

The Green Deal: will it deliver?

21st December 2010

Background

Following on from the AECB's recent key role in strategically and technically supporting the TSB's Retrofit for the Future competition (and the building of the TSB/AECB Low Energy Buildings Database – see www.retrofitforthefuture.org) the AECB has recently visited officials at DECC (Department for Energy and Climate Change). AECB CEO Andy Simmonds gave a presentation illustrating the potential cost effectiveness (and affordability to UK 'plc') of extensive energy efficiency measures applied on a national scale.

The presentation covered aspects of building and services energy efficiency, and importantly the implications of the 'design reality gap' in design and construction – issues that the AECB has been exploring for many years. The arguments in the forthcoming AECB paper 'Less is More – energy after oil' were summarised to DECC in order to further inform the debate around the optimum balance between demand reduction and future energy supply, in a sustainable and affordable national context.

AECB is also a member of the low carbon refurbishment coalition, the Existing Homes Alliance (www.existinghomesalliance.org): Mark Elton of ECD Architects is the AECB's representative.

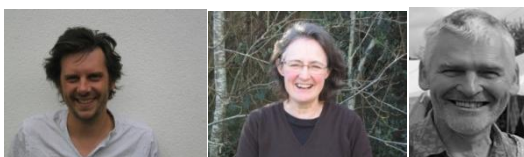
The AECB is concerned to see that the Green Deal genuinely delivers improved comfort *and* reduced GHG emissions - as well as being affordable and socially equitable. AECB has asked AECB member and refurbishment pioneer, Russell Smith of Parity Projects, to give us his view of how the Green Deal is shaping up, informed by his recent active engagement with DECC.

Andy Simmonds, AECB Web Editor Kate de Selincourt and AECB member Peter Warm put a series of questions to Russell, which he has answered for us on the following pages.

For links to other Green Deal information and for AECB members to add questions or comments, please visit the AECB forum www.aecb.net/forum/index.php/board,70.0.html ('Green Deal' thread on the refurbishment board, in the Technical Forums area).



Russell Smith – Parity Projects



Andy Simmonds (left) - CEO AECB
Kate de Selincourt (centre) - Web Editor AECB
Peter Warm (right) – AECB member and CarbonLite trainer

The Green Deal: Q&A with Russell Smith

Q: What and who is Parity Projects and what is its experience to date with low energy refurbishment?

Parity Projects is a company dedicated to making greener homes a reality for everyone. Every property is unique in its location, size, the materials it's made from, the weather it's exposed to and most importantly, the people who live there. Parity works hard to make the measures it recommends appropriate for each case. We are independent advisers and project managers to private homeowners, local authorities and housing associations.

This approach was piloted with the Carshalton Grove Eco-Renovation Demonstration Project, which achieved a +70% reduction in CO₂ emissions and a 60% reduction in water consumption. It won several awards including Building magazine's 2007 Award for sustainable refurbishment and the 2008 Observer Ethical Award.

Since then we have gone on to build our own software for assessing the most appropriate combinations of measures for individual houses and for large stocks of houses. We have carried out assessments of over 500 individual houses, strategic assessments for 300,000, and managed projects to £5m in value. We are also experts at building monitoring most recently gaining contracts to install monitoring to 18 TSB Retrofit for the Future projects and preferred bidder for around 200 houses next year.

Q: What do you think of the general level of debate around issues relating to low energy refurbishment within the mainstream industry?

As usual in industry, the debate is much polarised. There are existing mainstream practitioners of 'energy efficiency' in buildings, which has traditionally been pretty light touch but high volume. Then there are the 'radical refurbishers' who are keen for deep interventions which require high spend. There are few making sensible proposals in the middle ground. This polarisation leaves those making decisions around the green deal in quite a difficult position when trying to find the most cost effective and efficient mechanisms for change.

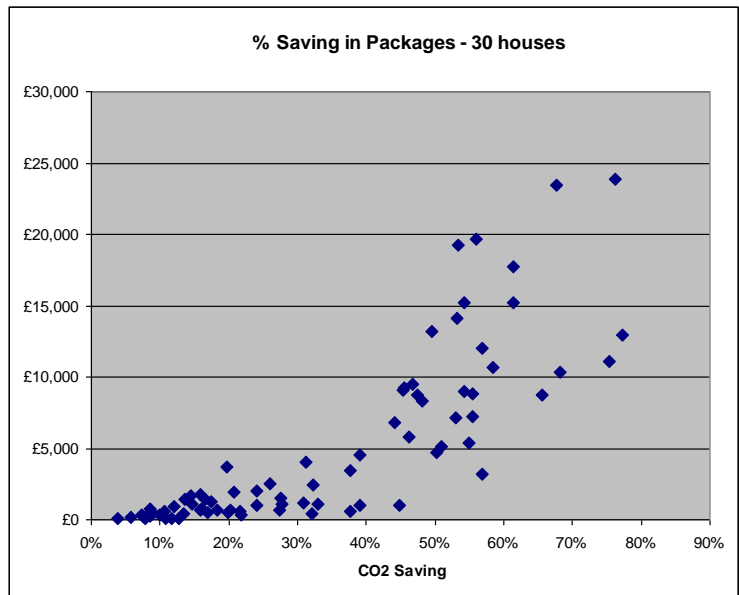
The ideal scenario for the UK is for our 24.8m homes to be refurbished with deep interventions at high volumes. We cannot afford this, it will take too long to achieve. Moreover as 68% of these homes are owner-occupied, the industry has to deal with 16.9m individual clients, so logistically we just have to get it right first time.

The debate on the ideal depth of intervention has been very basic i.e. "do we go for 90% or 50% emissions cuts". We need a more mature debate in order to set appropriate standards for building upgrade. Without appropriate standards the industry can set its own criteria on each project and the collective drive towards low CO₂ housing stock will be disjointed and untracked.

Our view is we need a flexible standard as every home is unique, and every household in every home is unique. We have analysed packages of interventions for over 500 homes in detail. Figure 1 is a presentation of three intervention packages of increasing depth for each of 30 houses – in other words, 90 possible interventions in all. As we apply more depth we see an exponential rise in cost per tonne saved as we head towards 80% CO₂ savings and beyond.

Figure 1:
Capital costs of refurbishment plotted against predicted CO2 savings for 30 different houses, for each of three intervention 'levels'

These are of course calculations, and there is real-world evidence for confounding factors at the 'shallow end' too. It appears that if you aim too low, you fail to realise significant savings in CO2 and in bills, as the better fabric performance is 'mopped up' in delivering improved comfort with the same fuel use. Comfort is necessary of course, and must be delivered by the first fabric improvements, before you can go 'deeper' and make the true fuel savings that will cut both bills and emissions.



Back at the 'deep end', we need to look at the whole energy picture, and add in our ability to decarbonise the grid and improve householder lifestyles as factors in the calculations, before driving forward with very expensive interventions. We need to remember, there simply is no government money – one way or another we will be paying for our own houses to be decarbonised and probably paying for those who cannot afford to do so too.

We would add as a rider that while it is invaluable to offer householders a home audit which takes account of their lifestyle, to help them select the right interventions for them, we have to bear in mind that householders may move on and new occupants might use the house very differently, benefiting either more or less from the same measures.

Q: How has Parity projects formed a view on the Department for Energy and Climate Change’s (DECC) plans for a Green New Deal?

Like others in the industry we are contributing to the debate and consulting on various elements of the Green Deal, directly and indirectly with DECC. We have also been working with B&Q in their role as client on a trial for the Green Deal (called Pay as You Save) in Sutton, Surrey. We have been representing householders in a process in which we analyse the measures that B&Q are offering, and others besides for comparison, and presenting them in such a way that the homeowner can judge for themselves the costs and benefits associated with each, how the loan repayments compare to the predicted energy savings and whether it is worth going ahead.

Q: What do you think of the general level of debate around issues relating to low energy refurbishment within DECC?

It's not really my position to comment but the good news is that they are sensible people who are willing to listen to sensible proposals. There have been a number of working parties and workshops to shape thinking at DECC. Rather unusually there have been discussions on micro-generation delivery that are separate from discussion on demand reduction, but one hopes that they are being joined up.

It is well documented in the press that there is to be an independent audit for each participating home and our view is that this is absolutely necessary, as every home is unique. (see graphic in Appendix 1)

The focus at this stage is on the delivery process, which is absolutely essential, but before all ideas are fully formed, some clear signposts to standards or performance at each stage of a process would help to direct any pre-Green Deal initiatives in forming their business model.

Q: Have you got the impression that there is a coherent, integrated refurbishment strategy forming, that complements national energy strategy?

We know that all roads lead from the Low Carbon Transition Plan (July 2009) and 'Warmer Homes Greener Homes' (Feb 2010) which set out UK and EU savings targets, but there is little detail in these publications, and less to go on in the recent announcements.

There needs to be an understanding that the Green Deal is a tactic – not a strategy in itself. It is not particularly clear how combinations of measures fit together on a national scale. For instance, how does this initiative that is so focussed on household interventions fit with community heating systems where spare heat is available on a large scale? Can we be sure that we will be successfully decarbonising the national grid before committing to the use of heat pumps? Will we focus on insulation before heat pumps, so that we only need a heat pump that is half the size?

Q: “Without breaking any confidences, do you have a feel for how the green deal might look in greater detail?”

a) *Do they have a clear savings target as other countries eg Germany, per house, per street, per region, UK?*

DECC works alongside the Climate Change Committee (CCC) to make projected CO₂ savings against periodic 'Carbon Budgets'. The Carbon Budgets are set by the CCC in a context of ambitious assumptions about the capability of industry and society to make savings. It would be fair to say that firm targets are some way off for savings in dwellings especially in a regional context. All we have to go on for now is an 80% savings target by 2050, which our clients are telling us is too remote and general to help with decision-making now.

b) *Do they intend to adopt a whole house approach?*

It is clear that all Government departments know that to get to the 80% reduction all possible options to reduce CO₂ will have to be deployed in all houses, including demand reduction measures as well as alternative sources of fuel. I don't think however it has sunk in that 'whole house approach' does not necessarily mean 'empty the house, gut it, renovate, re-house'. Low-energy refurbishment can be carried out over a number of years very successfully on more steady budgets, provided that a 'whole house plan' is in place. There is a very big difference on the thinking between these two approaches (the whole house: all-at-once, versus the whole house: plan-the whole and-seize-your-moments-as-they-arise). Most importantly we believe there is a very different cost of implementation to the UK -- which we calculate after re-analysis of our own projects, to be in the region of to be 30% or so for the same ultimate outcomes.

We have some concern that a similar approach may be taken to the Government's CERT¹ and CESP² schemes. Whilst CERT and previous schemes appear to have achieved more CO₂ savings than any other, they are based upon a matrix of assumed savings based on an

¹ *Carbon Emissions Reduction Target – the OFGEM regulated scheme where energy companies with more than 50,000 customers have CO₂ savings targets imposed on them, with the cost of that coming out of profits.*

² *Community Energy Saving Programme - this requires gas and electricity suppliers and electricity generators to deliver energy saving measures to domestic consumers in specific low income areas of Great Britain.*

individual, measures-based approach. Simply adding the assumed savings together can give a customer a very optimistic and inaccurate prediction of their savings.

As the green deal is to essentially be a financial product with expected returns in terms of savings, this approach would lead to the customer getting inappropriate advice. The net effect of combined measures can be radically different from the sum of their individual effects. A good example is where a property has a 65% efficient boiler. Any fabric measures based on the baseline property could show potential paybacks roughly 40% **shorter** than they would be if the boiler was upgraded – which should be one of the first things to take place.

The CERT Matrix can be viewed at:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?file=Carbon%20Emissions%20Reduction%20Target%20Carbon%20Reduction%20Matrix.xls&refer=Sustainability/Environment/EnergyEff/InfProjMngrs>

On the other hand, some measures are synergistic, certainly in terms of capital costs, and doing them at the same time can offer significant cost savings. For instance, underfloor insulation is 5 times cheaper to install if you are in the process of replacing your flooring; the marginal costs of applying external wall insulation drops significantly if done at the same time as re-roofing, and results in a much more technically correct result; an electrician re-wiring a house would do it significantly quicker if he were on site at the same time as an internal wall insulator. Combinations of measures often offer logistical/inconvenience saving as well as a CO₂ saving, and any modelling should reflect this.

c) *Do they intend to monitor actual performance at all?*

This has not been specifically mentioned for either a test of the first batch of houses or longer term sample. A lot of emphasis is being placed on the installation of Smart Meters in all UK homes by 2020 but I believe improved thinking needs to be put into this, as energy companies will get data from these meters, not necessarily Government.

Some monitoring, in whatever form, is extremely important as the Green Deal could be seen as a 3-way contract between the homeowner, the financial and the contractor(s). If the contractors' quality of workmanship is low, it is possible the energy savings will not be realised by the household, making the 'loan' difficult to pay for. This can be addressed by accreditation and sample monitoring. The householders' role in the contract is critical; if their lifestyle slackens and temperatures go up, they may claim that the measures have not done what they are supposed to do when they get their bills through, but more critically may now also not be able to make 'loan' repayments. This could be countered by Smart Meters that can collect and record internal temperatures -- surely only a minimal additional cost. This, combined with some 'energy coaching' for householders should ensure they hold up their end of the bargain.

d) *Is there a view on the integration with other schemes, e.g. appliance efficiency schemes, fuel poverty schemes, or FITS and PVs on the roof (before or after roof is insulated) ?*

There is a desire in DECC to ensure that the best solutions are made available to any given client. Their property and their personal circumstances will determine the most appropriate measures for the scheme to install and where the funding comes from. There is likely to be a reliance on an independent advisor who can identify not only the most appropriate measures for the household but can broker the best financial deal for the client. That might be a combination of finance options. Based on the extensive analyses we have done at Parity Projects, we do not believe the Green Deal can work very effectively from a financial point of view without the use of FIT, so we hope it is retained.

- e) *Does DECC intend to rely on fuel changes, e.g. burning biomass as part of the scheme? Is there a view on the use of heat pumps in gas grid areas?*

We have to remember that there are multiple drivers here, and fuel security is one of those. Combinations of fuel supply are appropriate but there appears to be a big drive towards heat pumps. There is an assumption that the grid will be heavily decarbonised, thereby justifying the use of heat pumps. It would be a worry if there was overconfidence on that front, and also a shame if heat pumps were heavily pushed before the use of demand reduction measures, and we ended up with a nation of oversized heating plant supply.

In virtually every house on the national gas grid in which we have analysed the likely impact of installing of heat pumps, or monitored actual performance, we have demonstrated a rise in annual fuel bills and a slight saving on CO₂. With a decarbonised grid the CO₂ figures can be more encouraging, but there is only one way that fuel bills are going – upwards. It appears that at this time the Green Deal is to be focused on individual dwellings and not an overarching view of local fuel. Local heat supply or electrical generation may have been mapped, but this thinking has not trickled into the thinking for the Green Deal.

Q: Do you have other concerns, for example around the overall levels of investment, how to judge 'cost effectiveness', how to protect consumers and ensure measures deliver savings, DECC's approach to the Reduction Factor and affordable warmth (ie not realising significant reductions from measures due to higher internal temperatures?)

At Parity Projects we represent the householders' perspective in pulling in the best and most appropriate finance and techniques available. We have developed our analytical processes to do this very quickly, and can right now accurately calculate the level of money saving which would seem essential to putting a sensible deal in place i.e. that the savings will be made and the homeowner can actually afford the repayments. Basing such a deal on the existing SAP or RdSAP tool would in our view cause problems. Both of these tools are benchmarking tools, assuming a standard family with a standard weather regime. They do not account for the variations of family lifestyle and the location of the house in the UK.

We have seen some comparison data between RdSAP and SAP software which shows that for 10% of houses the two packages give results that are 37% different from each other. If this was a house mortgage, having 10% of consumers out of pocket by 37% on their repayments would be an unthinkable travesty; front page headlines. We would also like to point out that this type of discrepancy occurs even before accounting for any variations due to individual customer's behaviour, which SAP does not address at all, so the gap between modelling and reality could be very big.

Our next concern is over the speed of learning and implementation leading to the green deal mechanisms. There is a danger that we do not learn the lessons that have already been provided by work elsewhere in the EU. There are things we know we don't know – but plenty more that 'we don't know we don't know'.

We would wish to see the householder placed at the heart of the Green Deal, not the house. As said, we are very keen for DECC and DCLG to set standards for the service provision as soon as they can. We have already seen the term 'Home Energy Advisor' exploited by training companies simply because that term was used in a Government report in February. Some retailers are also making noises about starting their own green deal very early. Unless there is clear consumer focus, we fear the exploitation of householders without standards of performance.

We are also concerned about how SMEs fit into the process, whether they are designers, architects or contractors. General contractors that we work with are finding that they are already

conversant with 95% of what will be needed in a low energy refurbishment of the future. The extra 5% needed is not skills but simple awareness. They can already do the work.

From the householders' and lenders' perspective, competition is very healthy and we look forward to the most able and most innovative suppliers being able to win work through the Green Deal on their own merits – and this must include SMEs. If SMEs are not allowed to flourish, the UK will miss vital opportunities to meet energy targets and encourage social entrepreneurship in this area. There is a danger that large organisations squeeze the coal-face for their own ends. Many homeowners also want local trusted faces in their homes, doing a good job.

Appendix 1
Baseline Analysis of 40 Houses in the London Borough of Sutton

Each pie chart represents the total annual energy consumption of one house in the borough. The sizes of the pies represent the annual consumption; the proportions of pies show the allocations. See the key at the bottom.

