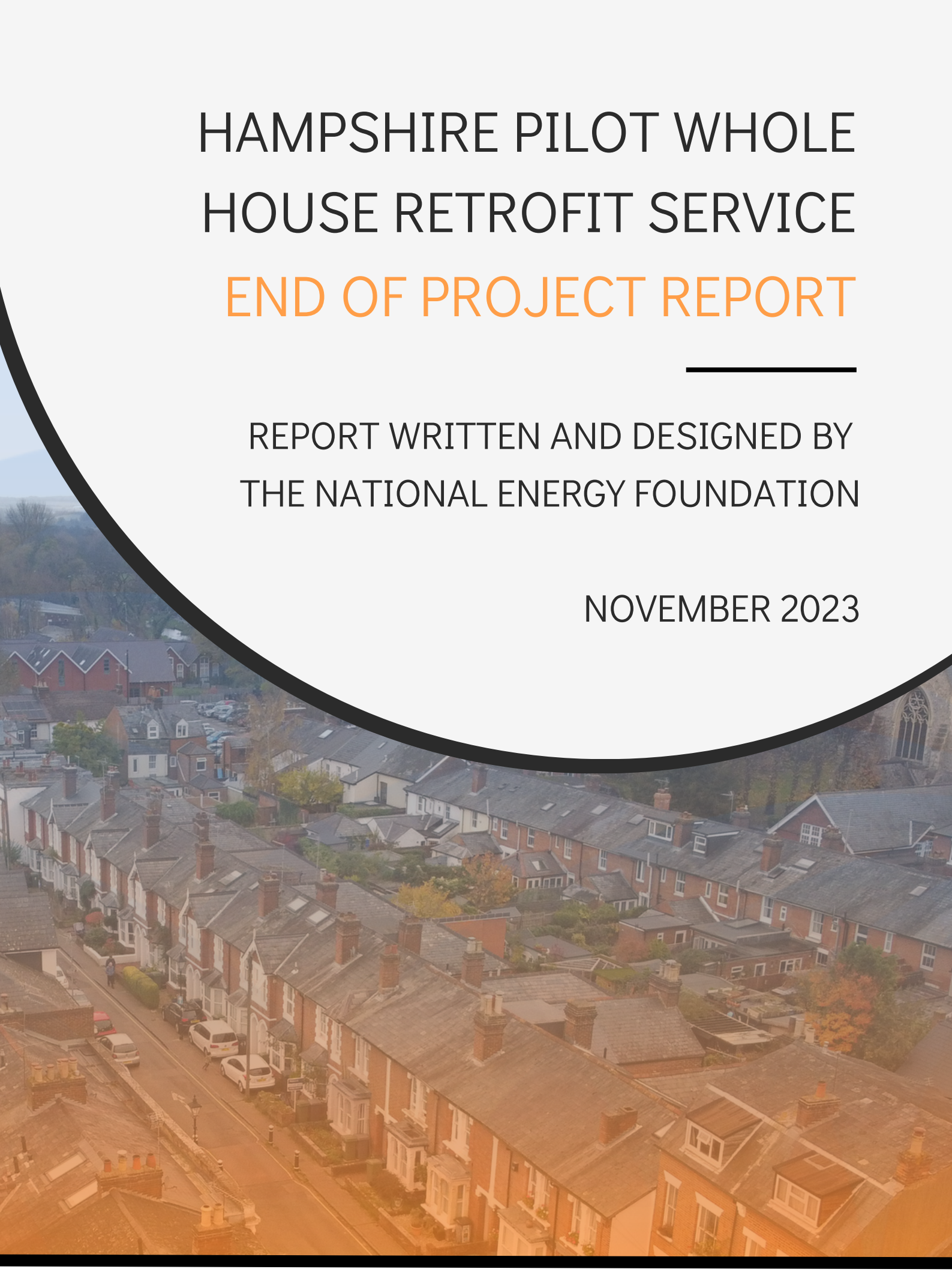
HAMPSHIRE PILOT WHOLE HOUSE RETROFIT SERVICE

END OF PROJECT REPORT

REPORT WRITTEN AND DESIGNED BY
THE NATIONAL ENERGY FOUNDATION

NOVEMBER 2023



SuperHomes

National Energy Foundation

PeCAN

WinACC
Winchester Action on the Climate Crisis

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Introduction

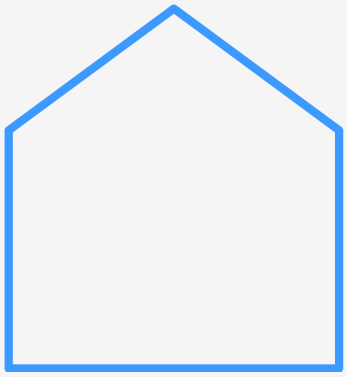
The purpose of this report is to disseminate the learning and findings from piloting a local area Whole Home Retrofit Service for the 'able to pay' housing sector over a period of 30 months which was based primarily in Hampshire. In so doing, the challenges, successes, and overall project impacts associated with project delivery will be summarised.

While this report contains learning that will be of interest to various retrofit stakeholders, it is aimed at organisations, such as local community groups, who are embarking on creating their own local retrofit service for the owner-occupier market.
The project was made possible following The National Energy Foundation (NEF) securing £0.75M of grant funding through the Energy Industry Voluntary Redress Scheme administered by the Energy Saving Trust (EST). The project benefitted from funding under a new innovation stream which allowed the creation of new services that promote domestic energy efficiency and affordable warmth.

At the end of each report section, a summary of the key learning points is listed. For clarification, this report focuses on the learning as an overall project case study and is not EST's mandatory end-of-project evaluation.

KEY OUTPUTS AND IMPACTS

305 WHOLE HOUSE RETROFIT PLANS DELIVERED





150

SUPERHOMES ASSESSMENTS

41 HOUSEHOLDS BEING MONITORED AND EVALUATED UNDER SUPERHOMES RATING SCHEME

15 PEOPLE ENROLLED ON RETROFIT COORDINATOR TRAINING





12

SME'S GAINING MCS/TRUSTMARK ACCREDITATION



£122,171.17 OUT OF THE £125,000.00 CAPITAL GRANT FUNDING SPENT

46

DISTINCT HOUSEHOLDS RECEIVED CAPITAL GRANT FUNDING

CARBON SAVINGS AND FUEL BILL SAVINGS OF MEASURES INSTALLED UNDER CAPITAL GRANT FUNDING:

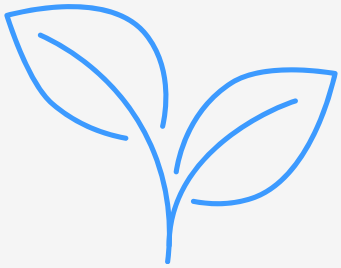
- ANNUAL CARBON SAVINGS: 36.5 TONNES CO2/YEAR
- ANNUAL FUEL BILL SAVINGS: £20,867
- LIFETIME FUEL BILL SAVINGS (30 YEARS): £621,300
- LIFETIME CARBON SAVINGS (30 YEARS): 1,073 TONNES CO2/YEAR

ANNUAL CARBON SAVINGS IF ALL WHRPS COMPLETED:

~2,700.51 TONNES CO2/YEAR

ANNUAL FUEL BILL SAVINGS IF ALL WHRPS COMPLETED:

~£259,784.67



SECTION 1: Project Aims, Objectives and Targets

The principal aim of the project was to:

- Build knowledge, capacity, and a local supply chain to create a new retrofit service that supports owner occupiers to transform the energy performance of their homes.

While the main objective was to:

- Implement a successful project creating ongoing demand for the retrofit service leading to the creation of a self-funded legacy service and to gain and disseminate learning from which other communities would benefit and replicate in their own local service model.

The project targets, as varied in agreement with EST during the life of the project, were as follows:

- Delivery of 300 x Whole House Retrofit Plans by Retrofit Coordinators (in accordance with PAS2035 provisions for 'medium term improvement plans') with subsidies for eligible households as the headline target.
- Provision of 150 x 'SuperHomes Rating Scheme' (SRS) assessments to test NEF's new retrofit assessment methodology which provides a benchmark of retrofit achievement and evaluate the success of application (original target 300).
- To facilitate demonstration homes to 'showcase' whole home retrofit and the benefits using video fly throughs and case studies (original target of 50 show homes).
- To deploy a monitoring package into each retrofitted show home to evaluate performance over a 12-month period enabling evaluation of project success and certification of SuperHomes against the SRS.
- To undertake research with a view to adding to the evidence base that a linkage exists (or should exist) between the energy efficiency performance of retrofitted homes and home asset value (original target pre and post retrofit valuations of the 50 show homes).
- That a minimum of an additional 50 homeowners, in addition to the show homes, who received a WHRP have commenced installation of one or more actual retrofit measures during the life of the project.
- To support 15 local professionals to become accredited as Retrofit Coordinators (PAS 2035) with the benefit of training course subsidies (original target 10).
- To support 15 local contractor/installer businesses to gain Trustmark (PAS 2030) or MCS accreditation status with the benefit of subsidies (original target 20).
- To explore the potential for exploiting retrofit 'trigger points' by collaborating with local Estate Agents and Local Authority Planning departments e.g. to sign up for a WHRP with a view to retrofit work coinciding with planned general refurbishment or expansion of dwellings.
- To award up to £125,000 of non-means test capital grant funding towards the cost of implementing retrofit measures recommended within a WHRP (additional target introduced as agreed with funder).

Key Learning:

- The original targets set were stretching and arguably overly ambitious. As such a 6-month extension to the project duration was agreed to maximise the chances of meeting the targets.
- Prior research into local home retrofit support needs would have helped in setting more achievable targets and potentially where efforts could best be focused to enable the targets to be reached sooner.
- Meeting the targets largely depended on the willingness of the targeted project stakeholders to participate in project activities. While effective marketing of the service, building trust in the community and offering general encouragement are all crucial, participation is ultimately decided by the individual or organisation.
- Some re-profiling and scaling back of targets was necessary as progress was made and learning in the project came through helping project partners understood what was realistically achievable.

SECTION 2: Project Partners, Roles, Governance and Management

The pilot project was tripartite partnership between NEF and two community-based climate action organisations namely Winchester Action on the Climate Crisis (WinACC) and Petersfield Climate Action Network (PeCAN).

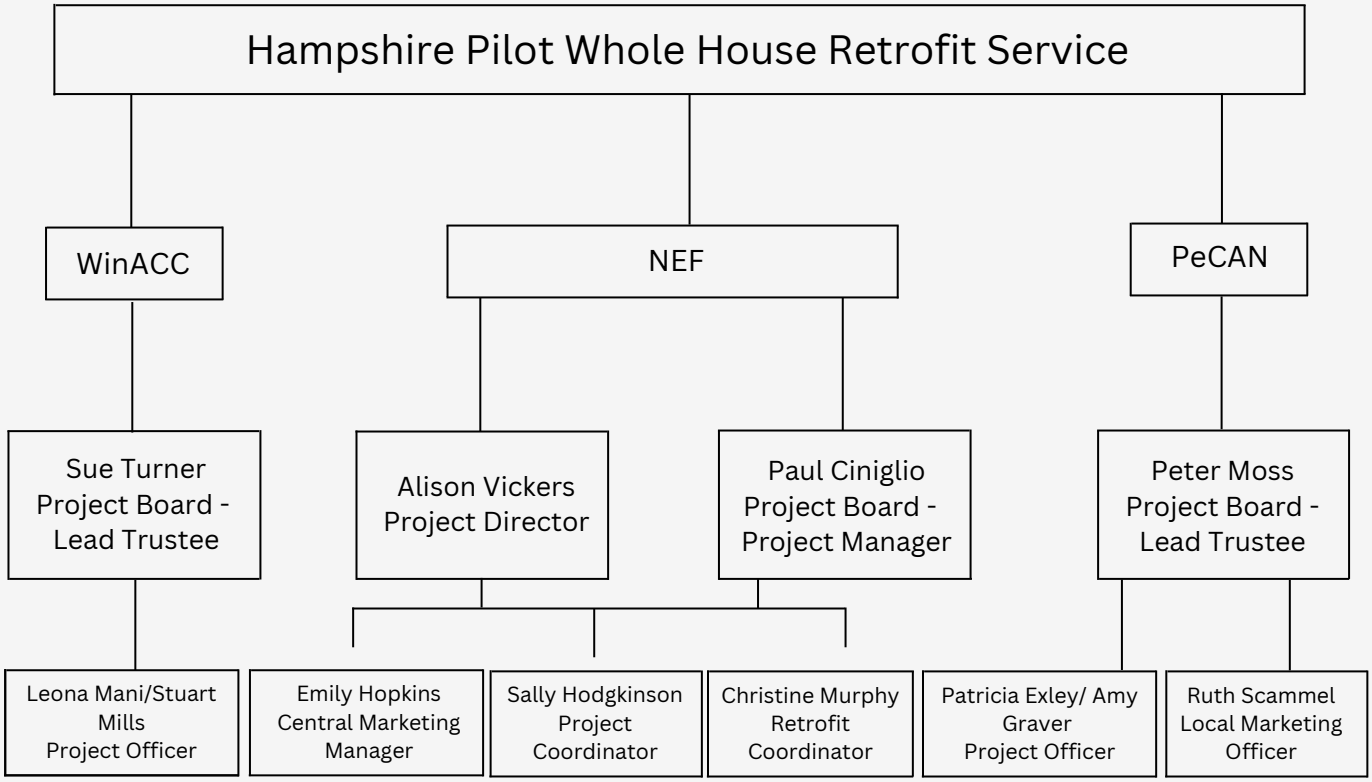
NEF's role was to lead the project and provide overall Project Management. The main responsibilities of the community groups were to identify and sign-up customers to the service and support them through their onward retrofit journey.

Project implementation was supported by several third-party specialist consultants, notably:

- Resolution Energy Ltd – Detailed energy modelling, SuperHomes Assessments and associated research.
- The Sustainability Centre – Project legacy service
- Trinity Rose Ltd (Chartered Valuation Surveyors) - Retrofitted Homes Valuation study
- The Sustainable Development Foundation – Research methodology on Retrofitted Homes Valuation study
- External Retrofit Coordinators – Abba Energy, Parity Projects, EcoAlex, Owens Insight, and BuildPass.

Project Management and Governance

The organigram depicted below represents the project management and Governance structure adopted:



During the project mobilisation phase and early stages of implementation, two meeting groups were initially established to monitor and oversee progress:

- Project Working Group - comprising the Project Coordinator and local Project Officers x 2 focusing on local delivery matters, and
- Project Board - holding overall project oversight and authority for decision-making made up by the Project Lead and Trustee project leads from each of the two community groups.

Meetings were held monthly by both the Working Group and Board on a staggered basis, the idea being that the working group could escalate matters up to the board for decision.

Later in the project life when the means of implementation became more standardised and familiar, it was resolved that the two meeting groups could be amalgamated for efficiency purposes with only the Project Board meeting monthly but attended by all.

Project Management Tools and Techniques

- Action log – matters arising were recorded on an action log which were tracked using a RAG status at every meeting in preference to recording detailed meeting minutes.
- Risk Management – A live risk management matrix based on risk occurrence likelihood and risk impact was set up and reviewed at each meeting with special attention given to risks changing in profile.
- Learning log – this was set up to record specific insights, challenges and reflective learning associated with the implementation of the service for sharing with others. The actual points are included in the learning summary following each section.
- Customer complaints and compliments log – these were recorded against the project discussion at board meetings and logged and dealt with in line with NEF's central policy.
- Customer Relationship Management (CRM) - A key component of delivering a successful project was the setup and implementation of a CRM system to track, manage and report on the various stages of the customer journey.

The building and setup of the CRM system took place from September 2021 and the system went live in December 2021, which meant NEF and the Community Groups could start to input new customers early on in the project, which significantly helped with reporting.

One of the biggest benefits of the CRM was the ability to move away from spreadsheets and issues with providing external access to them. This is because the CRM could be used by all NEF staff plus the Community Groups, meaning they could easily track how many signups they were achieving per month. The CRM also made reporting on figures much simpler and was of particular use when submitting quarterly reports to EST.

The CRM is a key component of NEF's project delivery and throughout its use on this project, the learnings gained from using it daily will help NEF's deliver of future projects.

- Financial accounting and spend tracking – Robust financial management is essential for all major projects. To supplement NEF's standard management procedures, a detailed project spend tracker for all budget items was established and maintained as a live project management tool. The tracker helped with the quarterly grant claim process and budget reforecasting.
- EST quarterly progress monitoring and reporting process – the documents required by the funder to be submitted with each grant claim helped track progress in a consistent and logical manner.

Key Learning:

- Creating a retrofit service from scratch is a significant undertaking. It requires a clear Project Governance and Management structure to be adopted and should be supported by appropriate tools and techniques for successful implementation and tracking of progress which are tailored to the achievement of specific project goals.
- A CRM is essential for smooth project operation and is particularly relevant for maintaining control when high number of customers are involved (~300) and their point on their retrofit journey needs to be tracked.
- Provisions should be made in advance so that when changes in key personnel occur during the life of projects that handover and customer case transition can be affected as smoothly as possible.

SECTION 3: Marketing and Customer Engagement

Essential to the success of delivering a new retrofit service, of a type that hadn't previously existed locally, is the marketing strategy and how potential customers are to be engaged.
It was determined that NEF would provide overall strategic marketing support to the project using its inhouse marketing team which would be resourced from a main central marketing budget. This covered, for example, the creation of two new webpages for the area-based community groups which were linked to an existing NEF website targeting retrofit in the 'able to pay sector' (see SuperHomes later); and to bring consistent branding to customer facing reports. The primary role of the local community groups was to recruit customers and a local marketing budget was made available to each group to help facilitate the signing up homeowners in connection with for example attendance at local events with branded stall materials, promotional flyers and paid advertorials.

The headline project target of signing up 300 customers to receive WHRP under the service would be demanding. The two community groups with their existing presence, trust and local networks would be essential in enabling the rate of sign-ups required to be achieved. NEF as an organisation was scarcely known in the Hampshire project area and to start community engagement from scratch would be hard going and take considerable time.

SuperHomes Network

As this project was a Pilot 'Whole House Retrofit Service', all sign-ups were entitled to a year's free membership of the SuperHomes Network. This Network is made up on homeowners who are wanting to improve their home's energy efficiency and are all at various stages of their retrofit journey. A benefit of the Network is that it allows for members to exchange knowledge and advice about their experiences of retrofit, which is of particular use as there are some members of the Network who were early adopters of retrofit and so can pass on advice to those just starting out with retrofitting.
A further benefit of giving project signups free Network membership was that it allowed homeowners to attend the online SuperHomes events about different retrofit topics. Over the course of this project, a total of 15 webinars were held, with topics spanning from insulation materials to heat pumps. A range of guest speakers took part, from Back to Earth to ISO Energy. The usefulness of these webinars was summarised by a respondent in the satisfaction survey who stated:

"I personally enjoyed the presentations given by the experts, for example on batteries and different types of insulation, and the real-life experiences of people installing the insulation/renewable measures"

Currently, there are over 500 members of the SuperHomes Network, a number bolstered by the Hampshire project, and it is projected that this number will continue to grow. Peer to peer learning on retrofit remains extremely powerful and encourages the wider take up of retrofitting.

Carbon Calculator Home



The carbon calculator house was a shared resource built for community engagement purposes to help users understand the impact of applying retrofit measures to a typical home and in the most appropriate order. Intended to encourage up take of WHRPs, it was well received as a bespoke tool based on simple jigsaw pieces and proved popular with families. Supplied by www.conceptshed.com





Combined Learning from WinACC & PeCAN - Marketing / Customer Engagement Strategy & Insights

The local marketing approaches included:

- Stalls at local events such as Eco-fairs
- Newspaper and magazine articles
- Website promotion and social media
- Promotional flyer delivery drops on a door-to-door basis
- Direct mailing letters to off-gas grid homes with poor EPC and homeowners who applied for planning permission to modify homes
- Capital grants
- Webinars
- In-person events and talks
- Community thermal imaging events
- Promotional videos – full-length and shorts for social media

From the list of marketing approaches used, PeCAN found that the most successful marketing tool was by far face-to-face conversations, whereas WinACC found it was social media. The in-person events enabled one-to-one engagement and were generally worthwhile when well attended.

Post the Covid-19 pandemic more people liked the ease and convenience of joining an event online from the comfort of their own home. These events were often recorded with the webinar being uploaded to YouTube channel with a link shared with everyone who signed up to the event, giving them the option to watch it in their own time.

The community groups ran a series of paid articles in newspapers and magazines with varied outcomes, but overall success leading to sign ups was very limited. Social media, including paid advertorials, was used throughout the project and proved successful for WinACC. Direct mailshots and leaflet drops didn't yield positive results in interest.
Promotional videos e.g. of homeowners talking about their retrofitted homes, gave a strong representation of the project and were a useful tool in promoting the project through websites and social media although it is not possible to know how much of an impact they had in terms of bringing in new customers.

Capital grants have had a very positive impact towards the end of the campaign and the marketing associated with this (through social media, on the website and through email marketing campaigns) made a big difference. The grants also helped to accelerate retrofit work with some customers bringing forward the dates of their planned retrofit interventions so they could benefit from grant funding.

Homeowners generally appreciated the advice given by the community groups, the trusted nature of the organisations involved in the project and the independent WHRP reports that were provided. The number of touch points with customers who signed up for a WHRP varied with some requiring several and others proceeding almost straight away. A pleasing number of additional sign ups were gained through customer referrals to friends. Most homeowners are unaware of the term retrofit or the benefits of a WHRP. This confirms that WHRP are still a relatively new way of identifying the most suitable measures for retrofitting and planning work.

Even when some customers were presented with a redacted WHRP in advance of signing up, a limited number were disappointed in the findings and content of the report stating that it did not give them the information they were expecting. This demonstrates the need to be clear on the limitations of a WHRP and that it is not intended as a design or specification of retrofit work. Some customers felt overwhelmed by the amount of information given in the plan and its technical nature often feeding back it was not user friendly (PAS 2035 approach).

The estimated costs of retrofit measures were of concern to some customers and may have led to a postponement or delay in implementing retrofit measurers. Many customers were looking for an acceptable 'pay back' period on their investment and felt the Government need to provide more support and information. Those who are interested in doing something to their homes are generally focussed on one or two measures typically insulation and or solar PV panels.

The support introduced by NEF to have a dedicated Retrofit Coordinator available to support customers post issue of WHRPs (see section 11) with technical matters and their onward retrofit journey generally was effective and seen as invaluable. It also assisted in allocating the full available capital grants. The price point of £500 for a standard WHRP plan is found to be too high for the majority of homeowners and extending the 50% fee reduction to Council Tax Band D customers mid project (in addition to A, B & C) helped to create more interest in the plans. The energy supply and cost of living crises were a factor in the ability to recruit customers and although the desire to save money on running costs would be expected to increase interest in the project, many homeowners seemed to be sitting tight to ride out the storm rather than investing significant sums in retrofit work.

Achieving customer sign-ups is influenced by the seasons with a dip found to occur over the summer months. The community groups felt that there is still a lot of confusion around the general topic of domestic retrofit. The lack of a clear national policy and the constant changing in availability of grants and other funding schemes is unhelpful. As a result, homeowners are often confused, and some will naturally hold off from implementing retrofit measures in the hope that they can take advantage of a grant scheme at some point in the future.The project enabled a much larger impact on the community than the level of sign-ups would suggest alone in terms of raising awareness about what home retrofit is and its benefits to a homeowner.

SECTION 4: Workshops, Events and Outreach

Summary of KPIs set by EST and reported every quarter:

- Number of events – 76 events were held over the project
- Number of households reached at events - 2,852. EST's target was 2,000.
- Number of households receiving telephone advice – 700. EST's target was 500
- Number of households advised via email or online activity – 8,411. EST's target was 5,000
- Total distinct households reached with advice – 2,936. EST's target was 2,000.

Key Learning from the Community Groups:

- Community sustainability groups who are already established in a local area are an effective route to customer engagement as they are known, trusted and have an existing network following.
- PeCAN found face to face conversations were the most successful means of signing up customers to receive a WHRP, WinACC found it was social media.
- Confusion remains amongst customers / potential customers around the whole retrofit agenda and the concept and benefits of a WHRP.
- The cost of a WHRP is viewed as too high by many and was a barrier to achieving sign-ups to the project.
- Providing customers with ongoing advice and support post the issue of WHRP was very well received.
- Grant subsidies and financial incentives on both WHRP and capital retrofit measures proved to be very successful.
- Making support available to customers in progressing with their onward retrofit journey post the issue of a WHRP is invaluable and is recommended to others running similar projects.
- A clear and stable retrofit proposition to homeowners is needed to remove uncertainty and replace this with confidence and broader buy-in. This needs both central and local approaches working together effectively and coherently.

SECTION 5: Project Mobilisation and Implementation

Considerable thought had been given to how the project would operate at the time that the funding application was made. It was necessary to mobilise the project to a position to where it was ready to be offered to customers and this process took approximately three months to complete.

At the time the project commenced, PAS 2035 "Retrofitting dwellings for improved energy efficiency", had only relatively recently launched as an endorsed approach to proceeding with retrofit and there were few accredited Retrofit Coordinators practicing in the UK.

"At the commencement of the project there was only one accredited Retrofit Coordinator based in Hampshire listed on the Trustmark website".

It was necessary to procure suitable Retrofit Coordinators to deliver the volume of WHRPs pledged under the project and three organisations were successfully appointed.

It was imperative that consistency of service delivery was offered to all customers across the project. This necessitated a single price point for plans being set at a cost of £500 inc VAT (other than homes over 200m2 floor area or having more than three construction types in which case a fee of £600 inc VAT applied).

A standard WHRP design and report template was adopted for use by all three organisations appointed to deliver Retrofit Coordination services, see section 6 for extracts.

A customer retrofit journey was established and included in a welcome pack containing various newly developed retrofit resources.

YOUR RETROFIT JOURNEY

REGISTRATION STAGE

START

1.Register your interest with Petersfield Area SuperHomes (PASH) via website

2. PASH Project Officer will call you to discuss project and complete registration

3. You will receive welcome pack with details of free SuperHomes Network membership and contact details of your assigned professional Retrofit Coordinator

SURVEY AND ASSESSMENT STAGE

4. Your Retrofit Coordinator will call to arrange pre-survey consultation. After the pre-survey consultation, a date for your home survey and free SuperHomes assessment will be booked

5. Home survey and SuperHomes assessment takes place

6. You'll receive a draft Whole House Retrofit Plan and predicted SuperHomes Rating. You'll then contact your Retrofit Coordinator to review the plan and agree on retrofit options

7. You'll then receive final Whole House Retrofit Plan.

8. You'll receive a feedback call from PASH to give advice on retrofit grants and discuss next steps for retrofitting including detailed design, recommended tests, procurement of work and statutory approvals

DESIGN AND RETROFIT WORK (CUSTOMER LED)

9. Your PASH Project Officer will help you decide whether or not to appoint a Retrofit Coordinator to project manage the design and construction phase or to manage this work yourself and obtain any approvals needed e.g. Planning Consent

10. Commission the necessary detailed retrofit design and specification before obtaining quotes for work and appointing contractor or installer

11. Retrofit work completed you will be provided with details of monitoring companies to contact if SuperHomes certification is required

MONITORING AND EVALUATION STAGE

(recommended, compulsory for SuperHomes certification)

12. If desired, you'll sign agreement and pay monitoring company (grant subsidies available)

13. 12 months monitoring period starts to collect performance data

14. You'll submit monitoring data and provide satisfaction feedback to enable evaluation

15. You'll receive SuperHomes certificate confirming verified rating and a summary of feedback on performance

END

During the early implementation phase, the customer journey and WHRP were piloted. It was found that that there were wide variations in the level of detail and narrative provided in the plans between the various Retrofit Coordinators and it took some time to get these to a common point of acceptable quality. Each Retrofit Coordinator understandably brought different strengths, knowledge and experience and NEF worked closely with them as a group to refine the approach provided under the project.

Later during the project, even though the Retrofit Coordinators had indicated their capacity to deliver forward WHRPs, their availability regularly fluctuated depending on other work commitments. This caused project management difficulties not least with customers needing to wait for a home survey and delivery of WHRP plans beyond the pledged service standards in terms turnaround time. A further consequence of this during one period, resulted in too many customer referrals being made to a single Retrofit Coordinator who was later unable to service them all in a timely manner, something which caused detriment to the project and was challenging to recover from.

Despite the project being communicated to customers as a 'pilot', as a paid for service (e.g. WHRPs) offered to the private sector housing market, there would be an expectation that the service should be always operated professionally and diligently.

Key Learning:

- The amount of setup and preparation time that is required at the start of a pilot retrofit service should not be underestimated. The time and resources needed to get the service up and running to a point where it is ready for offering out to customers are extensive.

- Ensuring a consistent quality of service of the type expected when on a paid-for basis takes time to bed in.

- Choosing an adequate number of reliable Retrofit Coordinators to meet demand while keeping the number of external suppliers to a manageable level is key albeit not necessarily easy to predict.

SECTION 6: Whole House Retrofit Plans (WHRPs)

The WHRPs produced for customers closely aligned with the provisions and recommendations of PAS 2035 “Medium term improvement plans”.

Their design was based on an established template produced by Parity Projects who the project team worked with to make some adaptions to suit our project needs. This brought consistency to the plans across the project in terms of their presentation, structure and technical content.

Produced by a Retrofit Coordinator following a home survey, the WHRPs are essentially a retrofit options appraisal which estimate the installation costs of retrofit measures / packages and predict the expected benefits, principally in terms of the reduction in running costs and household emissions. In many respects they are a simple cost benefit assessment of the retrofit potential.

The WHRPs include a retrofit phasing plan so that retrofit measures and the combination of interventions are implemented in an appropriate order (i.e., so measures work together rather than against one another).

A key element of the document is the Retrofit Coordinator’s technical review where a narrative tailored to the specific home and its retrofit potential is conveyed. A retrofit risk assessment is also an essential inclusion and commentary around the importance of maintaining adequate indoor ventilation is also routinely provided.

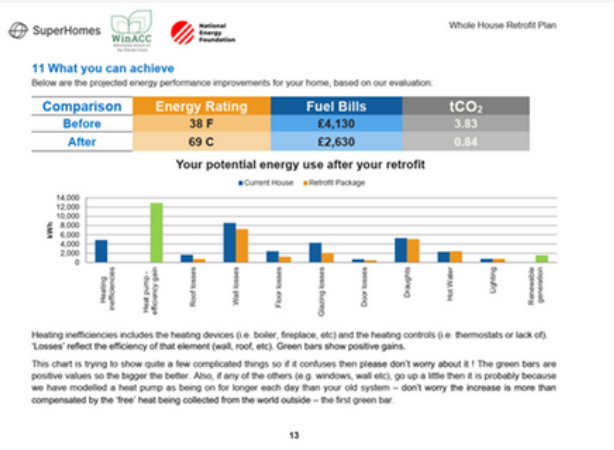
Historic and traditional homes under the project additionally underwent an ‘assessment of significance’ produced by a competent assessor to mitigate against the retrofit work being detrimental to the fabric, structure and finishes of the home.

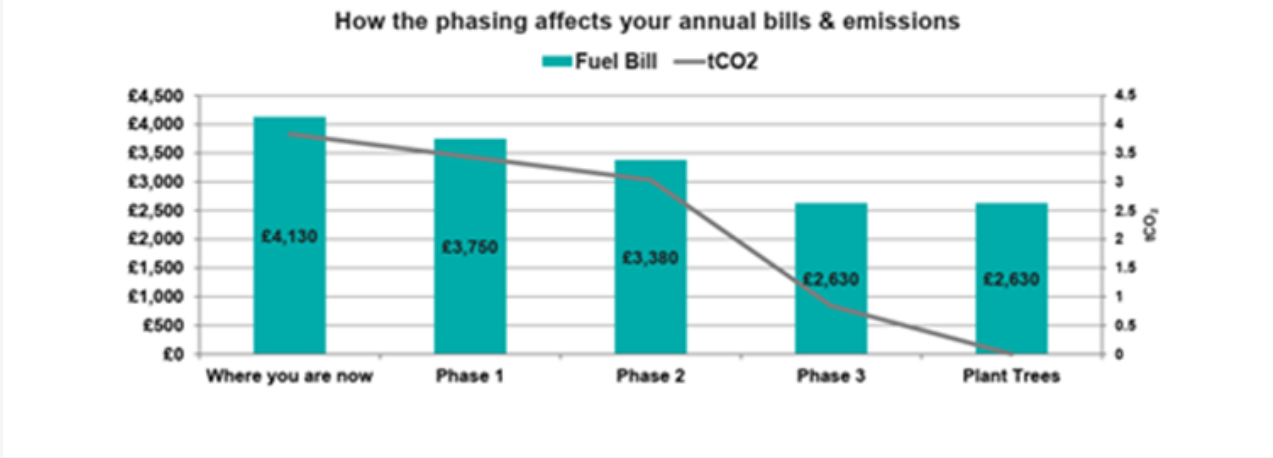
It is important for the Retrofit Coordinator to understand and bear firmly in mind what the homeowners retrofit aspirations and motivations are. Some customers are interested in only one or two specific measures as opposed to embarking on a whole home deep retrofit project. In addition, the Coordinator should find out if any extension or general refurbishment work is already being proposed or in the future by the customer so this may be considered.

The WHRP template incorporates an energy modelling module known as Surveyor Pro. This is based on rdSAP software meaning it has limitations but can be widely used by Retrofit Coordinators, Standard Assessment Procedure. In producing the plan, survey data is input to model the home as existing and as the home could be improved through the addition of appropriate recommended retrofit measures or packages. This enables an easy comparison of the home as an existing baseline (before retrofit – where it is now) and the retrofit potential (post retrofit – where the home could get to).
An essential part of the process in producing a WHRP is the consultation between the Retrofit Coordinator and the homeowner following the issue of the plan as a draft. This review enables the recommendations to be explained, a chance to answer any questions the homeowner has and to correct any inaccuracies relating to the survey and plan. Following the consultation any updates that are necessary are made and the final version is issued to the customer (refer to the customer journey graphic). The majority of customers took up the offer of the consultation with their Coordinator and on average these would take half an hour to complete.

Surveyor Pro automatically generates graphics to illustrate the modelling, and extracts of these are shown below. A different front cover was used for the two community group areas to bring a more local feel.







Number of WHRPs Delivered

During the 30-month project, in total 305 WHRPs were delivered, this being a variance of five extra against the original headline target of three hundred. Reaching this number was hard fought by the project team and largely came down to persistent determination to reach the number possible. It should be acknowledged that signing up to a paid for service is entirely a potential customer's decision as to if they chose to proceed. It is pleasing to the project team that the headline target was met.

Whole House Retrofit Plans Subsidies

To engage with a variety of homeowners, there were offers of subsidised Whole House Retrofit Plans. Winchester and Petersfield are regarded as generally affluent areas of Hampshire and so the majority of signups fell into the 'able to pay' category where the full price of £500 inc VAT was paid for a WHRP (£600 inc VAT for certain homes as described above).

To encourage signups of a wider variety of homeowners, a subsidy of 50% was available to customers whose home fell into the council tax bands A-C. A further subsidy of 90% was also available to those in receipt of benefits, however only six customers in this category signed up to the project. The reason for this low figure was mainly due to the fact these homeowners would be eligible for Government grant funding, such as LAD or ECO, and so would progress down this route to undertake a retrofit.

It was found during a review of the project's overall expenditure that the budget allowed for subsidised WHRPs was underspent. It was proposed in August 2022 to include homes in council tax band D as being able to receive a 50% subsidy. As a result of this change, the Community Groups received an uptake in signups of homeowners in this category. Overall, 97 customers received a 50% subsidy.

Value of WHRPs to Customers

Refer to the Customer Satisfaction survey for feedback on the usefulness of WHRPs (section 19).

Key Learning:

- Retrofit Coordinators who had not previously used the WHRP template found it an efficient way to produce WHRPs.
- It is important that Retrofit Coordinators make WHRPs sufficiently bespoke to the homeowners retrofit aspirations and their actual home. The Retrofit Coordinator 'Technical Review' and the narrative therein was important to convey the tailored nature of the plan to customers. A degree of work was needed early on to bring all Coordinators working on the project to a similar level of detail.
- It is important that customers are made aware that the plans are not a detailed retrofit design and specification, rather an appraisal and risk assessment of their retrofit options. The energy modelling based on rdSAP has limitations as is well known in the sector.
- The consultation on the draft WHRP between Coordinator and customer is an essential part of the service an take up of the offer by customers is to be encouraged. The level of technical detail contained in the plans could be overwhelming for some customers with the average length of a plan running to approx. 25 pages.
- The rdSAP energy modelling has limitations to what can be modelled and accurately modelled

SECTION 7: SuperHomes Rating Scheme and Assessments

The SuperHomes Rating Scheme (SRS) is a NEF initiative introduced in 2021 setting out a retrofit assessment methodology and provides a benchmark of retrofit achievement, for further information see Rating – SuperHomes.

The SRS is a 1-to-5-star rating scheme with assessment taking place at the retrofit 'design' stage, when a predicted rating is provided, and crucially at the 'evaluation' stage following a 12-month monitoring period post completion of retrofit when a verified rating and certification as a SuperHome takes place.

Assessment takes place against household emissions, space heating demand and various criteria promoting occupant health and comfort. A graphic summarising the SRS and the incremental performance levels is included below. The key aspect of the SRS is that it rewards actual measured performance rather than theoretical. A running cost check against EPC band 'C' is also performed during assessment.

To come even close to meeting 2050 net zero targets, NEF asserts that every UK home needs to be meeting one of the SRS performance tiers. Only level 5 represents a zero-emission home (regulated emissions only), and this level of retrofit performance is extremely challenging to achieve and simple will not be possible for many UK homes. The tiers offer flexibility to recognise the retrofit design constraints of the UK's broad housing stock and archetypes. As many retrofitted homes will not register on the SRS scale, more retrofits would need to be of an exemplar level to compensate for those homes which are retrofit constrained (be that practically or financially). The SRS is intended to help drive up retrofit ambition and performance in the UK when as many as one million deep retrofits are required every year in the run up to the middle of the century.

The SRS is the revamped approach to defining SuperHomes, a highly successful programme run by NEF originating in 2007. A challenge of piloting the new SRS was largely due to the high benchmarks set to reach the various star ratings. Many homes where the SRS was piloted, did not achieve a 1-star rating despite their WHRP including an extensive package of proposed retrofit measures. The Space Heating Demand metric (kWh/m2/yr) promoting fabric efficiency performance was the most challenging to satisfy with 'hard to treat' elements such as solid walls or rooms in the roof, which are also disruptive and expensive to upgrade.

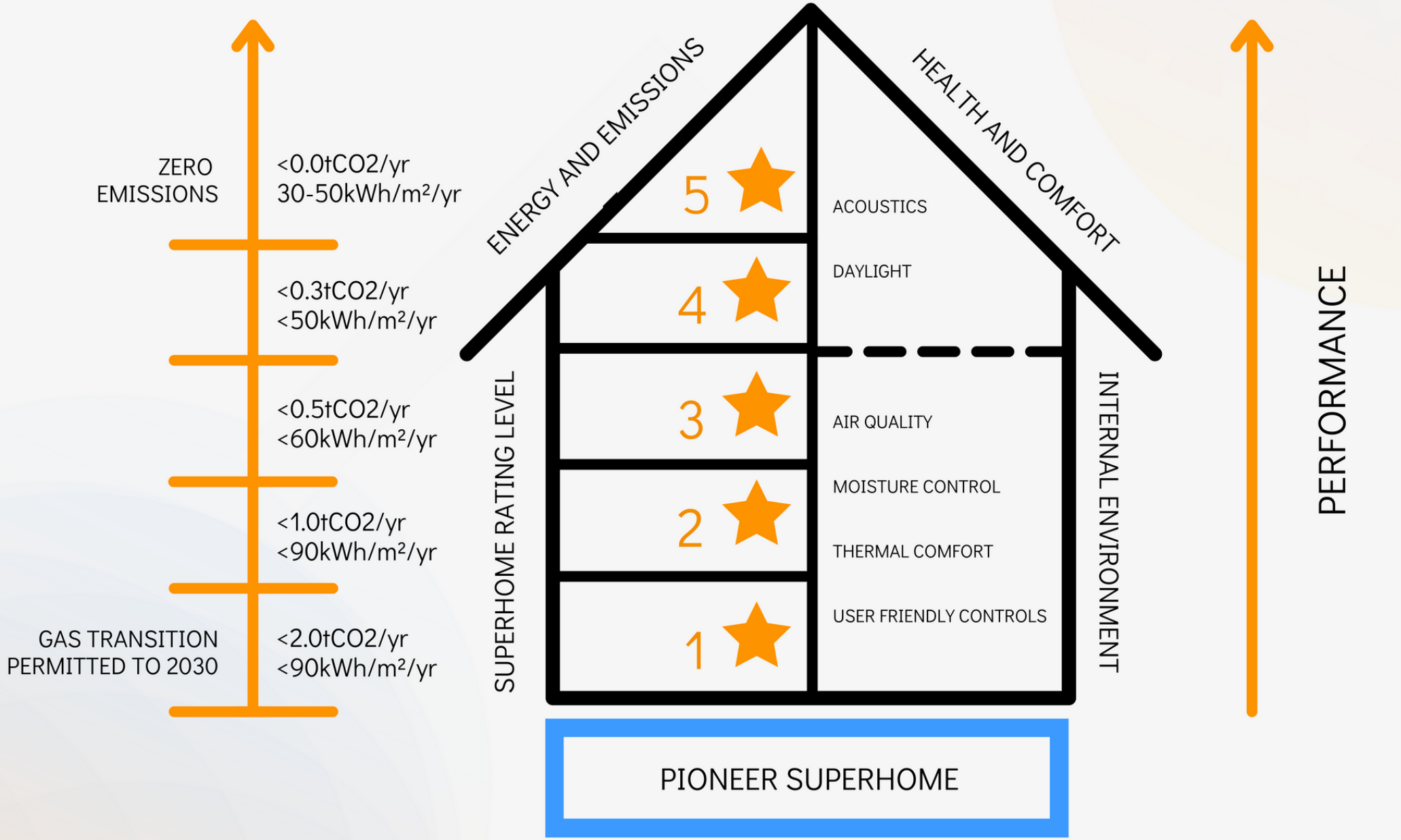
SRS assessments are an extension to the WHRP in planning for retrofit. It is considered that SuperHomes as a concept was beyond most people's initial ambitions and budgets for improving their home.

The opportunity to pilot SRS assessments for free under the project was highly useful. It did however reveal that most homeowners were not ready to embark on a full scale 'deep' retrofit or especially interested in having their project assessed against a rating scheme. For many, just receiving a WHRP is adequate to be working with early in their retrofit journey. Under the project, SRS assessments were provided free of charge enabling NEF to more thoroughly test out its methodology. It was not easy to ascertain the homeowner's perception over the value of distributing the free 'design' stage SRS assessments, mainly because it became clear that the information in the WHRPs was most useful and more positively received.

In total 150 SRS 'design' stage rating assessments were undertaken with 15 retrofitted homes progressing to the monitoring and evaluation, and pre and post retrofit valuation stages under the project. These homes will be evaluated in 2024 on completion of the 12-month monitoring period and will be the first SuperHomes to be certificated against the new SRS.

The pilot project represented the first chance for NEF to review the success and accuracy of the SRS in relation to a sample of 70 homes. This review commenced after the first year and the opportunity was taken at the same time to investigate if a correlation between EPC band ratings and the SuperHomes Rating Scheme existed, something NEF had received several queries on from project stakeholders. Overall, the SRS 'Design' stage assessments gave the expected results meaning they were true to the SRS methodology and were proven to work, regardless of the perceived benefits or otherwise to homeowners. The full report of this research is available upon request from NEF.

SUPERHOMES RATING SCHEME



A Change to the SuperHomes Rating Scheme Methodology

NEF's template for WHRPs used universally for the project included modelling of the Space Heating Demand (kWh/m2/yr) before and after retrofit. This was specifically included to enable retrofit assessment against the SRS to follow on after the plan has been issued. It was discovered that when heat pumps were recommended and input to the modelling that they had an adverse impact on the space heating demand e.g. it became worse (higher). The reason for this was investigated and it was found to be as a result of the way the Government's SAP modelling software functions and could be said to be a quirk. It is partly explained by the longer run times of heat pumps and this in turn effecting the space heating demand.

In view that the public are being encouraged to transition over to heat pumps, modelling them suggests they have a negative impact on retrofit performance is unhelpful. The modelling of running costs from heat pumps as compared to gas boilers is already problematic given the comparative energy supply prices. Partly for this reason, NEF considered if an alternative metric to space heating demand under SuperHomes assessment would be more appropriate. It was resolved that a Heat Transfer Coefficient (HTC) is a better measure of building fabric energy efficiency performance (whole building heat loss calculation) and can be easily and cost effectively measured by conducting smartHTC testing during the monitoring period. For this reason, the HTC metric is currently being adopted under the SRS to replace the original space heating demand metric.

At the outset of the project, it was hoped that 50 SuperHome 'show homes' would be delivered i.e., completed home retrofits achieving a 1 – 5-star rating for show casing purposes. This was overly ambitious, not least because of the typical lag time between the issue of a WHRP and a customer's readiness to embark on a retrofit project was underestimated and relatively unknown. Furthermore, making an allowance of time for retrofit work to be completed and monitored for a year. This serves to emphasise the overall time it commonly takes between a homeowner taking their first steps to plan for a retrofit project through to when it is completed.

Key Learning:

- Providing a predicted SRS assessment to customers following on from the issue of a WHRP at a similar time was generally adding another level of complexity and too much information to customers to absorb at a time they were appraising their basic retrofit options (NEF has now changed its approach so that an optional 'design' stage rating is provided at a later point when the customer is ready to progress their retrofit project).

- The SRS sets demanding performance criteria and promotes a best practice approach to retrofit (while recognising constraints to home retrofit) which is not currently appropriate to the mass market. Customer's wishing to push the boundaries to retrofit and measure actual performance to understand the success of their investment are more likely to buy into the SRS.

- The SRS is overall fit for purpose with predicted ratings appearing to be realistic (verified ratings post monitoring period awaited). The space heating demand metric was found not to be the most effective way to assess fabric performance. As a result, work commenced in 2023 to change this to a Heat Transfer Coefficient metric (also allowing simple but accurate SmartHTC tests to evaluate post retrofit performance more accurately). In setting the new 1-to-5-star benchmarks for HTC performance, consideration will be given to making achievement of a 1 star retrofitted home more attainable.

- Based on insights under the local project, it appears and understandably so, that the level of ambition, willingness and ability of customers to pay for advanced retrofit (i.e. akin to an SRS 3 star or higher rating) before the practicality of the retrofit is even considered, is a long way apart from what would be needed to move towards the achievement of UK net zero goals and at an alarmingly slow rate.

- The SuperHomes Rating Scheme is arguably ahead of its time and not ready for mass market take up. It is expected to be most useful and applicable to customers pursuing best practice deep retrofit where a keen interest in understanding the actual performance of retrofit and if the investment had been worthwhile is sought. Such insights would also be relevant to investors e.g. for ESG reporting.

SECTION 8: Subsidised Training of Local Retrofit Coordinators

One of the project's targets was to support 15 local professionals to become accredited as Retrofit Coordinators (PAS 2035) with the benefit of training course subsidies. The project subsidy offered a 90% discount to candidates meaning they only paid £139+VAT and NEF covered the remaining cost of £1,512 from grant funding.

The interest in this opportunity was high amongst professionals in the Hampshire area and by August 2022, we had filled the 10 places that were originally available. During a project spend review, it was agreed with EST to increase the number of places to 15, and by December 2022, the additional 5 places were filled.

Progress of course modules has been steady, and it is pleasing that 5 candidates have successfully completed and passed the course and are qualified Retrofit Coordinators.

One of the candidates who became an accredited Retrofit Coordinator was Nick Owens, Director of Owens Insight. Nick completed the level 5 Diploma in Retrofit Assessment and Risk Management course in good time and proceeded to shadow an existing Coordinator working on the project. He then proceeded to join the project as a new supplier and delivered WHRPs to homeowners near his place of residency.

A challenge for newly qualified Retrofit Coordinators is being able to put into practice the skills and knowledge they've learnt on the course. This is why we ensured, where possible, that newly qualified Coordinators could shadow an experienced one out in the field and when writing up WHRPs.
It is common knowledge within the retrofit industry that finding trusted and qualified Retrofit Coordinators is difficult, but this project has helped build up the local supply chain in Hampshire, even if it is a small number in the grand scheme of retrofit.

Key Learning:

- The subsidised places for professionals to gain Retrofit Coordinator accreditation were relatively easy to fill.
- Professional suppliers of technical services (e.g. non-manual labour) are as expected ahead of the manual supply chain in being aware of the UK retrofit challenge and are stepping up to seize the anticipated opportunity.
- Some candidates signed up to the course to gain knowledge around retrofit design (e.g. Architects) rather than with the intention to practice as a Retrofit Coordinator.

SECTION 9: Subsidised Support to Local SME Contractors to gain Trustmark (PAS 2030) and MCS Accreditation

Another area of grant funding NEF had was to support 15 local contractor / installer businesses to gain Trustmark (PAS 2030) or MCS accreditation status. The subsidy offered businesses / contractors up to £2,000 including VAT or 80% of the accreditation costs to help them gain the relevant qualifications.

Challenges

During a project spend review, it was agreed with EST to decrease the number of places available from 20 to 15 due to difficulties in finding interested businesses.

Our expectation was borne out that many contractors were not willing to 'down tools' and take time out to learn or up-skill to get ahead of their competitors and meet the projected future demand in domestic retrofit. Most contractors were already very busy with full forward order books or could not afford to take time off work something which was especially the case for sole traders.

Breakdown by Trades

Over the course of the project, 12 businesses have received a subsidy to help gain accreditation. All 12 contractors opted to gain MCS accreditation for solar PV or heat pump installations. There was a lack of interest and difficulty in finding businesses willing to gain Trustmark accreditation, emphasising the larger issue there is with the retrofit supply chain.

Withdrawals

Some businesses withdrew their applications for a subsidy, the primary reason being a lack of time to undertake the accreditation process, which is arduous and time-consuming, particularly for SMEs and sole traders. Had these withdrawals not happened then 18 businesses in total would have gone on to become approved installers.

Successes

It was pleasing that there were success stories from the award of subsidies under the project

> A success story of business assistance was that two contractors who successfully obtained their MCS accreditation to install solar PV then went on to design and install solar PV systems for homeowners signed up to the project. This is a perfect example of local businesses providing the local community with affordable and trusted renewable energy systems.

Key Learning:

- Despite the project team putting in significant effort into encouraging local businesses to sign up to gain retrofit installer accreditations, it was found to be very hard going with the majority of businesses unwilling to take time out.
- It is concerning that none of the local businesses / general contractors approached were interested in obtaining Trustmark accreditation. This does not bode well given the need to for example insulate 'hard to treat' homes e.g., solid wall and rooms in roof, of which there are an abundance.

SECTION 10: Retrofit Design, Specification, Procurement and Execution of Work

Retrofit Design

All retrofit projects require some level of design input from an appropriate and competent person. For more complex and higher risk retrofit projects it will typically be necessary for a 'Retrofit Designer' to be appointed such as a Chartered Architect or Building Surveyor (PAS 2035 provides guidance as to professional competency levels to suit the nature of retrofit projects). For example, to produce a detailed specification, drawings / enlarged retrofit details, or sizing of a service / microgeneration installation. This is necessary not only to ensure suitable and adequate retrofit proposals but also for enabling procurement of contractors / installers to be appointed and to obtain consistent competitive quotations. Thereafter the design is required as part of ensuring that the actual retrofit work is correctly executed.

For lower risk less complex retrofit, the supplier / installer - for example cavity wall insulation or a heat pump – should be competent to propose an appropriate solution, product and system design and sizing without the need for an additional third-party professional to be appointed, however, this must be determined on a case-by-case basis.

During the project, customers with more complex projects, such as those requiring solid wall insulation or needing planning consent, needed a third-party professional but had difficulties in finding this support leaving them in a difficult position from which to progress their project. It became apparent that there was a general lack of professionals who are familiar with retrofit or who wish to be involved in retrofit design and this represents a further barrier to retrofit work. As mentioned earlier in this report, several architects opted to undertake the Retrofit Coordinator training not so much as they intended to practice in this role, more to supplement their existing professional knowledge. Such professional support additionally demands a fee adding to the overall cost of retrofit.

Retrofit Supervision of Work in Progress

The Retrofit Coordinators who worked on the project were not required to offer 'Retrofit Supervision' of work in progress or Trustmark sign-off and lodgement. They were permitted to act in this capacity as a private arrangement with the customer although to NEF's knowledge very few if any were retained to do so. It is not anticipated that a high volume of customers would require Trustmark sign off and lodgement and this is generally only required for retrofit projects directly receiving Government grant funding.

The Local Retrofit Contractor / Installer Supply Chain

If the county of Hampshire is to successfully scale up to service the rate of retrofit interventions needed in the housing sector in pursuit of net zero, the supply chain urgently needs to be bolstered. See Residential Retrofit | Hampshire County Council for further information.
Several customers stated that they struggled to find trusted local installers. The skills shortage was more evident in the early stages of the project but improved as the project progressed.
Customers were more readily able to find existing contractors who were MCS accredited for the installation of micro-generation, whereas finding Trustmark approved contractors who work in the owner occupier sector and are willing to deal with single private properties were few and far between.

Trustmark approved contractors who undertake substantial elements of insulation work e.g. Solid Wall Insulation, are arguably better placed and more likely to be able to offer an overall Project Management service to customers where this is demanded by the nature and extent of the retrofit project. Overall coordination of whole home retrofit projects is essential for integrating the various trades e.g. insulation, plastering, electrics, plumbing, joinery and micro-generation. If a Project Management service is not provided / offered by a 'main' contractor, then a professional such as an Architect or Building Surveyor would be highly recommended. A key objective for the customer is for their project to finish on time, on budget, to the required quality and safely and this will invariably demand a Project Manager.

Key Learning:

- Urgent attention is needed to grow a trusted supply chain in the region to be able to meet the required demand for retrofit and solutions to making the offers of support need to be found.
- There is a shortage of general contractors with an interest and sufficient knowledge of retrofit projects and risks coupled with overall Project Management skills. Upskilling is needed to enable general builders to upsell retrofit services to tie in with planned maintenance, home refurbishment and extension.
- There is currently a shortage of recognised retrofit designers who have the required skills and who are willing to work in the owner occupier sector where the risks may be high and the rewards low. Architects, Building Surveyors and similar professionals have a key role to play in addressing the need.

SECTION 11: Retrofit Follow on Support Service

The Local Retrofit Contractor / Installer Supply Chain

The retrofit follow-on support service was introduced in September 2022. Initially the take-up was slow, however in the course of a year, 81 clients have been supported after their retrofit plans and consultations, to help implement retrofit measures. The majority have been a single online Teams meeting, with relevant follow up information sent. About a dozen have been more than one appointment and a small number have sought help at every stage in their retrofit journey.

Number of Clients Supported - Table 1

Support	**Number**	**Average measures**
Single appointment	64	On average each client was supported with 5 measures
Several appointments	10	
Ongoing support	4	
Support via email	3	
Total	81	

Measures and Advice Given - Table 2

CWI	IWI & EWI	Floor Insulation	Roof Insulation	Heating & Heat pumps
38	22	15	47	81
Renewables and Battery	**Windows**	**Ventilation**	**Architect**	**Lighting and Other**
64	27	44	37	39

This service has proven to be invaluable and has shown it is not enough for most clients just to give them plan and brief consultation, as one client said, "A follow on support service is essential on your retrofit journey, without question you will have many questions further down the line".

Support sessions have shown clients request help with a couple of measures but frequently this would lead to discussing other measures that they intended to install. The WHRP identifies the priorities, the best sequencing and gives a basic outline of some of the measures and the pitfalls. However, retrofitting a home is complex due to most houses being unique, as expressed by one client: "The learning and research began post the WHRP, I had no idea how difficult it would be, very detailed guidance would have been very helpful and saved hours trawling through the internet, the webinars were great but not the best forum to ask multiple questions". It is surprising from the list just how many clients needed support with what we may regard as straight forward measures such as loft insulation, cavity wall insulation and windows.

Barriers to Retrofit

One client highlighted the key barrier to retrofit by stating “The building industry is quite simply not set up to supply retrofit services, it is in its infancy”. Clients generally availed themselves to the support service once they started the process of finding installers and hit some obstacles that delayed them, caused them to hesitate, or even cancel the measure. This information has been collated in the table below. There are different barriers for different measures, for example, when installing EWI or IWI the biggest barrier will most likely be cost followed by disruption, understanding the risks and finding a designer and installer.

Barrier	Applicable to measures	No. of clients listing it as a barrier or delaying factor	Barrier overcome
Cost	A factor for clients, impacts most measures especially high-cost measures	60 %	Prioritise, consider payback
Supply chain and quotes	Varies throughout the year, most measures except windows, heating control	50%	Send suppliers list and other organisations to contact.
Finding a Retrofit Designer and risk of measure	Very difficult to find a Retrofit Designer, particularly for people wanting EWI, IWI, FI. Clients concerned about CWI	Most clients are not employing Retrofit Designer, most found it very difficult.	Difficult, there very few that were taking new clients
Conflicting advice/research	Many measures especially CWI, Windows, RI, ventilation, heat pumps	50% +	Give context, list of questions, contacting insulation suppliers' technical departments.
Disruption	IWI, Floor Insulation, windows, heating controls and heat pumps	This impacts young families more, it's a major delay	
Sequencing	Windows, CWI, ASHP, Floor Insulation, IWI, EWI	More than 50 % are delayed with 1 or more measures	
Objection from neighbours	Usually, PV, Heat Pumps, CWI	3 Clients	
Negative press	ASHP, CWI	30 to 40%	
Other maintenance renovation works	Loft insulation, CWI, EWI, IWI, Floor Insulation	40%	Advice, give context, explain
Risk of devaluing the property, or no payback	IWI, EWI, ASHP	10 to 15 %, many will ignore this risk	
Time	Particularly relevant working families with children	40 %	Support with research
Conservation area	PV	3	
Non-retrofit barrier i.e. job insecurity, moving home	Clients may still do fast payback measure	About 5 clients	
Fear that the retrofit measures won't function as expected, unsure of next steps	Clients' confidence tends to grow as they install measures, WHRP graphs are not so clear or logical	25%	

The follow-on service proved to be a big success and was welcomed by customers as exemplified by the following quote: "I am encouraged by your call; you have rejuvenated my interest in our retrofit project." Please refer to case studies 1 and 2 in the appendix which provide full details of the properties and the follow-on service.



Case Study 1 (please see appendix, Case Study 1)

Diane – High Number of Barriers to Retrofit

Overview

This is a hard-to-treat property and most of the quick wins were done. It was originally a 3 bedroom, detached, cavity wall house, built in 1965. It is now a 4 bedroom with 3 room extensions, so 3 of the bedrooms were part room in roofs. There is a south-facing roof with lots of shading from other roof sections. The central heating downstairs was on an old-style single-circuit heating pipework system, so energy efficiency was poor, and an upgrade was needed before considering a heat pump. Diane felt frustrated, negative, and defeated at times, as her home was so difficult to retrofit and conflicting advice from installers undermined her confidence. However, she was very proactive and persistent and followed through on information and advice.

Barrier to her retrofit:

- The cost - including the grant funding of £4,000, totalled £16,000.
- Obtaining quotes and suppliers.
- Hard to treat areas so a higher risk retrofit.
- Conflicting advice and research.
- Maintenance and other renovation work.
- Sequencing of measures also caused delays.

How barriers were surmounted:

Loft insulation:

- Diane contacted several loft insulation installers, most were not interested, as these were small areas, awkward to treat and impractical to do. She eventually found an installer, so now the loft has a minimum of 300mm insulation.
- Insulating the flat roof was postponed until the felt roofing is upgraded.

Cavity wall insulation:

- The cavities were filled 30 years previously with polystyrene beads, Diane missed the opportunity to have a thermal imaging survey.
- Walls were checked thoroughly via a borescope survey, this confirmed the extension walls were empty and the beads had slumped and needed topping up, some wall sections were hard to access.
- Other installers just wanted to extract everything and start again from scratch, without even visiting /inspecting the property, she felt this was unnecessary.
- She contacted 6 contractors in total, before choosing an installer to fill the new walls and top up the earlier insulation. This was done at a fraction of the cost and disruption of extracting and replacing all the existing wall insulation.

PV installation:

- Conflicting opinions and options from 7 contractors, many were not interested as it was a "difficult roof". Eventually, after having 3 quotes from installers who visited her property, she installed a 3.2 KW system with an 8KW battery.

Diane's Comments about the Service:

- "The Plan does a great job in pointing out what things need to be done and their impact, but the average person just will not know where to begin."
- "It was great to have someone to check in with, at first it is a mind-boggling number of choices".
- "I have learnt so much but having independent advice was extremely helpful and made the journey easier, I learnt a lot from the webinars as well".
- "Having the whole SuperHomes support has been key".

Case Study 2 - (please see appendix, Case Study 2)

Catharine

Overview



Catherine was uncertain about installing some measures as one cavity wall installer said her home was not suitable. In addition, her neighbor was strongly opposed to the CWI and Solar PV. She sought advice and so understood the CWI process and risks very well. She also knew she needed CWI to qualify for the Boiler Upgrade Scheme, to later install a heat pump. In August 2022, she had EPS bonded bead cavity wall insulation installed in the front and the rear of the house. The floor insulation would have been very disruptive but fortunately her floor was suitable for Q-bot spray insulation, which has been completed.

Barrier to her retrofit:

- Conflicting Advice
- Objections from a neighbour
- Risk of measures
- Cost

How barriers were surmounted:

Cavity Wall insulation:

- The main barrier was confidence that retrospective insulation was suitable for her property. Before installation, a borescope survey was carried out to confirm suitability for the measure by a CIGA installer, so there is a 25-year insurance backed guarantee. Catharine learnt a lot about CWI, how it should be installed and why it may fail.
- Furthermore, her neighbour objected forcefully to the CWI as she thought the insulation would spill into her walls, Catharine was able to explain the technical details that a brush would be installed down the entire length of the wall so there would be no issues with the insulation spreading into the neighbour's cavity.

Catharine's Comments about the Service:

- "I would have found it very daunting to embark on a project of making my house more energy efficient without expert advice on all the potential individual measures that were feasible and the order in which to install them. The SuperHomes scheme offered exactly what I wanted."
- "Being able to discuss measures, and neighbor issues with one of NEF's Retrofit Coordinators was very helpful."

SECTION 12: Retrofit Performance Evaluation

In total, 41 homes are being monitored under this project's funding, out of which, 17 are in Hampshire. The remaining homes are made up of our Pioneer SuperHomes Members, who retrofitted their homes some years ago and are located across the UK and encompass a wide variety of property archetypes. To qualify as a home to be monitored, at least three different retrofit measures had to have been completed.

The success of the 41 retrofits will be measured against the new SuperHomes Rating Scheme and the monitoring kit was selected to enable this process as a pilot. The equipment requiring installation in homes was a combination of two devices:

- Internal environment conditions - the original plan was for internal conditions of the property to be tracked by two Airwit sensors which measured temperature, humidity and air quality. These were supplied by PassivUK and operate by radio waves using the Sigfox network, are battery powered and take readings automatically every 30 seconds. Two devices were installed in the main living space and bedroom of each home.
- Space heating and hot water consumption - For homes which had electric primary heating e.g. a heat pump, an electric sub-meter which records cumulative energy consumption in kWh were installed by an electrician. This is so that energy consumption associated with provision of space heating and hot water could be disaggregated from overall household electrical consumption.

Additional manual readings of existing energy meters were required to be taken by the customer on a quarterly basis (including start readings) for which a simple template was provided. These were:

- standard utility fiscal or smart meters (for homes still on gas normal meter readings would take place), and
- generation meters for homes with solar PV.

The performance monitoring takes place over a period of 12 calendar months and starts from the date the Airwits and heating demand sub-meter (where necessary) become operational. Once the 12-month monitoring period is over, the data will be analysed, and homes will receive a verified SuperHomes star rating and certification.

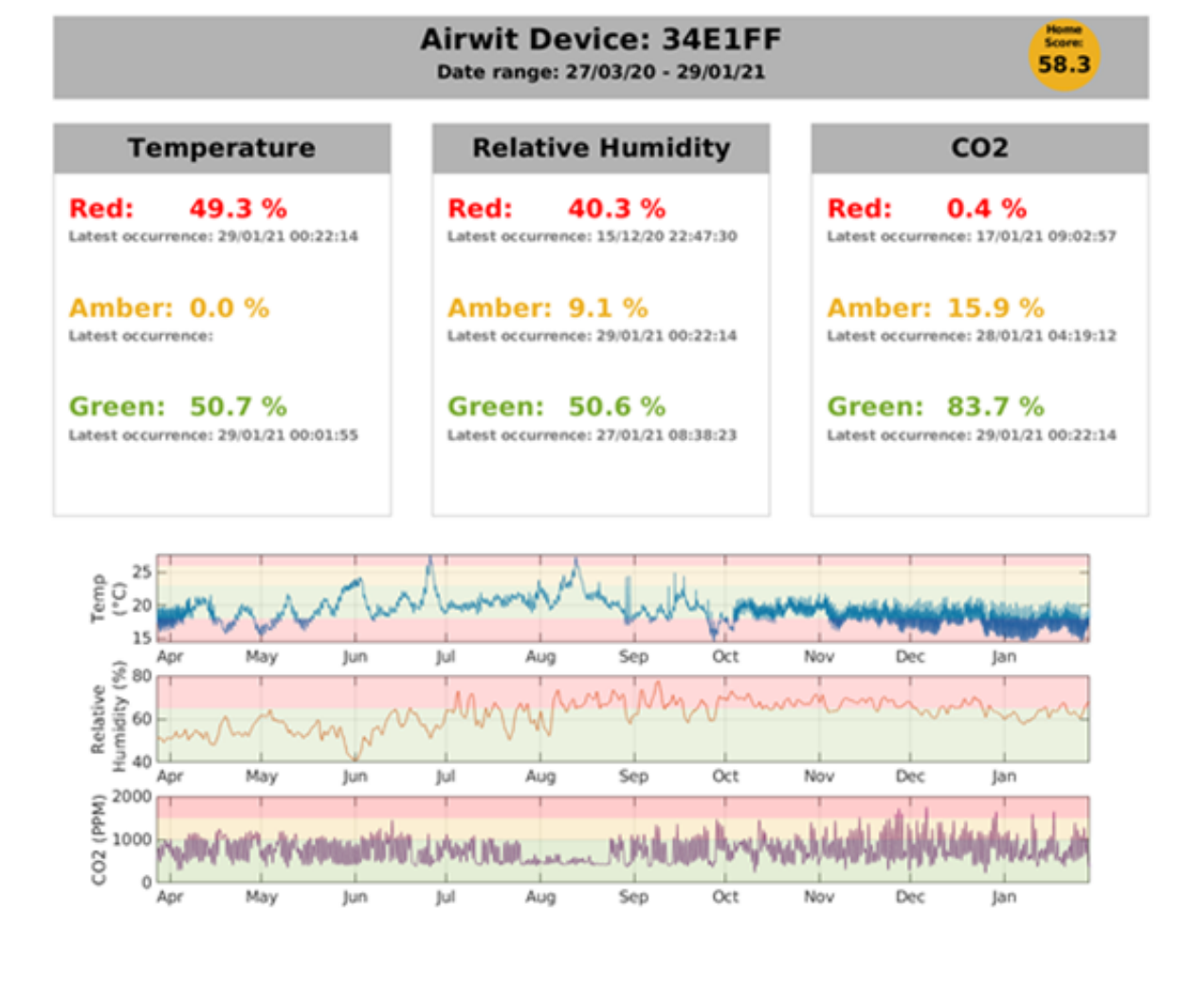
When installing the Airwits, it was found that not all homes in the sample had sufficient Sigfox signal for the devices to connect. Therefore, for these homes, alternative sensors from Build Test Solutions and Gemini Data Loggers had to be purchased and installed.



Electric sub-meter



Airwits Monitor



Example of performance monitoring results

Key Learning:

- The time taken to organise, set up and implement performance monitoring programmes should not be underestimated.
- Problems with connectivity of remote monitoring kit can and do occur and contingency plans should be adopted.
- A culture of retrofit performance measurement and evaluation is essential if the success of retrofit projects is to be properly understood.

SECTION 13: Retrofitted Home Property Valuations study

NEF commissioned Hampshire based Trinity Rose (Chartered Surveyors) to undertake research with a view to adding to the emerging evidence base that a link can be made between home energy efficiency performance and property value. The process began with a review of existing literature on the topic.

The study included the survey and valuation of 15 retrofitted properties in Hampshire, which were part of the project, using the RICS Red Book approach and comparison method of valuation. A pre and post retrofit valuation was attributed to each property. Uplifts in property value were attributed to common retrofitted components.

The research methodology was assisted by NEF and the Sustainable Development Foundation and including two surveys, one targeted at homeowners who had already retrofit their homes, the other at a group who had recently purchased home with an unknown interest in energy efficient retrofit. This provided a good insight into understanding attitudes and what consumers actually valued from two contrasting groups.

The research found that there was justification for suggesting up to a 5% increase in the property value of retrofit homes. Two homes were not valued higher following retrofit, the most common uplift was 2-3% while one home was valued at the 5% uplift.

- The full approach, methodology, findings and learning from this study are contained in a separate report which can be accessed via the SuperHomes website

SECTION 14: Subsidised Capital Grant Funding or Retrofit Measures

Following the revised budget approval from EST, from January 2023, we had a total of £125K of non-means tested grant available for homeowners signed up to the project and who satisfied our internal eligibility criteria. The grant funding programme took time to establish, as terms and conditions and funding agreements for customers needed to be prepared and was finally made available to customers in March 2023. The total number of distinct homeowners supported by capital grant was 46 and by the end of September 2023, £122,171.17 out of the £125,000.00 had been allocated. It was not expected that this level of funding could be committed and spent allowing for time for the customers to appoint an installer, for the work to be finished and claims to be processed, so the outcome was very pleasing. The grant funding covered a variety of insulation measures and renewable technologies, the most popular of which was solar PV, mainly because there is no existing Government grant for this, and it is a relatively straightforward retrofit measure to install. Please see a list below of all the measures installed using the grant funding and the carbon and fuel bill savings they will produce

Measures installed:

- Solar PV systems: 33
- ASHPs: 5
- CWI: 5
- IWI: 1
- EWI: 1
- Loft Insulation: 5
- Floor insulation: 2
- Roof / Room in Roof insulation: 3



Solar PV installation supported by subsidised capital grant funding.

Key Learning:

- The grant was well received by customers and proven by take up in a limited period of time.
- It's necessary to establish fair and consistent set of T&Cs.
- The grant acts as an incentive to bring forward planned projects sooner.



Enabling works for an Air Source Heat Pump installation supported by subsidised capital grant funding.

SECTION 15: Projected Impacts

If all the recommended energy saving retrofit measures from the 305 WHRPs are implemented, according to energy modelling, it is estimated that a reduction of approximately 2,700.5tCO2 and £259,785 in running costs would be saved each year.

This would lead to retrofit co-benefits including some of the financial savings ending up in spent the local economy; the health, comfort, and well-being of occupants would be improved, and local business and employment opportunities would arise helping to kick start a regional retrofit programme.
A more tangible impact of the project can be found in relation to the non-means tested capital grant funding subsidies made available to customers of the service which are as predicted by SAP energy modelling:

Carbon Dioxide Savings:

- Annual carbon emission savings: 36.5 tonnes CO2/year
- Lifetime carbon savings (30 years): 1,073 tonnes CO2

Running Cost Savings predicted:

- Annual fuel bill savings: £20,867/year
- Lifetime fuel bill savings (30 years): £621,300

It was not possible to track the exact implementation of actual retrofit work as not all customers chose to provide us with feedback or remained engaged in the project after receiving their WHRP. However, using the feedback obtained from the 70 respondents to the end of project customer satisfaction survey (see section 19) we are aware that:

- 51 customers have already installed 144 measures recommended in their WHRP with 19 customers not yet having made a start on their retrofit project, and

- In the next 12 months, a further 120 measures are planned for installation with only 4 customers not planning any work next year.

If this feedback and rate of retrofitting is extrapolated across the whole project to represent all service customers, it could be predicted that of all customers who had received their WHRP, 57% may have already installed 2 or more measures from their WHRP and 90.5% will have installed 2 or more measures from their WHRP by October 2024. We can also predict that by the same date, 12 months, hence that 98.5% will have installed 1 or more measures from their WHRP. While it is not possible to make predictions with any level of certainty, we applaud any level of retrofit, so this is a great success.

Key Learning:

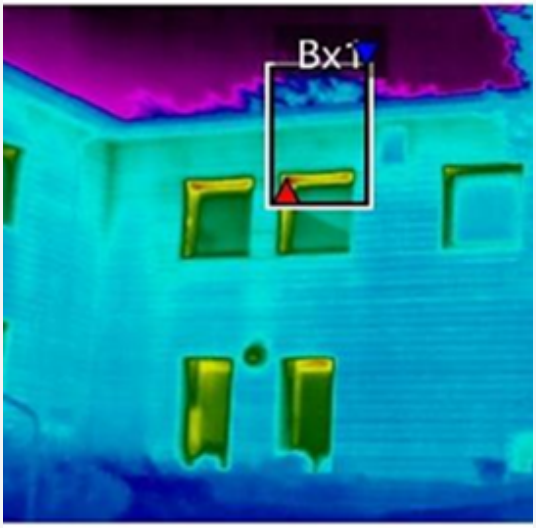
- It is not easy to accurately track and confirm the overall extent of actual retrofit work that takes place following customers receiving advice through WHRP.
- Positive and sizeable impacts can be achieved in terms of emission reductions, running cost savings and co-benefits of retrofit as a result of a pilot service project.
- The rigour around subsidising retrofit measures with grant enables a more accurate understanding of actual project impacts.
- Running a follow-on service for customers post original advice being received in a WHRP helps to facilitate retrofit work and yield greater impact.

SECTION 16: Specialist Reports and Surveys

During the course of the project, several customers undertook specialist testing to aid their understanding of home retrofit potential. Carrying out pre and post retrofit air permeability testing and thermal imaging for example helps to clarify the baseline performance of a home, to target weak points for action during the retrofit process and to enable comparative evaluation of the improvements achieved post retrofit. As such testing is to be encouraged.



Air permeability 'blower door' test



Thermal image of exterior elevation of a flat retrofitted with External Wall Insulation and triple glazing.

SECTION 17: Estate Agents and Planning Authorities

One of the objectives of the project was to engage with local estate agents and planning authorities. These organisations were perceived as key players for making homeowners aware of the benefits of retrofitting and the services on offer through the project.

This is because renovations will frequently occur soon after a home exchanges hands through sale or when an extension is being planned. These are an opportune time to combine already planned work with energy efficient retrofit interventions and enabling an overall cost saving as opposed to doing the work separately. These are often referred to as retrofit 'trigger points' or 'golden moments' which can be seized and exploited.

However, engagement with estate agents and the local planning authorities proved challenging and did not yield high conversions of project signups. Both PeCAN and WinACC kept persisting with these parties during the project, but it did not prove as fruitful as other marketing techniques. A reason for this is many estate agents are not yet engaged with the retrofit agenda and have little knowledge of the change that will inevitably need to happen in the future. Furthermore, it is perhaps not seen as their role and could cause complexity and delay when their priority is to achieve a sale.

WinACC arranged an evening gathering with free refreshments and food at a local venue with a view to enticing Estate Agents to engage with the project. They visited 20 estate agents in Winchester twice but unfortunately this resulted in no attendees, engagement or interest at all.

PeCAN hand-delivered letters to 8 estate agents and one letting agent in Petersfield inviting them to similar information and networking event. Only two representatives of the letting agent attended, and this resulted in useful discussions and some follow-up conversations about improving the energy efficiency of a small landlord's portfolio. The agents were aware that the Minimum Energy Efficiency Standards (MEES) and proposed changes had been exercising landlords. However, this did not result in customer sign-ups even when a pilot scheme of five WHRP's was offered to PRS landlords.

PeCAN sent 299 direct mailing letters to residents of East Hampshire who had applied for planning permission for a home extension or loft conversion, between November 2022 and June 2023. As a result of these letters, there were enquiries from 6 people, resulting in one customer sign-up.

WinACC's initial marketing strategy included contacting people from the planning portal, however nobody signed up for a WHRP.

Key Learning:

- Attempts to exploit opportune moments for retrofit work failed and more needs to be done in our opinion to interact with Estate Agents and Local Authorities to bring them firmly into the important retrofit agenda if regional targets are to be met.
- Estate Agents appear ill informed of the importance of the retrofit agenda and are expected to need instruction from higher authority e.g. Government legislation, RICS, Mortgage Providers or Company Directors etc to actively engage. A case for their having a vested interest needs to be demonstrated to the sector. At present there is no benefit to their participating it would appear.
- While within the Local Authorities we engaged with knowledge of the importance of retrofit exists, departments are often fragmented and a change in established planning procedures is hard to bring about especially when the LA's need to exercise independence and are working at full capacity.

SECTION 18: Case Studies

To see some detailed case studies about real-life examples of homeowners completing a retrofit during the project, please go to appendix 1 at the end of the report.

We filmed video fly-throughs at four homes. Two homes in Winchester and two homes in Petersfield. To view the videos, please click the thumbnails below:



SECTION 19: Customer Satisfaction Survey - CSAT

The CSAT survey was essential for understanding the success of the different elements of the project and to learn how a similar service could be improved upon in the future. Accordingly, the questions were designed to provide the required insights.

The survey was sent out to 260 customers who took part in the Pilot Whole House Retrofit Service. There were 70 respondents, however, two of these didn't use the service and so have been discounted as they were homeowners who had already retrofitted and so went straight to the monitoring stage. Satisfaction with the WHRP. The usefulness of WHRPs in helping customers understand their options for retrofit, the benefits and how they could plan for their onward retrofit journey were generally positive.

The survey asked the customers to rate on a scale from 1 to 5, where 5 is 'definitely yes' and 1 is 'not at all', how much they agreed with the following sentence: "Do you think the Whole House Retrofit Plan was beneficial in helping you appraise your options for improving home energy efficiency?". The survey revealed that out of 68 respondents:

- 25 rated a 5/5.
- 28 rated a 4/5.
- 10 rated a 3/5.
- 2 rated it a 2/5
- 1 rated a 1/5

92.6% of respondents rated a 3 or higher, meaning this proportion felt the Whole House Retrofit Plan was beneficial.

Satisfaction with the assigned Retrofit Coordinator

Customers were asked to rate on a scale from 1 to 5 how much they agreed with the following sentence, where 5 is 'definitely yes' and 1 is 'not at all': "Was your retrofit coordinator helpful and were you satisfied with their support?". The survey revealed that out of 68 respondents:

- 33 rated a 5/5
- 18 rated a 4/5
- 1 rated a 3/5
- 3 rated a 2/5
- 3 rated a 1/5

Therefore, 91.2% of respondents felt their retrofit coordinator was helpful and they were satisfied with the support received.

Satisfaction with Overall Service

The respondents were asked to rate on a scale from 1 to 5 the following sentence: "Overall, was the service useful in helping you to progress your retrofit journey?". Out of 68 respondents:

- 32 rated a 5/5
- 19 rated a 4/5
- 12 rated a 3/5
- 1 rated a 2/5
- 4 rated a 1/5

Therefore, 92.6% of respondents were satisfied with this service.

Customer Observations for Pilot Service Improvement

Perhaps the most valuable outcome from the CSAT survey is understanding how the Pilot Service could be improved and developed into a legacy service. Therefore, the survey asked, "If this service were to continue, what do you think we could do better?". The 3 most frequently repeated answers were:

"Homeowner-to-homeowner feedback and advice [is highly valuable]"

"More details about local installers"

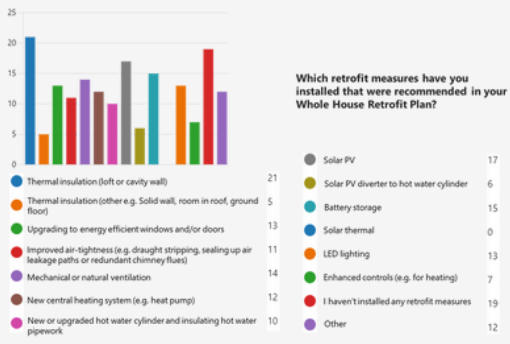
"Subsidise more the cost of the retrofit survey, as it is a significant amount of money which will put many potential customers off"

This highlights that two of the largest barriers for people interested in retrofit are lack of trust and funds. Customer compliments and complaints were both extremely valuable learning as to service improvement. A few comments relaying positive feedback are highlighted below:

"All my interactions and the information received have exceeded my expectations"

"I don't think there is much that could be done better. My overall experience of the service was very good"

"I have been very satisfied with all aspects of the service and the process; it was very helpful"



SECTION 20: Project Legacy

Original legacy proposal

At the outset of the pilot project there was a working assumption that the legacy of this project could be a social enterprise service. This assumption was based on the following:

- The two- and half-year timeline of this project would be sufficient to build capacity for a self-funding enterprise to be viable.
- The Enterprise itself would raise the finance, take on all risks and retain any surpluses
- The value of whole house retrofit plans to guide a householder journey would be more widely appreciated
- The assumption that the capacity of the homeowners to invest in the whole house retrofit plan and follow-up programme of works would be sufficient to support the initial phase of the Enterprise.
- the workforce would be in a better position to respond to consumer demand.

Emergence of Hampshire County Council – Proposed County-wide Retrofit Service

During the life of our project Hampshire County Council (HCC) developed a proposal for creating an able to pay retrofit service covering the whole of the county based on the 'Cosy Homes Oxfordshire' model established in 2019 and which continues to operate. The HCC proposal was informed by the reports and business cases of their consultants 'The New Economic Foundation' and 'Parity Projects'.

Project stakeholders from the Pilot Project 'The Sustainability Centre', PeCAN and WinACC were included in HCC's Advocate Groups to help shape and influence the development of the initiative.

At this point the project partners decided to put our project legacy efforts behind this rather than have two potentially competing services. We planned to have passed over customers, contractors, professionals and resources to Hampshire County Council. This approach was communicated to the Energy Savings Trust as our project funder.

Parity Projects developed a business case based on a self-sustaining model that charges homeowners and contractors a small fee while providing whole house plans and retrofit coordination. Around £500,000 was required to kickstart the scheme. The raising of this funding was hoped to be found with contributions from the Hampshire Local Authorities.

It is our current understanding that the funding to take this project forward has not been found to date and appears unlikely to be found in the short term. An alternative joint bid to Enterprise M3 (LEP) was submitted, however, this was rejected.

The HCC County-wide retrofit service would have been a perfect vehicle to take forward and build on the pilot project and expand it beyond its current boundaries. Its emergence and development had the effect of somewhat stalling our own independent progress and ability to finalise our own project legacy.

In the absence of the HCC solution coming on stream in 2023, the following project partners have come together to create their own proposal which aims to bridge the gap between the end of the pilot and the County-wide Retrofit Service coming on stream. It is reliant on attracting modest funding support.

Lead Partner

- To be decided

Core Partners

- Winchester Action on the Climate Crisis (WinACC) – Local project coordination
- Petersfield Climate Action Network (PeCAN) – Local project coordination
- The Alton Climate Action Network (ACAN) - Local project co-ordination – New Partner

Extended Partnership/Associates

- Greening Campaign
- Retrofit Southampton
- Energise South Downs
- Hampshire Climate Action Group
- National Energy Foundation – Supporting delivery (TBC)

Without funding support the existing pilot project will come to an end and with that the local communities of Hampshire will largely be left without support and advice in the short to medium term at least. The momentum which has already been built up over several years will be lost and confidence in the commitment of local, county, regional and national government to tackling the climate emergency and global warming will be damaged.

There is neither capacity nor willingness amongst partners to continue this as an unfunded voluntary service.

Legacy Project Proposal Statement/Outline: "Homes for the Future - Retrofit Hampshire"

This project proposal has been developed as the legacy of the funded pilot project and will be taken forward by some of the existing project partners immediately. The legacy aligns with initiatives and projects in East Hampshire, Winchester/Itchen Valley and Alton. The proposal seeks to provide a continuum of service to the community and maintain momentum achieved to date. It would operate in greater Winchester, greater East Hampshire and be extended into greater Alton areas.

Its proposed timescale allows more time for a comprehensive One-stop-shop across all of Hampshire or broader to come forward. Discussions are well advanced and ongoing between Hampshire County Council, Parity Projects and a number of other potential partners. It is our current understanding that this broader project is unlikely to start for a further 2 years.

Funding requirement and timetable

Now – End March 2024

- Maintain as much momentum as existing and new partners can
- Bid for 2 – 3 years of funding to support 5 or 6 community groups that span Hampshire
  - ~£15k per community group per year required.

April 24 onwards

- Focus on the intermediate goal – community groups with commercial referrals for WHRP's.
- Possible partnerships with other groups
- Once the "One Stop Shop" solution is funded then community groups would refer homeowners to 'Cosy Homes Hampshire'

Key outcomes:

- Grow the number of homeowners (and ultimately landlords) completing retrofit actions
- Reduced energy bills for homeowners and improved comfort
- Local employment opportunities (supply chain of retrofit coordinators, contractors and installers)
- Improved local energy security
- Reduced territorial emissions
- Ultimate goal to continue to support Hampshire delivering on its net zero transition

Potential funders may include Local Authorities; grant applications e.g. Redress funding bid; third party support or sponsorship e.g. District Network Operator.

SECTION 21: Conclusion

Overall, the project was a success and it achieved good, tangible outcomes. That is not to say it wasn't without its challenges. Achieving consistency across the service was hard to maintain, as was dealing with a relatively immature and inadequate supply chain in Hampshire. Furthermore, the need for a 6-month extension request emphasised the challenge of the project, but it did enable targets and capital grant funds to be reached and spent.

The challenges encountered throughout the project have informed key learning as highlighted earlier in the report, but one of the main takeaways is the need for a follow-on support service, which was imperative to encouraging and revitalising retrofit work to happen.

It is clear that the grant funding from EST made a huge difference in mobilising this project. It simply wouldn't have been possible to pilot a project of this size if done on an entirely voluntary basis with local community groups. This ties in with the fact that it is a shame funding for the legacy was not able to be found, which would have enabled the project to seamlessly continue knowing the big hurdles such as mobilisation and establishment of the service have been made. The uncertainty of a legacy leaves Hampshire homeowners limited as to their options for obtaining independent retrofit advice.

Furthermore, it has proved invaluable to have established climate community groups when piloting a project such as this. They are well placed to engage with homeowners and provide a trusted voice in a crowded space and lend themselves perfectly to lead on creating their own service.

Finally, this pilot project has provided NEF with a plethora of learnings and knowledge that will be key in the development of future retrofit services and schemes that arise.

SECTION 22: Acknowledgements

NEF and the Community Groups WinACC and PeCAN would like to thank all contributors and supporters of the project with special thanks going to:

Project Consultants:

- Resolution Energy Ltd (Energy Modelling & Technical)
- The Sustainability Centre – Project Legacy
- Trinity Rose Chartered Surveyors – Property Valuations
- Sustainable Development Foundation – Property Valuations research methodology
- AAIRS Ltd – Specialist testing
- Foulstons Domestic Electricians – Monitoring kit installation and commissioning

Retrofit Coordinators:

- Parity Projects
- ABBA Energy
- EcoAlex
- Buildpass
- Owens Insights

In addition, NEF wishes to thank the project funders EST for administering the grant funding on behalf of OFGEM and for making the pilot project possible.

APPENDIX 1
Selection of Case Studies

Case Study 1

Owner: Diane



I live in a detached 4-bedroom house that was built in 1965, I am retired, I had time, energy, determination and I am super motivated by climate change. I had a small amount of savings.

Measures installed:

- Increased loft insulation to over 30cm, where possible.
- Foam insulation installed in difficult-to-reach loft/roof spaces.
- Insulation of integral garage ceiling and internal walls.
- Cavity Wall Insulation (top up of existing insulation and new insulation in extension)
- Insulating some hot pipework.
- Improved ventilation with 2 humidity controlled extract fans.
- 3.2KW solar panels and 8KW battery storage to a difficult but south facing roof.

Measures planning to install:

- Changed to a circulation heating system. Went from single pipes in some rooms to double pipes and larger sized pipes.
- Installation of Air Source Heat Pump.

Personal Story:

I retained an interest in the subject of reuse/conserve/ improve efficiency of all fuel consuming aspects of life. My mother was a great recycler from the early 1950s. Nothing got thrown away that could have a second life.

My parents installed solar thermal panels to heat the hot water in 1982.

This house is south facing, and I have lived here since 1975. We had double gazing, loft insulation and cavity wall insultation but we had not considered more extensive insulation until the last ten years.

My husband has died, and I have inherited some money. This is my plan to do my bit to improve this house for the future.

Motivations for joining Winchester Area SuperHomes:
Locally, there are many support groups for conservation and energy efficiency support. I had kept my ear to the ground, but I knew I could not make all these decisions on my own so hearing of 'SuperHomes' I invested in the survey and got hooked.

Benefits of work carried out:
Too soon to calculate.

Favourite feature:
Solar panels, since I wanted these for 10 years.

Drawbacks of work carried out:
If I wanted to go to retrofit home, I would not have started from here. I wish we had known all we know now in 1975. We would have done so many things differently.

How could the retrofitting process be made easier:
Need for a more informal approach as well as the figures. The SuperHomes webinar from the lady who talked about her difficulty in understanding everything written down and making decisions was key.

Case Study 2

Owner: Catharine



I live in a mid-terrace 2-bedroom Victorian house built in 1894 and located in a conservation area. I am motivated by climate change and living in an uncomfortable draughty home.

Measures installed:

- Loft insulation topped up to around 400 mm deep.
- All original single-glazed windows replaced with hardwood double-glazed windows with trickle vents.
- Backdoor with single-glazed window replaced with hardwood door with double-glazed window.
- Single-glazed panel over front door replaced with double-glazed panel.
- Two continuous extractor fans installed, one in the bathroom, one in the kitchen.
- EPS bonded beads cavity wall insulation installed, front and back.
- LED light bulbs installed in every light fitting.
- A Vaillant aroThERM plus air source heat pump is being installed the week beginning 2nd October 2023.

Measures planning to install:

- Underfloor insulation to be installed by Qbot (robot installation). Survey already done by Qbot.
- Removal of gas fire in sitting room and blocking of chimney with chimney sheep.
- Photovoltaic panels to be installed on the roof if feasible. The roof at the front is suitable but next-door neighbours on one side are extremely hostile to this suggestion, so going ahead will be difficult.

Personal story:

I have lived in this Victorian terraced house for 23 years. After retiring, I became more aware of how draughty it was and of the costs of heating it. At the same time, as I read and heard more about the Climate Crisis, I became keen to lower my carbon footprint, so I started looking for a house that was highly energy efficient. But I love my current house and its location, so I decided it would be a very worthwhile project to make my house much more energy efficient and switch to low carbon sources of energy where feasible. That way, this Victorian house would be responsible for far fewer carbon emissions not just while I live here but hopefully well into the future.

Motivations for joining Winchester Area SuperHomes:

I would have found it very daunting to embark on a project of making my house more energy efficient without expert advice on all the potential individual measures that were feasible and the order in which to install them. I was delighted when I saw an article in the Hampshire Chronicle, inviting people to contact Winchester Area SuperHomes if they were interested in retrofitting their home to improve its energy efficiency. The SuperHomes scheme offered exactly what I wanted.

Property Background:

My house is a 2-bedroom mid-terrace house built in 1894. It is in the middle of a terrace of 10 identical houses at the end of a cul-de-sac in a Conservation Area. The houses still look very much as they must have done when they were built. They have not been listed. All the houses in the terrace have retained the original style of sash window. None of the houses in the terrace has had UPVC windows or photovoltaic panels installed, though the local planning department would not require planning permission for either of these.

I installed gas central heating about 20 years ago, so the boiler is probably now near the end of its life. The house had adequate loft insulation when I bought it, according to the surveyor, but not to the depth recommended currently. The exterior walls have a 90 mm cavity which had never been insulated.There are suspended chipboard floors in the sitting room and dining room - the original floorboards having been replaced due to rot before I bought the house - but the underfloor area is uninsulated. The house still had the original single-glazed timber sash windows. Over the last few years, I had installed 'low energy' light bulbs, but these use more energy than the LED bulbs that are now available.

Full details of measures installed/planning to be installed:

The loft insulation has been topped up, so it is now around 400 mm deep. All the original single-glazed windows have been replaced with hardwood double-glazed windows with trickle vents that are identical in style to the originals. The backdoor, which was half-glazed with a single-glazed pane of glass has been replaced with a hardwood door with double-glazed panel. A single-glazed panel of glass over the front door has been replaced with a double-glazed panel. Two continuous extract fans have been installed, one in the bathroom and one in the kitchen. EPS bonded bead cavity wall insulation has been installed in the front and the rear of the house. LED light bulbs have been installed in every light fitting.

A Vaillant aroThERM plus air source heat pump was installed the week beginning 2nd October 2023.I am intending to have underfloor insulation of the suspended floors installed by a robot system (Qbot); Qbot have carried out a survey. I would very much like to install photovoltaic panels. I got as far as paying a deposit for these, plus a battery, to be installed last year under the Solar Together scheme but then my next-door neighbours on one side objected very strongly on the grounds that I would ruin the appearance of the terrace (the entire terrace is roofed with tiles and there is no obvious boundary on the roof between houses). I also intend to remove the gas fire in my sitting room and block the chimney with a chimney sheep.

Benefits of work carried out:
It is probably too early to say what the effects of the cavity wall insulation are as this was only installed in August 2023, but the double-glazed windows made the house less draughty, helped to retain heat, and completely eliminated the large amounts of condensation that was a regular feature on my original windows in colder months. The amount of gas I used during the winter and spring was less than in the equivalent period prior to the installation of the additional loft insulation and the double-glazed windows.

Favourite feature:
My double-glazed hardwood windows. Compared to the original single-glazed windows, they open effortlessly, keep rooms very snug (while allowing ventilation via trickle vents), and look beautiful.

Drawbacks of work carried out:
None.

How could the retrofitting process be made easier:
I found the process straightforward, except when I received conflicting advice from insulation firm surveyors about whether the house should have cavity wall insulation.Being able to discuss this with one of NEF's Retrofit Coordinators was very helpful. It was also very helpful to be offered the chance of some grant funding towards the cost of implementing retrofit measures. This spurred me on to ask a fourth company to assess whether my house was suitable for cavity wall insulation and then to accept their quote. Having installed cavity wall insulation and topped up the loft insulation to the recommended level, I then became eligible for the Government's Boiler Upgrade Scheme grant. Even with the increase in this grant to £7,500 from 23rd October 2023, I am still having to pay a substantial amount for switching from a gas boiler to an air source heat pump. Had I not had sufficient savings to draw on, it would have been impossible to complete many of the retrofit measures in my Whole House Retrofit Plan.Ideally, more funding needs to be made available to help people make their homes energy efficient.

Case Study 3

Owner: Chris and Liz

We live in a 5-bed detached house that was built in 1959 and was extended in the mid-80s



Measures installed:

- 28 new windows and 2 new doors, all triple-glazed, replacing draughty old Crittall-style windows and secondary glazing.
- Cavity wall insulation in all external walls.
- Attic fully insulated and boarded.

Measures planning to install:

- New internal doors.
- Possibly, solar panels.

Personal Story:

We're a retired couple in our mid-60s. I cannot remember how we came across SuperHomes, possibly in the Hampshire Chronicle, but it piqued our interest and we enquired cautiously then had an initial meeting. After this we decided to pay for the audit which we found helpful in its recommendations which were specific and actionable. The report had provided a useful guide as we make home improvement decisions and plans.

Motivations for joining Winchester Area SuperHomes:

- Energy efficiency: reduce loss and usage.
- To make our house more comfortable.
- To avoid having to repaint Crittall windows every few years.

Property Background:

We moved in in 1998. The only major renovation project was to turn 3 small rooms into a bigger kitchen.

Key changes made as a result of the Whole House Retrofit Plan:

We were thinking about some improvements especially new windows, but we are also aware that we didn't know much about the hidden guts of our house e.g., cavities. The Whole House Retrofit Plan (WHRP) directly influenced our decisions: cavity wall insulation (CWI) might not have occurred to us, and the attic was not as well insulated as we thought. Hence, it's likely we would have done neither of these without the WHRP. We might have gone ahead with new windows without the WHRP, but having it was extremely helpful in a major, expensive decision. We were much better-informed so a) were clearer about what we wanted and b) were smarter in choosing JoeDan to do the work. We're delighted with the results.

Full details of measures installed/planning to be installed:
The CWI happened over 2 weeks: 4 days to remove the old insulation and one to re-fill. It's a messy dusty job, unavoidably, but our supplier A&M were excellent and did everything to minimise disruption. The attic insulation and boarding took one day and was not especially disruptive. Obviously, we had to empty the attic first which forced us to do a job we'd been putting off for years, which was well worth it. Replacing 28 windows and 2 doors took 2 weeks but was not especially disruptive as they did one room at a time, and we always knew which rooms were to be worked on in advance. We're delighted with the attic and windows. The CWI is invisible so we cannot tell. But from watching A&M work we're very confident it's a good job well done. We will consider further work e.g., solar panels, but certainly not before 2024 or 2025. No specific plans yet beyond thinking it's something we might (or might not) do.

Benefits of work carried out:
Warmer, less drafty, cleaner, and more stable internal environment. We are very happy with all 3 measures we have taken but the insulations are 'invisible'. The people SuperHomes suggested we use for insulation, A&M, were excellent. We also found very good window people (JoeDan) ourselves. We were very happy with all suppliers.

Favourite feature:
New windows as they are a visible improvement.

Drawbacks of work carried out:
CWI is horrid, especially the removal of old/defunct insulation. We still find dust in all sorts of places. But it's a necessary evil and A&M did all they could do to minimise the inevitable dust. It's well worth it despite the dust!

The only other downside is that legislation obliges window manufacturers to include trickle vents on all windows. They all feel this is idiotic as it makes the windows less effective to insulate from draft, cold and noise. But they have no choice, and we have no regrets.

How could the retrofitting process be made easier:
Maybe improve expertise on suppliers to recommend based on experience, as you increase your database of retrofits.

Case Study 4

Owner: Retired couple and aged around 80 years



We live in a 5-bed detached house that was built in 1959 and was extended in the mid-80s

Measures installed:

- Solar PV panels generating 5kWh with a 5.8kWh battery.
- Ten additional trickle vents fitted to windows in hall, sitting room, dining room and two of the bedrooms, supplementing those already fitted in the kitchen and cloakroom.
- Hot water pipework around the boiler and the immersion heater lagged to retain heat.
- Remainder of lighting in house replaced with LED lights.
- Humidity controlled extractor fan fitted in the hall and the extractor fan in the en-suite shower room was upgraded.

Measures planning to install:

No further measures projected but will consider as a need arises e.g., if boiler or windows require replacement or it becomes cost effective to do so. Our property was considered high risk, and this also affects our decision, as does our age.

Personal Story:

We have lived in this house for 25 years and would like to continue to live here as long as possible but, given our ages, this is not likely to be more than a further 10 years maximum. We try to live simply and not to waste resources. We recognise our responsibility to care for the planet and all its people.

Motivations for joining Petersfield Area SuperHomes:

We joined Petersfield Area SuperHomes as we wanted to make changes to the house to make it more energy efficient and environmentally friendly but were unsure what we could or should do and wanted impartial and authoritative advice.

Property background:

Several energy efficiency measures have been taken by us or the previous owner. Cavity wall insulation had been fitted in the 1980s and we had Weathershield microporous rendering fitted to exterior walls. There are double glazed windows and doors throughout, a mixture of pre-and post-2002 windows. The loft was insulated but not to current standards, however the floor and roof slopes had been boarded making upgrading difficult. All the radiators have been replaced with more efficient modern ones. There are two dormers, one of which has insulated plasterboard to the walls.

We replaced some of the windows in the early 2000s with double glazed units and at the same time had an insulated and double-glazed front door fitted. Ten years ago, we had an energy efficient condensing gas boiler installed.

Key changes made as a result of the Whole House Retrofit plan:

We had not considered installing further extraction measures (humidity-controlled extractor and trickle vents) but did so on the basis of the advice in the Retrofit Plan.

The Plan also gave guidance on further insulation measures and their effect, which enabled us to decide whether to go ahead and upgrade or not.

We were already considering installing Solar PV and the Plan gave us confidence to go ahead.

We had a thermal imaging survey (as suggested in the Plan) which showed our cavity wall insulation and double glazing were still functioning and there were no real cold spots.

What worked:

The Solar PV generates electricity throughout the day as the panels are erected facing three different directions. Over the summer this has covered the overwhelming majority of our electricity needs and has earned money for power exported to the grid. The power generated will decrease in winter as the panels are not fitted at the height of the house and will be impacted by shading when the sun is low in the sky. Having the Solar PV has made us more aware of energy usage and we now heat water, wash clothes and dishes and other household tasks when the panels are generating sufficient current (wherever possible). We are becoming more flexible and agile in our power consumption. The improved ventilation has improved air quality in the house.

Favourite feature:

The Solar PV generates some electricity (sometimes a surprising amount) even on dull days.

What didn't work:

We were unable to have fitted one of the features in our Solar PV plan – to heat the hot water with excess electricity to avoid exporting it to the grid. The connection between our immersion heater and boiler was incompatible with it. This was a disappointment, but we still heat the water by Solar PV, just not when the battery is full. If we ever get a heat pump this could be rectified.

How could the retrofitting process be made easier?

The report uses a standard format and standard assessment procedure, so it is long-winded and convoluted. These factors make it more difficult to understand.

The standard energy performance ratings are out of date. The calculation of our annual fuel bills using the standard assessment procedure was 50% higher than our actual bill, which included household appliance usages. All the other figures in the baseline estimate were based on this so were much higher than they should be. People need a more accurate assessment of where they are or the benefits of changes made as a result of the plan will be inflated.

Case Study 5

Owner: Lucia



I live in a mid-terrace.

Measures installed:

- Changed light bulbs.

Measures planning to install:

- Cavity wall insulation, a decision is yet to be made on whether this will be over the whole house or just the kitchen extension.
- Loft insulation.
- Triple-glazed windows/French doors in kitchen extension.
- Flat roof insulation, this will be done when existing roof needs replacing.

Personal Story:

I have been involved in climate-crisis-related activities for several years through which I had become increasingly concerned with reducing my own carbon footprint and met many people who were interested in the issue and/or working on the issue or who had taken action personally. However, I had no idea how to go about it until meeting a PeCAN representative at a CDC-hosted event in early 2023 who introduced me to the Petersfield Area SuperHomes initiative which I signed up to, and a few months later had a retrofit survey on my house. The other motivation was the 1970s kitchen extension which is freezing in winter!

Property Background:

The house is a three-bedroom (including loft conversion), 1887 mid-terrace property just outside Chichester city walls which I bought in 2018.

Key changes made as a result of the Whole House Retrofit Plan:

I have only got as far as the planning stage however; I am moving forward on the following immediately:

- Cavity wall insulation, a decision is yet to be made on whether this will be over the whole house or just the kitchen extension.
- Loft insulation, replacing and upgrading existing insulation.
- Triple-glazed windows/French doors in kitchen extension.

The measures that I will probably take in the next 2-3 years are:

- Flat roof insulation – to be done when existing roof needs replacing.
- Replacement of some/all remaining windows with triple glazed units.

I additionally considered what to do about the floors on the ground level (uninsulated tile floor in the kitchen extension and suspended wooden floor in the living room). Addressing either or both of these would involve significant disruption which is difficult given that I both live and work at home.

Benefits of work carried out:
Too early to say in terms of the work, but the retrofit survey was incredibly helpful for finding out what could be done, providing guidance on standards and companies that might be able to do the work, as well as informing my thinking on how to sequence measures. The surveyor and Retrofit Coordinator (Nick Owens) and NEF Retrofit Coordinator (Christine Murphy) also provided a lot of additional guidance and answered the multiple questions that I had.

Favourite feature:
Too early to say, but very much hoping that within the next year, the kitchen extension will be more comfortable in winter and measures will have contributed to reducing my carbon footprint, even if only by a small amount.

Drawbacks of work carried out:
As above, too early to say, but retrofitting an older house, even if not very large, is a significant undertaking that takes a lot of time, knowledge and money, none of which I have in vast quantities. Additionally, I had already done quite a lot of renovation of the house when I bought it before I had any knowledge of what could/should be done. As a result, I made mistakes/wrong choices which are difficult to rectify without tearing the house apart again, so some measures (such as insulation of suspended painted wooden floors in the sitting/living room) will have to wait until it is need of redecoration.

ven with Nick and Christine's guidance it has been difficult to find companies able or willing to consider CWI on a Victorian house and the 3 x surveys/quotes provided have given conflicting advice on what is possible – with only one considering that walls of the original house are suitable for CWI. Most CWI companies/surveyors also seem to think in terms of payback rather than comfort and/or carbon footprint (I was advised by one against loft insulation for this reason – i.e., the loft is small/it's not worth it. Another said the fact that no one had CWI in the street probably means it is not suitable for the houses!). With one exception (Cavity Tech UK) I found them quite dismissive of my motivations for retrofitting (not to mention often quite patronising – a perennial challenge for solo women engaging in any sort of building-related work!).

The 1970s kitchen extension should not be a problem (assuming sufficient access on the side adjoining the neighbour's extension and should hopefully make a significant difference). On the advice of one of the surveyors (Cavity Tech UK which carried out by far the most detailed survey and was generally super-helpful), I will prioritise the CWI in the kitchen over flat roof insulation which it seems has some insulation although not up to current standards. I can then move to this when the flat roof needs replacement. Ahead of the CWI, I will fill in an "extra door" in the kitchen and replace with a fixed window. The other window and French doors will also be replaced with triple-glazed doors/windows (currently double glazed) – currently on order from George Barnsdale. Part of the motivation is aesthetic, but I am really happy that I had not proceeded with this part of the renovation before the retrofit survey as certainly would not have made the right decisions! Eventually, I will do the same with other windows when they need replacing.

How could the retrofitting process be made easier:

The retrofit survey and the additional guidance provided through the PeCAN and SuperHomes scheme is invaluable and has made it possible for me to start the journey. It simply is not possible to do this without this sort of expert advice/guidance. Ideally, I would now employ a coordinator/expert to oversee the whole thing, but this is beyond my means and for reasons of time and cost I have to put in place measures incrementally.

There is a tension, which I am sure is not unique to me although I am unsure what SuperHomes can do about it, between what is needed and what is possible/practical. Although the recommended measures are sequenced and prioritised, even then it can be unrealistic for individuals to go the whole way both in terms cost and disruption, which leaves a slight sense of failure, but I guess it is better to do something than nothing! Information is key and signposting of where to look/what information is credible is also very helpful.

Case Study 6

Owner: Homeowner

I live in a Semi-detached house



Measures installed:

- Install LED lights in the few places where they were not present.
- Increase loft insulation from 150mm to 300mm.
- Cavity-wall insulation.
- Installed an Air-Source Heat Pump, replacing an oil boiler.
- Installed solar panels and excess solar diverter to heat water in a hot water tank.

Measures planning to install:

- Install trickle ventilation to windows.
- Optimise the performance of the heat pump with respect to the heat demand and Time-of-Use tariffs.

Personal Story:

My journey with Superhomes/NEF started with the PeCAN fair in Petersfield sometime in Summer 2022. I was planning to switch to more sustainable sources of energy, but the PeCAN fair provided the impetus to carry on with my plans. It was only after a Retrofit Survey was done that, I had a better sense of what could be done to my property in phases, guided by excellent support from Patricia Exley and Christine Murphy, my Retrofit Coordinator.

Christine also helped to bring forward installation of some big-ticket measures by making me aware of grants that I would not have known about otherwise.

Motivations for joining Petersfield Area SuperHomes:

As stated above, the PeCAN fair helped me get introduced to SuperHomes. There were some very informative webinars that helped at various stages of my project, in addition to being put in touch with people who have implemented measures similar to what I had in the Retrofit plan.

Property Background:

Ours is a 1982-built semi-detached house heated by an oil boiler. While it was reasonably comfortable, the living room (which had suspended floor) felt colder during winter months. This was the main pain point.

Benefits of work carried out:

- Better comfort, reflected in the better EPC rating.
- No longer using fossil fuel for heating (at least directly). A large portion of usage (at least in spring/summer) is achieved via Solar PV, while the rest is through electricity which hopefully will have greater proportions of renewable energy as the years go by.

Favourite feature:

Being able to adjust usage patterns and hot water temperature as per Time-of-Use rates. Although this has to be done manually, hopefully there's an app coming soon.

Drawbacks of work carried out:

Although the SCOP of the heat pump is about 3, the cost of electricity is 3 times as much as oil for the same heat output, any cost benefit is nullified. Therefore, there seems to be negligible economic benefit in investing in a heat pump at present, except for the environmental credentials. Hopefully, the installation price should come down for more people to take it up, unless hydrogen boilers take off!

How could the retrofitting process be made easier:

The follow-on support after creation of Retrofit Plan was essential for engagement purposes, if not for continuous guidance needed when one is on a journey and there are lots of questions down the line. I received this from Patricia and Christine regularly. I also benefitted from talking to people who had been through the heat pump/ solar panels journey previously - from a PeCAN trustee, no less.
If it does not already exist, a forum or a pool of volunteers who have had measures installed that a person with a new Retrofit Plan can speak to would be beneficial.

Overall, my experiences have been positive. The journey is still ongoing as I continuously seek to optimise energy usage in conjunction with electricity rates.

FIND OUT MORE:

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