

Manchester, England: Carbon Coop

Summary of the project

Carbon Coop, a bottom-up initiative active in the Greater Manchester region, is recruiting a number of private households with the aim to achieve carbon reductions of up to 80% per property as well as reducing fuel bills and improving comfort. The process is in a preparatory phase at this moment. The “whole house retrofit” concept means very extensive renovation, covering fabric, systems and additional work. The loosely organised voluntary home owner cooperation works together with specialized non-profit URBED, providing planning and design expertise; and receives support from a number of large scale and national actors. An additional aim of the initiative is to demonstrate that by co-operating via a community energy intermediary, energy efficient retrofitting can be carried out more swiftly and effectively.

Involved owners had a determining throughout the whole process, with the formal organisation and funders only contributing in specific roles; accordingly, the project is clearly a bottom-up one. Debates among participating home owners took place about the wider sustainability of the materials used, e.g. the preference wood based insulation materials etc.

Home owner Coop members involved in the assessment and decisions about what work to carry out through were provided

- Detailed technical information on how household energy is used and what kind of energy efficient improvements can be made;
- An in depth report to pass to builders and contractors, outlining the measures the house needs to meet 80% reduction in energy consumption to reach 2050 energy efficiency standards;
- A cost benefit analysis of these measures outlining what will pay off and how much will it cost.

Actors

Carbon Coop itself is a cooperative composed of a home owner community of around 80 household level members; its activities are coordinated by a board of members, some of whom are involved in energy efficiency project preparation and delivery besides their role of cooperative management. The cooperative has been carrying out a variety of engagement and outreach activities throughout Greater Manchester over the past 5 years, including workshops, events, stalls, energy assessment projects and open energy monitor workshops. Throughout this time the Co-op built a constituency of engaged and active members ready to participate in whole house retrofit activities.

Home owners are attracted through public events and the website to join the coop as members and then have access to the assessment and financial incentives. Members are entitled to the following:

- 25% discount on a household energy survey
- Exclusive household retrofit fact sheets, guides and case studies
- Ability to share idea, experience and best practice via the online Carbon Co-op members' forum
- Online 'ask the expert' sessions covering different aspects of retrofit and household energy
- Ability to purchase works and materials at discount via Carbon Co-op procurement channels
- Access to exclusive offers such as free energy monitors, training sessions and events
- Access to low cost finance packages to fund works.

URBED (Urbanism, Environment and Design) is an employee-owned cooperative company with 11 salaried staff and associates: planners, architects, and economist, and a sustainability expert. The conceptual ground work for the programme was developed in URBED's 'Community Green Deal' report.

Organisation

Carbon Co-op tendered for a local contractor with the assistance of Procure Plus, a social housing consortium. The use of such an intermediary, although presenting an additional cost, enabled Carbon Co-op to take advantage of their well-established procurement systems. They also acted as conduit to a range of contractors very familiar with energy efficiency measures through social housing improvement schemes. Procurement of a local contractor was important for a number of reasons. Firstly; it was important to the householders and wider members of Carbon Co-op to support the local supply chain. Secondly, there are practical reasons (such as minimising travel to site), as well as knowledge of the local housing stock. The two stage tender process produced two potential contractors, one of which was selected for project implementation.

Carbon Coop has a detailed business model and financing scheme for members to manage their participation in the retrofitting project:

Step 1: Becoming a member - £35/year, with access to free advice and forums as well as special offers and programmes.

Step 2: Assess the home's performance, create an action plan: Carbon Coop carries out whole house assessments, profiling the home's current energy performance and creating an action plan of costed measures to enable home owners to reach the 2050 targets. *[Flat - £275+VAT; House (3 beds or less) - £375+VAT; House (4-6 beds) - £500+VAT; Bigger by quote]*

Step 3: Carry out retrofit works:

i) Carbon Co-op retrofit service: Working with architectural technical partners URBED, Carbon Coop offers a full whole house retrofit service, implementing the action plan from the assessment. Elements of the service include design, procurement of works from contractors and project management. Members can join a waiting list for this service, when a critical number of homes are signed up Carbon Co-op will take forward a programme - this enables them to gain cost savings from working with a group of householders together.

Costs include an up front development fee.

ii) Carbon Co-op technical consultancy services. Owners may choose to take forward the whole house retrofit action plan with a designer or architectural practice of their choosing. In this instance Carbon Co-op are able to offer access to technical support and advice through URBED, their architectural consultancy services.

Options include use of energy modelling services and access to technical detail advice. The service is priced at £500+VAT/day.

iii) DIY approach: Owners may choose to take a DIY approach to retrofit. Carbon Co-op membership is a useful way to obtain advice and information to inform the work to be done via their forums and factsheets. Also, from time to time, they have bulk discounts and offers which members can take advantage of on items such as windows.

Implementation and financing

The procurement process for retrofitting activities is carried out by private social housing consortium company **Procure Plus**. The **Department for Energy and Climate Change's (DECC)** and **Greater Manchester Combined Authority** act as funders and stakeholders. The main source of funding was secured from the Department for Energy and Climate Change's (DECC) '**Go Early**' programme, launched in 2012, with Greater Manchester obtaining a share of funding with which to deliver a range of different projects. Project financing could be secured from a combination of owners' funding and grants/loans, giving Carbon Coop and URBED the opportunity to deliver a number of whole house retrofits, testing some of the key mechanisms around **Green Deal** and the **Energy Company Obligation (ECO)**, and delivering exemplars that could act as show homes across the area. DECC financing provides interest-free loans, which after repayment will be re-distributed as grants to households suffering fuel poverty. Repayment is managed on the level of individual households, and it level depends on the implemented retrofitting measures.

Bank financing was unnecessary as Carbon Coop received loan from social enterprise lending firm **Street UK**, a non-profit organisation specialising in the provision of a range of financial services for those who cannot access mainstream credit and banking services, including not only the provision of loans but also of business advice and support, enabling micro-enterprises and self-employed persons.

Regarding the physical implementation of highly energy efficient retrofitting, the two stage tender process produced two potential contractors, only one of which progressed to the second stage of tendering, who then sub-contracted certain elements of the project. The contractor provided both build and supply

guarantees. Guarantees differed depending on the technologies, from 6-25 years. The close involvement and free individual decision making of Coop members means that the exact technical content of the interventions vary greatly, although the ambitious aim to achieve an 80% energy use reduction will probably necessitate a number of similar (high end) retrofitting measures. Innovative/unusual technologies included wood fibre insulation, passive stack ventilation but the most innovative element of the project was the way they were deployed in combination.

Although it is too soon to comment on performance (with data from a full heating season needed), community energy organisations have an important role to play in creating a framework through which this can be monitored and feed into supply chain improvement. Carbon Co-op aims to do this firstly through its relationship with **Open Energy Monitors**, a project developing open-source energy monitoring tools. This provides householders with a tool to monitor their electricity and gas usage, as well as temperature and other environmental data (such as humidity). Secondly, formal research and evaluation will feed into programme development. Physical monitoring of the houses before, during and post-retrofit is being completed by **Salford University**.

Key challenges

Administrative constraints, inefficient management due to heavy bureaucracy

While ECO provided a crucial additional source of funding, it took several months for Carbon Coop to find a willing funder and negotiate terms. Although this was vital for many of the householders in order to proceed, the process and administrative burden was excessive. This is echoed across the industry with the Centre for Sustainable Energy's (2014) evaluation of the first year of ECO summarising that '*ECO's very precise eligibility criteria and onerous reporting requirements have increased delivery costs, slowed down activity and hindered customer take-up.*' The Government's 2013 Autumn Statement detailing changes to ECO arrived at a crucial time in programme delivery. The most relevant changes were to the CERO (Carbon Emission Reduction Obligation) strand; this saw rates plummet and dented the confidence of an already fragile solid wall insulation supply chain. In order to secure the rates already agreed, a tight deadline was imposed. The knock-on implications were significant with design work and contractor liaison condensed into a very short period of time. It also meant that climate sensitive works such as fixing insulation to external walls and applying render had to be done during winter months. Funding mechanisms like ECO are prohibitive for community energy organisations not only in an administrative sense of the time required to process paperwork and claims, but also in the complexity and level of liability that sits between funders. Clauses in contracts for non-compliance are commonplace and include financial penalties, or require that any shortfall in delivery is made up at a later date when rates may be significantly lower. Navigating policies such as ECO can be complex and technical expertise is required to ensure compliance. Many community energy organisations are not in a position to employ the services of such individuals. Furthermore, short term funding schemes are not conducive to planning longer term retrofit programmes, especially for community energy organisations. The Green Deal Home Improvement Fund (GDHIF) is a case in point, closing after less than 2 months due to 'overwhelming demand.' Although it is encouraging to see such demand for more complex improvements, this cycle of releasing and withdrawing funding from the market does very little to provide confidence and certainty for the supply chain. This lack of certainty is particularly damaging to smaller organisations and installers for whom cash flow is a very critical issue.

Reputational risk, technical expertise and performance gaps

Poor quality work and customer liaison from contractors, compounded by a lack of clearly defined roles and responsibilities poses a wider reputational risk to the community energy organisation. There is a clear need for technical experts to be resourced to support the supply chain in achieving high standards of retrofit so that any performance gap is minimised. Local authorities should establish this supply chain development as a priority and may be able to resource it through existing programmes such as Green Deal Communities.

Catering for the needs and wants of a diverse membership base

Another key question is how community energy organisations might develop a range of services that meets the needs and wants of its membership base. Householder demand will vary from a full retrofit service (design, procurement and project management) through to those wanting to go it alone. What is an acceptable level of risk and where do the liabilities sit? These are all questions to be addressed if we want to scale up this sort of retrofit.

Whole house retrofit as a tool to alleviate fuel poverty

Fuel poor households are typically only offered a basic range of energy efficiency improvements. Research by Guertler and Preston (2009) estimates that raising all properties in England to a SAP rating of 81 (equivalent to Energy Performance Certificate band B) would lift 83% of households out of fuel

poverty. However, this is not achievable by the application of piecemeal and basic measures such as loft insulation. This is often justified by arguing that fuel poor households are more likely to under-heat their homes, and so delivering more expensive interventions will not deliver in terms of simple cost savings/payback. Undoubtedly cost is a consideration, but we argue that this neglects the health and comfort aspects of energy efficiency, which arguably are just as important for those at risk, or in, fuel poverty.