Greater Manchester Community Energy Innovation Competition 2016: Outcomes and Lessons

Greater Manchester Community Energy

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Quantum

Contents

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What's in the Toolkit?

This toolkit is for community energy organisations interested in developing projects to benefit local people and the environment in an ever-changing context. It may be useful for supportive local authorities, local economic partnerships and district network operators. Community energy organisations are a key part of redesigning our national energy infrastructure and energy use to a low carbon distributed generation flexible network.

During 2016 Greater Manchester Low Carbon Hub used DECC (now BEIS) funding to raise awareness of community energy and to support community energy groups. Four projects were selected through an Innovation Competition to develop an innovative project, or to take a new approach to tackle a critical issue. Each was given a small grant to support their project and share their learning with other community energy groups. Groups worked with their own consultants and Quantum was appointed to help the groups coordinate their work, link to key stakeholders and to draw the findings of the projects together.

This toolkit covers:

- Project stories, lessons and useful information
- Top 10 innovation lessons
- What to look out for next in community energy – upcoming technologies and models
- Where to get further support

The four Innovation Competition winners were:

- **Bee Sustainable**: identifying mechanisms to sell the electricity generated by the proposed hydro scheme to multiple or distant customers through a "virtual private wire".
- **Biomass Energy Co-op**: to prove the technology and develop the business case for a biomass boiler fed from spent coffee grounds.
- **Carbon Co-op**: to develop a business plan for replicating or franchising the My Home Energy Planner whole house retrofit assessment service.
- **Oldham Community Power**: to assess the viable options for broadening the membership of OCP in a low income area.

These groups are just four out of a community energy sector in Greater Manchester and the North West which have installed at least one MW[1] of community owned renewable energy and retrofitted 30 homes. They are engaging local people on energy and developing new projects on district heat, LED lighting, PV, smart grids, electricity storage and energy saving.

The community energy sector in Greater Manchester and the North West has a role to play in delivering the future mix of distributed low carbon/renewable energy and heat and in managing energy demand. Collectively community energy groups are supportive of each other and positively share their skills, experiences, resources and ideas. As such, they are an important resource to help develop a low carbon future.

[1] Not including large on-shore wind schemes from Energy 4 All etc.

Carbon Co-op: Can Social Franchising work to scale up My Home Energy Planner?

Carbon Co-op brings its members together with housing specialists to save carbon and improve their homes, share knowledge and experiences, and reduce costs. Many community energy organisations install renewable generation, but Carbon Co-op start with energy efficiency, to reduce the amount of energy we need in the first place. Carbon Co-op has 6 staff.

Innovation Challenge: Can Carbon Co-op use Social Franchising to increase the use of the My Home Energy Planner service, assist its development, offer the service in other areas of the UK and prove its financial viability for Carbon Co-op and its Community Energy partner franchisees?

Developed by Carbon Co-op in 2012, **My Home Energy Planner** (MHEP) is a home energy assessment and retrofit decision making service. The open source tool it uses provides a benchmarked assessment of a home's energy performance using at its core the full SAP 2012 housing energy model.

You can test a 'vanilla' version of the tool here.

...and the open source code repository is here to implement and download.

People-focused: The service is delivered by a Carbon Co-op trained energy assessor who takes into consideration the household lifestyle, future plans, budget and aspirations in drawing up recommendations in a detailed, personalised report. This includes a cost-benefit analysis on home retrofit improvements grouped into packages:

- DIY, free and low cost retrofit measures
- Mid-range e.g. £3k - £8k investment
- Deep green retrofit to '2050 carbon targets' which could cost on average between £30,000 and £60,000 (including external wall insulation, triple glazing, under-floor insulation etc.)

Carbon Co-op also runs an event series of specialist seminars and workshops including DIY Retrofit for Homeowners, Finance for Retrofit, Eco-homes visits etc. to enable householders to procure and implement the improvements recommends in the reports.

In short, MHEP is aimed at **motivated early adopters** who are largely 'able-to-pay' to install retrofit measures to save carbon, be warmer and cosier, and to save on energy bills over the long term.

Since 2012, 90 MHEP assessments have been delivered; costing £300 (flat) - £600 (large house) and delivering an income for Carbon Co-op over that period of over £40,000.

Carbon Co-op partnered with three organisations to better understand how social franchising of MHEP could work in practice. It needed to understand the market for the assessment in different

areas, and the costs involved for the franchiser (Carbon Co-op) and the franchisees. For the market, key questions were: what key messages should be used to attract potential customer householders, how much will they pay and which are the most effective marketing channels to reach them? The costs and processes that were investigated are shown below:

Franchiser Costs (Carbon Co-op)	**Franchisee Costs**	**Management processes**
Supply of marketing collateral Administration & management of franchise network Delivering start up training to franchisees' assessors Quality Assurance of assessments Ongoing development of MHEP tool and service	Set up payment to become a franchisee of MHEP Payment to Assessor (employee/contractor) Annual % of turnover from assessment income to Carbon Co-op Marketing & Administration Assessor travel	Choice of franchise partner Training Assessors Quality Assurance Marketing Franchise areas Facilitating franchisee network

During this step of the innovation project Carbon Co-op has:

- Engaged architectural and retrofit specialists URBED to develop a Quality Assurance process
- Worked with URBED to develop, trial and cost the training and support of assessors
- Trained assessors at Salford-based Broughton Trust to deliver simplified assessments (free) to householders on low incomes, to identify low cost/DIY measures that can be delivered by householders or handy-people services such as Helping Hands, Care and Repair
- Supported Milton Keynes-based charity National Energy Foundation (NEF) to test different marketing messages, channels and price points, and build a waiting list for MHEP assessments.
- Delivered training to Cumbria Action for Sustainability (CAfS) to become MHEP Assessors and to align this with Big Lottery funded flood-risk assessments they will be delivering.
- Developed a plan for resourcing expansion, including securing REACH funding for business development and plans to raise £60k in share capital.
- Considered ancillary services vital to ongoing marketing and roll-out. These include identifying ways for householders to finance the measures recommended and supporting the local supply chain to deliver reliable, high quality retrofit. These elements are not currently part of the franchise offer, but are important enablers, and well-established groups may have links to specific funding in their area, and to reliable suppliers.

Carbon Co-op has learned that:

- Shared values are fundamental to selecting Community Energy social franchising partners
- It needs to be ready to adapt its model for different market areas and end customers.
- The best assessors are likely not to be 'traditional' energy assessors – and it has built up a person specification for assessor recruitment, including strong people skills, retrofit contractor experience and/or academic experience.
- QA and performance monitoring will need to form part of the franchise contract.
- It needs to seek well-established franchise partners with some staff capacity and think carefully about who is on which 'patch'. It has already developed a Survey Tool for potential franchisees to use.
- It will need to manage the expectations of franchisees and plan for managed expansion.

Will MHEP work for other Community Energy Organisations?

Many community energy organisations support activities on energy efficiency tackling fuel poverty in their own areas, using the revenue from energy generation to fund this. Is Carbon Co-op's innovation project one which groups can learn from or use?

Can we use MHEP social franchising to help tackle fuel poverty in our area?

Promoting simple measures locally might be a better way forward than the full MHEP assessment which is costly. Cumbria Action for Sustainability are providing free draught proofing and energy advice through grant funding. Low Carbon Lymm have done similar schemes with Global Action Plan support.

Visit Carbon Co-op to see progress on developing a simpler version with the Broughton Trust. GMCVO and other groups participating in the project workshop were interested in the scaled-down version and DIY retrofit training, which could be funded from grants or community funds, and used to provide wider benefit beyond shareholder Members.

We are still keen: how do we make it pay?

The model for MHEP is that the assessment and report retail at £300 - £600 and the franchisee would charge what they decided could make the business case viable. As well as a joining fee, they will also pay a % of their fees to Carbon Co-op. As explained above, Carbon Co-op will select franchise partners with shared values and sufficient capacity and market coverage to deliver MHEP effectively.

If your group operates in a good-sized area and is well-established, take the survey above to see if you have shared values and capacity to approach Carbon Co-op as a potential social franchisee.

Will our local authority support this?

That depends on your local authority. The local authorities contacted for this project were not keen to pay out for an 'able to pay' market. They were supportive of the concept, but are all hard-pressed to deliver on their core work of tackling fuel poverty. Some, such as Manchester City Council, offer Home Energy Loans which will usually be more expensive than adding costs to the mortgage, but which can be and often are, used for energy efficiency retrofit.

Can our community energy organisation join Carbon Co-op?

If you are based near Manchester, Carbon Co-op would be willing to work with your group to provide training events on DIY Retrofit for example. Attendees (or your organisation) would have to pay a fee to fund the course. Carbon Co-op may even be able to send a MHEP assessor out to conduct assessments on homes in your area for your Members at a fee. Your group could also promote Carbon Co-op events via its membership.

Achieving scale through replication

Why grow?

In whatever sector they operate, whatever their business, innovative organisations that develop successful new ideas tend to grow. After all, if something works in one area, why wouldn't it work somewhere else? 'Social Replication' is a broad term, but in general it relates to the replication of a socially or environmentally beneficial business activity. This can help to:

• **Generate new income streams**: carried out properly, replicating a successful business in another location will increase surpluses. Added exposure and brand awareness can increase income across the board and growing a customer base has the potential to achieve economies of scale.

• **Add new services**: as a business grows, the potential for additional ancillary or support services in the areas of marketing, logistics or supply chain, grows. In some cases, retail businesses can begin to vertically integrate, manufacturing their own goods and components.

• **Increase the social and environmental benefits**: in the case of social replication, those innovating are usually as much ethically as financially motivated. They may be looking to eradicate a social issue or an environmental problem. Replicating an idea or project begins to create a movement to tackle these issues. It generates a network of like-minded, supportive organisations and individuals addressing the same issue who can share ideas, knowledge and best practice.

• **Add credibility**: replicating a business helps make it more credible. Only 1 out of 10 new businesses succeed, but 9 out of 10 franchises do. Success means investor confidence is enhanced and businesses are better able to attract the finance they need to grow.

Whatever the motivations, it's important to prove the sustainability and viability of an idea first before replicating it. Seeking to make an unprofitable business profitable by scaling up will simple magnify its losses and ultimately prove futile.

Ways of growing. There are a number of strategies for replication. On a spectrum they range from dissemination at one end to setting up a new branch of the organisation at the other.

Dissemination: generally involves freely publishing information e.g. in the form of books, guides, case studies and videos. The originator has very little control over how ideas are implemented but there are very few barriers to spreading information.

Affiliation: the originator and replicating organisation are separate but have an established and ongoing relationship or financial agreement between them. This balances the originator's control against the freedom of the other organisation to implement in the way it sees fit. Includes social franchise, licensing etc.

Wholly-owned: in this model the originator directly delivers an idea or business in new locations, for example, through setting up a local or regional office or branch. The model offers most degree of control for the originator.

For more information and inspiration see the ICSF Replication Toolkit

Bee Sustainable: Bury Hydro Virtual Private Wire

Bee Sustainable Ltd (trading as Bury Community Hydro) has been developing a project to install a 60kW Archimedes screw turbine at Chamberhall Weir on the River Irwell in Bury, Lancashire. The site is near a business park with several potential customers for the electricity, including the Police Station, Fire Station and businesses. The Council-owned sports centre is further away (too far for a direct connection) but supplied on the same low voltage substation network.

In 2015 Bee Sustainable Ltd raised £40,000 through a Pioneer Share Offer and was awarded Urban Community Energy Fund support to carry out the development work. The project is well advanced and has all the necessary consents including Planning Permission, and is in the process of finalising the lease with Bury Council.

The initial project proposal was to sell around 60% of the electricity generated directly to a nearby organisation and export the remainder to the grid. However, the significant FITs rates reduction in 2016, meant the project is not viable as originally planned. A further challenge was damage caused to the weir by the 2015 floods which will add to the capital costs.

Finally, after working on the project for so long, capacity within Bury Hydro group is very low and suffering from "volunteer fatigue". There is a need to recruit more directors and volunteers to continue the project. Fortunately at the group's February 2017 Annual General Meeting, a new Director came forward to join the Board, but capacity remains low.

Innovation Challenge: Can Bury Hydro be made financially viable by: 1. reducing the capital costs and 2. maximising revenue from electricity sales by selling to more than one customer either using a virtual private wire agreement or on a private wire to multiple customers.

Capital Cost Reduction

The capital and development costs are now expected to total over £700,000. A new turbine supplier has offered a different design, based on a prefabricated steel channel for the screw which could reduce the capital cost by around £100,000. There is still some uncertainty around the costs Bury Hydro will have to cover for the weir repair and the EA gauging requirements.

Even with this capital saving, the project may only just pay pack within 20 years, so finding a customer who is prepared to buy the electricity at a viable rate is essential.

Maximising Revenue from Electricity Sales

Under the current FITs rates, the ability to sell the majority of the electricity generated to a single customer located close to the generating site is what makes most schemes viable. Bury Hydro doesn't have such a potential customer nearby, so has two options for generating income from their electricity:

- Virtual connection to one or more customers using the DNO[2] grid
- Direct connection to more than one local customer.

Virtual Connection (Virtual Private Wire)

Bury Hydro met Electricity North West (ENWL) to discuss the option of setting up a scheme to sell electricity to more remote customers using their wires. Connection into the grid at the nearest point would reduce the capital costs of grid connection and allow Bury Hydro the flexibility to sell to different customers in future. ENWL is in discussion with Ofgem about a derogation from the rules to allow them to reduce their charges for electricity that is generated and used on the same low voltage network.

Direct Connection (Private Wire)

To set up a direct connection to more than one customer, Bury Hydro will need to:

- Lay cable to the customers
- Set up a mechanism and metering system to allocate generation to customers and agree the charging methodology with them
- Offer an electricity price that is competitive with their existing tariff.

The land between the hydro site and potential customers is mainly soft landscaping, so the costs of laying the connection could be relatively low, although these haven't yet been quantified.

In earlier discussions, it appeared that Bury Hydro was unlikely to be able to offer a low enough price to compete with the current tariff of one of the nearest potential customers.

The innovation project concentrated on the virtual private wire option, so Bury Hydro will still need to assess whether the direct connection option is viable for other customers.

What they learned (See also box on Virtual Private Wires):

- The financial model is critical, and should be used to run different scenarios to understand the circumstances under which a scheme is or is not viable. In this project, many factors have been changing (including the capital costs and generation output), so the model has been re-run many times with different assumptions. For this scheme, the two essential outputs are the rate that needs to be charged for the electricity generated, and the percentage of it that can be sold to customers.
- While VPW is technically possible, there is a significant regulatory hurdle to overcome. Bury Hydro is not a registered supplier, so cannot sell electricity directly to customers except by a private wire connection. To make a VPW work, Bury Hydro would need an agreement with a registered energy supplier to set up the charging mechanism for the customers.
- Unless Ofgem agrees to their request, ENWL will not be able to offer any reduction in charges, as these are regulated under the Common Distribution Charging Methodology.
- It appears that at best any reduction in distribution charges would offer a 1p/kWh increase on the standard export rate, which for this scheme would result in a sale price of around 6p/kWh. The scheme is not viable at that sale price, so a VPW is not the solution for this project at this point, but could be an option in the future.

[2] District Network Operator (DNO) in this case, Electricity North West

What's next for Bury Hydro?

At their AGM Bury Hydro Members decided to persevere with the project to reach a final decision on viability. The team will need to:

- Look again at capital costs and likely output of the scheme to identify any more savings
- Check the impact of the recent business rates changes on the scheme finances
- Find out grid connection costs for a direct connection to customers on the business park
- Investigate potential grant funding to contribute to the capital costs
- Re-check the scheme viability to see what minimum electricity sale price is needed.

After this, if the minimum electricity sale price looks acceptable to potential customers, Bury Hydro will re-approach them. And if not, take the difficult decision on whether to proceed further.

Challenging Decisions for Community Energy Groups

Community Energy organisations have been working against a near-constant flow of changes in government policy that have adversely affected the viability of proposed (and sometimes implemented) projects. These have included:

- Drastic cuts in FITs rates in 2012 and 2015
- Removal of pre-accreditation for large scale schemes
- FCA changes in rules affecting co-operatives
- Removal of SEIS/EIS tax relief for investors
- Planning permission changes effectively killing on-shore wind turbine projects
- Business rates charging mechanism changes leading to substantial cost increases
- Damaging rhetoric around renewable energy policies affecting member/investor confidence.

For a scheme that has been in development for many months or years, these changes create situations where the decision may need to be taken not to continue with the project. This is a particularly difficult decision when members have invested considerable time, energy and emotional commitment in the project, as well as their own money. In order to take this decision, members must be prepared to consider:

- Whether the project has a realistic chance of being funded: either through community shares, crowdfunding, grants, social investment or loans.
- What conditions would make the project fundable (e.g. electricity prices double, capital costs reduce by 20%, grant support for 25% of costs, monetary value placed on carbon reduction)?
- Are those conditions likely to be met at some point in the future, if not at present?
- What did you set out to achieve? Installing a specific scheme or reducing carbon emissions or generating a community benefit fund? Is there a different project that would produce better results for the capital investment, while still meeting the objectives of the group (e.g. a different technology or site)?
- How would abandoning or postponing the scheme affect the current members: either as a financial loss, or a loss of commitment to the organisation or possible future schemes?

The emotional, ethical and financial investments by committed directors and members can make it difficult to focus on the business bottom line – the project has to be made financially viable to succeed. Without that, raising further share capital just won't be possible.

Virtual Private Wire Supply

Under current Ofgem regulations, a community energy company such as BCH it is not allowed to sell electricity to customers, unless those consumers are directly connected to the generating equipment by a privately-owned wire (a private wire network). A new concept has been developed to allow sales from local generators to consumers via the national grid: virtual private wire. This concept is in its infancy and only a few pilot schemes have been run, but is recognised as an important area for future grid development.

Electricity North West (ENWL), is keen to look at the potential to reduce network charges for virtual private networks, rather than having local generators invest in their own private wires. The benefits for ENWL are in reducing the risk of them having significant stranded assets. The benefits for the community energy group are:

- the potential to contract to sell electricity to more than one customer, or a customer not close to the site, so as to maximise direct sales
- reducing grid connection costs through connecting to the closest part of the existing network
- reducing ongoing costs for maintenance of a private wire.

There are potential cost savings for the generator through reducing the Distribution Use of Service Charges (DUoS), and ENWL is keen to introduce a mechanism whereby local generators are only charged for the use of the local grid, rather than the full distribution and transmission charges as applied through the standard charging mechanism. This mechanism is regulated by Ofgem and ENWL has applied for a derogation (exception) to allow it to vary its charges.

There are several issues that will affect the viability of any virtual network project:

- The "virtual network" can only contain customers connected in the same low voltage grid.
- The community energy group will need to sell electricity via a licensed supplier, and the price achieved will only reflect the saving offered by the DNO if that supplier is willing to pass it on. (ENWL is about to start discussions with a licensed supplier to see if they can offer such a package.)
- The DUoS saving may realistically only be worth up to 1p/kWh, so may not provide sufficient additional income to cover the costs of operating the scheme.
- Ofgem may wish to see additional benefits such as demand reduction or network management as part of any pilot project – this may reduce income for the community energy group or add costs.

ENWL is also interested in investigating the potential to incorporate flexible management of local generation schemes to help manage demand on the local grid. **They are therefore keen to identify local community energy generators who would be willing to get involved in large scale pilot projects.**

Virtual Private Wire	**Private Wire**
• Option for customers to change over time: shorter Power Purchase Agreements (PPA) • Savings through reduced Use of System Charges • Potential savings through time of day tariffs • Low capital cost and reduced potential for stranded assets • Needs Energy Supplier involved • Unit rate savings likely <1p/kWh	• Fixed PPA contract offers certainty • High capital cost • Responsible for maintenance • Likely to get higher PPA rate • Risk from reliance on single customer • Potentially higher ongoing administration costs if multiple customers.

Biomass Energy Co-op "Hot Coffee"

Biomass Energy Co-op (BEC) was set up to install and maintain biomass boilers and has fitted large biomass boiler systems in over a dozen community and charity owned buildings across the North West in the last four years. However, the directors recognised there are two significant challenges with biomass, which they would like to overcome:

- The long term sustainability issues around using virgin wood to provide fuel: are there other, more sustainable, locally-derived options for biomass materials?
- The cost of biomass fuel, which currently cannot compete with gas, therefore reducing the market to customers who are either not on the gas grid or are happy to pay extra to be "green". Can alternative fuels compete financially with gas?

In 2015 BEC ran a pioneer share offer and attracted grant support to raise funds to test the options for using other waste materials rather than virgin wood to fuel the boilers. They have obtained the UK & Irish rights to a Czech-built multi-fuel boiler (Multibio) which could be capable of running on fuels such as olive pits, waste paper, cereal and spent coffee grounds, and had already developed a relationship with the supplier.

Coffee is the second largest traded commodity in the world, and waste coffee grounds are produced in large quantities in city centres. Currently these have no value – in fact they are a cost to the businesses who are charged for waste collection.

Innovation challenge: Can BEC set up a coffee-waste fuelled boiler network in Greater Manchester, that is financially competitive with gas?

Is there a boiler that can run on waste coffee grounds?

In order to be suitable for urban areas and smoke free zones in the UK, and eligible for the Renewable Heat Incentive (RHI), the boiler must be certified for specific fuels to meet both the Clean Air Act and the RHI standards.

Biomass Energy Co-op organised the testing of the Multibio boiler in the Czech Republic with waste coffee ground pellets. The 50kW boiler has now received certification to the required standards. It is also certified to run on standard wood pellets, so can be used with these if no coffee pellets are available.

How can boiler customers source coffee pellet fuel?

A company in Cambridgeshire (Biobean) is already producing around 50,000 tonnes/year of spent coffee ground pellets/logs from waste coffee collected in London. Biobean has a proven collection system, and supplies fuel to power stations, but until now there were no small-scale boilers capable of using these pellets. In the short term, BEC could supply Biobean pellets to a Manchester market. While this is not "local", it is considerably closer than the source of most wood pellets which are imported from the US and Canada.

Can coffee pellets be produced in Greater Manchester?

In the longer term, it would be possible to set up a waste coffee ground collection scheme for central Manchester. There is sufficient waste coffee grounds from:

- Independent cafes & restaurants in urban areas (small collection rounds)
- Centres (airports, stations, hospitals, shopping centres).
- Chains via commercial refuse recyclers.
- Collection from coffee product manufacturers.

BEC has started discussions with local recyclers and identified that a collection service can be financially viable. The waste coffee collected could initially be sent to Biobean for processing.

A pellet production plant would need significant investment (around £2 million). The Biobean plant, which employs 25 people, processes 50,000 tonnes per year, which would feed around 1,800 50kW boilers. Further work is needed to identify the minimum demand needed to justify setting up a local collection scheme or processing plant. These could be set up by separate private or social enterprises.

Can waste coffee pellets be competitive with gas?

Wood pellets are currently more expensive than gas: around 5p/kWh against 3-4p/kWh for domestic/small commercial gas. The non-domestic RHI currently offers 2.85 p/kWh for small biomass boilers (under 200kW) and 5.24 p/kWh for medium boilers (200kW – 1MW). At this level the RHI mainly incentivises the use of biomass where the alternative is oil, LPG or electric heating. The 2016 consultation recommended reducing the RHI to between 2.03 – 2.9 p/kWh for all boilers to incentivise larger systems. It is also possible that the RHI for biomass may end by 2020.

To make waste coffee pellets a sustainable long term product, it must be possible to supply them at less than the price of gas. Although in the short term, the RHI will help to subsidise the additional cost of the boilers, these will also need to be RHI-proof in the longer term.

BEC has identified that it will initially be able to offer waste coffee pellets at 3.5 – 4p/kWh. However, as before, further work is needed to work through the business case to see if pellets can be produced from locally collected waste coffee grounds at that price.

What is the business model for funding the boiler installations?

There are five options for funding the purchase of boilers:

1. BEC owns the boilers and provides an operating package including maintenance.
2. BEC provides a Heat Service Package including owning the boiler, all maintenance and supply of fuel.
3. BEC supplies and installs the boilers which are owned by other community energy organisations, with or without a service package, financed from their own funds which could include community shares.
4. BEC supplies and installs the boilers which are owned by the customer, with or without a service package.
5. BEC offers a financing package to customers or other community energy groups.

It is likely that a mix of these options will be suitable, providing a solid business for BEC and opportunities for other organisations. Further work will be carried out to refine the offer.

Who are the likely customers?

BEC and Quantum carried out some initial market research into the type of customer that might be interested and what the marketing issues might be. People were very attracted by the novelty of heating their buildings with coffee waste, and the circular sustainability of locally generated fuel. There is interest from:

- Private businesses and community organisations interested in reducing heating bills and cutting their carbon, but the high capital investment is an obstacle.
- Community energy groups as an addition/alternative to PV schemes.
- Borough councils who saw the possibility of turning capital into revenue schemes by purchasing heat supply rather than a boiler.

New Technology Project Lifecycle

There are several stages of project development needed to be able to identify whether a new technology is marketable:

Technology: Does it work? Does it meet the standards required? Are there technical barriers to overcome? Are you (or your contractors) competent to overcome these?

Intellectual Property: Does your organisation own the rights to the technology? Are others likely or able to offer the same thing? How would that affect your organisation?

Development Costs: How much do you need to spend to get to the stage where your project is investable? Where will that funding come from? What happens if you don't end up with a viable project?

Suppliers: Is there a ready supply chain for any components or longer term supplies needed (e.g. fuel)? Do you need to set this up? Is there sufficient value for other organisations to supply you? What risks do you face from any failure in your supply chain?

Market: What type of customer is it aimed at? Who are the early adopters? What is the realistic scale of the potential market? What factors will influence that scale?

Customer Issues: What are the barriers the customers will face? How can the company overcome these?

Business Case: What is the business model and business case for the company? What is the business case for customers?

Risks and Barriers: What are these, which are the most critical and how can they be addressed?

Financing: How much capital will be required? How can that be raised and serviced?

Next Steps for BEC

The financial modelling established that coffee biomass could be viable with:

- 16 boilers (50kW – 600kW) with a combined output of 3000kW
- 6.7 MWh per year of heat, using 1400 tonnes of coffee pellets

This would save the boiler users a combined £68,000 per year in fuel bills and 1,400 tonnes of CO2.

To install these boilers would require capital of £1.3 million, with an indicative return on investment of 11.5%.

The next steps for BEC are to obtain the investment capital with a 3 step approach:

1. Promote and sell boilers to interested sites.
2. Upfront funding of installations in suitable (community/public) sites.
3. Community share offers locally to pay back upfront funding.

Can Other Community Energy Organisations Offer Waste Coffee Biomass?

Community owned coffee-fuelled biomass systems are feasible, and community energy groups can help to develop the local market and potentially create enough demand to support setting up a local waste coffee collection scheme. The systems are most suitable for buildings which:

- Have a reasonably high heat demand: the RHI is maximised if the system is operating for at least 3066 hours per year i.e. 35% of the time.
- Have sufficient dry space to store the pellets with delivery vehicle access.
- Can manage the delivery, movement and loading of the pellets into the boiler.

Alongside this, the most likely "early adopters" are organisations that:

- Are particularly keen on environmental sustainability
- Need to replace their existing boiler
- Have difficulty accessing the capital for that replacement.

At present the only boiler accredited is 50kW – sufficient to heat a building which has gas bills of around £3,500 – £5,000 per year. Other sizes will be accredited once BEC has raised more development capital.
If the system is installed within 2017/18 it is likely that the RHI will be sufficient to cover the costs of capital raised through a typical community share offer – although this should be thoroughly checked for each potential site.

For more information, contact Ricky Davies: ricky@biomassenergy.coop

Oldham Community Power

Oldham Community Power (OCP) is the largest generator of community energy in Greater Manchester. Its 2016 share offer raised £50K and with a £200k Oldham Council loan it has installed solar PV on five schools and a community centre. Electricity generated is sold to the sites through Power Purchase Agreements (PPA).

Sites were suggested by members of the public during the project start-up, with 25 schools and 25 community centres being put forward and assessed for suitability. With good community engagement, OCP attracted 46 people to invest in shares. However, people used to meeting large capital expenditure through hire purchase, lease purchase agreements or mortgages, do not normally have savings with which to buy shares. It was difficult for some potential investors to find the minimum share purchase amount of £100 in one go.

Oldham Council supports OCP and has a permanent seat on the board. It is working closely with OCP to develop further projects and community benefits. As a Co-operative Council, it is committed to the concept of **Inclusive Growth**, whereby local people from all income levels have an opportunity to be actively involved in the local economy. The council sees share ownership in community energy as an example of such inclusive growth. OCP needs to raise additional share capital to pay back its loan to Oldham Council, so needs to recruit new members.

Innovation Challenge: £100 is a lot for some people to put into a community energy project. How do we get 200 more members from within a community with a low awareness of share ownership or saving? Can our business model support ownership of shares incrementally or paid for by direct debit?

The Community Shares Unit *Inside the Market Report* June 2015 found that most community share investors fell into the average income category and were overwhelmingly using their savings to invest, indicating they are 'normal' people who don't invest regularly, or access financial advice. They were typically well-educated and in management or professional jobs, although the alignment with average and lower incomes indicates these may be in the public sector, part-time workers or retired people. Ethex Positive Investor 2016 research (due for publication 2017) also showed the investors to be Christian/no religion, home owners, and aged 50 – 70; very few Muslim, Sikh or Hindu investors showed up in the data.

OCP needed to understand more about their local community to recruit new local members from across its diverse groups for their share offer launch in April.

Working with local community groups, OCP held **Focus Groups** to consult people on what they wanted from membership of their local community energy organisation and what they felt about putting money into OCP. Feedback was positive about helping the community and being involved, although providing information on share interest and risk was seen as too complicated and put people off.

"My money can help the community through more projects"

How do you persuade 'ordinary' people to put money into their local community energy scheme?

There are a range of factors at work here:
- Awareness of the community energy project
- Awareness of community shares
- Attitude to spending, saving, investing: decision-making about money and how to spend it.

It's not just about the minimum level share purchase and making that affordable for local people, although that is a factor. In OCP's case, if they want to **raise as much capital as possible** to pay back their £200k loan, a higher limit for share ownership and a campaign aimed at informed investors would raise more capital. However, as they want to **engage more community members**, they need to make it easier for people new to community shares and less accustomed to saving, to invest. A minimum share purchase of £100, made possible over ten payments of £10 through standing order is how they are doing this.

Community shares have been instrumental in saving local assets like football clubs, pubs and piers which give people something tangible to rally round. They have been immensely successful at getting people on low incomes with low share ownership awareness to invest. Some such schemes do not always aim to provide a return to their investor members. Community energy schemes set up in opposition to 'dirty' energy generation, such as fracking are also a similar call to action for local investors. **Making your scheme local, visible and relevant is key to engaging people.**

Community development organisation Locality offers the advice, ***"develop a local story on energy saving advice, energy generation and money savings, promote share offers locally through schools and community centres where the schemes are sited."***

Repowering London set its minimum share purchase price at £50 and secured 90% of its members from within a mile radius of projects in Brixton, Lambeth and Hackney; it also offers internships and volunteer schemes to build the skills in the renewable energy sector locally. Its advice? ***"Get known locally, get your faces out there at all the markets and events, talk to people."***

If your scheme's finances are robust enough to handle it, a lower minimum level for locals in a specific postcode area can be offered, with a higher level for more remote investors. Energise Barnsley offered this approach for its local community. Similarly, if this works financially for the project, "sweat equity" can be used for people to put in skills and voluntary time to earn their shares if they are not in a position to invest.

Administration comes at a cost.

Some groups pay an outside organisation to manage their share offers and membership administration, while others budget a fee for a director or local person to do this. Other small groups undertake all their own administration. Even if administration is done by a volunteer, increasing the number of shareholders has an administrative cost in posting out share certificates alone. Transferring share interest by BACs or adding it to share accounts is a lower administration cost than sending out cheques. There will be ongoing member administration (HMRC inquiries, deaths, changes of address and share withdrawals etc). **So working out the administration costs of wider inclusive membership is important.** As part of this innovation project, Sharenergy were asked to model the impact of incremental share purchase through direct debits on OCP's finances.

What does it cost to have more members?

MORE Renewables (with 42 members) assumes around £3,000 administration cost per year. Around half of this is fixed costs for accounting, memberships of CEE/FCA etc, and would only increase marginally with extra members. MORE has also allowed members to purchase shares in increments in past share offers. **If you do this, you will need to select a date at which they become a member and when interest is applied.** Grimsby Community Energy has also estimated costs of around £3,000 per year to cover directors' expenses, accounting and administration, for a £180,000 share investment.

Sharenergy provides share offer and member administration to many community energy groups and finds that £50 minimum share purchase is insufficient to cover the upfront and ongoing annual administration costs. Sharenergy charges a fixed rate for a minimum size of society, and £10 per member per year for member administration. Payment by Standing Order (not direct debit) is the best way to take incremental share purchase payments. The cost for Sharenergy of processing a 10-payment standing order will be slightly higher in the first year but once a member has paid their full £100 the administration costs are then the same as for any other member.

Minimum level investments help people dip a toe in the water

Sharenergy points out that while some community energy groups prefer larger individual investments to lots of small amounts, most groups have a spirit of inclusivity and community benefit. A lot of minimum level investors may not appear attractive to community energy groups aiming to hit their share targets, but in the longer run, these members will gain confidence and may invest larger sums in future schemes. **OCP has learned that in its local community:**

- There is very low awareness of community shares
- Many people do not understand the concept of interest or IRR (internal rate of return)
- People like the idea of using profits for community benefits and were interested in donating their share interest to "do their bit"
- They liked the idea of "having a say" in their community
- Some people would like energy saving tips
- Several people would like to have interest credited through the Credit Union or to set up a Green Saver Scheme at the Credit Union
- Uncertainty and risk are a barrier, as is not being able to get money back for 20 years.

What about the risk and not being able to get my money back for 20 years?

Ultimately, investors funds are at risk, and share offers must make this clear. Good share offers will warn **"If you can't afford to be without this money please do not invest in this scheme."**

Although of course, shares are withdrawable and Members can request their money back at the discretion of the directors; indeed, most community energy organisation's financial models rely on paying back share capital incrementally over the project lifetime. A very clear explanation of this suitable for non-experts is available in the guide Investing in Community Shares available from the Co-op Community Shares Unit.

OCP has shown that through active community engagement local people are keen on being involved in community energy on their local buildings, and contributing to schemes that have community benefits. The focus groups have been effective in delivering a face-to-face dialogue with local people. OCP will continue to work with other community groups to get its message out and promote its share offer.

OCP will be testing the following approaches in its new share offer:

- Giving face to face time to explain the advantages of becoming a member and buying shares
- Raising the benefits of membership, by providing regular newsletters and meetings about energy savings and developments in sustainable energy
- Allowing 10 x £10 standing order payments to reach minimum share purchase
- Offering members the option of rejecting share interest for ethical or religious reasons, to use the money to fund new energy savings projects.

OCP will be monitoring which of the approaches above proves effective in raising their membership numbers and more share capital.

Promoting Community Energy Shares in Muslim Communities

Put simply, Islamic Finance requires that:

- *money **cannot** be made from money – so earning or paying interest 'riba' is not permitted*
- *money **can** be made from trading and any gains are shared between the person providing the capital and the person providing the expertise, so sharing profit from trade is permitted*
- *there has to be some **risk** to the money, but not undue risk*
- *there should be an **ethical** dimension to the investment or business invested in.*

Of course there are many interpretations to this, some people say that interest from ethical investments is acceptable; some say no interest should be paid at all (for example, interest from the bank account), some say that a return on investment relating to profits created is not really interest (although in community energy that is what society rules and the FCA refer to).

It is not possible to claim that investing in community energy shares does or does not meet Islamic Finance rules. The best approach would be for a society to simply explain what happens to Members' investments and how the society is run, for example:

- a Community Benefit Society exists to benefit the community – refer to the objects of your society (such as to generate renewable energy; help benefit the environment; help people save energy; support a community fund to pay for local projects)
- Regardless of the number of shares purchased, every member has one vote and can vote at meetings and get involved as a director, volunteer etc. in the running of the society
- Share capital is raised from investors (people, organisations) within the community and used to install the scheme or run the organisation
- Any profit made must be used for the benefit of the community
- Members vote on what share interest they receive (up to a maximum limit)
- Members may be able to choose not to take their interest, but to donate it to the community fund
- Members' capital may be reinvested in new schemes or will be repaid to them over the project lifetime
- The value of a share cannot increase over time
- Money invested is at risk, and the capital could be lost if the scheme fails to perform as expected. If the society fails, its assets have to be transferred to another community benefit society.

As with any prospective investor it's up to them whether they'd like to become a Member and invest in the society, and community energy organisations should just explain how they operate and answer any questions clearly and honestly.

More information in the Community Shares Handbook

Top 10 Innovation Competition Lessons

1. **Peer Challenge**: Creating a comfortable space for peer challenge was important. For this project we held a workshop at the start to introduce the projects to each other and to ask difficult, challenging questions that really focused groups on what they were doing and why. Then bringing 14 community energy organisations together to hear about the innovation projects and to discuss how replicable or transferable the lessons and ideas were was very helpful to the innovators and to the community energy groups. We identified additional topics that can unblock community energy projects and hope to set up a network. Peer challenge is a much more comfortable way of asking those questions of each other. Everyone was in the same position and shared their own experiences, ideas and suggestions.

2. **External Credibility**: An innovation project that has been externally supported helps get traction with important groups, like the DNO and potential clients/customers for market research. Being part of an innovation project, and supported by external consultants, made it easier to meet and discuss with ENWL and gave space for collaboration with other groups. Organisations contacted for market research (rather than as a sales pitch) were more receptive as the project was described as part of an innovation programme. This was easier than an individual community energy organisation trying to do this alone.

3. **Understand Your Aims**: What is your group trying to achieve? For community energy groups this might be reducing carbon emissions or raising awareness or encouraging others to act on climate change. But there may be other aims such as providing opportunities for green local investment, or enabling the organisation to finance future project development. Sometimes these aims might conflict so you need to agree which is your main priority. This was a key question for Oldham Community Power – what's the priority: more members or raising significant share capital?

4. **Financial Viability**: Projects need to focus on financial viability as well as their wider innovation or social aim – as a community business the organisation has to be financially viable. And viability should be an ongoing concern, not just at the point of investment in the project. How is the scheme performing and how well are you managing costs compared with your initial assumptions?

5. **Understanding Financial Modelling**: Community energy organisations need to understand their financial spreadsheets and models really well, especially for new projects with low or no FITs. They should play with the different assumptions, such as interest rates or inflation, as well as checking the impact of changes in major items like capital costs or sale prices. At what point does a scheme become viable? What are the factors that influence this? If your assumptions turn out to be wrong (as they will), how could you deal with the impact of this? Skill and familiarity with financial modelling gives Directors confidence to manage and plan their projects better (negotiate on capital costs, negotiate power purchase price etc).

6. **Policy Proofing**: Most community energy schemes have depended on government policy, such as FITs/RHI. Could new projects be 'policy-proof'? Check what would happen if policy support were removed – would the scheme still be viable?

7. **Decision Points and Dependencies**: All projects will have critical issues that, if not solved, will kill off the project. In your project planning these need to be identified early so as not to spend too much time on other work that may be wasted. For example, there was little point

in Biomass Coop investigating potential customers before proving the boiler could be used in the UK. Innovation projects also need break-points in the plan – times to step back and review, decide whether to continue to invest time, energy and money, or to change the plan. People in the voluntary sector in particular can get emotionally invested in making a project happen that a commercial organisation would not proceed with. While this can be hugely beneficial in overcoming barriers, a degree of realism is also needed.

8. **Adaptability**: Be prepared to adapt as you progress your project, for example if conditions or external factors change, or your initial idea doesn't work as well as you'd hoped. Carbon Co-op adapted MHEP for a low-cost simplified assessment for the Broughton Trust and to fit the flood-adaptation elements needed to fit the Cumbria context. Bury Hydro changed their plans to focus on how to sell the electricity when the FITs changed. Know how far you're willing to adapt whilst sticking with your values and core business model. Define what is or is not up for grabs.

9. **Replication:** It is essential to understand the factors that make a project work in one location which may or may not be transferable. What can we learn from other projects but also why might it not work for us? What were the factors that drove the initial project or contributed to it working in that place that you may not have? Did they have grant funding for the development? Do they have a key enabling organisation supporting them? Do they have paid staff who can spend time on project development? Ask the searching questions behind the headline grabbing success story.

10. **Volunteer fatigue**: the community energy sector has taken a policy battering in recent years. Volunteers get tired and have other calls on their time. We feel energised when we have successes, but exhausted when the project is progressing slowly. It's important to be able to recognise this within your group and work out when people need to step back, or get new people in to take over.

What's coming up for Community Energy?

Developments in technologies and business models for energy storage, aggregation, local supply and demand side management are always in the news. But despite pilot projects and some research publications, it is not yet clear how these innovations can be applied in a community energy organisation. As they progress, the sector is reviewing the pilot lessons and studying how to replicate or adapt them to create value that fits in a viable community business model. As technology costs drop, regulations change and sector confidence grows, expect to see more on:

Community heat – Burneside Community Energy and Cornwall County Council are investigating the potential for community owned district heat systems. This is quite a new area, but it's one to look at for new housing developments in particular. HNDU funding is available for local authorities to contribute to development studies. The Rural Community Energy Fund (RCEF) is still available for a range of renewable technologies in rural areas including heat (see resources below).

Energy storage – electricity storage is likely to grow in importance, with larger scale storage now commercially viable. There are various National Grid schemes for frequency response (i.e. supplying electricity very rapidly into the grid at peak demand) and DNOs are using battery storage to avoid expensive grid reinforcement costs. Domestic scale electricity storage, often in tandem with PV systems, however is still expensive. Community scale trials are underway such as Moixa trials in Oxford and Barnsley with local community energy organisation Energise Barnsley, funded by DNO Innovation Allowances. Regen SW is investigating storage through a grant funded scheme. Carbon Co-op is piloting a distributed energy storage flexibility aggregation service for its members and also developing an aggregation pilot with a housing association using heat pumps as a source of grid based flexibility. No community energy organisations are yet delivering electricity storage as a core business.

Local supply – selling electricity to local Members and providing local people with cheaper electricity is an aspiration of many Community Energy organisations. But as yet only a few pilots have been carried out: Wadebridge Sunshine Tariff, Energy Local's trial in Bethesda and Picolo/Good Energy. Linking up with the DNO on an innovation project is a way forward, while the sector awaits changes to the electricity system regulations. Carbon Co-op is developing a Local Supply pilot using a virtual private network and a community generator.

Credit Unions –The Robert Owen Community Bank is hoping to research whether a Green Savings Account can be established with Credit Unions to help people move off pre-payment meters, pay for energy, borrow to install energy efficiency measures and to own community energy shares.

Post FITs PV – Several community energy groups are modelling PV schemes with limited or no reliance on FITs but just well priced electricity sales through PPAs, and shorter leases.

Oldham Council working with the Greater Manchester Low Carbon Hub, together with six other European partners, has secured €1.1 million in INTERREG funding for COALESCCE (Community Owned and Led Energy for Security, Climate Change and Employment), a four year project to boost the community renewable energy sector to meet carbon reduction targets, create jobs and economic growth, and provide energy security. COALESCCE is looking at all forms of renewable energy including energy efficiency equipment, technologies and receiving educational support.

The first phase of the project aims to build a network of businesses, community energy organisations and educational establishments to strengthen the community energy sector.

Where to go for Information, Support & Funding

GMCE Pledge

For information and sector representation **Community Energy England** and the **Community Energy Hub**.

Rural Community Energy Fund is still open to support the development of renewable energy projects, but sadly the equivalent Urban fund is no longer taking new applications.

The Hive – the Co-operative's business support programme will provide support from community energy mentors and experts

Business Development & Investment

REACH Fund (Social Investment Business & Access)

Community Shares Fund

Booster – the Power to Change delivered by the Community Shares Unit & Locality providing business development grants and equity investment in areas under-represented for community businesses

NW Community Energy Network – The Innovation workshop participants representing 14 community energy organisations want a home-grown network to support them in the region.
If funding can be found this will:
- support an active network of Community Energy Organisations in the NW
- provide training including: financial modelling specifically for community energy organisations; understanding leases workshop; virtual private wires etc.
- coordinate site finding and talks with industry and commercial premises
- help make the sector visible to local authorities, mayoral candidates and LEPs
- continued co-ordination and support with the Tyndall Centre for Climate Change Research at the University of Manchester
- ongoing collaboration with Community Energy England and other support organisations

DNOs have ICE (Incentives on Connections) workplans which help you understand what they are working on. They also have stakeholder events and an officer – for ENWL this is Rebecca Lees Rebecca.lees@enwl.co.uk

Sharenergy helps communities set up and own community renewable energy societies and provides an administration service for share offers and member administration.

Dr Tim Braunholtz-Speight & Dr Carly McLachlan, ***Financing community energy:*** *lessons learned and future innovations to deliver a low-carbon future research into community energy finance* a UK Energy Research Centre project at the Tyndall Centre, University of Manchester timothy.braunholtz-speight@manchester.ac.uk

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