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change

business in  
community  
hands

# Evaluation of the Next Generation programme for Community Energy - innovation

Year 3 report



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## About Power to Change

Power to Change is the independent trust that strengthens communities through community business. We use our experience to bring partners together to fund, grow and back community business to make places thrive. We are curious and rigorous; we do, test and learn. And we are here to support community business, whatever the challenge.

We know community business works to create thriving places when local people take ownership of spaces that matter and deliver services that communities need. Our 2021-26 strategy sets out how, using strategic funding, trusted partnerships, rigorous research, policy insight, and a strong network of remarkable community businesses we will back the sector, creating the ideas, evidence, and exemplars that make the case for others to back them too. Ultimately, we will amplify the efforts of community businesses and put them at the heart of a fair economy.

## About the authors

CAG Consultants is an employee-owned co-operative with more than 30 years' experience of high-quality research and evaluation on economic, social and environmental issues, with particular expertise on evaluation and sustainable energy. [www.cagconsultants.co.uk](http://www.cagconsultants.co.uk)

## About this report

This report presents findings from Year 3 of CAG Consultants' evaluation of the Next Generation programme. The programme was delivered for Power to Change by a consortium led by the Centre for Sustainable Energy. While the overall programme started in June 2018, CAG Consultants, in partnership with Fiveways, were commissioned by Power to Change to evaluate the Next Generation programme in April 2019. The programme aims to support the community energy sector in two ways:

- By bringing more solar farms into community ownership whilst maximising the financial, environmental and social impact for their local communities (CORE)
- By supporting the development of innovative business models for the community energy that are not dependent on Feed-in-Tariff subsidies (Innovation).

This report presents final evaluation findings about the innovation strand of the Next Generation programme, covering the processes used and outcomes/impacts. It also shares learning from the programme for the benefit of community groups, policy makers and other community energy stakeholders.

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## Glossary of abbreviations used in this report

Abbreviation	Description
ABI	Association of British Insurers
API	Application programming interface
ASHP	Air source heat pump
BWCE	Bath and West Community Energy
BCE	Burneside Community Energy
BEC	Brighton Energy Co-operative
BEIS	Department of Business, Energy and Industrial Strategy
BUS	Boiler Upgrade Scheme
CAG	CAG Consultants
CE	Community energy
CEB	Community energy business
CEE	Community Energy England
CCEL	Chester Community Energy Limited
CORE	Community Owned Renewable Energy

COVID	Coronavirus – COVID 19
CREW	CREW Energy
CSE	Centre for Sustainable Energy
DNO	Distribution Network Operator
DSO	Distribution System Operator
ESC	Energy Systems Catapult
ESCO	Energy services company
ERDF	European Regional Development Fund
EU	European Union
EV	Electric vehicle
FCA	Financial Conduct Authority
FiTs	Feed-in-Tariff
GCEC	Gloucestershire Community Energy Company
GHG	Green Homes Grant – voucher scheme
HCA	Home Carbon Audit
LED	Light emitting diode (low energy lighting)

LLS	Lockleaze Loves Solar
NDA	Non-disclosure agreement
PSDS	Public Sector Decarbonisation Scheme
PEC	Plymouth Energy Community
PV	Solar photovoltaics
PV + EV	Solar photovoltaics with electric vehicle chargepoint(s)
RCEF	Rural Community Energy Fund
RHI	Renewable Heat Incentive
R&D	Research and Development
TECC	Tisbury Electric Car Club
ToC	Theory of change
UKPN	UK Power Networks (DNO)
WPD	Western Power Distribution (DNO)

# 1. Introduction

**Summary:** *this paper presents CAG Consultant's 'summative assessment' for the third and final year of Power to Change's Next Generation innovation programme. This programme aimed to support existing community energy businesses to make a step change in the nature and scale of their current business. The three- year programme enabled community energy businesses (CEBs) to identify and pursue opportunities arising from the energy transition to Net Zero, aiming to capture value for local communities and to identify viable business models that could act as successors to previous subsidy-supported renewable electricity generation activity. The evaluation methodology is set out in Appendix 1.*

## Introduction

This paper presents CAG Consultant's 'summative assessment' for the third and final year of the Next Generation innovation programme. It provides our overall assessment of process and impact, covering the evaluation aims and research questions. It also draws out learning to inform future work in the community energy sector by Power to Change and other stakeholders.

The paper is structured as follows:

- chapter 2 – overview of progress on the innovation programme
- chapter 3 – evaluation of project-level activities
- chapter 4 – evaluation of programme-level activities
- chapter 5 – overall assessment of the innovation programme against Power to Change outcomes, Theory of Change and systems map
- chapter 6 – overall learning and recommendations for the future.

Evaluation findings on the community ownership strand of the programme (CORE) will be presented in the Year 4 report.

## Rationale for the Next Generation programme - innovation

Power to Change's Next Generation programme aims to support existing community energy businesses to make a step change in the nature and scale of their current business. The programme started in June 2018 and was expected to run for 3 years to June 2021. Owing to delays arising from COVID, the innovation programme was extended to March 2022 while the CORE element of the programme has been extended to December 2023.

A major driver for the Next Generation programme was the recognition that community energy businesses (CEBs) offer opportunities for generating income that, depending upon

the business model, can subsequently be used to finance socially beneficial activity, for example by providing a mechanism for addressing local issues and priorities. In most cases community energy businesses are locally rooted and accountable and offer significant opportunities for integration with other local initiatives (e.g. through the integration of energy-focused schemes within other forms of community regeneration initiative, such as affordable housing schemes).

With the demise of grants and subsidy schemes such as the 'Feed-in-Tariff'<sup>1</sup>, community energy schemes needed to pursue different approaches to ensure their ongoing sustainability. New opportunities were thought to be available through the creative use of technologies to effect commercial linkages between community businesses and their customers. Other opportunities appeared to be offered by energy storage, demand-management technologies and crowd-funding mechanisms. The Next Generation innovation programme offered an opportunity to investigate and demonstrate how community energy businesses could identify and exploit these potential opportunities and thereby capture value for local communities.

## Methodology

The approach and methodology used for this developmental, theory-based evaluation are set out in Appendix 1, highlighting the limitations of the evaluation research.

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<sup>1</sup> The Feed-in-Tariff (FiTs) provided subsidy for renewable electricity generation. It was available for community energy installations commissioned by end March 2020. Other types of energy providers received FitS on installations commissioned by end March 2019.



## 2. Overview of progress on the innovation programme

**Summary:** *The Next Generation innovation programme generated considerable learning about innovative business models for community energy, including learning about how CEBs can add value. The programme also helped to build the capacity of participating CEBs, raising their profile, helping them to progress project ideas, acting as a stepping-stone to further funding and helping them to broaden their activities from renewable electricity generation to include energy or transport services for members of their local communities. A total of 11 innovation projects received grant support from the Next Generation innovation programme. Six groups made good progress in implementing their business models, albeit to a slower timetable than anticipated because of COVID and other external factors. They were flexible and dynamic in responding to challenges and delivered at least some measures on the ground, but the viability of their business models is currently marginal. The five remaining groups pursued their business models as far as possible within the Next Generation programme but, for a variety of reasons, could not proceed with implementation of measures. Nevertheless, all the groups generated learning and developed financial models and other tools that should help other CEBs considering these approaches. This chapter highlights the success factors and challenges experience by the groups and describes their progress using a 'four journeys' innovation scale, covering their 'commercial', 'organisational', 'market/technology' and 'legal/regulatory' journeys.*

### Overview of status of innovation projects

A total of 11 innovation projects received grant support from the Next Generation programme between 2019 and 2022, of which five joined in Round 1 and a further six in Round 2. Further details of each project, and a location map, can be found [here](#).

The Next Generation grant for each group was up to £100,000, divided into four Phases with around £25,000 of grant support being provided in each phase. Projects were required to meet 'stage gates' at the end of each Phase, based on completion of activities set out in their final grant application. The final grant to each group ranged from £10,000 to £99,985 depending on the stage that they reached. The timetable of the project was extended to the end of March 2022 because of COVID impacts on delivery. A summary of the nature of each project is shown in Table 1 below.

**Table 1: Description of innovation projects**

Innovation group	Description
Bath & West Community Energy	developing a network of small consumers that can potentially offer flexibility services to their local Distributed Network Operator using a range of assets such as water heaters, heat pumps and EV chargers

Innovation group	Description
Brighton Energy Co-op	piloting of electric vehicle (EV) charge points located at BEC solar photovoltaic (PV) sites that provide workplace, visitor or residential parking
Burneside Community Energy	developing a community-owned renewable energy supply for a proposed new housing development in Cumbria
Carbon Co-op	developing data tools for energy users, led by an Energy Data Co-operative
Chester Community Energy	developing a loan scheme to fund LED lighting and other energy efficiency improvements on community buildings
CREW Energy	installing heat networks and renewable heating systems on community buildings and/or social housing and – latterly – offering energy efficiency retrofit services to ‘able to pay’ customers
Gloucestershire Community Energy	developing low carbon heating system for social housing, including heat pump, PV and battery systems, potentially including flexibility services
Green Fox	developing energy services model for Zero Carbon Schools, to create energy bill savings for schools while funding energy efficiency and other low carbon measures in these schools
Lockleaze Loves Solar	developing a model for the installation of roof-top solar PV panels on community homes, for those who cannot afford to invest in panels themselves
Nadder CE	developing a rural car club using EVs, to provide better access to low-carbon transport for those with no or limited access to a car
Plymouth Energy Community	developing business models for community-led, net zero carbon affordable housing

The Centre for Sustainable Energy (CSE) and a number of CSE-led consortium partners (e.g. Everoze, Co-operatives UK, Low Carbon Hub) delivered support to the 11 innovation projects. Each project liaised with a CSE support worker and was allocated a technical lead within the CSE-led consortium via a monthly or bi-monthly progress call. In addition to follow-up support actions agreed in these calls, a number of other activities were implemented by the CSE-led consortium during Year 3 of the programme:<sup>2</sup>

- Ongoing provision of the online Basecamp platform for sharing documents and messages within the innovation programme (between projects, CSE-led consortium, Power to Change and CAG).
- Informal monthly drop-in sessions up to end December 2021, hosted by CSE, which were open to any members of the innovation project team to discuss current issues that they were encountering.
- External monthly ‘innovation lab webinars’ up to end December 2021, organised and hosted by CSE, which showcased learning from innovation projects within and beyond the Next Generation programme to a wider audience.
- Implementing a CE mentoring programme led by CSE in partnership with Co-operatives UK between July and January 2021.

Our findings on programme management and dissemination are presented in chapter 4. Evaluation findings on the mentoring scheme are presented in a separate report.

## Assessment of progress on business models

The Next Generation innovation programme generated considerable learning about innovative business models for community energy, including learning about how CEBs can add value (e.g. acting as ‘trusted intermediaries’; providing services in niches less attractive to commercial providers; being responsive to community needs and generating social value (e.g. through community benefit fund donations)). This learning was shared with the wider community energy sector. The programme also helped participating CEBs to develop in a number of different ways: building their capacity, confidence and competencies raising their profile locally and nationally, helping them to progress project ideas, acting as a stepping-stone to further innovation or development funding and helping them to broaden their activities from renewable electricity generation to include energy or transport services for members of their local communities. Further details about these wider impacts are set out in chapter 5.

We have grouped the 11 Next Generation projects into two categories in terms of their progress with their business models, as shown in the table below.

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<sup>2</sup> Owing to the ongoing constraints imposed by COVID, and the efficiencies gained by remote working, all Year 3 activities were virtual.

**Table 2: Status of innovation projects**

Category	Description	Projects
Measures delivered on the ground	<p>Five groups have made good progress in implementing their business models, albeit to a slower timetable than anticipated because of COVID and other external factors. They have been flexible and dynamic in responding to challenges and delivered at least some measures on the ground. However, the viability of most of these business models is marginal, as described further in chapter 3.</p> <p>A sixth group, Chester CE, was held up by a regulatory issue but finally obtained limited permission for its 'pay as you save' scheme from the Financial Conduct Authority (FCA). The 'pay as you save' scheme is now operational, viable and potentially replicable by other groups.</p>	<p>Bath &amp; West CE</p> <p>Brighton Energy Co-op</p> <p>Carbon Co-op</p> <p>CREW Energy</p> <p>Nadder CE</p> <p>Chester CE</p>
Modelling undertaken but delivery of measures not feasible	<p>The five remaining groups have pursued their business models as far as possible within the Next Generation programme and found that they could not proceed with implementation of measures. There were two main reasons why these three groups were unable to progress their business models: firstly, the economics of their business models were marginal; and secondly, they were adversely affected by external factors (e.g. decisions made by partner organisations and the end of the Renewable Heat Incentive (RHI) subsidy scheme). Nevertheless, these groups have generated learning and developed financial models/other tools that have been shared with the wider CE sector.</p>	<p>Plymouth Energy Community (PEC)</p> <p>LLS</p> <p>Green Fox</p> <p>Burneside CE</p> <p>Gloucestershire CE</p>

We have reflected on why the programme faced challenges in identifying replicable, viable business models for community energy. Our assessment of the evidence suggests that the main reasons were:

- The choice of projects supported by the innovation programme (e.g. in one case, the existence of a constraint that could possibly have been identified from the outset; in two cases, the inclusion of projects dependent on time-limited RHI subsidies).

- In a few cases, the organisational capacity of the CEB (e.g. FCA approval being more challenging for volunteer groups that cannot offer a 24 hour complaint/support service to their credit customers).
- Factors external to the projects (e.g. changes in the level of subsidy or policy support for different types of initiative; changes in the commitment or availability of project partners).
- Some COVID effects on levels of usage within certain projects (e.g. lower than expected use of EVs during the pandemic).

## Success factors

The level of commitment, agility and determination shown by the CE groups was impressive. These were key factors in contributing to the levels of success observed here, with some projects making major 'pivots' when they encountered obstacles. Not surprisingly, those groups that had more limited capacity (e.g. were 100% volunteer run) appeared to find it more challenging to make such 'pivots' and generally took longer to do so.

Most groups reported that the support provided by the CSE-led delivery consortium was very helpful. The level of support provided by the CSE-led consortium was not generally cited as a constraint on progress except that one group would have liked more support for dissemination of their model. Reflections on support are covered in more detail in chapter 4.

Projects that made most progress exhibited the following success factors (similar to the success factors identified in the Year 2 report):

- They were led by individuals with commitment and perseverance.
- These individuals had the necessary capacity and expertise to implement the projects.
- The projects were managed in a flexible, agile and resilient way.
- The lead organisations followed professional standards of project management and user engagement.
- The lead organisations developed a clear mutual understanding of roles with partner organisations.

Those projects that made most progress also tended to exhibit at least some of the following factors:

- More organisational capacity (e.g. one or more member of paid staff).
- Less complex dependencies on multiple partners.

- The business model being less innovative (and hence less risky and complex than more ‘cutting edge’ business models).<sup>3</sup>
- The project not being held up by external regulatory factors.

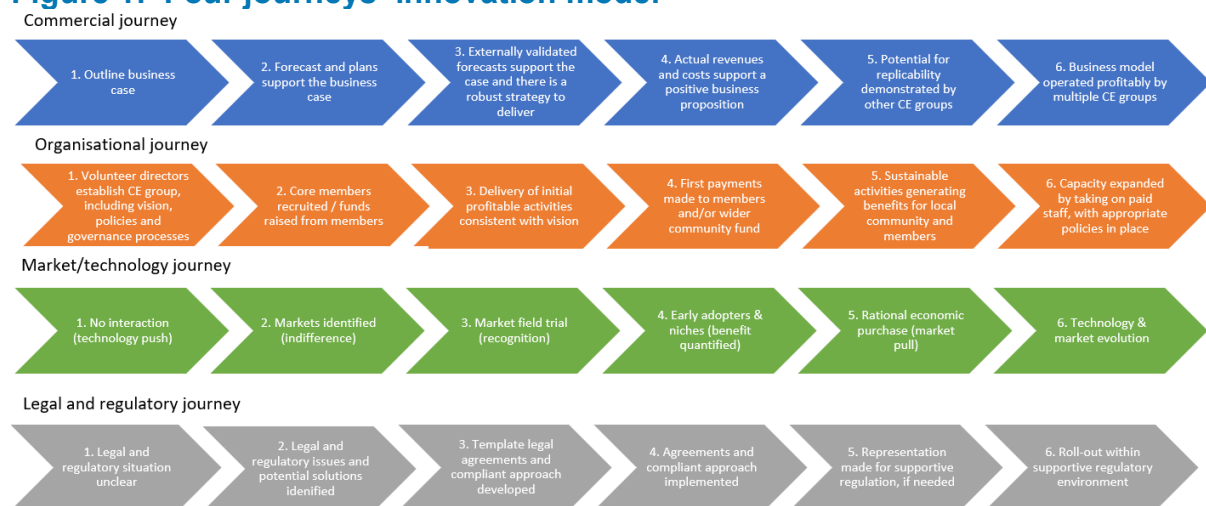
Those that demonstrated more impact on local users tended to be more closely engaged with their local community, responding to the needs they were aware of through this engagement. And those groups that were best networked, either prior to or because of their participation in the programme, tended to have more impact in sharing their learning with other groups in the CE sector and beyond.

## Overall progress on innovation across the programme

Those organisations with most experience of cutting-edge innovation (e.g. Carbon Coop, PEC, Burnside, BWCE) emphasised that real innovation involves a slow, steady journey, as depicted on the ‘four journeys’ diagram below. With hindsight, it may have been unrealistic to expect Next Generation (offering £100k of support per project) to deliver commercial and replicable business models within 2 years, particularly for more innovative projects. A more realistic expectation might be that the programme enables projects to move along a step or two in their innovation journey, against at least some elements of journey, with other ‘successor’ sources of support helping them with later stages of the journey. Support from the Next Generation programme helped several projects to obtain funding from other sources for further development or roll-out of their projects.

The ‘four journeys’ innovation model used during this evaluation can be used to chart the progress made by each programme. The steps in the model are shown in Figure 1.

**Figure 1: ‘Four journeys’ innovation model**



<sup>3</sup> Subject to the caveat that all the projects involved business models that were more risky and complex than the ‘traditional’ CE business model of FiTs-supported installation of renewable electricity generation.

The table below summarises our high-level assessment of progress by each group against these four innovation journeys, as well as their overall level of innovation, the viability of their business model and progress on sharing learning with other CE groups.

As Table 3 shows, most groups have made at least some progress on certain elements of the journey. The exception is Burnside CE: this group withdrew from the programme early in Year 3 owing to external factors. Although Burnside CE and some other projects made limited progress towards a 'viable business model', they still generated significant learning for the wider sector, as explained in chapters 3 and 4. Generally, the more innovative models (e.g. community flex, microgrids for low carbon housing) generated more learning for the CE sector as a whole while less innovative models (e.g. those involving heat pump installation, LED lighting and EV chargepoints) delivered more direct impacts for their local communities.

In interpreting Table 3, please note that the assessments are subjective and based on the evaluation team's review of available evidence together with discussion of the 'four journeys' model with project teams during Year 3 interviews. One point on the scale can make a significant difference: for example, level 3 on the commercial journey means that a project modelled costs and revenues while level 4 means that they ran a live pilot or trial. Level 5 on the organisational journey indicates a well-established volunteer-run group with other project activities, while level 6 indicates a group that has some paid staff. On the market/technology journey, reaching level 5 (rational economic purchase/market pull) is critical for viability but this is largely dependent on external market factors outside the group's control – and this type of viability is lowest for the most innovative projects. Similarly, on the regulatory journey, level 4 means that agreements and compliant approaches were put in place while level 6 means that lobbying has improved the regulatory or policy framework.

The next chapter presents high-level findings on the seven innovation projects that were researched in detail by the evaluation team during Year 3. Further detail on the assessment of each project, and its progress on the 'innovation journey' is presented in Appendix 4.



Table 3: Summary of 'innovation journey travelled' during Next Generation programme (blue text = current blockage)

	Level of technology innovation <sup>4</sup>	Years assessed <sup>5</sup>	Commercial journey <sup>6</sup>	Organisational journey	Market/Tech- nology journey	Legal/ regulatory journey <sup>7</sup>	How viable is the current model?
<b>Bath &amp; West CE</b>	High	2, 3	3 >> 3/4	6=	3 >> 4	4	Not currently viable
<b>Brighton Energy Co-op</b>	Mid-range	1, 2, 3	3 >> 4	6=	4 >>4/5	4=	Viable in some contexts
<b>Burneside CE</b>	High	2	2	5	2	3	Not currently viable
<b>Carbon Co-op</b>	High	2, 3	2/4=	6=	3 >> 5	3 >> 6	Viable
<b>Chester CE</b>	Low	1, 2, 3	4 >> 5	5=	5=	2 >> 1*>> 4	Viable
<b>CREW Energy</b>	Mid to low	2, 3	3 >> 4	6=	4 >> 5	4 >> 5/6	Viable in some contexts
<b>Green Fox CE</b>	Mixed	1, 2	2/3 >> 3	5=	5 >> 3/5	2/3 >> 1**>>3	Not currently viable
<b>Gloucestershire CE</b>	Mixed	2, 3	2 >> 3	5	3/5 >> 4/5	2 >> 2/3	Viable in some contexts
<b>Lockleaze Loves Solar</b>	Low	1, 2	2/3 >> 3	5=	5=	2/3 >> 3	Not currently viable

<sup>4</sup> This correlates with the 'market/technology' journey indicators. 'High' technology innovation is equivalent to 3 or less on the market/technology journey. 'Mid-range' is equivalent to 4 on this journey, while 'low' is equivalent to 5 on the market/technology journey

<sup>5</sup> Year 1 assessments excluded Round 2 projects because the projects had not yet started. Year 3 assessments excluded projects that closed at the start of Year 3.

<sup>6</sup> Arrows >> represent progress over the time period of the assessment. Equals sign '=' means no change over the assessment period.

<sup>7</sup> Regulatory barriers: \* problems in obtaining FCA approval, now granted; \*\* regulatory barriers to solar PV in schools, now resolved; \*\*\* issue with insurance for car clubs, largely resolved



	Level of technology innovation <sup>4</sup>	Years assessed <sup>5</sup>	Commercial journey <sup>6</sup>	Organisational journey	Market/Tech- nology journey	Legal/ regulatory journey <sup>7</sup>	How viable is the current model?
<b>Nadder CE</b>	Mid-range	1, 2, 3	2 >>3 >> 4/5	5 >> 6>>5	4 =	2 >>1*** >> 2/3	Not currently viable
<b>Plymouth EC</b>	High	2, 3	1-2 >>3	6	3=	2=	Not currently viable

### 3. Findings on individual innovation projects

**Summary:** **Bath & West Community Energy (BWCE)** piloted a 'Flex Community' project, investigating the scope for BWCE to act as a 'community aggregator' offering flexibility services from local households. **Brighton Energy Co-op (BEC)** piloted the addition of EV chargepoints to solar PV arrays, finding that this would slightly improve the viability of certain PV investments. **Carbon Co-op** progressed several data analysis tools for energy users in the community, making the PowerShaper Monitor available to Carbon Co-op members and potentially to other CEBs. **CREW Energy** developed their capability to provide heat pump services and Home Carbon Audits, installing a large heat pump in a community building with support from the Renewable Heat Incentive (RHI). However, **Gloucestershire CE** ran into delays and were unable to use RHI subsidy to fund a renewable heat/electricity in council-owned sheltered housing. **Nadder CE** piloted a community-led EV car club in rural Tisbury, while **Plymouth Energy Community (PEC) and Burneside CE** developed techno-economic models for community-owned energy systems in zero-carbon housing developments. **Chester CE** developed a 'pay as you save' system for LED and other energy efficiency measures in community buildings while **Green Fox CE** developed a financial model for energy systems services in schools and **Lockleaze Loves Solar** explored the viability of offering domestic solar at no upfront cost to low-income households.

#### Introduction

This chapter presents more detailed findings on the seven projects that were researched in detail by the evaluation during Year 3. The groups are presented here in alphabetical order. More detail on each of these groups is presented in Appendix 4.

- Bath & West Community Energy
- Brighton Energy Co-op
- Carbon Co-op
- CREW Energy
- Gloucestershire Community Energy
- Nadder CE
- Plymouth Energy Community

The remaining four projects (LLS, Green Fox, Burneside and Chester CE) closed near the start of Year 3 and were not researched in detail during Year 3. A brief summary of developments with these projects is presented at the end of this chapter.

Case studies, videos, tools and other resources created by all of the Next Generation projects can be found on the [Next Generation resources page](#).

## Bath & West Community Energy

Through the Next Generation programme, Bath & West Community Energy (BWCE) has piloted a 'Flex Community' project, run in partnership with Stemy Energy. This project has investigated the scope for BWCE to act as a 'community aggregator' offering 'flexibility services' from local households.<sup>8</sup> BWCE engaged local households that owned electric water heaters, air source heat pumps or electric vehicle chargers, and used these assets to model provision of 'flexibility services' to the local Distribution Network Operator (Western Power Distribution, WPD) and the National Grid Balancing Mechanism, via Stemy Energy's cloud-based platform. Electrical equipment within 12 'Flex Community' households was actively controlled by Stemy for several months during the trials, with modelling of potential household income from trading flexibility.

The project generated significant learning for BWCE and other CEBs, including evidence about how best to engage households in flexibility trials; evidence about the extent to which domestic households tended to overrule 'turn down' or 'turn up' flexibility offers on their equipment and evidence about the potential financial benefits of flexibility services for households, BWCE and Stemy Energy. The financial benefits were found to be low at present, so the viability of a 'community aggregator' role would be dependent on reducing costs or stacking flexibility revenues from different sources. However, BWCE have developed a ['Flex Community Toolkit'](#), available free of charge on their website, to share their learning with other community energy groups. BWCE reported that they are now progressing their flexibility services business model further in a EU-funded project, ReDream: the Next Generation project provided a stepping stone towards this.

The evaluation found that BWCE brought a high-level of expertise, professionalism and organisational capacity to this project. The group's trusted reputation with the local community contributed to their success in this project, as did the group's links with energy organisations and contractors (including WPD and Stemy Energy). Evidence from project interviews and BWCE documentation showed that the project helped BWCE to transition from being a CEB focused solely on renewable energy generation to being a group involved with different aspects of the energy system. This brought them more in contact with users and required them to develop approaches to managing user service, user satisfaction and user impacts for local households involved in the Flex Community. Further details about the BWCE project can be found in Appendix 4 and on the Next Generation website.

## Brighton Energy Co-op

BEC were funded by Next Generation to investigate and pilot electric vehicle (EV) charge points linked to their existing solar panels ('PV + EV'). The aim was to develop a business model for EV charge points that would help to support future investment in community-

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<sup>8</sup> 'Flexibility services' or 'demand side response' (i.e. electricity consumers reducing or shifting their electricity demand to reduce the load on the electricity grid at peak times) can play a role in enabling the local electricity grid to accommodate more renewable generation.

owned solar beyond the end of the Feed-in-Tariff, while also supporting low-carbon charging of EVs by members of the local community. BEC installed a total of 11 EV chargepoints (7 kw) at different locations during the Next Generation programme, across a range of their solar PV sites including workplaces (e.g. Brighton University, Shoreham Port), visitor attractions (e.g. Bolney Wine Estate, Amberley Museum) and residential estates (Parkgate).

Surveys with the local community around each site found that location was the primary factor affecting EV drivers' use of a chargepoint, with a green, local energy source being the second most important factor, followed by charging price. The surveys found that potential users were more attracted by the energy being from a green, local source than by it being community owned. Usage of the chargepoints was lower than expected because of the impacts of COVID. The viability of chargepoint investment was found to be highly location-specific, depending on site-related installation costs, levels of usage and competition from any free chargepoints in the vicinity. But BEC found that, in the right locations, EV chargepoints can add to the viability of solar PV installations. They reported that larger-scale rooftop and ground-mounted solar PV arrays (50-100 kW or more) are currently viable in some contexts despite FITs have ended, because of cost reductions and electricity price increases. BEC sometimes offer EV chargepoints as an extra – where this is attractive to the site owner - even where this is marginal in investment terms. BEC's experience with EV chargepoints in the Next Generation programme helped them to obtain ERDF funding for a successor project that offers 'PV' or 'PV + EV' installation to local businesses in the Brighton area. However, take-up of the 'EV' option via the ERDF project was reported to be low.

Throughout the project, BEC approached the 'PV + EV' project in a professional manner. They brought in expertise as needed to deliver all aspects of the project. Delivery was spread over a long timeframe, largely because of the COVID pandemic. The project enabled BEC to start new activities that were more user focused and built their experience with installing EV chargepoints. As non-profit operator, BEC is now able to install chargepoints in locations that would not be attractive to commercial operators. And BEC has developed a financial model for chargepoint installation that they are willing to share with other CE groups.

## Carbon Co-op

Carbon Co-op used Next Generation funding to explore the possibilities for an 'Energy Data Co-op'. Carbon Co-op sees a potentially powerful role in the digital energy system for citizen co-operatives: groups of consumers, enabled through digital technology, to collectively provide and use energy services. To date, they note that the private sector has dominated data collection, manipulation and management. Carbon Co-op took forward three services within the Next Generation programme: improvement and roll-out of the 'PowerShaper Monitor' which allows householders and other organisations to access, view and download high-definition smart meter data, helping them to evaluate the impacts of energy measures; development and piloting of an 'Impact Tracker' tool which allows users to baseline their energy use and track the impact of technical and behavioural changes over time; and initial development of a 'building performance evaluation tools' to allow users to collect home environmental data to evaluate the impact of domestic energy efficiency measures on the home environment. Carbon Co-op reported that 105 people were using the PowerShaper Monitor in June 2022, while the Impact Tracker had been piloted with 100 Carbon Co-op members.

Initially, Carbon Co-op aimed to recruit 1,000 users for the PowerShaper Monitor, seeing this as the commercial break-even point. However, the market has evolved and some commercial operators are now offering similar services for free. The Carbon Co-op now see the PowerShaper Monitor service as part of their overall offer to co-op members, with inclusion of this free service enhancing the benefits of joining. Carbon Co-op also envisages selling the service to other CE organisations, so that (for a fee) they can make it available to their own members. Carbon Co-op suggest that their PowerShaper Monitor will become financially self-sustaining within a year, potentially less. They also anticipate being able to generate income through the Impact Tracker and Building Performance Evaluation tool at some point in the near future.

Carbon Co-op has obtained funding from Innovate UK for a successor project that will take forward the PowerShaper Monitor and Building Performance Evaluation service. Carbon Co-op's final report states that this project has the potential to inform the delivery of future government energy efficiency programmes, moving the UK away from outdated and inaccurate deemed or modelled assessments and towards a more accurate and scalable 'pay by performance' approach.

Carbon Co-op takes a long-term view: interview evidence suggested that Carbon Co-op's Next Generation activity built on and evolved from previous work and will be built on in its turn. The Next Generation project helped Carbon Co-op to develop a better understanding of the processes involved in new product/service development. Carbon Co-op reported that they have used the experience they gained from working on the Next Generation project during the challenges of COVID to inform a significant overhaul of their internal working arrangements. In a recent report, Carbon Co-op make the case for more support for digital community initiatives and suggests that there is a need to invest in the development of 'community tech creators', to build capability and capacity within the sector. Power to Change have recently launched a ['community tech' support programme](#) that responds to the need in this area.

## CREW Energy

The initial aim of CREW's innovation model was to develop a financially sustainable model for installing and maintaining heat pumps in public sector or commercial buildings as well as housing estates, with installation costs funded through a community share offer. CREW successfully led the installation of air source heat pumps (ASHPs) for one community organisation (Devas Club), but in Year 2 they recognised that they needed to adjust their project in light of changes in their operating environment (most notably the demise of the non-domestic RHI and emergence of the Public Sector Decarbonisation Scheme (PSDS) and the replacement of the domestic RHI with the Boiler Upgrade Scheme (BUS)). With the support of Next Generation, CREW expanded their consultancy work to include non-domestic carbon audits and a domestic Home Carbon Audit (HCA) offer, in addition to their existing 'energy café' advice work. At June 2022, CREW reported that they had delivered over 50 HCA's and were working on two domestic heat pump installations. They also reported having 2 commercial clients for their non-domestic carbon audit offer and were actively progressing a number of non-domestic heat pump opportunities in London.

There have been technical issues with the Devas heat pump installation, exacerbated by the installation firm going out of business. But CREW have seen growth in interest and demand

for heat pumps from the market, although the number of actual installations remains small. CREW have seen strong demand for their HCA offer with this being triggered by climate concerns, a desire to reduce costs, and regulation. This suggests that the delivery of this service, and retrofit support services, may offer a significant opportunity for CEBs.

CREW reported that they could not have launched this part of their business without the support of the Next Generation scheme. Participation has helped them to bring in the necessary resource to explore new areas and to develop new commercial offers that will help to grow the business moving forward. CREW noted that they are now seen by potential partners as 'knowing' about heat pumps and this has led to them being approached with several new opportunities. CREW successfully ran their first share offer during Year 2 and also bid for new funding. They attribute this, in part, to having increased competencies and confidence as a result of participation in the Next Generation programme. CREW is now working with multiple other third sector bodies, including other community businesses, to secure funding to enable additional, new heat pump installations. The flexibility of Next Generation has been essential as the project has had to reinvent itself, with CSE being supportive and Power to Change allowing CREW to come up with new ways forward.

## Gloucestershire Community Energy

Gloucestershire Community Energy is a volunteer-only group that has previously installed solar panels on a building in Gloucester. Their Next Generation project focused on enabling the installation of heat pumps, solar panels and battery storage in social housing homes. The project evolved considerably, from initial proposals to install solar PV and batteries in council-owned sheltered housing (which was found not to be economically viable) to later proposals to install a shared-loop Ground Source Heat Pump supported by the non-domestic RHI (which was delayed by COVID and did not obtain council go-ahead for installation ahead of the end of the non-domestic RHI scheme at end March 2021). The final project plan involved the installation of air source heat pumps with batteries and solar PV on 7 social housing bungalows. Premised on domestic RHI, which ended in March 2022, this would have piloted a suite of renewable and low carbon technologies combined with time of use tariffs. Unfortunately, this project did not proceed because discussions with the main partner took longer than anticipated and this meant that the domestic RHI funding deadlines could not be met and other funding was not feasible within the timeframes of the Next Generation programme.

Although the project did not go ahead, GCEC reported that they learnt from the project and this learning will better enable them to pursue future projects. In addition to developing improved technical and commercial understanding, the project has given the group more confidence to take on more complicated projects. It was also reported to have helped them to raise their profile, attract new recruits and strengthen their relationship with local partners. The local council reported that their work with GCEC had encouraged them to consider installation of heat pumps and batteries in 27 independent homes, funding using the Government's social housing decarbonisation funds.



## Nadder CE

NCE were awarded Next Generation funding to set up a pilot [electric car club](#) in Tisbury, using the grant to investigate possible models for the club, to develop proposals for the club, secure two electric cars and launch operation of the car club. The car club is now operating. While car usage levels were impacted by the pandemic, NCE reported that membership has risen since the Year 2 report and, in summer 2022, was just short of their target of 60 members.

Evaluation research with users suggest that the car club saves members money compared to owning a car. NCE reported that 4-5 households had been able to reduce to one rather than two cars because of using the car club in place of owning a second car. The club provides discounted rates for lower income individuals, aiming to help alleviate transport poverty and aims to make EV usage more accessible to those who could not afford to buy an EV. At present the club is being run by volunteers as the business model is not currently able to maintain paid staff members. There have been challenges in insuring the cars and in providing support for users 24/7. NCE has minimised the need for volunteer inputs through its co-operative ownership of 'The Mobility Factory', a technology platform which includes 16 car clubs, 250 cars and 3,500 users across Europe. Even with platform membership and volunteer input, and with the car purchase being grant funded, the club is not financially sustainable without additional financial support and NCE have looked to raise external funds through sponsorship and grants.

NCE are interested in developing a UK, or pan-European, network of car clubs to share overhead costs. Building on their Next Generation activities, they have forged strong links with two other UK groups, Green Fox CE (another Next Generation group) and the Derwent Valley Car Club. Participation in the project has helped to raise the profile of NCE, not least through the visibility of the cars themselves in the local area. The project is viewed positively by the local community and has built confidence and new competencies within NCE. However, there was mention of volunteer fatigue within the group which may affect the car club going forward.

## Plymouth Energy Community

PEC has been working with its sister organisation, PEC Homes, to support the development of 70 community-led, zero carbon, affordable homes in Devon. Next Generation funding was used to explore whether a community-owned Energy Services Company (ESCO) could help to deliver higher energy efficiency standards in developments by community housing developers. The rationale was that it could provide community housing developers with a financial mechanism that would allow them to deliver their low carbon aspirations. In addition to the PEC Homes site, a proposed development by Launceston Community Development Trust was used to provide a real-world case study. PEC developed a business modelling toolkit for ESCO-led microgrid systems for zero carbon homes which was tested with both PEC Homes and Launceston Community Development Trust. The toolkit was developed with support from a specialist consultancy, Hydrock.

The project found that involvement of an ESCo in a community housing development would bring added complexity to developments that are often already challenging. Whilst a

community-led development might wish to meet higher energy and carbon standards, in practice the added complexity may mean that they prefer to default to a business as usual scenario. There are regulatory barriers to microgrid systems and heat networks (such as electricity licencing rules, restrictions on peer to peer trading, metering requirements for heat networks) and issues about the acceptability of ESCo arrangements to house purchasers and mortgage lenders. There is also a risk (at least in theory) of householders choosing to switch to an alternative energy provider.

PEC is a well-established and well-networked community energy group which already offers a wide range of services, including renewable electricity generation, fuel poverty advice and consultancy. Next Generation funding has enabled PEC to explore a proposition that offers significant benefits but is complex and risky. The funding has enabled PEC, and the community housing developers they partnered with, to develop a better understanding of the practicalities or developing a microgrid-based, community-owned ESCo. The business case remains unproven, but the funding has moved thinking on and may yet be an important enabler of future work. Both PEC and their partner Hydrock are looking for opportunities to take this forward.

## Update on other groups

While the sections above present findings on groups that were researched in detail by the evaluation during Year 3, this section gives a quick recap on the status of the four other Next Generation projects closed early in Year 3.

### Burneside CE

Burneside CE started a Next Generation-funded project involving a community-owned microgrid for new zero carbon homes, similar to PEC's proposal. As outlined in the Year 2 report, some progress was made in exploring how a community energy group could be involved, developing template agreements with the landowner and developer, and exploring technological options for the development. While the project was closed early in Year 3 because the landowner decided not to proceed with the development at this time, there was considerable learning as documented in Burneside CE's final report and resources shared on the Next Generation website.

### Chester CE

Chester CE used Next Generation funding to develop a 'pay as you save' scheme to fund LED lighting and energy efficiency improvements for community buildings. Obtaining approval from the Financial Conducts Authority was problematic because Chester CE was a small, volunteer-led community energy group that was not able to meet full FCA requirements as a credit provider (e.g. having 24 hour helplines or complaint services for customers). With the support of external experts, the group eventually obtained 'limited approval' from the FCA during 2022, allowing unincorporated community organisations to install LED and other energy efficiency measures in community buildings at no upfront cost. For appropriate sites, where building and lighting usage is relatively high, the 'pay as you save' scheme is sufficiently viable for Chester CE to raise funds via a community share offer. The share-funded 'pay as you save' model, although less innovative than some of the other Next Generation business models, has good potential for adoption by other CE groups.



## **Green Fox CE**

Green Fox CE used Next Generation funding to explore an ESCO model for zero carbon schools. With support from the Energy Systems Catapult and Loughborough University, they developed a financial model for pilot schools in Leicestershire, in partnership with Leicester City Council. As outlined in the Year 2 report, the full zero carbon schools model was not viable at that time but the 'Base model' was viable, premised on savings from tariff switching, energy efficiency measures and solar PV installation. At the time, there were issues around Department for Education (DfE) approval of solar PV on schools. These have now reportedly been resolved through partnership working between Community Energy England and DfE. But the availability of capital funding for energy work in schools via the Public Sector Decarbonisation Scheme (PSDS) suggests that the role of community energy groups is currently likely to be limited to advisory, educational or specific project work. While it is currently unlikely that this will justify the further development of the ESCo model for schools, the financial modelling work undertaken by Green Fox provides learning that may be useful to other CE groups.

## **Lockleaze Loves Solar**

Lockleaze Loves Solar used Next Generation funding to explore the potential for affordable domestic-scale solar PV for low-income households, involving no upfront cost for the household. Evidence from Lockleaze Loves Solar and other groups in the Next Generation programme, including BWCE, indicates that rooftop solar PV installation is currently viable for 'able to pay' households. The challenging aspect of Lockleaze's model was finding a way to offer panels at no upfront cost to lower income households. The project was initially supported by an energy supplier who would have bought the electricity from the solar panels and offered it back to participating households free of charge, as part of their overall energy supply. However, the project ran into problems when the energy supplier went out of business. The group 'pivoted' to try other options for ownership and funding of the solar panels, including bulk purchase and involvement of a local credit union. As set out in the final report for this project, the model was not viable at the time but could become viable in future for mature CE groups with appropriate partnerships in place, if solar costs came down or electricity prices rose sufficiently.

More details about the models researched during Year 3 are presented in Appendix 4. The next chapter presents overall findings on management of the Next Generation programme.

## 4. Evaluation of programme management and dissemination

**Summary:** *management of the innovation grant programme by the Next Generation board worked smoothly during Year 3. The board was flexible and pragmatic in how it managed the grants, which was critical to success of this innovation programme. Stage gates were effectively used to control expenditure. While some projects would have liked more specialist support from the CSE-led consortium, most stakeholders reported that the Next Generation programme was well run. A wide range of activities were undertaken during Year 3 to disseminate learning from the Next Generation programme to the wider CE sector and to other energy stakeholders. The impacts of this dissemination activity, led by the CSE-led consortium, CAG Consultants and the projects themselves, is difficult to assess but may increase when the final outputs have been publicised.*

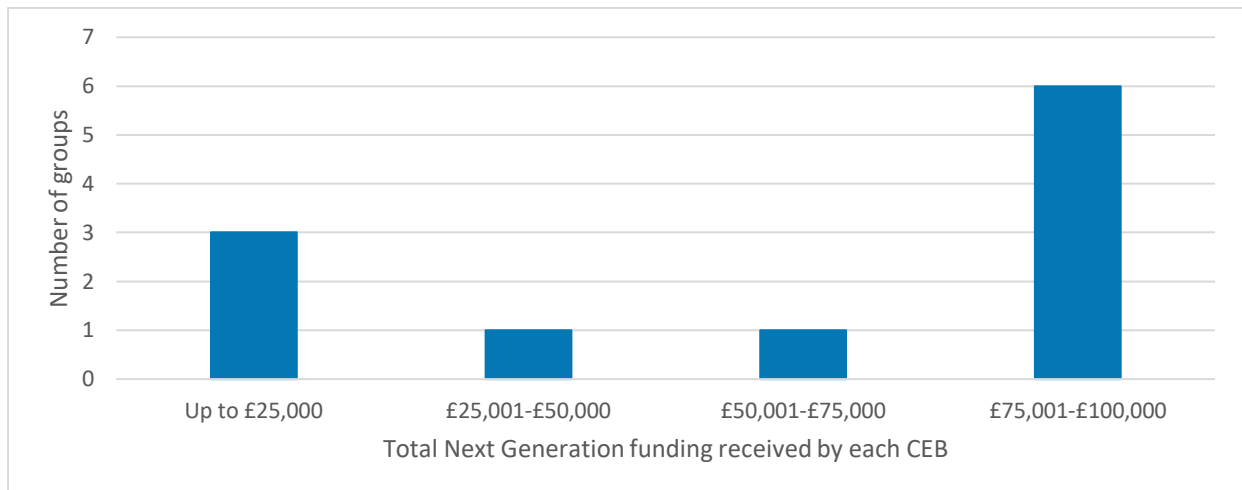
This chapter presents our findings on programme management and programme-level dissemination activities for the Next Generation programme. An overview of how the innovation programme worked is presented in Appendix 2.

### Evaluation of overall management of innovation programme

Management of the grant programme by the Next Generation board appeared to have functioned smoothly during Year 3. The board was flexible and pragmatic in granting extensions to projects that had been delayed by COVID and in accepting changes of scope where projects needed to adjust their plans. Both the project leads and programme leads saw this flexibility as critical to success of an innovation programme where activities carried risks and outcomes were uncertain.

Disbursement of grants was managed carefully by the board, with stage gates linked to project milestones being used to control expenditure. Generally, those projects that did not deliver measures to users received lower levels of funding rather than those that delivered measures on the ground. There was an exception to this in that one project received the full grant without delivery of measures, because they were working in a cutting-edge area of innovation. The funding covered development of a tool designed to help others CEBs considering this model.

**Figure 2: Level of Next Generation funding received by participating CEBs**



*Source: Next Generation final internal records for each project.*

Feedback on the support provided by the Next Generation programme was generally very positive. Aspects of the support that were well received by the Next Generation projects included:

- Flexibility and pragmatism about delivery timescales.
- Proactive support from CSE for changes in project plans, where needed to overcome obstacles encountered by projects.
- Regular friendly, professional and supportive progress catch-ups with the CSE project lead and, where appropriate, the technical lead for that project within the CSE-led consortium acting as a sounding board for the projects.
- Relatively light touch documentation compared to some other funders.
- The opportunity for informal exchange of ideas between projects in monthly internal webinars, including problem solving on challenges faced.
- Signposting to other sources of advice (e.g. ShareEnergy, Co-operative Futures).

Aspects of support that could have been improved, in the view of some Next Generation participants, were:

- More specialist support was needed by some of the more cutting-edge projects, in some cases going beyond the skills available within the CSE-led consortium. It is possible that a call-off contract for third party support, with approval of external contractors by CSE/Power to Change, might have been a better route to providing specialist support to these projects.

- One project questioned whether the programme had achieved as much as they could in getting groups of CE organisations to innovate and learn together. They felt it might have been useful to set up more conversations between groups doing similar things (e.g. ESCPs, EVs), rather than having generic internal webinar sessions. If circumstances had permitted, more face to face interactions would also have been valued.
- As noted in the Year 2 report, considerable negotiation was needed in a few cases where proposed spend involved types of items that Power to Change did not anticipate (e.g. use of Next Generation funds to make capital purchase of EV chargepoints; use of funds for NCE to buy shares in The Mobility Platform as the best route to give it access to a telematics system for the Tisbury EV car club).

But, on balance, most stakeholders reported that the Next Generation programme was well run.

## Evaluation of programme-level dissemination activities

Building on the learning points from the Year 2 evaluation, a wide range of dissemination activities were undertaken during Year 3, led by the CSE-led consortium, CAG Consultants and the projects themselves. We cannot present a fully independent assessment of these activities, as CAG Consultants' evaluation team led some of these activities.

### Knowledge sharing within the Next Generation programme

Activities to share internal learning within the programme included:

- Internal webinars led by CSE, with support from CAG Consultants, up to end December 2021.
- Basecamp file sharing and 'chat' system, led by CSE.
- An internal learning workshop in May 2022, led by CAG Consultants.

The internal webinars had mixed levels of attendance. Some participants attended regularly and reported that the webinars were useful to share informal learning with other groups on issues they encountered. But others found the internal webinars too general for the needs of their project and would have preferred more tailored groupings. The Basecamp 'chat' function was used only occasionally, as in earlier years. However, the internal learning workshop in May 2022 was well attended and generated learning that was captured and shared with participants, including CEE. The learning from this workshop has informed this report.

### Knowledge sharing with other community energy groups

A wide variety of activities were undertaken to share learning from Next Generation projects with other groups in the wider community energy sector:

- CSE presented resources for each project on the Next Generation microsite, including videos, case studies, final reports and templates/tools available to other groups.
- CSE completed the programme of twelve innovation lab webinars (up to end December 2021) showcasing Next Generation projects or other innovative CE business models, with recordings made available on the Next Generation microsite.
- Close-Up Research, working with CAG Consultants, prepared four five-minute videos showcasing innovation projects that had delivered benefits to users (i.e. Nadder CE, Bath & West CE, CREW Energy and Brighton Energy Co-op).
- CAG prepared six final case studies for the innovation projects that had made significant progress since their initial case studies (i.e. BWCE, Brighton EC, Carbon Co-op, CREW Energy, Nadder CE and PEC), plus five thematic case studies on issues commonly encountered across the projects.<sup>9</sup>
- Community Energy England created a Next Generation page in the 'How to' section of their website, highlighting the resources available and linking to the Next Generation microsite.
- Findings from the Next Generation groups were presented, alongside other learning, at two Community Energy England events: an online Community Energy event on 7 October 2021 (Community Energy: NOW and NEXT) and a face to face 'Energy Transition Conference' on 18 June 2022. Resources from these sessions were made available via the CEE website.
- Individual Next Generation projects also made various presentations to other CE groups and to regional CE networks.

The impact of this dissemination activity is difficult to assess. Polls undertaken at the CEE online event in October 2021 showed that 25% of respondents were aware of Next Generation resources and 16% had accessed the materials. About half of the respondents who were aware of, or had accessed, the materials were directly involved in the Next Generation programme themselves. Given that the range of dissemination activities undertaken up to that point, including highlighting of the Next Generation programme at three CEE events in 2019, 2020 and 2021, this highlights the challenge of raising awareness of Next Generation resources, even within the community energy sector.

The Next Generation videos were highly valued by the groups featured in those videos, because they provided a resource that they could use themselves. Four of the videos have now had more than 100 views in total, with CREW energy leading at 164 views. Similarly, 7 of the innovation lab recordings created by CSE have now had more than 80 views in total, with the BEC leading at 170 views. In total the Next Generation microsite had attracted

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<sup>9</sup> These covered general partnership working by CE groups, partnership working with local authorities, partnership working with private firms, managing risk in innovative business models, raising funds for community energy activities and the impact of CE group involvement.

10,612 users and generated 27,858 page views to 18 October 2021 (up from 8,651 and 19,858 to 2 August 2021).<sup>10</sup>

External stakeholders commented that structuring of the Next Generation website, including the 'resources' page, could be made more accessible to groups seeking information on a specific topic. While the 'resources' page is partly structured by business model, the information is presented in basic list format rather than in a visually attractive way. CSE reported that their budget for the year ahead does not currently cover further restructuring of the Next Generation microsite, although the budget does provide for the microsite to be kept live until 2024.

### **Knowledge sharing with wider stakeholders, beyond the community energy sector**

CAG Consultants, CSE and Power to Change also undertook a range of activities to share learning with wider audiences beyond the community energy sector (including BEIS, DNOs, other energy systems stakeholders and third sector/funding organisations). These activities included:

- Communications campaigns in autumn 2021 and spring 2022, coordinated between CAG Consultants, Power to Change and CSE, to publicise outputs to the community energy sector and beyond, timed to coincide with COP26 and with the launch of the Year 2 report and case studies, respectively.
- Direct emails in the first quarter of 2022 to share policy recommendations, as well as links to case studies, videos and other resources, with wider stakeholders to whom findings may be relevant (including BEIS, DNOs, ENA, Ofgem, third sector bodies, other funders).

Interviews with a range of external stakeholders during Year 3 showed that they were aware of the Next Generation work but did not identify specific impacts of the programme learning. For example, one external stakeholder described the Year 2 report as forming part of their evidence base on community energy but could not ascribe specific impacts to it. Another commented that they were not aware of the programme informing work by other stakeholders but anticipated that the programme would have more impact when final reports were publicised.

CE sector influence on policy was increased during Year 3 with the re-convening of a 'Community Energy Contact Group' by BEIS. A similar contact group was operational during 2013-2015 but it appeared to have been dormant in the intervening years. We do not have evidence about the factors that led to the re-convening of this group. Going forward, it provides a route by which Community Energy England and other CE stakeholders can share evidence and insights with BEIS and other Government departments.

The next chapter provides an assessment of the Next Generation programme against Power to Changes' strategic objectives and against the programme's Theory of Change.

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<sup>10</sup> These statistics include periodic bot-attacks which CSE estimate to account for about 2,000 users.

## 5. Summary of findings against Power to Change strategic outcomes, theory of change and systems map

**Summary:** *the Next Generation innovation programme generated impacts against many of Power to Change's **strategic outcomes**, including helping to make CEBs more impactful and resilient, strengthening CEBs relationships with external stakeholders and their local communities, contributing to tackling the climate challenge, and acting as a stepping stone to funding from other funders. The programme made little contribution to improving the diversity of CEBs, although two groups served users from disadvantaged groups. Some groups were already supporting other CEBs in learning about their emerging business models but overall impacts on the CE sector were limited as few of the business models were yet viable. For this reason, the target outcomes set out in the programme's **Theory of Change** were not fully achieved, although considerable learning was generated for the CE sector and other strategic stakeholders. Findings from the evaluation have been used to update a '**systems map**' of the community energy sector.*

This chapter summarises our findings from the innovation programme as a whole. The findings are summarised against:

- The high-level strategic outcomes sought by Power to Change.
- The theory of change for the innovation programme.
- The systems map for community energy.

### Overall assessment of programme impact against Power to Change strategic outcomes

Power to Change aims to achieve six strategic outcomes. These outcomes were defined as part of Power to Change's revised strategy during 2021. They are not specific to innovation programmes such as Next Generation but relate to Power to Change's broader strategic aims. In general, the projects generating most impact within the timeframe of the programme were those involving less innovative approaches. These strategic outcomes do not fully capture the potential longer term impacts of more innovative projects. The success of Next Generation as an innovation programme is considered in the next section.

Our overall assessment of the impact of the Next Generation programme to Power to Change's strategic outcomes is summarised in the table below.



**Table 4: Overall assessment of contribution to Power to Change strategic outcomes**

Power to Change strategic outcomes	Assessment summary
More impactful and resilient community businesses	<b>Some evidence</b> for all the groups researched in Year 3, including strong evidence for some groups about the broadening of their offer to include more user-facing activities.
Growing understanding of and support for community businesses	<b>Some evidence</b> for all but one group researched in Year 3, relating to improved relationships with external stakeholders or their local community.
A more diverse and inclusive sector	<b>Very little evidence</b> of this from Year 3 research, other than two groups serving some users from disadvantaged groups.
The contribution of community businesses to addressing society's challenges increases	<b>Some evidence</b> of contribution to climate challenge for all the groups researched in Year 3, with relatively strong evidence for three groups.
Funding and support for community businesses increases	<b>Strong evidence</b> from several groups that reported using their learning and experience from their Next Generation project as the basis for successful funding bids from other funders.
The Community Business Sector grows	<b>Some evidence</b> from groups which are already supporting other CEBs in learning about their emerging business models. But limited impact as few of the business models are yet viable.

Further details of this assessment are given below and in Appendix 4.



## More impactful and resilient community businesses

*Summary: Some evidence for all the groups researched in Year 3, including strong evidence for some groups about the broadening of their offer to include more user-facing activities.*

Next Generation funding has helped several groups (e.g. BWCE, BEC, Nadder CE) to start delivering or piloting user-facing services for their local community rather than being focused entirely on renewable energy generation. Through survey work and research with users they have increased their understanding of local people's needs. Evidence of actual impacts for users is limited at this stage, particularly for more innovative projects such as BWCE. The strongest evidence for user benefits emerged from Nadder CE (where the EV car club provided access to an alternative vehicle when users' main car was unavailable) and BEC (where EV chargepoints enabled a few people to charge their vehicles more cheaply than at home). CREW's installation of heat pumps also has good potential to benefit users but there had been some technical problems with their first major heat pump project.

All the groups reported that their project activities would not have happened without funding from the Next Generation programme. Next Generation support had enabled them to become more resilient, by diversifying their range of activities and funding the testing of new activities that were too risky to be funded through community share offers or bonds. Two groups commented that the programme had helped them to develop more robust and effective internal processes, while several groups commented that the programme had enabled them to raise their profile and build contacts within and beyond the community energy sector.

## Growing understanding of and support for community businesses

*Summary: Some evidence for all but one group researched in Year 3, relating to improved relationships with external stakeholders or their local community.*

There was evidence of Next Generation groups developing stronger and more credible relationships with partners through the programme, with increased understanding of CEB roles within those partner organisations. The ways in which this happened varied between projects. For example, BWCE liaised with a number of external partners in the energy system including Western Power Distribution (WPD, the local Distribution Network Operator), National Grid (the Electricity System Operator), Everoze, Stemy Energy and Ofgem, although some of these relationships may have been pre-existing. Two projects, both BEC and Green Fox, have developed links with the Energy Systems Catapult while PEC's project was reported to have made a consultancy firm see community businesses as potential clients for microgrid work in new housing developments.

Both GCEC and Nadder CE reported that the projects had improved their standing in the local community. In Nadder's case, the visibility of the car club cars had contributed to wider understanding of their role and evidence of their commitment to the local community. The only group where we did not find evidence of growing understanding and support was Carbon Co-op which was already well-networked and which was delivering a project which did not require engagement with external stakeholders.

## **A more diverse and inclusive sector**

*Summary: Very little evidence of this from Year 3 research, other than two groups serving some users from disadvantaged groups.*

There was no evidence of the Next Generation projects improving diversity or inclusion within the CEBs themselves. But there was some evidence from CREW and Nadder CE of some beneficiaries being from disadvantaged groups. Nadder CE offered discounted rates to car club users on low incomes, although engaging with these potential users was reported to be challenging. CREW's first heat pump installation was in the Devas Club which offers recreational facilities for young people from ethnically diverse and disadvantaged backgrounds in London, but its 'Home Carbon Audit' service is targeted at customers who can afford to pay for heat pumps and/or energy efficiency retrofit measures. GCEC's potential project would have involved social housing tenants but the project did not progress far enough to undertake engagement with this group.

There was no evidence of other groups serving diverse or inclusive groups. PEC's microgrid tool did not involve work with users. BEC's EV chargepoint users were people who could afford to buy EVs (BEC), although the group is now discussing EV charging with a community transport organisation. We do not have any evidence of the type of users involved in Carbon Co-op's Powershaper Monitor pilot. And BWCE learnt through their project that it was not appropriate to involve elderly or vulnerable people in the pilot stages of the Flex Community because of the risk of technical problems leaving them without heating or hot water.

## **The contribution of community businesses to addressing society's challenges increases**

*Summary: Some evidence of contribution to climate challenge for all the groups researched in Year 3, with strong evidence for three groups.*

All of the projects aimed to develop business models that would contribute to meeting the climate challenge. The programme developed considerable learning about these business models but direct carbon savings were too low to be meaningfully measured. Three projects (Chester CE's LED installations in community buildings, CREW's heat pump installations and Home Carbon Audit service and Nadder CE's EV car club) are understood to have generated carbon savings while Carbon Co-op's PowerShaper Monitor may also have encouraged users to save energy and carbon. The scale of these savings is likely to be small and considerable further work would be needed to quantify these savings.

As discussed in chapter 6 below, several models were found to be viable in some circumstances and have potential to be replicated by other CE groups, helping them to respond to the climate challenge. These are: Carbon Co-op's PowerShaper Monitor; BEC's 'PV + EV' model; Chester CE's 'Pay as You Save' model for energy efficiency in community buildings; and CREW's heat pump and 'Home Carbon Audit' service. Considerable learning was also generated about the more innovative models, such as BWCE's Flex Community and PEC/Burneside's microgrids for zero carbon housing, but these models are not yet viable and require further development to make a future contribution to the climate challenge.

## Funding and support for community businesses increases

*Summary: Strong evidence from several groups that reported using their learning and experience from their Next Generation project as the basis for successful funding bids from other funders.*

Several CEBs in the Next Generation programme reported that they had used their learning and experience from Next Generation projects to successfully bid for and win funding for successor programmes, funded by the EU or other funders. For example, the Next Generation project had acted as a stepping stone to BWCE obtaining funding from the EU for its role in the [ReDream](#) project. The Next Generation project was reported to have enabled BEC to obtain ERDF funding for a large-scale follow-on project which is supporting wider roll-out of solar PV, including EV chargepoints where viable. Development of the building performance evaluation tool by Carbon Co-op, whilst incomplete, is understood to have contributed to Carbon Co-op being successful in a bid to Innovate UK to support the [OpenEnEffs](#) project. And CREW Energy has been able to successfully bid for new funding and attributes this, in part, to having increased its competencies and confidence as a result of participation in the Next Generation programme. CREW is now working with multiple other third sector bodies, including other community businesses, to secure funding to enable additional, new heat pump installations.

## The Community Business Sector grows

*Summary: some evidence from groups which are already supporting other CEBs in learning about their emerging business models. But limited impact as few of the business models are yet viable.*

Several Next Generation organisations reported that they were actively supporting other community energy groups who were interested in their emerging business models, despite some of these models not yet being fully viable. For example, CREW was supporting a number of other CEBS interested in heat pump installation, including one contact that came through the Next Generation mentoring programme. Carbon-Co-op was also working with a mentee organisation who was interested in the PowerShaper Monitor. Nadder CE reported that they were actively working with at least two other CEB groups who have, or are interested in developing, EV car clubs (i.e. Derwent Valley Car Club and Green Fox). With these and other groups, Nadder CE has developed ideas for cost sharing between car clubs, possibly via an 'umbrella organisation' of multiple EV car clubs across the UK. Other groups such as BWCE and BEC also reported that they were making presentations and sharing their learning with CEBs across the country.

## Review of Theory of Change for the innovation programme

This section assesses how far the Next Generation innovation programme achieved its own objectives, as set out in its Theory of Change. This assessment is based on evidence to date – further impacts may become evidence in future, beyond the timeframe of the innovation programme.

A Theory of Change (ToC) describes, in diagrammatic form, how an intervention (in this case the Next Generation innovation programme) is intended to lead to its desired outcomes. A ToC diagram describes programme inputs and highlights key activities and behaviours, and the links between them, that should lead to the delivery of a defined target outcome, or outcomes. The innovation ToC provides a model which describes how the programme was intended to work, against which we can compare how the programme has been found to work in practice.

A baseline ToC was prepared for the innovation programme during summer 2019, in consultation with Next Generation programme stakeholders. This is shown in Appendix 5. The baseline was then reviewed in summer 2020, January 2021 and summer 2021. The review below is the fourth review of the baseline ToC.

We have reviewed the ToC in the light of evidence gathered during Years 1-3 of the evaluation and present our assessment in Figure 3 below. Each element of the ToC is assessed using the symbols below, with our reasoning captured on 'pink stickies'. The 'bright pink stickies' relate to assessments made in Year 3. The 'pale pink stickies' are assessments unchanged since earlier years of the evaluation. In particular, we have assessed whether the assumptions that underlie the design of the programme appear to hold. These assumptions are shown as 'clouds' linking the different steps in the logic chain, which lead upwards from the rationale at the bottom of the diagram to the target outcomes at the top.

A commentary on our assessment is provided after the diagram. If the small text on the diagram is not readable, please zoom in to view the diagram more clearly.





Our summary assessment of the Theory of Change is provided below, starting at the bottom of the diagram and working up.

### Rationale

**Supported:** The rationale is still valid because innovation funding at the scale offered by Next Generation remains difficult for all but the most established and professional groups to access. But there was a slight shift in the context for CE innovation during 2022 in that, based on evidence from Next Generation groups, larger renewable electricity investments (i.e. roof-top solar PV above 50-100kWp and larger ground-mounted schemes) were viable in some circumstances for CE groups during 2022 despite the end of the FITs subsidies. This was because technology costs had reduced over time and electricity prices had increased, at least temporarily, as a result of the war in Ukraine during 2022. However, viability was affected by site costs, installation costs and by the match between the profile of electricity generation and that of onsite (or private wire) electricity consumption. It was not clear how high levels of inflation and rising interest rates would affect the viability of CE investments in renewable electricity projects going forward.

To the extent that CE groups can still generate surplus through renewable electricity investments, the rationale for funding new, innovative business models relates more to extending and broadening the role of the CE sector than to the economic sustainability of CE groups. There are several drivers for broadening CE groups' role, not only responding to wider aspects of the net zero energy transition but also increasing the resilience of CE groups and responding to the cost of living crisis faced by many households during 2022. Next Generation funding has helped to explore the viability of new business models and has explored how the CE sector can contribute more to the energy transition. It has made a small contribution (via CREW and GCEC) to exploring business models that help reduce energy costs for disadvantaged households, but fuller exploration of this role for CE would have required use of different project selection criteria at the start of the programme.

### Logic chain and assumptions

**Supported:** As noted in the Year 2 report, most of the steps in the logic chain have worked fairly smoothly, with flexible programme and project management (e.g. extended timeframes) overcoming most of the challenges posed by COVID. However, the assumption that 'the projects worked as intended' was not fully supported. Unsurprisingly for an innovation programme, some business planning assumptions did not work as expected.

### Intermediate outcome

**Mixed:** While some projects met their delivery objectives in broad terms, some projects did not complete owing to external factors or unanticipated barriers. Some of those that completed were fundamentally different in design to that originally expected and/or did not deliver originally expected benefits. This is not surprising given the risky nature of innovation projects. However, a range of wider intermediate outcomes were also observed for the Next Generation innovation projects, including enhanced capacity, confidence and capability on

the part of CEB groups, learning about emerging business models, raised profile for CE groups and success in gaining follow-on funding<sup>11</sup> for project activities.

### Strategic target outcomes

**Mixed:** Despite mixed achievement of the intermediate outcome, the programme still generated considerable learning about what worked well and what worked less well which will help to inform future CE activity. Key lessons learnt from the programme were communicated to wider external audiences during Year 2 and further communication work is planned for Year 3 outputs. However, achievement of the strategic target outcomes of the programme was mixed, as explained in the table below.

**Table 5: Progress on Next Generation innovation programme strategic target outcomes**

Strategic target outcomes	Progress
<p>The project raises understanding amongst Government and other strategic stakeholders of the role that community energy businesses might play in the energy system transition.</p>	<p>Year 2 learning was shared with strategic stakeholders and external audiences, including insights on some specific barriers to the CE innovation business models. However, feedback from external stakeholders suggested that impact had been limited to date: while Next Generation resources were reported to have contributed to the wider evidence base about the CE sector, external stakeholders interviewed by the evaluation team could not cite examples of direct influence by the Next Generation programme. There is potential to share final programme outputs with a wider range of audiences, via both the CSE-led consortium and CAG Consultants activity. As discussed further in chapter 6, this will require the identification of key messages from the programme for different audiences and communication via appropriate channels. There is potential for learning from Year 3 outputs to be shared more effectively with policy makers via BEIS's reconvened 'Community Energy Contact Group'.</p>
<p>The project demonstrates new and replicable forms of business model and opportunities for businesses in the community energy sector and assists in enabling the sector to transition into a post subsidy financial environment.</p>	<p>Four of the business models explored by the programme appear to be viable and suitable for replication by other CEBs, providing a modest return for CE groups in at least some circumstances. However, with the exception of Carbon Co-op's PowerShaper Monitor, these were not the most innovative models, as they involved technologies that are becoming relatively well-established such as energy efficiency improvements, heat pumps and EVs. The more innovative models (e.g. flex community, microgrids, EV car clubs) have generated significant learning for and interest within the CE sector. While they currently appear too risky or unviable for most CE groups, they may justify further innovation support and development because of the benefits they</p>

<sup>11</sup> In at least two cases, the follow-on funding was several times higher than the Next Generation funding.

Strategic target outcomes	Progress
	<p>could potentially offer to community members and the wider energy system. Overall, the models contribute more to broadening the role of CE groups vis a vis the energy transition than they do to supporting the CE sector in a post-subsidy financial environment.</p>
<p>The programme further reinforces the value of the social investment sector in the eyes of policy makers and funders.</p>	<p>There is emerging evidence from the Next Generation programme to support the added value from CEBs in terms of:</p> <ul style="list-style-type: none"> <li>• CEB's 'trusted intermediary' role (e.g. in BWCE's 'Flex Community', CREW's heat pump work, Chester CE's energy efficiency work for community buildings)</li> <li>• CEB's willingness to provide services in niches less attractive to commercial providers (e.g. Nadder CE's EV car club; BEC's installation of EV chargepoints in more remote locations; Carbon Co-op's commitment to open data systems)</li> <li>• CEB's responsiveness to community needs (e.g. CREW's pivot into energy advice work; Nadder CE's response to transport needs in the local community).</li> </ul> <p>Although some insights on added value were shared during Year 2, there is further evidence that could be shared to progress this strategic outcome during Year 3.</p>

### External factors

COVID had a reduced impact on the Next Generation programme during Year 3 compared to Year 2, although the viability of some projects (e.g. BEC, Nadder CE) were adversely affected by reduced levels of travel post-covid. It is difficult to say whether COVID hindered sharing of learning during Year 3: while the only face to face event was the sector-wide June 2022 event run by CEE, good use was made of online events which were convenient for people to attend.

The final months of Year 3 were affected by significant increases in energy costs linked to the war in Ukraine, leading to rising inflation, higher interest rates and a cost of living crisis. This prompted CREW to adjust their final Next Generation activities to focus on training of energy advisers who now provide a 'Home Carbon Audit' service. While we understand that this service is targeted primarily at 'able to pay' customers, it may increase the skill levels of CREW's team that also runs 'energy cafes' and advice services for customers in fuel poverty.



Two further external factors that affected outcomes for specific projects were the end of the Renewable Heat Incentive scheme (which affected proposed heat pump investments by CREW and GCEC) and difficulties in obtaining FCA approval for 'pay as you save' schemes for other community groups (particularly for small, volunteer-only CEBs such as Chester CE).

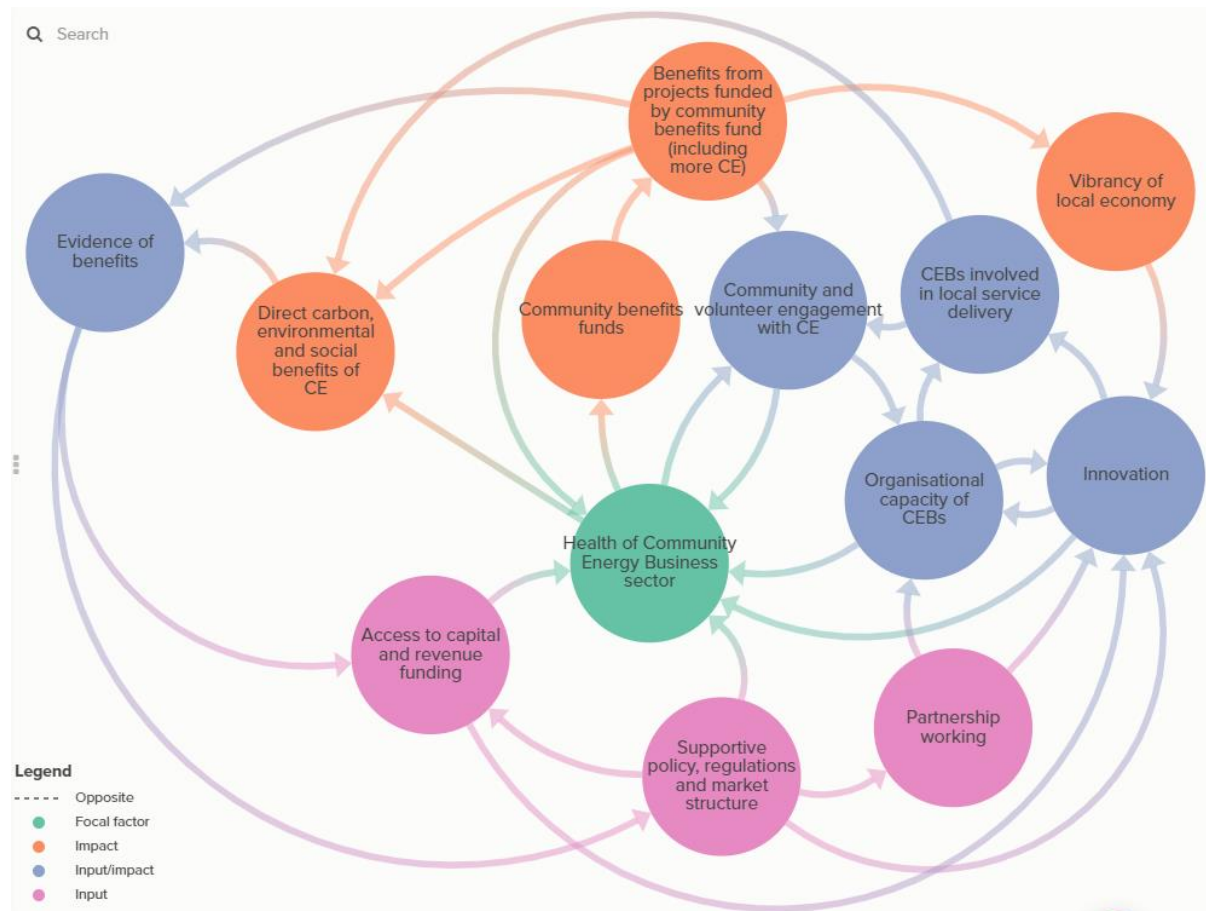
### **Possible unintended consequences**

A positive consequence of the programme was that it developed the capacity and increased the profile of some CEBs participating in the programme. While some groups such as BWCE, Carbon Co-op and BEC were sufficiently well established to be well-networked and well known in the CE sector ahead of the Next Generation programme, others such as CREW, Nadder CE, GCEC and Green Fox CE reported that they developed their profile and networks through participation in the programme. And many groups, including some that were already well-established, reported that the programme had enabled them to develop knowledge and improve processes and procedures. In effect, Next Generation's innovation programme has delivered 'capacity building' as well as innovation and testing of new business models.

### **Implications for systems map for Community Energy**

In this section, we relate the evidence from the innovation programme to the systems map that was created during the first year of the evaluation. The purpose of reviewing the systems map is partly to check the accuracy of the systems map in relation to the real-world community energy system and partly to consider where the innovation programme has intervened in the community energy system. This is a precursor to thinking about how future interventions could best interact with the system (see chapter 6). Our revised systems map for the community energy sector is shown in Figure 4 below.

**Figure 4: Simple systems map for community energy (revised)**



Key points in relation to the systems map are that:

- The innovation programme acts mainly on the blue 'innovation node'.
- We have incorporated some additional linkages that were identified in the Year 2 evaluation report (i.e that complex innovation models are highly dependent on partnership working (pink node) and organisational capacity of the CEB (blue node), and that the success of innovation projects is highly dependent on two other pink input nodes ('access to capital and revenue funding' and 'supportive policy, regulations and market structure').
- As flagged in the Year 2 report, the relationship between 'organisational capacity' and 'innovation' is two way, since innovation support also has a positive influence on the capacity of groups in terms of knowledge and skills.
- We have added a node to represent CEB involvement in local service delivery. Year 3 evidence suggests that this is an important aspect of many of the innovation models. It is dependent on CEBs having the necessary organisational capacity to deliver services to the local community, but service delivery helps to reinforce

community engagement with the CEB because people can see that the organisation is directly benefiting the local community. Local service delivery also has potential to generate direct carbon, environmental and social benefits, in addition to those generated through investment of community benefit funds.

For the innovation models in this programme there is still little evidence of the Next Generation business models making a significant contribution to health of community energy businesses (central green node) or the surpluses that they generate (orange nodes). While there may be a contribution from the four viable business models identified in this report, the contribution is likely to be modest as their viability currently appears marginal and dependent on a range of factors.

## 6. Learning and recommendations

**Summary:** *While the programme did not fully achieve its original aim of identifying successors to FITs-supported business models in the CE sector, it generated considerable learning about innovative business models for CE and learning about how CEBs can add value, while generating considerable benefits for participating CEBs. The Next Generation programme identified four business models that are 'near viable', capable of generating a modest surplus in some contexts, and suitable for replication by a wide range of CEBs. It also identified two more tricky business models that may work in certain circumstances and for specific communities. Finally, the programme identified three business models that are currently challenging for CEBs and require further development work but which offer potential to make important contributions to the energy transition. Learning from the programme highlights the added value that CEBs can contribute to meeting community needs and meeting the challenges of climate change and the energy transition, in partnership with local authorities and DNOs/DSOs. Learning also highlights the need for future innovation funding in the CE sector, and the importance of using an 'innovation scale' in future funding programmes of this nature.*

This chapter draws together learning from the evaluation findings and sets out recommendations arising from this learning. The learning is set out under four headings:

- Learning about the viability of specific business models
- Learning points for policy makers and other audiences
- Learning about designing and running a potential future innovation programme
- Conclusions

### Learning about the viability of specific business models

Findings about the potential viability of different business models provide important learning points for community energy groups, and for funding/support organisations working with the community energy sector. Figure 5 below provides an overview of the potential viability and replicability of the business models explored by the Next Generation programme, drawing on the findings presented in chapter 2. These models are characterised further in Appendix 3.

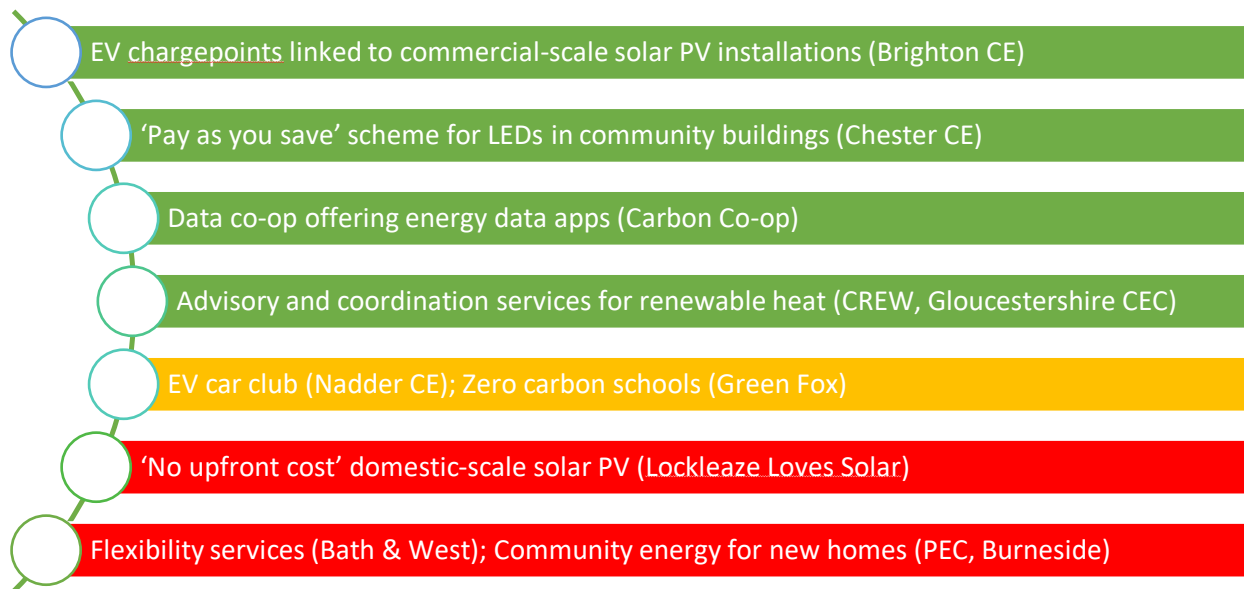
Figure 5 classifies the Next Generation business models as 'Red', 'Amber' and 'Green' (RAG) in terms of their current accessibility to other community energy businesses (and to community groups considering work in the energy field). Two of the three '**Red**' business models are the most innovative and therefore the most challenging at present. All three red models are only suitable for groups with considerable expertise, organisational capacity and appetite for risk. Despite their complexity, these models have potential to make important contributions to the energy transition. There is considerable interest in these models and it is hoped that they will be progressed through further innovation support and/or feasibility studies.

The two ‘**Amber**’ business models are fairly complex. While they do not currently appear to be financially viable or sustainable, there may be circumstances where they can be supported by committed local communities (as is the case for Nadder CE’s EV car club) that are willing to put in volunteer time and/or raise funds to support these activities. Changing circumstances may improve the viability of these models in future.

The four ‘**Green**’ business models are relatively straightforward to implement, although some are more risky than solar PV installations. They could be replicated by a range of CEBs. In appropriate circumstances, they should cover costs and generate small-scale returns while meeting local community needs and contributing to the energy transition.

The diagram does not include viable business models outside the Next Generation programme (e.g. investment in larger renewable electricity projects (e.g. solar PV > 50-100 kWp on schools/businesses/halls) and domestic solar schemes targeted at ‘able to pay’ households. Further details of the conditions in which these models are viable is given in Appendix 3.

**Figure 5: Overall RAG recommendation on Next Generation business models**



Key:

*Green – ‘near viable’ (i.e. profitable in some contexts) and accessible by quite a wide range of CE groups*

*Amber – currently more tricky, but may be worthwhile for groups in certain contexts (e.g. car clubs in rural areas)*

*Red – require more development and/or only suitable for groups with considerable expertise, capacity and risk appetite*

## Learning points for policy makers, energy systems stakeholders and local authorities and other audiences

This section identifies key messages and learning points for a range of different external audiences that could learn from Next Generation experiences.

### Key learning points for policy makers, energy systems stakeholders and local authorities

#### Added value from CE involvement

- CEBs can add value to flexibility and energy efficiency projects as ‘trusted intermediaries’ who can help to engage individuals within their local communities. For example, BWCE’s network and reputation enabled them to recruit ‘early adopter’ households for their Flex Community trial. Similarly, CREW Energy’s trusted reputation and independent stance contributed to the marketing of their ‘Home Carbon Audit’ service and of their services to local third-sector organisations and businesses.
- CEBs can deliver energy and transport-related services in niches that are too marginal for commercial providers (e.g. EV chargepoints, renewable electricity installations, energy efficiency advice).
- CEBs can help to identify and respond to community needs (e.g. responding to ‘fuel poverty’ and ‘transport poverty’ in the local community).
- CEBs can add ‘social value’ to service delivery compared to commercial providers (e.g. social objectives; surplus being contributed to community benefit funds).
- For lower risk projects, CEBs can raise capital funds via community share or bond raises.
- The level of professionalism within community energy organisations is high. This is particularly evident for groups that have paid staff (e.g. BWCE, BEC, PEC and CREW within the Next Generation programme). Both paid staff and volunteer directors are often experts in their fields.

#### Scope for partnership working

- CEBs can offer local authorities assistance in progressing their strategic objectives (e.g. Net Zero, Climate Emergency, local economic development, social engagement, fuel poverty reduction) while partnership with local authorities can contribute to income security for CEBs. For example, CEBs can be funded by local authorities or social care partnerships to provide energy efficiency or fuel poverty advice to vulnerable people within the community.

- CEBs can play an important role in Local Area Energy Planning processes, helping to ensure that local people have a say in big decisions about their local energy system.

### **Remaining policy barriers**

Policy barriers remain, including:

- The lack of a supportive environment to encourage DSO/sDNOs, local authorities and other public sector organisations to collaborate with CEBs on projects, despite the added 'social value' they can contribute compared to commercial providers.
- The lack of incentives for renewable heat installations in communal buildings.
- Restrictions on 'peer to peer' trading of electricity.
- For small CEBs, the challenge of obtaining limited FCA approval.
- Incompatibility between different flexibility services and lack of standardisation across DSOs.
- The value of flexibility services being based solely on 'avoided grid costs' rather than 'avoided carbon savings' from load shifting.
- The lack of common open data standards for smart meter data, to enable CEBs to participate in energy services on a level playing field.

### **Key learning points for funders of community-led climate initiatives**

- Given both the cost of living crisis and Climate Emergency, funding might usefully be targeted at encouraging more CEBs to expand into energy efficiency, low carbon heat and retrofit activity. There are business models that are close to being viable for the 'able to pay' market and public-funded models that have already been demonstrated in the 'fuel poverty' market.
- Funders could support the roll-out of these and other more viable models across the CE sector (e.g. through skills development and capacity building).
- Funders can fund further development and feasibility work on promising innovative models that are too risky for CEBs to take forward using community share funding.
- Where the viability of CEB business models improves with scale (e.g. EV car clubs, flexibility services, renewable energy investment), funders can provide grant funding for development work on larger scale initiatives across groups of CEBs.
- Volunteer fatigue can be a significant constraint for small CEBs – by helping to fund 'at risk' development work on potential income-generating projects, funders can help to develop CEB capacity and make CEBs more financially secure in the longer term.



## Key learning points for community-led groups considering energy initiatives

- Larger renewable electricity installations (e.g. solar PV installations of 50-100 kW) remain one of the most viable business models for CEBs, despite the end of FiTs.
- The Next Generation programme has identified and provided learning resources for a range of other business models that can be viable in certain circumstances (including 'PV + EV', 'Pay as you save' energy efficiency initiatives, energy data apps and heat pump/energy efficiency work).
- The near-viable models for the delivery of energy efficiency, low carbon heat and retrofit to the 'able to pay' households, as well as public-funded models for delivery to households in fuel poverty, can potentially contribute both to the cost of living crisis and Climate Emergency.
- Some models such as EV car clubs currently appear dependent on scale to become viable, as this would allow sharing of overheads across multiple CE groups.
- The more innovative and challenging models considered by the Next Generation programme (such as flexibility services and microgrids for new housing) could make a significant contribution to the energy transition but require more funding and development work before they can be self-supporting and viable for CEBs.

## Learning about designing and running a potential future innovation programme

Key learning points about innovation funding in the CE sector, from the Next Generation programme, are:

- There is a need for further support for the more innovative funding models in the Next Generation programme as these require further work if they are to achieve viability. Similarly, there is a need for support for further demonstration and roll-out of the more viable models identified by the programme.
- There is still a need for innovation funding within the sector, as only a few high-capacity, professional CEBs can realistically access funding from Innovate UK and other mainstream innovation programmes. Funders could consider providing capacity building support to CEBs on accessing innovation funding.
- Use of an innovation scale is strongly recommended in innovation programmes, both in specifying funding requirements and in assessing applications – this can be used to clarify whether the objective is to fund early stage, risky innovation or later stage projects that are close to being replicable (or both).
- Funders need to be aware that development of more innovative approaches takes time, potentially requiring successive rounds of innovation funding and periodic major rethinks to reach viability and replicability. Again, an innovation scale is useful in monitoring progress on the journey towards viability.

- Given the uncertain nature of innovation project outcomes, flexible management of innovation programmes is important in maximising the chance of success.
- But funders need to accept that, despite careful selection of projects and strong project implementation, some innovation projects will fail to achieve their objectives as they are inherently involve risk.
- Use of stage gates (as implemented in the Next Generation programme) is an effective way of managing funding for risky innovation projects, reducing the risk of continuing to spend funds on projects that have encountered insurmountable external barriers or are failing to meet their objectives for other reasons.
- In designing any future innovation programme in the CE sector, funders should bring together Next Generation participants to help inform the design process.

## Conclusions

The Next Generation innovation programme generated considerable learning about innovative business models for community energy and about how CEBs can add value, sharing this learning with the wider community energy sector. The programme also helped participating CEBs to develop in a number of different ways, in line with Power to Change's strategic objectives.

Nevertheless, the Next Generation innovation programme has not achieved its original objective of identifying viable business models, suitable for replication across the CE sector, that would support development and expansion of the sector as successfully as FiTs-supported renewable electricity investment. The most profitable type of activity for CEBs still tends to be larger-scale electricity investment (e.g. solar PV above 50-100 kWp), which continues to be viable in certain circumstances without FiTs.

However, the Next Generation innovation programme identified a number of models that are close to being viable and replicable. These were generally the less innovative projects in the programme but they have more potential to generate social impacts in the near term than the more innovative projects. While these models appear unlikely to generate surplus for the CE sector on the same scale as renewable electricity projects, they involve more direct service delivery to local communities (e.g. on local transport, energy efficiency, retrofit etc) and can enable CEBs to contribute more fully to the energy transition and to meeting local community needs. CEBs can potentially contribute add value through their 'trusted intermediary' role with the local community and their willingness to run services for social objectives rather than profit. Support for further demonstrations and capacity/skills building within the sector would be needed to support roll-out of these business models.

The most innovative projects in the Next Generation innovation programme (e.g. the Flex Community and microgrid projects) are still some way from viability. Given their potential contribution to the energy transition, and the potential added value from CE involvement in these projects, further policy support and innovation funding for these initiatives appears justified. In several cases, Next Generation funding has provided CEBs with a stepping-stone to further funding for their emerging business models.

# Appendices

## Appendix 1. Evaluation approach and methodology

### Systems map and Theory of Change

In the early stages of the evaluation, we worked with community energy stakeholders to develop a systems map for the community energy system. This has been used by the evaluation to highlight the elements of the system targeted by the innovation programme, and to review the key factors that influence successful outcomes from the innovation programme.

Development of the systems map was followed by development of a Theory of Change, in consultation with key stakeholders in the programme. The Theory of Change sets out the strategic goals of the innovation programme and how it aimed to achieve these goals.

The systems map and Theory of Change are presented and reviewed in chapter 5, taking into account evidence from Years 1-3 of the evaluation (i.e. summer 2019 to summer 2022).

### Approach to evaluation

The aims of the evaluation, as defined by Power to Change, were:

1. To test the relevant Power to Change hypotheses for Community Energy Businesses (CEB), and develop, test and refine additional hypotheses or theories specific to the Next Generation programme.
2. To develop understanding of the outcomes and impacts generated by the CEBs supported by Next Generation and the role of the Next Generation programme in facilitating this. This will provide both a formative assessment and summative assessment of programme impacts.
3. To evaluate the processes of the administration, management and delivery for the Next Generation programme.
4. To generate insights on Next Generation processes and practise through continuous learning, and support delivery of a proactive learning strategy for the programme, so as to:
  - a. influence the programme and grantees

- b. inform Power to Change’s future programmes
5. To connect and disseminate the insights that emerge from the programme with the external policy environment and wider community energy marketplace, as the programme proceeds.

## **Power to Change strategic outcomes**

The Power to Change hypotheses referred to in aim (1) have been retired and have been superseded by a set of strategic outcomes for all of Power to Change’s work. The assessment in this report is therefore made against these strategic outcomes, as shown below.

### **Impact indicators for the outcome “More impactful and resilient community businesses”**

- Do CBs have improved qualities key to durability? As defined by the four dimensions of durability:
- It realises its goals
- It is appreciated by the community
- It has adequate staff with enough capacity to deliver well
- It is financially stable
- Are CBs resilient to external shocks and able to continue despite them?
- Do CBs have increased connections between themselves, and key stakeholders?
- Do CBs have the capabilities to support their communities and address societal challenges?
- What impact do CBs have? (also explored within ‘The contribution of community businesses to addressing society’s challenges increases’)

### **Impact indicators for the outcome “Growing understanding of and support for community businesses**

- Do target stakeholders have increased awareness about the existence, value, and potential of community businesses?
- Do target stakeholders know what support CBs need?

### **Impact indicators for the outcome “A more diverse, equitable and inclusive sector”**

- Is there increased diversity, equity, and inclusion within CBs?
- How are CBs embracing equity, diversity, and inclusion?
- Are people who experience discrimination actively supported to create, nurture and grow CBs?
- Are CBs based in deprived communities?

- How many assets and of what type are held by communities? What benefits are these assets providing to their communities?
- How are we enabling greater diversity?

### **Impact indicators for the outcome “The contribution of community businesses to addressing society’s challenges increases”**

- What is the impact of CBs on:
  - city and town centre renewal
  - social inclusion
  - a fairer economy
  - creating opportunities for people to participate in the economy
  - creating local re-investment
  - green transitions
  - digital inclusion
  - climate action
  - tackling racial injustices and inequity
  - health and social care

### **Impact indicators for the outcome “Funding and support for community businesses increases”**

- Is there greater funding provided to CBs?
  - From/by whom?
  - In what quantity?
  - What kinds of new support are being offered to the sector?
- What is the quality of that support? What impact does it enable?

### **Impact indicators for the outcome “The Community Business Sector Grows”**

- Has the sector grown?

## **Developmental approach to evaluation**

To achieve the evaluation aims, we approach this as a ‘developmental evaluation’. Our approach is highly collaborative and flexible to allow us to respond to the initial needs of the programme, any issues arising during implementation and any emerging lessons for Power to Change and the wider stakeholder community.

At the heart of our approach is a learning cycle (see Figure 1.1). On a six-monthly basis, we work with programme representatives to review evaluation findings, to assess any implications for hypotheses being tested, to refine or extend these hypotheses, to identify lessons and messages that should be communicated to different audiences, and to identify the priorities for research in the next cycle.

**Figure 1.1: Evaluation learning cycle**



## Evaluation and research methodology

Our methodology is structured around a ‘learning framework’ which sets out our approach and the ways in which we plan to gather evidence to test hypotheses and generate learning. The learning framework includes a broad-ranging suite of indicators and is reviewed at the start of each learning cycle. The learning framework for this evaluation includes a broad-ranging suite of indicators and is reviewed at the start of each learning cycle. This allows successive layers of evaluation evidence to be compiled, tracking progress during the programme and focusing on those issues of most interest and relevance at the time.

Our research activities in the second year of the evaluation have been designed to gather evidence against the current learning framework. The information that we have looked for in our review of documents, and the questions that we have asked in interviews, have been informed by the learning framework. The research activities that we undertook in Year 3 of the evaluation included:

- Online interviews with the project lead from the seven active innovation projects (in spring/summer 2022).
- Online interviews with Power to Change and the programme delivery body (the Centre for Sustainable Energy (CSE)).

- Online interviews with four external stakeholders (Community Energy England (CEE), the Department for Business Energy and Industrial Strategy (BEIS), Regen and one of the DNOs).
- Review of programme and project documentation, including end of Phase reports, final reports and the CSE's progress dashboard for innovation projects.
- Insights from attendance at internal webinars up to December 2021, led by CSE, involving representatives from the innovation projects.
- Insights from preparation for and discussion at an online annual learning event in October 2021 and a face to face event in June 2022, hosted by Community Energy England, at which some innovation projects made presentations
- Insights from an internal webinar in May 2022 involving the Next Generation innovation projects, delivery team and Power to Change
- Insights from case studies and videos prepared by the evaluation team in collaboration with the groups that had delivered measures on the ground.

The topic guides that we used for the interviews were agreed with Power to Change in advance and are available on request.

## Method for assessing innovation

As part of our Year 1 evaluation work on the innovation workstream, we reviewed existing scales that are used to assess innovation projects. These include the widely-used nine-point scale for 'Technology Readiness Level' (TRL)<sup>12</sup> and the six-point scale in the Carbon Trust's 'four journeys' model<sup>13</sup>.

We adapted the 'four journeys' model so that it can be used to track progress of innovation projects within the Next Generation programme. We have not used the TRL scale because it is primarily technology focused, and does not cover business model, market, regulatory or organisational issues. We have adapted the Carbon Trust's four journeys (technology journey, company journey, market journey and regulatory journey) to become the commercial journey, organisational journey, market/technology journey and legal/regulatory journey for CE groups, with only the 'market/technology journey' being unchanged from CT's model. The suggested model is presented below and is used to assess the projects in chapter 2 and Appendix 4.

<sup>12</sup> The TRL scale was originally developed by NASA and can be viewed at:

[https://www.nasa.gov/directorates/heo/scan/engineering/technology/txt\\_accordion1.html](https://www.nasa.gov/directorates/heo/scan/engineering/technology/txt_accordion1.html)

<sup>13</sup> Carbon Trust, 2009.



Figure 1.2: 'Four journeys' scale for community energy innovation



Source: CAG Consultants, adapted from Carbon Trust (2009).

## Limitations

This report can only present limited findings on programme outcomes and impacts, partly because of the limits of Power to Change's evaluation budget and partly because of the research burden on the community volunteers that run and benefit from Next Generation innovation projects. Long-term impacts cannot yet be assessed where these extend beyond the timeframe of the programme.

This report presents both favourable and unfavourable findings on the Next Generation programme. We have named specific groups but have protected the anonymity of respondents as far as we can. It may be possible for those close to the programme to work out the source of certain views.

Finally, this report presents an assessment of some dissemination activities that we led ourselves. It is impossible for us to present these assessments as fully objective. But we have attempted to achieve some objectivity by triangulating our own views against evidence from stakeholder and project interviews and presenting objective statistics where possible.

## **Appendix 2. How did the Next Generation programme work?**

### **Application process for Round 1 and Round 2 groups**

Each group submitted an Expression of Interest (EOI) during the initial application process. Groups that submitted a successful EOI then received some support and funding during their 'Research and Development (R&D) Phase' to work up a full grant application. The full grant had to be confirmed by the Next Generation grant management committee. All of the groups that submitted successful EOIs passed the 'R&D Phase' and were accepted onto the main programme. The Round 1 grants were confirmed in summer 2019 while the Round 2 grants were confirmed in spring/summer 2020. There were some variations in the timing of grant approvals between different groups because varying amounts of work were required during the 'Research and Development Phase'. In a few cases, there was significant change of project proposals between the EOI and final grant application, owing to the groups developing a fuller understanding of project feasibility during the R&D Phase.

### **Project timescales**

The timetable of the project was extended because of COVID impacts on project delivery. While it was originally anticipated that projects would run to spring 2021, this was eventually extended to end March 2021, with final reports being submitted by June 2022.

### **Provision of support by CSE-led consortium**

Up to end March 2021, a consortium led by the Centre for Sustainable Energy (CSE) provided support to the active innovation projects. The support included monthly or bi-monthly 'huddle' meetings with the project lead, a member of CSE's programme staff and – where needed – a technical lead drawn from the wider CSE-led consortium. CSE and the consortium team also played a role in reviewing final reports and other outputs from the projects.

### **Grant approval processes within the programme**

The Next Generation grant was divided into four Phases with around £25,000 of grant support being provided in each phase. Projects were required to meet 'stage gates' at the end of each Phase or at points when they wanted to change or adjust their proposed activities. As outlined in the main report, the total grant award to each project varied according to that project's progress. Approvals were made by the grant committee, which included representatives from Power to Change, CSE and the wider CSE-led consortium. Release of each major phase of grant funding to each project required approval from the Next Generation grant committee. Grants were released in advance of each phase of

expenditure and were justified retrospectively by submission of receipts. The projects were held accountable for grant expenditure by CSE, with advice and support from the technical support lead for each project.

## Appendix 3. Conditions for viability of Next Generation business models

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
PV + EV – installation of EV chargepoints linked to PV installations	<b>Green – currently viable in the right circumstances</b>	<p>EV chargepoints can currently pay back in 10 years in good locations that offer:</p> <ul style="list-style-type: none"> <li>• Regular usage by EV drivers</li> <li>• Low installation costs (e.g. not too much digging)</li> <li>• Low competition from mainstream chargepoint providers (e.g. rural)</li> </ul>	Relatively straightforward for most CE groups, if they have solar PV in suitable locations (e.g. workplaces, visitor attractions, residential)	<p><a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a>: Brighton innovation lab webinar</p> <p><a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a>: final report, lease template, EV+ PV financial model, case study, final video</p>
'Pay as you save' for LEDs and other energy efficiency	<b>Green – currently viable in the right circumstances</b>	<ul style="list-style-type: none"> <li>• 'Pay as you save' schemes for community buildings can be run by</li> </ul>	Feasible for most CE groups who have some knowledge of	<a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a>

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
measures in community buildings		<p>small CE groups, provided they get 'limited' FCA approval</p> <ul style="list-style-type: none"> <li>Definitely worth getting external FCA specialists involved</li> <li>LED investments appear sufficiently robust to be funded via community share offers</li> </ul>	LED installations, provided they bring in external support to help with FCA accreditation	Final report, financial spreadsheet, LED quotation template letter, 'terms and conditions' for payment by instalments
Energy data apps offered by 'data co-op'	<b>Green – currently viable in the right circumstances</b>	<ul style="list-style-type: none"> <li>Viable as an add-on to, or enabler for, other activities</li> <li>The PowerShaper Monitor app is currently available to Carbon Co-op members but Carbon Co-op hope to make it available to other groups on a social franchise model</li> </ul>	Any group that approaches Carbon Co-op for use of these apps, in return for a franchise fee	<a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a> : Carbon Coop innovation lab webinar  <a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a> : final report , case study and other resources
Renewable heat and energy efficiency services,	<b>Green – currently viable in the right circumstances</b>	<p>Viability depends on the target group.</p> <p><b>Community buildings</b> – currently problematic because of closure of the</p>	Advisory role feasible for groups with technical know-how – services to 'able to	<a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a> :

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
<p>trialled by CREW and GCEC</p>		<p>non-domestic RHI and lack of subsidies for communal heat schemes (except for larger schemes which might qualify for the Public Sector Decarbonisation Scheme, Social Housing Decarbonisation Scheme and Green Heat Network Fund)</p> <p><b>‘Able to pay’ households</b> – potentially viable via the ‘Home Carbon Audit’ approach being implemented by CREW (or the ‘People Powered Retrofit’ approach developed by Carbon Co-op, outside the Next Generation programme). This may be solely advisory or may involve ‘end to end’ support for domestic heat pumps installation, which can be part-funded by the Boiler Upgrade Scheme (successor to the domestic RHI).</p> <p><b>‘Fuel poor’ households</b> – many examples outside the Next Generation Programme of CE services being grant</p>	<p>‘pay’ market can be self-funding but services to ‘fuel poverty’ market currently require external funding</p>	<p>CREW innovation lab webinar</p> <p><a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a>: Gloucestershire case study, final report; CREW final report and templates</p>



Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
		funded by Local Energy Advice Partnerships or local authorities (e.g. PEC, BHESCO) or of 'energy café' or similar advice services being funded directly by CE groups (e.g. CREW) including via surplus from other CE projects.		
EV car club – Nadder CE	<b>Amber – not currently viable but may be worth pursuing in some circumstances</b>	Viability would depend on: <ul style="list-style-type: none"> <li>• Identifying regular users for the vehicles</li> <li>• Funding car purchase via grant funding</li> <li>• Fundraising to support ongoing running costs (e.g. £8k per year)</li> <li>• Having a very willing and supportive group of volunteers to help with administration)</li> </ul>	Requires significant input from CE group, but may be worth pursuing in rural areas where a car club can really benefit the local community	<a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a> : Nadder innovation lab webinar; <a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a> : [coming soon] Tisbury Electric Car Club final report, case study

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
		There is potential to improve viability by sharing costs with other CE car clubs (e.g. insurance, telematics)		
Zero Carbon Schools – Green Fox CE	<b>Amber – not currently viable but may be worth pursuing in some circumstances</b>	<p>There has been considerable CE activity in putting solar PV on schools, but this may now be less attractive to schools who have access to Low Carbon Skills Fund (development) and Public Sector Decarbonisation Scheme (capital).</p> <p>There is still scope for CE groups to play an advisory role to schools and local authorities, supporting them in accessing PSDS funding. To provide an advisory role, CE groups need a high-level of technical know-how but Green Fox’s modelling of options may be helpful</p>	Advisory role only suitable for CE groups with high-levels of technical know-how	<p><a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a>: Green Fox innovation lab webinar</p> <p><a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a>: case study, final report and financial models</p>
‘No upfront cost’ domestic-scale solar PV –	<b>Red – not currently viable but potential added value from</b>	Domestic-scale solar is already viable for ‘able to pay’ households. But for a ‘no upfront cost’ model to be viable, LLS	Many CE groups can get involved in domestic solar for the	<a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a> :

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
Lockleaze Loves Solar (LLS)	<b>CE role justifies further innovation and/or feasibility funding</b>	<p>found that some or all of these conditions would have to be met:</p> <ul style="list-style-type: none"> <li>• domestic solar PV would have to cost £500/kW or less</li> <li>• annual average domestic self-use would have to be greater than 40%</li> <li>• there would have to be a 25-year guaranteed electricity export tariff &gt; 6p/kWh.</li> </ul>	‘able to pay’ market. The ‘No upfront cost’ model is only suitable for groups with an appetite for risk and significant organisational capacity (e.g. able to develop partnerships with housing providers, suppliers, funders)	Lockleaze Loves Solar innovation lab webinar <a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a> : case study, learning report and financial models
Flex Community - BWCE	<b>Red – not currently viable but potential added value from CE role justifies further innovation</b>	Community-led aggregation is still some way off being viable. Potential revenues from flexibility services offered by DNOs and national electricity grid currently appear slim, even in Constraint	Currently only suitable for CE groups with high-levels of technical know-how and organisational capacity, able to	<a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a> : B&WCE innovation lab webinar <a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a> :

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
	<b>and/or feasibility funding</b>	<p>Management Zones, so viability depends on stacking revenues.</p> <p>Considerable technical know-how is required. Flexibility services might become more viable if pricing reflected the carbon benefits of demand shifting (i.e. avoided use of fossil fuels at peak times) as well as avoided grid reinforcement costs.</p>	access innovation funding and take risks	final report, case study and supporting documents, Flex Toolkit
Zero carbon microgrids for new homes – PEC, Burnside CE	<b>Red – not currently viable but potential added value from CE role justifies further innovation and/or feasibility funding</b>	<p>CE groups need high-level of technical know-how to take forward a project of this nature, involving multiple partners, regulatory issues and risk management.</p> <p>There are examples outside the Next Generation programme of community-owned energy systems in developments where houses are communally owned (e.g. Lancaster Co-Housing) or where</p>	Currently only suitable for CE groups with high-levels of technical know-how and organisational capacity, able to take risks, possibly in partnership with a	<p><a href="http://www.next-generation.org.uk/webinars">www.next-generation.org.uk/webinars</a>: PEC innovation lab webinar</p> <p><a href="http://www.next-generation.org.uk/resources">www.next-generation.org.uk/resources</a>: Burnside case study, learning report and financial models; [coming soon] PEC report, case study and models</p>

Business model tested by Next Generation	Overall assessment of viability (RAG – Red, Amber, Green)	Under what conditions would this type of project be viable for CE groups?	What types of CE group could pursue this?	Next Generation resources
		<p>development is led by a Community Land Trust (e.g. Transition Homes, Totnes).</p> <p>PEC's modelling tool may help to identify the best technology options in different contexts.</p>	local Community Land Trust.	

## Appendix 4. Detailed assessment of active projects during Year 3

This appendix presents detailed findings on the 7 innovation projects that were researched in detail by the evaluation during Year 3. These are (in alphabetical order):

- Bath & West CE's Flex Community scheme
- Brighton Energy Co-op's 'PV + EV' scheme
- Carbon Coop's energy data co-op
- CREW Energy's low carbon heat project
- Gloucestershire Community Energy's low carbon homes work
- Nadder Community Energy's EV car club
- Plymouth Community Energy's microgrid for zero carbon homes

## (a) Bath & West CE's 'Flex Community' Scheme

### About the group and their innovation project

Bath & West CE (BWCE) is a well-established community energy group, established in 2010 and structured as a Community Benefit Society serving an area with a population of around 260,000. The group was founded to contribute to decarbonisation of the energy system by implementing renewable energy that is locally controlled, delivering local benefit and involving local people in developing solutions to the low carbon energy transition. At the time of this report, the group had 2 full-time and 2 part-time staff, together with 20 regular volunteers and around 1,000 shareholder members and bondholders, of whom about 45% lived in Bath and North East Somerset.<sup>14</sup> At this time, BWCE had raised around £20 million through community shares and bonds and loans from ethical banks. It had installed 12.55 MW of renewables capacity and had distributed over £300,000 of surplus for community benefit, focusing on fuel poverty and carbon reduction initiatives. At the time of this project, BWCE was transitioning from being a renewable energy provider towards becoming a community energy services company.

BWCE received innovation funding from Round 2 of the Next Generation programme for their 'Flex Community' project, run in partnership with Stemy Energy. 'Flexibility services' or 'demand side response' can play a role in enabling the local electricity grid to accommodate more renewable generation. This project simulated the provision of flexibility services by local households to the local Distribution Network Operator (Western Power Distribution) and National Grid Balancing Mechanism, aggregated by BWCE via Stemy Energy's cloud-based platform. Selected electrical equipment in 'Flex Community' households (e.g. domestic hot water heaters, air source heat pumps and electric vehicle chargers) was controlled remotely via the Stemy platform to optimise consumption and/or provide flexibility.

### Review of progress in Year 3

The BWCE final report and project interviews showed that this project simulated real-time flexibility requests to test household responses and validate the business model for scaling and replication. Electrical equipment within the 'Flex Community' households was actively controlled by Stemy for several months during the trials, but potential household income from trading flexibility was modelled rather than real. Although the Flex Community encouraged participating households to install new flex-ready equipment where appropriate (including EV chargers, heat pumps and/or hot water heaters), project interviews indicate that – owing to installation delays - the trials were eventually undertaken with people who had already installed suitable equipment themselves. Those installing new equipment may be able to take part in a follow-on demonstration project with BWCE (see reference to 'ReDream' below).

The project final report indicated that the number of people participating in the final trial was lower than expected: 12 households participated in the final trial, compared to the original target of 50. While over 2,000 households were reached through publicity work, figures

<sup>14</sup> Survey of BWCE members, shareholders and volunteers, undertaken by CAG Consultants on behalf of Community Energy England.



quoted in the report show considerable fall-off with each stage of engagement. The reasons for this are explained in the 'process' section below.

Both project-level and programme-level stakeholders reported that the project generated significant learning for BWCE and other CEBs. This learning included new evidence on the extent to which domestic households tended to over-rule 'turn down' or 'turn up' flexibility offers on their equipment, as well as estimates of the benefits generated for households, BWCE and Stemy Energy. The final report stated that the community aggregator role (as played by BWCE in the 'Flex Community' business model) was not yet viable for a CEB, subject to issues flagged in the 'business model' section below.

### **Factors contributing to success**

Evaluation evidence, including project and programme interviews, suggests that factors that enabled a successful trial included:

- BWCE's high level of expertise, professionalism and organisational capacity, as one of the leading CEBs within the UK.
- BWCE having a strong local network of households who were committed to action on climate change, who trusted BWCE and who would consider joining the trial.
- BWCE having strong partnerships with local organisations and contractors, including Stemy Energy and WPD.

### **Challenges**

Challenges reported by BWCE included:

- A number of external factors (e.g. COVID, Brexit and the Government's Green Homes Grant policy) contributing to shortages of equipment and delays in installing equipment, which in turn contributed to households dropping out.
- Technical issues with the hot water controller leading to withdrawal of this technology from later parts of the trial.
- Technology providers not allowing access to their Application Programming Interface (API).
- Cloud to cloud communications being intermittent and inconsistent, requiring Stemy Energy to provide and install additional control equipment which was not anticipated at the start of the project.

BWCE staff reported that Next Generation funding did not cover all the project costs: BWCE and Stemy Energy both contributed some of their own funding, while EU funding was obtained for a follow-on demonstration project 'ReDream'.

### **Findings on project management processes**

Project-level interviewees reported the Next Generation programme, via the CSE-led consortium, Power to Change and CAG Consultants, provided not only funding but helpful

support for the project. The project also reported that the two project extensions, granted because of COVID, were really valuable in allowing additional data collection and simulation of flex offerings to DNOs and the Balancing Mechanism.

As the number of people engaging with the project was lower than anticipated, the project was given permission by CSE and Power to Change to reallocate underspend to develop an online 'Flex Community Toolkit' for other CEBs who were interested in establishing a Flex Community. As outlined in the dissemination section below, this is now publicly available on the BWCE website.

A key learning point on project management was that flexible management, by Power to Change, CSE and the project itself, was important in a project of this nature.

### Findings on engagement processes

Key findings on engaging with householders were that:

- Flexibility is a complex concept and needed to be explained carefully to potential trial participants (even to those already engaged with environmental issues).
- Face to face events worked better than virtual events when engaging people with complex issues, partly because they could speak to each other.
- Delays contributed to households dropping out, as did equipment failures, COVID constraints, expectations being raised by the Green Homes Grant scheme and older customers being too vulnerable or having insufficient internet connectivity to participate
- BWCE's targeting of suitable households improved during the project, as they learnt which types of households were most and least likely to benefit from flex.<sup>15</sup>

Engagement of installers was also challenging because of the high level of heat pump activity during the trial, stimulated by Green Heat Grant offers. Installers were carefully selected and were trained up by Stemy Energy. But some installers found the complexity of the project off-putting, compared to installing non-flex enabled equipment.

### Findings on impact

The [final project report](#) sets out project achievements and learning in detail, while further insights can be found in the project video and final project case study. This section briefly summarises the project's impacts against Power to Change's strategic aims. The strategic aims are listed in Appendix 1.

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<sup>15</sup> The final report explains that BWCE has learnt to target people who use electricity as their main source of heating, to exclude vulnerable customers and to exclude households who already have multiple renewable energy systems (e.g. EV chargepoint, heat pump, solar PV plus systems that use excess solar power to heat water) because the Stemy Energy flex controller might interfere with optimal operation of these systems.

## Has this Next Generation project helped community business(es) to become more impactful and resilient?

**Significant evidence** - there was considerable evidence that this project had helped BWCE to become more impactful and resilient.

### **More impactful?**

Evidence from project interviews and BWCE documentation showed that the project had helped BWCE to transition from being a CEB focused solely on renewable energy generation to being a group involved with different aspects of the energy system. This had brought them more in contact with users and had required them to develop approaches to managing user service, user satisfaction and user impacts for local households involved in the Flex Community.

The final report presents evidence from a number of user surveys and focus groups. The evidence showed that technical issues did arise in many cases, but that issues were quickly resolved, with most users being happy with the level of communication and service provided by BWCE and Stemy. Users generally found Stemy equipment intuitive to use. Those taking part in the hot water controller trial reported occasional inconvenience from lack of hot water at times it was needed, but generally users were happy from the viewpoint of comfort and wellbeing. Impacts on household energy bills were mixed, with some observing savings but others seeing increased energy bills because of moving from gas or oil water heating to electric water heating.<sup>16</sup>

This was consistent with feedback from in-depth household interviews undertaken for the evaluation:

*I was always impressed [...] with the amount of information we were given [...] the lead times were short and the efficiency and, really professionalism of the electrician who came and did the job. Whenever something went wrong there was always someone to get in touch with and the intervention would be almost instant or the next day, we never felt abandoned to whatever was happening and we were able to provide feedback. (trial participant)*

In-depth interviews with users for the evaluation found examples of strong commitment to environmental concerns, with trial participants explaining that they were participating for the common good rather than for individual benefit:

*I was very much aware [...] that it was a pilot. So there was no great expectation that there would be immediate benefits to us. We would be part of a program to see what could be done. So I don't think we were ready to be either enthused or disappointed, you know, we were Guinea pigs essentially. (trial participant)*

In the trial, participating households did not receive flexibility payments. Analysis of trial results by Everoze, presented in the final report, showed potential flexibility payments to

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<sup>16</sup> Detailed analysis of trial data by Everoze showed that energy use tended to increase during months when equipment was automatically controlled by Stemy compared to earlier months when users controlled their equipment manually, but the reasons for this are not understood and may have been influenced by external factors (e.g. occupancy levels, seasonality).

households would have been low (c. £25 per household per year, if energy bill savings were split evenly between BWCE, Stemy Energy and participating households). Some of these savings were attributable to optimisation of household equipment usage by the Stemy platform, in addition to flexibility revenues.

The initial trial of hot water controllers found that around 77% of households provided flexibility when requested by the Stemy device (i.e. they did not override the request by boosting their water heating). However, the delivery of flexibility was lower during a second trial, for reasons that BWCE was still investigating at the time of this research.

### **More resilient?**

As outlined above, Next Generation funding has generated considerable learning for BWCE and has helped the organisation to diversify away from renewable energy generation. For example, BWCE reported in interview that staff members have been upskilled in how to communicate with local households about flex issues.

*The organisation has learned a huge [...] amount about how to set up a flex project, and what we will do differently next time. Our learning from this project has been massive. (project lead)*

The project has also helped BWCE to develop 'customer facing' services and develop their approach to customer service.

*We have learned that we have to have a dedicated customer service facility. If we don't have it for future projects, we will lose people quite quickly. (project lead)*

BWCE also commented in interview that the organisation was more resilient because it had diversified from solar generation into customer-facing work. Learning from the Next Generation project was reported to have enabled BWCE to secure EU funding for a follow-on demonstration project which would take forward the next few stages of 'Flex Community' work.

*I feel that we are now much more secure as an organisation, much more able to respond to where the energy market is going. (project lead)*

### **Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some evidence** - there was some limited evidence of Next Generation support contributing to this aim. The final report and interview provided evidence of BWCE liaising with a number of external partners in the energy system including Western Power Distribution (WPD, the local Distribution Network Operator), National Grid (the Electricity Systems Operator), Everoze, Stemy Energy and Ofgem, but some of these relationships may have been pre-existing. It is possible that the BWCE's 'Flex Community' project may have raised understanding of potential CEB contributions to flexibility, beyond the community energy sector, but we did not find direct evidence of this in our research with external stakeholders.

BWCE reported that their relationship with WPD had developed significantly in the successor EU-funded project, ReDream, where they are working directly with WPD.

Interview evidence indicates that the Next Generation project provided a stepping-stone towards this.

### **Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** - there was no evidence of the BWCE project contributing to this aim. The project focused on upcoming societal challenges (see next section) rather than on improving the diversity or inclusivity of BWCE's work. The final report indicates that the trial was publicised to a wide audience of local people, beyond BWCE's membership. However, BWCE reported that it was inappropriate to accept vulnerable people onto the trial because of the risk of technical failure which might leave them without hot water or heating. There was also a risk that vulnerable people might not fully understand the nature of the flexibility trial, despite BWCE briefings. Although the evaluation team has not seen demographic data, interview evidence suggests that trial participants were generally owner-occupiers who had invested in EV chargers, hot water heaters and/or heat pumps.

### **Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence** - the BWCE project had progressed the possibility of CEBs addressing the climate challenge by encouraging households to participate in flexibility services. BWCE's report explains that the direct carbon savings by households participating in flexibility services were limited, being subject to the same caveats as outlined above for energy bill savings. However, the report highlights that flexibility services are important for Net Zero objectives because they can enable more renewable capacity to connect to the electricity grid. Essentially, flexibility services help to improve the match between electricity supply from renewables and electricity demand from consumers. This was emphasised in interviews with BWCE and Stemy Energy staff:

*Flexibility is very important if you want to have 100% renewable system, [it] will keep the stability of the electricity system. Also [it] can avoid congestion in the future - [bringing in] more EVs, more heat pumps, flexibility will enable that without having to put in more wires. (project partner)*

The BWCE project has generated significant learning on whether and how CEBs can help to address climate change by acting as a 'community aggregator' of flexibility offered by domestic households. While the project has not resulted in a viable business model (see section below), it has clarified how a CEB could fulfil such a role, if and when such a business model becomes viable.

### **Has this Next Generation project resulted in increased funding or support for community business(es)?**

**Strong evidence** – the Next Generation project had acted as a stepping stone to BWCE obtaining funding from the EU for its role in the [ReDream](#) project. In this follow-on project,

BWCE is working with WPD and Stemy Energy to demonstrate further flexibility services and peer to peer energy trading with local households in a Constraint Management Zone.<sup>17</sup>

*[The] project provided foundations to get EU funding for a 3 year programme. In summary the project acted as an essential stepping stone in taking us toward a more thorough understanding on what is needed, and inching towards a viable business model. (project lead)*

It is possible that the ‘community aggregator’ role for CEBS, offering flexibility services to local households, may eventually generate additional funding streams for CEBs. However, the business model for this is not currently viable.

### **Has this Next Generation project contributed to the growth of the Community Business Sector?**

**No evidence** – as the business model for ‘community aggregation’ by CEBs is not currently viable, there is no evidence at this stage that this project has contributed to growth of the Community Energy Business Sector. This may change in future if the model becomes viable under conditions discussed below.

### **Findings on business model viability**

While the BWCE project generated considerable learning about how CEBs could act as ‘community aggregators’ for flexibility services from local households, the business model is not currently viable. In interview, BWCE reported that they had identified a number of areas, where they needed to adapt the model to make it viable, from a market-level and service delivery perspective. Considerations flagged in the final report included:

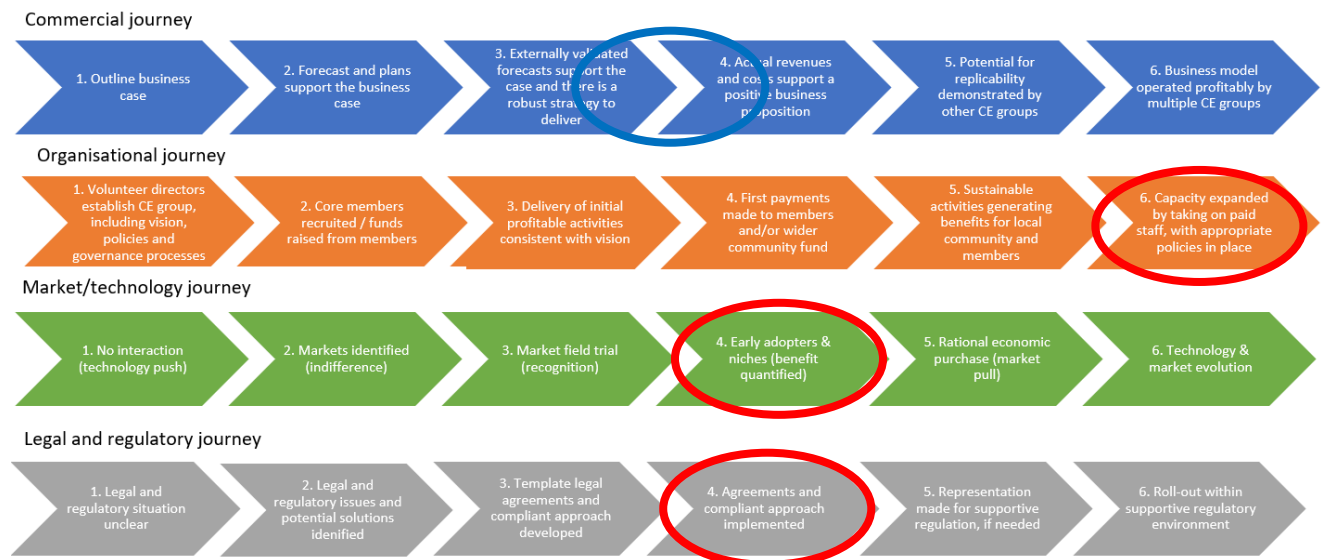
- The levels of take-up of ‘Time of Use Tariffs’ compared to portals for flexibility services - the report found that households approaching the trial who were already on Time of Use Tariffs tended to have less scope for flexibility services because they were already shifting their demand to obtain cheap tariffs (e.g. by charging their EV overnight).
- The need to ‘stack’ revenues from multiple flexibility services in order to improve the viability of the business model, involving complex rules about which types of services could and could not be offered at the same time to the DNO and the National Grid (ESO).
- The possibility of generating other revenue streams for a ‘community aggregator’ service such as referral fees from equipment installers (which might prejudice trust in the service) and/or charging installers a fee to access the flex platform (which would only be viable when the platform could demonstrate access to significant volumes of households).

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<sup>17</sup> A Constraint Management Zone is an area where the Distribution Network Operator has identified a shortage of capacity in the local distribution grid for electricity. Flexibility services offered in these zones will generally have higher value to the DNO because they help to avoid or delay investment in new grid infrastructure.



The evaluation and BWCE's joint assessment of the status of the business model is shown below. Progress has been made on the 'market/technology journey' since the Year 2 report, with this progressing from step 3 to step 4, as shown by the red ovals. The blue oval on the 'commercial journey' shows that the project is between step 3 and 4, having a mix of actual data (on costs and on household behaviour) and modelled data (on revenues). This oval is shown as blue because there is not currently a positive business proposition.



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

BWCE's final report highlights that the following changes would be needed to make the 'community aggregator' viable for CEBs:

- **Increased scale** – e.g. aggregation across 500-1000 households.
- **Cost reductions** (e.g. streamlining the staffing of service provision or using volunteers for some tasks to reduce costs; reduction of 70-80% reduction in the cost of the smart energy controller; or improved cloud connectivity so that the smart energy controller is no longer needed) .
- **Increased revenue streams** – income from flexibility services or other sources would need to increase by 25-30% for the model to be viable.

### What types of CEBs might this business model work for?

The 'community aggregator' role is complex and requires high levels of technical expertise and customer service. BWCE's final report and interviews recommend that this is only suitable for CEBs with paid staff and a willingness to accept risk.



## What advice should be given to other CEBs considering this type of work?

Key advice from BWCE to other CEBS considering work in this area is:

- **Stay current:** this is a fast-moving field so find out about the latest developments before embarking on any projects involving flexibility.

*Do your homework - listen to the free webinars - to find out the state of the energy transition and the flex markets, and what measures you can use to deliver flexibility. Find out what hardware/software is out there. (project lead)*

- **Recruiting participants:** the concept of flexibility is complex so clear messaging and a nuanced approach to targeting is required to successfully recruit households to a flex community. This should aim to draw in participants who are not already effectively flexing their demand or whose needs match the level of flexibility service being offered.
- **Supply chain:** good quality installers of both energy technologies and smart devices are limited, are exceptionally busy and have limited capacity to focus on new approaches, so it is essential to establish good working relationships, with clear expectations on both sides around workflow and non-standard installations where necessary.

Detailed learning from this project has been integrated into a Flex Community Toolkit which is available online [here](#).

## What policy changes could help to make this model work?

In the final report and in interview, BWCE made a number of specific recommendations for the wider energy sector, including:

- Increase the compatibility of flexibility services offered by both national and regional markets to maximise the potential to stack revenue streams.
- Speed the adoption across all Distribution Service Operators of standardised systems, expectations, and services with regards flexibility.
- Improve smart meters such that data can be recorded at a level of resolution that will facilitate flexibility at a domestic level, or adapt domestic flexibility services to rely on lower resolution data (e.g. WPD's Sustain-H).
- Adapt electricity supply regulations such that the sale of electricity to local consumers can be recognised within the market and value can be attributed to the reduction in distribution and transmission costs.
- Consider pricing flexibility services to reflect the carbon benefits that flexibility offers (enabling the grid to connect more renewable energy) rather than basing it solely on the value of avoided upgrades of electricity grid infrastructure.

A shift in regulations to facilitate peer to peer trading, which are included in the Local Electricity Bill, would also bring benefits for the flexibility business model.

### **What are the next steps for the CE sector?**

BWCE would support some form of peer learning group or peer mentoring process for CEBs interested in progressing business models for offering flexibility services via a 'community aggregator', subject to funding being available for this.

### **To find out more**

Further learning from BWCE's project can be found on the [Next Generation website](#):

- Final project report.
- Project video and case study.
- The Flex Community Toolkit, including detailed customer journey, learning strategy documents and so on.

## **(b) Brighton Energy Co-op's 'PV + EV' scheme**

### **About the group and their innovation project**

Brighton Energy Co-op (BEC) is a well-established CE group that has been running for 10 years. It has over 700 members with about 70% in the Brighton area and has more than 80 solar PV arrays at 40 locations across the South East. Income from selling this solar electricity is distributed as interest to their members, as capital repayment and also goes into their community fund which currently funds environmental education initiatives for schools. The group has several paid staff and takes a highly professional approach to its work and has run multiple community share offers.

BEC have been funded by Round 1 of the Next Generation programme to investigate and pilot electric vehicle (EV) charge points linked to their existing solar panels ('PV + EV'). The aim was to develop a business model for EV charge points that would help to support future investment in community-owned solar viable after the end of the Feed-in-Tariff, while also supporting low-carbon charging of EVs by members of the local community.

### **Review of progress in Year 3**

BEC had installed a total of 11 EV chargepoints (7 kw) at different locations by the end of the Next Generation programme, offering 17 charging ports. These were installed across a range of sites including workplaces (e.g. Brighton University, Shoreham Port), visitor attractions (e.g. Bolney Wine Estate, Amberley Museum) and residential estates (Parkgate). Most of these sites offered electricity from onsite solar PV arrays, while one potential site offered electricity from an onshore wind turbine. Two further EV chargepoints were bought by BEC from the Next Generation programme and will be installed at further locations by BEC, beyond the end of the programme.

#### **Factors contributing to success**

BEC worked closely with the landowner at each site to install the EV chargepoints, with revenue being shared between BEC and the landowner. BEC reported that the chargepoints work well, with few technical problems, although 'back office' support from the chargepoint provider can be slow.

Throughout the project, BEC approached the 'PV + EV' project in a professional manner, bringing project management expertise from their extensive solar PV experience. They brought in expertise as needed to deliver all aspects of the EV project, including an additional team member contributing communications and research expertise one day a week.

## Challenges

Usage of the chargepoints was lower than expected because of the impacts of COVID: the highest usage was seen at university workplace car parks and the lowest usage in residential or school locations where there are currently few EV users. BEC report that the most challenging aspects of the project were:

- Identifying suitable sites for EV chargepoints.
- Negotiating agreements with landowners.
- Assessing future trends in the EV market.

*The legal agreements have been time-consuming and more complicated than we first thought. [...] For each of the organisations, we had to go through agreeing a different type of license agreement and then once that was agreed, doing an electrical survey and working out where's the best location for a chargepoint. (project lead)*

## Findings on project management processes

BEC were positive about the support they had received from the CSE-led consortium and the flexibility that had been shown in granting project extensions. Delivery was spread over a long time-frame, largely because of the COVID pandemic. It would possibly have been more efficient to deliver the project over a shorter timeframe, contributing 2-3 days/week rather than 1 day/week.

One partner reported some communication delays in the early stages of the project, relating to COVID and lease negotiation issues, but partner organisations were generally very pleased with deliver, reporting that installation was efficient and well organised. Some partner organisations mentioned that they could track chargepoint usage via a live dashboard offered by the chargepoint provider.

## Findings on engagement processes

BEC undertook a survey at each site with EV drivers and non-EV drivers, using a tailored approach to reach the local community at each site. For example, Brighton University broadcast the survey to people using university car parks, as part of email communications relating to a green travel scheme. Key findings from the surveys were that:

- Location was the primary factor affecting EV drivers' use of a chargepoint, with a green, local energy source being the second most important factor, followed by charging price.<sup>18</sup>
- Use of a renewable energy source for the EV chargepoint was reported to be a stronger draw than community ownership, if the location, availability, charging speed and price of chargepoints was equal.

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<sup>18</sup> Attitudes to electric cars, solar PV and Community Energy research, Brighton Energy Co-op 2021. Respondents may have been 'early adopters' or environmentally motivated as they chose to respond to a survey about EVs.

- Frequently quoted reasons given by those who had not yet made the change to an EV were lack of charging at home and not enough public chargers, in addition to the concern about the purchase price of EVs.

Different methods were used to engage users depending on the nature of the charging site (e.g. workplace sites, residential sites and 'destination' sites):

- **Workplaces** tended to know who their EV users were and could promote the EV chargepoints directly to them. The chargepoints were marked on their location maps, and signposted in their customer/staff communication about parking.
- **Residential sites** were publicised via local residents committees (e.g. via WhatsApp groups) and by putting postcards with QR codes through the letterboxes of local residents and pinning them on local notice boards.
- **Destination sites** publicised the chargepoints to potential visitors via their website and communications, as part of their sustainability and accessibility credentials.

In all cases, chargepoints were publicised via EV chargepoint mapping apps (e.g. ZapMap, podpoint maps, Plug Share). Given the relatively low take-up of EVs at present, marketing via targeted routes (e.g. 'Electric Brighton' and 'the Sussex EV Facebook Group') and the mapping apps was more cost-effective than marketing to untargeted audiences.

*Maps are so important for user confidence to invest in EVs - they are number one. It's not worth us spending lots of money to market individual chargepoints – we can spend that time getting the maps right. (project lead)*

BEC chose to set up their chargepoints as a 'network' so that they are all shown as BEC installations, enabling the chargepoints to be shown as community owned. The level of competition from free and low-cost chargepoint providers was significant in urban areas but lower in more sparsely populated rural communities outside Brighton.

## Findings on impact

The final project report sets out project achievements and learning in detail, while further insights can be found in the project video and final project case study. This section briefly summarises the project's impacts against Power to Change's strategic aims. The strategic aims are listed in Appendix 1.

### Has this Next Generation project helped community business(es) to become more impactful and resilient?

**Some evidence** - there was some evidence of the project helping BEC to become more impactful (in terms of engaging with users and installing chargepoints in sites that would not be viable for commercial providers) and more resilient (in terms of increasing its expertise and broadening out from solar PV installation).

### **More impactful?**

Prior to this project, BEC's social impact mainly related to installation of FiTs-supported solar PV and distribution of surplus to support local climate action. This project enabled BEC to start new activities that were more user-focused.

BEC project staff reported that, because BEC was not a commercial operator, it did not need to make a profit on the chargepoints, and could therefore install chargepoints at locations that would not be attractive to commercial operators (e.g. sites in rural areas outside Brighton where commercial and 'free to use' chargepoint densities were lower).

As noted above, BEC undertook research with potential users in each chargepoint area ahead of installation. This deepened BEC's understanding about user needs and about patterns of chargepoint usage and EV ownership.

*The Next Generation funding has enabled us to understand more about potential and existing EV drivers' needs and requirements when it comes to charging in their local area.. [...] We've also carried out research surveys at each site to understand what people are looking for, for their charging and what's stopping them from buying electric vehicles at the moment.  
(BEC communications lead)*

BEC was not able to survey chargepoint users directly because the chargepoint provider did not share the identity of users and their vehicles for confidentiality reasons. Although usage of chargepoints was relatively low during the research period, because of people travelling less during the pandemic, the chargepoints offered reasonably priced charging to a small number of users from low carbon community-owned energy. Benefits identified through user interviews led by the evaluation team were small-scale, owing to the scale of the trial, but included that:

- One residential area and several workplaces/visitor attractions had their first chargepoints installed - these enabled local people to consider EV usage.
- Regular users were able to charge their EV at work, in some cases more cheaply than at home - while purchase of EVs involved a high capital cost upfront, the costs of EV charging were reported to be significantly lower than fuel costs for petrol or diesel cars.
- Users reported that charging from a renewable energy source was attractive to them
- Chargepoint partners reported that EV charging facilities helped to attract prospective staff, building tenants and visitors and contributed to their sustainability goals, particularly because the chargepoints were linked to renewable energy.

One user commented that the chargepoint service would be improved if there was a system to remind you that your car was fully charged so that you could move on and let someone else take the space. Some partner organisations also commented on the other benefits of engaging with BEC including community engagement activities and educational activities.

### ***More resilient?***

Next Generation funding enabled BEC to test and pilot the 'PV + EV' business model, which would have been too risky for them to have funded via a community share offer. The installation of EV chargepoints broadened BEC's previous focus on installation of solar PV and hence made some contribution to the resilience of the organisation. Through this project, BEC has learnt where EV chargepoints are most likely to add to the viability and resilience of their solar PV investments.

The project lead also commented that Next Generation, and its successor funding obtained from ERDF, effectively helped BEC to bridge the gap between FiTs-supported solar PV project activity and their future pipeline of unsubsidised solar PV developments. There was a gap in solar PV activity when FiTs subsidies ended, which coincided with the COVID pandemic in 2020/21, but the market for solar PV has now taken off again, driven by interest in Net Zero and other changes in the market (e.g. reduced PV prices, increased energy prices). BEC is run on a 'lean' basis, with staff being paid for the days they work, so having additional 'project days' funded by Next Generation and ERDF helped to make the organisation more resilient by supporting some of BEC's key staff during the gap in solar PV activity.

More generally, the project lead commented that involvement in the Next Generation programme had diversified BEC's knowledge and experience and had raised their profile. The funding enabled them to bring in expertise to support the EV project and involvement in the programme as a whole enabled BEC to develop new connections and conversations (including conversations with Nadder CE about a potential EV car club in the Brighton area).

### **Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some evidence** – The Next Generation funding enabled BEC to bring in a part-time expert to work on the 'PV + EV' project. This expert was subsequently recruited by the Energy Systems Catapult (ESC), also on a part-time basis. This individual reported that their understanding of the Community Energy sector deepened through their engagement with the project. They have taken this understanding into their work at ESC which involves encouraging local authorities to take action on the Climate Emergency. Indirectly, and on a small scale, the project may therefore have contributed to some increased understanding of CEBs within ESC.

### **Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** – Interview evidence suggests that early adopters of EVs tend to be relatively affluent. While it is possible that lower income households may eventually benefit from the EV chargepoint located in the residential community at Parkgate, and that this chargepoint may reduce barriers to EV usage in this community, the level of EV usage within that community is currently very low. BEC is also in discussions about installing EV chargepoints for a local community transport organisation.



### **Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence** – BEC was already addressing climate change issues prior to its engagement with the Next Generation project, through community-funded investment in solar PV arrays and through distribution of surplus profits to energy-related community initiatives. The Next Generation project was intended to improve the business case for additional solar PV arrays, by showing that EV chargepoints could generate additional revenues. In practice, the project found that the addition of EV chargepoints to a solar array investment may or may not improve the viability of a solar array, depending on the detailed characteristics of the site (e.g. construction cost, predicted usage, extent to which charging profile matches renewable energy generation profile and so on).

If the 'PV + EV' model is widely replicated, BEC's approach may also contribute, eventually, to the extension of EV chargepoint networks into rural areas less well served by mainstream providers, helping to 'future proof' and support these areas. There is as yet little direct evidence of this except at a few 'destination' locations in rural areas, such as Amberley Museum and Bolney Wine Estate. At present, BEC's modelling work suggests that EV chargepoints can be viable in combination with solar PV but not on a standalone basis.

### **Has this Next Generation project resulted in increased funding or support for community business(es)?**

**Strong evidence** - The Next Generation project acted as a stepping-stone for BEC to obtain ERDF funding for a follow-on project which is supporting wider roll-out of solar PV, including EV chargepoints where viable.<sup>19</sup> Depending on the characteristics of potential 'PV + EV' locations, roll out of the business model may increase the revenues generated by BEC and other community groups from 'PV + EV' investments.

### **Has this Next Generation project contributed to the growth of the Community Business Sector?**

**No evidence** – there is no evidence that the Next Generation project has yet contributed to growth in the Community Business Sector. It is possible that this evidence may develop over time.

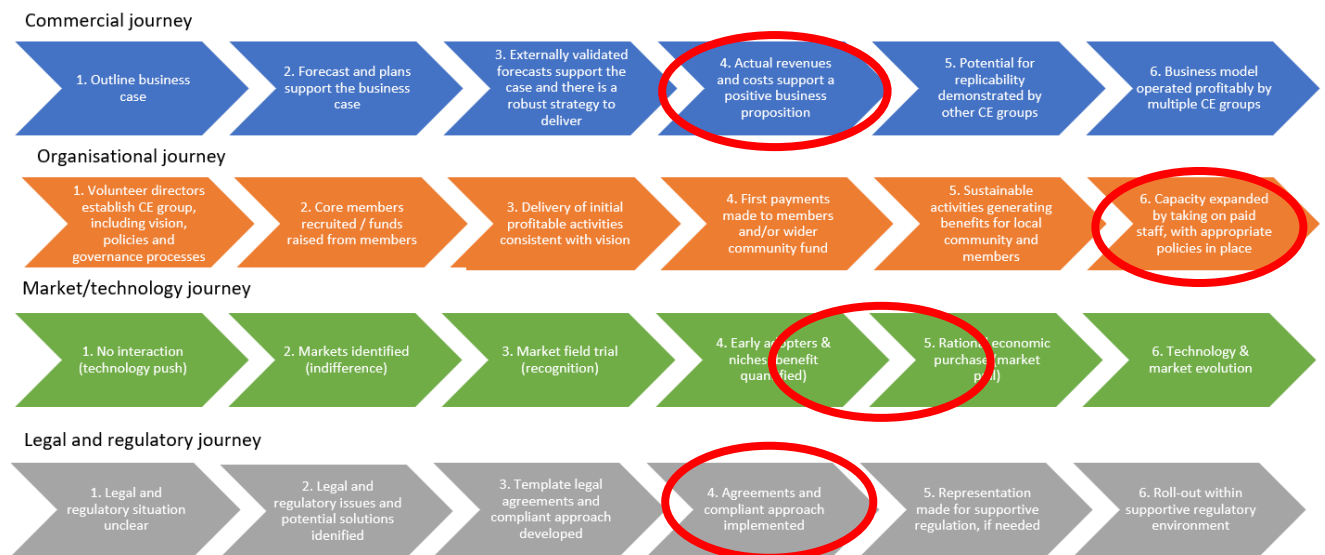
## **Findings on business model viability**

In our assessment of the business model, the commercial journey has moved from step 3 in Year 2 to step 4 in Year 4. BEC's organisational journey remains at step 6. The 'market and technology' journey is now assessed as between steps 4 and 5, as there is beginning to be 'market pull' for EVs, with sales of EVs now being reported to be higher than diesel. High fossil fuel prices also push towards EVs, although electricity price going up too. BEC reported seeing a modest increase in usage of chargepoints over time. In terms of the legal/regulatory journey, there are few barriers but few incentives: grants from the Office for Low Emission Vehicles (OLEV) are available for businesses to install chargepoints but there are no incentives for homes to install chargepoints or buy EVs. While local authorities have

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<sup>19</sup> BEC report that take-up of EV chargepoints via the ERDF project has been low, with most of the project beneficiaries option for solar PV without EV chargepoints.

access to public sector funding to fund installation of chargepoints, there are no incentives for local authorities to make links with CE groups.



## Implications for CE sector

BEC found that the ‘PV +EV’ model can, for certain types of sites, add to the viability of solar PV investments. It can also diversify the activities of CEBs, giving them a role in meeting the transport needs of local businesses and residents. The EV market is evolving fast: the niche for CEBs is likely to be in locations that would not be attractive to commercial chargepoint providers.

### What needs to change to make this business model viable for CEBs?

BEC found that installation of EV chargepoints could add value to renewable electricity installations where:

- The location would generate reasonable levels of usage (e.g. a few hours of charging on a daily basis).
- The location was not close to free chargepoints made available by other providers (e.g. supermarkets, local authorities).
- Installation costs were low (e.g. short distance to suitable electricity supply).
- Cheap renewable electricity, generated onsite, could be used to provide a high proportion of charging, reducing usage of more expensive grid electricity.<sup>20</sup>

<sup>20</sup> BEC’s approach did not involve installation of batteries alongside the EV chargepoints. This would increase the capital cost but would also enable more usage of onsite renewable electricity.

### **What types of CEBs might this business model work for?**

The 'PV + EV' business model is relatively straightforward for most CE groups, if they are investing in, or already have solar PV, in suitable locations (e.g. workplaces, visitor attractions, residential). It may also be viable for other renewable energy sources (e.g. wind).

### **What advice should be given to other CEBs considering this type of work?**

Key advice from BEC to other CEBs considering work in this area is:

- Margins are tight - EV chargepoints may add to the viability of solar PV where:
  - installation costs are low (e.g. location is very close to an adequate power supply, to avoid too much digging to lay cables)
  - charging patterns makes the most of cheap solar power during the day
  - chargepoints are regularly used for a few hours a day
- Stay current - the EV marketplace is changing fast.
- Avoid locations likely to have strong competition from other chargepoint providers.
- In negotiating with landowners, tap into their sustainability goals.
- Use lease/licence templates to reduce legal and procurement overheads.
- Keep insurance costs down by integrating chargepoint insurance with other site insurance (e.g. solar PV installation insurance).
- Select your hardware carefully, considering warranties, on-costs, support software and follow-up service - consider running a tender if buying in volume.
- Publicise your chargepoints using mapping services (e.g. Zap Map, Plug Share).
- Promote the renewable and community benefits of your chargepoints.

### **What policy changes could help to make this model work?**

BEC report that policy changes that would improve the viability of this model for CEBs include:

- Improvements in the inter-operability of EV chargepoints from different manufacturers/providers (so that CEBs could where necessary switch between providers for ongoing operation and maintenance of their chargepoints).
- Incentives for take-up of EVs within the population.
- A more supportive environment that encourages local authorities to collaborate rather than compete with CEBs in the provision of EV chargepoints.

### **What are the next steps for the CE sector?**

The next step is to publicise BEC resources to the CE sector, to help other groups considering investment in EV chargepoints. BEC have suggested that this could include a 'process flow' diagram setting out the steps involved in installing EV chargepoints alongside renewable energy installations.

### **To find out more**

Further learning from BWCE's project can be found on the [Next Generation website](#):

- Final project report.
- Project video and case study.

## (c) Carbon Co-op's energy data co-op

### About the group and their innovation project

The Carbon Co-op is an energy services and advocacy co-operative that aims to help people and communities to make the reductions in home carbon emissions necessary to avoid runaway climate change. The Carbon Co-op was founded in 2008 as a response to members' concern about the threat of climate change and to enable the development of a collective and pro-active response leading to a large-scale reduction in carbon emissions from homes and communities. At the end of 2020, the co-op had 450 members and 18 employees with governance provided by a board of 13 directors made up of both members and staff.

The co-op has had an interest in digital systems since its inception and over time has developed a growing suite of digital tools and services as it perceives that the creation, aggregation, processing, analysis and manipulation of energy data is becoming increasingly important as the energy system becomes more decentralised and more decarbonised. To date the private sector has dominated data collection, manipulation and management. However, Carbon Co-op sees a potentially powerful role in the digital energy system for citizen co-operatives: groups of consumers, enabled through digital technology, to collectively provide and use energy services, and has used funding from the Next Generation Fund to start to explore the possibilities for an Energy Data Co-op.

Carbon Co-op distinguish between two types of data co-op:

1. A co-operative that offers **specific data services** to its members, selling/protecting data generated from everyday activity from browsing the internet to using a phone. This kind of co-operative is unlikely to directly engage in any kind of activity other than managing member data. Eg <https://data.coop>
2. A co-operative generating income based around using data and digital tools in combination with other services. These co-ops might be titled 'digital first' or '**digital organisations**'. For inspiration see Janet Hughes' '[What a digital organisation looks like](#)'.

With the support of Next Generation funding, the Carbon Co-op sought to explore Data Co-op model no.2.

Source: Carbon Co-op, Energy Data Co-op Final project report (June 2022).

## Review of progress in Year 3

This is a Round 2 project which joined the Next Generation innovation programme in the summer of 2020. The project has now been completed. An early action of this project was the development of a longlist of potential software-based energy services, this was subsequently refined through a mini business modelling process. Four service options were identified as being suitable for further development, and three of these have been taken forward with Next Generation support.

### **PowerShaper Monitor** <https://powershaper.io>

This fee-paying service allows householders to access, view, download and analyse high definition smart meter gas and electricity data via Carbon Co-op's portal. The service can be used by householders to evaluate the impacts of measures they have taken to improve the energy performance (in terms of efficiency and carbon) of their home, including heat pump installations. As of June 2022, the Carbon Co-op reported that 105 people were using the service.

Although originally intended for householders Carbon Co-op have come to realise that the tool can be of used by the co-op and other organisations, including other community energy groups, who wish to evaluate the performance of their interventions, NESTA are reported as having commissioned the service as part of a heat pump engagement trial and the co-op anticipate further such activity in the future.

### **Impact Tracker** <https://hub.carbon.coop/impact-tracker/>

The Impact Tracker tool allows users to baseline their energy use and then track the impact of technical and behavioural changes on their energy use (including changes arising from their involvement with Carbon Co-op). The tool has been piloted with over 100 Carbon Co-op member users but is not yet considered to be fully market ready.

### **Building performance evaluation tools**

This service involves the use of monitoring equipment in the home to enable users to collect home environmental data to evaluate the impact on the home environment of domestic energy efficiency measures. At the end of the Next Generation project this service was in a beta testing phase in its development. Equipment had been installed in four homes and energy dashboards in development. Carbon Co-op believe that it could play a significant role in future service offers and have secured funding from Innovate UK to enable further development of the product.

*Powershaper Monitor and Building Performance Evaluation services are being integrated into OpenEnEffs, an Innovate UK-funded Carbon Co-op project to develop a scalable and open evaluation approach for energy efficiency interventions based on the CalTRACK methodology. This project has the potential to inform the delivery of entire government energy efficiency programmes and move the UK away from outdated and inaccurate deemed or modelled assessments and towards a more accurate and scalable 'pay by performance' approach. Source: Carbon Co-op, Energy Data Co-op Final project report (June 2022).*

### **Factors contributing to success**

The co-op is keen to continue to engage in the digital arena, to evolve existing products and services, and to develop new ones. An interviewee noted that the co-op has a long-term view and that products developed with Next Generation support build on and evolve previous work, and will be built on in their turn, thereby contributing to as yet unrealised benefits for the co-op and its members.

*PowerShaper Monitor, sort of, plays a part in that because it is a small tool but it's actually quite foundational to other income-generating things. Strategically, it fits into our wider strategy and it's good. (project lead)*

Whilst the Carbon Co-op, unusually for the community energy sector, has a strong focus on software design and digital services participation in the Next Generation Innovation programme has helped them to develop a better understanding of the processes involved in new product/service development. This has led to a significant improvement in the way that the co-op approaches software design and development.

*It's [Next Generation support] been huge because it's underwritten that development and that learning. It's enabled us to, really, through action, through doing stuff, reflect on and learn about systems and processes and, importantly, the kind of skillset that we need internally. It's enabled us to build that skillset internally as well. (project lead)*

### **Challenges**

Delivering the Next Generation project led the co-op to realise that the existing organisational structure, the roles of some individuals, and the ways in which teams worked together needed to change.

Project management initially caused some challenges as managing the development of software to supply direct services requires a range of technical, commercial and people skills. Individuals with the necessary skillset are in short supply and a problem for the community energy sector is that they are competing with commercial businesses able to offer substantially more attractive salaries. Eventually the co-op identified an individual with the right skill-set and this was important in ensuring the successful conclusion of the project.

Another internal challenge was found to be the inherent tendency for specialist teams to operate in 'team bubbles' during the development process – something that was exacerbated by the pandemic. This meant that some aspects of the work developed without sufficient input from across the wider team and potential user community. This meant that some time was lost as a result of teams working together to develop an aspect of a product



that, when exposed to wider challenge, was found not to be fit for purpose. As noted above, Carbon Co-op have used the experience they gained from working on the Next Generation project to inform a significant overhaul of their internal working arrangements.

### **Findings on project management processes**

Carbon Co-op interviewees had little to say about the management of the programme but one interviewee expressed disappointment that they had not received more help from Next Generation with the dissemination of project learning. They wondered whether one reason for this is that the organisation, and the project, do not fit the mould of conventional community energy projects. In particular, the interviewee wondered whether there was a lack of understanding of what the project is seeking to achieve and the processes involved. This was reported as having created some occasional tensions as the outputs from the project were not as tangible as those from others, and it was less clear to Next Generation how funds had been spent.

### **Findings on engagement processes**

Involving end users to inform the development of the services was found to be very useful but one interviewee felt that this should have happened earlier and been more sustained. The same interviewee felt that the project had drifted at one point and suggested that higher levels of user engagement might have provided the project team with greater focus at that time.

Carbon Co-op initially anticipated that members would be a key initial audience for their new services, and that the customer base would then be extended to non-members who would be expected to pay a modest annual fee. A target of 1000 users was set for PowerShaper Monitor, this being the commercial break-even point.

In practice, the market has evolved and there are now commercial operators offering similar services for free as a means of attracting customers to use other, paid for services. Realising this Carbon Co-op have revised their approach and are now taking a more holistic perspective on value creation from the tools and PowerShaper Monitor in particular. This includes recognising that the inclusion of the service for free to members enhances the attractiveness of joining the co-op. In a similar vein, Carbon Co-op plan on selling access to PowerShaper Monitor to a sister organisation, People Powered Retrofit, who will then offer the service for 'free' to their customers. The co-op sees most of the future revenues growth from the Monitor as coming from such arrangements and reported having had discussions with a number of potential customers. Potentially, instead of needing 1,000 individual customers, commercial viability could be attained through commercial relationships with two to three partner organisations.

*What we've realised is, "Hang on, this isn't a mass-market low-value tool, it's a [...]low-cost tool that underpins other high-value services. That's now our route to market. (project lead)*

### **Findings on impact**

The [final project report](#) sets out project achievements and learning in detail, a short key point summary can be found in the [final project case study](#). This section briefly summarises the

project's impacts against Power to Change's strategic aims. The strategic aims are listed in Appendix 1.

### **Has this Next Generation project helped community business(es) to become more impactful and resilient?**

**Mixed evidence** - there was little evidence that this project had helped the Carbon Co-op to become more impactful, but strong evidence that it is helping the organisation to become more resilient.

The Carbon Co-op is a well-established and widely connected organisation and there is ample evidence that it has, and continues to, play a role in shaping the conversation about domestic energy efficiency matters. It is not clear that participation in the Next Generation innovation programme has improved its ability to be impactful, but the evidence suggests that it is helping the organisation to continue to evolve, particularly in relation to its involvement in the digital arena of the energy debate.

Carbon Co-op sees the provision of digital/software energy services as an important component of their forward strategy and, in particular, are keen to identify and pursue commercial opportunities that both deliver against the co-op's agenda, whilst also helping to create meaningful income streams. The available evidence suggests that Next Generation support has enabled the co-op to improve the robustness and effectiveness of internal processes; something which will improve their ability to take on future projects. Whilst also enabling the development of one and potentially two, income generating services, one of which, PowerShaper Monitor, is forecast to be commercially viable (i.e. to at least generate sufficient income to pay for itself) in the near future.

### **Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**No evidence** - the nature of the project meant that there was limited need to engage external partners and none were interviewed during the evaluation. It is possible that the involvement of Carbon Co-op in the digital space may positively influence the view of external stakeholders by demonstrating that community businesses can operate within this arena, but we have no evidence to support this view.

### **Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** - there was no evidence that the project contributed to this aim. One interview suggested that the project may have helped to support a growth in the co-op's membership, albeit as one of several factors. Such growth may have led to the involvement of people from different backgrounds becoming involved with the co-op, but there is no evidence to support this supposition.

### **Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence** - the project aims to improve understanding of the effectiveness of domestic energy efficiency and low carbon technology installations. This is a critical issue as such measures often do not achieve expected levels of effectiveness either as a result of errors in design or installation and/or incompatible user behaviours. In helping householders,

and organisations working on domestic energy efficiency, the project is making a contribution to helping to address an important issue and thereby is making a contribution to helping to deliver a more effective response to the challenge of climate change.

### Has this Next Generation project resulted in increased funding or support for community business(es)?

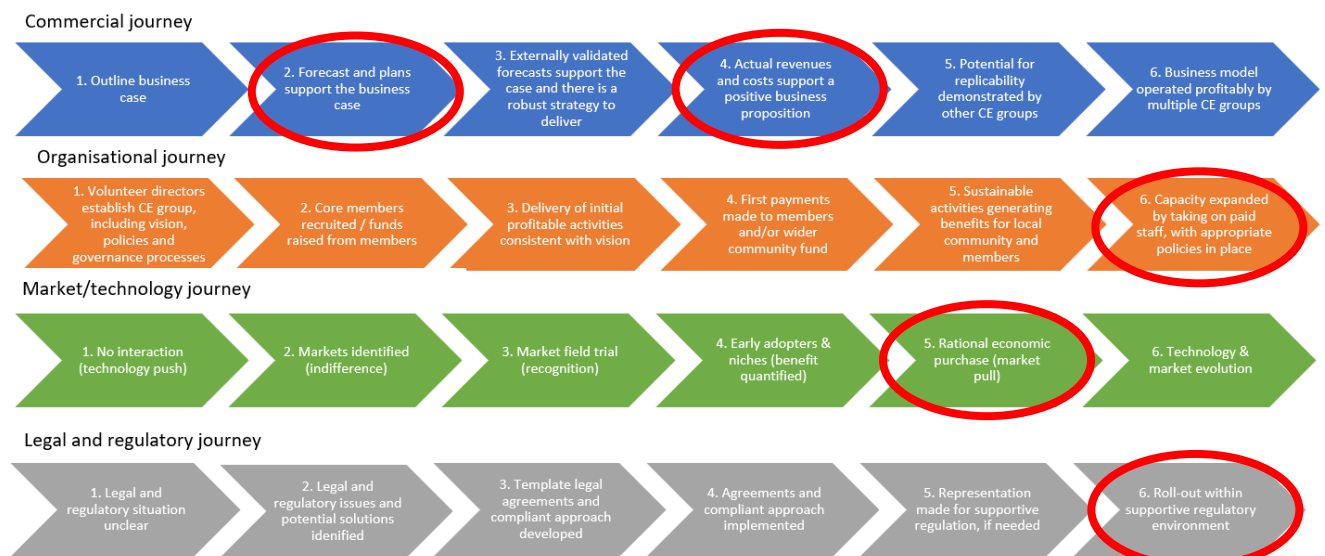
**Some evidence** – the development of the building performance evaluation tools, whilst incomplete, is understood to have contributed to Carbon Co-op being successful in a bid to Innovate UK to support the [OpenEnEffs](#) project .

### Has this Next Generation project contributed to the growth of the Community Business Sector?

**No evidence** – the project has developed a service, PowerShaper Monitor, which is expected to be used by other community businesses to support and enhance the attractiveness of their offer. This may help to improve the growth rates of community businesses, but we have no evidence to support this supposition.

## Findings on business model viability

An assessment of the status of the business model is shown below. Carbon Co-op suggest that their PowerShaper Monitor will become financially self-sustaining within a year, potentially less. They also anticipate being able to generate income through the Impact Tracker and Building Performance Evaluation tool at some point in the near future. The commercial journey for PowerShaper Monitor is therefore shown as step 4 while the other tools are shown as step 2.



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

As noted in the preceding section, the model is viable and other community energy businesses are able to buy access to the services that Carbon Co-op is developing.

### What types of CEBs might this business model work for?

In relation to replicability, the tools either are, or are expected to be, available to other community energy groups, and other entities who might wish to make use of them. This though would require the user organisation to pay a fee to Carbon Co-op for their use. In addition to enabling the co-op to pursue its commercial objectives, levying a fee is necessary as the services need to be maintained and developed over time, and this requires an associated income stream.

### What advice should be given to other CEBs considering this type of work?

Engaging with digital technology will be new for many community energy groups and will not be a viable option for all. If groups do feel like engaging in this arena then key advice from the Carbon Co-op includes:

- **Make use of open source technologies.** Open source hard and software is cheaper than funding new commercial work and is often more stable, quicker to develop and more robust. A commitment to using open source software also enable interoperability.
- **Be prepared to experiment.** If you don't have a track record in this area get involved with hacker or maker space groups. Carbon Co-op cite their Eco Home Lab <https://www.meetup.com/eco-home-lab-manchester/> as an example but note that there are numerous hacker and coding clubs around the UK.
- **If you see a gap, fill it.** If groups have identified specific problems that could be addressed through the development of a new solution then why not try to address it? 'Tech for Good' is a meetup, an organisation and a broad term for simple technology that meets societal needs. Have a look to get some inspiration: <https://www.meetup.com/techforgood>
- **Involve potential users from the start.** Involving the intended user can help to ensure that product designers take account of the needs and preferences of the end user, thereby increasing the chance that they will make use of a service.

### What policy changes could help to make this model work?

Carbon Co-op model is still evolving, but has already demonstrated some measure of success. The project lead noted that the co-op has inputted into another report ([The Case for Community Tech](#)). This makes the case for more support for digital community initiatives in the round and suggests that there is a need to invest in the development of 'community tech creators', to build capability and capacity within the sector.

### **What are the next steps for the CE sector?**

The Carbon Co-op are interested in hearing from any organisation that thinks that they might benefit from one or more of the services they have developed. The most mature of these, PowerShaper Monitor, could be useful to any organisation working in the domestic energy efficiency space that wants to be able to determine the impact of its work on householders.

### **To find out more:**

Further learning from the Carbon Coop project can be found in:

- Final project report, published on the [Next Generation website](#)
- On Carbon Co-op's website <https://carbon.coop/portfolio/the-energy-data-co-op/>

## **(d) CREW Energy's low carbon heat project**

### **About the group and their innovation project**

CREW Energy is a volunteer led not-for-profit Co-operative based on south-west London. Established in 2014, CREW helps community groups and individuals in London – and particularly in the boroughs of Wandsworth, Merton and Lambeth – to access low-carbon solutions. At the time of the Next Generation application in Round 2, CREW had three directors who received part-time payments and also put in additional voluntary time. They also had around 20 members and shareholders, plus around 10 regular volunteers. A couple of members were paid for specific tasks (e.g. 'energy café' work, funded via a grant from UK Power Networks (UKPN)).

The initial aim of CREW's innovation model was to develop a financially sustainable model for installing and maintaining heat pumps in public sector or commercial buildings as well as housing estates, with installation costs funded through a community share offer. The intention was that revenue would be generated through Renewable Heat Incentive (RHI) payments as well as potentially flexibility payments through Demand Side Response services. It was also intended that support would be offered to private sector householders to facilitate the installation of heat pumps.

CREW have successfully led the installation of air source heat pumps (ASHPs) for one community organisation (Devas Club), but in year 2 they recognised that they needed to adjust their project in light of changes in their operating environment. Most notably the demise of the non-domestic RHI and emergence of the Public Sector Decarbonisation Fund (PSDS) and the replacement of the domestic RHI with the Boiler Upgrade Scheme (BUS). With the support of Next Generation, CREW have now expanded their consultancy work to include non-domestic carbon audits, and a domestic Home Carbon Audit (HCA) offer.

### **Review of progress in Year 3**

As noted above, CREW have looked to develop an end-to-end domestic heat pump offer. While CREW would lead on initial site surveys and overall project management, they work with a third-party designer, with installations being undertaken by a local company, Switched On. Next Generation funding has been used to pay for Switched On staff to be trained in heat pump installation.

As of June 2022, CREW reported that they had delivered over 50 HCA's and were working on two domestic heat pump installations. CREW also noted that they have two commercial clients for their commercial carbon audit offer.

CREW remain active in looking to identify non-domestic heat pump opportunities and have:

- Written a grant proposal for a new project at the Polka Theatre.
- Secured funding from the London Community Energy Fund (LCEF) to undertake four scoping projects.

- Partnered with Repowering to support bids involving heat pumps for a school and civic centre.
- Partnered with One Stone Grove on a heat pump project at their centre in Barnet.
- Planned to bid for a heat pump project installation in Islington.

Less positively, the initial installation at Devas continues to have technical issues. One problem is that the installation firm, Greensquare, has gone out of business. A further challenge is that a proposed communal heating project at Bennets Courtyard (originally scheduled for Phase 3 of the Next Generation project) remains on hold, owing to changes in the funding environment, and a failure by the leaseholders to acquire freehold of the site.

### Factors contributing to success

There has been a market growth in awareness of heat pumps and their benefits, especially carbon reduction. This, in tandem with the higher profile of energy, has meant that there has been a growth in interest and demand from the market – although the number of actual installations remains stubbornly small.

CREW have seen strong demand for their HCA offer with this being triggered both by climate concerns, a desire to reduce costs, and regulation. They report that the delivery of this service and retrofit support services appear to offer a significant opportunity for CEBs.

The flexibility and commitment of the CREW team, and of Next Generation support, was an important success factor. Next Generation has been essential as the project has had to reinvent itself in the light of changes in the funding environment.

### Challenges

The CREW project encountered multiple challenges, these were mainly associated with the immaturity of the heat pump market and changes in government support mechanisms.

- **A lack of installers** meant that those that were available were in high demand and therefore costly, and often struggling to meet their commitments. Meanwhile, less experienced installers might not, at least as yet, have developed the necessary range of skills. The Devas installation was hampered by an installer going out of business.
- **Long lead in times for heat pump projects**, particularly community schemes, meant that anticipated government support might no longer be in place by the time a project reached the installation phase.
- **Utility companies have a growing interest in the domestic heat pump market** and this will affect the scope for community energy businesses to operate in this arena. It may be necessary to pivot to provide ancillary and support services rather than installation, with these potentially being delivered in partnership with larger entities offers. There may though be scope for community energy within the small-scale commercial market, particularly within the public and third sector markets.



### Findings on project management processes

CREW were highly appreciative of the support they received via the Next Generation programme. The funding was valued, but so was the flexibility of the programme as this allowed them to change tack when finding that an anticipated avenue was no longer open to them.

CREW reported that the CSE-led consortium's approach to project management was supportive, whilst the technical support provided useful challenge. They also noted that initial support on the organisations structure and governance had helped them to upgrade their systems and processes.

CREW would have liked to have had the opportunity to get to know the other innovation projects better as they think that this would have enabled the development of some valuable new relationships. This, however, was understandably made more difficult by the pandemic and the associated loss of the planned face to face meetings.

### Findings on engagement processes

CREW's engagement activities to date have focused mainly on engagement with the owners of buildings, such as the Devas club. CREW reported that there had been no problems with engagement on the Devas project because they know the client well and there were no objections from external stakeholders. Engagement with the installer was problematic as the company went out of business. The timing of the evaluation research did not allow direct collection of evidence about CREW's engagement with domestic households around the Home Carbon Audit, but there is evidence of CREW already engaging with households via energy advice drop-in sessions and 'energy champion' advice services.

## Findings on impact

### Has this Next Generation project helped community business(es) to become more impactful and resilient?

**Strong evidence** - CREW reported that they could not have launched this part of the business without the support of the Next Generation scheme. Participation has helped them to bring in the necessary resource to explore new areas and to develop new commercial offers that will help to grow the business moving forward. They noted that they are now seen by potential partners as 'knowing' about heat pumps and this has led to them being approached with several new opportunities; whilst the experience they have gained has given them the confidence to pursue them.

In terms of impact, the Devas Club installation has enabled a community club working with a diverse range of young people to progress its sustainability goals. CREW first worked with the club to install solar PV and then (with Next Generation support) to install the heat pump.

*it [...] is really important that we put sustainability first and I've been so inspired by the work that Devas has been doing [...] to bring firstly solar panels to the roof, and now to bring a heat pump so that we can generate*

*the energy that's needed to make a comfortable space for young people to come in and to learn, to engage and be inspired. (project partner)*

**Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some evidence** – as a community business, CREW's involvement in the heat pump sector has raised their profile. The fact that, as a result of the work supported by Next Generation, they have been approached by a number of organisations seeking their support and assistance seems likely to be helpful in demonstrating the ability of community businesses to develop and deliver, what are in this case, quite complex technical solutions.

**Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** - there was no evidence that the project directly contributed to this aim. However, the beneficiaries of the heat pump installation at Devas Club are young people from a wide range of ethnic backgrounds, including disadvantaged groups. While CREW's Home Carbon Audit and 'end-to-end' heat pump service are paid-for services, primarily targeted at 'able-to-pay' households, their energy advice services and energy champion services are open to a wider range of households including those in fuel poverty.

**Has this Next Generation project helped community business(es) to address society's challenges?**

**Strong evidence** -Next Generation support has helped CREW to improve its capacity and capability, to contribute to the Net Zero transition by supporting the installation of renewable heat projects. Now CREW, in its turn, is assisting other organisations, including other community businesses, to move forward with their low carbon ambitions.

**Has this Next Generation project resulted in increased funding or support for community business(es)?**

**Strong evidence** – CREW itself has been able to successfully bid for new funding and attributes this, in part, to having increased its competencies and confidence as a result of participation in the Next Generation programme. It is now working with multiple other third sector bodies, including other community businesses, to secure funding to enable additional, new heat pump installations.

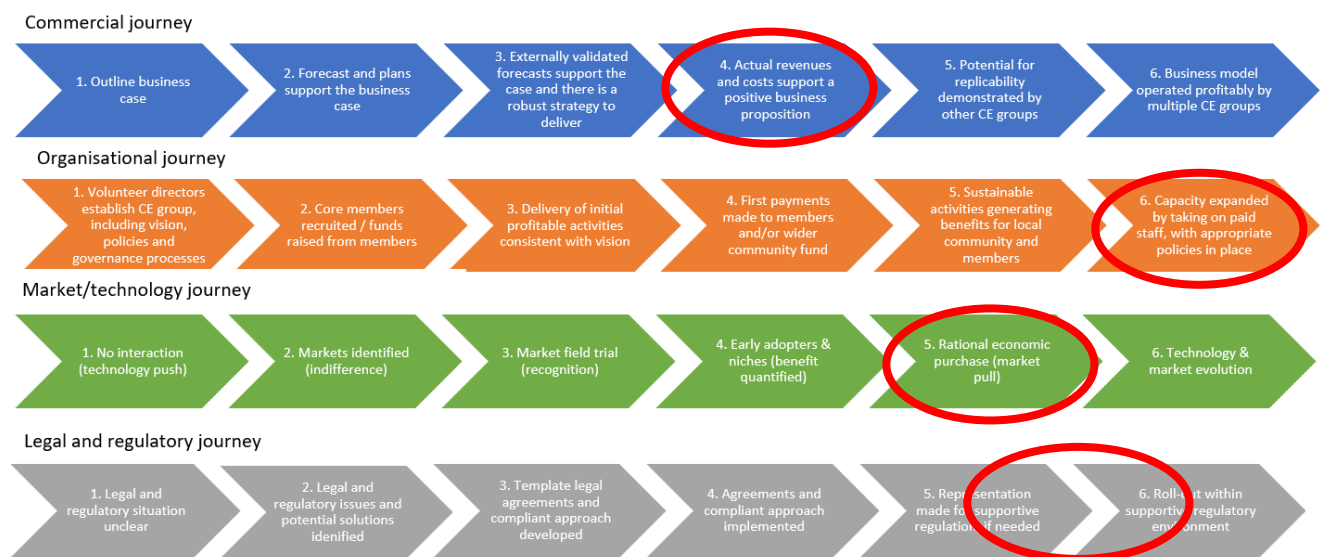
**Has this Next Generation project contributed to the growth of the Community Business Sector?**

**Strong evidence** - CREW reported that they are grateful to the support they have received and that it has encouraged them to support other CE groups like Repowering, Power Up North London (PUNL) and One Stone Grove as they set out on their first heat pump projects. CREW's involvement in the Next Generation peer mentoring project also generated an ongoing support relationship with another CEB.

**Findings on business model viability**

The figure below shows our assessment of status of the project at the end of the Next Generation programme. The commercial journey is shown as moving towards step 5

because of the work that CREW are doing with Repowering and others, i.e. replication has not yet been demonstrated, but there is evidence of early stage work. Since the last report, CREW have demonstrated that there is a demand for their offer and have therefore progressed along the market pathway. The legal and regulatory assessment reflects the fact that some aspects of work are able to be rolled out in the current regulatory environment: in the domestic market, the Boiler Support Scheme (BUS) provides a successor to the domestic RHI scheme. Indeed, the domestic HCA offer has been enabled by the introduction of regulations requiring landlords to improve the energy efficiency of their properties. However, the policy environment has become less supportive of communal heat pump installation, with the end of the non-domestic RHI scheme, and it is understood that CREW have made representations to BEIS on this matter.



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

The original aim of this project was to develop a sustainable community energy business model focused on the provision of renewable heat. This focused primarily on the roll out of air source heat pumps (ASHP) across an urban context to generate renewable heat, reduce gas consumption and improve air quality. Initially it was anticipated that such work would be enabled by the government's RHI scheme. In practice the RHI has now closed and been replaced by the less generous BUS scheme.

CREW were able to develop one RHI-funded scheme but, in the absence of new sources of government funding, certain forms of scheme (e.g. community-led communal heat pump projects) will be reliant on grant funding. Despite this, owing to a combinations of rising energy costs, concern about energy security and increased awareness of the need to respond to climate change, CREW feels that there is a niche market for CEBs in developing small-scale non-domestic heat pump projects.

In addition, they suggest that commercial domestic heat pump installations will see significant growth in numbers as a result of the entrance of some major utility companies into this space. CREW feel that whilst this may crowd out community businesses from the installation market, it will create new opportunities for CEBs to provide ancillary services, possibly via affiliate or other forms of partnership arrangement with the lead installer.

Beyond the non-domestic market, CREW feels that there is significant potential for CEBs in the domestic sector. They have seen strong demand for their HCA service and believe that this, in tandem with other retrofit services, is a potential growth area.

### **What types of CEBs might this business model work for?**

The work that CREW are doing appears to be replicable. CREW report that they are looking to enable replication through their mentoring work with other CEBs, including Repowering.

The area of work and operating environment developed by CREW is likely to be familiar to many CEBs and is something which many could reasonably aspire to do. However, CREW's services include providing professional services, including project management. Other CEBs would need several staff members, and or access to a highly skilled and motivated cadre of professional volunteers, to replicate CREW's approach. Additionally, organisations would need a well-developed back-office function. In short, it is most likely to be suitable for well-established, medium/large community energy businesses.

### **What advice should be given to other CEBs considering this type of work?**

- **Finding reliable installers is a challenge:** you should research potential suppliers as much as possible before entering a relationship with them.
- **If you are relying on some form of grant or subsidy, don't be tempted to try to beat the deadline.** Projects need a long lead in time: CREW applied for RHI six months before the end of the scheme and this was highly stressful.
- **There are high levels of interest in heat pumps,** but as yet this is not matched by installation activity. However, the direction of travel favours heat pumps.

### **What policy changes could help to make this model work?**

The Boiler Upgrade scheme (BUS) is not a 'like for like' replacement for the RHI: it is less generous but also more restricted to individual householders. This does not work for communal properties where a collective solution is likely to be more efficient, in terms of both cost and carbon. CREW feels that policy needs to change to better enable activity in multi-occupancy communal settings (e.g. apartment blocks).

CREW would like to see the proposed shifting of so called 'green levies' from electricity to gas sooner than currently anticipated. They feel that this would make a significant difference to the heat pump sector.

### **What are the next steps for the CE sector?**

There are growing levels of interest in heat pumps. While installation numbers are currently low, CEBs should stay the course but think hard about who their potential customers are. Target groups recommended by CREW are:

- Domestic early adopters who have already installed solar PV and/or operate an EV and who are able to pay for heat pump installation, with BUS support.
- Non-domestic clients who have set firm carbon reduction targets and who will need to rely on heat pumps to achieve them.
- Off-gas non-domestic clients. These can be found even in urban areas.

### **To find out more:**

Further learning from CREW Energy's project can be found on the [Next Generation website:](#)

- The final project report.
- Final case study and project video.

## **(e) Gloucestershire Community Energy Company's low carbon homes work**

### **About the group and their innovation project**

GCEC is a relatively small group: it had 48 members in spring 2021, all from the local area. Its aim is to enable local communities and individuals to take part in renewable energy schemes across the county, and to encourage energy saving initiatives. Through projects such as installing solar panels on community buildings, and developing suitable sites for wind and hydro schemes, they aim to give everyone in Gloucestershire a chance to benefit from low carbon, locally generated electricity and renewable heating.

Most of the group's work is undertaken by their five voluntary directors; there are no paid staff. The group was established in 2010 and its main activities to date have been to install 45 kWp of solar panels on the CityWorks building in Gloucester and selling low-cost electricity to community groups who use the building. GCEC have investigated a number of potential projects in recent years, including potential purchase of a solar asset via CORE. Their Round 2 Next Generation project was focused on enabling the installation of heat pumps and solar panels with battery storage in social housing homes.

### **Review of progress in Year 3**

The Gloucestershire project changed considerably over the lifetime of the project. The initial plan was to install solar PV and batteries in council-owned sheltered housing, but this was found not be economically viable. A revised plan, involving the addition of a shared-loop Ground Source Heat Pump supported by non-domestic RHI was developed, but was disrupted by COVID which made it difficult to work in sheltered housing, owing to presence of vulnerable tenants. COVID also generated delays meaning that the project did not obtain council go-ahead in time for installation before the end of the non-domestic RHI scheme in March 2021.

In response, GCEC developed a revised plan, involving the installation of air source heat pumps (thereby allowing access to the domestic RHI), batteries and solar panel equipment on 7 social housing bungalows. This would effectively have served as a pilot for a suite of renewable and low carbon technologies, generating heat and power. GCEC planned to offer time of use tariffs to enable them to provision of flexibility services to the electricity grid, to assess whether the potential for providing flexibility services to the electricity grid.

Unfortunately, the project was ultimately unable to proceed, primarily because discussions with the main partner proved to be more protracted than anticipated, and this meant that the project ran up against funding deadlines.

### **Factors contributing to success**

One interviewee reflected that whilst the project had ultimately been unsuccessful they had come close to realising a project. They suggested that the project had been challenging and to get as far as they had required a significant amount of commitment from those involved.

### **Challenges**

The COVID pandemic was a major challenge for the project. GCEC's key partner, unsurprisingly, prioritised other projects over the energy project. An added complication was the need to avoid exposing vulnerable residents to higher levels of COVID risk.

Another challenge was the length of the decision-making process required by the key partner. It proved very difficult to secure a satisfactory legal agreement. One interviewee suggested that it was difficult to reconcile the different priorities and perspectives of the main partners. The parties struggled to agree how project risks should be allocated between them.

The protracted nature of discussions meant that the project ran up against external headlines, most notably the cessation of domestic RHI payments and the end of the Next Generation grant programme, and this rendered the project non-viable.

Ongoing changes in government support mechanisms are challenging for CEBs. As was the case with this project, taking an initiative from start to finish often requires a multi-year delivery period. This can mean that anticipated support mechanisms disappear during project development. At the least this requires project redesign, at its worst it can fatally undermine the viability of a project.

### **Findings on project management processes**

GCEC felt that the Next Generation programme had been well run and supportive, i.e. it had accommodated changes in the project. The group were also appreciative of the peer review and technical/commercial support that they had been able to access via the CSE-led consortium.

### **Findings on engagement processes**

GCEC had some direct contact with the householders that would have been involved in their project, but no learning points were reported.

## **Findings on impact**

### **Has this Next Generation project helped community business(es) to become more impactful and resilient?**

**Some-evidence-** GCEC have learnt from the project and this learning will better enable them to pursue future projects. In addition to developing improved technical and commercial understanding, the project has given the group more confidence to take on more complicated projects. For example, the group reported that they were close to completing a school solar project that had required direct engagement with the Department of Education. The group's participation in the Next Generation programme has helped to raise their profile



and in attracting new recruits. It is also better enabled the group to take on new and more ambitious, challenges and opportunities.

**Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some-evidence** - One interviewee also noted that involvement with the Next Generation project had helped them to recruit more volunteers and had improved their standing within the local community. Also, despite the project not proceeding, the main partner stated that they were keen to work with the group on future opportunities. Prior to Next Generation, they had only had informal contacts with this partner, suggesting that they are now seen by them as a credible future collaborator.

**Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** - there was no evidence that the project had contributed to this aim. While the beneficiaries of this project would have been social housing tenants, the project did not go ahead.

**Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence** – as noted above, participation in the Next Generation programme has increased the confidence and capability of GCEC and this is impacting on their approach to the development and delivery of other carbon reduction initiatives.

**Has this Next Generation project resulted in increased funding or support for community business(es)?**

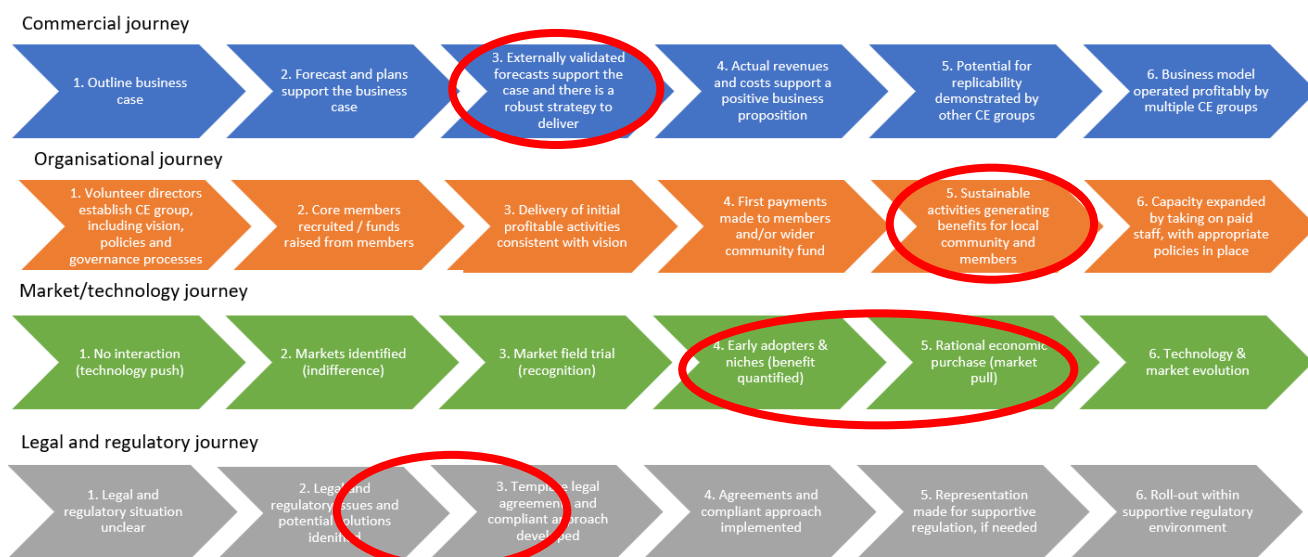
**No evidence** – the evaluation team does not have evidence of GCEC or other CEBs obtaining any follow-on funding as a result of its Next Generation project.

**Has this Next Generation project contributed to the growth of the Community Business Sector?**

**No evidence** – while the project has contributed to GCEC's own development (see above), it has not contributed to the growth of the wider sector.

## **Findings on business model viability**

Our assessment of this project's business model against the innovation scale is shown below. The market technology journey is shown across steps 3-5 because the technology would have included some well-tested elements (e.g. heat pumps, solar PV) as well as less tested elements (e.g. home batteries).



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

GCEC feel that they have identified a model, based on share loop ground source heat pump systems, that could be replicated anywhere in the UK. However, they believe that the current support regime provides insufficient support for the model to be viable. In particular, there would need to be improved support for the shared loop ground source element of the model as the non-domestic RHI is no longer available for communal schemes. There is also a need to find partners willing and able to commit to partnering with CEBs.

### What types of CEBs might this business model work for?

GCEC does not have any paid staff but does have an experienced board of volunteer directors. This should be considered the minimum necessary for any group considering this model as it seems likely to require extensive engagement with any households likely to be connected to any future development.

### What advice should be given to other CEBs considering this type of work?

Community energy initiatives routinely involve the installation of technologies on others land or buildings. The decision-making processes of partner organisations can be lengthy, particularly when they require the development and agreement of legal matters.

This needs to be factored in by community energy organisations, and the need for legal agreements identified and actioned as early as possible within the process. One interviewee noted that it is better to identify any 'deal breakers' as early as possible to avoid partners investing time and money fruitlessly.

### What policy changes could help to make this model work?

Greater consistency in the provision of government support would be helpful. Short duration initiatives and changes in policy support make it difficult for CEBs to pursue more complex projects.

As noted by CREW, further support for small-scale communal heat pump projects (such as shared ground loop heat pumps) would be helpful, as the non-domestic RHI is no longer available.

### **What are the next steps for the CE sector?**

GCEC feel that shared loop ground source heat pump systems are an effective and attractive technological solution for decarbonising housing. With rising electricity costs integrated solar PV, battery and heat pump solutions may become viable even without subsidy, but they will still require access to significant upfront capital and long repayment periods. GCEC feel that the community energy sector may be able to help groups of householders (e.g. groups of owner occupiers) by enabling access to community finance (e.g. share offers).

*the future role for a co-op may be in helping local groups of owner-occupiers realise a collective solution to their need to decarbonise their heating that is better and more affordable than they can achieve individually. (Final Report)*

### **To find out more:**

The [Final project report](#) and [case study](#) are published on the Next Generation website.

## (f) Nadder Community Energy's EV car club

### About the group and their innovation project

Nadder Community Energy (NCE) is based in Tisbury in rural Wiltshire and has six directors, two staff and around 130 members. The group has run several community share offers and has invested in a number of solar PV arrays and other local energy projects. It contributes about £5,000 per year to a community benefit fund which is used to support local green projects and groups.

In a departure from their usual areas of work, NCE were awarded Round 1 Next Generation funding to set up a pilot [electric car club](#) in Tisbury and used the grant to secure two electric cars. Nadder CE's main activities related to the Tisbury Electric Car Club (TECC), but NCE also looked to stimulate wider interest and activity in car clubs in the UK.

### Review of progress in Year 3

TECC is now operating. Since the last report NCE reported that membership has risen to the high fifties and is now just short of their target of 60 members. At present the club is being run by volunteers as the business model is not currently able to maintain paid staff members. Even so, the club is not financial sustainable without additional financial support and NCE have looked to raise external funds through sponsorship and grants. They reported mixed success: several grants bids were unsuccessful, but the group had secured some funding from business sponsorship, a lottery, from the county council and had established a crowdfunding page.

Beyond the car club, NCE have looked to engage with other groups to stimulate wider activity on car clubs and the possibility of a national network. NCE have made a significant contribution to a national community transport initiative. This looks likely to secure funding to deploy car clubs up and down the UK using 'The Mobility Factory' infrastructure that NCE introduced to the UK. However, NCE parted ways with this after this became largely focused on the delivery of transport services for disabled people and it became apparent that the funding would not be accessible to groups with a broader focus. NCE retain an interest in the possibility of a UK network, and beyond this a pan-European network, and have forged strong links with two other UK groups, Greenfox and the Derwent valley car clubs.

### Factors contributing to success

The commitment and enthusiasm of project staff and volunteers has been essential to establishing and securing the immediate future of the car club. Partnerships with other organisations have also been important. For example, NCE avoided the capital costs on vehicle charging points by partnering with [Charge my Streets](#). NCE's co-operative ownership of [The Mobility Factory](#), a technology platform which includes 16 car clubs, 250 cars and 33,500 users across Europe, has worked well. The network has given NCE access to a 'community of practice' on community car clubs, while the telematics technology has reduced the need for volunteer inputs compared to other community car club models.

## Challenges

NCE's final report identified multiple challenges:

- COVID caused significant disruption to the project and meant that the car club only ran for six months of the Next Generation programmes lifespan, rather than the anticipated eighteen. This meant that the project was unable to fully test some of the project assumptions.
- NCE had to offer significant discounts, on membership fees and usage rates, to secure interest. This helped to attract members but has undermined the original financial projections and therefore the financial viability of the project.

*We have had to reduce our prices significantly from the assumptions as part of “educating the market” and making the journey from non-user to member as frictionless as possible. (Final Internal Programme report)*

- One interviewee suggested that the model is sustainable when run on a volunteer basis. They were unsure about how far into the future it could operate that way noting that, for example, the vehicles would need to be replaced at some point and income levels would not cover this. Charges would therefore need to be increased at some point.
- Ensuring that users have a positive experience is seen as critical to retaining use rates and members. The group reportedly lost some potential custom owing to it only being able to provide part time/volunteer staff cover. This meant, for example, that it was difficult to ensure that cars were thoroughly and regularly cleaned, or that overnight cover was available for the emergency helpline. In general, despite membership of the technology platform, securing and maintaining volunteer involvement has been a problem and the project has suffered from ‘volunteer fatigue’. Ideally the group would appoint a full-time member of staff to manage the day to day operation of the club.
- Securing affordable insurance was a major challenge. The insurance sector is not set up to deal with the car club model. One problem is the range of potential users, these may be over 70, have health problems, been fined for driving offences and so on. Eventually the insurer stopped accepting new members over 70. The group expended considerable resource in trying to locate an affordable supplier but were unable to achieve this. NCE contributed to a wider industry initiative which is expected to provide car clubs with a more affordable option from 2022 onwards.
- An internet-based platform meant that the service was not universally accessible. Even where users do have internet access, not everyone is confident using online booking systems and this can deter some types of potential user.
- Some users have found the current lack of extensive charging infrastructure to be a significant source of stress and frustration, particularly on longer journeys where a charger was found to be inaccessible or out of action.

- Commercial competition is on its way in the form of carsharing platforms. These offer advantages, but there is a concern that it might not be accessible for all types of users and so would not address transport poverty.

### **Findings on project management processes**

NCE were highly appreciative of the flexibility of the Next Generation programme and reported that they had found the CSE-led consortium to be supportive and helpful.

### **Findings on engagement processes**

After an initial community survey in Tisbury (see Year 2 report), NCE undertook wide-ranging activities to promote TECC to members. Despite these activities, NCE found it difficult to engage with less affluent members of the community.

## **Findings on impact**

### **Has this Next Generation project helped community business(es) to become more impactful and resilient?**

#### ***More impactful?***

Evaluation research with users suggest that the car club saves members money compared to owning a car. NCE reported that 4-5 households had been able to reduce to one rather than two cars because of using the car club in place of owning a second car.

*we reduced to one car instead of two. [...] it's an experiment to see what we'll do going forward. I mean, currently what I like about the club it's convenient. I've never had a problem with a slot. When I booked a slot, the car is perfectly easy to drive. (car club user)*

The club provides discounted rates for lower income individuals, aiming to help alleviate transport poverty. It also aims to make EV usage more accessible to those who could not afford to buy an EV.

*So aside from any environmental benefits, it has the direct impacts on the local community, because people can save an awful lot of money by being part of the car club. So, we did some research [...] on what people are generally spending on owning a car locally and it tends to be within £2-3000 a year. Joining the car club with a projection of costs, could save people up to £2000 pounds here. (Nadder CE board member)*

#### ***More resilient?***

Participation in the project has helped to raise the profile of NCE, whilst building confidence and new competencies. However, reports of volunteer fatigue around running the car club were a concern: this may negatively affect NCE if core members withdraw their engagement owing to fatigue.

### **Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some evidence** - The project, most notably in the form of the cars themselves, is highly visible and helping to raise awareness of the groups work and the possibilities of what can be pursued via a community business model. The initiative is, reportedly, viewed positively by the local community and this may translate into improved support for future projects.

### **Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**Some evidence** – Alleviating transport poverty in a rural area was one of NCE's aims for the car club. While the car club is enabling some middle-income households to meet their needs while running one rather than two cars, NCE has found it challenging to engage lower income households with the car club, despite offering discounted rates for lower income individuals.

### **Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence** - Interviewees felt that the project had made some contribution to addressing the challenge of climate change. It achieved this by giving people an alternative, less impactful, transport option. This is believed to have both led to direct reductions in users carbon footprints. There is also anecdotal evidence that people have made decisions not to retain cars, whilst others have used the car club to test the prospect of moving to an electric vehicle as a future replacement vehicle.

The club is also felt to have helped to build community engagement and cohesion. For example, NCE have been keen to promote the 'club' aspect of the car club through social media and other engagement activity.

### **Has this Next Generation project resulted in increased funding or support for community business(es)?**

**Some evidence** – The group has had mixed success with fundraising. Some small amounts of funding have been raised via sponsorship, small grants and a crowdfunding page. Larger grant bids have, however, been unsuccessful. NCE feels that the project falls 'between the gaps' for the majority of funders.

### **Has this Next Generation project contributed to the growth of the Community Business Sector?**

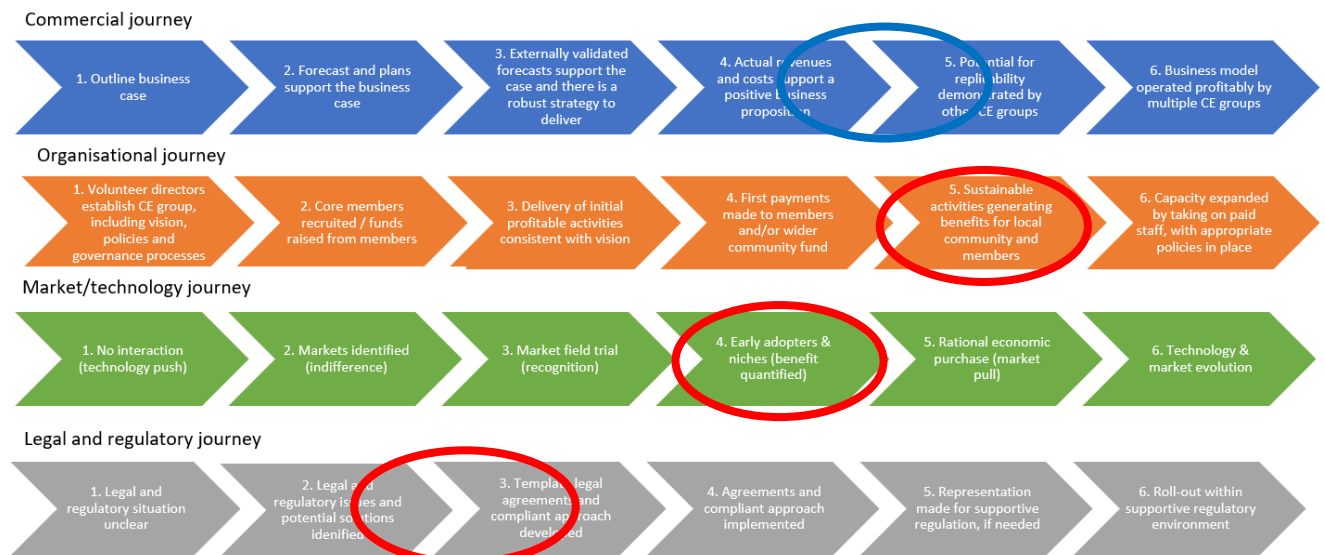
**Some evidence** - NCE report that they have played an important role in the development of a new community transport initiative. This is corroborated by evidence of car clubs being considered by several other CE groups in England, although the viability of these activities has not yet been established.

## **Findings on business model viability**

The car club is not yet viable, in as much as income from the hire of the cars does not cover the costs of operation. For this reason, the commercial journey is shown by a blue oval. Funding has been secured to continue operations in the short term, but it is unclear whether



it will be sustainable in the medium term. In the longer term there will be a need to replace the vehicles and currently this could not be funded through surplus from the scheme. One reported issue is the reliance on volunteers: ideally the club would be supported by one or more paid staff, but this is not possible under the current operating model. Next Generation funding paid for temporary staff inputs during the project (as reported in the Year 2 report) but this is not currently sustainable.



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

To become viable, membership and usage in the car club would need to increase, and the prices charged for both membership and usage would need to rise. This might affect user engagement with the car club.

### What types of CEBs might this business model work for?

In theory, the model could be replicated by other groups but they would require a dedicated volunteer workforce, access to capital to purchase the vehicles and necessary software, and some level of subject specific expertise. In its present form, the project appears likely to only be replicable where groups are able to access both capital and revenue funding. In practice, it seems likely that groups would need to draw on external expertise (e.g. from Nadder or another existing car club) and to have access to grant funding.

### What advice should be given to other CEBs considering this type of work?

Key insights for other CEBs include:

- NCE recommend starting with a committed group of people whose journeys you know (i.e. who have been logging their journeys)

- A need to ensure that prospective groups understand the demographics of their potential users. NCE found that the profile of rural users is very different from that of urban car clubs.
- There is a need to understand potential/target end-user needs and preferences when designing a project, from the outset.
- It is challenging relying on a volunteer model, NCE would prefer to be able to appoint full time staff to ensure that they are able to deliver the level of customer services that at least some users appear to expect.
- It is useful and valuable to be able to tie the car club to other forms of community initiative, this helps build interest, customers, support etc.

Additionally, NCE identified two general learning points:

- Ensure that your plan has built-in contingencies to allow you to deal with unanticipated external impacts.
- Your delivery team should be cohesive, highly motivated and bring together a range of complementary skills sets. Team members should be able to cover for one another at need.

### **What policy changes could help to make this model work?**

Two years of funding is insufficient to enable a business like this to become self-sustaining. The nature of the project doesn't seem to fit with the expectations and criteria of other funders, one interviewee suggested that they keep 'falling through the funding cracks' between energy and transport funding.

A major challenge is that the state of the UK's charging infrastructure needs to improve. The majority of journeys were reported as being hassle free, but if there was a problem, for example a charger was out of action, then it could quickly become an urgent matter. Multiple interviewees identified uncertainty about the availability of charging points as a major source of stress when using, or planning to use, EVs.

### **What are the next steps for the CE sector?**

NCE believes that community-owned car clubs have a future within the UK and are keen to continue networking with other UK car clubs. They suggest that – in the long term – there could be a Europe-wide car club co-operative with members able to use cars across the whole network. As part of this, they would like to influence the community transport initiative which is focusing on transport needs of disabled people (see above) to establish whether any infrastructure (e.g. back office functionality) could potentially be opened to the wider community car club community.

## To find out more

[Case study](#), video and final reports on [setting up a community EV car club](#) and [Business models for rural community car share](#) are published on the Next Generation website.

## **(g) Plymouth Energy Community's microgrid for zero carbon homes**

### **About the group and their innovation project**

Plymouth Energy Community are a well-established community energy group with strong links to, and support from, Plymouth City Council. Founded in 2013, the PEC Trust has eight trustees, around 100 members who are active within the organisation and 500 supporters, many of whom are former service users. PEC's vision is to empower their community to create a fair, affordable low-carbon energy system with local people at its heart. Their broader work includes installation of community-owned renewable energy and energy efficiency work targeted at the fuel poor and most vulnerable, working with in partnership with other community energy groups in Devon.

In 2019 PEC established a community-led housing developer and in 2020 PEC Homes was established as an independent Community Benefit Society and Community Land Trust. Currently PEC Homes, in partnership with Plymouth City Council, is developing 70 community-led, zero carbon, affordable homes in Kings Tamerton, Plymouth.

PEC established contact with seven other community housing developers across Devon and Cornwall, all of which are keen to see higher energy efficiency standards in their developments. The additional cost of such measures, however, means that they are often lost, during the value engineering process, to ensure the viability of the overall development.

Next Generation funding was used to explore whether this challenge could be addressed through a community-owned Energy Services Company (ESCo). The premise being that this could provide community housing developers with a financial mechanism that would allow them to deliver their low carbon aspirations, by enabling the following types of activity:

- Highly energy efficient building fabric.
- Integration of PV and storage technology.
- Communal heat solutions utilising biomass or heat pumps.
- Electric car club and charging infrastructure with vehicle-to-grid functionality.
- A microgrid.
- A new affordable rental model encompassing comfort (heat and power) and transport charges (EV car club) into a single package.

In addition to a PEC Homes site, a proposed development by Launceston Community Development Trust was used to provide a real-world case study. The involvement of their site was important in 'truth testing' a business modelling toolkit, which forms one of the main outputs of the pilot.

## Review of progress in Year 3

The project is now concluded, year 3 work included the delivery of Phases 3 and 4 of the project with the main output being the development of the toolkit.

### Factors contributing to success

The Next Generation funding has allowed PEC to explore an issue on which they had done some previous thinking, but which needed considerably more resource to investigate in depth.

After some initial difficulties, the relationship with the consultancy commissioned to develop the business modelling toolkit, Hydrock, has worked well and generated benefits in excess of what PEC had hoped for or expected. One reason for this appears to be that Hydrock share PEC's view that the development of microgrids to serve new, and under certain circumstances existing, housing developments, whilst challenging, offers considerable potential to deliver multiple benefits.

### Challenges

**The involvement of an ESCo in a community housing development** brings added complexity to what are often already challenging projects. Their involvement creates the need for change and challenge to established norms, and pose new, real and perceived risks. Whilst a community-led development might wish to meet higher energy and carbon standards, in practice the added complexity may mean that they prefer to default to a 'business as usual' scenario. To navigate this challenge requires close engagement between the community energy organisation (the ESCo) and the community housing developer. This should be guided by a clearly defined set of aims and objectives, and an understanding of the parameters of each partner's position, i.e. priorities, red lines, etc. In their final report, PEC describe the following key points of contention:

- Concerns about the visual impact of low carbon technologies.
- The management of tenant energy bills particularly:
  - agreement to future cost rises
  - whether the ESCo bills the housing development trust, or the tenant
- Concerns about the stability of energy supply.
- The need for a housing developer to provide grid connection and other energy infrastructure.

**Assumptions had been made about regulation** but some of these proved to be incorrect. PEC's initial assumption was that the use of an ESCo could avoid some regulatory constraints if it were able to supply services directly to the housing developer. PEC concluded that any ESCo supplying electricity or heat to households should expect to

comply fully with the laws and regulation regarding to B2C relationships, even if they do not have a direct relationship with domestic customers.<sup>21</sup>

Despite this, PEC have concluded that it is still possible to conceive of a viable ESCo business model. Their final report provides advice on this matter. However, PEC feel that the supply of heat, for example via a district heating option, is not a viable or attractive proposition.

**The right to switch** energy providers poses a challenge for the type of microgrid solution envisaged for new housing developments. In their final report, PEC acknowledge that the possibility that householders would seek to exercise their right to be supplied by an alternative energy provider a 'significant risk'. In practice, they think that switching would be unlikely to occur.

**Working with Distribution Network Operators (DNOs) is challenging.** The culture of DNOs and their approach to new projects often constrains, rather than enables new developments. There is a need for them to take a more proactive and engaged approach to local energy initiatives.

### **Findings on project management processes**

PEC were grateful for the funding as it has allowed them to unpack a complex issue and helped them to develop their understanding of the matter, and to chart a way forward.

One interviewee suggested that they would have liked to see more collaboration between Next Generation grantees. They suggested that one reason that this had not happened was that programme participants were, by and large, pursuing very different projects and that this limited the scope for collaboration. In their final report, PEC queried whether the Next Generation programme has supported the right types of projects and suggested that funding might have been usefully targeted at expanding community energy businesses attention onto the retrofit market. They feel that this currently offers the greatest opportunity for community energy businesses, but that further work is needed to develop suitable business models.

### **Findings on engagement processes**

As noted in the challenges section, PEC found that whilst community energy and community housing developers share many common goals and values, there have different needs and priorities and these need to be identified and acknowledged at an early stage of any potential partnership work.

## **Findings on impact**

The [final project report](#) sets out project achievements and learning in detail, while further insights can be found in the [final project case study](#). This section briefly summarises the project's impacts against Power to Change's strategic aims. The strategic aims are listed in Appendix 1.

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<sup>21</sup> *Final Report (p.18)*

### **Has this Next Generation project helped community business(es) to become more impactful and resilient?**

**Some evidence** - PEC are one of the UK's leading community energy businesses and one of the most innovative. Next Generation funding has enabled PEC to explore a proposition that offers significant benefits, but is complex and risky. The funding has improved PEC, and the community housing developers they partnered with, to develop a better understanding of the practicalities of developing a microgrid based, community owned ESCo. The business case remains unproven, but the funding has moved thinking on and may yet be an important enabler of future work. For example, by demonstrating the need for, and helping to inform the nature of, future pilots. The consultancy who developed the toolkit feel that projects of this nature are going to become a major opportunity area in the near future, and reportedly wish to maintain a relationship with PEC Homes and the Launceston project, and there is a shared intent to 'update and improve the modelling tool'.

### **Has this Next Generation project helped to grow the understanding of, and support for, community businesses?**

**Some evidence** – as a community business, PEC's involvement in such a complex and potentially significant area of work may help to improve the understanding of the potential of such entities to stakeholders external to the sector. For example, the consultancy firm who developed the toolkit reported that the integration of microgrids into new housing developments is going to become a major issue. They have been trying to persuade their traditional clients to take an interest in this, but it is a community business that has provided them with the opportunity to develop their work and thinking in this area. They now see community businesses as a potential client.

### **Has this Next Generation project contributed towards community business(es) becoming more diverse or inclusive?**

**No evidence** - there was no evidence that the project contributed to this aim. The project worked with a community land trust, whose aims is to provide affordable housing, but it did not get to the stage of working directly with households.

### **Has this Next Generation project helped community business(es) to address society's challenges?**

**Some evidence**- the project has helped to move forward understanding on the issue of how best to decarbonise new community housing without compromising on core objectives, such as the need for such developments to remain affordable. Innovation is a process and PEC and their partners report that they have developed in-house capability as a result of this project. Such learning is likely to be of benefit to them in their pursuit of other low carbon initiatives, even should they prove unable to move forward with the funded project. For example, a PEC interviewee reported that participation in the project was helpful in informing other forms of project activity.

### **Has this Next Generation project resulted in increased funding or support for community business(es)?**

**No evidence** – a feasibility study would be an essential part of the necessary evidence base were PEC to seek funding for a community owned ESCo, but to date we are not aware that any such bid has been submitted.

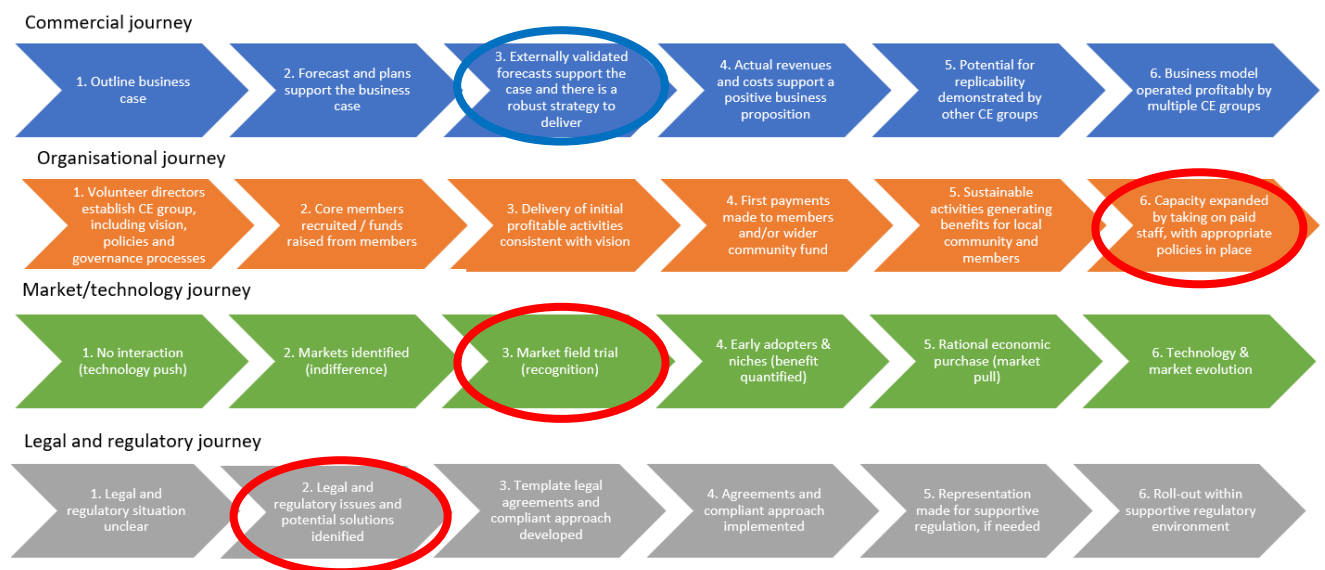


## Has this Next Generation project contributed to the growth of the Community Business Sector?

**No evidence** – we found no evidence to suggest that the project has contributed to the growth of the community business sector but, as noted above, the project may provide a stepping stone to further work which, in turn, may help to unlock growth opportunities for the sector.

## Findings on business model viability

The final business model journey is shown below. PEC concluded that a smart grid based EScO is theoretically viable for the site modelled in the project. There are, however, high levels of uncertainty within the business case and in their final report they suggest that this level of uncertainty renders a development unlikely in the absence of a grant and or access to a highly favourable (non-commercial) loan. The commercial journey is therefore shown by a blue oval, as not yet being fully viable. PEC's experience suggests that whilst community-led housing developers, and other non-profit operators, are interested in the concept, in practice, the complexity of the arrangement represents a significant challenge. The project faced an unanticipated regulatory barrier in relation to the supply of electricity but believes that it has identified a solution. Other regulatory issues remain and the supply of heat, via heat networks, has been discounted.



## Implications for CE sector

### What needs to change to make this business model viable for CEBs?

PEC believe that the model may be viable but needs to be proven in practice and that it will not be adopted without the establishment of one or more pilots. These would, however, need to be funded, as the high costs, in combination with a high risk/uncertainty profile, meant that initial developments are unlikely to secure commercial funding.

### **What types of CEBs might this business model work for?**

The complexity of this sort of project means that it is most suitable for larger, well established, groups with paid staff. It is important that the group have sustained access, ideally through both staff and board members, to the technical and financial competencies needed to steer a project from inception, through to successful completion, a process that can take up to 5 years.

PEC have not been able to demonstrate a viable business case for an ESCo on a community housing site. However, they believe that such a proposition is feasible and that a viable business model could be developed, provided the following apply.

- **The right-sized site.** Fewer than 25-30 houses would be challenging, while developments of more than 100 houses begin to approach the restrictions of Ofgem exemptions.
- **The right site designs.** This will have many variables and is complex, however the Hydrock tool enables any community energy organisation to work with housing organisations to assess this.
- **A housing provider that is committed to investing in low carbon technologies,** ideally having committed to investing in heat pumps and solar. In this circumstance an ESCo on site would be likely to reduce capital costs for the developer and deliver better social and environmental outcomes.
- **In addition to this, smart grids may be particularly valuable in grid-constrained locations,** where they have a potential to avoid the need for reinforcement through new substations or similar.

A key output of the project has been the development of the business modelling toolkit. This is freely available to other community business organisations and its availability will help groups looking to explore opportunities in their locality.

### **What advice should be given to other CEBs considering this type of work?**

PEC suggest that community energy businesses looking to develop a community owned ESCo will need significant internal capacity and expertise. They will also need to be able to secure high levels of capital to enable the necessary investments.

### **What policy changes could help to make this model work?**

PEC believe that the integration of microgrids, managed via ESCo's, could be a key enabler of low carbon housing. As noted above, however, funding is required to enable proof of concept pilots. Government funding for such work is one potential option.

### **What are the next steps for the CE sector?**

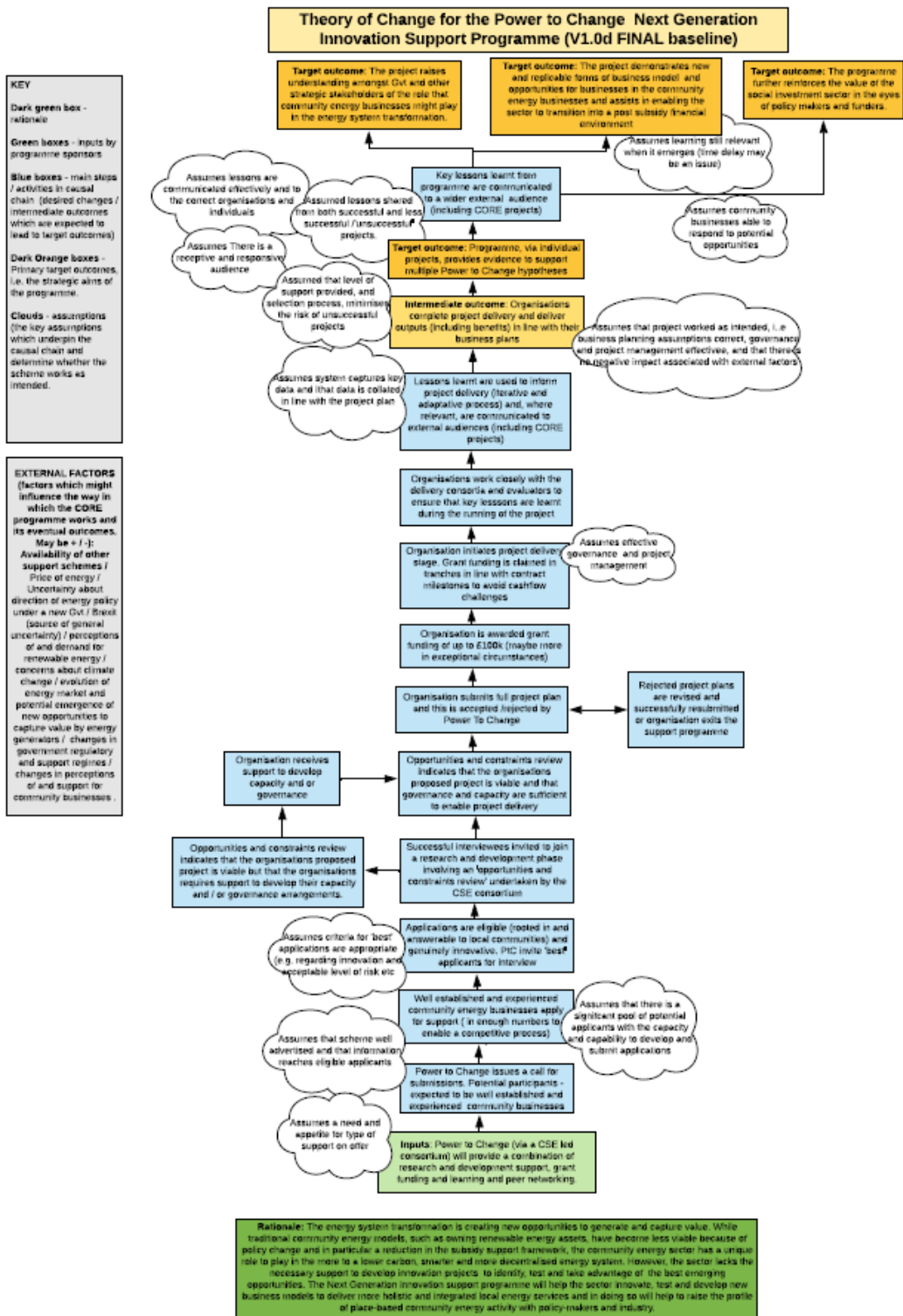
The CE sector and partners in the social investment community should consider how they might support and enable the development of one or more pilots.

## To find out more

Further learning from PEC's project can be found on the [Next Generation website](#):

- [Final project report](#)
- [Case study](#)
- The Microgrid Toolkit, freely available to CEBs via PEC and/or Hydrock

# Appendix 5. Baseline Theory of Change for innovation programme





power to  
**change**

business in  
community  
hands

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