FUTUREFIT REPORT PART ONE

A groundbreaking project that gives a unique insight into how the Green Deal could work in social housing

September 2011

Affinity Sutton


FUTURE
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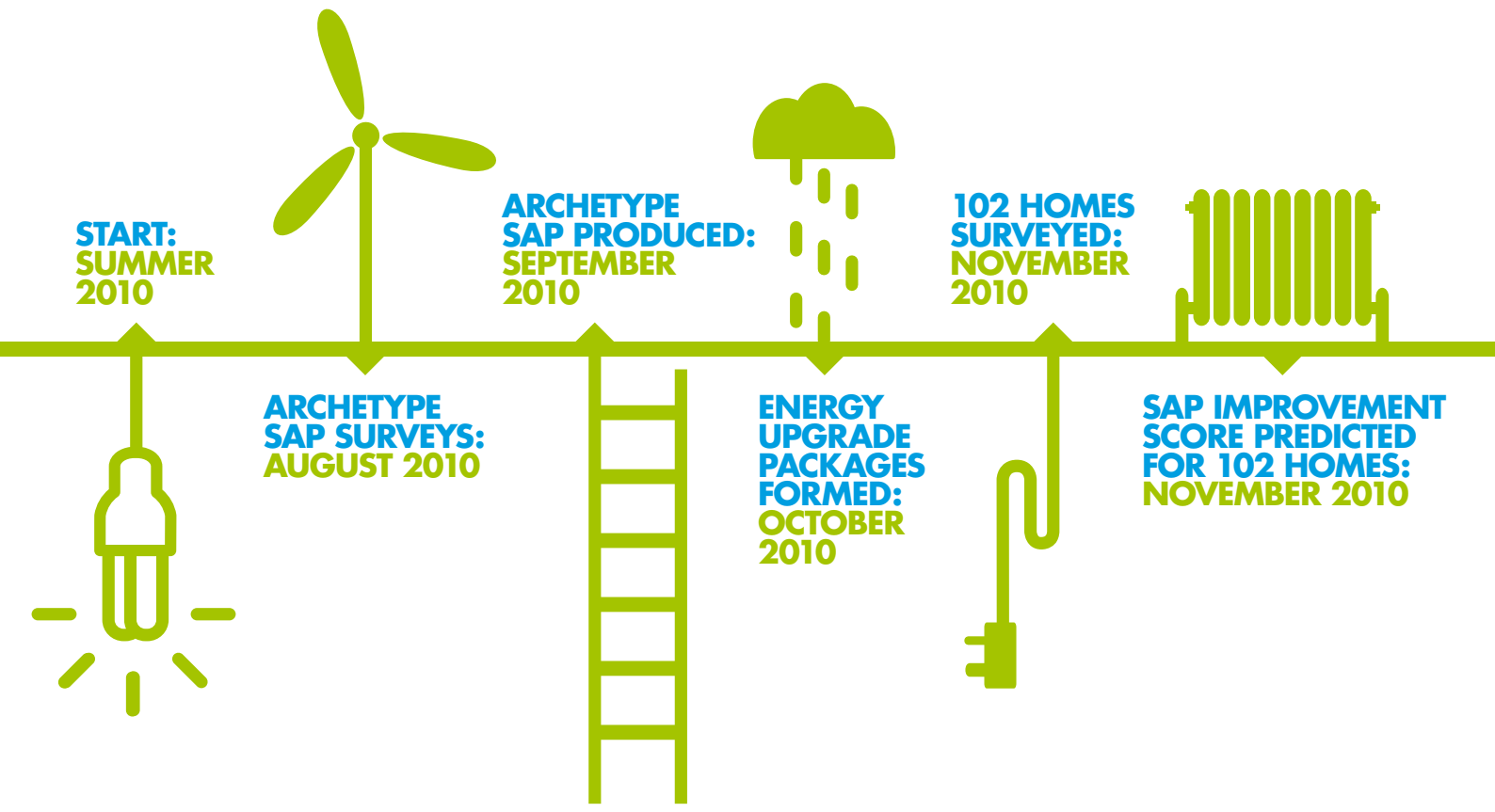
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FOR 102 HOMES:
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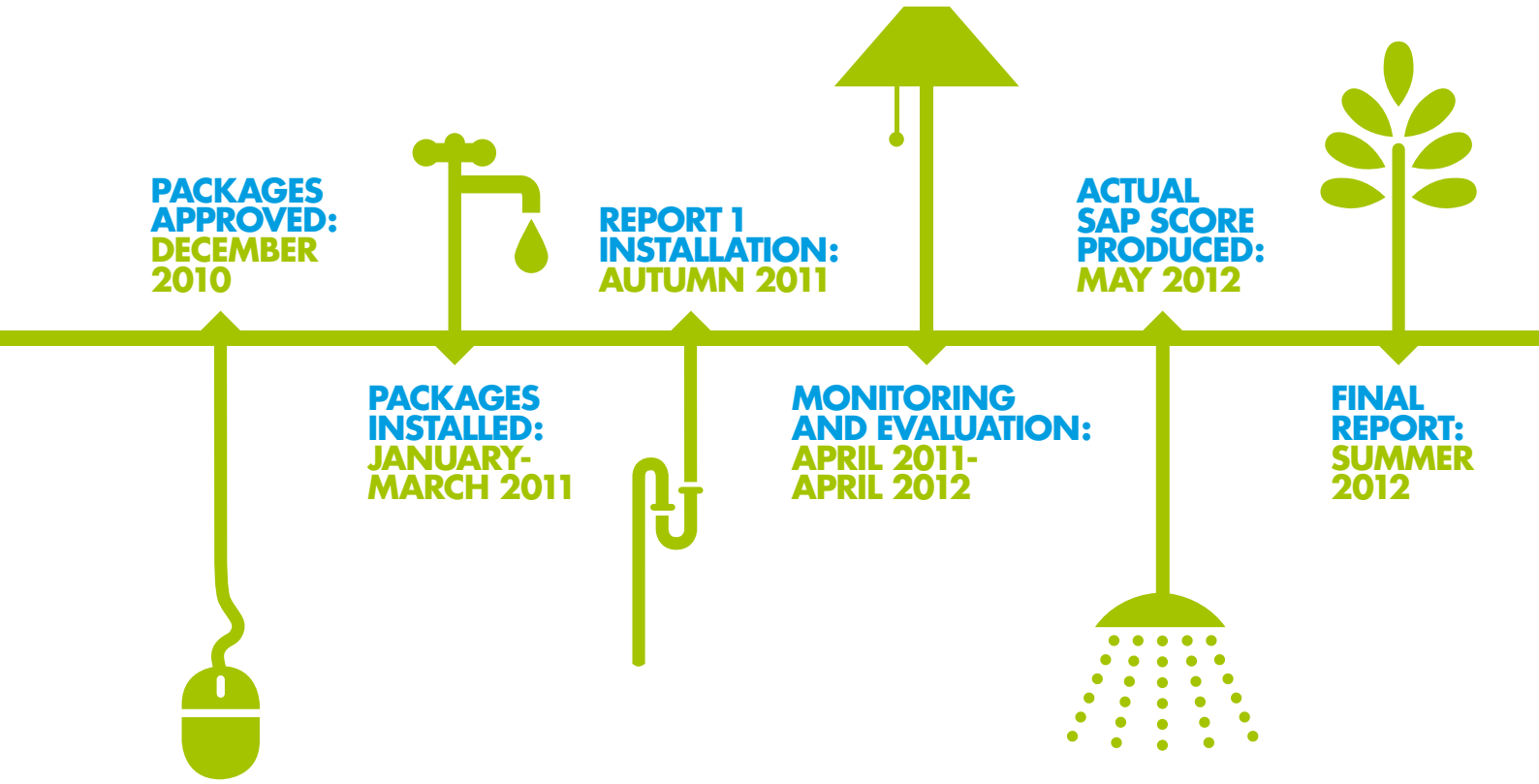


FOREWORD

Affinity Sutton's FutureFit project provides the social housing sector with a much needed insight into how wide-scale retrofit, and the Green Deal in particular, could work in practice.

FutureFit worked with 102 homes and many more residents around the country, using existing supply chains and focusing on budgets rather than carbon targets. The results show not only what the project really means for all involved, but also what can realistically be achieved.

When FutureFit started, it was uncertain how the UK would discharge its legal commitment to reduce carbon emissions by 80% by 2050. While a great deal of that uncertainty still exists, the introduction of the Green Deal gives us an idea of how this commitment will be delivered, at least partially, within the housing sector.

The Green Deal was designed primarily as a funding vehicle for the owner-occupied sector. While we welcome it – and any other initiatives that will help fund environmental change – it does need amending for the social housing sector.

FutureFit has identified a significant funding gap which can only be fully resolved if our sector works closely with the government to deliver a strategic approach to improving the energy efficiency and carbon performance of social housing. If this is limited to designing packages purely to meet the Golden Rule that requires savings to be greater than the additional repayments, we will significantly reduce the amount of carbon that can be saved.

FutureFit has also shown that a lot more work still needs to be done to convince society of the value of carbon reduction. Many residents are simply not interested in the retrofit agenda or having works undertaken to their homes – even when they are free. If the Green Deal is to work, the government will need to invest in promoting and marketing its benefits.

What is needed is a strategic approach that promotes warmer homes at a lower cost. Energy efficient retrofit must be part of the integrated asset management programmes that housing associations are committed to. It will then reduce fuel poverty, improve the quality of people's lives, add real benefit to the local economy, create new jobs and training opportunities and make significant inroads into meeting the carbon reduction challenge. Social housing providers want to play a leading role in meeting this challenge: that's why the Green Deal is necessary. But, vital though the Green Deal is, it's not enough on its own. It is even more important that Energy Company Obligations, Feed-in Tariffs, the Renewable Heat Initiative and any other mechanisms are all part of a fully strategic approach to delivering energy efficiency in our homes.

This report is an important contribution to our understanding of the issues and challenges we face. These are challenges that we must meet if we are to deliver the twin objectives of reducing carbon and improving people's lives.

David Orr
Chief Executive
National Housing Federation

EXECUTIVE SUMMARY

Our FutureFit project shows that while the proposed Green Deal will work, in the social housing sector it is likely to deliver only limited carbon savings, falling far short of the commitments made by the UK government. This report identifies a series of ways to increase these savings and ensure cost effectiveness, whilst providing a better deal for our residents.

The government's flagship Green Deal is due to be implemented in October 2012. So if housing associations are not yet thinking about how it will affect them, they need to do so now. Even if you decide not to get involved in delivering the scheme, you'll need to consider your role as a landlord. You're likely to be faced with requests from residents who want to take part. And you'll also need to consider the maintenance and customer care implications of external organisations carrying out works to your properties.

The FutureFit project delves into previously untested territory. Instead of the more usual one-off exemplar or desktop study, this national project, involving more than 100 homes, provides Affinity Sutton with an in-depth understanding of the practicalities of wide scale retrofit across our 56,000 homes. It should provide lessons for social landlords everywhere of the challenges that retrofit presents.

This report follows the entire journey of the retrofit process, illustrating key findings and detailed results for each stage. It starts by identifying the properties to retrofit, works out the packages to install, moves through to installing the packages, and moves on to understanding the resident experience and what happens when works are finished. Finally, it explains how the FutureFit project has discovered ways to spread the benefits of retrofit more widely.

The report provides valuable insights into the challenges to be faced:

- If the Green Deal finance mechanism is applied, Affinity Sutton will face a funding gap of £130m, even to apply a 'low package' of works (£6,500 per home) across our stock.
- This low package reduces the carbon emissions of our whole stock by just 18%. And if packages are designed solely to meet the so-called Golden Rule (so funding is not provided to cover the gap), this percentage will fall significantly.
- To deliver this agenda and ensure support from residents, all delivery staff – from surveyors and contractors to supply chains and resident-facing staff – will need training.
- There is little appetite for these works among unengaged residents. Without strong encouragement and support, take-up is likely to be low, calling into question the viability of the Green Deal's proposed consumer-led approach.

It would be a mistake to see retrofit as a purely technical challenge; this report shows that it's more about people than technology. As well as the skills we will need to make existing homes more energy efficient, we need to convince our residents to have the work done and help them change their behaviour to live in an energy efficient manner. This is precisely why Affinity Sutton has undertaken this important piece of work – we want to get ready to face the challenges of the retrofit agenda and reduce the carbon emissions from our homes.

Keith Exford
Chief Executive
Affinity Sutton Group

INTRODUCTION
FUTUREFIT

THE RETROFIT AGENDA

The UK is legally required to reduce its total carbon emissions by 80% by 2050, with an interim target of 34% by 2020. More than a quarter (27%) of the UK's carbon emissions come from homes. Making existing homes more energy efficient – retrofitting – has therefore been identified as one of the biggest contributions we can make towards meeting these targets.

What is the Green Deal?

The Green Deal is a funding mechanism proposed by government to fund energy improvement works. It is based on the premise that the cost of energy efficiency works can be covered by third party investment, then repaid through a long term surcharge on the reduced energy bills for the property. The Green Deal's Golden Rule means that savings must be greater than the additional repayments. This is a new concept for the UK and the policy will require a great deal of detail to succeed, not least how much Energy Company Obligation (ECO) funding from energy suppliers will be needed to meet the Golden Rule in harder to treat and vulnerable households.

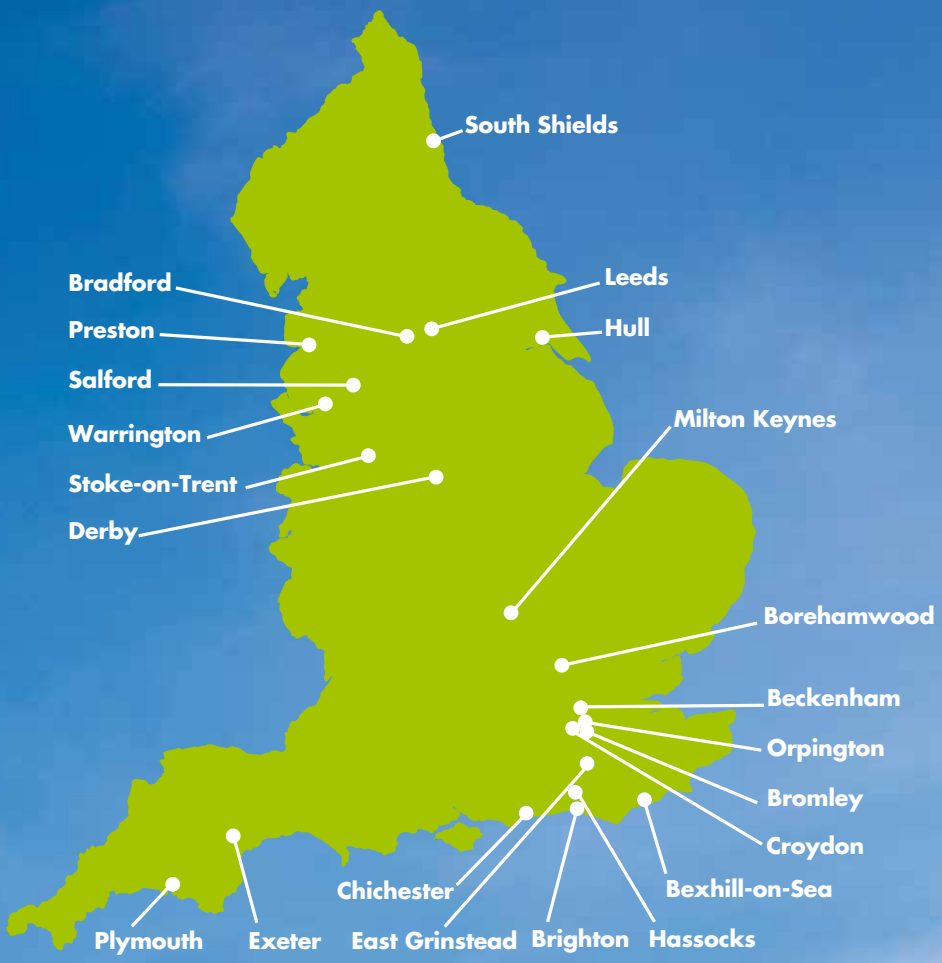
What is FutureFit?

FutureFit is Affinity Sutton's response to exploring the challenge of greening the 56,000 homes we own and manage. We are working with 102 homes and many more residents around the country to deliver combinations of retrofit works and lifestyle advice. Rather than undertaking a pilot project led by the 80% carbon reduction target, we aim to investigate the practicalities involved and what energy savings can actually be achieved at three different price points.

In this way, FutureFit will provide us with an insight into how the Green Deal might work in reality.

FutureFit aims to:

1. Understand the practical implications of delivering large scale programmes of retrofit.
2. Identify actual costs and actual energy savings through a robust monitoring and evaluation process.
3. Develop best practice and guidance on the delivery and funding of carbon reduction in existing homes.
4. Engage residents and stakeholders in the design, evaluation and prioritisation of retrofit solutions.



Approach

We're making sure our approach is sustainable and replicable by:

- working with existing partners and staff to investigate capacity and skills
- retrofitting 102 properties using three different budgets rather than focusing rigidly on carbon reduction targets
- basing property selection on 22 common archetypes – homes that represent Affinity Sutton's housing stock and, when broadly compared to the English House Condition Survey, 75% of the wider housing sector
- locating archetypes nationwide to get a wider perspective.

There are two phases to the project, with reports produced at the end of each phase:

Phase 1: April 2010 – May 2011
Preparation and installation of works

Phase 2: May 2011 – June 2012
Monitoring and evaluation of works and lifestyle advice.

Next steps

We will be releasing more detailed results from the first phase of the project and in summer 2012 will launch a second report. This will cover actual energy and fuel bill savings and the impact of our lifestyle programme, FutureFit Living.

From FutureFit to the Green Deal

From cost to supply chains, lack of skills, resident apathy and access to finance for differing property types FutureFit digs into these issues to prepare Affinity Sutton and the wider sector for the delivery of large scale retrofit in the future.

FutureFit Living

To make homes greener, we need to improve the fabric of our buildings. But we also need to provide the residents of those homes with advice and support on how to live in the most energy efficient way. FutureFit Living – the second phase of our FutureFit project – gives us an opportunity to assess the impact of this advice. We're comparing the savings that are being made through retrofit works alone to the additional savings that can be achieved by giving residents advice on how to live more energy efficiently.

FUTUREFIT METHODOLOGY

The FutureFit project provides a snapshot of the process of retrofitting:

1. Identifying the properties

To test real-life scenarios, 95% of the properties we identified for the project were occupied. All of the FutureFit homes came under one of the 22 archetypes; these were defined not by energy characteristics but by aspects of the properties themselves, as follows:

- built form (mid-terrace or end-terrace)
- wall construction (cavity, solid, system built of timber frame)
- age (age bandings from between 1900 and 2002)
- property type (flat, house, maisonette).

2. Identifying packages of works

The energy assessment tool normally used for existing homes, Reduced Data Standard Assessment Procedure (RdSAP), does not capture or analyse sufficient information for the project's aims. We therefore used the full SAP system which is normally used for new build properties to check compliance with government standards. This allowed much more detailed information about the home to be collected.

We started by carrying out extended SAP data collection surveys, set out in the traditional surveying format, at a selection of properties. We used the information from these in conjunction with a cost model to create three target packages for each archetype: low (£6,500), medium (£10,000) and high (£25,000). The low and medium packages are comparable with the Green Deal funding figures.

To refine these packages further, we completed extended surveys at every property and used a works selector flowchart to map out where changes should be made to the target packages.

We followed the energy hierarchy at all stages – looking at improving the fabric of the building first, then heating and hot water systems and finally the potential for low and zero-carbon technologies. Using this approach, we tailored the packages so that they would achieve the greatest possible SAP point improvement.

The result was a low, medium and high target package of works for each archetype.

3. The works: installation

We aimed to install at least one low and one medium package per archetype, along with high packages where suitable. To test current capacity, we worked with existing contractors, partners and staff. We held regular meetings with contractors and staff and posted updates on our intranet for other teams affected. We also created an online Knowledge Hub which contains all relevant information and a forum to keep all involved staff and contractors engaged.

4. The works: residents

Existing Affinity Sutton staff and contractor Resident Liaison Officers (RLOs) carried out a resident engagement programme before, during and after works. Because FutureFit is based on property archetypes, it wasn't possible to target specific groups of residents (by a particular demographic, for instance). This is likely to present an ongoing challenge in engaging people in retrofit. For all works we carried out, the usual defects period applied, followed by Affinity Sutton's existing repairs process.

"FutureFit's practical approach starts to show the reality of wide scale retrofit. By considering the crucial role of people it will complete the picture."

Jeremy Kape, Director of Property Investment, Affinity Sutton

5. Funding retrofit

We produced a FutureFit financial model to identify the actual cost of energy savings per archetype and illustrate potential funding options. As the archetypes were selected to represent common types of housing, this model allows for the massing up of any results to the wider housing stock. The model also allows us to play with different scenarios, such as the impact of Greening the Grid and of rising energy prices. We created the model in consultation with our finance department so that results are relevant to the business.

6. Post works

We monitored FutureFit in two phases:

During **Phase 1: installation,** we monitored the actual cost of retrofit, industry capacity and resident satisfaction by:

- testing each property for air tightness, before and after retrofit
- asking residents, RLOs, staff and contractors to keep log books and diaries
- carrying out satisfaction surveys
- using cost recording tools
- keeping a queries and learning log.

During **Phase 2: energy performance and FutureFit Living,** we are monitoring the actual energy performance of the homes against projected performance, the actual costs of energy savings and the impact of FutureFit Living by:

- fitting a gas meter, electricity meter, internal temperature sensor, external temperature sensor and any sensors needed for green technologies in every FutureFit and FutureFit Living property
- transmitting all data from these to a web portal for analysis against previous energy bills, UK 1990 CO_2 levels and CO_2 levels measured in Affinity Sutton stock in 1990.

7. Spreading the word

Five empty properties were also retrofitted. Staff and resident led design workshops were held for four of these.

Residents and staff outside of the project attended workshops to compile the packages themselves which were then installed in these properties.

The workshops cover the whole retrofit process – from weighing up energy and cost implications to how it could be funded.

Focused on best value for money, so even with a maximum budget of £25,000, groups did not always spend the full amount.

IDENTIFYING THE PROPERTIES

KEY FINDINGS:

- **Archetyping properties helped to model costs for all of our stock.**
- **Large stock databases are often unable to provide the level of detail and accuracy required for desktop modelling of retrofit works – individual packages need to be created at property level.**
- **Empty properties should be included in the Green Deal to maximise the potential to deliver effective retrofit packages.**
- **Targeting individual properties rather than groups of residents was more challenging, but more in line with the consumer-led aspiration of the Green Deal.**

FutureFit mirrors a traditional asset management approach by looking at its stock in terms of representative property types and areas.

This allows an understanding of the financial implications of the Green Deal for the whole of Affinity Sutton's stock and will also allow economies of scale to be achieved through effective planning and delivery by tying into existing programmes of planned works. However, for energy efficiency (rather than basic property improvement works) this approach relies on a level of stock data that has not previously been collected and it does not conform to the proposed consumer-led approach of the Green Deal.

What we found...

- Affinity Sutton has more than 56,000 homes, so it was difficult to rely on the overall accuracy of stock energy data.
- Grouping properties into archetypes makes it easier to devise a strategy for retrofitting our entire stock and allows for financial modelling.
- However, grouping by property type does mean that home occupiers won't be able to choose which works should be installed from any menu of options proposed under the Green Deal. (This is explained further in the section, Installing the packages.)
- Although we largely excluded void properties from the FutureFit programme, they should be included in the Green Deal since it is the clearest opportunity to carry out intrusive works at lower cost.
- Retrofitting void properties will also allow the supply chain to develop.

"Our logical starting point of identifying archetypes was forced to change. People and their homes are too individual. In reality Affinity Sutton has 56,000 archetypes."

John Milner, Baily Garner

From FutureFit to the Green Deal

Social housing property improvement programmes have never been consumer-led or organised on a per property basis. The Green Deal will therefore have a radical impact on the way the sector delivers improvements. If housing associations could offer the Green Deal to their tenants as part of their own improvement programmes, the complexity introduced by consumer choice could be mitigated.

IDENTIFYING PACKAGES OF WORKS

KEY FINDINGS:

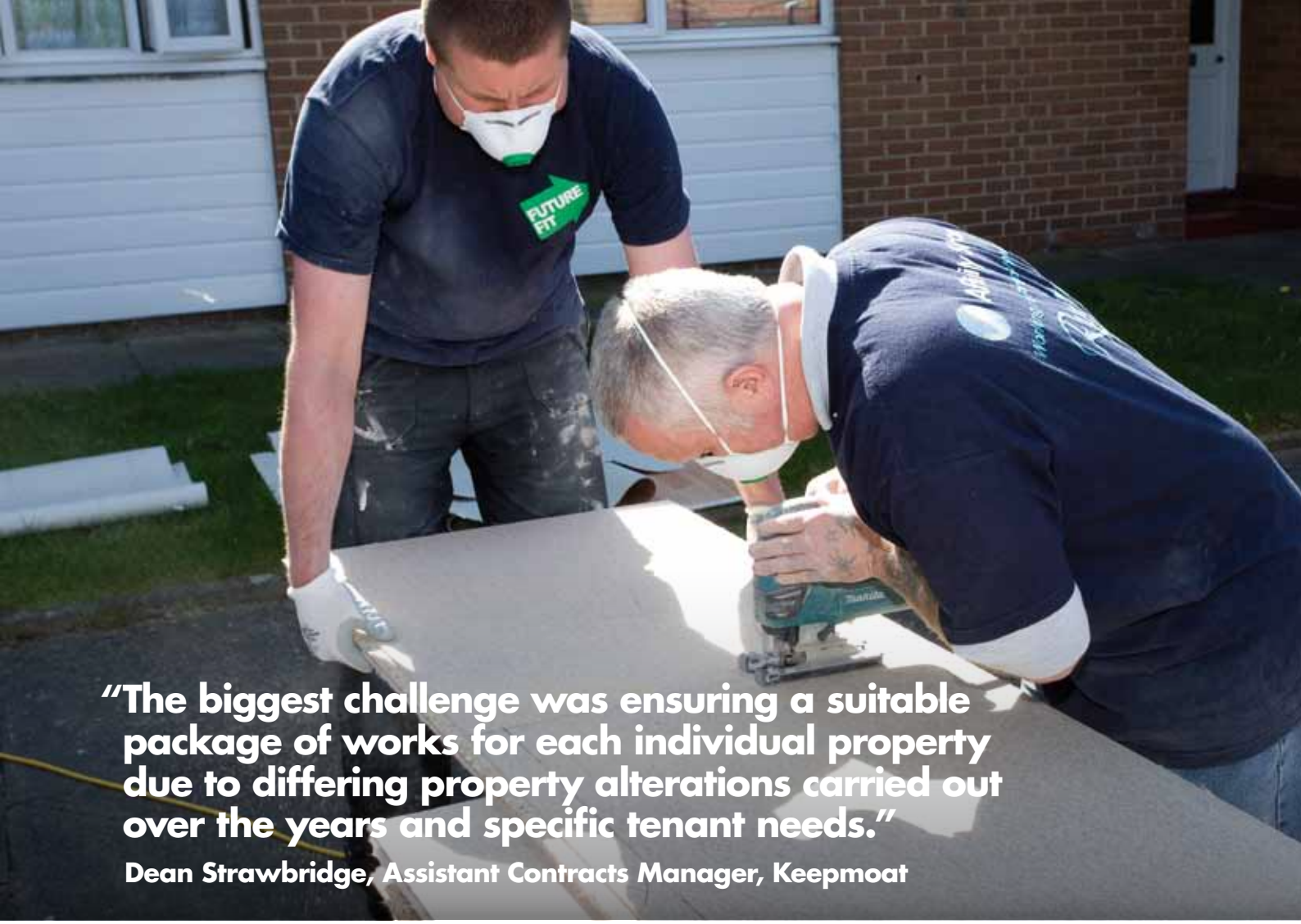
- **The easy wins have already been made in social housing.**
- **Reaching the highest SAP scores is potentially cost prohibitive.**
- **The current SAP model is not up to the job.**
- **There is a mismatch between the energy assessment and surveying process.**

A great deal of improvement work has already been carried out in social housing thanks to ongoing boiler replacement and cavity and loft insulation programmes.

This means that creating packages that result in high SAP improvements can be challenging. Although a decent SAP point improvement can be achieved for relatively low cost, to reach the higher SAP levels, and so achieve the 80% carbon reduction target, we must install measures that require significantly higher funding. Furthermore, the current SAP model will not be adequate to accurately assess homes for energy improvements.

What we found...

- We estimate that, since 1990, we've already achieved a 24% carbon reduction across Affinity Sutton's General Needs stock.
- There is a law of diminishing returns with SAP – the bigger the SAP score improvement, the more it costs. This means that significant SAP point increases can be made in low packages, but the same degree of improvement is often challenging to achieve with medium packages. For one archetype, only a low package could be specified. For another, the high package wasn't an option – either because so much work had already been done or because it was cost prohibitive.
- There is a skills and knowledge mismatch between two key parts of the retrofit process – the SAP assessment and the property survey. For example, although FutureFit adapted SAP assessment tools to suit traditional surveying practice, there was still a lack of consistency in the information gathered.
- Also the language within SAP differs from common surveying terminology: for example, SAP says 'heat loss wall' where surveying says 'external wall'.



"The biggest challenge was ensuring a suitable package of works for each individual property due to differing property alterations carried out over the years and specific tenant needs."

Dean Strawbridge, Assistant Contracts Manager, Keepmoat

- Equally, practical implications are not always appreciated by SAP assessors, with some decisions resulting in certain works being unviable in reality. The specification of less than 1KwP systems of photovoltaics was one example of this. Although these work in SAP models and new build properties, they are not viable to fit in existing properties.
- Every home is different, inside and out. To make the works practical FutureFit eventually had to produce 102 individual packages.
- The new SAP model needs to consider all measures that could have an effect on energy in the home, such as radiator reflectors, and especially occupation patterns.

Workforce Engagement:

Energy efficiency in the home has not always been a priority for the housing sector. If the retrofit agenda is to proceed on a wide scale, training and awareness initiatives will be needed, along with a certified and consistent set of tools. We found that close contact and regular communication is necessary to keep all stakeholders engaged. To achieve this, we hold monthly discussions online via the forum on the FutureFit Knowledge Hub. Discussion topics included resident lifestyle, monitoring and evaluation and resident incentives. In total, 37 members have joined the FutureFit Knowledge Hub.

From FutureFit to the Green Deal

Many energy efficiency measures have already been tackled in social housing. Further improvements are likely to be cost prohibitive – although some of this shortfall could potentially be made up by ECO funding. In addition, the current SAP model and process of energy assessment needs serious adaptation if it is to be used on a wide scale to accurately identify where improvements can be made.

THE WORKS: INSTALLATION

KEY FINDINGS:

- **Applying target packages en-masse will not work in practice.**
- **Decent Homes has potentially dumbed down the sector's ability to respond to wide scale retrofit.**
- **Planning policy must be aligned with retrofit policy.**
- **For some apparently simple measures, only 20% of planned works could actually be installed.**

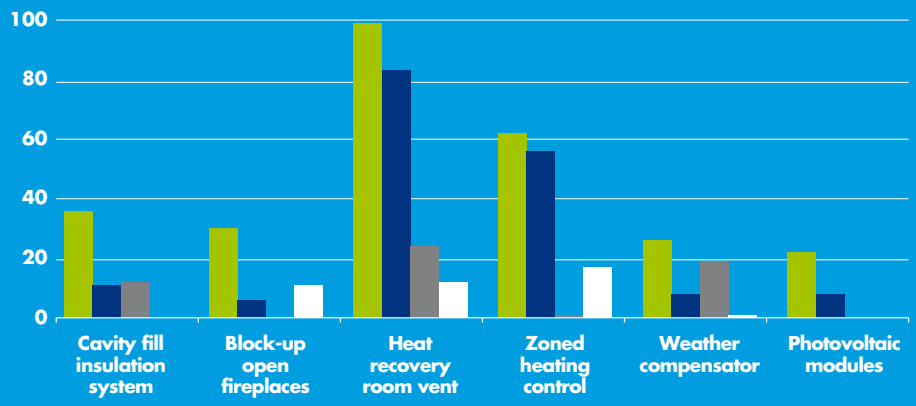
A significant proportion of the specified works were not installed.

This was due in part to target packages not being reflective of individual properties or inaccurate stock database information. However, many uncompleted works were down to issues with residents or practical concerns (see Figure 1). We could potentially overcome these issues by engaging residents more and improving our workforces' understanding; despite their enthusiasm for the agenda, they will need significant training if they're to carry out works effectively.

What we found...

- The 'bulk' approach used in applying packages of traditional, Decent Homes-style works differs drastically from that of energy assessments, which are reliant on specific property and resident requirements.
- This gap becomes even more dramatic if an element of consumer choice is introduced, as is proposed under the Green Deal.
- Planning authorities must come on board if the Green Deal is to succeed. During the project, we were refused planning permission to externally render properties, despite them being outside a conservation area and other properties in the area having already been rendered to a similar specification.
- Some supposedly straightforward measures, like zoned heating and heat recovery room vents, were challenging to fit and often unpopular with residents (Figure 1) who found installation too disruptive and the systems too complex.
- Several quick win measures were also refused by the majority of residents (Figure 1). They considered the works too disruptive and were opposed on personal requirements. For instance, they didn't want open fireplaces blocked up or their gas fires replaced.
- Both these issues could potentially be overcome if residents were more engaged in the agenda and the supply chain is trained to achieve this engagement. (There is more information on this in the next section).
- Cavity wall insulation could not be fitted to individual flats within blocks (Figure 1). Therefore, we need to take an area-based approach when fitting cavity wall insulation to non-detached properties.
- Insulation as a whole posed challenges. Existing cavity insulation was often degraded. New internal insulation proved disruptive to fit and we were refused planning permission to fit external render.

Figure 1: Key measures – how many were installed and what were the issues?



- No. measures specified
- No. measures installed
- No. installation issues*^
- No. resident issues*^

*Please note that where properties had both installation issues and residents objecting to the works, then these have been included in both.

^Also note that measures may have been added or discounted for other reasons, such as property characteristics being different from what was originally suggested in the initial surveys, or to ensure that the overall cost of the package did not exceed the budget.

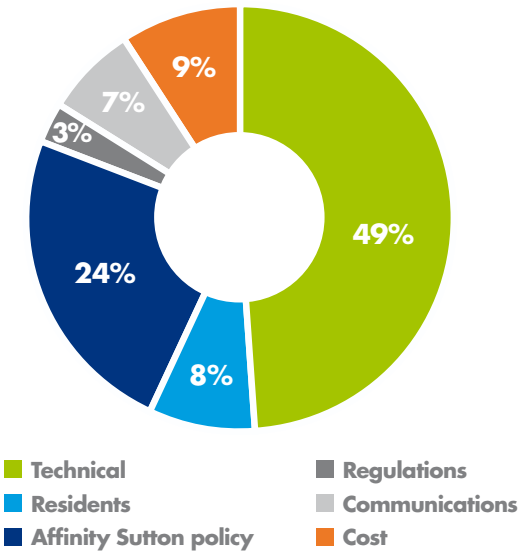
- Medium packages could not be installed to four archetypes due to issues with residents or installation, or the high cost of further SAP improvements.
- There was an overall delay to the work programme on a third of properties. In 18% of cases, this was due to inefficiencies in the supply chain, while in 10% of cases it was due to issues with residents, including getting their agreement to measures and gaining access. This suggests that extra resources may be required under the proposed Green Deal.

From FutureFit to the Green Deal

Under the proposed Green Deal, energy improvement works will be much more consumer led than previously. Add that to the fact that works already have to meet specific property and resident requirements, and it's evident that the traditional bulk works approach for social housing is about to be turned on its head. Government commitment to wide scale retrofit and extensive training will be required for a workforce which, though enthusiastic, has been dumbed down by the Decent Homes initiative.

- The FutureFit queries log tracked 166 issues, nearly half of which were technical (Figure 2). This highlighted the knowledge gap in an industry that has focused solely on Decent Homes for the last decade.
- The supply chain is very keen to take up this agenda but will need training, commitment and volume if it is to be able to meet the Green Deal challenge.

Figure 2: Workforce issues log – breakdown by theme



THE WORKS: RESIDENTS

KEY FINDINGS:

- **Response from residents to our initial contact was low.**
- **There was a high drop-out rate before and during works.**
- **Overall, residents' satisfaction with works was high, but their understanding of systems was low.**
- **The Green Deal must include education for residents and funding for this needs to be identified.**

Even when energy improvement works were offered free of charge and from a trusted party (Affinity Sutton), resident take-up was low and access was an issue.

There were also some issues with residents not understanding systems. The low take-up could be down to the fact that we couldn't hand pick the most engaged residents and we had no additional resources to increase their level of buy-in. But this was a necessary approach to reflect the reality of retrofit. Despite the engagement issues, we were able to carry out works without offering incentives and residents were largely happy with the works process.

Resident messaging

One of the strongest messages usually used to gain buy-in to the retrofit agenda is that residents will save money on energy bills. However, we were keen to avoid making promises around non-guaranteed benefits. A benefit of retrofit for many people living in fuel poverty – the largest proportion of whom live in social housing – is that they will finally be able to afford to heat their homes to a comfortable level. However, they will not necessarily pocket any monetary savings. This situation is known as 'comfort take'. ECO funding will be critical for these households, since they will not meet the Golden Rule (which states that savings must be greater than additional repayments). As such, the FutureFit message to residents was consistent: the works would create a warmer, more comfortable home – and they could potentially save money.

From FutureFit to the Green Deal

The Green Deal is currently designed to be consumer-led. But cherry picking only engaged residents will not be an option if we are to deliver significant improvements. So we need to take into account the effort and costs of getting buy-in and access permission from residents when calculating actual costs of the Green Deal – especially if the government is aiming for 14 million homes to be retrofitted by 2020. Any potential Green Deal provider also needs to allow for abortive costs from dropouts after initial resources have already been invested.

"Although residents did take part without incentives, the message of warmer homes and potentially lower bills had to be explained on a number of occasions."

Nicola Donnelly, Rydon RLO Manager

What we found...

- A basic invitation to take part in a free eco-project sent to more than 800 residents resulted in only a 4.8% response rate.
- Out of 294 phone calls made offering free energy upgrade works, 52% said no, 45% said yes and 3% said maybe.
- Among those residents who initially agreed to the works, 23% withdrew their permission, either leading up to or during the works period. They stated that the works were "too inconvenient", "too disruptive", said that they were moving house or blamed health or family issues.
- Many residents were keen for FutureFit to save them money on their bills. Because we had to be cautious about guaranteeing savings, it was more difficult to get people engaged early on.
- Once residents were engaged and taking part in the project, the incentive of a warmer home became more important to them than saving money (though this only applied to works being installed at no cost to the resident).
- The role of the RLO is key in explaining the project and its implications. They need to be on hand during the works to resolve any issues and maintain resident engagement in the scheme. For this reason, resident-facing staff need training on retrofit works and their implications for residents.
- Our own surveyors, who are familiar faces for many residents, were also crucial to maintaining resident engagement through the process.
- Despite the dropout rate, and although it might have made the project more popular, we didn't offer incentives to take part in FutureFit, since we needed every aspect of the project to be replicable in reality.
- Getting access to homes was challenging at times. There were a number of wasted visits from contractors and two properties pulled out during the works phase.
- From survey to completion, the number of visits per property ranged from 6 to 20.
- We estimate the cost of engagement for FutureFit (including phone calls, letters, emails and visits) to be approximately £450-£1,350 per property, depending on the number of visits required.
- The majority of residents who's homes were retrofitted were satisfied with the relevance and level of disruption of the works.
- A quarter of residents felt that their understanding of how to operate the systems installed in both the low and medium packages was only basic.
- Delivery teams felt that resident engagement needed to go beyond getting a yes to the works and understanding the systems. Residents needed to fully understand the process and the implications of adapting packages of works.

FUNDING RETROFIT

KEY FINDINGS:

- **There is a funding gap of at least £130m across all of our General Needs stock.**
- **This gap grows when we consider higher packages – but the CO_2 savings increase only marginally.**
- **There's still potential for the Green Deal to work if our suggested approach is adapted.**
- **With all potential savings taken into account, we still must save 26% of carbon emissions by 2050.**

There is a significant gap between the potential value of energy savings and the cost of actually installing retrofit works (Figure 3), which would not be covered by any Green Deal funding mechanism.

There are a number of ways this gap could be closed. Introducing a level of ECO funding, redefining packages of works in light of the learning from FutureFit and enabling the Green Deal to be delivered at scale could all contribute. FutureFit has shown that the specific nature of energy saving works can make this challenging: the suggested consumer-led element of the Green Deal makes it unviable.

What we found...

- Figure 3 shows the significant gap in funding for the three FutureFit packages of works. But it also illustrates the potential energy savings available across Affinity Sutton's General Needs stock.
- The funding gap of £2,900-£10,000 per property (Figure 4) does not include the engagement costs identified by FutureFit. These could be as much as £1,350 per property.
- Only two FutureFit archetypes broke even using the Green Deal. Every other property type would require additional funding to close the gap, whether or not it qualifies for the planned ECO funding.
- ECO funding on a per property basis, along with packages designed purely to meet the Golden Rule, could start to close the gap.
- Applying 0% VAT to all energy efficiency measures could also contribute.
- A major step would be to achieve economies through volume. This would require integration with existing major works programmes and a shift away from the suggested consumer-led approach.
- Even if the funding gap is resolved, projections show that the low package of works only promises an 18% reduction in carbon (Figure 4).
- If the Golden Rule has to be adhered to, less CO_2 might be saved, since the package will be dictated by cost rather than carbon savings.
- Although the medium and high packages achieve marginally better carbon reductions, the funding gap for them increases dramatically (Figure 4).
- Taking into account the carbon savings already made in social housing, if Greening the Grid achieves a 20% reduction by 2050, and if the low package of works that has been adapted to meet

Figure 3: Value of energy savings vs funding gap in retrofit

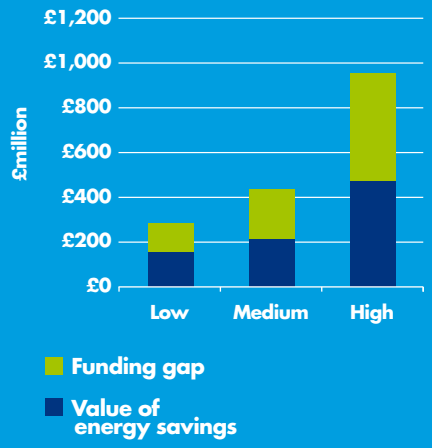
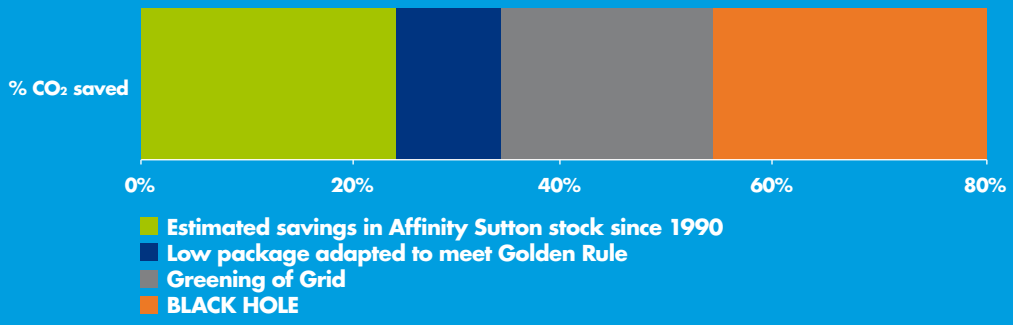


Figure 4: Cost of retrofit for whole Affinity Sutton general needs stock

PACKAGE	NET PRESENT COST OF INVESTMENT IN RETROFIT PACKAGES*	VALUE OF ENERGY SAVINGS	FUNDING GAP	TOTAL CO_2 REDUCTION	AVG NET PRESENT COST / DWELLING
LOW	£283m	£156m	£130m	18%	£2.9k
MEDIUM	£439m	£218m	£224m	23%	£5.0k
HIGH	£959m	£478m	£487m	34%	£10.8k

* includes operational and maintenance costs

Figure 5: The carbon black hole



the Golden Rule is applied across Affinity Sutton's stock, this still leaves a substantial black hole of funding if we are to reach the 80% target (Figure 5).

- There are property types that do present a more positive outlook, such as 1930s end of terrace houses. These could be targeted first.
- FutureFit does not provide all the answers but it has helped start the process by identifying where works packages could be refined to increase energy savings.

> "On a larger scale project the time issues around sourcing materials would be more easily overcome as there would be better stock resources held."
>
> **Chris Doyle, Divisional Director, Apollo**

From FutureFit to the Green Deal

The Green Deal as an initiative can work, but we must first overcome some serious obstacles. Allowing housing associations, who have shown an ability to deliver works at scale with Decent Homes, more control in the process would help the Green Deal to succeed. If we are able to take more of a lead in offering energy efficiency works, making them less consumer-led and perhaps not allowing customers to unreasonably refuse works, the potential to deliver retrofit at scale would be far greater. Going beyond the Green Deal, there remains a substantial black hole that needs addressing if the UK is to reach its 2050 carbon reduction target.

POST WORKS

KEY FINDINGS:

- **The overall costs are higher than desktop studies specify. This must be considered in any Green Deal modelling.**
- **Resident-facing staff will need training as well as supply chain staff.**
- **Air tightness levels are better than anticipated so there are fewer low-cost high-value works available.**

FutureFit has provided a unique understanding of what it really costs to retrofit.

The difference between FutureFit costs and those in the widely-used Energy Saving Trust (EST) Housing Model clearly illustrate how important this is (Figures 5 and 6). The EST Housing Model figures do not include the add-on costs of VAT, preliminary costs and overheads. To compare like for like and show how much these works would cost in reality, we have provided FutureFit's actual costs, both exclusive and inclusive of these add-ons. Energy efficiency training is also needed for staff working directly with residents, in addition to the more technical training required for the supply chain.

What we found...

- Although some of the FutureFit costs (without VAT, preliminary costs and overheads) are lower than the EST model, the actual amount required to install these works is almost always greater (Figures 6 and 7).
- Even for tried and tested measures, like cavity, floor and internal wall insulation, costs were significantly higher in reality (Figures 6 and 7).
- There were several reasons for this variation: from FutureFit using a higher specification, thinner floor insulation to avoid consequential works on stair risers and doors, to supply chain issues.
- Conversely, fitting new boilers cost less during FutureFit.
- The cost for installing photo voltaic (PV) panels was higher than the EST Housing Model projected. But this is likely to be due to the smaller system sizes specified for FutureFit. The main finding was that the more PV installed, the lower the cost.
- There was huge cost variation for zoned heating. This was not comparable with the EST Model, since that only covered room thermostats, cylinder thermostats and thermostatic radiator valves.

Figure 6: FutureFit vs EST Housing Model – marginal costs to install insulation per m²

Figure 6 shows the marginal costs of a selection of the measures: that is, the costs per m² excluding any additional expenses such as scaffolding and storage of residents' belongings.

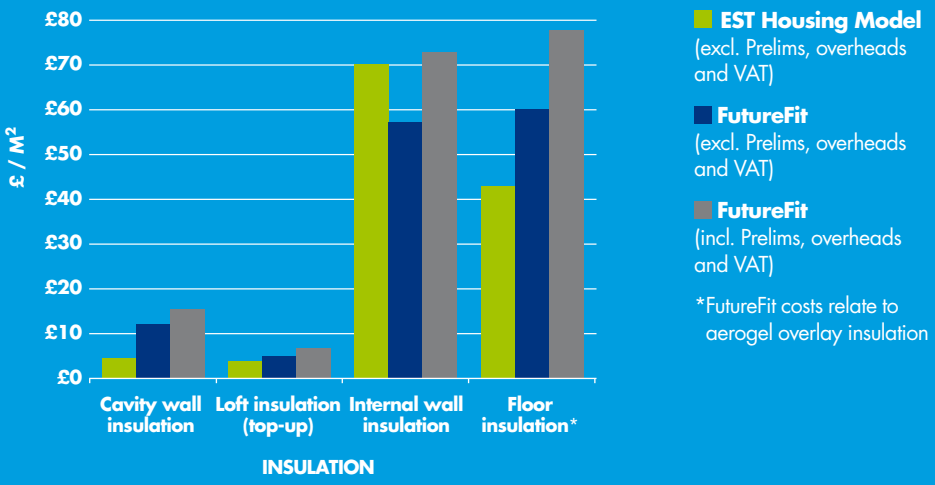
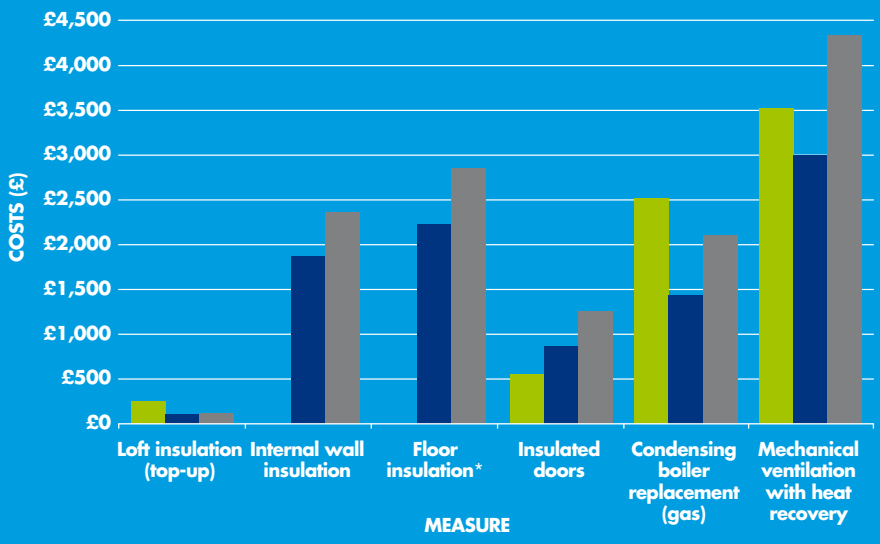


Figure 7: FutureFit vs EST Housing Model – fixed costs per unit

Figure 7 shows the fixed costs for a selection of the measures – that is, the cost to install a single unit of each measure (one new door for example) – and includes all add-on costs.



- The main finding was that wireless zoned heating systems were the simplest to install and resulted in the least disruption for residents, but they were by far the most expensive.
- On average, nearly half the archetypes were already better than the target air tightness before any works. This suggests that few low-cost, high-value savings would be available in these properties.
- There was significant variation in air tightness within archetypes with no clear trends emerging, even before the works. This highlights the uniqueness of each property.
- In several instances, contractors had to return to properties to remove works – including zoned heating and low-flow water attachments – because residents were not happy with their performance.
- For these works to have their desired impact and to ensure a smooth process, the entire delivery team including contractors, surveyors and RLOs need training. This will make sure that the same message and levels of understanding are passed on to residents.

From FutureFit to the Green Deal

Overall, retrofit measures cost more in reality than anticipated. Even if some of these costs are due to the lack of economies of scale, several well-established measures proved more expensive to install than the EST Model projected. These findings need to be fed into any Green Deal financial modelling. FutureFit has also identified other resources that will be needed under the Green Deal: training for the entire delivery team and resident education. If we are to achieve the projected savings, funding must be identified for these resources.

SPREADING THE WORD

KEY FINDINGS:

- **For the proposed Green Deal to succeed, we need to engage with a wide audience.**
- **When we held stakeholder-led design workshops, 80% of attendees rated all aspects of the day as "excellent".**
- **The remaining 20% rated them "very good".**

Engagement with a wider audience with no previous interest in retrofit has rarely been tackled.

So we held workshops, where residents and staff not involved in FutureFit were invited to design packages of energy improvement works for four of the five empty properties included in the project. These packages were then installed in the properties. The workshops covered the whole retrofit process, with the aim of engaging with the wider audience. The workshops proved a successful engagement tool for the wider audience that allowed real participation and resulted in highly positive feedback – not just on the process, but also on the aims of FutureFit itself.

What we found...

- This method of engagement was extremely well-received: 80% of all workshop attendees rated all aspects of the day "excellent" and 20% rated the day as "very good".
- By the end of each workshop, residents and staff alike expressed interest in the agenda. One resident said: "All was excellent – much of it was new and I found the whole day very interesting." Staff found it: "All extremely interesting and relevant".
- We received particularly positive feedback for the high level of participation. One staff member said that their favourite part of the day was: "Putting the package together and the process of establishing the impact the different elements had." One resident said: "Enjoyed the day, looking forward to seeing outcomes in the property."
- One resident from Haywards Heath who attended the second workshop felt so enthused that she went on to give a talk about the project at a residents' meeting.

We used a range of tools at the stakeholder-led design workshops, including:

- a tour of the empty property
- a diagram of the house with flashcards that illustrated the pros and cons of each measure
- an energy and cost assessment model to predict the likely savings
- information panels and a retrofit quiz
- further tours of the property during and after installation.

"Getting people who have no prior interest actively engaged in retrofit has always been tough. These workshops have shown it is not only possible but can result in real, ongoing participation."

Alex Willey, FutureFit Project Manager, Affinity Sutton

From FutureFit to the Green Deal

If the Green Deal is to reach 14 million homes by 2020, we will really need to engage with consumers – especially those who are not already interested in the green agenda. That means we're going to need a significant awareness programme. Stakeholder-led design workshops could form part of this programme, particularly since social landlords are already established as a trusted brand for residents.

FURTHER INFORMATION

Supporting documentation to this report is available at www.affinitysutton.com/futurefit

Supporting information includes:

- the FutureFit Works Selector Flowchart
- the FutureFit Extended SAP Survey
- the FutureFit Cost Model.

These are the three key tools we used to create the packages of works.

If you would like to know more about FutureFit email us at future.fit@affinitysutton.com

Join the discussion at www.affinitysutton.com/futurefitblog

Written by Alex Willey, FutureFit Project Manager, Affinity Sutton with contributions from project partners.

GLOSSARY

Comfort take:
If a household is struggling to pay energy bills, it might be that the home is being under heated in order to save money. If energy improvement works are installed, the residents may choose a warmer home over any monetary savings meaning that they end up paying the same amount. This is referred to as 'comfort take'.

Energy Company Obligation (ECO) funding:
ECO funding will be available through energy suppliers to sit alongside the Green Deal, and provide financial uplift for hard to treat homes and vulnerable households where the Golden Rule will not work alone. It will replace existing energy supplier funding streams that are due to end next year, such as CERT (for insulation and other small measures) and CESP (for community-based efficiency programmes).

Energy hierarchy:
The energy hierarchy is an ordering of works installed to improve a home's energy efficiency. The first step is to address the fabric of the building, to keep heat in, the second is to upgrade any heating or hot water systems and the final step is to install any low and zero carbon technologies.

Energy Saving Trust (EST) Housing Energy Model (March 2010):
This model shows costs for installing energy efficiency works to homes. It contains information compiled from discussions with trade associations, manufacturers and installers and excludes any grants or 'hassle' costs.

English House Condition Survey:
The English House Condition Survey is a national survey of all housing in the UK carried out on a continuous basis. It provides physical and energy information about the condition and energy efficiency of homes gained from physical inspections carried out by surveyors.

Extended SAP data collection surveys:
For FutureFit we decided to use extended SAP surveys so that more detailed information could be captured. This included diagrams showing the location of the cylinder and boiler to decide whether insulation of the pipe work or replacement of the cylinder were appropriate measures, for example.

Fuel poverty:
A household is defined as being in fuel poverty if it needs to spend more than 10% of its annual income on fuel bills to maintain a satisfactory level of comfort in the home.

FutureFit cost model:
As part of the FutureFit project Baily Garner produced a cost model which allowed property information to be inputted to a cost spreadsheet. Calculations could then be made automatically showing the impact of adding or removing certain measures to a specific property in terms of: CO_2 saved, fuel bill saving and SAP point improvement. Go to www.affinitysutton.com/futurefit for an example of the model.

FutureFit works selector flowchart:
To aid surveyors and contractors in the refining of works packages, we created a works selector flowchart that could be taken on site. Used in conjunction with a prepared ticksheet showing what measures should be appropriate for the properties (created using the information from example property surveys), this tool takes the user through each of the measures that can be applied. It follows the energy hierarchy approach alongside trying to achieve the greatest SAP point improvement. Further information is available at www.affinitysutton.com/futurefit.

Golden Rule:
Part of the Green Deal concept is the 'Golden Rule' that the savings made due to the works must be greater than the surcharge on the bill. The overall rule is that the resident still saves money on their energy bills.

Green Deal:
The Green Deal is the government's flagship energy efficiency policy due to come into effect in October 2012. It is essentially a funding mechanism that will allow people to access a loan to install energy upgrade works to their homes. This loan is then repaid over a period of years through a surcharge on the home's energy bill, with the idea that the upgrade works will reduce the bills enough that the resident will still save money.

Greening the Grid:
The UK has a series of targets to reduce the carbon emissions associated with its generation of energy, and as such assumptions are made that over time the energy supplying the National Grid will come more and more from renewable sources.

Knowledge hub:
An online file sharing area was set up for FutureFit partners where all relevant documents and information about the project were stored. The knowledge hub also held an interactive forum where partners could post views on different issues.

Reduced Data Standard Assessment Procedure (RdSAP):
RdSAP is the UK government's official procedure for assessing the energy efficiency of existing homes.

SAP 2005:
The Standard Assessment Procedure (SAP) is the UK government's official procedure for assessing the energy efficiency of new buildings and is used to demonstrate compliance with building regulations. This version of the tool was the most up-to-date at the start of the project.

FUTUREFIT PARTNERS

Affinity Sutton Group Limited

Level 6, 6 More London Place
Tooley Street, London SE1 2DA

Telephone: 0300 100 0303
Email: future.fit@affinitysutton.com

www.affinitysutton.com/futurefit

Printed on paper from sustainable sources.