproof have always recorded measures installed rather than customers, though in the evaluation interview CSE envisaged that most customers have installed single measures. It should be noted that these are measures installed by customers who were supported *to any degree* by Futureproof, as opposed to being handheld through the process from initial enquiry to QA of completed works. Linked to this, only 4 of the recorded measures were installed by FAB (Futureproof Associated Builder) installers, and 35 by other associate organisations.
[7] Some double counting due to multiple-measure contractors.

were expected over the three year period. And whilst, for the contextual reasons discussed further in this section, targets have been re-negotiated and revised down several times, most quantitative KPIs have not been met on conclusion of the funding.

It should be acknowledged that projects structured their activity with the expectation that most quantitative KPIs would be delivered in Year 3 of the funding. Year 1 of the programme saw projects designing and developing their approaches, establishing delivery and governance structures, marketing materials, and tools and systems to support delivery of the customer journey. Year 2 saw further project refinement of their approaches, and those approaches starting to be tested with small numbers of customers and supply chain representatives. It was generally anticipated by the project teams that the final year of the programme, Year 3 (2020-21), would see a significant increase in activity, and more customers going through and testing the journey. Discussed in the sections below and throughout this report, a number of factors – not exclusively, or even *primarily*, related to COVID - have made those intentions difficult to realise.

Successes

Four key areas of success were identified across the evaluation, albeit with some qualifications; this section explores each in turn:



Generating insight

The principal purpose of the demonstrator projects was generating learning, with an increase in retrofit projects as a secondary objective.

The limited number of completed retrofits does commensurately limit the extent of insight and learning generated i.e. testing supply chain coordination in the planning and delivery of works, and the stages of the installation process beyond this - QA, aftercare, payment etc. In response to Evaluation Questions exploring retrofit delivery (and supply chain experience and benefits arising from the improved works coordination and economies of scale the projects were hoping to enable), detailed and robust insights are not possible.

However, lack of progress, as long as there is understanding of the reasons for it, is valuable. In terms of generating deeper insight on the barriers to successful customer and supply chain engagement, as well as informing the assessment and design of future schemes and / or wider policy, project experiences have been valuable.

Customer engagement, satisfaction and attribution

For each project, being able to highlight interest amongst customers, and the presence of a potential 'market' for retrofit activity in each area, is crucial to efforts to engage the supply chain. All project delivery partners commented positively on householders engaging with the projects. And aside from the Homeworks project in Cornwall, project teams could point to substantial numbers of households 'engaging' with their schemes, with hundreds choosing to register with the schemes and explore them further. These numbers are relatively small set against ambitions to retrofit millions of homes, but they should be placed in the context of limited project promotional activity. Across the five projects funded up to the end of Year 3, marketing to householders has frequently been deliberately curtailed in order to ease pressure on later elements of the customer journey, where processing customers efficiently had become a challenge.

That some marketing activities were either not deployed, or not rolled out, has limited the extent to which projects have been able to fully test and assess the relative efficacy of activities within the lifespan of the funding programme.

However, a wider concern is that, in the context of limited marketing, initial interest seems to be indicative of a level of *latent* householder interest and willingness to explore whole house retrofit. Evaluation interviews with customers found a number with longstanding intentions to pursue retrofit, for whom finding out about, or being approached by, the project team had been a catalyst. This latent demand, and the typical profile of customers to date[8], cannot be taken as strong evidence of the *ongoing* interest in retrofit amongst the *wider* 'able to pay' market. In effect, the projects may be capturing and servicing 'early adopters'; there is no certainty that initial levels of interest will be maintained over time.

In addition, as noted in the 'challenges' section below, this initial householder enthusiasm for engaging with the projects has not necessarily translated to an appetite for progressing with retrofit works[9].

Overarching observations of householder customers across the funded projects

- Householder customers appear to be able-to-pay early adopter customers, with many reporting that their homes already had some form of energy efficiency measures installed at the time they engaged with the funded projects[10]. Across all projects, the most commonly reported motivation for engaging with the project was a desire to reduce environmental impact; but many also stated a wish to improve comfort levels (something sometimes linked to health concerns); and for financial benefits.

[8] Very environmentally aware, driven to explore retrofit by primarily environmental considerations, often linked to eco community organisations and with simpler measures already in place in their properties.
[9] In many cases it is too early to say whether a retrofit project will develop, but there are already a substantial number of confirmed 'drop-outs'.
[10] Albeit some were in place before the customer themselves had moved in.

- In interviews with the evaluation team, many reported that they had longstanding intentions, in some cases stretching back many years, to undertake retrofitting work. Barriers to doing so have included concern about the complexity of retrofitting and potential short- and long-term disruption to the property (especially older properties), cost, and availability of contractors. Triggers for action had been the projects making contact, the need for refurbishment and / or equipment replacement, and for declining health of house occupants. A number of interviewees made reference to the Green Homes Grant (GHG) as a trigger for them to take action; several of these identified cost savings as an important driver.

- Householder interviewees heard about their projects from a broad range of sources – already being aware of the delivery partners, online searches, adverts in the press and online, news articles, via events, the GHG website, and word of mouth. All project teams emphasised the value of advocacy and promotion by trusted local organisations, in particular local community groups and councils.

- Householder interviewees were split between (a) those with a broad interest in taking action, but who hoped the projects could provide them with authoritative guidance as to the specific measures they should prioritise; (b) those with a pre-existing idea of action they would like to take, who were hoping the projects could assist them with practical steps such as identifying and selecting installers, and / or, in Year 3, accessing the GHG. Individuals in both groups were sometimes seeking a project management service to deliver works for them.

- Householders in the latter group include a number of customers less suited to the project offers i.e. individuals often focused on a single measure who are not open to whole-house retrofit. In Year 1 and 2 of the programme, the projects were spending substantial time and resource explaining the project offer and effectively managing these customers to an inevitable drop-out. In Year 3, and in response to the Covid social distancing provisions, some of the projects launched digital pathways to engaging and receiving an initial digital home assessment that requires little to no resource and is proving effective in filtering customers unlikely to take up paid-for project support.

- Amongst customers who have progressed through the schemes offered by each project, and even amongst many of those that decided not to, satisfaction is high. Respondents found home assessments and the resultant Whole House Plan (WHP) reports valuable[11], though some felt these could be shorter and more tailored. A consistent criticism of the projects has been the relatively slow speed at which the process moves at points (especially around sourcing contractor quotes). However, the overall view of householders that engaged with the evaluation was that the projects provided an important role in supporting more retrofit, especially in providing

[11] Even where the WHP did not tell the customer anything new, many said it provided endorsement of – and so confidence in - their pre-existing plans.

authoritative advice to households on how their homes could be improved, what the benefits of that would be, and links to trustworthy suppliers and installers to do it.

- At the time of the Year 3 evaluation, whilst many of the customers interviewed had received – or at least booked – home assessments, few had progressed to installation of measures (either within or outside the projects). Due to delays in quotes being provided by scheme contractors, or unexpectedly costly quotes, some had elected to progress installations on their own. Slow progression and poor communication from the projects were commonly cited issues in customer interviews across the projects, though some acknowledged that COVID and the GHG were exacerbating this. Sometimes the delays are with the customer (still considering whether to install measures and / or which to go for).
- There is clear evidence that even amongst this relatively knowledgeable and enthused early adopter market, the schemes have had an impact upon the level, type and speed of retrofit activity. For those deciding to progress works within the projects, the support / service they were receiving had at least some influence upon their decision to take action – sometimes the decision to act at all – but certainly informed the types of measures and the order in which they were planned, as well as the speed with which they have acted compared to their likely speed in the absence of the projects.

Despite not needing to proactively market their schemes to a great degree, a particular customer engagement success for the project teams has been their online services. Partly influenced by COVID, projects have developed online webinars and training modules, online events (e.g. virtual open homes tours) and digital / remote home assessment tools that prospective customers can complete themselves. The latter has proven very useful to the project teams in providing an initial filtering of customers for whom the scheme may not be a good fit.

Building sustainable models

- A key purpose of the scheme is to support the development of delivery models that are sustainable and could potentially be replicated at a broader scale. With Homeworks funding withdrawn, there remain two broad delivery models:

Ecofurb, Cosy Homes and Warmer Sussex	•A more fixed, intensive and coherent support package; with the additionality to retrofit action clear if the journey is followed through.
Futureproof and People-Powered Retrofit	•A more ad hoc approach; customers can dip in and out, selecting from a suite of separate services / support. Arguably more resilient (in that it is flexible to changing circumstances), though the additionality of the schemes is sometimes less clear.

It should be noted that in terms of customer throughput and 'stress testing' the later (retrofit) stages of project delivery models, the projects are still at a fairly early stage. More significant volumes of activity might provide clearer understanding of which components of the overall delivery models are working well or not, and therefore highlight necessary changes.

The three years of the programmes have seen some adjustments to delivery models. For example, a general drift to provision of online services to complement / replace in-person support; a reduced focus on finance advice for customers within the scheme; and some (often short term / pragmatic) adjustments to the level of involvement of the assigned retrofit coordinator (RC) in customer journeys. As discussed in the sections below, external factors have impacted upon at least some elements of how the projects are ordered and delivered.

In Year 3 in particular, the project teams have been focused on designing and refining a resilient model that will be self-sustaining beyond BEIS funding. Aside from Homeworks, all project delivery partners have planned to continue delivering their schemes, and many decisions and efforts have been directed to build the foundations for that, as opposed to focusing upon delivery of retrofit numbers. Projects have been building key partnerships (e.g. with local authorities) that are intended to strengthen the schemes' place in the regions; recruiting key roles for project delivery moving forward (e.g. a supply chain recruiter across the three schemes involving RetrofitWorks); refining services and solutions that will form the core of an ongoing project (e.g. Ecofurb's UI and the Plan Builder app); and conducting customer research to understand the potential for – and effects of – adjusting the pricing structures in their schemes for a post-funding climate.

Whilst reducing our opportunities to gather insights related to key evaluation questions (around on-site retrofit in particular), the time projects spent on post-funding preparation is of course a positive and necessary process, especially as the development of self-sustaining business models was an objective of the project. And delivery partner decisions have demonstrated a commitment to the core aims of the programme and alignment with PAS2035. A stand-out example has been the focus of the Ecofurb, Cosy Homes and Warmer Sussex projects on whole-house retrofit, not fully supporting customers interested only in simpler single measure projects, even when accommodating these could have boosted project metrics.

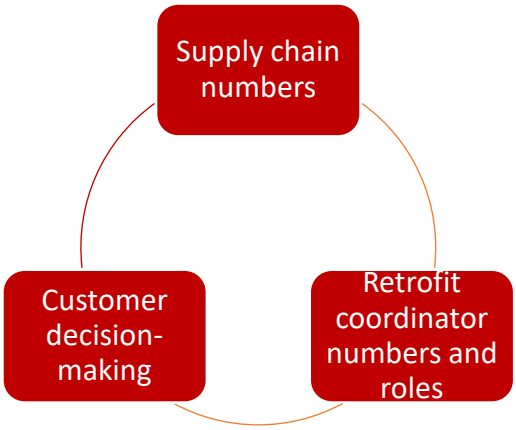
All five projects intend to continue into 2021-22 and beyond. Although no project team expected their scheme to be financially self-sustaining immediately after the end of the grant funding, all projects have developed business plans outlining how they can attain growth and sustainability. In the short term at least some cross-subsidy from other delivery partner activities is expected. For most, completed installations are essential to demonstrating scheme viability; it is also assumed that it will become easier to attract more contractors to the model once there is a body of 'able to pay' work to demonstrate.

The evaluation has identified evidence of replication, both within the funded projects (e.g. provision of training by one project team to another[12]) and in nascent schemes. One example

[12] PPR to Futureproof.

is a domestic retrofit scheme being developed by Otley Energy near Leeds[13], with the currently envisaged customer and supply chain journeys being very similar to the RetrofitWorks model. The scheme also makes retrofit coordinators central to delivery. Another is the conversations Carbon Co-op are having with various organisations in pursuing a social franchising model for the PPR scheme.

Challenges



Recruiting retrofit coordinators

The retrofit coordinator role is central to PAS2035. For three of the six funded projects, retrofit coordinators are an integral part of their model, effectively a technically skilled 'account manager' for the customer at all stages of their involvement, delivering home assessments and measure recommendations, sourcing contractors, managing works and conducting post-installation QA.

At the start of Year 2, for those schemes in particular, the role was proving challenging to recruit for, in terms of attracting sufficient interest from individuals matching the (substantial) required mix of skills. These comprise a combination of technical skills (potentially across a substantial range of measures and property types) and softer skills (customer and supply chain communications and management).

For those without the requisite skills mix, becoming a coordinator requires substantial training (requiring time and monetary costs for courses) and it was noted that some in the industry still recall their investment in Green Deal Assessor training, which did not yield substantial returns. Certainly in Year 2, some demonstrator project delivery models provided limited initial remuneration for coordinators, with significant remuneration only once / if a customer took forward and completed works.

The lack of coordinators led, at least early in Year 2, to some delays in processing customers through the earlier stages of the customer journeys. This delay is felt to have led to a small number of customers losing enthusiasm / trust and disengaging. Furthermore, it meant that the intended coordinator role – managing every aspect of the customer's journey from engagement to post-works QA – was not practical, as there was insufficient capacity.

Towards the end of Year 2 and in Year 3, delivery partners stated that the situation was improving[14], though there continue to be issues with coordinators not being able to devote sufficient time to the schemes (many are self-employed and only deliver project work part-time

[13] https://otley2030.com/
[14] For example, in Year 3 the number of coordinators on the Cosy Homes project more than doubled from 5 to 12.

around their core business), or being unable / unwilling to deliver specific elements of the role, which then fall to the delivery partner's team.

Customer behaviour

Time and space for customers to make decisions and progress with the customer journey are factored into the design of each project. In Year 2, some customers were taking more time over decisions and communicating more slowly than had been anticipated; this was attributed by the project teams to the costs of works being higher than customers had expected, and their systems not filtering out customers who were never very enthusiastic about major / whole-house works anyway.

The latter meant that significant project team and retrofit coordinator resource was being invested in customers never likely to take forward significant retrofit. Some customers signed up for an assessment of the best retrofit measures and to get quotes for works through the projects, then went direct to suppliers. This could sometimes be installers they may have known before approaching the project, or sometimes firms providing quotes through the project[15]. This effectively cut out the project and did not serve to test their end-to-end delivery model; some customers were clearly not seeing the added value of the coordination and quality assurance that the demonstrator projects were offering.

In Year 3, COVID was felt to have exacerbated these delays. For potential customers who were shielding, progression to on-site works was not possible, but some households not officially 'at risk' still requested delays to steps in the process that would have required in-home interaction, e.g. site surveys or installations. From interviews with project teams or customers, the economic consequences of the pandemic did not seem to be a *significant* factor delaying customer decisions, though this cannot be dismissed[16].

It should be noted that delays to customer progression are as likely to have originated with the projects, especially at the points where engaging the supply chain is required e.g. sourcing quotes for agreed work packages. And because of this, delays in customer decisions have sometimes provided welcome respite for the project teams in their attempts to get on top of workloads and progress others through the scheme. There has been some reluctance amongst project teams to 'nudge' undecided customers, as they know the project supply chain isn't fully established to meet demand anyway.

Engaging the installer supply chain

A key objective of the scheme was to tease out the barriers and challenges to successful engagement and coordination of a potential retrofit supply chain, and in this regard it succeeded. Projects were aiming to engage the installer supply chain by: (a) offering a pipeline

[15] This practice was cited by several respondents in relation to stand-alone renewable energy measures.
[16] COVID-related delays in customer decisions mostly revolved around health and safety concerns about home visits / works. Limited mention of financial issues may also reflect the 'able-to-pay' profile of early project customers; it was for this reason that in Year 2 the projects largely postponed efforts to develop a financial support offer to customers. It is possible that financial uncertainties led some customers to take forward fewer measures than they may have otherwise, but the projects may not have been made aware of this in many cases.

of leads / customers; (b) providing detailed home assessment information to build installer confidence and inform accurate quotes; (c) picking up project administration and customer management.

The situation, across the projects, has been one of sufficient interest and engagement from most specialists (i.e. installers focused on a particular measure), but less interest from many of the generalist builders and fabric measure installers integral to building the critical mass within the supply chain for a rolled-out retrofit scheme[17]. Within the delivery models, it was envisaged that generalist builders would deliver some fabric work, preparatory work for complex retrofit measures, and many of the more straightforward measures, as well as, in some projects, acting as a trigger point at which more carbon neutral solutions can be upsold[18].

Even where supply chain firms are ostensibly 'signed up' to projects, the project teams have had difficulties securing active participation from them, in the sense of providing quotes or making themselves available for works. This in turn has made organisation and delivery of whole house retrofit works very challenging, certainly at the scale the projects were aiming for.

Multiple interdependent reasons have been given for the situation:

- General scepticism from the installer supply chain about the likely returns, and / or long term prospects of a Government funded scheme; often on the basis of previous experiences e.g. Green Deal. Killip et al. argue that the failure of the Green Deal led to a return to familiar and core business activity and that Government policy is not long lasting enough for the supply chain to heed and respond properly, ergo little attention is paid to it (Killip, G., et al., 2020). Wider industry stakeholders interviewed as part of the evaluation corroborated this. They stated that some in the supply chain have had *"their fingers burnt"* with past initiatives, resulting in a lack of trust in government initiatives.
- Many builders deemed by project teams to be of sufficient quality to be approached tend to have full order books and often have no interest in growing the business, negating one of the key 'selling points' of the projects (lead generation): *"the ones that get it [builders supportive of whole-house retrofit] are busy."* Various papers cite the fact that not all microenterprises want to grow (Maby, C. and A. Owen, 2015) and that currently there is plenty of work without engaging in the low carbon sector (Killip, G., 2015).
- Many builders consider energy retrofit in general, and particularly whole house retrofit, as being fraught with risk due to the complexity of some of the technology and the interdependence of measures, including the need for these to be installed in an optimal order. This point is echoed in recent literature[19]: deep retrofit carries higher process risk in terms of ordering of tasks and technical risks to structural performance when multiple

[17] Where any such firms had engaged with the projects, these seemed to be driven by a personal / organisational interest in, and commitment to, environmental goals as much as expectation of increased commercial benefits.
[18] In Cornwall for example, it was expected that builders brought in for conventional refurb projects could initiate conversations with the householder about retrofit measures, though ultimately the conclusion from the project and wider stakeholders was that this route would not work.
[19] Killip et al., and in Topouzi, M., Fawcett, T., Killip, G. and Owen, A. (2019) Deep retrofit approaches: managing risks to minimise the energy performance gap

changes are made without considering the building physics as a whole. If the retrofit measures don't work, fail, or there are other issues, the installer may be called back to fix it, something they will struggle to charge for. By sticking to the familiar, they don't carry the same commercial (and potentially reputational) risk.

- Where the project model anticipated the involvement of a coordinator for all retrofits, paid for through a percentage of the building contractor fee, some contractors have expressed reservations about having to inflate their costs to factor in this additional fee. And whilst intended as a beneficial offering to the supply chain, aspects of the retrofit coordinator role could be perceived by installers as a threat e.g. QA of work, undermining customer trust etc.

Overall, with strong customer demand for their existing offer, for many firms in the installer supply chain the theoretical benefits (increased customer referrals and sales) may not outweigh the perceived drawbacks (increased costs, challenge and scrutiny).

Many of the issues above tend to be more acute for the established, smaller, more local supply chain that projects were encouraged to prioritise; these firms tend to have less capacity, time and resource to engage with the demonstrator projects, and generally less interest in expanding. As wider industry stakeholders commented, this group tends to have a good level of business from existing customers and are comfortable with this. Projects have had relative success in recruiting *newer* small firms, with less of an existing pipeline of works; some having been established with a focus on 'green' retrofit.

Some project team representatives had hypothesised that COVID could prove to be a catalyst for more supply chain engagement with the schemes, as firms' conventional work dried up, but this has not proven to be the case. As stated, many of the firms the project teams most want to engage have continued to be busy.

The challenges in recruiting the supply chain have necessitated a careful balancing act for projects when engaging with customers. Projects have not wished to over-recruit customers who, without sufficient project supply chain capacity, might not get attention for weeks or months and so lose interest. But not regularly communicating with and nudging some customers will lead – and has led – to them losing interest and either not progressing to measures, or doing so independently (and potentially less effectively). Equally, being able to evidence a large potential customer base is crucial to attracting the supply chain to the project and seeing it as a viable income stream.

It should be noted that the online home assessment tools have been useful in engaging customers even when schemes have been overwhelmed, and these tools can also provide efficiencies in giving coordinators / advisors an initial idea of customer profile and priorities. However, even with these tools, Year 3 drop-out rates have been high.

Some of the challenges around supply chain engagement would have been well understood and considered by the demonstrator projects when first engaging with the programme and agreeing targets with BEIS - finding effective ways to engage the supply chain was the rationale underpinning the whole programme. Therefore, whilst acknowledging that supply

chain and customer recruitment targets were deliberately ambitious, the extent of the shortfall for some KPIs is stark. This was explored with project teams and it was acknowledged that the severity of the aforementioned issues has often been greater than envisaged.

Taking into account the main challenges the schemes have encountered, the next chapter considers some of the key factors that have influenced / exacerbated those.

Wider factors

Project resourcing

The budget allocation for the pilots was reduced in Year 2 as a result of resource constraints on a range of government programmes. Funding for the pilots was increased in Year 3. However, the delay to provision of - and reduction of - Year 2 funding compared to expectations, as well as confirmation of Year 3 funding less than a month before the beginning of that budget year, was cited by delivery partners as a key factor delaying activity, having three principal effects:

1. Preventing recruitment of key positions in the projects (e.g. a marketing lead in Sussex), which in turn impacted upon capacity to carry out certain customer and supply chain marketing and recruitment activities.
2. Creating, amongst those in the installer supply chain aware of the revisions, scepticism towards the project as a long term prospect. This echoes findings from a range of literature on supply chain barriers to retrofit engagement (some cited above); a number of stakeholders perceived that the reduction confirmed some supply chain views of retrofit projects as ‘another Green Deal’.
3. Creating a general air of uncertainty, making the project teams more cautious about over-committing in terms of both resources and promises to third parties. The concern was not so much the revision to Year 2 funding, as the possible implications for future funding. For one project, the issues might have led to more guaranteed workstreams being prioritised.

Linked to this, whilst project funding has been significant enough to enable some dedicated resource, responsibility for quite substantial elements of each project have often sat with a small core of key staff (with some projects being largely driven by one person). Over Year 2 in particular, the excess workload, and / or lack of availability of key individuals, effectively stalled parts of projects at times. This was notable where delivery partner representatives were picking up aspects of the process that were intended to sit with the retrofit coordinators, of which there were not enough. In addition, recruitment and coordination (i.e. obtaining quotes) of the installer supply chain has required more resource than perhaps originally anticipated. Some delivery partners have had a number of additional activities running at the same time as the funded demonstration projects.

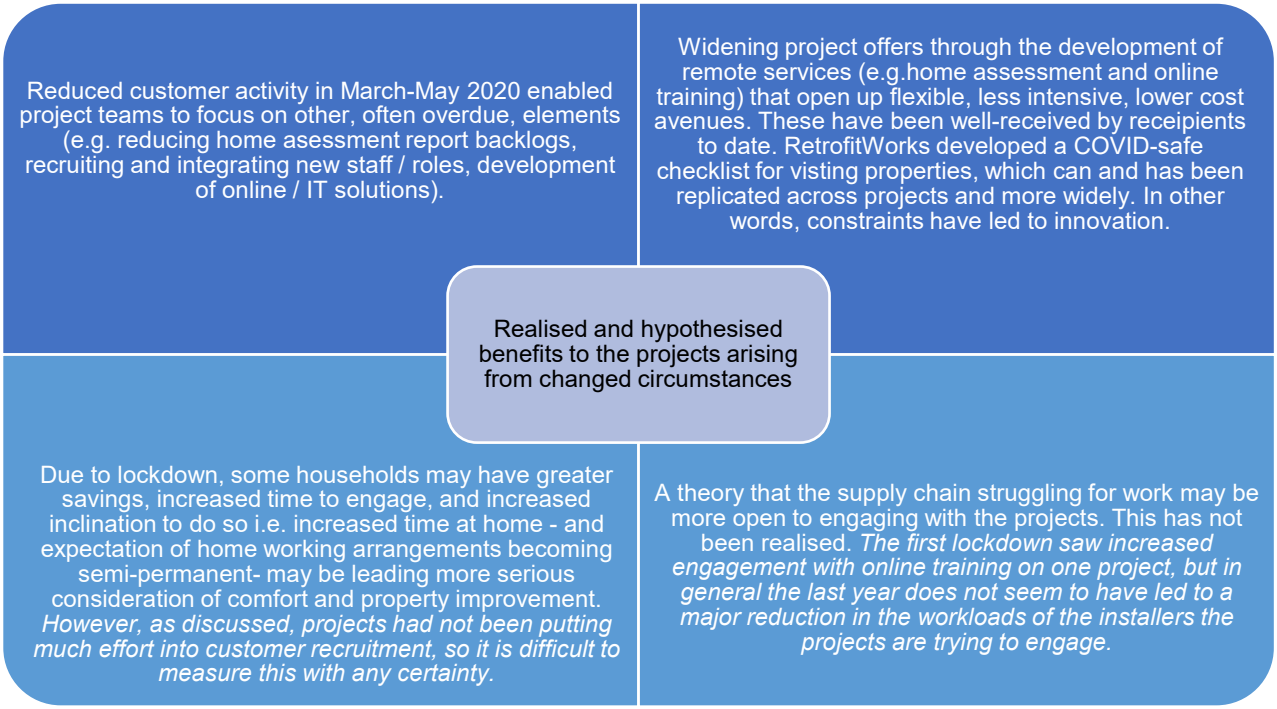
Observed throughout the programme, one of the key advantages for the three projects involving RetrofitWorks has been the sharing of staff (coordinators, installers, marketing and supplier engagement) and assets (e.g. the Plan Builder online home assessment tool) across the projects; this has been more cost-effective than each scheme developing their own versions.

As projects have neared the end of the funding period, motivation to deliver / be seen to be delivering retrofit works against programme targets may have been weakening, especially as they focused on getting scheme resources and processes in order, preparing for life without the Green Homes Grant scheme.

COVID

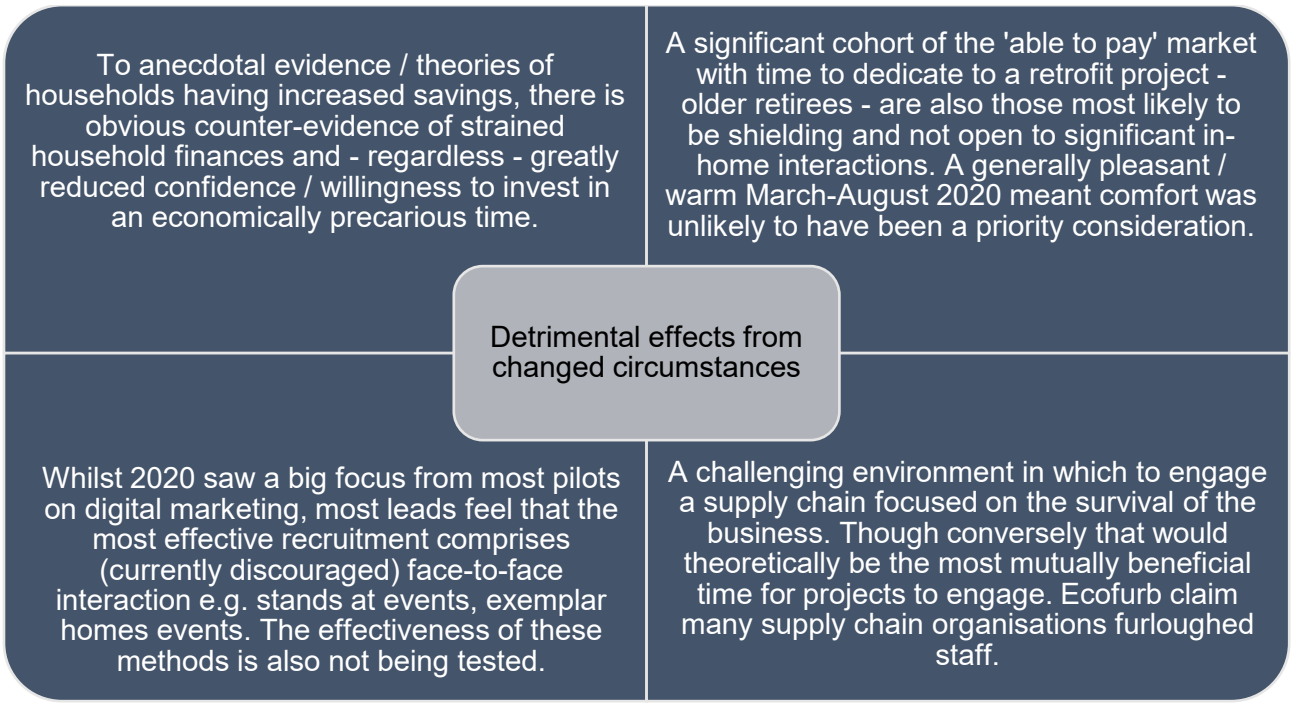
The factor that might be expected to have had the most substantial detrimental influence on programme and project delivery in 2020-21 is COVID and its associated restrictions. The pandemic has undoubtedly had several significant effects.

When asked in April 2020 for an immediate view on the impacts of the pandemic and restrictions, projects were still cautiously optimistic about Year 3 delivery, dependent upon the duration and frequency of the first, and any further, lockdowns. And COVID has not been perceived by the pilot leads to have been *wholly* detrimental to project delivery, though two of their more positive interpretations were theoretical rather than experiential, and the evaluation has not found clear evidence of either.



Despite these (potential) benefits, on balance, it is clear that COVID has been a detriment to projects[20].

[20] COVID was given by BRE as one of the main factors contributing to Homeworks under-performance.



A further issue which project representatives were uncertain whether to attribute to COVID or Brexit has been shortages of key equipment and supplies for retrofit, especially certain models of heat pumps, plasterboard and wood fibre insulation.

Overall, 2020-21 has been a year of unprecedented conditions. COVID and its associated restrictions, have created a social, economic and political environment that the projects were not designed to operate in, and ostensibly hard to disaggregate in evaluation of project performance. However, there are two caveats to this:

1. As noted above, these circumstances have not always impacted the projects negatively. Many of the project functions and processes have been designed to be delivered principally or entirely online, and so are relatively unaffected.
2. The detrimental effects they have created are not sufficient in explaining the difficulties and challenges projects have encountered across the three years of delivery. Projects have often pointed out that they cannot support significantly higher numbers of customers through their processes anyway, and progression of customers has often been slow regardless of the COVID context. Equally, many of the supply chain players targeted by the schemes have continued to be very busy regardless of restrictions.

The Green Homes Grant (GHG)

An appraisal of the Green Homes Grant voucher scheme (GHG) is not within the scope of this evaluation; a separate evaluation of that scheme is currently in progress. Furthermore, a wide range of policies will have had indirect effects upon the projects across the three years of the programme. However, the GHG is perhaps the most directly relevant, having been launched in September 2020 in the wake of COVID as an economic stimulus scheme with the aim of delivering a surge in domestic retrofit activity and stimulating the installer supply chain. As

such, it has been inextricably linked with the progress of the demonstrator projects in Year 3 of the programme.

At the outset, and across the project partners, the response from the pilot leads to the potential impacts of the GHG on delivery of the pilots was mixed, and its effects on the projects tended to become more rather than less negative as the scheme progressed.

All projects welcomed the *principle* of greater allocation of funding to support retrofit, and the GHG undoubtedly raised household interest in retrofit activity. As well as clear correlations between the GHG being announced and an increase in per month numbers of customer enquiries, the evaluation found strong anecdotal evidence of customers directly choosing to engage in the projects because they had heard about the GHG.

Furthermore, the deadline for GHG applications (March 2021) meant many customers were motivated to make prompt decisions and progress actions rather than deliberating. This was integrated into project marketing i.e. 'to enable voucher use before the deadline, you need a home assessment now'; and projects (e.g. Cosy Homes) have tried, where appropriate, to include GHG-eligible measures in the recommended 'first phase' measures of Whole House Plans.

However, evaluation interviews with pilot delivery partners, wider stakeholders, and even some customers and installers, highlighted a number of concerns about adverse effects the GHG was having on the schemes, outweighing potential benefits:

- Measure mix – the project leads argued that, whether intended or unintended, with its six-month window the GHG tended to encourage a single-measure approach, rather than the whole-house approach being advocated by the pilots.
- Customer engagement – linked to the measure preferences the GHG influenced, whilst it generated an increase in customer enquiries, the projects found that this didn't translate to a greater conversion to action. Many customers wanted a quick route to the GHG and weren't interested in what they might have viewed as the more protracted approach being encouraged by the projects. The project teams were therefore expending resource in fielding these individuals when they were unlikely to become revenue-generating customers for the projects. In other words, the GHG encouraged measure installation, but not necessarily through the projects.
- Customer trust and engagement – due to delays in the administration of the GHG, some customers waited several months to hear whether or not their application was successful, affecting the timetable for delivery of works and potentially future engagement. Evaluation interviews with customers found some evidence of householders conflating GHG issues with the local supply chain projects, albeit related to administration / communications rather than installation quality.
- Supply chain distraction and engagement – the GHG was felt by the pilots to have exacerbated the aforementioned supply chain engagement challenges in three ways:

- Lowering householder, and so supply chain, interest in the projects' 'whole-house' offers, as GHG funding was sought by contractors through simpler single-measure projects.
- Delivering GHG-funded work required certain certifications which some of the supply chain signed up to the projects did not have. This meant that where a project customer wished to utilise the grant to offset the costs of works (and many did), some of the projects' already limited list of contractors were not eligible to do the work. That said, the perceived complexities of PAS and TrustMark certification did offer a route to attracting installers; Cosy Homes engaged contractors by offering to walk them through the certification process.
- The pilots reported that some contractors were unwilling to engage with the GHG scheme because of perceived concerns about scheme delivery. Where projects' householder customers wished to use the GHG, the project teams couldn't approach these contractors.

Project delivery - at a practical level, the projects found that it was time-consuming to integrate the GHG into their marketing strategies and messaging, as well as field enquiries from customers unlikely to progress through the intended project journey. This was at a time when delivery partners say they would have preferred to be focusing time and resource elsewhere. Indeed, one project found that due to the volume of customer interest generated by the GHG, it had not been sensible to launch a number of the planned promotional activities for fear of overwhelming their systems; those approaches were therefore not tested (at least within the funding period) and no learnings generated.

Future policy

Across Years 2 and 3, and regardless of the short term / unexpected challenges they faced, project teams advocated further changes to the wider policy environment to more fully support them in the achievement of the objectives of the demonstrator programme.

Throughout the evaluation, interviews with delivery partners, wider stakeholders and the supply chain have included discussion of policy opportunities. As part of the evaluation, in February 2021 a workshop was conducted with the five remaining participating project delivery partner organisations to discuss how retrofit at the scale required to deliver government targets might be delivered. Commonly recommended measures from both these conversations, and the wider secondary research / evidence review conducted as part of this evaluation, are summarised below[21]:

- An umbrella / overarching national programme of retrofit which can give weight to the various area-based initiatives that themselves bring the benefits of local knowledge and coordination. And potentially as part of this programme, extension of funding for retrofit,

[21] Some are also covered in Fawcett, T. and Topouzi, M. (2019) What buildings policy might look like if we took climate change seriously. IOP Conference Series: Earth and Environmental Science, 329. 012004.

albeit with the GHG issues addressed to ensure any future scheme aligns more with the policy goals around effective whole-house retrofit. The Energy Efficiency Infrastructure Group (2020) and ClimateXChange (2018) research have argued that policy stability and predictability are important for retrofit policy effectiveness, both for the development of householder demand and the capacity of supply side actors to respond: *"[they] provide confidence for industry to invest in the supply chain, and for consumers to invest in their homes."* Along these lines, the Construction Leadership Council recently published a report emphasising the need for a multi-phase National Retrofit Strategy, requiring significant investment in sector skills development, and householder communications and incentivisation[22].

- As endorsed in the findings from the demonstrator projects, ensuring that messaging to the public on the benefits of retrofit doesn't focus solely upon environmental or cost reduction benefits, but wider benefits such as health, comfort, and even house values. Though as pointed out in Energy Efficiency Infrastructure Group (2020) research, energy cost reductions will be valuable in regions most affected by unemployment, under-investment and fuel poverty, reducing geographical disparities.
- Whilst views on the effectiveness of EPCs are mixed[23], suggestions for enhancing these include mandating up-to-date EPCs for all properties (i.e. not just when let or sold) and, linked to this, reducing the lifetime of an EPC, meaning more regular updates. It was also felt that there could be stronger enforcement in areas where EPCs are currently required under existing regulations.
- Government signalling. Those consulted through the evaluation suggested gas price rises, more stringent building regulations, favourable VAT on retrofit activities and products, and / or property values taking energy efficiency more into account, as clearer signals - to consumers but particularly the supply chain - as to the future direction of travel and destination, and so motivating action now. Even if not immediate, respondents recommended the trailering of future policy steps, citing the effectiveness of those on the phasing out of diesel engines and encouragement of EV take up: *"You've got some contractors that are doing pretty well, they're making loads of money. The only way to get those sorts of people to redirect properly is for there to be a long term vision put out by government [to show] that retrofit is here, and here to stay."* As several stakeholders highlighted, new standards / regulations would need to be enforced: *"In theory we could use MEES [Minimum Energy Efficiency Standards] to ensure landlords improve the efficiency of their properties. But we can't afford to have a MEES enforcement person. It's great to put policy on paper. But pointless if there's no enforcement."* And in designing enforcement, stakeholder questioned the effectiveness of financial penalties unless they were relative to landlord size: *"The big landlords…they'll just write a cheque."*

[22] https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2020/12/CLC-National-Retrofit-Strategy-final-for-consultation.pdf
[23] Shown for example in the LENDERS project Innovate UK (2017)

- Focused on supporting the development of supply chain capability to embrace retrofit opportunities, Killip, G. (2020) argues for an overhaul of the construction sector, building greater 'competence' (understood as a blend of '*theoretical knowledge, practical skill and integrity of character*'). Specific recommended measures to stimulate this include industry licences, regulation of building performance outcomes, greater required accreditation (with associated training), properly resourced compliance checks[24] and stringent enforcement. Whilst acknowledging the risks of such a major reform programme, the paper argues that the counterfactual risks of the status quo may be more severe. In the workshop, demonstrator project leads argued for attractive training opportunities in retrofit, both for the existing construction workforce and for new entrants into the industry, that embed low carbon in construction courses. Projects also supported a national apprenticeship programme (especially for more technical / substantial measures like external wall insulation). There is evidence of growing recognition of the need for upskilling in the industry e.g. in the CITB's Building Skills for Net Zero report, published in March 2021.
- Linked to this, BEIS consultations on Building a Retrofit Market (2019) and Energy Efficiency Infrastructure Group (2020) research highlighted the need to consider the economic opportunities associated with what might appear to be costly / high risk interventions. These include improved public health outcomes (and so potential to re-focus resources), significant job creation, upskilling of the workforce, investment in manufacturing, export opportunities, and increased equity value.
- In the workshop with the demonstrator projects, many participants stressed the need for open and transferable data for individual properties in order to support wider retrofit activity. A key recommendation was a "building passport"[25], which would stay with the property over time and provide information on its fabric and energy performance, information that could be used to build a Whole House Plan. One participant argued that EPCs do not contain sufficient accessible survey data.
- Cost remains a key barrier. Even amongst the able-to-pay early adopters targeted by projects in the demonstrator programme, a substantial proportion of drop-out has been due to customers baulking at the estimated costs of significant retrofit. Regarding finance to support retrofit delivery, the Green Finance Institute (2020) has published a number of suggested mechanisms and approaches, listed below. In addition to these, several householder respondents to the evaluation suggested that council tax bands could be adjusted / tailored to incentivise retrofit:
    - Mortgage and similar products to allow homeowners to unlock equity in their property to pay for retrofit on favourable terms.

[24] Compliance checking would not only enforce regulations, but could also highlight issues in industry practices and processes, which could then inform the future development of training.
[25] Also covered in the Green Finance Institute (2021). Building Renovation Passports: Creating the pathway to zero carbon homes

    - A salary sacrifice scheme that allows employees to invest in home energy improvements. A similar mechanism has been used for the Cycle to Work scheme.
    - Certification for financial solutions supporting retrofit, enhancing the confidence of lenders and borrowers.
    - Financial institutions providing long-term capital for retrofit projects, with LAs / independent third parties collecting and passing on repayments via property charges.
    - To incentivise landlords, providing Green Leases, and adjusting the 'affordable rent' definition to include modelled energy costs.
- Finally, evaluation interviews with wider stakeholders and supply chain representatives highlighted two potential investment areas for the UK:
    - One supply chain representative highlighted the 'bio-based construction' sector as having potential, commenting that companies in the sector are currently too small to meet demand, but that there are a number of UK manufacturers and there is scope for growth in this area, on the basis that *"healthy buildings"* and indoor air quality are becoming more of a concern.
    - Regarding building supplies issues, most respondents to the evaluation hoped that these would start to ease as COVID restrictions are removed and post-Brexit disruption lessens. However, one supply chain representative suggested that certain products could be manufactured in the UK to better secure their supply, e.g. heat pumps and certain types of insulation.

In the next six chapters, this report focuses on each of the six individual demonstrator projects, providing an outline of their approach and delivery over the programme, though with particular focus on the latest Year 3 delivery, exploring project-specific successes and challenges. The report presents first the three projects adhering to the 'RetrofitWorks' model, with a focus on the retrofit coordinator role and a fairly fixed customer journey, then discusses the other three, more flexible, schemes. A concluding chapter discusses key implications and learnings arising from the projects and evaluation findings.

Ecofurb (London)

Delivery organisations	Led by Parity Projects with partners RetrofitWorks, Icaro and the Behaviouralist.
Summary of the project approach	Ecofurb is one of three demonstrator projects that embodies the 'RetrofitWorks' template. Customers can drop out of the process at any time / just utilise a specific service, but the intended journey is for the customer to be supported through the whole process by a retrofit coordinator, from identifying the optimal retrofit measures to quality assurance of installations: • Prospective customer finds out about the project, visits the Ecofurb website and completes the Plan Builder survey (essentially a remote assessment of suitable measures and priorities). • The customer is then passed to the Ecofurb team who assign a retrofit coordinator and the customer signs up for an Ecofurb Plan (coordinator visit and follow up report). • Customer liaises with the retrofit coordinator and chooses a package of measures to progress. • The coordinator helps to finalise specification and gather prices from several vetted contractors, and puts the agreed contracts in place. • Only contractors signed up to the scheme (who meet quality requirements) are approached for quotes. To date supply chain recruitment has been ad hoc and largely focused on organisations already known to Parity / RetrofitWorks. • Measures are delivered under the project's management and the coordinator conducts customer liaison and QA throughout.
Supply chain recruited as of March 2021	36 – the majority being SME companies (few sole traders) operating at different scales (5 nationwide; the rest vary between operating solely within London, covering the surrounding counties, and covering the whole of the south of England).
Number of customers entering the customer journey (i.e. not	78[26]

[26] This includes triallists who did not pay for their Ecofurb Plan.

just enquiring but agreeing to pay for further services/advice)	
Retrofits completed as of March 2021	1
Key successes	• Engagement of a number of London Borough Councils with the project through use of the CROHM tool. • Finalising and launch of the online platform and 'Plan Builder' app, providing initial home assessment and a low-resource filter for less engaged customers. • Substantial customer engagement and use of the Plan Builder since launch, • Albeit potentially self-selecting, most 'signed up' installers value the role of the retrofit coordinator, and the collaborative nature of the project. • Good levels of customer satisfaction with the Plan Builder and (where accessed) subsequent project support. • Appointment of dedicated resource for supply chain recruitment. • Strong London Borough Council support for the project.
Key challenges	• The atypical 'London' context e.g. housing profile, conservation areas, minimal parking. • Installer supply chain recruitment and obtaining timely quotes from those ostensibly 'signed up'; issues felt to be exacerbated by the GHG. • Delayed launch to householders due to concerns about the numbers and availability of the project supply chain to meet demand. • Delays to progression of 'signed up' customers, largely due to the limitations of supply chain participation. • High proportions of customers primarily motivated to engage with the project in order to access the Green Homes Grant, often for single measures. • Some customer dissatisfaction with delays, communications and overly-technical reports.

Supply chain engagement

As of March 2021, Ecofurb had 36 contractors 'on the books', albeit a number of these are set up to deliver multiple measures.

The core issue for Ecofurb, and one shared across the demonstrator projects, was that some contractors were not responding (either at all or at least in good time) to the project's requests for quotes. One partner reiterated that for the quotes system to be meaningful and prompt, there needed to be, for each measure, at least three contractors capable of delivering it. This was not the case for some measures as of March 2021.

The issues are well understood: good contractors are busy, used to finding their own customers, some aren't particularly interested in growing, and many of those that might be want to see significant customer demand to be interested. A recent supply chain engagement event also highlighted the issue of some supply chain firms trusting only their own property surveys / assessments in order to form quotes.

This issue – of good firms being sufficiently busy not to need to quote for more work - was highlighted in Year 2. However, anecdotal evidence from the evaluation, and conversations the project team have had with supply chain contacts, strongly suggests that this issue was exacerbated by the GHG. Many firms opted to fill their schedules with quicker, simpler, single measure jobs that carried less risk and didn't involve the oversight of a retrofit coordinator. The short timescale of the GHG meant funding support was geared to things that could be done quickly. The project team reported that there are firms still delivering big refurbishment projects, but that they tended to be very busy, with some not even taking future bookings.

This delay in provision of quotes frustrated some customers, with some disengaging and seeking contractors themselves. Perhaps a consolation for Ecofurb was that many customers who attempted to obtain quotes themselves found it equally difficult: *"whilst they are quite frustrated, there is at least a sense that it's not necessarily us."* None of the Ecofurb customer interviewees had had any engagement with contractors through the Ecofurb project as of March 2021. A few had tried to contact contractors directly and said they couldn't get a response. *"I contacted around 12 contractors who said they did external wall insulation and only one got back to me."*

Even without the wider context, the project team feel supply chain engagement would have been challenging. Both Parity and RetrofitWorks are based in London and have conducted many successful projects in the city. Yet in Year 2, prior to the GHG announcement, RetrofitWorks contacted around 300 supply chain organisations and found very limited take up. Ecofurb engaged in cold calling, sending out mailshots and, where possible, arranging one to one meetings with interested installers. One council considered that they (the council) could be working more to join up their social housing work supply chain with Ecofurb's. The same council noted that pending evidence of impacts, they may be prepared to help fund Ecofurb.

There is however sufficient retrofit coordinator resource in London (attributed by some to the presence of Parity, RetrofitWorks and recent retrofit schemes). London Borough Councils

(LBCs) are very supportive of the coordinator role in Ecofurb because of challenges (over-pricing, technical issues, consequent householder loss of confidence) encountered on previous schemes without the role. Ecofurb assigns jobs to suitable coordinators based on their specialisms in certain measures or property types. One partner commented that it can be a challenge to manage some retrofit coordinators: *"they come with their own biases. And the role attracts people who may not be as hard-nosed and commercial as they need to be."*

Supply chain outcomes

With only one retrofit completed as of March 2021, Ecofurb has not generated evidence of delivering the supply chain benefits sought by the demonstrator programme: greater coordination of work, supplies and labour; and movement of installers to the owner occupier domestic market[27]. The scheme does not include formal provision of training for installers, and does not seek to increase installer confidence in offering retrofit to customers, as the project team 'sell' to customers and manage those communications / that relationship.

In Year 2 and 3 of the evaluation, interviews were conducted with supply chain firms signed up to Ecofurb. Many of those interviewed said they had been invited to join Ecofurb off the back of a pre-existing relationship with one or more of the delivery partner organisations. Aside from this, one contractor had heard about the scheme through Trustmark. All hoped that the scheme would boost business, but many equally valued it because of their firm's ethics: "*I'm a big fan of being green and saving energy."*

The interviews found that those who had signed up to Ecofurb were motivated and satisfied with their involvement to date, even though for most this had been limited to providing a handful of quotes. Some firms reported that they valued working with knowledgeable retrofit coordinators, who can build their skills and knowledge on specific properties and measures, and enable more confident quotes: *"they know their stuff and they give us a good survey; we can price from that."* However, several contractors said it would be beneficial for them to do their own survey of properties before quoting, rather than being reliant upon the coordinator report and photos. Several respondents also said they valued the collaborative nature of the scheme: *"We learn more…by working with others."*

Householder engagement

Stakeholders described particular issues for a London retrofit scheme; a high % of solid wall properties, a high % of flats, a large number of conservation areas, minimal parking, the Ultra-Low Emission Zone and lower levels of English as a first language. Some of these perceived challenges did chime with the evaluation interviews with existing customers, though, as might

[27] Though some of the contractors working with Parity and RetrofitWorks on previous social housing schemes have been invited to provide services for Ecofurb.

be expected for early adopters still participating in the project, responses and customer profile did not vary considerably from those found in other projects.

Active marketing of the offer to customers was delayed to Year 3, principally because of concerns about the supply chain not being ready to meet significant demand. Ecofurb's marketing plan was to undertake marketing in targeted areas, once the digital user interface had been launched and Parity Projects and RetrofitWorks were confident that the project has enough installers in London to handle demand. The GHG rendered this approach unnecessary.

The scheme is designed to start at the Ecofurb website. Since the soft launch in August 2020, there have been c.2000 website users. Of these, there have been c.650 customers utilising the Plan Builder. The project website analytics show steady but low numbers, which then grew rapidly around the time of the GHG launch. This is also the point at which the scheme itself launched, therefore it is hard to absolutely disaggregate interest in the scheme from interest in the GHG, though enquiries and click-throughs spiked when RetrofitWorks were listed on the Simple Energy Advice and Trustmark sites.

Because of this, and the capacity of the project to process customers, significant marketing effort was rendered unnecessary, and has been limited largely to activity amongst a group of LBCs, and maintaining social media and the website: *"We've always wanted to do digital-first approach. We want people to be registering online, so we want them to see us online, click through, go through the Plan Builder and register that way."* The design of the marketing has been to have this digital approach 'backed up' with other channels to provide endorsement and build brand awareness. The messaging in project promotion has led with climate-focused information but also included an emphasis on warmth, comfort and lower bills. The project was also promoted by project partners and wider stakeholders, not least a number of LBCs who have featured the project in bulletins. Beyond the marketing channels utilised by the project and its partners, a large proportion of customers arrived at the Ecofurb site through the Simple Energy Advice (SEA) website or Trustmark.

The Ecofurb team lack strong evidence as to which marketing routes have worked and which haven't. Inability to properly test marketing collateral has been one of the key issues arising from not having had to conduct much marketing, and the team currently has little data from which to refine / design approaches in future. In terms of generating enquiries, the largest number have come through the SEA website. However, the quality of the leads (in terms of conversion to customers working through the full journey) has been mixed. The overall project team view on the GHG is that it has been effective as a mechanism to stimulate activity, but is in conflict with the type of retrofit and supply chain the demonstrator projects are being asked to build. Amongst those contacting Ecofurb after having heard about it through SEA or Trustmark (a proxy for being initially motivated by the GHG), there was a much lower conversion to taking up the Ecofurb support offer than amongst customers from other sources - 9% vs. 38% respectively. The former group tended to have less existing knowledge of Ecofurb and its purpose / approach, and tended to want contractor quotes rather than advice.

Customers interviewed in Years 2 and 3 of the evaluation had heard about Ecofurb through a wide range of sources. As well as GHG channels, these included council newsletters and events; other events where Ecofurb had a stand; via contractors (who were unable to do the work the customer had sought and suggested they contact Ecofurb); word of mouth from a friend; and online searches. Tying in with the project team's aim of different marketing channels reinforcing each other in the customer's mind, two interviewees mentioned hearing about the project in multiple ways: *"I did some online research, then an architect I've been working with (not related to retrofit) suggested I contact Ecofurb."* Those discovering Ecofurb through their council said that this source had given them confidence in the project.

As noted above, householders that chose to register with the project seemed to match the profile of enthusiastic early adopters. Amongst customers interviewed in Years 2 and 3 of the evaluation, most had already installed some of the lower intensity retrofit measures (glazing / draughtproofing / loft insulation), or were aware that these had been done to their property before they moved in. All but one reported environmental considerations as their motivation for exploring retrofit at all, with some referring specifically to the climate crisis. Most also mentioned bill reduction and comfort / warmth. One customer also mentioned wanting to support new technology. Most customers had been thinking about getting work done for some time; in several cases for more than a decade, though for a few a recent move to an inefficient home had been a trigger. Many acknowledged that they had been prompted to take action now because of the Green Homes Grant.

Indeed, several Year 3 customer respondents said that they had contacted Ecofurb specifically because they wanted to access the GHG. Some wanted a home energy assessment or retrofit measure options and recommendations, though the majority of this group also wanted to access the GHG. *"I was prompted to take action because of Green Homes Grant and the short deadline. I needed to know with more certainty what needed to be done to the house."* Several customers contacted Ecofurb purely because of the GHG but, having spoken to Ecofurb, were persuaded of the merits of having a whole house assessment before deciding which measures to pursue: *"I was interested in the government scheme and then Ecofurb said 'we'll do a proper survey' and I thought well, okay."*

Whilst some customers were primarily seeking an Ecofurb Plan, others were looking for a company that could organise and install measures for them. In a couple of cases, customers did not feel they needed an Ecofurb Plan, as they felt they already had a good understanding of the work that was required: *"I'm an engineer and I knew exactly what I wanted; I just wanted someone who could quote for and install EWI and access the Grant for me."* Some customers contacted Ecofurb to find out more about specific technologies (e.g. heat pumps, replacement windows or the right kind of insulation), and one to get help with planning issues related to EWI (External Wall Insulation). Most respondents had not explored any alternative support; one interviewee had started by trying to find a contractor directly (to install a range of measures) but wasn't able to find any available; one of the contractors they contacted had pointed them to Ecofurb.

Whilst principally an information-gathering tool to provide Ecofurb with valuable data and context before engaging with a customer *("customers come with an idea of what they need and*

how much it will cost"), the Plan Builder has been valuable in helping customers for whom Ecofurb is not the right route to realise this and drop out before taking up significant project team resource. However, customer interviews in Year 3 indicate that the process has persuaded some of those initially pursuing single measures of the potential benefits of an Ecofurb Plan to explore wider options. The initial plan generated by the Plan Builder, along with the Ecofurb Plan, is seen by the project team as a useful stand-alone service that customers could take to contractors independently if they wished, but this is coincidental rather than by design: "*…that's not where we're going to be making the money."*

The main adjustment to the customer journey in Year 3 was driven by the team being unable to process the large amount of customer interest. Upon filling out the Plan Builder, customers receive an automated email asking if they want Ecofurb to let them know when they have availability to support them. Some customers have dropped out at this point, and even some of those requesting further support have dropped out as the wait for contact from the scheme has been too long[28] for them.

A key success from the project has been Parity Project's development of the CROHM stock assessment tool[29]. Several LBCs have historically worked with Parity and RetrofitWorks on other programmes and have utilised the CROHM tool[30] (without charge) to inform their own strategies, building a picture of the housing stock in their area. Whilst councils focus on their own stock, those engaged with the scheme see Ecofurb as vital in engaging the private homeowners that comprise a significant proportion of the council's carbon emissions, and so supporting the council in meeting climate commitments. The councils are aware that Ecofurb are currently under-resourced to meet demand, but feel that the components of the scheme – the Plan Builder, Ecofurb Plan and overall customer journey – are solid. One council commented that they appreciate the scheme's whole-house ethos: *"They aren't just trying to sell x number of loft insulations."* Council stakeholders / partners were also complimentary about the governance of the scheme: *"Ecofurb is one of the most well managed projects I've been involved with."*

Household retrofit activity

Amongst those paying for an Ecofurb Plan, drop out has been low; of the 49 that have had an Ecofurb Plan, only one has said they definitely do not wish to progress further. However, due to delays in engaging contractors, the lead partners envisage further drop-outs if customers can get quotes more quickly elsewhere.

Analysis conducted by the Ecofurb project team found that the target turnaround speed for booking in and carrying out home surveys was – on average – being met. However, turnaround speed for delivering Ecofurb plans, conducting follow-up calls, and sending out Client Service Agreements was 3-4x slower than initially targeted. Since RetrofitWorks has

[28] Often weeks, sometimes months.
[29] http://parityprojects.com/professionals/crohm-retrofit-stock-assessment/
[30] https://parityprojects.com/wp-content/uploads/2019/10/CROHM-Summary-SH-Oct-19.pdf

recruited and trained office support, targets are being met throughout these early stages of the customer journey.

In terms of being able to process the customer pipeline efficiently, Ecofurb also benefited from a strong knowledge of customer profile and priorities through the Plan Builder, and through having some directly employed coordinators that could give all their time to the scheme. This differs from the other projects where most coordinators are part-time, freelance, and tend to devote some/most of the time to their other (often core) business. Despite this, a lack of contractor engagement has led to difficulties for the project in progressing customers beyond the Ecofurb Plan and Building Performance Specification (BPS) stages.

The evaluation made sure to cover customers at different stages of the customer journey. Some had only completed the Plan Builder tool and were either waiting to be contacted to progress (which some were finding frustrating) or had decided not to go any further, often due to the delay that Ecofurb had informed them of. One respondent also felt they did not need what the service was offering and was planning to access a contractor directly*: "I've already got a plan which I've developed myself. I'm not prepared to pay for the whole house plan."* Of those that had received a WHP, there was confusion about next steps; some were keen to go ahead and discuss which measures to proceed with but were waiting for Ecofurb to contact them. *"I've received my report and I'm really keen to go ahead with the measures but I'm waiting for Ecofurb to contact me; I know they've been very busy."* Others thought they needed to contact Ecofurb about the next steps, but hadn't got round to this yet, for one due to the complexity of the report - it seemed this customer would benefit from a further conversation about the Ecofurb Plan.

Where customers had used the online Plan Builder, they were generally satisfied with this, commenting that it was straightforward to use and it was interesting to see potential savings and to get an idea of priorities. Where customers had paid for and received an Ecofurb Plan, they were also satisfied with this. Individuals commented that the survey was well done, and they were satisfied that they got good value for the cost. Customers valued the knowledge of the Ecofurb team, and the coordination of contractors: *"Ecofurb take that work off our hands, and they have the expertise to talk that language with contractors. I would have no idea whether contractors I found individually would be the right ones or would do a good job, or whether their quotes were reasonable. So that's absolutely worth the money – getting that confidence in the companies and their quotes."*

Despite the good satisfaction levels, customer respondents suggested a number of ways in which the service could be improved:

- Many issues related to communication. Several customers expressed frustrations over management of timing and delays at different stages of the process, whether waiting to arrange a home assessment, or receiving a post-assessment Ecofurb Plan: "Timewise I would give them 1 out 10. I didn't get any contact…I had to be the one chasing them." Several said momentum had been lost on taking action; for one customer, the lack of communication led them to decide to look elsewhere for a quote. Some customers were understanding of the reasons for the delay: "It's obviously frustrating to wait so long. But

there's a huge shortage of expertise and companies, so I accept it will take a while." The planned extension of the GHG to March 2022 meant customers were more patient than they might have been otherwise, although the scheme was eventually scrapped in late March 2021.

- Several customers found the Ecofurb Plan to be a bit too technical, and lacking in information on the level of disruption involved with particular measures. "Some of the phrasing was a bit scientific." Some would have liked more dialogue with the retrofit coordinator, either because they didn't understand the recommendations, or to discuss the phasing and prioritisation.
- Several customers expressed frustrations with the Green Homes Grant (e.g. eligibility, or grant amounts) and conflated these with Ecofurb.

Interviews with Ecofurb retrofit coordinators highlight that in a number of cases customers have baulked at the unexpectedly high costs of certain measures, especially EWI: *"Some will say 'I had no idea how much was involved; I need to think; I need to save up for more money'."* But coordinators emphasised the value that customers have placed on their services: *"I would say it's hugely informative and helpful. One early comment sums it up - from a client who said, 'I don't understand why my builder, interior designer, architect and structural engineer weren't able to tell me any of this!'"*

None of the customers interviewed for the evaluation had installed measures. Though none had definitely decided *not* to do so, several said that whether or not they did, they wouldn't be proceeding through Ecofurb, due to the project teams' lack of availability: *"They didn't get back to me so I assume they are too busy."* Others were either awaiting a home assessment, the subsequent Ecofurb Plan or discussion of that Plan. Some that had received a WHP were still considering whether to go ahead – cost being a key consideration - but felt that if they did go ahead, they would do so through Ecofurb.

Customers that had received at least some support at least partly attributed subsequent action to Ecofurb, though some tied this to the project enabling them to access the GHG. Several reported that they would have found it challenging to take forward retrofit without Ecofurb: "*Ultimately what we would end up doing otherwise is probably doing a bit of research on line, having a best guess and maybe getting it wrong, or maybe doing nothing because we're concerned about getting it wrong."* One customer said that they may end up installing more measures than they would have done without Ecofurb support. *"I may not have gone ahead with insulating the extension. I wouldn't have a clue how to go about that without Ecofurb."* One customer said they would definitely be installing measures more quickly than they would have done without the project. Another respondent said they would be installing the same measures within broadly the same timeframe, but that because of the Ecofurb advice they would be installing them in a different sequence.

As of March 2021, 9 customers had paid for a Building Performance Specification (BPS), the more detailed study following an Ecofurb Plan; a further five have had their BPS and requested that Ecofurb source quotes for them. Two installations were in progress and one completed.

Whilst not guaranteed to progress, analysis conducted by the Ecofurb project team provides a sense of the profile of retrofit projects that customers have indicated that they wish to implement. Of these, the average project cost (inc. VAT) is just over £20,000, with average per annum energy bill savings of just under £700 and carbon savings of over 3tCO_2e (corresponding to typical EPC rating improvement of D to C).

Beyond the BEIS grant

Regarding the influence of the BEIS grant upon the scheme, delivery partners emphasised that they would have been attempting a scheme with broadly similar aims anyway[31]. However, they would have lacked the funding for key project team management roles, or website development, and such a scheme would have been *"a very poor version of what we've got."* They also said that the fact that funding was delivered by BEIS meant that there was more rigorous management of spend: *"you really stretch your money because you have to justify where you spend it."* The benefits of the demonstrator programme have not been solely financial; it was felt by the team to have given the project a structure and kept its goals prominent: *"reporting to BEIS refocuses you on certain points every month."* The project leads feel that in general, having a third party to monitor and challenge delivery against deadlines helps avoid project drift and challenge original decisions. With reduced resources and a less structured and focused project, one partner organisation estimate that it would have taken *"maybe six or seven years"* to get to the stage Ecofurb is now at.

Over the past three years, enabled by the BEIS grant, Parity and RetrofitWorks have predominantly focused resources on ensuring a solid foundation for Ecofurb, developing and refining scheme processes and systems. Meetings over Year 3 of the project have largely been online, and this has provided an efficient and cost effective option that can be continued as the project moves forward. The project delivery leads therefore anticipate that beyond the BEIS grant, project costs will be largely limited to the operation of Ecofurb. The delivery partners argue that whilst they could have focused efforts on simply ensuring customer throughput and delivering more on programme targets, their concentration on the processes and operation *"gives the best shot of Ecofurb working in the longer term."*

Parity made clear that they would continue Ecofurb with no major changes planned, accepting that as of 1st April it would not be *"a self-sustaining business model"*. Because of this they wanted to be able to test the viability of the model as soon as possible after grant funding came to an end. The 'mid-growth' business plan overview produced by the Ecofurb team had a target – from July 2021 – of 24 Ecofurb Plans, resulting in 18 CSAs, resulting in 16 retrofits per month, with projects averaging £14.5k. This projected a significantly greater rate of interested customers progressing through all stages of the journey than has been seen to date. The period of non-profitability would be offset by both continued investment from Parity Projects

[31] Parity Projects has been developing the RetrofitWorks model for several years. The partners used the BEIS funding to accelerate a process they were committed to already.

and income from wider partners (related to software licences, consultancy and other insight). The expected budget allows for ongoing service / process development.

Parity's current expectation is that a year will be a sufficient timescale for assessment, pointing out that any improvements in take-up and works – perhaps alongside a more conducive wider environment in terms of COVID and the GHG – will reduce the costs and risks in this period: *"if we reach a point where we're bringing in enough income to cover basic salaries, that would be a good turning point."* Delivery partners are also considering whether and to what extent the (currently very supportive) LBCs may be willing to contribute financially to the scheme, thus extending the window in which it would need to become self-sustaining.

Two factors mean that some steady months of trading are needed to fuel steady growth. Firstly, to expand (without a higher level of investment at risk than already allocated by the organisations involved) requires income from completed installations. Secondly, it is assumed that it will become easier to attract more contractors to the model once there is a greater volume of 'able to pay' work to demonstrate. One longer term concern expressed by the delivery partners is not knowing the point at which they will have *"gone through"* the easy-to-engage early adopters, but the issues and focus at the moment is on contractors.

Beyond ensuring sufficient customer throughput for Ecofurb in London, the project team have ambitions to expand the offer into surrounding areas: "*we are getting enquiries from the Home Counties."* The nascent Otley Energy project in Leeds is evidence that the RetrofitWorks model is being taken and applied in other areas and contexts. Currently the project delivery partners are considering how the set up costs – recruiting scheme managers and coordinators / contractors – for such expansions might be met as it is unlikely these could be covered by Ecofurb. One option is seed funding from local authorities, though one respondent felt the LAs may need to be incentivised by government to take that leap, perhaps through *"match funding or a loan fund?"*

Cosy Homes (Oxfordshire)

Delivery organisations	The National Energy Foundation (NEF) and Low Carbon Hub working in partnership with RetrofitWorks.
Summary of the project approach	• Prospective customer finds out about the project (usually through community group networks, including events, Cosy Homes presence at third party events, and / or social media activity), enquires and signs up for a Whole House Plan (retrofit coordinator visit and follow up report). • Customer liaises with the retrofit coordinator and chooses a package of measures to progress. • The retrofit coordinator helps to finalise specification and gather prices from several vetted contractors, and puts the agreed contracts in place. • Measures are delivered under the project's management and the coordinator conducts customer liaison and QA throughout.
Supply chain recruited as of March 2021	106[32] - all SMEs (approximately 30% micro, 60% small and 10% medium), mostly local (33%) or regional (49%), and a high proportion of sole traders (40%).
Customers that registered with the scheme ('referrals')	569
Retrofits delivered as of March 2021	6
Key successes	• Utilising the 'Plan Builder' app (shared across Retrofit Works' projects), providing initial home assessment and a low-resource filter for less engaged customers. • Substantial customer engagement from the outset of the scheme, despite minimal marketing.

[32] Some double counting due to multiple-measure contractors.

	• Albeit potentially self-selecting, most 'signed up' installers value the role of the retrofit coordinator, and the collaborative nature of the project. • Good customer satisfaction with the home assessment / Plan Builder and (where accessed) subsequent project support. • Recruitment of sufficient retrofit coordinator resource to meet current customer demand. • Appointment of dedicated resource for supply chain recruitment.
Key challenges	• Installer supply chain recruitment (generalist builders and for some specific measures) and obtaining timely quotes from those ostensibly 'signed up'; issues felt to be exacerbated by the GHG. • Limited promotion of the scheme to householders due to concerns about the numbers and availability of the project supply chain to meet demand. • Delays to progression of 'signed up' customers and significant numbers dropping out of the process, due in part to customer profile but also supply chain limitations. • Some ostensibly able-to-pay customers are baulking at the costs / fees involved in whole house retrofit through the scheme. • Some customer dissatisfaction with delays, communications and overly-technical reports. • Limited appetite amongst organisations targeted to participate in the Cosy Homes 'Trusted Brands' concept.

Supply chain engagement

The scheme has recruited 106 supply chain organisations – 95 contractors[33], 8 retrofit coordinators and 3 architects. Contractors have been in part recruited from pre-existing Low Carbon Hub and RetrofitWorks contacts. Others have been recruited through an individual working across the three projects involving RetrofitWorks, with a specific remit to engage and recruit contractors. This ensured that Cosy Homes had the space to talk contractors through the membership of the scheme / RetrofitWorks co-op and the benefits of joining, as well as assisting with the administrative process of becoming a member: in other words,*"slimming the onboarding process."* It was also necessary to look outside Oxfordshire for contractors to deliver specific measures. Personal recommendations – from delivery partner organisation

[33] Albeit the number of individual contractors is lower than this, as contractors are counted by Low Carbon Hub for each measure they can cover / install.

colleagues and through community groups – were also vital in reaching generalist builders in particular. In March 2021 Cosy Homes hosted an online conference to engage the supply chain, comprising presentations and discussions on specialist topics, technical and softer skills (innovation, entrepreneurship), and networking opportunities.

Several delivery partners described a constant struggle throughout to balance customer demand and scheme supply chain capacity: *"it's really tricky, because you need to be able to point to the homeowner interest to get the contractors on board."* However, as referred to in the "Household retrofit activity" section below, the key challenge for Cosy Homes has been securing quotes and commitment to work even from those ostensibly signed up to the scheme, let alone other contractors they may approach.

The Cosy Homes scheme contractor matrix shows good coverage for most individual measures, but EWI[34] installers, glaziers and general builders have been hard to recruit and secure active participation from. Moreover, the team are concerned that there may air source and ground source heat pump supply issues in the future due to large and growing demand.

Regarding general builders, Cosy Homes have found some interested in taking on more work and expanding the business: *"We are finding a small number of firms saying they can scale up for Cosy Homes – they're the ones we want."* However, the typical experience was that the contractors they wanted to engage *("the ones who get it"*) are very busy, and often have no desire to grow, with low / no marketing costs and no issues getting work. It was noted that many pay Check-a-trade or similar services for leads. On the ostensible benefit of the WHP providing the data to save contractors time and money in formulating quotes, some contractors still wanted to do their own surveys, increasing overall costs for the customer. In summary, for significant parts of the target installer supply chain, the Cosy Homes was not sufficiently compelling when weighed against the drawbacks, i.e. giving away a % of revenue (or having to overcharge the client to avoid that), and being monitored and quality assured.

The evaluation explored the solutions Cosy Homes developed to this seemingly intractable problem. Several project representatives talked more generally about building the supply chain, investing in training and apprenticeships: *"There's jobs and a market there. How do we get the young and unemployed into training programmes?"* In addition to streamlining the onboarding process, certain members of the project delivery team have been mentoring individuals to upskill and join the supply chain. Aside from these steps, one project team member talked about adjusting expectations to accommodate the busy contractors: *"For really good ones with full order books, it's about timing. If you ring them up with a project and say 'can you do it?' They'll say no. Instead I talk to them about work we might have at the point of their next gap…we're getting them to quote for projects in 2-3 months' time. They aren't ready to jump in straight away, but they know we've got work when they want it. We need them to feel working with Cosy Homes is a nice sausage machine – nice projects, being paid the right amount, at the right time, with the right profit."*

[34] Taking EWI as an example, Cosy Homes had eight retrofit projects lined up featuring EWI and went through five potential installers trying to secure just one.

On the basis that the programme was designed to find solutions to known supply chain challenges, and that the projects had formulated approaches and agreed KPIs, the evaluation explored whether installer recruitment had been a greater challenge than envisaged at the outset, and if so why. Discussions with project delivery leads indicated that in part there may have been optimistic expectations based upon previous, not directly comparable scheme experiences (e.g. RetrofitWorks's Greater London Authority projects). Various respondents also emphasised that the GHG compounded the contractor issues, with firms either being distracted by the more straightforward single measure opportunities, or withdrawing from the GHG scheme after poor experiences and therefore unable to deliver on projects where the Cosy Homes customer wanted to make use of the scheme.

Relatively speaking, retrofit coordinator recruitment has been less of a challenge. The issue was less about the number of coordinators attached to the project than the amount of time individual coordinators (often freelancers with their own businesses) could devote to it. Cosy Homes are considering giving new and existing RCs the option of being permanent employees so that the scheme had guaranteed hours from them, or at least formulating a guaranteed 'minimum days per week' arrangement. The other change, which was deployed to an extent, was an adjustment to the RC role to free up space. The original model was for RCs to do the work and customer engagement all the way through, but Cosy Homes have sometimes delegated contractor sourcing and coordination to other team members. Another idea is to combine the BPS and WHP.

As well as the supply chain, retrofit supplies have been an issue, and felt to have been exacerbated by COVID and Brexit. In particular, there are long delays on certain (popular) models of heat pump, and certain insulation materials (due to certain factories closing): *"Brexit is exacerbating the fact that the UK comes last in the chain for some materials anyway…the six new wood fibre insulation producing factories are all on the continental mainland and outputs will be prioritised there."*

Supply chain outcomes

With the project managing customers on behalf of contractors, and with no formal Cosy Homes contractor training, there has been little evidence of contractors upskilling in technical or softer skills through the scheme. However, in April 2021, RetrofitWorks rolled out a training programme to all members, comprising fortnightly to monthly 1-hour CPD sessions on whole-house retrofit.

Similarly, there has been insufficient retrofit progressed to date to evidence improved supply chain collaboration, coordination or economies of scale, though the Cosy Homes team are working to organise future jobs in a way that maximises efficiency. A member of the project delivery lead organisation highlighted the potential benefits of grouping customers requiring similar measures*: "There is an opportunity for Cosy Homes to do more of a blanket approach. There are houses that have similar builds on [the] same street."*

Householder engagement

The Cosy Homes project saw strong levels of customer interest since launch (over 550 referrals) and – like other projects – has had to consistently hold back on marketing activity to keep the customer interest and pipeline at a manageable level: "*Quite early on everyone got too excited and had lots of conversations with intermediaries and they then got excited. Lots of promotion [was] happening before the process was really fixed and [there were] contractors in place… [but] we don't want to funnel loads of people into a waiting list."*

Cosy Homes saw increased demand – in terms of new referrals – after the GHG launch, with referrals almost tripling around this time. This was also at a specific time when Cosy Homes's RC resource was limited: *"we probably didn't have enough retrofit co-ordinator resource to immediately meet the suddenly increased demand anyway, but absences compounded that."* Referral numbers in early 2021 indicate that the GHG spike eventually settled down. The spike led to a waiting list, with the team seeking to maintain contact with potential customers on that list, but this led to some drop out due to waiting times and householders losing interest.

Cosy Homes have found events (and the 1:2:1 conversations they enable) to be useful in awareness raising and encouraging householder engagement; COVID limited this activity, though online webinars on heat pumps and insulation have had some interest: *"Anything that enables conversations and answering questions based on house type has been good for us."*

All delivery partners agreed that community groups have been key to raising customer interest over the course of the programme. As of March 2021 there were twelve Community Advocates (i.e. local community groups promoting the Cosy Homes programme). In the latest Community Advocates meeting, group representatives felt that events and digital content had been effective, though admitted that they had not tracked customer take-up through these. Most groups intended to utilise the Cosy Homes marketing collateral built up over the programme to promote the scheme further in events iun summer 2021. Although there was no detailed assessment of the relative effectiveness of different methods, the delivery partners detected spikes in referrals after events. Some more specific community group approaches included offering (further) discounted WHPs, and targeting the participants of a separate thermal imaging project. One idea arising from the Advocates meeting was, with householders' permission, to put boards up outside properties being retrofitted through the scheme, advertising that they are a Cosy Homes project.

Customers have tended to match the early adopter characteristics seen on the other projects. Of the customers interviewed as part of the evaluation, most had installed one or more retrofit measures previously. Customer motivations for exploring energy retrofit included reducing carbon emissions, improving comfort and lowering heating costs. One customer said: *"I've been feeling bad about having heating on all day and being cold in the winter so the main things were to reduce cost and improve comfort."* Some also mentioned futureproofing: *"It seems like gas isn't the way to go for the future so I wanted advice on what the options are."*

Customer interviewees had heard about the Cosy Homes project from a range of sources, including word of mouth from friends, family or neighbourhood / community group, and

information on social media. Customer reasons for getting in touch with Cosy Homes varied. Several were keen on having a home energy assessment, with some commenting that getting expert advice on the best solutions for their unique property was the driver. *"To have someone do an assessment of why you are consuming so much is really helpful."* Some were keen on having help finding reputable, good value contractors. One got in touch with Cosy Homes purely because their architect had suggested it.

One of the main ways in which the delivery partners had hoped to increase awareness of the project and strengthen perceptions of it, amongst both householders and contractors, was 'Trusted Brands'. Throughout Year 2 it proved harder than expected for the team to engage the organisations they were targeting for this, and this has remained the case in Year 3. A project deemed to have great potential was assessment and retrofit of a handful of selected National Trust properties in the region, but this stalled, with numerous meetings delayed or cancelled. Approaches to other national brands also stalled, with their central communications teams moving slowly, and with some outright refusals. One delivery partner feels that Cosy Homes is perhaps not currently big enough to be recognised as a valuable proposition for these brands. Successes have been focused more locally, e.g. engaging the local Co-op, an organic farm shop, and a luxury holiday cottage company. A potential project with an Oxford college that owns a street of properties has also stalled. There is a suggestion that COVID – with its pressures on higher education institutions – has been a recent barrier to progress with that.

Across Years 2 and 3 the National Energy Foundation explored the private rental market. There were preliminary conversations with Oxford City Council, who invited Cosy Homes to talk at their landlord forum. Cosy Homes also directly messaged letting agents, but with limited response, which was felt to be surprising in the context of MEES requirements for lenders. The project team speculated that, with many agencies running their own property maintenance companies, Cosy Homes *"might be seen as competition."* The team also created a marketing communications pack for tenants around the GHG launch, including templates for emailing their landlord for works.

Household retrofit activity

Cosy Homes has seen substantial householder interest, with c.550 referrals, but has also seen substantial drop out rates. Delivery partners recognise that this is the issue to work on: *"what goes in should come out; we want to get away from a 95% drop out to about 5% drop out…there will always be odd ones not going ahead due to circumstance."*

As of April 2021, Cosy Homes had started 6 retrofits, though at the time of the final evaluation interviews only 2 had been completed. One completed retrofit was felt to have been delivered fairly smoothly, taking around six weeks, though the occupant had agreed to be absent for the duration. The other project suffered delays due to the customer specifying wood fibre insulation, which fewer installers work with.

A further 29 customers were at the stage of being ready to progress, with signed Client Service Agreements (CSAs)[35], and either having or sourcing quotes. Planned works averaged c.£23,000. Whilst the group progressing to quotes included several scheme staff, the project team considered most to be 'typical' customers. All are implementing multiple measures, which is key to the Cosy Homes business model: *"For us to be viable and make revenue and make the model work, it can't be single measures…early on we just wanted to help everyone. We're a bit clearer now on where we sit and what we can help with."* This has meant substantial drop-out from householders looking to progress single measures, and although Cosy Homes do try to engage all WHP customers on the benefits of a more holistic approach / need for certain upfront measures, the team are comfortable with agreeing with some customers that Cosy Homes is not for them. The team feel they are getting better at filtering customers and this is something the Plan Builder – brought over from Ecofurb – has helped with. Householders insistent on installing a single measure under the GHG were signposted by Cosy Homes to other sources of information and advice.

Behind those definitely progressing works, Cosy Homes had a further 45 Client Service Agreements as yet unsigned at the end of March 2021. This was partly attributed to COVID, although RetrofitWorks had developed COVID protocols to enable works to progress within social distancing restrictions[36]. But project team representatives also noted that the CSA signs the customer up to a bigger fee to Cosy Homes, which may have caused further deliberations. Customers baulking at measure and fees costs have been an issue throughout the programme (and across all projects) and one Cosy Homes representative noted that the WHP costs are *"still quite blunt and limited because they focus on measures."* This individual pointed out that they had recently reviewed a quote which included £10,000 for skips, parking permits etc.: *"The WHP doesn't even look at that. Then clients point out [when it comes to the CSA] that costs are twice as much as the WHP led them to expect. We need to make sure people are very aware very early on about likely true costs."* The scheme also provided more accurate estimates as more quotes were obtained: *"Heat pumps installation is coming in at over £15k; our early WHPs were suggesting more like £5k. Demand is driving up prices and outstripping supply."*

Behind this group are customers that have only received a WHP to date, and this is where substantial drop out can occur, especially for customers uncomfortable with prices and further fees. As one project representative noted: *"You might do a WHP because you're curious, even if you've no real intention to take action."* Separate customer surveys conducted by Cosy Homes and the evaluation found a very positive response to the WHP document, which was seen as providing about the right level of information and offering good/excellent value for money at the current £175 price[37]. Respondents were impressed by the level of detail that

[35] A more detailed specification following on from the WHP.
[36] It is interesting to note that the team developed a remote WHP in response to COVID, but later removed this; partly because the Plan Builder served a similar function (in terms of providing a less detailed overview of potential retrofit options), but also as most customers still opted for the in-person WHP.
[37] Half of recipients said they would have been willing to pay up to £300, though this was only once they had seen the 'product'.

went into the plan, and (where conducted) appreciated the follow up call with a retrofit co-ordinator.

A common theme across both surveys was strong satisfaction with the quality of advice, but not with the length of the process: “I’m very satisfied with the project specification; it takes a while but it’s very helpful and practical on what we should do and what would have biggest impact.” Several people commented that Cosy Homes appeared to struggle to find suppliers to quote for them, leading to frustration and drop out for some: “It has been hard to find suppliers for contracting works and they seem a bit stretched.” Some customers are proceeding (or hoping to proceed) with work outside of Cosy Homes: “it actually took a long time waiting around for their contractors to quote, but then this didn't come through so we went on to do things ourselves.” It was noted back in Year 2 that some customers had already engaged builders before contacting Cosy Homes and likely never intended to progress works through Cosy Homes; they just wanted reassurance from retrofit co-ordinators on their plans.

One of the ongoing challenges for the project has been freeing up retrofit coordinator time, with RCs writing building performance specifications, CSAs and WHPs, as well as discussions with customers throughout. The Cosy Homes team now feels it has a sufficient bank of coordinators (including specialist measures and property type expertise) to deliver WHPs to those customers currently at the applicable stages, but need more to support any increase in throughput.

Customers taking or planning action generally felt that Cosy Homes had influenced the work they had carried out or the timeframe they had done this in: *“I probably wouldn’t have done anything at all without Cosy Homes. Having them increased my confidence, as all [their] advice has been excellent.”* Another said that the benefit of using Cosy Homes was project management: *“They organise it all and control the contractors and jobs and I do not have to hunt around for people.”*

Cosy Homes has moved away from the original intention to develop a finance offer for consumers, stating that it wasn’t a priority. However, the numbers of customers dropping out / delaying decisions because of concerns over the price of measures and / or support indicates that a finance offer may have had more traction than estimated and delivered more retrofits.

Beyond the BEIS grant

One delivery partner felt that a scheme like Cosy Homes was *“on the radar”* but would have progressed on a smaller scale and much more slowly without government funding. Another felt that BEIS funding was essential: *“given the current ‘broken’ retrofit market in the UK, it would have been very unlikely that the three partners would have been able to come together to address the issue of the supply chain in Oxfordshire [without grant funding].”* The same respondent felt that, bearing in mind the delays to the start of the programme and Year 2 funding reductions, an extension of BEIS support, perhaps even performance-based, would be helpful: *“This year is the first time we’ve had a full grant; to suddenly go to zero is a hard transition.”*

Low Carbon Hub and RetrofitWorks are continuing Cosy Homes beyond March 2021 but *"very much at risk",* and their partners in the National Energy Foundation (NEF) will no longer be formally involved. In the short term at least the scheme will be able to contribute to other schemes being delivered by Low Carbon Hub to justify some cross-funding: for example, Cosy Homes tying in with Project LEO (Local Energy Oxfordshire), a smart grid trial in the Oxfordshire area.

There needs to be a steady stream of customers progressing to retrofit to make the project commercially viable; the Cosy Homes proposal approved by the LCH Board assumes 5 retrofit projects per month at an average value of around £23,500. This means 60 retrofits per annum, assumed to come from around 450 WHPs. As for Ecofurb, this will require a substantial increase from the current conversion rate.

If Cosy Homes's internal operations and their supply chain can be engineered to process more customers more quickly, it is felt that the existing level of householder interest could sustain the project for some time. However, several partners emphasised that Cosy Homes will at some point need to reach out *"into a market that would need more persuading*[38]*."* Partly for this reason, the team would be uncomfortable increasing the prices of some of the early stages of the journey (like PPR) to de-risk drop outs: *"£150 - £200 [for a WHP] is better if you really want to go nationwide rather than [simply] the eco-warriors."*

There will be a reduced budget for marketing in 2021-22, but the previous three years have seen the development of substantial marketing collateral, so future new activity (at least in the short term) is likely to be primarily digital. The scheme will continue to work with the Community Advocates and the marketing collateral is available to these groups as well.

[38] The same respondent noted that this had been considered from the outset, and even the name 'Cosy Homes' was positioned to focus on well-being / health / comfort etc. to reach beyond the climate argument.

Warmer Sussex (Sussex)

Delivery organisations	Led by RetrofitWorks with partners Citizens Advice 1066, Citizens Advice Arun & Chichester, Hastings Borough Council and Brighton and Hove Energy Services Cooperative.
Summary of the project approach	• Prospective customer finds out about the project (via community groups / local authorities engaged by the project team and through Warmer Sussex promotional material), enquires and signs up for a Whole House Plan (consisting of a retrofit coordinator visit and follow up report). • Customer liaises with the retrofit coordinator and chooses a package of measures to progress. • The retrofit coordinator helps to finalise specification, gathers prices from several vetted contractors and puts the agreed contracts in place. • Measures are delivered under the project's management and the coordinator conducts customer liaison and QA throughout.
Supply chain recruited as of March 2021	53 – split roughly equally between micros and other SMEs; all are companies (as opposed to sole traders) and all are local / regional.
Customers that registered with the scheme ('referrals')	329
Retrofits completed as of March 2021	2
Key successes	• Utilising the 'Plan Builder' app (shared across Retrofit Works' projects), providing initial home assessment and a low-resource filter for less engaged customers. • Substantial customer engagement through promotion by regional councils and community organisations. • Albeit potentially self-selecting, most 'signed up' installers value the role of the retrofit coordinator, and the collaborative nature of the project.

	• Good customer satisfaction with the home assessment / Plan Builder and (where accessed) subsequent project support. • Recruitment of sufficient retrofit coordinator resource to meet current customer demand. • Appointment of dedicated resource for supply chain recruitment.
Key challenges	• Installer supply chain recruitment (generalist builders and for some specific measures) and obtaining timely quotes from those ostensibly 'signed up'; issues felt to be exacerbated by the GHG and a limited supply chain in the region anyway. • Delays to progression of 'signed up' customers and significant numbers dropping out of the process, due in part to customer profile but also supply chain limitations. • Some ostensibly able-to-pay customers are baulking at the costs / fees involved in whole house retrofit through the scheme. • Some customer dissatisfaction with delays, communications and overly-technical reports.

Supply chain engagement

As of March 2021, Warmer Sussex had onboarded 53 contractors, with a further 7 in the process of onboarding. In addition, the project had 9 individuals in an assessor and / or retrofit coordinator role.

Both project delivery partners and stakeholders highlighted that the retrofit installer supply chain is particularly limited in the region, with some GHG customers having to look for London-based contractors. As one council stakeholder noted: *"In this part of Sussex I know that the retrofit supply chain is close to non-existent. I'd like to work with the local enterprise partnership [to see] what the council can do to help - links with colleges, apprenticeships. There's huge opportunities there if we can grasp them."*

Many firms signed up to the Warmer Sussex scheme have worked with the delivery partners before, and / or are particularly motivated to deliver environmentally beneficial retrofit: *"I believe in what Warmer Sussex is trying to do… I want to play a role in improving the carbon footprint of the UK."*

The delivery partners stated in early 2021 that they had achieved the capacity and capability to deliver almost all retrofit measures, though the need for GHG eligibility for some installers had led to some gaps. Delivery partners also felt that the GHG had discouraged some small, local firms for working with them, instead encouraging these firms to deliver single-measure retrofit independently.

As with installers, the project has struggled to find local retrofit coordinators. More generally, RC concerns about liability and insurances has necessitated Warmer Sussex taking on liability to reassure and recruit potential RCs: *"We've taken on a ludicrous level of professional indemnity insurance internally now."* This requires Warmer Sussex to audit RC work.

With the project managing customers on behalf of contractors, and with no formal Warmer Sussex contractor training, there has been little evidence of contractors upskilling in technical or softer skills through the project. Similarly, there has been insufficient retrofit progressed to date to evidence improved supply chain collaboration, coordination or economies of scale.

Householder engagement

As of March 2021, Warmer Sussex had 329 referrals. As with the other projects, project delivery partners saw a large volume of interest around the time of the GHG launch, but largely comprising householders not suited to the project*: "A lot of them just wanted a quote [but] we're charging for a service; people don't like hearing they've got to pay for a quote."*

Prior to the launch of the GHG, the project was already seeing interest matching their delivery capacity. In particular, the links with regional and local organisations (councils and community groups) has been important in raising awareness and building trust in the project. A number of councils and groups are signed up to advocate for the project[39]; this can range from promoting it in communications (newsletters etc.) to mentioning Warmer Sussex in relevant council strategies. For example, Brighton & Hove Council have cited Warmer Sussex in their plans to achieve net zero. Climate emergencies declared by a number of authorities seem to have also encouraged interest in engaging with Warmer Sussex. Whilst these wider partners had not measured the impact of different promotions, it was generally felt by them and by project delivery partners that community group and council-run events had proven to be particularly effective promotional methods before lockdown restrictions.

A Warmer Sussex webinar series took place in late January 2021, attracting over 100 attendees and leading to a spike in client registration and website engagement in February. There have been requests from wider partner / stakeholder organisations for these to be repeated for their staff.

As with the other two projects involving RetrofitWorks, Warmer Sussex have introduced the Plan Builder, with 45 plans produced as of March 2021. As well as the filtering benefit[40], project delivery partners feel the tool works well as a seamless introduction to the project from digital marketing.

Customers interviewed through the evaluation matched the early adopter profile in the other projects. Most interviewees mentioned wanting to reduce their environmental impact, with

[39] Councils have seen it as a beneficial project to tie in with economic recovery and green jobs.
[40] "The aim of the Plan Builder has been that we can get good quality leads; [we] want to filter out the people not particularly interested and find the committed ones."

several wanting to become carbon neutral. However, comfort, money and health were also mentioned as motivations: *"Age and illness have intruded - I feel the cold badly these days. And I'm beginning to learn that it's vitally important to insulate our homes."*

Interviewees had heard about the project through a wide range of sources including the GHG website, online searches, local events, local community groups via Eastbourne Eco Action Network, or through their own places of work[41].

Some customers were attracted by the survey and the whole house plans; they wanted to access bespoke, technical advice. Several contacted Warmer Homes primarily because they wanted to access the GHG. Others were not so motivated by the GHG but wanted a project management service. *"They made the retrofit process sound manageable by giving us access to a network of contractors that we knew (from experience) we wouldn't be able to reach; and they seemed to be offering project management, which we felt they needed."* Some customers valued the reassurance of independent advice and a trustworthy organisation: *"We'd had a previous experience where our cavity wall insulation was not well installed so we ended up with dry rot…so after this we knew we needed good people to do the job and the Warmer Sussex pitch was compelling."* Another customer mentioned that it was particularly important to him to use local installers rather than national contractors.

Household retrofit activity

Over 50 customers have received a home assessment and WHP, with about half progressing to quotes and two retrofits completed as of March 2021.

Whilst the GHG created challenges in generating interest from householders not interested in the full Warmer Sussex offer, customers already in the project often wanted to utilise the GHG. These customers required contractors with specific GHG certifications, leading to a bottleneck in the Warmer Sussex supply chain. Customer interviewees that had proceeded to the building specification stage were finding the process of obtaining quotes frustratingly slow (several months for some). There was some understanding that this was largely down to problems with finding installers registered with Warmer Sussex. who could do GHG work. Despite this, some interviewees struggled to separate out their views on Warmer Sussex from their views of the GHG.

Across the programme, a key concern for the Warmer Sussex team has been drop out / disengagement following the WHP. Some customers have been happy to have a WHP at a relatively low cost, with no apparent intention of acting on it, certainly not in the short term / within the Warmer Sussex process. The Plan Builder has been useful in enabling householders to conduct a basic assessment of retrofit opportunities for their home, thereby filtering out those with only a casual interest from placing demands on project resources. In summer 2020, Warmer Sussex brought in a marketing consultant to make sure marketing materials were clearly promoting the scheme as an end-to-end process. This led to updates on

[41] One interviewee works in one of the partner councils; another for a local community energy project.

the website, providing more information about the whole process and with more 'per stage' costing information: *"It's a balance because it's a long process, it's technical and people can lose interest really quickly."* A priority for marketing the project has been to bring a retrofit job to completion and use it as a case study outlining the whole experience.

The principle challenge from COVID has been organising the supply chain to deliver works, especially once the tiering system was introduced as a means of managing local risks of COVID. This meant that certain contractors couldn't cross into certain areas, and new plans had to be made (and re-made when the tiers changed). This required substantial administration, which was harder to coordinate when COVID also meant no central office for the lead delivery organisation to operate from.

For householders interviewed in the evaluation who had paid for a WHP, levels of satisfaction were mixed. The Warmer Sussex service was felt to be friendly, professional, polite and efficient. Customers were positive about the retrofit coordinator and their depth of detail and knowledge. Some were very happy with the communication from Warmer Sussex and felt that they communicated any delays and the reasons for these very well, though some customers felt they had not been communicated with sufficiently: *"The most disappointing thing is the lack of communication from them. I have to chase them rather than the other way around. It can go months without any contact."* There was also a positive comment noting how the survey was conducted in a very COVID-secure way. Customers welcomed the follow-up conversation with Warmer Sussex after they had received their WHP, as well as the staggered approach to works. One customer would have valued an updated WHP rather than the CSA they received, whilst another felt the WHP didn't go into enough depth on a specific issue / measure and have opted to do their own research.

A number of suggestions were made for how the service could be improved. Several customers felt that the options in the WHP could be simplified: *"[The appendix] has every single possible measure listed and a price - it would be easier if the things that don't apply to each home were taken out so the householder could see the information that relates to their particular recommendations."* There was also a comment that the plan could be more tailored to the home. *"The Whole House Plan was very generic; it wasn't very tailored. It felt more like an EPC."* Some customers could tell that their plan was not put together by the same person who did the property survey, and sensed some disconnect between the two.

Amongst householders interviewed for the evaluation, no retrofit works had been installed. Some were about to go ahead with the 'stage 1' measures that were recommended in the WHP. "*We are proceeding with the stage 1 measures (costing £4-5k); we want to try them out first before we commit any more money."* One customer was undecided about whether they can go ahead; at the time of interview they were waiting for Warmer Sussex to contact them. Amongst those not planning action, one had decided to fund an extension instead of a retrofit. One found the GHG too complicated to access, despite needing it to fund measures. Another was shielding which meant they did not want installers in their home. One customer reported being put off by the charge for the assessment: *"I wasn't prepared to pay £250+ for something that might not tell me anything new."* Of those planning action, two customers felt they might

not have taken any action at all without Warmer Sussex. *"Warmer Sussex has given me confidence in the process."*

Warmer Sussex is another project that has moved away from the original intention to develop a finance offer due to perceived lack of demand amongst its current early adopter customer base. The numbers of customers dropping out / delaying decisions because of concerns over the price of measures and / or support indicates that a finance offer may have had some traction and delivered more retrofits.

Beyond the BEIS grant

The project lead was unequivocal that *"without BEIS subsidising this scheme in Sussex it just wouldn't have happened."* Warmer Sussex is continuing beyond March 2021, part-funded from other delivery partner activities in the region. The aim is for the project to be self-sufficient within two years. The latest business planning by Warmer Sussex places a target of 33 WHPs, 19 CSAs, and 14 paid retrofit projects per month by March 2022, with projects averaging around £10,000. This requires a significantly greater conversion rate than has been seen to date.

The project delivery lead is considering how stakeholder and partner funding can be encouraged to support the project in the longer term, though is not optimistic about securing additional funds. Local councils will benefit from a successful project and may be willing to contribute to it if it would otherwise disappear*: "maybe if the local authorities see that it might not continue if they don't support it; even if they're just paying for the software, then they might step up to the plate."* The two other schemes involving RetrofitWorks are felt to be in a stronger position due to partners being able to support those projects.

One of the project delivery partners commented in Year 3 that the model needed to be reviewed to make the process more streamlined and therefore less costly. To streamline and speed up the process for customers, the project delivery leads are planning to make the lead contact for customers someone in the central operations team, with another individual taking responsibility for contractor coordination, and the RC being the technical expert who will visit the property and conduct in-person discussions.

Homeworks (Cornwall)

Project discontinuation: changes to the scheme and BEIS funding

Homeworks was based around the opportunity to introduce the potential for retrofit to customers in 'unplanned scenarios', i.e. when a homeowner is seeking a general improvement to their home (e.g. a new kitchen, an extension or a new boiler). The idea behind the project was to raise awareness amongst tradespeople that typically only install / deliver one type of home improvement of potential energy efficiency measures / work that could be done to the home whilst the other 'regular' work is conducted. The proposed customer journey was as follows:

- A tradesperson undergoes some relatively simple training regarding energy efficiency retrofit via the Homeworks app.
- When the tradesperson visits the homeowner about some unconnected general maintenance, whilst getting the originally intended job done, they would also discuss potential things they could do to their home to improve energy efficiency and provide ballpark costings / expectations of disruption etc.
- The tradesperson refers the homeowner to other members of the supply chain that can deliver retrofit work. The tradesperson would earn a referral fee for their time and for any retrofit work that goes ahead.

The delivery model or 'customer journey' employed by Homeworks changed twice during the three years of the pilot, in reaction to external developments. The first change was at the start of Year 2 following the publication of the PAS 2035 requirements. The project team had originally hoped (based on a draft version of PAS 2035) that they would be able to automate some of the steps in the PAS 2035 process via the Homeworks app, but the published version indicated that PAS 2035 compliant retrofit work requires a retrofit coordinator visit to the property. This led to a revised model:

- A tradesperson undergoes some relatively simple training regarding energy efficiency retrofit. Once training is complete they become a Low Carbon Ambassador (LCA).
- When the tradesperson visits the homeowner about some unconnected general maintenance they can, whilst getting the originally intended job done, have a Low Carbon Conversation (LCC) with the homeowner. This would cover potential things they could do to their home to improve energy efficiency and provide ballpark costings / expectations of disruption etc.
- If the homeowner is interested in getting the retrofit work done, the LCA will refer them to a retrofit coordinator. The coordinator will conduct an assessment (£250) and 10% of this goes to the LCA for making the referral.

- The customer then chooses whether or not to progress with recommendations in the coordinator report.

Upon the announcement of Green Homes Grant funding, the Homeworks team felt that their model should be adapted again due to the belief that awareness of energy efficiency work would be significantly increased amongst homeowners through the introduction of the GHG, and that therefore there would be a reduced need for tradespeople to raise awareness of energy efficiency retrofit to homeowners (which the Homeworks model was based on). Furthermore, the project team felt that Retrofit Assessments within homes may not be possible with COVID restrictions.

The team felt that the Homeworks project should support the anticipated demand that would be generated through the GHG by "guiding homeowners towards the grant and helping them maximise the value from it in terms of thermal comfort, energy efficiency, getting the order of works right, and ensuring compliance with PAS 2035." The team also felt that that the continuation of Homeworks in its current form would be difficult as the GHG only required PAS2035 compliance in selected circumstances. Homeworks put forward the following suggested change to their delivery model:

- Engage householders directly (via information packs, webinars, and online marketing) to access advice through Homeworks, giving them an understanding of the potential benefits of a whole house approach, whilst supporting them to maximise the benefits to them of access to the GHG (including through revising the capacity building modules to be aimed specifically at households).
- Support households in undertaking an 'energy triage' using the SEA website and through an initial assessment of the home based on the PAS2035 risk matrix.
- Refer households to GHG.

This proposal also suggested that Homeworks could continue with their Year 2 model - engaging tradespeople to increase their awareness and understanding of retrofit opportunities (through the modules on the Homeworks App) and incentivise them as Low Carbon Ambassadors to refer householders to Homeworks to undertake an energy triage, though they anticipated that this would probably be at a lower level due to households accessing the GHG through other routes.

Partly due to the planning and implementation of these changes, the project was not focused on, or achieving, significant levels of engagement or customer / supply chain sign up. Throughout the programme, Homeworks has produced the lowest numbers in terms of customers engaged, supply chain engaged and retrofits either progressed or likely to be progressed.

In September 2020, no longer confident that the Project could deliver against its adjusted targets, nor meet the overarching objectives of the Supply Chain Demonstrator Pilot project, BEIS informed BRE that funding for the Homeworks scheme would cease in September 2020, six months earlier than originally intended. Two key factors influenced the decision: the limited

progress of the Project in relation to its KPIs, and the proposed Year 3 changes to the scheme no longer directly addressing the programme objectives.

At the point of project closure, and after some initial approaches to potential partners and funders, Homeworks agreed that the model was not self-sustaining and as a result the team had no plans to continue the scheme: *"there isn't any funding we can tap into to support it, and it isn't a financially sustainable business model."*

Household engagement and outcomes

Homeworks's marketing activity direct to householders was limited, as the focus was on increasing awareness and understanding of retrofit amongst the supply chain, who would then encourage their customers to undertake retrofit work. In addition, the significant changes made to the delivery model and uncertainties over continuation of funding meant that there were periods where Homeworks felt that they shouldn't promote the project if they weren't able to communicate a clear message.

Marketing approaches tested by Homeworks included sending out home information packs to homeowners; exhibiting at the Home Show in Cornwall in Year 2; sending a regular newsletter to homeowners who had signed up for it; advertising through Google and Facebook; hosting a series of fortnightly webinars during Year 3; and providing information for the council to email out to approximately 750 landlords. The key messages to homeowners were around becoming greener and saving energy.

The lead delivery partner felt that of all the marketing they tested, the most effective way of engaging homeowners was the Home Show event, with five homeowners recruited to be case studies and several others signed up to the newsletter. Google and Facebook advertising during the first half of Year 3 resulted in 16 home-owners signing up to the Homeworks newsletter.

In total, 20 householders signed up to the Homeworks newsletter. Eight agreed to be a Homeworks case study and receive a free retrofit assessment, trialling the Homeworks process. However, due to COVID, only one ultimately received an in-home assessment, with the remaining seven receiving a 'virtual assessment' via Zoom or telephone. Homeworks anticipated that interest in the Green Homes Grant would generate further interest in an assessment but this did not materialise.

Two householders agreed to provide feedback to the evaluation. Both were looking for impartial advice on how to make their home warmer and reduce their heating bills. Interestingly, they were not the original target audience as they had been specifically interested in energy efficiency retrofit from the outset, as opposed to general maintenance on their property providing the opportunity to encourage them.

One of the homeowners had contacted regular tradespeople but found that they just tried to advise and sell whatever measures they specialised in, leaving them unsure which measure / options would be best. They therefore found the assessment extremely useful; *"I got to ask lots*

of questions as they went round my property, they were extremely knowledgeable and I trusted their advice. The visit resulted in recommendations on what work could be conducted on the property, the priorities and sequencing of getting the work done, and a link to Trustmark to find providers." Following the assessment, the homeowner sought contractors to install timber-framed double or triple glazing but was unable to find any based in Cornwall on the Trustmark website. As a result they have decided to engage with a non-Trustmark installer, though they may have to wait up to twelve months to have the windows replaced due to the installer's existing order-book. Based on the advice received through the assessment, the homeowner felt that they would be prepared to pay (around £100) for a similar assessment in the future, although also acknowledged that they would have been reluctant to pay for it before knowing how useful it was.

The second homeowner was interested in replacing the existing render on her property with EWI for their single brick, uninsulated property. The homeowner had a call with Homeworks via Zoom and sent Homeworks some photographs of their property, with the intention that they would conduct an in-home assessment when COVID restrictions were lifted. This was ultimately not provided due to the discontinuation of funding. The homeowner reported that they will continue to explore energy efficient options for their home but feels the lack of an in-home assessment is preventing them from taking action.

Homeworks were aware of outcomes for three other householders that they had engaged with. Two householders were planning to get quotes from builders / installers on the Trustmark site and intended to apply for the GHG. Another had already engaged a builder prior to contacting Homeworks; the works had already started and there was a limit to what Homeworks could advise. Overall, no retrofits were delivered through the scheme: "*No retrofit work has been undertaken that we are aware of - although this was not a key target for HomeWorks - we said referrals would be made - but nothing quantitative about numbers of installs."*

Supply chain engagement and outcomes

Homeworks expected to create a user group of 15 tradespeople to test the functionality and usability of the Homeworks app, and gather feedback on the project more generally. In total, nine agreed to be part of the user group. Only one member of the user group provided feedback on the app, despite Homeworks offering an incentive of £30 as compensation for their time. 60 installers signed up to the newsletter.

Homeworks tested a number of methods to engage the supply chain, including targeted digital advertising and mail shots, breakfast meetings / events to promote the project, newsletters, and promotion through partners and stakeholders such as Trustmark and the University of Exeter to their installer networks.

Despite this, Homeworks managed meaningful engagement with only a small number of tradespeople. The team felt that the remote locations of the households receiving retrofit assessments meant installers did not feel it would be worth a journey to engage them. The project team were also cautious: expansion of the user group was put on hold as the team felt

that it would be inappropriate to approach businesses suffering impacts from COVID restrictions. Furthermore, the team's lack of clarity on the GHG meant they were reticent to reach out to new leads and so risk trust in the project.

Overall, the conclusion of the project team, and a view suspected by stakeholders interviewed in the evaluation, is that trying to 'push' energy efficiency improvements on to the customer through tradespeople does not seem to be effective:

- Tradespeople do not want up-sell energy efficiency retrofit to their customers, taking them over the budget they had in mind for the project they wanted to undertake.
- The £30 referral fee was not seen as worthwhile, and greater incentives would not have been sustainable within the Homeworks pilot.
- The model doesn't necessarily provide the impartial advice that most homeowners would like; "We've learned that impartiality is really important to homeowners in terms of the advice that they are willing to take on board. Having a tradesperson refer other works to other tradespeople - that isn't really being impartial."

Homeworks developed a series of training modules, and at the end of each one a questionnaire was developed and added to test and verify the knowledge learned by tradespeople completing them. However, Homeworks did not capture evidence to confirm whether any of the supply chain completed the training modules / questionnaires, and none of the supply chain agreed to participate in the evaluation.

All available evidence is that the scheme made no significant changes to the retrofit supply chain in Cornwall, and therefore had no subsequent impacts in terms of selling retrofit or retrofit skills enhancement.

Futureproof (Bristol & Bath)

Delivery organisations	Led by CSE with partners Bristol City Council, the Green Register and Greenhouse PR.
Summary of the project approach	Futureproof is a flexible model which places the onus on customers to proactively identify and request support needs, as opposed to the customer being steered along a journey to retrofit. The Futureproof approach - largely unchanged through the programme – is as follows: • Through digital and other marketing campaigns, local networks and events (in particular exemplar homes events such as Bristol Green Doors), the customer becomes aware of, and then contacts, Futureproof. • Futureproof respond with a quick phone survey to ascertain more information (property profile, status of existing retrofit plans). • The customer is then allocated an advisor who manages them, tailored to the specific situation and interests of the customer. Customers can choose from a suite of support options, from a piece of support in isolation (a home assessment and report, thermal imaging, EPC, on-site QA, quote comparison) to a full package of retrofit project management. • If the customer decides on a retrofit measure / set of measures the advisor may assist by referring them to suppliers to gather quotes or surveyors for further surveys, after which a further conversation may be needed. Customers may also re-contact advisors with queries on quotes. • There is *generally* no formal involvement beyond this point. Futureproof have lately been checking in with customers to see how they have progressed. • Supply chain firms do not work directly for, or within, the Futureproof project; the project is linked to the Green Register. Though there are certain services (e.g. training courses and a Futureproof WhatsApp group) open to the supply chain through the project.
Supply chain recruited as of March 2021	75 Futureproof Approved Builders (FABs) – 30% micros, 60% SMEs, 10% large. All local / regional.
Customers engaged	829 enquiries, of which 239 have been referred onto various delivery partners or to FABs

Retrofits completed as of March 2021	150 ‘measures’ installed across supported customers[42].
Key successes	• Significant customer engagement despite limited promotion. • Some take up of supply chain training, and strong satisfaction, with attendees reporting improved knowledge and skills. • Albeit potentially self-selecting, most ‘signed up’ installers value the collaborative nature of the project.
Key challenges	• Installer supply chain recruitment, especially on EWI and glazing. • Ensuring dedicated resource for the project and providing customers with the enhanced level of support that some require. • Some customer dissatisfaction with delays and communications.

Supply chain engagement

Futureproof’s marketing of its training offer to the supply chain has included toolbox talks, free / subsidised training, informal talks on building sites, digital advertisements, and posters/flyers. Futureproof’s view is that, regardless of their materials, word of mouth has proved to be the most effective promotional channel amongst the supply chain[43]. Supply chain representatives interviewed for the evaluation generally found out about the scheme through word of mouth or through knowing people in CSE or the Green Register, though social media was also mentioned. Many were motivated by becoming a better builder through learning new skills and techniques, and more specifically being better informed when discussing retrofit with customers.

Taking into account the extent of the Futureproof marketing campaign, subsidising of the training and regular promotion in the trade press, the eventual sign-up to the course might be considered low. One partner noted that their pool of suppliers to refer customers to lacks trusted window and EWI installers, as well as roofers. Project partners accept that the typical local builder they are tasked with attracting is often a small, family firm, perhaps with a handful of subcontractors. Such firms have little free time (and energy) to engage with Futureproof on top of their day job. They have full order books and consequently limited interest in tackling a

[42] As noted in the opening chapters of the report, these are measures installed by customers who were supported *to any degree* by Futureproof, as opposed to being handheld through the process from initial enquiry to QA of completed works. Linked to this, only four of the recorded measures were installed by FAB (Futureproof Associated Builder) installers, and 35 by other associate organisations. Many more measures have been installed by FABs but with customers who did not receive any kind of support from Futureproof.
[43] Futureproof conducted some social media promotion to the supply chain in 2020, which didn’t seem particularly effective. However, they they acknowledge that this was an unusual time for all parties, making fair judgements difficult.

new, perhaps more challenging field. As noted by one delivery partner, some intend to retire within the next ten years anyway.

Supply chain outcomes

Through their extensive training, the outcomes that Futureproof is demonstrably having on the supply chain are an increase in installer knowledge and an increase in confidence in conducting and selling retrofit. Nevertheless, this assessment is based upon statements from members of the supply chain who have undergone training, not on works completed. Despite the ostensibly significant number of completed retrofits by customers that contacted the project, the minimal involvement of the project in many of those retrofits means there is little evidence of the supply chain outcomes being sought by the demonstrator programme. There is anecdotal evidence of Futureproof's WhatsApp networks facilitating FAB coordination on the availability of jobs and supplies, though this is usually outside the project and not necessarily in relation to retrofit.

Futureproof recruited over 70 FAB-certified firms, with the only perceived shortfalls being for roofers, glaziers and EWI installers. Many have attended training courses delivered by the project and participate in their forums. Indeed, Futureproof have developed core training sessions that they feel are not only appropriate for their project but could be rolled out beyond the region. This enables the peer-to-peer training that forms an important part of the proposition. The project training has secured builders as speakers, which is felt to enhance the perceived value of the training and get key messages across more effectively.

In response to COVID, the planned 'toolbox training' moved online and is felt to have gone well. The evaluation team observed an event and sought feedback from attendees; these concurred that the session generally worked well online, with good attendance. Futureproof attributed this at least in part to relative inactivity during the first lockdown. In fact, feedback indicated that some firms *preferred* the online format, the only possible drawbacks being:

a. The lack of content on soft skills (e.g. selling retrofit)[44], and the substantial amount of content the trainer had to cover in the 2½ hour session; indeed, time for questions and detailed answers was limited. Nonetheless, both issues would presumably have also been true of 'in-person' training.

b. The lack of opportunity for networking; if important to attendees, this would seem to be something that could be addressed with future events, as nothing in the format prevents the inclusion of fixed breaks, or separate / break-out discussions etc.

Interviews with members of the supply chain who have attended training have found that the interlinking influence of personal interest, detection of rising customer interest, and a desire to expand skillsets are key motivators for engaging with Futureproof training. Despite this, some

[44] This is a deliberate choice; as one partner stated: "we assume they know how to sell and how to liaise with customers."

respondents did have existing links to CSE and / or were encouraged to attend by colleagues or external contacts. Attendees represented a mix of experienced firms and new entrants; most had learned how to sell and install retrofit measures 'on the job', with no formal training. Satisfaction with the training was high and was compared favourably with college courses. Respondents cited increased knowledge and skills including on air circulation, resolving damp issues, sustainable timber, heat pumps, horizontal vs. vertical cladding, heat recovery systems and retrofitting older properties. Attendees said that they valued being able to use the learnings to present retrofit in an understandable and trustworthy way to customers, and come across as more authoritative with customers: *"in my experience the clients are so excited about [retrofit] that they possibly know more than me about it. I feel that I do have more knowledge and more confidence to talk to customers about various different cost options they could go for and detailing and resources on where to get stuff from."* The only suggestion for improvement was for the courses to be formally accredited.

In terms of quality of service, most Futureproof customers reported having had some level of engagement with potential and actual installers, and/ or architects and surveyors, with design work being undertaken, quotes provided and in some cases, installation works completed. Householders interviewed reported a mixed experience of dealing with contractors. Some reported their contractors as often being very busy, wanting to get on with the job and not really engaging with them. One noted that the sales team were good at communication, but once the job had been awarded the quality and frequency of communication had declined. However, others reported that they were happy with the contractors they had dealt with and the quotes they had received.

Some supply chain interviewees had seen increased enquiries since attending the courses. Although not all could be sure this was attributable to Futureproof, some were certain that customers had got in touch because they were now visible as "*one of the builders who have gone through the programme".* None of the customer approaches attributed by these interviewees to Futureproof have resulted in work as of March 2021, though sometimes this was because the firm was too busy to quote.

FABs value Futureproof's networking, advice sharing, and opportunities for collaboration, a realisation of one of BEIS' key objectives for the schemes: *"It's collaborative not competitive…a lot of the time they're working on their own and trying to solve problems and there might be somebody now that they can phone up and say, 'I don't know how to deal with this; I was thinking of doing X, Y and Z, but I'd really interested to hear what you've got to say about it...'"* Year 3 supply chain interviews indicate that some are now sharing job opportunities (not necessarily retrofit) and materials requests with the group: *"We needed wood fibre sheets, which would have taken ages to order, but someone in the group had them and I was able to get them straight away. We also sometimes pass over jobs if we are at full capacity."* Networking is an important aspect of the project and partners, stakeholders and supply chain alike highlighted the good sense of community amongst the signed up supply chain.

One issue for the FABs has been that gaining certification from Futureproof does not make them Trustmark or PAS registered. Therefore depending upon the measure, Futureproof wasn't able to point to FABs if customers contact them about a GHG project. Futureproof since

agreed to support one FAB through the certification process and analyse the level of work required.

Householder engagement

Despite Futureproof's direct marketing to customers being largely limited to digital promotion and a presence at 'exemplar home' events such as Bristol Green Doors, as of February 2021, almost 500 customers were recorded as having contacted Futureproof, with more than 150 recorded as receiving in depth advice / support. Customers encountered Futureproof through CSE's existing community group networks, word-of-mouth and internet searches, as well through the Bristol Green Doors events. In 2020, the Bristol Green Doors event moved online, though observation of the event in the evaluation found good attendance (over 100 to the first event and around 60 at each event thereafter). These digital events retained the core benefit of a trusted peer (another householder) demonstrating and recommending retrofit and renewable technology.

A review of the project marketing materials as part of the evaluation concluded that all materials looked professional and well-designed, using easy-to-understand language. Messaging tended to lead with environmental motivations – "save the planet" / being prepared for a low carbon future – but reduced costs and comfort were also prominent.

As with the other demonstrator projects, Futureproof have seen a lot of customers dropping out of the process at an early stage. Project delivery leads are not certain of the reasons, though suspect some customers aren't sufficiently motivated to complete the short survey on the site before they are passed to an advisor. This survey has been adapted so that customers can just provide their contact details; previously all questions were mandatory: *"I'd rather capture more info at the beginning, but not if it is going to discourage people."*

Throughout the programme, Futureproof have noted that significant levels of marketing have not been required and levels of householder interest have at times been more than the core delivery team could efficiently process. Customer interviews indicated a group that was often motivated by environmental considerations, many of whom had implemented previous (albeit limited / single measure) retrofit measures. Many had been actively looking for support before they found Futureproof, demonstrating some latent demand for support (which in turn helps to explain the interest despite minimal marketing)[45]. Futureproof also reported a large number of GHG-related enquiries which emerged very quickly even before the voucher scheme had been formally announced; this proved to be somewhat problematic, as the lead delivery partner had not had time to research and prepare clear information and guidance on it.

The Futureproof experience of sustained customer engagement in the absence of significant marketing is encouraging to a degree, though it does mean the marketing materials developed during the project haven't been fully tested , and learnings around what works / doesn't work

[45] Triggers for exploring retrofit at this point were often moving house or embarking on a wider renovation project.

are minimal. More pertinently, the encouraging levels of engagement have not necessarily translated into attributable retrofit activity.

There was a drop-off in customer enquiries in the first lockdown (April/May 2020), with numbers starting to increase again in June, and then increasing rapidly after the announcement of the GHG. Futureproof used the quiet period over the first lockdown to re-build their website, improving presentation, and building in an improved and much more efficient customer relationship management system (saving substantial time for the lead delivery partner). The website also includes an 'interactive house', aimed at both customers and supply chain, explaining considerations for different types of measures.

Household retrofit activity

The c.150 retrofit measures known to have been installed by customers engaging with Futureproof (as of February 2021) seems relatively high compared to the other funded projects. However:

- According to Futureproof, most of the 150 comprise single measure retrofit projects; not necessarily unwelcome, but not tying in with the whole-house approach in the smaller number of confirmed works on other projects.
- The number of 150 has been ascertained through follow-up calls Futureproof have been conducting with customers that received *any form* of advice and / or support from the project. It does not necessarily follow that Futureproof had a significant – or even any – influence over the subsequent installation activity. Indeed, customer interviews as part of the evaluation found that most who had taken action reported doing so 'outside' of the project, and few felt Futureproof had a significant influence on this action. Some were very clear that Futureproof had *not* provided them with the assistance they had needed e.g. identification of installers. However, one respondent did state that they had specified higher quality, more impactful models of their preferred measures as a result of consulting Futureproof, and several others praised the endorsement and confidence that the project gave them in their plans, saying this had accelerated action, and potentially even driven it where they otherwise might have decided not to act. Overall, the lack of strong attribution to the project seems commensurate with Futureproof's limited involvement in most householders' journey to implementing retrofit, and highlights a core issue for the project of not providing customers with the support they *needed,* even if (limited) expectations tended to be met.

Most customers accessed the project hoping for expert advice to assess the most effective retrofit options for their property and / or to identify suitable contractors[46]. Typically, householders interviewed as part of the evaluation reported that they had been thinking about undertaking retrofit work for some time. Barriers holding them back included concerns about causing harm to the property, cost, availability of contractors, and the complexity of retrofitting,

[46] Some had identified contractors but valued CSE's reputation and wanted their independent advice.

particularly for older properties. In Year 3, several householders were looking for advice to help them secure funding through the Green Homes Grant scheme and had wanted advice on eligible measures.

Customers had received (usually phone) advice, though one respondent had received a home energy assessment. Despite officially offering a range of services, Futureproof paused in-person home assessments and thermal surveys in March 2020 because of pandemic restrictions. Despite this, they intend to reintroduce assessments after March 2021. Futureproof do provide in depth advice customers with a "*generic*" report: *"relevant advice based on the conversation we've had. It's not tailored to their house but gives them more detail about some measures."*

There was good customer satisfaction with the support provided, commending the expertise of Futureproof staff and saying they had provided householders with reassurance and confidence in their plans. However, echoing attribution ratings, several customers said they would have valued more in-depth support. One interviewee, who had a home assessment conducted over the phone, expressed reservations about whether the assessor could really understand their property when the assessment was undertaken in such a fashion. Another noted that receiving support over the phone meant that they had found it difficult to keep track of everything which was discussed and would have liked a written follow-up. One would have liked to receive more bespoke advice on a more complicated building issue.

The Futureproof advice line provided a high-level appraisal of options and assessment of any ideas the customer had (e.g. optimal order[47], identifying which options might be less effective, planning constraints pertaining to particular measures etc.). However, Futureproof deliberately designed their advice offer to avoid stifling customer choice and to limit (reputational) liability[48]: *"I won't tell somebody what insulation they should use. I will give them options of different types of insulations and the pros and cons…It's probably obvious in my response what I would do…but I'm not a specifier."* This drawing of boundaries on advice was somewhat borne of necessity. It was acknowledged that advice line advisors sometimes lack in-depth retrofit knowledge / experience to match the sometimes quite complex customer queries. This has at times meant senior project staff being required to step in to deliver responses to customers ('case work'); this was not anticipated at the project and is not felt to be sustainable.

On contractor signposting, Futureproof did not provide customers with a recommended supplier, instead referring customers to lists on the Futureproof website, which are of different length depending upon the measure. The rationale for this decision was limited knowledge about each contractor and again a preference to avoid the liability that might arise from a specific recommendation: *"[the contractor] might not work in that person's part of the city or they're in a different county, or they don't get on with that person, or the contractor's got their*

[47] It was noted that Futureproof have likely deliberately limited their retrofit numbers through conscientious advice: "lots of people are wanting air source heat pumps and we could have sold loads, but sometimes they clearly needed draught proofing first."

[48] Project team representatives noted that some customers do not follow advice anyway, e.g. they do not want to wait to progress measures in a particular order: *"[We] are choosing not to focus effort on these."*

books full for 18 months…we don't want to be responsible for that. They can have a list and they can decide themselves who they want to call."

Whilst reservations about risk are understandable, the decision to not provide specific contractor advice did not appear to insulate Futureproof from customer dissatisfaction. Several customers expressed disappointment that Futureproof had been unable to recommend contractors, or that their home energy assessment reporting had not included contractor recommendations. One felt Futureproof had *"left us to it"* on searching for suppliers, whilst another talked about contractors on the website not responding to enquiries (indicating that they linked these contractors' behaviour with their Futureproof experience regardless). One customer also suggested that, if not contractor names, Futureproof might at least provide advice as to the sort of qualifications and credentials that customers should expect contractors to have.

Furthermore, there could be a perceived dissonance in Futureproof's acknowledgement that retrofit is complex, but simultaneously claiming customers are sufficiently equipped to select appropriate suppliers themselves.

More generally, several customers reported that Futureproof / CSE had been too busy to assist them at the speed with which they wanted to move forward: *"I went online and put in my details of what I wanted and it seemed to take a long time for them to get back to us with suppliers - so I just went on to do it myself. When they did get back to me I had already found installers."* Customers being without the support that they deemed valuable may have contributed to delays in their decision-making, which is already influenced by wider factors.

Uncertain numbers and questions about the attribution of the retrofit activity that has been advanced by customers also reflect limited monitoring. In Year 2, after referring customers on to their supplier list, Futureproof only knew if any works have progressed if customers proactively informed them. The lack of customer follow-up (partly by design but also due to resource constraints) has meant that Futureproof haven't been proactively aware of whether (and if so where) customers are stuck on their retrofit journey, and so how they can be helped to move along it.

Albeit resource intensive, a more rigorous tracking system could presumably have been developed. Project team responses in Year 2 seemed to view the demonstrator programme targets, even revised, as unrealistic[49], but also that the project was delivering useful outcomes: *"I'm feeling confident that what we're doing is making an impact, albeit small scale and quite slow. We're not going to transfer this overnight…not with the market we're dealing with."*

The issue for the project is that the approach taken to customer engagement and monitoring means that there is limited evidence to support the view that the project is making an impact. From a wider programme and evaluation perspective, the lack of focus on in-depth support and support at the retrofit installation stage – and limited customer tracking – has meant a dearth of

[49] One respondent noted that a target on EWI hadn't even been reached in a separate scheme that came with grants.

insight against a number of key evaluation questions. These include questions on the delivery of home assessments; increased customer appetite for and trust in quotes and quality of work; and learnings on obtaining quotations, on the installation process, and on QA and aftercare.

Beyond the BEIS grant

Due to the GHG, the project team have had limited time to make plans for the future sustainability of the scheme: “Instead of working on how we are going to make Futureproof viable after March I've had to get my head around the GHG, how it affects Futureproof and how we can best serve our customers.” As of February 2021, the perception of the project lead was that the other four active supply chain demonstrator projects were more advanced in settling upon a post-grant delivery model.

The services most householders have engaged with through the project (the customer advice line and supply chain training) were subsidised with the BEIS grant and not charged for. Business planning by Futureproof envisages the revenue streams to be charging for advice, referral fees from installations, and paid-for training, though definitive pricing had yet to be agreed, and there is still uncertainty as to whether even a high cost for home assessments will cover retrofit coordinator remuneration. The model for Futureproof moving forward is that staff will work mainly on other programmes (Energy Company Obligation (ECO)/Green Homes Grant Local Authority Delivery Scheme (LADS)), but devote about 20% of their time to the paid-for services. This de-risked approach means Futureproof can potentially scale up according to the level of able-to-pay demand.

Another long-term challenge is how to run more uncertain commercial services within a charitable organisation: “We could set up a small holding company to reduce the risk to the charity’s finances. However, it’s still not clear if the long-term opportunity exists, as how PAS 2035 will be applied to retrofit isn’t clear. If it just sits across LADS, HUG [Home Upgrade Grant] and ECO then there isn’t an able to pay market as such, or a driver for a household to pay for RC services.”

A significant concern for the project going forward is the importance of the aerospace industry to the Bristol area. The pandemic, and potentially Brexit, are having an effect here: *“there are likely to be lots of redundancies.”* The team are concerned that this will mean fewer people open to spending the large amount of money required for retrofit. However, the lead delivery partner also hypothesised opportunities arising from post-COVID working arrangements: *“there are more people working from home, and they are thinking this might be a more permanent arrangement; they will need an office set up, garages / spare bedrooms converted, and there may be others that realise it's freezing at home, my heating is really expensive, I better do something about it.”*

Futureproof will remain a relatively reactive service, providing assistance as and when, and where, customers request it, e.g. sending supplier lists to customers rather than organising / coordinating quotes. Should the customer reach a new hurdle, the Futureproof journey is reliant upon the customer proactively contacting them*: “[Some other projects] are quite*

intensive in terms of hand-holding the customer. Futureproof are offering something different and want to see if it works."

People-Powered Retrofit (Manchester)

Delivery organisations	Led by Carbon Co-op and Urbed with involvement from Arc4 Limited, Quantum Strategy & Technology Ltd, Fieldwork Labs Ltd, Cumbria Action for Sustainability and ShortWork Limited.
Summary of the project approach	People Powered Retrofit (PPR) is a flexible scheme, giving customers control over the process and the extent to which they use – and therefore pay for – a suite of services: • Prospective customer finds out about the project (most commonly through existing awareness of Carbon Co-op or PPR promotion via social media / radio / Carbon Co-op events), enquires and has a screening call to assess their readiness for retrofit. • A consultant completes the Home Retrofit Planner assessment on behalf of the customer to identify property profile and priority measures. • The briefing call helps to determine the route recommended to the customer but this is only finalised after a home energy report has been produced. Route A is support for simple measures, route B retrofit co-ordinator led, route C is architect-led. • Most customers are recommended to have a home energy assessment. Subsequent support offered is largely determined by which measures the client wishes to proceed with. • The project has recruited contractors that can be signposted or quotes sought from, either by the customer or, if requested, by the project team.
Supply chain recruited	228 – mostly equally split between micros and SMEs, with about 5% being large companies. Almost half are sole traders and 95% operate at the local / regional level only.
Customers engaged	208 enquiries, of which 88 progressed to the assessment stage at least.
Retrofits delivered	9 (with 2 in progress)
Key successes	• Well-attended workshops and events targeting the supply chain and prospective customers, as well as some encouraging networking between the two groups. • Supply chain willingness to pay for webinars. • Significant customer engagement despite limited promotional activity.

	• Establishing an early assessment tool that can filter potential customers; perhaps as a result, conversion from enquiries to payment for services has been over 50%. • Generally high levels of customer satisfaction. • Strong potential for franchising of the PPR model in other regions.
Key challenges	• Insufficient contractors for some more complex retrofit works, exacerbated by COVID, Brexit and the GHG. • Limited onsite training (due to COVID) preventing some more practical demonstrations of retrofit. • Some delays to the home energy assessment process due to shortages of assessors. • Low conversion of even paying customers to retrofit action. • Some customer issues with the speed of the process and communications.

Supply chain engagement

The chief concern for the project is installers: “We’ve got half a million pounds worth of work to procure in the next six months that is going to need more suppliers than we have at the moment." PPR has recruited almost 230 contractor contacts, though this includes consultants (architects, designers, specialists in air tightness etc.) as well as building contractors[50]. They are aiming to recruit local firms, especially for the actual building work, but have found some expertise to be scarce, and a number of contacts are drawn from a wider area. This chimes with the customer experience, with many finding it hard to find contractors prepared to undertake more risky and complex work.

PPR have developed contractor mapping and personas to inform their approach to marketing to the supply chain, determining which channels and messages are most effectively used to reach different types of contractor. PPR’s experience is that networking and follow-ups from webinars have been the most effective way of engaging and recruiting the supply chain. They have also found that a lot of local companies advertise on Facebook, and lots of people find recommended suppliers through this route. As such, they are starting to use Facebook adverts to engage with different contractor groups. Recently, the project has published a series of contractor case studies, in which the study subject – builders, installers and trades – describes how they got into retrofit and the benefits of working in ‘eco-renovation’. The case studies conclude with details of PPR and how firms can become involved.

[50] Some contractors have been in the Carbon Co-op network for a long time; a persistent theme is Carbon Co-op being well-embedded in the area and having an extensive network.

In terms of wider factors affecting engagement, delivery partners and stakeholders cited COVID, Brexit (skilled contractors moving back to mainland Europe) and the GHG. However, whilst the last of these has distracted some contractors, PPR have also found they have needed to reassure firms that they are not connected to the GHG: *"some suppliers have been put off the scheme [due to the perception of contractor bills not being paid on time]."*

The perception of one delivery partner is that over the last year the "national conversation (build back better etc)" has helped to shift thinking: "Traditional quite conservative builders are taking more of an interest and appreciating that this is the way that market is moving. Builders see the risk of that and are keen to get access to training and advice by which risk can be reduced."

Finally, a unique (at least to date) feature of PPR is the hosting of 'match-making' events. The rationale is that a key barrier to retrofit is mistrust on all sides: "*Some householders have run across cowboy builders, builders have met nightmare clients, both have met inept architects*." So these events, with all three groups in attendance, aim to build trust and enable early conversations involving all actors.

PPR have been advertising assessor and coordinator roles via their website and have had a lot of interest. They don't require applicants to have a particular qualification, and this has been felt to make recruitment easier: *"Some schemes have said they only want retrofit coordinators with this qualification, and there is a dearth of them, so therefore they've got a problem. There are people with those skills out there, often highly qualified in associated areas."* PPR have developed in-house induction and training packages to ensure that those they recruit possess the necessary suite of expertise and competencies.

Supply chain outcomes

PPR see a challenge in engaging more conventional builders, who are often wary of retrofit due to its complexity. The team feel this often leads these builders to significantly overprice retrofit jobs (if they go for them at all) in order to de-risk them. PPR has attempted to address this need to reassure conventional builders through a more flexible approach to training. Prior to lockdown, training was site-based, participants were subsidised to attend, expert builders provided some of the training, and training was held on days and times specifically chosen to minimise disruption to attendees' 'day jobs'. During the first lockdown, online courses and paid-for webinars were introduced, and have made organisation and logistics much easier, as well as enabling them to reach more people. The webinars have been extremely popular and the lead delivery partner highlighted that they are now generating nearly £1,000 per month for the project. However, the team also feels that lockdowns have prevented them from capitalising fully on latent supplier interest via on-site training: *"Builders want to understand practicalities; they need the theory, but most prefer training to be as hands-on as possible."*

In terms of training and webinar subject areas, PPR have to date been largely making their own assumptions about what would be valued by attendees. But supplier events are increasingly tailored to / informed by requests from the supply chain, e.g. an eco-renovation

course was provided in response to supplier interest. Heat pumps and ventilation have also been popular topics for the supply chain. In addition to practical skills, PPR have also seen a market for more courses on general business skills, e.g. courses on how to quote for work, particularly amongst smaller and newer businesses.

In terms of greater supply chain coordination, as well as PPR facilitating connections, the team note that their events have supported networking, i.e. contractors participating in an event and then forging relationships. One delivery partner reported that they had heard anecdotally that suppliers are collaborating, but had no specific evidence: *“Our WhatsApp has been a bit quiet, it needs another push.”*

Householder engagement

With over 200 enquiries as of March 2021, Carbon Co-op have not needed to do much marketing of the PPR scheme: *"We’re getting a steady stream of enquiries…more demand than we can satisfy.”* Lockdown affected demand initially, but it has since grown. PPR associate this growth with the fact that some customers were in their home more and were perhaps more conscious of their immediate environment, in addition to having more time and money. The GHG has clearly driven interest for many, but PPR have chosen not to fully engage with those not interested in whole-house retrofit: *“We can signpost them onto other sources of information and that’s fine, but there’s no point in us helping them.”*

PPR have now established a screening process to ensure they are focusing resource upon customers that most need the support they offer and who are likely to take forward significant retrofit works. BEIS funding has assisted the development of both a bespoke CRM (customer relationship management) and a new version of their Home Retrofit Planner tool (similar to the Plan Builder for the RetrofitWorks schemes). The team have created an assessment system when dealing with initial queries. Customers who score highly in terms of potential to implement whole house retrofit are offered a discounted rate on a home assessment. The success of this might be shown by the fact that PPR are not aware of anyone who has taken up the paid-for service and then dropped out. However, the high assessment cost[51] (relative to other demonstrator projects) also likely filters out those with only a casual interest. Despite this filtering, PPR has encountered the same issue as other projects in the slower-than-expected speed of customer decision making. Nevertheless, its model seems less vulnerable to this issue, as the higher charge for the the initial home assessment means that the scheme can better sustain customers not progressing.

As part of their marketing approach, PPR invested considerable upfront time in identifying a set of consumer archetypes. The archetypes deemed to be potentially most receptive to the PPR offer were older, wealthy, environmentally-aware homeowners. Whilst many of the project’s customers fit within this profile, the project has identified a new type of customer, driven by an interest in what they loosely describe as ‘green bling’; in other words, some of the cutting edge

[51] £500.

technological aspects, and status, of certain retrofit measures. In evaluation interviews with customers, most interviewees reported that their property had previously been fitted with some form of energy efficiency or renewable energy installation. Interviewees cited one or more of climate change (a desire to reduce their impacts), comfort and health as their main drivers for exploring retrofit. Project stakeholders praised PPR's focus upon comfort and *"liveability"*: *"co-benefits are very important, often more important than the financial ones…people want to live in a cosy and healthy home. You don't buy a kitchen because of payback."*

A number of householders interviewed for the evaluation had been considering having work done on their property for some time, in some cases several years. Moving house and refurbishment projects were prominent triggers for customers in exploring retrofit. Several interviewees stated that coming across PPR was the trigger they needed to take action on retrofit. One interviewee reported that they had commissioned a home energy assessment in 2017, but found the complexities of retrofitting bewildering and so had not taken the matter any further until making contact with PPR.

Most interviewees were aware of Carbon Co-op before becoming involved with PPR, and many noted that they had known of them and in several cases been associated with them for several years. In some instances, respondents had heard about PPR via newsletters. One referred to having heard someone from Carbon Co-op speak on the radio, whilst another came across them as a speaker at an event. Familiar with the Carbon Co-op, they admired their ethics and saw them as a trusted source of advice to take their project forward.

PPR's webinar series, a key element of their marketing strategy during COVID, has been a particular success for customers, attracting hundreds of attendees and leading directly to customer enquiries and customer / supplier communications.

Household retrofit activity

Although attracting customer interest has been straightforward, and conversion from enquiries to payment for services has been relatively good (over 50% conversion), progress in converting to retrofits has been slower. 9 projects have been completed, with several others in progress as of March 2021.

Across Year 3, Manchester has had more severe lockdowns in place for longer than most other regions. Some customers have been more cautious about having assessors / coordinators / installers visit their property, whilst some contractors have decided they are uncomfortable undertaking some forms of work. Contractors have also highlighted that COVID has led to shortages of certain building supplies.

However, delivery partners pointed out that COVID has required them to design new systems for customer engagement and these have helped to streamline the process. For example, questionnaires that used to be completed onsite are now done remotely and this helps give the assessor a feel for the project before they go onsite.

PPR customers interviewed for the evaluation had, with one exception, all been through the home energy assessment process. In most cases this was highly valued, with customers placing particular value on having access to a trusted advisor with whom they could discuss their options. Some praised the quality and detail of the report, but there was evidence of a split of opinion, with others identifying the length, detail, and technical language of the report as challenging: *“It was difficult to see the wood for the trees.”* One interviewee wondered if the general information provided in the report could have been more clearly separated from the specific issues relating to their property.

Delays in customer decisions have generally not been an issue, with coordinators finding that people have made quite prompt decisions – usually within a couple of weeks of the assessment. This differs from other projects, where customer decision delays have been significant, perhaps pointing to how PPR has targeted its offer. In any event, due to the comparatively high pricing for home assessments highlighted above, delays in customer decisions are less of an issue for the project, as they are better remunerated in the early stages and there is less pressure to ensure customers progress to retrofit in a timely manner.

However, most customer interviewees reported that the home energy assessment process had been subject to sometimes significant delay. PPR have encountered pinch points with shortages of assessors, and at one point there was a three month delay for assessments. In response the team trained up and doubled the number of assessors, but are now finding that they don't have enough retrofit co-ordinators. As of March 2021 they have 13 assessors and 4 retrofit co-ordinators, and are looking for more of the latter.

An associated concern was poor communications; customers noted that they had had to chase PPR for information, and one felt that PPR should be being more proactive in communicating with them: *"I was told to expect a visit and report in February but have not heard from them and am not sure when I will."*[52]

Most householders interviewed had either not yet received a report or not had sufficient time to reflect and plan their next move. One noted that they were somewhat deterred by the costs and challenges identified in their report and this had curbed their ambition. They expressed uncertainty as to whether the perceived high costs would represent value for money, as they were unsure whether they would remain in their house in the long term.

Most householder interviewees felt that they would have made some progress without PPR but that their eventual projects might be less ambitious and slower to be realised. One customer planning retrofit works felt that, in the absence of PPR, they would have proceeded with some less complex work; the services provided by PPR had given them greater confidence to plan more complex works. Another customer, who was just about to undertake some works, also noted that PPR had given them confidence to move forward, and felt that they would make better choices as a result of having commissioned their home energy report.

[52] This is an interesting contrast from stakeholders who generally praised the communication, organisation and knowledge of the PPR team.

Of those who had undertaken work, one had undertaken some complex roof insulation work, with PPR supporting the installer. This interviewee reported that they were 'daunted' by the costs of retrofitting, but had agreed a plan with PPR and suggested proceeding on an incremental basis. Another customer interviewee reported that they had undertaken work, but were doing so without PPR support; they expressed concern that PPR were recommending more costly options than they (the customer) considered necessary, e.g. wood framed triple glazing rather than UPVC.

PPR staff were identified as trusted experts and applauded for their commitment and enthusiasm. Several householder interviewees praised what they saw as the flexible and 'non-pushy' nature of the service offered by PPR. Despite this, it should be noted that some had expected, and would have liked, to be able to hand over more of the retrofit project management and decision making to PPR. Multiple interviewees across Years 2 and 3 expressed dissatisfaction with the pace of the service. One interviewee suggested that PPR had a relaxed approach to scheduling, something they attributed to the culture of the organisation, and suggested that whilst they themselves were comfortable with this, other types of customer might not be. Whilst most householder interviewees stated that they would recommend PPR to others – with several reporting that they had already done so – a number of interviewees suggested that they would be careful about recommending the service to those looking to take action quickly.

Beyond the BEIS grant

The lead delivery partner's view is that without the programme funding PPR would have happened but on a smaller scale: "We would probably have [had] a project like PPR but it would have proceeded more slowly and at a more modest scale… in short, the BEIS funding de-risks the activity." The funding has provided the space to trial approaches and learn from them. For example, PPR initially offered discounted costs to customers for assessments by subsidising this with the funding. They have now refined their systems and procedures; the process takes much less time, and they no longer need to offer a discount. "I think the change between 6 or 9 months ago and today is that we now have a better idea of what we're doing at every stage. Before, we were like, 'oh we're doing design development, we'll charge three days for this'. We know now that it takes a day and we know what a day costs us and we charge for that."

Carbon Co-op will continue operating PPR beyond March 2021. They plan to keep developing and growing the project – informed by customer and contractor mapping exercises - and expected to have achieved some level of sustainability by the end of the demonstrator programme funding.

The delivery partners are optimistic: "The project is generating income at each stage and we're looking at an average per customer of £2,500-£3,500 in fees…if we do that with 100 customers

[per year] the service starts to become profitable[53]." Partners are confident that they have created a service which some people appear to be ready to pay for, but there is still uncertainty as to how big that market is. The one stakeholder suggestion for adjustments to PPR beyond March 2021 was to at least partly subsidise the cost of detailed advice provision / assessment: "upfront payment is likely to deter some people, but the advice and support is essential." PPR see the Home Energy Planner tool as being important in enabling the scaling up of activity more cost-effectively in the future.

Any future business model will likely include social franchising: *"We've been pleasantly surprised by other organisations' willingness to pay for our advice and replicate our approach."* In return for a fee, the franchisee gets access to a tried and tested system, the CRM, and the home energy tool database. Carbon Co-op are already in discussion with five other groups about the potential for replicating the project elsewhere in the UK and expect to generate income by doing so: *"We got loads of interest in replication from other parts of the UK. We're now at the stage of quoting for stuff and starting to plan in work and training…with the social franchise model we do the training and then we get an ongoing percentage from the tools."*

On replication, one stakeholder felt that whilst PPR provides a useful template, its effectiveness would be contingent upon it being delivered by an organisation with *"similar motivations and qualities to Carbon Co-op…PPR may be a recipe for others to follow, but will others be able to assemble the right ingredients (people, skills, expertise, motivation etc) to enable them to successfully replicate it?"*

When asked about the future sustainability of PPR, one stakeholder felt that the benefits of the scheme are such that "organisations such as energy companies / DNOs [Distribution Network Operators] might support PPR as the scheme is delivering benefits that those organisations are required – or might wish – to deliver."

[53] Albeit this doesn't necessarily account for the opportunity costs of converting interest into paid project delivery.

Cross-project learnings

Within the demonstrator programme, there have been three broad project types:

1. Delivery organisations with quite a ‘hands off’, customer-led, pick-from-a-menu model (Futureproof and PPR). This enables tailoring the process to customer and supply chain interests / preferences, especially where customers are arriving with some pieces of the retrofit jigsaw already in place (e.g. contractors appointed, measure preferences fixed). Consequently, it enables the projects to add some value to a retrofit project, and receive some revenue, even where a customer may not be interested in a full package of support. The drawback, cited by project representatives, is that this more agile approach can appear quite uncertain / disorganised in terms of customer management and coordination of project resources. It is perhaps also harder to evidence the influence of the support on subsequent retrofit activity, especially where this support has been relatively minor.

c. The RetrofitWorks approach (Ecofurb, Cosy Homes and Warmer Sussex), based upon a more fixed and intensive customer journey. The pros and cons of this approach would seem to be converse to those for the first group. A fixed process makes it easier to plan / organise resources, and, where customers progress to retrofit, it is clearer to see the level of influence the schemes had on that. The required commitments can be a harder sell to customers, and mean significant (and under-remunerated) resource input at the front-end of the process, sometimes ending with the customer deciding not to progress, or doing so outside the project. However, from the perspective of providing specific support to encourage retrofit activity (as opposed to ensuring the financial sustainability of the project), it could be suggested that this model is providing as much support, and achieving as much impact, with its ‘stalled’ customer journeys as the Futureproof / PPR model is achieving with those recorded as ‘fully suppported’. Separately, a significant benefit of the RetrofitWorks involvement in all three of these pilots has been the transferability of assets (e.g. CROHM) from one project to the other, creating efficiencies.

d. The Homeworks model in Cornwall, with a journey instigated (and to some extent driven by) the tradesperson, rather than being customer-led. The theoretical benefit was ensuring that conversations with householders about exploring retrofit were happening right at the trigger point of other works being considered / carried out on their property: an attempt to co-opt the generalist supply chain into feeding customer appetite for retrofit, rather than simply delivering on it. As highlighted by some respondents, the potential challenge with this approach is insufficient supply chain interest / incentive to play this role. The model was never significantly tested, in part because the scheme was not able to attract sufficient interest from either the supply chain or householders.

The table below collates the project experiences to highlight good practice and learnings on some of the key programme elements and themes:

Customer engagement	The overall context is that despite limited promotion, projects have reported customer interest as higher than they had expected, or could easily process; indeed, projects have deliberately dialled back on planned promotion to avoid their systems becoming overwhelmed. This in turn has meant limited learning on which methods and messages are most effective in reaching and encouraging take up. Furthermore, because the latent interest sparked by the projects has seemed to exist predominantly amongst enthusiastic early adopters, even what is known about effective promotional channels cannot be reliably applied to the wider UK able-to-pay, owner occupier market. The potential challenge of engaging beyond this early adopter group is indicated by the finding that even some engaged enthusiasts have baulked at even quite heavily subsidised in-depth services and installer quotes. It should be recognised that the overall numbers of customers engaging are still small (in the hundreds) compared with the task of retrofitting millions of homes. And there is no certainty that initial levels of interest will be maintained over time. The schemes have generated a number of learnings: • Having a strong existing presence in an area seems valuable. Prospective customers will already know (and hopefully trust) the brand. For example, the longstanding presence of Carbon Co-op in the Manchester area has been a factor in many customers hearing about PPR and deciding to register for support. • Nevertheless, and especially for organisations without a local presence, building partnerships with organisations that do have a strong existing presence, and promoting through those, is effective. Despite Low Carbon Hub's pre-existing status in the Oxfordshire region, Cosy Homes cite the importance and value of promotion through their local community groups (Community Advocates). Warmer Sussex have benefitted – in terms of customer awareness and trust - from the vocal support of local councils in the region. • Digital promotion and a digital presence have been important for the schemes, not only in presenting a professional image, but also in providing a simple and efficient way for customers to find out more about their offer and, should they choose to, start on the customer journey. • Further illustrating the importance of trust, a householder selling the benefits of retrofit - and the scheme experience – to their peers is also valuable. Cosy Homes have had interest arising from the case studies of completed retrofits posted on their site. Similarly, Futureproof have found the Bristol Green Doors event to be an excellent way to inspire householder interest in exploring retrofit. • One method that the projects were unanimously confident had been impactful was events (including presence at a third party event), as specific expressions of interest / referrals could be linked directly to

	conversations at those events. In Oxfordshire, per-month engagement figures showed a clear spike in referrals following certain events. • In terms of marketing messages used to engage customers, all projects have tended to adopt a mixture of environmental, financial and health/comfort messages across their communications. This has aligned closely with the motivations of customers that have engaged with the schemes to date, albeit this may be somewhat self-fulfilling if that has been the focus of the messaging.

Customer retention and progression to action	Despite strong initial interest, projects have had a large customer drop-out rate and few customers progressing to retrofit as yet. The reasons for this vary, as do the potential solutions:
	• Some customers engaged with the schemes without fully understanding what was being offered, or sometimes misinterpreting this, and dropped out upon gaining greater understanding. Examples include customers already set on certain measures, and those seeking a simple single-measure retrofit. The projects would in theory not be looking to engage such customers without a significant shift in their focus and purpose. There are two considerations here:
	  • That these customers approached the projects at all *may* point to necessary refinements in how – or where – schemes are promoted and communicated. The main learning would therefore be how projects have minimised the resource expended on these householders. As outlined above, digital registration and tools such as the Plan Builder and Home Energy Planner have been particularly useful for filtering in Year 3.
	  • However, there is an alternative perspective – that it may be worth trying to engage and convert customers from pursuing a single measure to considering and implementing more impactful whole-house retrofit. There are examples of this having happened in the schemes, and it would seem a missed opportunity (potentially one the schemes cannot afford to miss) not to develop an approach to nurturing this partial interest in retrofit. It should be noted that the projects think the Plan Builder-type tools could be useful in converting some customers who might be motivated by the information to seek further engagement and support.
	• All projects are producing a tailored home assessment for customers and find this is an effective way of giving customers suitable retrofit possibilities and priorities for their property (something many are seeking) and providing a clear output from which next steps can be discussed. It is also a monetiseable service at a relatively early stage of customer journeys, though project experiences differ as to the charges customers will tolerate (from £100 to £500). The report and subsequent

	discussion are also useful in reassuring customers that a phased approach can be taken on what might, for many, look initially like an unaffordable set of recommendations. • The home assessment – or at least the subsequent report – is provided by a retrofit coordinator. The coordinator has been presented in the 'RetrofitWorks model' as being central to handholding the customer throughout their progress from registration to post-works QA; less so in PPR and Futureproof. However, in the actual delivery of schemes to date, coordinator involvement has been much more patchy (sometimes necessitated by resource constraints): for example, in Cosy Homes and Warmer Sussex, there has been some consideration as to whether certain (perhaps less technical) elements / responsibilities should sit elsewhere. The learning here is that for a coordinator to deliver the full originally-intended role may require more resource than first expected, and it is therefore an ideal but not necessarily pragmatic approach. • Although they had initially considered developing a finance offer, by Year 3 all projects had focused efforts elsewhere, insisting that there was little demand or need for it in the early adopter market. However, the evaluation has found evidence of high proportions of customers either delaying works or dropping out because of the higher-than-expected costs of works. This would seem to indicate that even amongst the ostensibly able-to-pay early adopters, affordability is an issue, and development of financial support may have been useful. On the other hand, as evidenced in schemes such as Green Deal, there may have been unwillingness amongst many households to take on debt to enable substantial retrofit. • Good communication is paramount, especially when the installer supply chain situation is creating significant delays in progressing customers through the scheme. Customers complained, but were generally understanding, about delays caused by sourcing contractors; many had experienced the same issue themselves prior to approaching the schemes. However, there was dissatisfaction – and sometimes drop-out – where customers felt that the projects had 'left them to it' or were not giving updates. • In terms of maximising potential for action, or at least seizing upon opportunities, moving house was cited by a surprising proportion of existing customers as being the trigger point for pursuing retrofit, indicating the potential value of projects working more closely with estate agents, an avenue several pilots are exploring. • Another idea arising from both the Manchester and Oxfordshire projects is selling a more collective retrofit approach; offering assessments and measures street by street to similar profiles of housing that might benefit from similar measures. If effective, such an approach could bring

	economies of scale (on labour and materials), better attracting the supply chain with this and with customer volume, and could enable the upselling of bespoke additional measures to certain properties.
Supply chain engagement and active participation	The considerations in the row above are important in retaining and progressing customers, but ultimately progression to retrofit is contingent upon engaging the installer supply chain. Whilst the schemes have a solid supplier base for most (specialist) measures, there continue to be specific gaps. And even where installers are ostensibly signed up to a scheme, obtaining commitment to works – or even quotes – from these firms is proving challenging. Helpful approaches to supply chain engagement, and encouragement to fully participate, are as follows: • There has been a realisation for projects that customer generation and cutting bureaucracy may not be sufficiently attractive to a large enough section of the supply chain. However, from interviews with the signed up supply chain, it is clear that someone else generating new business / warm leads and managing the customer is attractive to these installers. • Although not feasible during COVID restrictions, PPR commented upon the success of their 'clinic' events, where homeowners, builders and other professionals could gather together to discuss their projects, network and progress works. • For both retrofit coordinators and installers, delivery partner organisations have been able to draw upon contacts built up over the years, often from previous projects / programmes. This shows the benefit of the organisation having a track record in retrofit. • Offers and incentives can prove attractive. PPR and Futureproof have provided subsidised training to engage installers, whilst Cosy Homes held a 3-day online event in March 2021 aimed at engaging installers, addressing retrofit challenges and promoting involvement in the scheme. • Cosy Homes have appointed a specific individual to focus on supply chain engagement and recruitment. This individual commented that projects needed to be flexible and plan ahead; contractors need to have a clear idea of upcoming work so they can book in scheme works in three or six months' time, even if the contractor isn't available in the short term. This then helps to build the trust and confidence of the contractor that there is scheme work there for them. These approaches have been helpful, but have not been sufficient to address the issues. The GHG is widely felt to have exacerbated some of those issues. A key learning across the projects is that to ensure installer engagement at the levels required, there will need to be a seismic shift, probably necessitating changes to national policy (e.g. construction skills programmes, licences and

	building regulations) to create the conditions for market and supply chain interest. There was also a potential geographical dimension, whereby Cornwall and Sussex, the two projects covering the largest and most rural areas, found particular difficulties in engaging local installer supply chains.
Supply chain benefits	The key supply chain benefits that the programme sought from the projects were (a) increasing retrofit skills and knowledge, so enabling them to better 'sell' retrofit to customers; (b) realising benefits related to installation works themselves, such as closer collaboration and coordination, and economies of scale. • PPR and Futureproof in particular have conducted extensive training for the installation supply chain, conducting onsite 'toolbox talks', or evening courses which do not impinge on the contractors' working day. Futureproof have also encouraged an online FAB (Futureproof Associated Builder) community where there is evidence of contractors swapping experiences and advice, but also notifying other members when they have an available job or leftover supplies. Encouraging this type of 'project community' would seem to be an effective platform for realising some of the aforementioned benefits. • There is clear evidence of the schemes upskilling contractors that have engaged with the training, with some attendees specifically stating that they now feel more confident in advising customers on retrofit and specifying measures. However, within the RetrofitWorks model in particular, it is the role of the scheme, not the contractors, to engage with and sell retrofit measures to the customer; as such, the scheme designs do not create the opportunity for evidence of supply chain sales skills. • On benefits connected with coordination and efficiencies in retrofit works, no schemes have yet seen enough large retrofit projects to demonstrate how the models are delivering these benefits. BEIS intend to continue to liaise with projects as they (hopefully) grow and increase their experience of onsite delivery.

Overall conclusions

Whilst the offers and customer journeys have differed, the successes, issues and learnings from across the projects funded by the Retrofit Supply Chain Demonstrator Programme have been remarkably similar, and provide clear key findings and implications for BEIS.

In Year 1 of the programme, projects focused on establishing project systems and processes. This continued into Year 2, with new tools being developed and processes refined. Projects did start to operate and engage customers, but at a fairly low level, forced principally by the challenges in engaging a sufficient installer supply chain. The project teams contend that the delays to confirmation of – and reduction in – programme funding in Year 2 were unhelpful, though were unclear as to how full funding would have been used to address the issues underpinning limited activity. The final year of the funding programme (Year 3) was expected to be the year in which customer throughput would be ramped up, project approaches properly tested, and the year in which outcomes would be observed.

There have been successes in scheme design, in particular:

- The development of online toolkits to capture customer and property profile data and provide initial recommendations on measures. These have also served as effective customer filtering systems.
- Building relationships with supportive local and regional stakeholders (including councils and community groups) that have been and will continue to be integral to promoting and advocating for the projects.
- Development and refinement of the marketing channels and messages used to engage customers and installers.
- Testing of the value that customers and installers each place on different project elements and incentives.
- Identification of models through which the projects could be sustained in the longer term[54].
- Evidence of project models being replicated outside the pilot areas, often in consultation with the funded projects.

Despite these successes, Year 3 has largely repeated Year 2 in producing limited evidence of the outcomes that the programme was designed to demonstrate, i.e. household retrofits and a proven local retrofit supply chain experiencing multiple benefits around collaboration and skills. As of March 2021, within the context that the *original* programme targets envisaged several thousand retrofits by the end of the programme, the total number of retrofit projects delivered through the funded schemes is less than 200. Furthermore, a majority of these come from one

[54] Though an observation on this is that whilst the projects won't need large numbers of customers to be cost-effective, those cost-effective customer levels are nowhere near those required to achieve wider UK targets; the projects have identified sustainable business models, but the challenge of achieving scale remains.

scheme where the precise influence of the scheme support on the eventual retrofit activity, and the nature of that activity, is very unclear.

Across the five projects that continued to receive funding until March 2021, there have been few issues with generating customer appetite. Even with minimal marketing, projects have been approached by hundreds of householders, and have actually had to take steps to limit marketing to households and manage householder expectations on the timing of formal engagement and support. All projects now have in place a form of triage: an online tool that all customers need to complete to register. This gives the householder a certain level of guidance, and provides the project teams with useful customer profile information before they engage in person. Another key (and somewhat intentional) benefit of these tools to the projects has been to filter out customers whose objectives / expectations do not align with what the project is offering, i.e. those pursuing a single-measure installation rather than a whole-house approach.

It could be argued that projects are missing out on the opportunity to test the feasibility of persuading such customers to explore a 'whole-house' approach, and certainly the profile of customers progressing through the customer journey to date have been predominantly enthusiastic early adopters. In other words, it is clear that the projects have benefitted from some latent householder demand. Yet the project prioritisation of early adopters is understandable on the basis that even for the limited number of customers that have progressed through the journey, there have been substantial delays between stages.

Customers responding to the evaluation were often critical of slow progress and communications, but the evaluation found generally good levels of satisfaction with the advice and support provided. Most customers interviewed as part of the evaluation said they had been considering retrofit work for a while (with the implication that the presence of the project had nudged them to act on this). And in most cases where a customer was progressing works, they felt the project had influenced their selection of measures and / or the speed with which they had acted. An as yet unanswered question for the projects is how big this enthusiastic, early adopter market is. Drop-out even amongst this group has been substantial, though this has been caused in part by the delays to scheme delivery, and in part by a lack of retrofit coordinator and supply chain resource.

For projects where the retrofit coordinator function is central to the delivery of the customer journey, there is now generally sufficient resource to meet the current (carefully managed) demand. On the installer supply chain, over Year 3, project teams have increased the numbers officially signed up to their projects, but it has been equally as challenging as it was in Year 2 to actually secure quotes, book in works, and so deliver retrofit on the ground. There are longstanding barriers to securing supply chain delivery of retrofit. With the exception of EWI and glazing, projects have generally not struggled to find and recruit firms specialising in individual measures / technologies. Most challenges have centred around the generalist builders necessary for a whole-house approach. Almost by definition, most of the 'good' firms that the projects feel are suitably skilled and qualified have full order books, no shortage of new work coming in, and (for many of the local, smaller firms) no particular desire to grow / expand their business and workload. In this context, few firms are keen to take up relatively complex and risky retrofit projects when there is no compulsion to do so. In the last year, all projects feel

the supply chain challenges have been greatly exacerbated by the Green Homes Grant scheme.

There have been two key external influences on the projects in Year 3. COVID of course has to be acknowledged. Restrictions have affected planned project activities e.g. marketing at events, onsite training, and delivery of onsite elements of the customer journey (home assessments, surveys, and actual works). Yet whilst COVID has undoubtedly affected delivery across the Year 3 – the year that projects had hoped would be the key one for realising intended metrics / outcomes – in some ways its effects have not been entirely detrimental to the projects. There has been some dampening of customer enthusiasm for progressing, giving projects more space to process their remaining pipeline. COVID has also led to innovations, with projects designing COVID-secure assessments and refocusing upon digital tools and customer pathways, the benefits of which have been discussed throughout this report.

The general view from the projects is that the factor having most effect upon Year 3 delivery has been the Green Homes Grant voucher scheme, launched in September 2020. The ostensibly beneficial effects of the GHG have been to generate a spike in householder enquiries and a generally higher level of interest than projects previously encountered. However, as discussed above, projects were actively attempting to limit householder recruitment, and GHG-inspired enquiries tended to fall into the category of those least aligned with project offers i.e. customers seeking contractors for quick single measures, rather than a more involved whole-house approach. The lack of supply chain engagement, which meant that the customer pipeline had to be tightly managed, is felt by the projects to have been exacerbated by the GHG. This was either by encouraging firms away from the local supply chain pilots to deliver single-measure projects, or by limiting the firms that the pilots could approach to conduct works: where the customer was utilising GHG, certain certifications were required.

In both Year 2 and Year 3 the projects did not deliver on many of the quantitative KPIs agreed with BEIS at the outset of the demonstrator programme funding. The sense that the targets were more aspirational than obligatory continued to permeate project considerations. There is a strong sense from the evaluation that projects realised that the target numbers would not be deliverable, especially in the context of COVID and the GHG, and that, perhaps particularly as funding draws to a close, the priority should be upon preparing the scheme for life after the BEIS grant. This is understandable, but the prioritisation of resources for design and refinement to best ensure project resilience has meant limited robust insights for BEIS in a number of areas:

- On the most effective marketing strategies, projects have some sense of this, but many of the activities and approaches developed in Years 1 and 2 have not been well tested, nor their effectiveness compared. This is partly due to COVID, but also because the projects took the prudent decision not to launch a number of activities due to concerns about the project operations being overwhelmed (with resultant delays and reputational damage).

- Across the projects, there is no strong sample of completed (or even in-progress) retrofit projects with which the delivery partners have been able to test and refine their systems and approaches at this stage of the process. In particular, the value of the site / contractor management and QA role of retrofit coordinators has barely been measured. It should also be noted that a number of the customers reaching the retrofit stage have been atypical (members of, or closely linked to, the project team).
- Because of the timing, nature and minimal sample of retrofit works to date, there has been little to no evidence of the hypothetical benefits that BEIS were hoping to test around supply chain collaboration / coordination and economies of scale. Installer respondents to the evaluation valued the training provided by the schemes (where they had taken this up) but there was limited evidence that this had increased their confidence in talking to customers about - and conducting - retrofit. In any event, however, in most schemes the role of engaging and selling to the customer sat with the delivery partners.

Aside from Homeworks, all five of the projects receiving programme funding planned to continue operating beyond March 2021. No project is yet fully 'cost effective' (in the sense of generating a self-sustaining revenue), and all will be reliant upon cross-funding from the delivery partners' other activities, though the feasibility of contributions from wider stakeholders is being explored. For the three projects based upon the RetrofitWorks model, all with substantial overheads, this extension will be monitored and dependent upon the projects starting to achieve the customer throughput and conversion to action that are essential to scheme revenue. Most pressingly, there is a specific timetable for assessing the viability of Warmer Sussex. PPR seem more optimistic about sustaining their lighter-touch service, and are exploring a social franchising model (with fees for the use of certain tools / training). CSE's Futureproof will remain a relatively reactive service, providing assistance as and when, and where, customers request it.

Revisiting the objectives of the funded schemes, and programme overall, achievements have been mixed. In terms of the core objective – a proven model for engaging the local supply chain to deliver domestic retrofit work at scale to the able-to-pay, owner occupier market – it could not be said that, as of March 2021, any of the schemes have *fully* demonstrated this. There are however three key caveats to this assessment:

1. All funded schemes have generated substantial learnings and insights on a number of aspects of scheme design and wider subjects, e.g. challenges in engaging the supply chain, or working with wider stakeholders. These can be harnessed and applied to future policy efforts.

2. Whilst they cannot explain all the difficulties the projects have encountered in delivering on the originally agreed programme objectives and KPIs, COVID and the GHG have had clear and (mostly) detrimental impacts on project delivery in precisely the year that they were hoping to ramp up delivery and test/prove the effectiveness of their approaches.

3. The projects have not generated substantial outcomes *yet*[55]. As noted, five of the six projects are expected to continue in 2021-22 and, in a more favourable environment, have, supported by the programme, built the foundations and systems to deliver models at scale.

Ultimately, this evaluation sought to assess the extent to which the retrofit demonstrator projects have pointed the way to building a local installer supply chain with the capacity and capability to deliver domestic retrofit at scale. Attracting the supply chain was the underpinning rationale for the programme: on the one hand, the projects' conviction that this has been the most difficult aspect (greater than they had expected, and with as yet no proven solution) is not particularly helpful for BEIS. After three years, six dedicated programmes delivered by experienced, agile and committed organisations have resulted in less than 200 retrofits, even from an ostensibly enthusiastic 'early adopter' customer group.

On the other hand, programme outcomes to date cannot be considered in isolation from the uniquely unfavourable combination of circumstances for the projects – in particular the GHG, COVID, Brexit, and funding delays and reductions in Year 2. Furthermore, through the experience of project design and delivery, the project teams and wider stakeholders have provided a number of ideas and recommendations for BEIS as to how the wider policy environment[56] could be (and perhaps needs to be) adapted to better overcome public and supply chain indifference and realise the UK's domestic retrofit, and wider net zero, ambitions.

[55] As mentioned above, BEIS intends to maintain a relationship with the pilots and follow their journeys.
[56] The National Retrofit Strategy makes the case for a set of interlocking building blocks that need to be in place, around: Leadership and communications, Research and innovation culture, Performance standards, Finance and grants, Training and accreditation, Materials and equipment, Creating customer demand, Compliance and quality regime. BEIS' consultation on further improving the energy performance of privately-rented homes has concluded, and BEIS are analysing the feedback. The main proposal is to introduce a minimum EPC rating of band C for privately-rented homes, where practical, cost-effective and affordable. Government has also committed to consult on possible regulatory changes to the energy performance of owner occupier homes.

Annex: Wider evidence bibliography

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This publication is available from: www.gov.uk/government/publications/supply-chain-demonstrator-project-final-evaluation-report

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