



Refit West: Update from the front line

real homeowner retrofit journeys and barriers the Green Deal must overcome



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Contents

Executive Summary.....	3
Introduction	4
The Retrofit Process.....	5
Understanding the Survey and Recommendations	7
Selection and Scheduling.....	9
Ensuring Appropriate Design	10
Getting Pricing Right and Assessing Value.....	12
Confidence in Contracting and Delivery	13
Refit West Outcomes	14
Our Conclusions.....	15
Project Partners.....	16

Forum for the Future is a non-profit organisation working globally with business and government to create a sustainable future. We aim to transform the critical systems that we all depend on, such as food, energy and finance, to make them fit for the challenges of the 21st century. We have 15 years experience inspiring new thinking, building creative partnerships and developing practical innovations to change our world.

If you would like to work with FFTF to develop, deliver or assess a large-scale domestic retrofit project please contact b.ross@forumforthefuture.org

Written by Ben Ross, March 2011

www.forumforthefuture.org

Email: info@forumforthefuture.org and call: 020 7324 3630

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Registered office: Overseas House, 19-23 Ironmonger Row, London, EC1V 3QN, UK.

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Executive Summary

In order for the UK to implement a large-scale home energy retrofit scheme and to reduce the 27% of UK carbon emissions that come from our 27 million existing homes we must ensure:

- There is the required **demand** from homeowners
- The **delivery** processes are trusted and capable of high quality cost effective works
- **Financial mechanisms** enable access to capital and recognition of the increased value of homes that are fit for the future

70% of the homes in the UK are owner-occupied, presenting enormous potential for reductions in monthly fuel bills and greater comfort for homeowners. Nationally, success in tackling domestic energy efficiency will reduce greenhouse gas emissions and increased national energy security.

Despite significant political rhetoric over the last few years emissions from the domestic sector in the UK have only fallen by 6% since 1990. The Government's impending 'Green Deal' presents an enormous opportunity for a structural change in the way we finance and deliver domestic energy efficiency, which Forum for the Future welcomes as necessary to meet the scale of the challenge. We, along with many others await further developments for this and offer our experience from working on the frontline to support effective delivery.

Forum for the Future's Refit West project has been working in the Bristol city region to support homeowners to carry out energy efficiency works to their homes. This has been through:

- i) convening an expert panel to develop a process to overcome many of the common barriers experienced,
- ii) increasing trust in both the process and contractors
- iii) supporting individual homeowners and bringing together a community to share experience and learning

We have found that:

- An independent survey needs to empower and to present the options to the homeowners and that current tools are insufficient.
- Surveys need to identify the opportunities presented by planned maintenance and upgrades.
- Appropriate information is required by homeowners as well as the professionals involved.
- Domestic energy efficiency is best delivered within the owner-occupied housing market by developing trust and confidence in the tools, processes and organisations involved.
- The current skills-gap is marginal, and that the building trades require only a relatively small amount of up-skilling to install the new materials and measures over the decades to come.
- Financial models need to be tuned to provide capital and respond to household preferences.
- The costs of some measures will far exceed the finance available through the Green Deal.
- The planning system is currently a barrier to action, delivering sub-optimal solutions.
- Future risks and benefits need to be understood and built in to the housing and capital markets.
- Residents must engage with the need to change and understand how to live with and within their retrofitted properties.



Introduction

Our homes are responsible for a quarter of the UK's carbon footprint, and improving them is seen as one of the most cost effective means of reducing emissions. 70% of homes in the UK are owner occupied, but so far no-one has succeeded in delivering large-scale retrofit projects efficiently or effectively. Despite past national and local initiatives, residential carbon emissions have only fallen by 6% since 1990.

There is cross-party political support for urgent action to improve the energy efficiency of our housing stock. The Green Deal¹ provides the opportunity to attach a loan to a property, rather than an individual, and has the potential to offer many of the required solutions.

Since 2008 Forum for the Future has been running Refit West², a scheme to support private homeowners reduce the energy and resource consumption of their homes. We have been working with 11 pioneering households in Bristol and the West of England as part of our work to make it the most sustainable city-region in the UK³.

Our approach begins and ends with the homeowner: providing information on the most appropriate and cost-effective options for *their* property; designing solutions to meet *their* needs; ensuring suppliers provide quality and value for *their* money.

Refit West has prioritised empowering and supporting individuals as they make decisions and commission works to their homes. We believe a flexible and people-centred approach, delivering a positive experience for early adopters, is the best way to radically transform our property market and housing stock.

To do this at scale will require a broad view which takes account of three key elements: providing appropriate financial incentives to refit houses; creating demand from home-owners; and ensuring there is a workforce with the skills to carry it out.

The pioneering homeowners we have had the pleasure of working with were not a representative cross section of the UK's population. Rather they were all well informed about domestic energy consumption, carbon emissions and climate change and all wanted to reduce their impact.

Refit West is supported by a coalition of partners, dedicated to overcoming the barriers and making the scheme a success. We would like to thank all of those who have worked with us during this project, especially Energy Saving Trust⁴, who have provided additional technical support and evaluation.

This report provides an insight into the customer focused challenges faced in order to transform our existing housings stock to a low carbon future. While we recognise the role of finance to enable the changes required we have deliberately not gone into any detail on this or delivery costs within this report.

¹ www.decc.gov.uk/en/content/cms/what_we_do/consumers/green_deal/green_deal.aspx

² www.forumforthefuture.org/projects/refit-west and www.refitwest.com

³ www.sustainablebristol.com

⁴ www.energysavingtrust.org.uk



The Retrofit Process

In order to achieve a large-scale uptake of any product or service it is important that the customer understands the process from end-to-end, and feels informed and confident throughout. The Refit West process engaged with the homeowner and allowed them to ask the significant questions at key stages. This was developed in discussion with a local consortium⁵ of experts and stakeholders and refined through our direct experience of working with the homeowners. The stages identified are always going to be a guide and any end-to-end delivery process needs to allow for flexibility.

Within this report we have focused on the delivery of a large-scale domestic energy efficiency programme for the owner-occupied housing sector. Due to the scale and variability of the works carried out by households within Refit West we have not included detailed costs within this report, nor have we gone into any depth on the financial mechanisms required to support this spend. Forum for the Future has been developing innovative financial models⁶ in parallel to enable the large-scale uptake of energy efficiency across our existing building stock.

We are also pleased to be working locally with Bristol Green Doors⁷, and nationally with a wide range of organisations including the Great British Refurb⁸ and the Sustainable Energy Academy's Old Home Super Home⁹ network to raise demand by showcasing those who have already carried out improvements to their properties.

One of the most significant challenges to ensure progression through these stages is the provision of information for each of the parties involved, to build trust and ensure appropriate action. Not only are the information requirements very different between the delivery professionals, from analysts to sub-contractors, but also between property owners. While one owner may build confidence with a contractor very quickly and take a hands-off approach, others may prefer to scrutinise each and every decision or to manage the entire project.

According to Refit West homeowners:

“We found the gathering of information a headache, as detailed guidance was not readily available.”

“...our living room, with its 2 outside walls and some rising damp, remained a cold spot. We had been racking our brains (i.e. trawling the internet!) trying to find out how we could deal with the walls. Unfortunately we were just getting more confused by the technical stuff which came up, so we jumped at the chance for some advice.”

It cannot be overstated that when an individual or family chose to invest thousands or tens of thousands of pounds in their home they need to trust the contractors making recommendations and carrying out works. While this is no different to any major building project, the emergent nature of the retrofit market presents a challenge to build up trust and networks of referrals. Recent research by the Great British Refurb campaign¹⁰ found that local organisations, including councils, builders and renewable energy installers, along-side electricity and gas suppliers would be the most trusted routes to contract works through the Green Deal.

⁵ See page 16 for full list of consortium members

⁶ www.forumforthefuture.org/projects/climate-finance and www.forumforthefuture.org/projects/Innovative-structures-for-social-and-environmental-outcomes

⁷ www.bristolgreendoors.org

⁸ www.greatbritishrefurb.co.uk

⁹ www.sustainable-energyacademy.org.uk

¹⁰ www.greatbritishrefurb.co.uk/images/pdfs/gbr-greendealmarketresearch.pdf



For this phase of Refit West we carried out appropriate due diligence on contractors to build trust and subsidise the survey costs such that the homeowners paid £100 for services often worth in excess of one thousand pounds. We then brought the homeowners together to discuss their projects and share experience. The project manager then remained available to interpret information, answer questions, inform decisions and support progression throughout the process.

We have endeavoured, with some success, to reduce risks for the homeowner. These include both the financial and physical risks of committing capital and commissioning often major building works to their single biggest asset; their home. Forum for the Future has also been able to support homeowners through the numerous intellectual challenges of the retrofit process, whether making decisions or understanding the similarities and differences between the building regulations, the code for sustainable homes and energy performance certificate ratings.

The process developed through the Refit West project:



- Thermal image demonstrating heat loss through solid wall and around windows in one of the Refit West properties.

Understanding the Survey and Recommendations

There are some simple recommendations to be made regarding the survey; that it is clear, concise and accurate. But within each of these lie a number of issues that need to be addressed: What is the motivation of the homeowner? What is their technical knowledge? And, what are their demands and expectations on action?

The survey, and surveyor, need to respond to the individual motivations. For every household within the group of Refit West homeowners there was a strong motivation to reduce their environmental impacts, and specifically carbon dioxide emissions. This was the most significant motivation to become involved in the scheme. Secondary motivations included the reduction in current and future fuel bills and increasing the comfort and quality of their homes. However, motivations are often multiple and complex, and potentially conflicting, e.g. increasing habitable space and reducing carbon dioxide emissions. While all properties were owner-occupied the demographics varied considerably from retirees to recent first time property owners.

A few motivations expressed by Refit West homeowners were:

“...we believe passionately that urgent action is needed to tackle climate change, and society is not doing enough.”

“I was vehemently against anything that would make our rooms any smaller – 200 year old cottages are small and dark enough without shrinking them by 3ins on each wall! That effectively ruled out any internal solution”

“The savings we will make on fuel will be enormous: a reduction of 70% in our fuel consumption. The way that I express it to people is that as fuel goes up, it will take more and more of your disposable income so that you have less money to spend. And so we get the financial returns as well.”

A number of homeowners also took the opportunity to upgrade elements of their property that required work or needed to be replaced – this often worked out as the most cost effective approach to property maintenance and improvement.

Two constraints felt by all participants to some degree or other were the total capital costs of the project and the expected returns on investment. While Refit West supported the survey costs all of the homeowners funded the capital costs.

The project allowed people to explore the most cost and carbon effective solutions for their property. The survey and report were produced by an independent expert. This avoided any conflict of interest. It provided a set of measures that could be implemented over time when appropriate for the property owner. The recommendations could also be taken to a number of potential installers to compare prices.

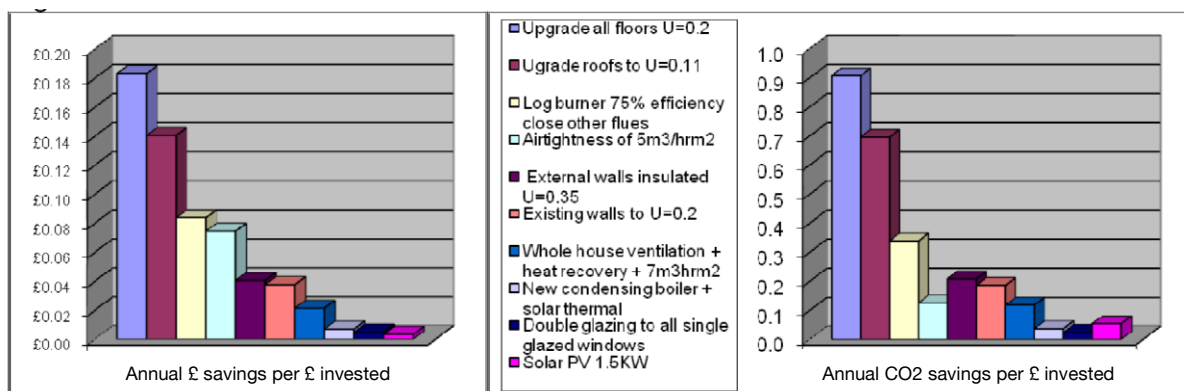
Refit West contracted BristolIDEA¹¹ to carry out rdSAP¹¹ and full SAP¹² assessments for 9 properties. SAP outputs were then manipulated within the physical constraints of the modelled property to identify a number of cost and carbon saving measures, as well as the optimum combination of these.

¹¹ www.bristolidea.co.uk

¹² SAP 2005 and rdSAP 2005 http://en.wikipedia.org/wiki/Standard_Assessment_Procedure



The homeowner report presented this information in context to the homeowner, modelling both cost and carbon savings. Measures were presented in isolation as the investment decisions would be dependent on numerous factors including the cost effectiveness, disruption, scheduling, total capital available and planned future maintenance.



- Example of presentation of information for one Refit West home. (This graphic was compiled prior to the Feed In Tariff or Renewable Heat Incentive.)

A further two surveys were carried out by Parity Projects¹³ to test an alternative approach to assessment and presentation of results, presenting measures both in isolation and against a number of 'packages' developed in discussion with the homeowners. The Parity Projects report provided good value for money, costing £250+ depending on the size of the property. For the Green Deal there needs to be some form of validation process to ensure quality is maintained for any survey and modelling tool that could be integral to its roll out.

An indicative schedule of rates was also developed by Forum for the Future, but as the project developed it became clear that any schedule of rates is only a very rough guide and that on-site constraints and decisions by the property owner had huge implications. This clearly has implications for the pricing of roll out of any Green Deal delivery package.

Analysis of the results from rdSAP and SAP assessments found that, although designed for large-scale assessment of the energy efficiency of domestic buildings, rdSAP is too inaccurate to be used to present cost based recommendations to private homeowners.

The average difference between the SAP and rdSAP energy efficiency rating across the houses surveyed was 10%, with differences on individual properties ranging from 0% to 37%. This further adds to the evidence base that the current modelling tools, both rdSAP and SAP, are unfit for purpose as cost effective diagnostic tools for the Green Deal.

	Before	After
rdSAP	43	66
SAP	48	79

- Further analysis of one solid wall property after works had been completed presented an even greater and inconsistent gap between the results between the SAP and rdSAP modelling tools.

Appendices presenting further information and the full study results are provided through the Refit West page¹⁴ on Forum for the Future's website.

¹³ www.parityprojects.com

¹⁴ www.forumforthefuture.org/projects/refit-west



Selection and Scheduling

Once a report has been issued the emphasis is on the homeowner to define the works they want to carry out and follow through. Often homeowners come to the process with an expectation of the outcome. When the report suggests an alternative approach may be more effective, this may be ignored, or create confusion and stall the process. It is at this point that the homeowner needs to be able to access independent impartial and considered advice, appropriate for their particular needs.

The process of selecting which measures to install could, on the face of it, seem relatively simple. However, when taking a whole house approach there are a number of competing and potentially conflicting factors; there are the personal factors of motivations, capital budget, investment criteria, and the physical interaction of different combinations of measures.

Providing a report at the outset drives decision making but as one homeowner, Ozzie Ffield, put it:

“This is an interactive process with the people who produced the SAP: You want to interrogate the SAP with different options during the project, not just at the outset.”

For an engaged homeowner installing multiple measures and spending a significant budget on their property the opportunity to explore variations would be a valuable tool. For future large-scale rollout a web based tool could be developed to ensure the homeowner is, when they chose to be, at the very centre of the decision and delivery process.

One of the most significant challenges to ensure progression through these stages is the provision of information for each of the parties involved, to build trust and ensure appropriate action. Not only are the information requirements very different between the delivery professionals, from analysts to sub-contractors, but also between property owners. While one owner may build confidence with a contractor very quickly and take a hands-off approach, others may prefer to scrutinise each and every decision or take a very hands on role to project management, contracting skills and services rather than contract the entire project.

Previous research ‘Retrofit at Scale, Bristol’¹⁵, carried out by Arup through Forum for the Future’s Engineers for the 21st Century programme, modelled the potential for improvements in energy performance and the costs for delivery. This demonstrated that scale delivery of certain measures to a single housing type within a neighbourhood can reduce costs by up to a half. However, homeowners are not all ready to undertake specific works within a specified time scale.



- One property within the Refit West project deferred the start of their works to maximise the potential for their garden to recover. Alan and Mary Pinder, when talking about meeting a contractor to schedule external wall insulation:

“This made us realise some potential issues such as the climbing plants on the house walls. We will have to cut down a wisteria (probably survive) and a clematis and vine (may not) but we hope that they might be able to work around our fan-trained damson tree.”

¹⁵ www.forumforthefuture.org/project/retrofit-at-scale-bristol



Other issues raised during this small pilot study with regards to the scheduling of works were;

- The need to carry out all works in the shortest possible time and make the house habitable as the property was a new purchase and delay meant additional costs.
- The potential to carry out works when half of the household were away for a period of time.
- Delays in the building schedule raising security concerns about scaffolding being in place when the occupiers were away for a few days.
- Changes to the specifications during the works reducing the efficiency of the build process and increasing costs.
- Availability of specialist subcontractors to deliver within the overall project schedule.

Ensuring Appropriate Design

The detail of designs required is entirely dependent on the measures being installed, and how a number of these interact with each other. For the majority of single measures with an experienced industry, such as solar systems, boilers, draught proofing or replacement windows the design costs are embedded into the total installed cost. Where complex measures such as external wall insulation or mechanical ventilation with heat recovery (MVHR) are required there is often a significant design cost, to ensure risks are minimised and installations are carried out efficiently and effectively. The installation of a number of measures potentially simple in isolation, but complex when combined, could also require greater upfront consideration and design.

- Installation of ducting for mechanical ventilation with heat recovery system in a north Bristol Refit West property.



Ozzie Ffield, who was investing a large amount in building works made the following comment:

“The next step was design and specification. We couldn’t find an architect or other professional who could give us the impression that they had sufficiently got their heads round eco issues to contribute to the process, so we decided to use a architectural technician to do the design. Much later, we came upon an architect who could have written the specification. He gave us a couple of hours to improve it but, because of his workload, wasn’t free to take on the supervision of the project. We would recommend to anybody to find an architect who could toughen up the specification to the best and highest standards.”

The challenge within the design phase of the project is to ensure the homeowner is informed of the potential for, and scale of, costs as early as possible so they can factor these into their budgeting. A recent report ‘Freedom from Fuel Poverty’ by the Centre for Sustainable Energy¹⁶ found that the additional costs of design, planning and building regulations and a structural survey could be over five thousand pounds, in addition to the costs of the insulation works themselves.

¹⁶ www.cse.org.uk/downloads/file/freedom_from_fuel_povert_final_report.pdf



As outlined above appropriate information is equally important for the contractor as the homeowner, although often presented in a different format and with greater technical detail. The correct installation and commissioning of the majority of energy demand reduction measures, such as insulation and heating controls, can significantly influence the outcomes, both regarding energy consumption and long term structural concerns.

For example, there are potential long term issues from interstitial condensation associated with the insulation of solid walls so in order to build confidence for the approach proposed by the contractor the homeowner contacted the technical support advice lines provided by two competing foil backed PIR insulation boards. When presented with the same installation method the two companies offered completely conflicting and contradictory advice. This then had to be resolved on site between the homeowner and the contractor. Without appropriate information or advice the homeowner could be left picking up significant costs if installations are not carried out correctly, either in the short or long term.

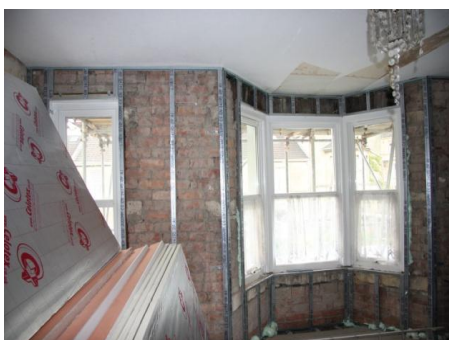
Appropriate design also has significant implications for the management of the heritage building stock within the UK. The Refit West project did not tackle the conservation issue head on as, for a first phase pilot, it was considered there was enough to learn without the added complications and delays associated with receiving planning permission for conservation areas or listed buildings.

However, it is not possible to consider the roll out of large-scale domestic retrofit schemes for energy efficiency without addressing the inefficiency of the solid wall housing stock, which makes up the majority of our listed buildings and conservation areas. Approximately 21% of the homes in England were built prior to 1920, on average costing nearly twice in energy and producing twice as much carbon dioxide emissions per annum as a house built since 1990¹⁷. While we want to maintain the value associated with the external facades of many of our solid wall properties, national Government will need to facilitate retrofit in conservation areas.

Although not in a conservation area by way of an example, one Refit West household decided that they would replace the cornices after fitting internal wall insulation. This was in keeping with the overall character of the property and could have compromised the value of the property had it not been replaced. But this added around 50% to the cost of insulating the walls.

The Refit West team came across a number of examples where a suboptimal solution was required due to the constraints of the current planning system:

- Where a homeowner in a conservation area was only allowed to install slim line double glazing panels, and not the greater efficiency of deeper double glazing units.
- Replacing a single glazed window in a grade 2 listed building had to be like for like, when the window proposed for replacement is not visible from any public space.
- Internal wall insulation was to be allowed as long as the original cornicing was not affected, leading to a complex design solution leaving a very confused set of cornices.



- Installation of internal wall insulation in the only Refit West property in a conservation area, with existing planning consent.

“Planning’s first concern was the profile of our extension and how it would match the profile of the coal shed next door (which our neighbour may well knock down!). The second concern voiced during our pre-application discussion was that they would like to minimise the amount of solar panels.”

¹⁷ www.communities.gov.uk/housing/housingresearch/housingsurveys/englishhousecondition/

Getting Pricing Right and Assessing Value

As with the costs and introduction of fees for detailed design, it is critical that the costs presented at the outset of the project are deliverable and the homeowner has sufficient budget in place. The balance here is for the independent survey results to accurately reflect the likely total costs of the measures installed and the property made good. Hidden costs, such as replacing cornicing, would reduce the certainty of the report and cost effectiveness of the recommendations. This will be another key challenge, which has significant impact on the Green Deal's 'golden rule'¹⁸ that the cost of measures should be less than the savings achieved.

High quality detailed design and specification can allow the homeowner to approach a number of building contractors to get comparable quotes for works and schedules. Budgets for works through the Refit West project ranged from a few hundred pounds to tens of thousands.

With the scale of some of the works required for a house to reduce energy consumption and emissions in line with national targets there is a risk that additional structural issues will be uncovered. Fortunately this was not the case during the Refit West project but remains a concern, when the cost of remedial works could be very high.

The question of value is also vital as a 'simple payback' approach does not include a number of immediate and future benefits. Across Britain we spend millions of pounds per annum in property improvement, without considering the payback. Investment in reducing energy demand results in more comfortable and healthier homes that are also resilient to future rises in energy prices.



- Chris Preist installed high efficiency double glazed sash windows at a cost of £15,000 despite the 44 year payback:

"I asked a friendly estate agent about the financial pros and cons. He said that, for a Victorian house, installing pvc double glazing would reduce its value significantly, but installing well-made period style double glazing would certainly increase its value, possibly by almost as much as the installation. Of all the energy measures we are considering, this is the one that is most 'understandable' currently to buyers, and so will have the biggest impact on the property value."

This cost far exceeds any of the figures being considered for the Green Deal.

There is a huge amount of work to do to ensure that estate agents, surveyors, mortgage companies and valuers internalise the value added by retrofit works, else the market will penalise early adopters. In particular valuers and estate agents are not used to or prepared for valuing future revenue streams from reduced energy spend, feed in tariffs or the renewable heat incentive. Furthermore we would recommend that Green Deal surveyors need to consider and report on the effects that the recommended measures would have on a property's value, e.g. uPVC windows in period homes, solid wall insulation and microgeneration.

¹⁸ www.decc.gov.uk/assets/decc/legislation/energybill/1010-green-deal-summary-proposals.pdf



Confidence in Contracting and Delivery

The nascent domestic retrofitting industry, currently led by specialist small building firms, is certainly flexible enough to work with the various demands of households and is capable of delivering the solutions modelled by the assessment and report. The challenge is often in the process of finding, evaluating and appointing one or more professional building contractors.

For any major domestic works it is generally recommended to receive a number of quotes, with the Federation of Master Builders suggesting at least three¹⁹. Membership organisations such as the Green Register and the Association of Environmentally Conscious builders provide a route to lists of trained and passionate professionals but there is currently no accreditation scheme and little to provide confidence between those that claim and those that actually can deliver. As a result finding comparable quotes from trusted professionals can be extremely difficult.

In order to reduce risk and remove this barrier Refit West carried out a due diligence process for experience, training, accreditation and wider business issues such as health and safety on a number of interested contractors. At the time this was carried out, in early 2009, we felt confident to refer homeowners to two local building firms; Footprint Building²⁰ and Ecos Renew²¹.

There is a strong argument to suggest that while the majority of the technical solutions exist the industry currently presents numerous options within this and very little direct comparison. This was evident for one of the Refit West homeowners, who met with five separate builders before settling on a firm, Clean Footprint²², based over 50 miles from the project site.

Gavin Spittlehouse, another Refit West homeowner had a similar experience:

“We spoke to quite a few building contractors before we found Bespoke [Building Contractors]. A couple we rejected, three chose not to quote (one took over two months of chasing before he let us know that no quote would be forthcoming), one other builder did quote and although we were confident that he’d do an excellent job his prices were far higher than we’d expected.”

Once a contractor has been appointed there is still the issue of quality of works carried out. With no accreditation or policing of these new works that exceed compliance with current building regulations, the situation really is caveat emptor ‘let the buyer beware’. While the skills required installing energy efficiency measures are marginal for competent trades people they do need to be mastered in order to achieve the optimum outcome.

The other factor that needs to be considered throughout the process is the disruption. This is well recognised for measures such as solid wall insulation, and the experience of Refit West homeowners was no exception. While there are innovations that will reduce the amount of time and disruption incurred this will, at least for the foreseeable future, be a major hurdle for the Green Deal in reaching thousands, if not millions of homes within the UK.

¹⁹ www.fmb.org.uk/find-a-builder/helpful-advice/choosing-the-right-builder/

²⁰ www.footprintbuilding.co.uk

²¹ www.ecostrust.org.uk

²² www.thecleanfootprint.com





- Our Refit West homeowners in Thornbury described the disruption of installing their external solid wall insulation and new windows:

“We have tried to stay positive despite the frustration & not let the delays colour our view of the work. We have been really pleased with the effect of the insulation – we are warm and comfortable and we have already worked out that our daily usage of gas during this cold winter [2010 – 2011] is less than the yearly average of the previous 12 months (i.e. including the summer months when gas usage is minimal).”

- Chris Preist, homeowner in north Bristol, said:

“One thing that I would say: As well as financial outlay, the disruption that work of this kind can lead to must also put people off. We were very lucky in that we could live elsewhere while the work was being done, but for others this option is not there.”



Refit West Outcomes

11 properties were surveyed. Of these:

- Ten households took action, from loft insulation to complete whole house refurbishment.
- Four completed major works.
- A fifth, at the time of writing, has a major project in progress – extension alongside significant refurbishment and upgrade to the retained building fabric.
- Three more plan to carry out works in line with planned maintenance or when the capital funding is available.
- Two are still eager to reduce the energy demands and green house gas emissions from their homes, but for personal reasons have had to put any major works on hold.



- Before and after images of Alan and Margaret Pinder's cottage:

“Our aim with regard to our cottage was that the works that we have had done should not be obvious to see. We wanted the cottage to look as it did prior to the building work. You can see for yourself if we achieved this.”



Our Conclusions

Supporting these homeowners as they progressed through the various stages of their own domestic retrofits has been an enlightening and rewarding experience. While many of the lessons do not stand out on their own, it is the complexity and sheer number of significant insights that we believe make this Refit West project extremely valuable. Of course, motivations are varied, complex and potentially contradictory. Environmental concerns and a desire to reduce the carbon dioxide emissions from their properties are hugely significant at this stage in developing the domestic retrofit industry.

This report has focussed on the owner-occupiers; the people that the Green Deal needs to engage. We have looked at where to begin and how to proceed through the retrofit journey. The significance is that this journey needs to be completed for each and every one of the 19 million owner-occupied homes in the UK.

- An independent **survey** needs to empower and to present the options to the homeowners, allow them to achieve their objectives through their motivations. The current tools are insufficient and, while there are good alternatives available, there needs to be an assurance process in place prior to a mass rollout.
- Recommendations need to identify the opportunities of **scheduling** energy efficiency works alongside other building projects and the marginal costs of **upgrading** planned maintenance.
- As the nascent industry develops there is an urgent need to provide **information** to, and appropriate for, homeowners, designers, building contractors and others.
- It is our belief that the strongest way to get to scale for the delivery of domestic energy efficiency and the Green Deal is through building **trust** and confidence in the tools, processes and organisations involved.
- There are a number of SMEs at the vanguard of the industry, building strong local relationships and supply chains. There is currently a **skills-gap** in the industry but that this is a marginal difference between the professional building trades and the new materials and measures that they will be working with over the decades to come.
- Even for a committed group of homeowners the realities of **finance** are never far away, with regards to capital costs and returns on investment.
- Even at scale the **costs** associated with domestic retrofit works are likely to far exceed the finance to be made available through the Green Deal. It is recognised that the Government wants to include solid wall insulation schemes in this mechanism but it needs to address issues of disruption, motivation and value. There is also the looming issue of how we work with our historic buildings and whether the planning system is a barrier or an enabler.
- During the sale and purchase of homes the true **value** of works needs to be understood by all professionals, with future savings and revenue streams factored in. Surveyors and builders also need to understand the implications on value of the measures being recommended and installed.
- Last, but by no means least, is the issue of **behaviour**, and how residents engage with the need to modernise. With swift action and strong leadership we may be able to retrofit the entire housing stock within the next 40 years, but if our consumption increases in line with the last decades we will lose significant ground to 'comfort take' and increasing energy use.



Project Partners

Homeowners

We would like to thank the homeowners for working with us to learn from their experience and share this with others: Ozzie & Mary, Chris & Isla, Martin, Anthony and Liz, Margaret & Alan, Gavin & Carrie, Jon, Paul, Tim, Sue & Brian and Ben

For further information and personal blogs from the Refit West homeowners see www.refitwest.com

Members of Refit West Consortium

Archipeleco Architects
Bristol City Council
Centre for Sustainable Energy
Ecomotive
Energy Saving Trust
South Gloucestershire Council
Wessex Reinvestment Trust

Bath and North East Somerset Council
Bristol DEA
Chris Howell
Ecos Renew
Footprint Building
Vertigo Sustainable Development Consultants

Refit West Project Supporters and Partners

Bond Pearce
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UK Green Building Council
WWF

Refit West Contractors

Bristol DEA
Parity Projects



- Refit West homeowner, Chris Preist (right), with Al Doggart of Footprint Building. Over the winter Chris tested the insulation and MVHR system in his finished Refit West home:

“According to our external thermometer, today is the coldest day of the year so far. At about 8am, it was reading -2, and there was a beautiful frost layer on our velux windows, with the winter sun shining through it.

So I thought I'd try an experiment and switch the heating off: The inside temperature was reading 18.5c. How would it change through the day? Over the next couple of hours, it sank to 17.5, but then actually went up again to 18 thanks to the winter sun heating the front of the house and that warmth being spread elsewhere. It's now gone back down to 17.5c as the sun has gone in. So 5 hours after turning the heat off, the house has lost about 1 degree.”

