



Powering Down Together Community Green Deal Case Study Summary

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Community Green Deal was a home retrofit project run by Carbon Co-op working in partnership with design consultancy URBED. This report on Community Green Deal shows that:

- Whole-house fabric retrofit plus installation of renewables can cut energy use by around 50%, carbon emissions by around 60% and achieve energy bill savings of between £800 and £1,100 per year.
- This can all be achieved at an affordable level of capital spending.
- Given the right support, owner occupiers are willing to largely self-fund this level of retrofit, and would recommend it to others.
- With careful design and installation of measures, whole house retrofit can improve comfort and living conditions while reducing carbon emissions and energy bills – a win-win outcome.

About the project

Carbon Co-op is a community benefit society, based in Manchester, established to assist its members in making large scale reductions in their domestic energy consumption. URBED is a sustainable building and neighbourhood design consultancy, run as a worker co-operative.

Community Green Deal began in 2013, and was completed in 2015. The project was part of a larger programme under the umbrella of AGMA (Association of Greater Manchester Authorities), which received funding from DECC (Department of Energy and Climate Change) for the 'ECO Go Early' programme to pilot approaches to home energy retrofit, in advance of the Green Deal and ECO (Energy Company Obligation)¹ programmes.

With Community Green Deal, Carbon Co-op and URBED set out to explore whether, by offering 0% loan finance alongside mutual support and expert technical input, owner-occupiers could successfully self-finance a more ambitious level of energy retrofit than is typical of government programmes.

Achievements

The project demonstrated that by retrofitting the fabric of homes and installing low-carbon generation, in many cases with the occupants in-situ throughout, cuts of 40-60% or more can be made in domestic energy consumption and emissions.

Gas use was very nearly halved, and for the majority of participants, PV panels generate approximately as much electricity as the household uses. The project came very close to achieving the ambitious target of cutting emissions to $17\text{kgCO}_2/\text{m}^2.\text{a}$ – representing the ~80% emissions cut from 1990 levels needed to reach the nation's 2050 emissions targets.²



¹ ECO is grant funding made available from energy companies to top up the costs of domestic retrofit, and in its early stages there was a focus on solid wall insulation

² The Climate Change Act established a target for the UK to reduce its emissions by at least 80% from 1990 levels by 2050



‘Hard to treat’ homes

Of the 12 retrofits completed under this programme, nine were consolidated into a single contract, with Carbon Co-op as the client, managing the project on behalf of householder members. In the joint contract, householders spent between £20,000 and £60,000 each (average around £40,000) on the retrofit, PV panels and associated fees, depending on the size of the house and the number of basic energy efficiency measures already in place.

Most of the houses in the project were older, traditionally-built properties with solid walls, so had not been able to take advantage of previous subsidised cavity wall insulation programmes. By looking at the whole dwelling and developing an integrated specification, the designers took care to ensure measures were not working against each other, or introducing problems elsewhere in the building. For example, purpose-provided ventilation was specified for all dwellings that did not already have it, to ensure that even after airtightness improvements, there would be a good supply of fresh air.

Varying combinations of around 15-20 measures were specified depending on the individual requirements of each house and the priorities of the householders: the following were widely installed:

- External wall insulation as appropriate; mostly woodfibre (for vapour permeability and all round sustainability)
- Internal wall insulation (as appropriate, often on front elevation), also vapour open
- Triple-glazed timber replacement windows
- New insulated doors
- Humidity controlled passive stack ventilation systems
- Loft insulation top up
- Floor insulation
- Air tightness works
- High-efficiency solar photovoltaic panels
- Low flow hot water fittings

New efficient boilers were installed in the three homes that did not already have them.

Project impact

The project succeeded in its main aims. There was an average of 47% reduction in gas use and for the majority of the houses, the PV panels generate approximately as much electricity as the household uses. Before retrofit, households had energy bills ranging from around £500 to £2,000 a year. After retrofit, these fell decisively, with households saving from £200 (off an already small bill) up to £650 per year. Adding in the income from the Feed-in Tariff from solar generation, savings effectively rose to between £800 and £1,100 per year for these homes.

Many of the householders reported an improvement in comfort and indoor conditions post retrofit, including:

- Homes are warmer, including first thing in the morning.
- They feel less damp and the air feels fresher.
- Homes are less draughty.
- Homes are cooler in summer when it's hot



Householder priorities

- Householders planning to retrofit their homes are looking for
- Accessible and affordable finance
- Competent trusted contractors
- Technical information and design advice for example on selection and sequencing of measures

The 0% finance offer in the Community Green Deal was particularly successful in drawing people to participate. Householders were as keen to improve the comfort of their homes as they were to reduce energy bills, and were prepared to invest in comfort and a healthy living environment even if this entailed a net outlay for a number of years into the future.

Householders were also drawn to the project because of the level of technical expertise and contract management offered. Each household benefited from individual calculations and specifications for each home, offering:

- More realistic energy saving predictions than typical under rdSAP
- Retrofit strategies that guarded against thermal bridging, moisture problems and loss of traditional character of older homes.

On-site training for site crews and regular site visits by the design team supported a high quality of installation – and job satisfaction for the tradespeople.

The distinctive features described above are believed to have contributed to the overall success of the project. The project team also recommends a number of additions or modifications to future project design.

Contractual arrangements

Although amalgamating nine of the retrofits into a single contract gave the project access to price discounts of 25 to 50%, there were a number of hidden costs:

- The decision to run one large contract constrained the choice of contractors, ruling out some smaller firms that might have had more relevant experience.
- Central administration of the contract left Carbon Co-op as the conduit for all communication between contractor and householders - which slowed communications, imposed a very large workload on the co-operative, and frustrated all concerned.
- Running the builds as one project caused delays mid-build for some individual households.

In line with what most householders say they would prefer, Carbon Co-op recommends most owner-occupier retrofits be run as individual contracts – though some householders would still like a full third-party management service for this.

A majority of participants also said they would prefer to have been able to move out during the most disruptive parts of the work (and some indeed did so) but only a minority would recommend being absent for the entire duration.

Experience of ECO

ECO funding (funding that the government obliged energy companies to make available for home energy efficiency) imposed a disproportionate burden on the project in a number of ways:

- The application process was complex and time consuming.
- Poor administration of the ECO scheme and associated training programmes led to false starts and delays.
- The funding came with highly restrictive criteria, limiting both the choice of contractor, and of materials that could be used in the project.

In retrospect, Carbon Co-op and URBED believe the project would have run better without the ECO funding element, including in financial terms, and take the view that ECO funding is 'not fit for purpose'.



Lessons for future retrofits

All construction projects involve an element of uncertainty, and some mess is also inevitable. However, whole house retrofit would probably be easier for participants in future programmes (particularly vulnerable householders eg elderly, disabled or on low incomes) if the following were put in place:

- Better advance information about what is going to happen when, and what will be involved, enabling householders to prepare better.
- Offer of physical help with preparation (eg clearing lofts, moving heavy or built-in furniture)
- A daytime ‘refuge’ or in some instances, alternative accommodation, for the most disruptive parts of the build: the majority of householders said they would have preferred to have been able to move out for at least a short period during the build.

Carbon Co-op is now offering householders training and ‘buddying’ opportunities, and chances to network with contractors. This support has contributed to up to 50 more retrofits being independently procured by members. The co-operative feels it is now building up a network of trusted contractors, another aim of the project.

Conclusions

A workable strategy to deliver deep cuts in household energy use and carbon emissions is urgently needed. In November 2016, the UK ratified its commitment to the Paris Agreement on Climate Change. Retrofitting the UK’s homes to reduce home energy demand will be an essential part of our progress towards meeting this commitment.

Every £1 invested in energy efficiency³ is estimated to return £3.20 to the economy. Cold homes lead to or exacerbate a range of health problems, including cardiovascular and respiratory problems. Whole house retrofit like those in Community Green Deal should enable people to keep warmer and healthier while saving money on bills.

But despite all these arguments in favour of home retrofit, and especially whole house retrofit, progress is still drastically short of what is needed.

Community Green Deal indicated that the UK construction workforce is readily able to develop and deploy the specialist skills required to carry out this type of high-performance retrofit. However, the funding and administration of current government support for retrofit stands in the way of scaling this kind of intervention.

A rethink is needed of support for retrofit, for both the able-to-pay and more vulnerable occupants, in order to make this kind of retrofit feasible at scale. The obstacles are political and administrative, not technical, nor necessarily financial. If support were to be redesigned it would be a great deal easier to cut domestic energy use – and without widespread domestic retrofit at this level, the UK’s wider decarbonisation goals will remain out of reach.

Community Green Deal offers a scalable model for achieving cuts in household emissions and energy use compatible with our 2050 climate goals. Elsewhere in the world funding models similar to that used in Community Green Deal have been used with success. They are viewed as an infrastructure investment, and deliver net benefits to the national economies, as well as cutting emissions. Community Green Deal shows the model could be a great success in the UK, too.

To read the full report visit www.carbon.coop/content/whole-house-retrofit-community-green-deal

³ Building the Future: The economic and fiscal impacts of making homes energy efficient. Verco & Cambridge Econometrics, 2014

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