

Evaluation of the Rural Community Energy Fund (RCEF) Programme: North East & Yorkshire



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Executive Summary

This report provides an independent evaluation of the Rural Community Energy Fund (RCEF) delivered in the North East and Yorkshire region of England and administered by the North East and Yorkshire Net Zero Hub. In 2013, Defra and WRAP jointly launched the £15 million RCEF, with the goal to help rural communities in England carry out local energy projects. Due to low uptake during WRAP's administration, the RCEF was relaunched by BEIS (now Department of Energy Security and Net Zero) with the scheme being administered by England's five Local Net Zero Hubs (previously, named "Local Energy Hubs"), established as part of the UK government's Clean Growth Strategy in 2017. These Hubs were established to develop local energy strategies and intervention plans; and to support the development of pipelines of local net zero energy projects up to the point of commercial investment.

The RCEF was relaunched in June 2019 and ran until March 2022 with a total budget of £10 million allocated across the five Net Zero Hub regions for:

- Stage 1 grants of up to £40,000 for a renewable energy feasibility study.
- Stage 2 grants of up to £100,000. The purpose of this to provide funding for business development and planning to support projects to reach a stage where they are investment-ready.

Out of a total of 54 applications, 41 have been funded, with ten of those projects progressing to Stage 2 funding. Most projects that progressed to Stage 2 and/or completed Stage 1 are currently in the early stages of development, meaning that tangible project benefits are not yet being delivered. The evaluation, therefore, focused on gathering and reviewing ex-ante estimates of project benefits. The evaluation also sought to capture and review the role of the Hub in its delivery of the RCEF programme and understand the enablers or barriers encountered by community organisations in delivery of their RCEF projects and the support or interventions received to overcome such barriers.

Evaluation Methodology

The evaluation was conducted using a range of qualitative and quantitative methods, including stakeholder interviews, review of project documentation, and review of monitoring data held within the BEIS 'Project Tracker'. Due to the limitations of the information contained within the Project Tracker, we chose to also review documentation associated with individual projects (such as feasibility studies) to gather details about their potential carbon savings. Furthermore, as many projects still being at early stages of delivery, we draw particular attention to findings from qualitative the qualitative and case study elements of our research. We conducted extensive research and developed three detailed case studies (available in Appendix D) to gain a deeper understanding of the projects, their characteristics, potential impacts, and the challenges they faced.

RCEF in Context

In 2011, the Rural Economy Growth Review developed a package of policies designed to stimulate sustainable growth within the rural economy and help rural businesses to reach their full potential. The £15 million RCEF programme led by DECC and Defra was one such scheme that was launched in 2013 and administered by WRAP. Due to low uptake during WRAP's administration, in 2019 the RCEF was relaunched by BEIS (now Department of Energy Security and Net Zero) with the scheme being administered by England's five Local Net Zero Hubs. The main aims of the fund were to:

- Support rural communities to achieve the maximum income from renewable energy, and to implement these projects locally;
- Increase renewable energy generation as per the government's target and do so by promoting community-owned renewable projects; and
- Help support growth and job creation in rural areas by making economic benefits of renewable energy schemes accessible.

Rural regions face innate challenges that can hinder development opportunities but can also have unique opportunities in comparison to urban areas. However, in response to the net zero challenge, locally led initiatives offer attractive growth prospects and opportunities to redress long-standing challenges experienced by rural communities.

Renewable energy generation is possible at much smaller scales than typically used for fossil fuel-based energy generation. Energy policy and regulation, however, is set at national level across England, rather than being devolved or localised. Whilst subsidy schemes were launched between 1990 and 2011 that supported renewable energy schemes including community-driven projects (particularly the Feed-in-Tariff and Renewable Heat Incentive), these programmes have now closed, leaving a gap in national-level policy support.

Implementation

Out of a total of 54 applications, 41 have been funded, with ten of those projects progressing to Stage 2 funding. A total of £2.1m funding was applied for, of which £1.7m was awarded. The majority (26) of grants were between £20k-£40k, and the majority of funded projects are solar PV. Other funded project types include deep geothermal and heat networks. Almost all funded projects are in the York & North Yorkshire or North East LEP areas, with a very small number of projects in the remaining LEP areas.

The support provided by the RCEF team was characterised as open, honest, and transparent, which allowed for concerns to be raised early. The RCEF team had differing levels of involvement with teams, depending on the level of support that was required from them. This included direct support during both application and delivery stages (including monitoring and reporting), facilitating connections with key stakeholders, signposting consultants, and identifying post-Stage 2 funding opportunities.

The RCEF lead at BEIS played a supervisory role within the RCEF governance process and kept track of key information about projects through monthly group meetings, ad-hoc calls, and an internal project tracker (the BEIS Project Tracker).

The RCEF team was considered to be broadly flexible with altering timescales to suit community group needs but faced consistent issues such as COVID-19 causing delays and capacity challenges. Despite this, community groups still faced severe challenges with time slippage, primarily due to exogenous factors. This meant that many project teams felt they were not able to progress as far as hoped, or as outlined in their initial application forms.

Other key issues named in the delivery of projects were factors such as difficulties with procuring consultants and establishing a grid connection.

The North East and Yorkshire RCEF process employed multiple levels of risk management, which started at the application stage and was reflexive to emerging risks. This included developing trusted relationships with the community groups, signposting advice, and trusted consultants, and attempting to address potential barriers to delivery.

The Impact of RCEF

The Hub's role in the delivery of RCEF was effective, resulting in targets set out in the Memorandum of Understanding between the Hub and BEIS to be met or exceeded with a total of 31 Stage 1 projects funded, and ten progressing to Stage 2.

CO₂e savings for the 41 funded projects were estimated from data extracted from feasibility studies and estimated to be between 223,819 and 232,079 tCO₂e using BEIS long-run marginal (domestic) electricity emissions factors and a static 2021 BEIS emission factor for grid electricity respectively. For this 'best case' scenario and including, we estimated a Benefit Cost Ratio (BCR) in the range of 29-30 for both Stage 1 and Stage 2 projects, with the potential to unlock £39,271,765 of investment.

For the ten projects progressing to Stage 2 but including the RCEF grant funding for Stage 1 and Stage 2 projects, CO₂e savings were estimated to be 30,250 tCO₂e. For this 'worst case' scenario, we estimated a BCR of 4.

Both 'best case' and 'worst case' scenarios implies that the RCEF programme has represented value for money. Additionally, RCEF activities have produced significant wider benefits and strategic added value. This includes providing education for the local community, developing their own skillsets, and fostering valuable relationships between stakeholders from differing sectors. However, there are also a number of anticipated barriers to fulfilling the intended impact of community energy activities. This includes the prospect of raising capita for implementation, grid connection access, the high cost of grid connections and uncertainty caused by fluctuating external factors such as energy prices.

Recommendations

The report presents a set of final recommendations based on the findings gathered throughout the study. Key recommendations are as follows:

Support available for grant beneficiaries

Whilst stakeholders interviewed widely praised the support provided by the RCEF team, our research suggests there are several areas for improvement:

- **Establishment of processes to encourage peer-to-peer support, networking, and mentorship.** This includes recognising the importance of learning from this and previous rounds of RCEF and providing accessible documentation on how to succeed. Whilst this was enabled to a degree, a more coordinated effort, in collaboration with the other RCEF delivery regions, would have significant benefits in terms of capacity building. In effect, the RCEF team could act as an intermediary, brokering relationships within and between regions to support the delivery of projects and encouraging other communities to consider applying for funding; and
- Despite the North East and Yorkshire region initially being considered to have limited community energy activity prior to the RCEF programme, the capabilities of the community energy sector are reflected in the diverse range of technologies that have successfully proceeded to Stage 2. Technologies that are less novel and carry lower risks (e.g., ground or roof mounted solar PV), however, could be seen as a "gateway" for some community groups, particularly those with limited experience. If the right conditions exist to support more innovative or complex technologies (e.g., heat networks) such as support from experts (external or embedded within the community group), local institutions like universities, and so on, then these projects can succeed. However, when considering

innovative approaches, the capability of the community group should be carefully considered. This, therefore, makes a strong case for the need for a support system – including funding – that continues to drive innovation in the sector. As well as funding, this should deliver opportunities to access experts, link with academic institutions, and partner with private and local government organisations to deploy innovative projects.

Enduring support for RCEF Stage 2 projects

Despite the success of a number of Stage 2 projects, being in a position for deployment is more an exception than a rule. We note, however, RCEF sought to get Stage 2 projects to a point that they were 'investment ready'. As such, this isn't surprising. However, the majority of Stage 2 projects are not yet in a position to attract interest from private investment. Given this, there is potentially a role for:

- **A Stage 3 to RCEF**, that includes extended support from the RCEF team including guidance on or access to finance experts to support the development of innovative finance models and potentially a small grant to cover project management. Access to finance or further funding opportunities are currently limited in scope, and several community groups have found this to be a significant barrier to progressing beyond Stage 2, either because of the complexity of applications or the requirement to submit several applications to cover the capital required. Early-stage finance is of little use unless community groups can access finance from the private sector or self-fund their own projects. 'Stage 3' may not be required by all community groups, but the availability would provide the opportunity for those requiring more support – technical or financial – to move their project to implementation; and
- **Exploration of the potential 'bundling' of Stage 2 projects into a portfolio in a region or sub-region** for an investor/ developer (this may include a municipal energy company) or establishing a partnership with a peer-to-peer lender (e.g., Abundance Energy) to raise capital. It is also worth noting that research has identified that community groups that were able to raise significant sums of community finance tended to be located in areas with relatively low-deprivation indices.¹ This may imply that high-deprivation communities (or rural areas with small populations) may be limited in terms of what can be raised locally. Early-stage finance schemes such as RCEF may have the objective of supporting rural (or less affluent) communities, but without a supporting financing infrastructure realisation of the benefits from operational projects may be limited. Recommendations for enhancing the financing architecture are discussed in more detail below.

Monitoring and reporting

We identified there was a weakness in governance in terms of the monitoring and reporting processes. This impacts the ways in which projects can be tracked by BEIS, and how the overall progress and success of the RCEF programme can be tracked. All parties need to be able to see the value in this, in order for this process to be effective. Given this:

- **There should be a careful review of defining success of a project.** Only 20% of projects progressed to Stage 2 (we note, however, this well exceeds the KPIs outlined within the initial Memorandum of Understanding which required that at least two Stage 2 projects to be funded). There were, however, multiple co-benefits experienced by communities such

¹ Hannon et al. (2023) Carrots, sticks and sermons: Policies to unlock community energy finance in the United Kingdom. *Energy Research & Social Science*, 100, p.103086.

as enhanced sustainability, literacy of the community, enhanced capacity and process literacy of the community group which can provide a strong foundation to build on in relation to low carbon projects and wider community development. Capacity and capability gaps are critical to the growth of the community energy sector, and the RCEF programme has provided an opportunity to bridge these gaps, preparing communities to take advantage of development opportunities, capital grants or a more favourable policy environment when it arises (e.g., Local Energy Bill). As such, the value of capacity building should not be underestimated, particularly in the North East and Yorkshire where the community energy sector started from a low base; and

- **Whilst a core objective of the RCEF fund, decarbonisation is one of many benefits experienced by community groups.** This implies that there should be some adaptation of the tracker to capture additional key co-benefits. The methodology should be led by DESNZ (formerly BEIS). At a project level, there is also a potential to work with community groups at the application stage, or at project inception to agree on a set of indicators that best captures the impact they expect to generate and agree a process to monitor and report on these over the duration of the project. In particular, a mechanism for charting the unexpected benefits of community capacity building would be useful. Community energy researchers, highlight that benefits that accrue from community energy funding has not been adequately researched.² As such a mechanism for capturing the longitudinal impacts would not only be beneficial for capturing the full impacts of community energy funds to inform future support, but also enhance the wider evidence base.

Alignment with wider policy environment

As discussed previously, the recent political climate and frequent changes to renewable energy policy has created a challenging environment for community energy schemes, particularly with the closure of the FiT and RHI schemes to new entrants. These schemes have underpinned the community energy sector by providing price stability, de-risking community energy projects for citizen investors and allowing smaller projects to be funded by low-cost citizen finance. The de facto moratorium on onshore wind is also limiting the potential for local community wind schemes. In particular, it is widely understood that local opposition can be mitigated through community ownership whereby communities in close proximity receive tangible benefits from hosting such schemes. Since, the de facto moratorium in 2016, England has experienced an 80% fall in approvals, yet the potential for currently un-tapped onshore wind to meet the UK's Net Zero targets is significant.³

The FiT scheme was particularly important for community share offers, where people are investing their own money into a scheme. Research by the University of Manchester conducted in 2020 into the community energy sector identified that, although 90% of the community energy projects surveyed made a financial surplus in a single-year snapshot, this falls to 20% after removing income from the FiT scheme; and just 11% after discounting projects with special circumstances. Whilst the FiT scheme closed to new projects in 2019 and has been replaced by the Smart Export Guarantee, the new scheme is more complex and offers less security than FiTs.

Moreover, even during the years of RCEF operations pre-2019, changes to government policy hindered the efficacy of the fund, such as alterations to tax relief policies which affected the

² Professor Matt Hannon, pers. comm. (May 2023)

³ <https://theconversation.com/onshore-wind-farm-restrictions-continue-to-stifle-britains-renewable-energy-potential-147812>

financial feasibility of projects and the uncertainty that came with being unable to confirm rate of returns and funding costs due to wholesale electricity and gas price volatility.

Community energy schemes in the UK are significantly lacking in terms of their scale and deployment when compared to those in other European countries such as Denmark, Germany, and Austria. One of the reasons for this is the challenges local renewable energy generators face selling their energy directly to their own community and accommodating local demand.⁴

The current regulation for energy distribution has created a barrier for the UK's community energy sector to grow. This is in part due to the lack of consideration afforded to the wider decarbonisation benefits of community energy schemes not being more considered in policy decisions leading to, for example, high grid connection costs and access charges which limit revenues and wider socio-economic benefits. This issue has been recognised within a number of local energy strategies within the region and by Hub internal stakeholders. Nevertheless, this is still a significant barrier to community energy schemes progressing to implementation.

Whilst this evaluation has shown that the RCEF programme has provided value for money, this is predicated on the deployment of projects that have completed Stage 2. As such, the right financing architecture is necessary to ensure these projects progress to deployment. A recent study made several recommendations in this respect.⁵ These include:

- **A detailed review of community energy related to State Aid.** Currently securing state finance is contingent on how much of the project's cost are being covered by private finance. However, broadly, the finance sector lacks familiarity with community energy and the appetite for large-scale projects. The study concludes that with the removal of revenue payment schemes (e.g., FIT and RHI), there is no longer a risk of 'double subsidy' and this means there is an opportunity for new low or zero-interest finance to be provided that could be counted as State Aid and administered through, for example, the UK's Infrastructure Bank. The Public Works Loan Board and Salix are also cited as potential vehicles for providing zero or low-interest loans for community-owned or shared-ownership energy projects.
- **The state could provide a junior debt facility.** Here the state is considered a lower priority for repayment when recouping any debt owed compared to senior private lenders. An existing example is the Scottish Government's Energy Investment Fund.
- **The state could provide loan guarantees for community energy bodies,** which would make it easier for communities to secure private finance.

The RCEF programme should be considered within the existing policy context, recognising that the environment needs to be more supportive of decentralised and small-scale schemes, in order to reach a scale that will have a considerable impact on the UK's Net Zero targets.

⁴ For example, Bray et al (2019) op. cit.

⁵ [Hannon et al. \(2023\) Carrots, sticks and sermons: Policies to unlock community energy finance in the United Kingdom. Energy Research & Social Science, 100, p.103086.](#)

Contents

Executive Summary	i
Evaluation Methodology	i
RCEF in Context	i
Implementation.....	ii
The Impact of RCEF.....	iii
Recommendations.....	iii
Contents	vii
1 Introduction.....	1
Context of the Evaluation.....	1
Overview of the Rural Community Energy Fund (RCEF).....	1
Purpose of the Evaluation	1
Overview of methods used in this Evaluation.....	2
The Programme Logic Model	5
Report structure	6
2 Context, Rationale and Objectives	7
Key messages & overall assessment	7
Introduction.....	8
Energy policy context	8
The regional policy context	12
Rationale for intervention and history of the programme	13
Objectives, and pathway to impact.....	15
3 Characterisation of the Programme: Inputs, Outputs & Implementation	17
Key messages & overall assessment	17
Funding & resources.....	17
Project characterisation	19
Governance & partnerships	23
Delivery of the programme	26
4 Impact & Value for Money	33
Key messages & overall assessment	33

Key methodological considerations	33
Quantified portfolio benefits.....	36
Value for Money conclusions	38
Wider benefits & strategic added value.....	40
Barriers to impact.....	41
5 Conclusions & Recommendations.....	43
Conclusions.....	43
Recommendations.....	47
6 Appendices	51

Figures

Figure 1-1: RCEF Logic Model	6
Figure 2-1: Eligible organisations for Stage 2 RCEF Funding.....	Error! Bookmark not defined.
Figure 3-1: Profile of Stage 1 & 2 Projects funded by RCEF in the North East and Yorkshire Net Zero Hub Region	18
Figure 3-2: Geographical Distribution of Stage 1 & Stage 2 Projects funded by RCEF in the North East and Yorkshire Net Zero Hub Region	18
Figure 3-3: RCEF Process.....	19
Figure 4-1: Estimated total lifetime carbon savings for the portfolio, split by technology type	37
Figure 4-2: Estimated total lifetime carbon savings by project geography.....	37
Figure 4-3: Carbon savings being delivered by individual projects.	38

Tables

Table 1-1: Evaluation Questions.....	1
Table 1-2: Methodology Summary	2
Table 1-3: Key metrics from the BEIS Project Tracker	4

Annexes

- A Documents Reviewed**
- B Aide Memoire – Stakeholder Engagement**
- C Case Studies**

D Benchmarking Technical Note

E Net Zero Policy Context

1 Introduction

Context of the Evaluation

- 1.1 Steer-ED has been commissioned by the Tees Valley Combined Authority on behalf of the North East and Yorkshire Net Zero Hub to conduct an independent evaluation of the Rural Community Energy Fund (*henceforth* RCEF) delivered in the North East and Yorkshire region and administered by the North East and Yorkshire Net Zero Hub. In parallel, the delivery of RCEF by the four other Net Zero Hubs (South West, North West, Greater South East, and Midlands) are also undergoing evaluations, in addition to a national-level synthesis of the regional evaluations.

Overview of the Rural Community Energy Fund (RCEF)

- 1.2 The Rural Community Energy Fund was jointly launched in 2013 by Defra (Department for Environment, Food & Rural Affairs) and WRAP⁶, with the aim of supporting rural communities in England to deliver local energy projects. Specifically, the aims of the fund were to:
- Support rural communities to generate income from renewable energy and to implement these projects locally;
 - Increase renewable energy generation in line with the Government’s Net Zero ambitions by promoting community-owned renewable projects; and
 - Help support growth and job creation in rural areas by making economic benefits of renewable energy schemes accessible.
- 1.3 In 2019 the RCEF programme was relaunched by BEIS, with the scheme being administered by England’s five Local Net Zero Hubs (previously, named “Local Energy Hubs”). These Hubs were established to develop local energy strategies and intervention plans; and to support the development of pipelines of local net zero energy projects up to the point of commercial investment.
- 1.4 Although not well documented, it is understood that the WRAP administered scheme had limited uptake over its lifetime. It was viewed that devolvement of the RCEF programme administration to the Net Zero Hubs, who are locally embedded, would enhance uptake and enable support for grant recipients to be better tailored to regional contexts and local planning matters. The configuration of RCEF was also modified including: an expanded scope of technologies and interventions to be considered; and change in the amount of funds allocated to Stage 1 (feasibility) and Stage 2 (business development and planning of feasible schemes) in terms of the maximum value of funding. The mechanism by which the funds were distributed was also changed (i.e., Stage 2 shifted from an unsecured loan to a grant).

⁶ WRAP (Waste and Resources Action Programme), a registered charity and former arm’s length body of the Department for Environment, Food & Rural Affairs. It supports businesses, individuals, and communities to achieve a circular economy by helping them reduce waste, develop sustainable products and use resources in an efficient way.

Purpose of the Evaluation

1.5 This programme Evaluation aims to answer important questions about the governance and delivery of the RCEF programme, alongside enabling activities to engage communities and the resulting pipeline of low carbon projects. The purpose of the Evaluation is to provide an assessment of the opportunities, challenges and regional circumstances encountered within the Hub area in the context of delivery of the RCEF programme and to provide a nuanced understanding of impact. Taken directly from the commissioning brief, the core aims of the evaluation are as follows:

- To review delivery of the RCEF programme against the original premise of unlocking investment for renewable energy technology. Where possible, provide evidence of early outcomes and impacts against the original RCEF objectives;
- To review the effectiveness of the administration and delivery model (including any associated enabling activity) in mobilising community energy activity and explore any challenges or barriers faced;
- To explore any difficulties encountered by community organisations in delivering their RCEF projects and the support or interventions received to overcome them;
- To assess the leverage of private/commercial investment into community projects and provide justified suggestions for how this might be improved; and
- To provide evidence-based recommendations to inform future delivery of support for community based local energy projects including the role of community energy in the context of, and in additions to, national decarbonisation policy.

1.6 Reflecting these five objectives, Table 1-1: sets out the evaluation’s research questions, which were defined by BEIS and the Local Net Zero Hubs as part of the specification for this work.

Table 1-1: Evaluation Questions

Evaluation Objective	Evaluation Question	Evaluation Sub-Questions
Review the delivery of the RCEF programme against the original project objectives	Has the delivery of the programme been carried out as intended?	<ul style="list-style-type: none"> • Has investment in renewable technologies been unlocked? • What quantifiable impacts can be attributed as a result of RCEF? • What has been the impact of interventions undertaken by the Hub? • What are the reasons for any non-delivery or slippage?
Review the effectiveness of the administration and delivery model in mobilising community energy activity	Was the selection process robust and effective in ensuring the programme achieved the best outcomes?	<ul style="list-style-type: none"> • Were any opportunities missed? • Were timescales realistic and achievable?
Explore difficulties encountered by community organisations in delivering their RCEF projects, and the level of support received to overcome them	Were appropriate resources in place to safeguard the programme and maximise delivery?	<ul style="list-style-type: none"> • How were risks to the programme managed and mitigated?

Assess the leverage of private/commercial investment into community projects and provide suggestions for improvement	Has the programme provided a positive return on public investment?	<ul style="list-style-type: none"> • Has the expected economic and social value of the schemes been realised? • What is the benefit of community energy projects in addition to national decarbonisation policy?
Provide evidence-based recommendations to inform the future delivery of support for community based local energy projects	What has the programme ultimately achieved?	<ul style="list-style-type: none"> • What has happened, or expected to happen as a result? • Have there been any additional benefits or opportunities of investment? • What would have happened in the absence of RCEF? • What will be the carbon emissions savings as a result of RCEF?

Source: NEY Net Zero Hub/ BEIS, 2022

Overview of methods used in this Evaluation

- 1.7 In this section we briefly outline the qualitative and quantitative methods used to undertake the study. A detailed description of the national RCEF programme and its delivery in the North East and Yorkshire region, including regional-level projects and activities, can be found in Chapter 2 of this report.
- 1.8 The evaluation process was influenced by several key factors, including the nature of the projects being evaluated, the status of those projects, and the quality and availability of information. A summary of our approach is show in Table 1-2 below.

Table 1-2: Methodology Summary

Evaluation Objective	Our Approach
Review the delivery of the RCEF programme against the original programme objectives.	Document review (e.g., feasibility studies, local and national policy documents) to gather and embed contextual information about the RCEF portfolio.
Review the effectiveness of the administration and delivery model in mobilising community energy activity.	Depth interviews with key internal stakeholders including BEIS, programme administrators and the RCEF lead to gather views on the implementation process from different perspectives.
Explore difficulties encountered by community organisations in delivering their RCEF projects, and the level of support received to overcome them.	Depth interviews with key community group leads to understand their experiences of the RCEF implementation.
Assess the leverage of private/commercial investment into community projects and provide suggestions for improvement.	Qualitative and quantitative evidence gathering to understand the leverage of investment into RCEF-funded project activities
Provide evidence-based recommendations to inform the future delivery of support for community based local energy projects.	All streams of evaluation work (including quantitative analysis, desk review and qualitative interviews) will contribute to generating evidence-based recommendations.

Source: Steer-ED, 2023

Document review

1.9 Following a scoping review, seven core documents were identified for review (see Appendix A). Key messages from these documents were extracted to help assess the context, rationale, and objectives of the RCEF Programme. Specifically, the document review enabled us to answer the following questions:

- What is the national and regional policy context for supporting renewable energy within rural communities?
- What has been the historical decision-making process with regards to community energy funding?
- What position has RCEF served, for example in the intent of its inception, in the wider context of community energy?

Qualitative Research

1.10 Our research team conducted a total of eight semi-structured one-hour interviews with both internal and external RCEF stakeholders. This included, for example, the Net Zero Hub RCEF Programme Managers and beneficiaries of the RCEF programme. The breakdown of consultations was as follows:

- **Two “internal”** stakeholders – those who have overview of project administration and/or delivery, to provide strategic and process-level insight into the overall delivery of projects; and
- **Seven “external”** stakeholders – those who have been directly involved in community project delivery, to provide granular accounts of project delivery and impact.

1.11 The purpose of the qualitative research was to gain a deeper and more nuanced view of how the projects have operated in practice and mobilised community energy activity, the efficacy of governance arrangements, and the Strategic Added Value provided by the RCEF. We also sought to understand whether there are key successes and lessons to help shape future activity. The consultations were guided by an aide memoire (see Appendix B).

Case Study Development

1.12 To develop a deeper understanding of impact, successes and lessons learnt, we developed three deep-dive case studies for projects delivered within the North East and Yorkshire regions. Projects were nominated by the RCEF Programme Manager and selection sought to maximise variation across project location, size, and sector involvement. Projects which provided the opportunity to demonstrate a range of experiences in terms of successes, barriers, and lessons learned were prioritised.

1.13 The purpose of the case studies was to create an evidence base that draws out insight on levels of success and lessons learned in terms of:

- Implementation of the programme;
- Impacts and added value of the programme;
- Governance of the projects; and
- Barriers and enablers of success.

1.14 Case study development involved a combination of interview evidence and desk research:

- **Interviews** (one per case study) guided by an aide memoire (see Appendix B). Stakeholders were selected on the basis of one interview with a project stakeholder (to

provide an in-depth assessment of the project), and one with a wider Hub stakeholder (to provide an overview of project implementation and progress).

- **Desk research** used project-relevant documentation to provide an overview of each project. This included feasibility reports, progress reporting, final reporting, and application forms. The case studies are summarised in Appendix C.

Quantitative Research

1.15 We were provided access to two key sources of project information:

- **The ‘BEIS Project Tracker’**, an Excel spreadsheet shared between the RCEF Programme Manager and BEIS, which is used to track key metrics related to the RCEF such as technologies supported, location, scale, funding decision, grant awarded, project status and so on. The fields with the greatest relevance to the evaluation include project category, status of the project, project geography, project size and CO₂e (carbon dioxide equivalent⁷) savings from the project. Table 1-3 provides a high-level summary of the data contained within the BEIS Project Tracker; and
- **Project supporting documents** (i.e., feasibility reports, progress reporting, final reporting, and application forms). We received a total of 28 supporting documents, which together provide coverage of 26 of the 31 Stage 1 projects.

Table 1-3: Key metrics from the BEIS Project Tracker

Metric	Coverage
Project name (Project title)	Available for 100% projects
Project location (LEP area)	Available for 100% projects
Project status (Completed, still delivering, cancelled)	Available for 100% projects
Community group delivering	Available for 100% projects
Technologies used	Available for 53% (n=21) of projects
Potential energy generation (kW)	Available for 30% (n=12) of funded projects
Potential CO ₂ e Savings (tCO ₂ e/year or lifetime tCO ₂ e)	Available for 30% (n=12) of funded projects

Source: Analysis of BEIS Tracker, Steer-ED, 2023

1.16 The quantitative research workstream began with an initial review of monitoring data held within the BEIS Project Tracker. As of February 2023, there were a total of 54 projects recorded on the Project Tracker, 41 of which have been funded, and ten of which have progressed to Stage 2.

Carbon quantification

1.17 After an initial review of the Project Tracker, it was found that the coverage of CO₂e savings associated with proposed projects was incomplete. This was due, in part, to a late requirement by BEIS to provide details on CO₂e savings for each project, which was not reflected within the contracts with Stage 1 and Stage 2 grant recipients.

⁷ Greenhouse gases are converted to carbon dioxide equivalents by multiplying each gas by its 100-year global warming potential value: the amount of warming one tonne of the gas would create relative to one tonne of CO₂ over a 100-year timescale.

1.18 In response to these gaps in CO₂e savings reported in the Project Tracker, we made use of data from the supporting documentation provided (in particular, feasibility studies) to estimate project-by-project CO₂e savings and capital costs (CAPEX). These estimates were then compiled to provide a programme-level estimate of CO₂e savings and drive an overall Value for Money (VfM) assessment. The benchmarks and conversion factors adopted for carbon savings and CAPEX estimates can be viewed in full in Appendix D of this report.

1.19 We note the following advantages of this approach:

- Because we are adopting a whole portfolio approach and using the same benchmarks across all projects, carbon saving estimates are comparable/on a 'like for like' basis; and
- It was straightforward to conduct sensitivity testing of the impact of various assumptions on final outputs.

1.20 In contrast, our approach has one key limitation: some technologies are more suited to the benchmarking approach than others. Technologies such as heat pumps, and heat networks have high levels of uncertainty due to their complex nature. They involve multiple variables such as the size of heat pump, size of heat network, heating demand, and building fabric⁸. Therefore, it is difficult to obtain reliable estimates of their performance through benchmarking. On the other hand, more straightforward technologies such as solar PV, wind, and micro-hydro are more conducive to benchmarking and can be estimated more readily. This limitation aside, for all projects where data on CAPEX and installed capacity were available from the BEIS Project Tracker or feasibility studies, we were able to obtain reasonably good estimates of CO₂e savings.

Value for Money

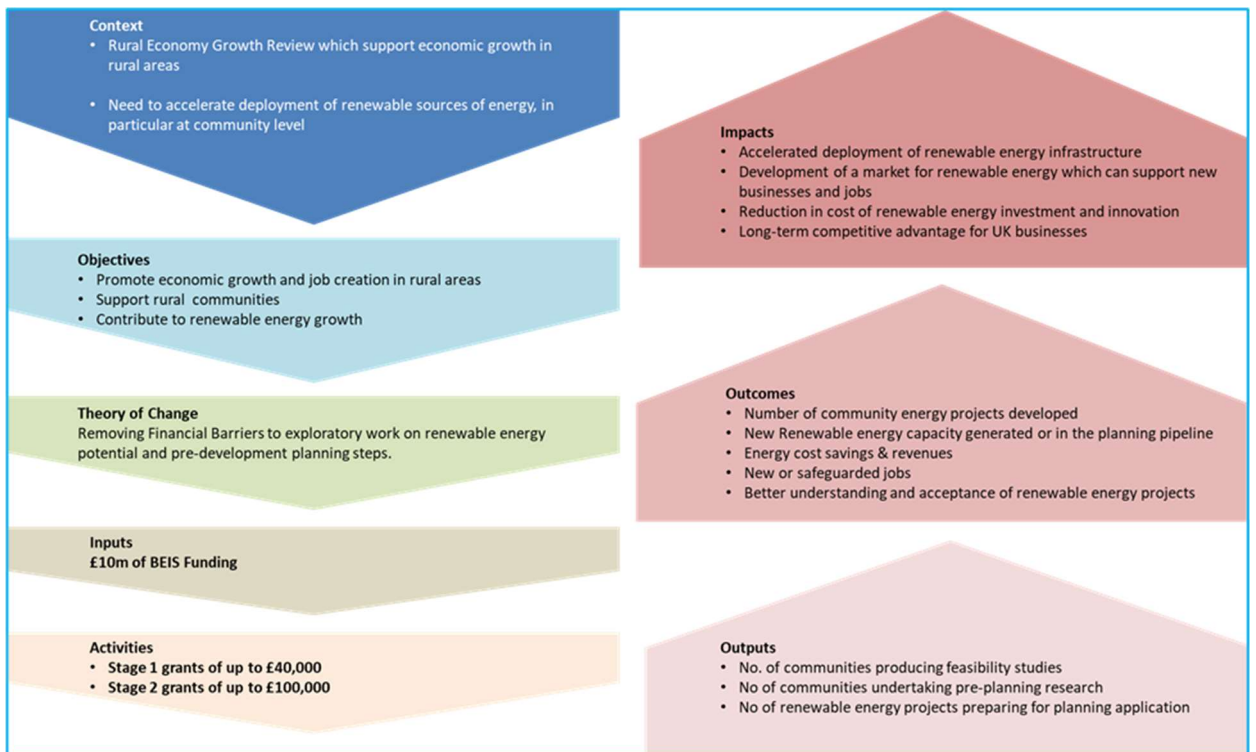
1.21 Value for Money was estimated by calculating the Benefit Cost Ratio (BCR) from the capital expenditure of a project (including the total grant funding received from the RCEF) and the monetised value of the CO₂e savings associated with that project. Projects that were cancelled or shown to be unfeasible in their proposed configuration (and had not been revised) were not included.

The Programme Logic Model

1.22 A Logic Model is a key foundation of any evaluation, since it expresses a programme's intended objectives and routes to achieve those objectives through a series of inputs, activities, outputs, outcomes, and impacts. These causal links are then tested throughout the evaluation. The programme logic model developed by the Department for Environment, Food and Rural Affairs (Defra) and the Department of Energy and Climate Change (DECC) for the first round of the RCEF and shared within West of England Combined Authority's project specification is presented Figure 1-1. The Logic Model has been updated to reflect the second iteration of the RCEF scheme.

⁸ We note that for projects involving anaerobic digestion (AD), we have assumed the plant produces biogas only (i.e., we are not assuming this is a CHP plant) and have estimated emissions on the basis of substituting natural gas.

Figure 1-1: RCEF Logic Model



Source: Steer-ED, adapted from North East and Yorkshire Net Zero Hub/ BEIS, 2022

Report structure

1.23 The remainder of this report is structured as follows:

- **Context, Rationale & Objectives (Chapter 2)** evaluates the evolving context within which the RCEF has been implemented, the rationale, objectives and anticipated outputs, outcomes and impacts of the Fund.
- **Characterisation of the programme inputs, outputs, and implementation (Chapter 3)** primarily evaluates the delivery of the RCEF and draws heavily on qualitative research.
- **Impacts & Value for Money (Chapter 4)** evaluates the outcomes and impacts of the project including quantified CO2e savings and concludes with an appraisal of value for money.
- **Conclusions & Recommendations (Chapter 5)** sets out the evaluation’s key findings, lessons learned and recommendations to shape future programme design and delivery.

2 Context, Rationale and Objectives

Key messages & overall assessment

- Rural regions face innate challenges that can hinder development opportunities but can also have unique opportunities in comparison to urban areas.
- However, in response to the net zero challenge, locally led initiatives offer attractive growth prospects and opportunities to redress long-standing challenges experienced by rural communities.
- Renewable energy generation is possible at much smaller scales than typically used for fossil fuel-based energy generation. Energy policy and regulation, however, is set at national level across England, rather than being devolved or localised.
- Whilst subsidy schemes were launched between 1990 and 2011 that supported renewable energy schemes including community-driven projects (particularly the Feed-in-Tariff and Renewable Heat Incentive), these programmes have now closed, leaving a gap in national-level policy support.
- In 2011, the Rural Economy Growth Review developed a package of policies designed to stimulate sustainable growth within the rural economy and help rural businesses to reach their full potential. The £15 million RCEF programme led by DECC and Defra was one such scheme that was launched in 2013 and administered by WRAP. The main aims of the fund were to:
 - Support rural communities to achieve the maximum income from renewable energy, and to implement these projects locally;
 - Increase renewable energy generation as per the government’s target and do so by promoting community-owned renewable projects; and
 - Help support growth and job creation in rural areas by making economic benefits of renewable energy schemes accessible.
- Due to low uptake and the establishment of the Local Net Zero Hubs, the RCEF was relaunched in June 2019 and ran until March 2022 with a total budget of £10 million allocated across the five Net Zero Hub regions for:
 - Stage 1 grants of up to £40,000 for a renewable energy feasibility study.
 - Stage 2 grants of up to £100,000. The purpose of this to provide funding for business development and planning to support projects to reach a stage where they are investment-ready.

Introduction

- 2.1 This chapter evaluates the evolving context within which the RCEF has been implemented, the rationale for its initial launch in 2013 by Defra and WRAP and re-launch in 2019 by BEIS and the Net Zero Hubs, and the objectives it sought to achieve while looking at both at the UK level and the North East and Yorkshire Net Zero Hub region.
- 2.2 In the context of the climate crisis, effective mitigation of climate change requires urgent and simultaneous global transitions toward low-carbon electricity, heat, agriculture, transport, and other systems. Transition strategies require careful consideration of significant socioeconomic challenges, such as energy affordability, quality of life, and inequality, in order to support development that is sustainable and just. These socio-economic challenges are particularly pertinent given the recent energy price rises due to international tensions, recovery from the COVID-19 pandemic, and inflation driving up the cost of living – all of these factors leading to substantial increases in the number people living in poverty (including fuel poverty).
- 2.3 Rural regions, however, face challenges that can hinder development opportunities. These include low population densities, distance from labour or capital markets, higher infrastructure costs, outward migration. Low-carbon and sustainability transitions, however, offer attractive growth prospects and opportunities to redress long-standing challenges experienced by rural communities. In particular there may be unique opportunities compared to urban areas, such as availability of land and proximity to renewable resources. In contrast, there may be economic obstacles such as comparatively higher installation costs (although costs have fallen dramatically in recent years). Second, rural renewable schemes may compete with agriculture, recreation, or tourism for the use of land or landscape and nature amenities and therefore may be subject to local planning restrictions or community opposition.

Energy policy context

- 2.4 Over the past three decades there has been a major shift in UK energy policy, with privatisation and liberalisation shifting ownership of energy generation, distribution, and supply from the state to the private sector; and several reforms creating and shaping energy markets.⁹ This led to significant developments in efficiency and cost but has resulted in, and maintained a centralised energy system (generation, distribution, supply, financing, and regulation) dominated by large players with bias towards large-sale facilities and corporate ownership.¹⁰
- 2.5 Most energy supply and generation in the UK has been concentrated into six large companies (the Big Six), with less than 1% of the generated electricity originating from outside these utility firms. It is noted, however, that increasing competitive and financial pressures has changed the profile of the supplier market in recent years. Currently there are now five large companies within a total of 23 active suppliers in the domestic gas and electricity retail markets. Furthermore, the gap in market share between the smallest of these and the fastest growing medium suppliers is in decline.¹¹ These smaller competitors are potential new

⁹ UKREC (2020) *Evolution of Community Energy in the UK*

¹⁰ Bauwens et al. (2016) *What drives the development of community energy in Europe? The case of wind power cooperatives. Energy Research & Social Science, 13, pp.136-147.*

¹¹ <https://www.cornwall-insight.com/press/suppliers-use-energy-market-turbulence-to-gain-market-share/>

customers and collaborators community energy schemes.¹² Whilst the market shares of the “Big Six” are falling overall, the domestic supply market can still be characterised as relatively uncompetitive and there have been concerns raised by the regulator as to the poor outcomes being realised by householders and SMEs.¹³

- 2.6 Renewable energy generation is possible at much smaller scales than typically used for fossil fuel-based energy generation. By design, however, energy policy tends to favour a centralised configuration rather than supporting smaller-scale generation with more active participation. Indeed, as highlighted above, large utility companies continue to dominate the UK generation market, including renewable generation. Energy supply policy and regulation is set at national level across England, rather than being devolved or localised. Energy generation and energy consumption are matched at a national level, using large-scale transmission and distribution networks. The distribution network is privately owned and managed at regional level but integrated into a UK-wide transmission system, and subject to UK-wide regulation and pricing. Energy supply companies are also obliged to offer their energy UK-wide.¹⁴
- 2.7 In contrast, decentralised generation, comprising geographically dispersed and small-scale units located closer to consumers - are said to present several advantages over centralized ones, including a more efficient, cleaner, and cheaper electricity system through reduced costs for transmission and distribution systems¹⁵, reduced grid power losses, more efficient data management systems and a larger share of zero-carbon technologies.¹⁶ This is in addition to potential societal benefits to local communities hosting or in close proximity to smaller-scale renewable generation. For example, the development of decentralised renewable energy projects that are steered by members of the community within which they are deployed can enhance social acceptance of technologies (i.e., wind) by embedding these within local institutions¹⁷, increased environmental literacy and pro-environmental behaviour change, local economic development (e.g., reducing energy bills, local employment, and financial revenues for shareholders, members of the local community). Place-based, collaborative solutions also have the potential to engender a more just transition.¹⁸
- 2.8 Over the past three decades, the simultaneous shifts in technology and regulation, combined with the nature of renewable energy technologies, created opportunities for small firms. Indeed, over the same time period has also seen the introduction of policies to encourage renewable energy generation with a view to meeting the UK’s Net Zero ambitions. Major schemes include the Non-Fossil Fuels Obligation (NFFO, which ran from 1990-2002), the Renewables Obligation Certificates (ROCs, introduced 2002), the Feed-in-Tariff (FIT, introduced in 2010) and the Renewable Heat Incentive (RHI, introduced in 2011). The FIT

¹² UKERC (2020) op. cit.

¹³ [Competition and Markets Authority \(2015\) Energy Market Investigation](#)

¹⁴ UKERC (2020) op. cit.

¹⁵ [Shakoor et al. \(2017\) Roadmap for Flexibility of Services to 2030 \(Climate Change Committee\)](#)

¹⁶ [Bray et al \(2019\) Policy and Regulatory Barriers to Local Energy Market \(University of Exeter, Energy Policy Group\)](#)

¹⁷ [Bauwens et al 2016. What drives the development of community energy in Europe? The case of wind power cooperatives. Energy Research & Social Science, 13, pp.136-147.](#)

¹⁸ [Ibid.](#)

scheme in particular boosted the formation of community-driven energy projects which were disproportionately initiated in rural areas.¹⁹

Community Energy

- 2.9 Community energy is defined as “An energy project initiated through grassroots action, which is wholly or partly-owned, delivered and managed by a community group, and whose mission is to deliver environmental, social and economic value for a specific place.”²⁰ Community energy projects offer an alternative to privately owned, large-scale energy provision, with various forms of community energy already found across Europe, North America and elsewhere.²¹ A healthy community energy sector has the potential not only to contribute significantly to the zero-carbon transition, but also to strengthen and empower communities, providing a broad range of co-benefits as described above.

Evolution of policy support for community energy

- 2.10 In November 2011, the Rural Economy Growth Review developed a package of policies designed to stimulate sustainable growth within the rural economy and help rural businesses to reach their full potential. Within the Review, the government committed to promoting the development of community-scale energy projects in England through the establishment of the £15 million RCEF programme led by DECC and Defra.
- 2.11 The RCEF aimed to help rural communities meet the upfront cost of developing renewable energy projects. This was to be achieved through the provision of grants to support early feasibility and loans to enable planning work necessary to develop viable renewable energy schemes in which the private sector is willing to invest. The RCEF was considered an efficient and effective way of using public money to support jobs in the manufacturing, construction, and maintenance sectors, and unlocking investment from private developers whilst also contributing to the Government’s renewable energy targets.
- 2.12 RCEF was part of a wider package of measures designed to deliver the then Coalition Government’s commitment to “encourage community-owned renewable energy schemes” where local people benefit from the energy produced. This also included the launch of a Community Energy Online Portal and the short-lived Local Energy Assessment Fund (LEAF) which ran between December 2011 and March 2012.
- 2.13 LEAF recognised that community-led groups require initial strengthening in terms of capacity building (knowledge, skills, membership, organisation, and legal status) to enable them to reach the point of actively installing community energy projects at a later stage. The purpose of LEAF was to help prepare communities in England and Wales to act on energy efficiency and renewable energy and to take advantage of the opportunities offered by policies such as the Green Deal and Renewable Heat Incentive (RHI), as well as FiTs.²² In total, the LEAF programme supported 236 community energy generation and management projects across

¹⁹ UKRC (2020) op. cit.

²⁰ Cairns et al. (2023) [Financing grassroots innovation diffusion pathways: the case of UK community energy. Environmental Innovation and Societal Transitions, 46, p.100679.](#)

²¹ Brummer, V., 2018. [Community energy—benefits and barriers: A comparative literature review of Community Energy in the UK, Germany and the USA, the benefits it provides for society and the barriers it faces. Renewable and Sustainable Energy Reviews, 94, pp.187-196.](#)

²² [DECC \(2014\) LEAF Evaluation \(DECC\)](#)

England. The RCEF opened to applications in June 2013 and to a degree built on the capacity developed through LEAF.

- 2.14 In 2014 the UK government published the first-ever *Community Energy Strategy*²³, presenting a decentralised vision of energy transitions in which communities would play a leading role. The Strategy was in part driven by successes observed in other European countries such as Germany, Denmark, and Austria, all of which have a flourishing community sector which has significantly contributed to the widespread and rapid deployment of renewable energy. The Strategy also recognised that community groups can be more effective at reaching vulnerable individuals and communities and meeting local needs. They are also often more trusted by sceptical consumers. Further, co-design, shared ownership and community benefit has the potential to overcome the challenges of so-called ‘nimbyism’ in renewable energy deployment. A key part of the Strategy was also to enable the development of partnerships between local authorities, commercial organisations, and local networks to support community energy deployment.
- 2.15 The Strategy stated that the community energy sector could deliver 3,000 megawatts (MW) of generating capacity by 2020 and that the potential for further growth beyond this was even more substantial.²⁴ (According to Community Energy England’s State of the Sector Report (2020), however, the realised generation capacity of the sector in 2020 was just 2% of this (68 MW)). RCEF was one of two flagship programmes identified within the Strategy. The second was the £10 million Urban Community Energy Fund.
- 2.16 The Community Energy Strategy combined with a favourable financial support environment, such as FiTs, led to a significant growth in community energy schemes. Nevertheless, as the size of the UK renewable energy market continued to grow, the wider suite of policies tended to favour very large-scale projects, particularly nuclear, through investment and several measures supporting renewable energy – including community owned – were reduced or withdrawn. These included the reduction and eventual closure of the FiT, the removal of the exemption for renewable electricity from certain investment tax reliefs, and significant changes to the National Planning Policy Framework (NPPF) to limit any further deployment of onshore wind in England. These added to an already challenging environment for community energy. At the close of 2016, the Renewable Energy Association stated that government policy measures had created the most difficult period to date for the renewable energy sector.
- 2.17 RCEF closed to applications on 31st March 2022. At the time of writing, the future of the RCEF programme is unknown. After acknowledging in their *State of the Sector 2022 Report*²⁵ that the previous year had been the most challenging ever for community energy, Community Energy England (CEE) requested that the government replace RCEF with a National Community Energy Fund. This was supported by the Environmental Audit Committee, the Labour Co-op Party, and seventy-five national and community organisations²⁶. The Government has instead recommended that community energy actors ‘work closely with local authorities’ to access UK-wide capital and revenue funding such as the Community Renewal Fund and Towns Fund.

²³ [DECC \(2014\) Community Energy Strategy \(DECC\)](#)

²⁴ The community energy sector is currently less than a tenth of this and accounts for just 0.5% of the UK’s electricity generating capacity.

²⁵ <https://communityenergyengland.org/pages/state-of-the-sector>

²⁶ [Government decides not to fund a National Community Energy Fund | Community Energy England](#)

According to CEE, however, these funds are not suitable for community entrepreneurs who need ‘at risk’ development money to get projects investment ready – community energy organisations often lack the assets to borrow against, or the wider financial security of their commercial counterparts and are not in a position to investment their own funds ‘at risk’.²⁷ Instead, what community energy projects need, according to the CEE, is continued support through small amounts of grant funding (or in-kind support in the form of local authority development officers) for feasibility and development to get projects ready for private investment – either financiers or citizens (who are increasingly looking for sustainable investment opportunities).

- 2.18 The current version of the ‘Local Electricity Bill’²⁸, which seeks changes to current supply regulations that would, among other things:
- Guarantee small energy generators a stable tariff for selling their energy based on current energy market rates; and
 - Establish a local energy supply mechanism allowing small energy generators to operate as suppliers, selling electricity directly to local people; and
 - Give Ofgem a statutory duty to introduce new markets rules, ensuring the set up and operational costs of selling community generated energy directly to local customers is proportionate to the size of the energy generator’s business.
- 2.19 The Bill is in its second reading in The House of Commons and could result in many of the barriers to community renewable energy schemes being overcome. By relieving community energy markets of disproportionate costs and regulatory burdens, community energy projects could become more viable and could reshape the market as a whole as seen in other European countries such as Germany and Denmark.

The regional policy context

- 2.20 The North East and Yorkshire region is home to an internationally recognised and globally relevant renewable energy industry (viz., offshore wind) and the locus of net zero innovation. In contrast, Community Energy England (CEE) reported in 2020 that the community energy sector has not evolved in the same way as it has in many other parts of the country and has the fewest concentration of community energy organisations of any regions in England.²⁹ The region is served by the Distribution Network Operator (DNO) Northern Powergrid and comprises six LEPs:
- Tees Valley Combined Authority;
 - West Yorkshire Combined Authority;
 - Hull and East Yorkshire LEP;
 - York and North Yorkshire LEP;
 - North East LEP; and
 - South Yorkshire Mayoral Combined Authority.
- 2.21 From 2018, all LEPs produced Energy Strategies, with the remit to:

²⁷

https://communityenergyengland.org/files/document/585/1646131579_LettertoKwasiKwartengaboutfundingcommunityenergy.pdf

²⁸ [Local Electricity Bill \(parliament.uk\)](https://www.parliament.uk/bills/2021-22/local-electricity-bill)

²⁹ <https://www.northernpowergrid.com/sites/default/files/2021-12/5674.pdf>

- Identify energy opportunities and challenges across each LEP area, for power, heat, and transport;
- Set out energy demand and carbon emissions trajectories;
- Provide a focus for low carbon energy projects; and
- Assess the economic potential associated with this transformation and inform Local Industrial Strategies.

2.22 Alongside this process, energy and carbon targets were developed by some LAs and many declared climate emergencies. Across the North East and Yorkshire, the objectives, and targets from the six published energy strategies are commonly comprised of the following principles:⁷

- Decarbonising heat and power, retrofitting homes, and tackling fuel poverty;
- Renewable energy generation and integration of smart grid infrastructure;
- Investment in low-carbon economy skills; and
- Enabling the uptake of EVs and shift to sustainable transport modes.

2.23 Although the rationale and scope for investment in energy interventions varies across the North East and Yorkshire, there are commonalities in the priority investment needs to enable the clean energy transition, which include:

- Tackling the challenge of fuel poverty;
- Facilitating energy demonstration and innovation particularly around regional growth sectors (offshore energy, low carbon heat, electric vehicles, and batteries);
- Enabling the uptake of EVs whilst facilitating modal shift to sustainable modes of transport to support the journey to Net Zero and address local air pollution;
- Making improvements to energy efficiencies across existing and proposed public and private assets;
- Investing in development of low-carbon economy skills and education; and
- Supporting community energy generation schemes to enable secure, low carbon, and low cost distributed energy generation.

Rationale for intervention and history of the programme

Wrap Administration of RCEF

2.1 The RCEF was jointly launched in 2013 by WRAP and Defra, with the goal to help rural communities in England carry out local energy projects. The explicit focus of a fund for rural communities³⁰ was that rural projects, whilst equally valuable both in terms of economic returns and wider co-benefits, were often less attractive or feasible due to the smaller populations and potential scale of the programmes. Furthermore, supporting the development of the rural community energy sector could redress social and economic challenges that rural communities increasingly face such as economic decline, fuel poverty, outmigration, and the withdrawal of public services.

2.2 The Fund responded to the growing interest in developing local renewable energy projects, but the recognition that communities often struggle to find private investors willing to support them through the feasibility, planning and preparation work necessary to obtain planning

³⁰ For the purposes of fund allocation and application, a rural community (for whom RCEF was available) is a settlement with a population below 10,000 and in some cases, areas with between 10,000 and 30,000 can be considered as wider rural communities.

permission. Thus, RCEF provided financial support via loans to help rural communities undertake these initial stages, so that they can go on to benefit from the savings and returns available to them once the projects were developed. The fund provided up to £150,000 of funding for feasibility and development work to help projects become investment ready. The RCEF (WRAP administered) provided support in two stages:

- Stage 1 provided a grant of up to approximately £20,000 to pay for an initial investigation into the feasibility of a renewable energy project; and
- Stage 2 provided an unsecured loan of up to approximately £130,000 to support planning applications and develop a robust business case to attract further investment.

2.3 The main aims of the fund were to:

- Support rural communities to achieve the maximum income from renewable energy, and to implement these projects locally;
- Increase renewable energy generation as per the government’s target and do so by promoting community-owned renewable projects; and
- Help support growth and job creation in rural areas by making economic benefits of renewable energy schemes accessible.

2.4 Additionally, in order to apply to Stage 2 of funding, communities had to be legal entities (see **Error! Reference source not found.**).

Figure 2-1: Eligible organisations for Stage 2 RCEF Funding

- 
- Community Interest Companies
 - Community Benefit Societies
 - Charitable Incorporated Organisations
 - Pre-commencement societies
 - Registered Charities (local not national)
 - Co-operatives
 - Development Trusts
 - Amateur sports associations
 - Town or Parish councils
 - Registered Social Landlords

Source: Steer-ED adaptation from RCEF Guidance Document , BEIS and Defra, 2020.

Local Net Zero Hubs Administration of RCEF

2.5 In 2019 the RCEF programme was relaunched by BEIS, with the scheme being administered by England’s five Local Net Zero Hubs. An evaluation of the RCEF delivery by WRAP implied relatively low uptake. With administration shifting to the five regional Net Zero Hubs, it was viewed that they would take an active role in encouraging and supporting applications, whilst also providing tailored support based on regional contexts and local planning matters.

2.6 Although the objectives of the Fund remained the same, with reinstatement came several tangible changes to the scheme as a whole and to the two funding stages.

- First, the Net Zero Hubs have Local and Combined Authorities as accountable bodies for funding and have Local Enterprise Partnership heads as board members. This is advantageous for RCEF as it has been shown that Local Authority involvement in a project can act as a catalyst for project success³¹;

³¹ <https://energy-evaluation.org/wp-content/uploads/2020/07/eee2020-paper-birchby-david-31-148-birchby-david.pdf>

- Second, the configuration of the programme was also modified including: an expanded scope of technologies and interventions to be considered; and reconfiguration of the amount of funds allocated to Stage 1 (feasibility) and Stage 2 (business development and planning) to a maximum of £40,000 and £100,000, respectively; and
- Third, the mechanism by which the funds were distributed was also changed. Specifically, Stage 2 shifted from an unsecured loan to a grant.

Objectives, and pathway to impact

- 2.7 The rural focus of the RCEF aims to support rural regions who face particular challenges that can hinder economic development. These include low population densities, distance from labour or capital markets, higher infrastructure costs and outward migration. The programme sought to achieve its objectives by removing the barriers to investment in small-scale, rural low carbon energy projects, which are currently viewed as prohibitive. Currently, the costs of exploring feasibility and developing an investment-ready business plan are high and finance for this is not readily available in the commercial market. As such, the RCEF provided funding to community organisations to cover these up-front costs with a view to develop a pipeline of feasible projects as well as to build capacity and drive partnerships between the community energy sector and local government and the private sector.
- 2.8 The core objectives of the RCEF programme as delivered by the Local Net Zero Hubs were to:
- Promote economic growth and job creation and volunteering opportunities in rural areas to enable communities to access the economic benefits associated with renewable energy schemes;
 - Support rural communities by helping them to maximise the income generating potential of renewable energy and putting this to work locally; and
 - Increase the uptake of community and locally owned renewable energy, to support the Government's targets for renewable energy and Net Zero.
- 2.9 The total funds allocated to the five Net Zero Hubs for the delivery of RCEF was £10 million. Support was provided to rural communities in two stages:
- Stage 1 grants of up to £40,000 for a renewable energy feasibility study for a renewable or low carbon generation project, including heat pumps, solar, wind or hydro; and
 - Stage 2 grants of up to £100,000 to fund business development and planning work, helping projects reach a stage where they are investment ready.
- Eligible projects needed to be led by a community organisation (see **Error! Reference source not found.** for examples) which would own at least 50% of the project and distribute a share of the project revenue within the hosting community.³²
- 2.10 By the end of the Stage 2 grant, projects were expected to be able to demonstrate a position of investment readiness, having determined the following:
- Business case and delivery plan to take the project through to construction;
 - Financial model and investment strategy;
 - Community benefit agreement and/or community investment plan;
 - Secured finance or have a firm financial plan in place;

³² <https://www.swenergyhub.org.uk/wp-content/uploads/2021/01/RCEF-Stage-1-Guidance-Notes-SW-V3.pdf>

- Planning permission will be granted and any studies that are a condition of the planning approval will be complete;
- Legal agreements will be in place for the land and site access;
- Grid connection will be agreed and secured;
- Energy supply contracts will be agreed in principle; and
- Plans for procurement for the construction phase.

2.11 The fund's anticipated outputs, outcomes, and impacts (see Figure 1-1) were consistent with its aims as stated above:

- **Outputs** include the production of feasibility studies, and development documentation including planning application, business case and investment strategy and relevant legal agreements;
- **Outcomes** include an increase in the number of community energy projects developed and renewable energy capacity generated or in the pipeline, realised energy cost savings and revenues, CO₂e savings, new or safeguarded jobs and improved understanding and acceptance of renewable energy projects within the hosting communities; and
- **The longer-term impacts** anticipated as a result of RCEF include the accelerated deployment of local renewable energy infrastructure, development of new business models for community owned renewable energy which can support local economies, technology cost reductions and the acceleration of sector innovation, supporting the long-term competitive advantage for the UK in the sector.

3 Characterisation of the Programme: Inputs, Outputs & Implementation

Key messages & overall assessment

- Out of a total of 54 projects, 41 have been funded which included 31 Stage 1 grants with 10 progressing to Stage 2.
- The support provided by the RCEF team was characterised as open, honest, and transparent, which allowed for concerns to be raised early.
- The RCEF team had differing levels of involvement with teams, depending on the level of support that was required from them. This included direct support during both application and delivery stages (including monitoring and reporting), facilitating connections with key stakeholders, signposting consultants, and identifying post-Stage 2 funding opportunities.
- The RCEF lead at BEIS played a supervisory role within the RCEF governance process and kept track of key information about projects through monthly group meetings, ad-hoc calls, and an internal project tracker (the BEIS Project Tracker).
- The RCEF team was considered to be broadly flexible with altering timescales to suit community group needs but faced consistent issues such as COVID-19 causing delays and capacity challenges. Despite this, community groups still faced severe challenges with time slippage, primarily due to exogenous factors. This meant that many project teams felt they were not able to progress as far as hoped, or as outlined in their initial application forms.
- Other key issues named in the delivery of projects were factors such as difficulties with procuring consultants and establishing a grid connection.
- The North East and Yorkshire RCEF process employed multiple levels of risk management, which started at the application stage and was reflexive to emerging risks. This included developing trusted relationships with the community groups, signposting advice, and trusted consultants, and attempting to address potential barriers to delivery.

Funding & resources

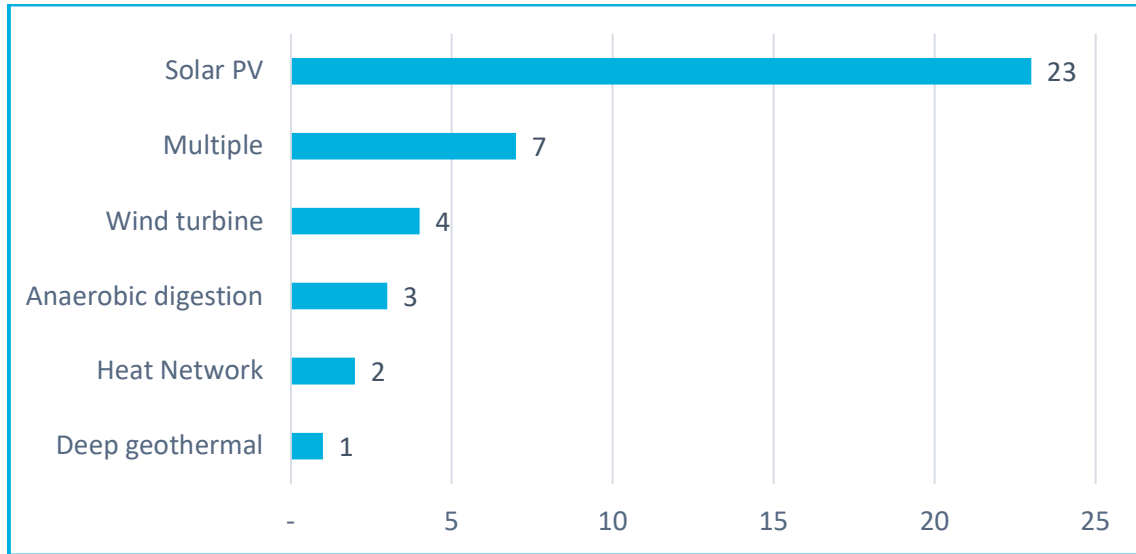
3.1 High-level analysis of the information in the tracker has been completed. The tracker was last updated on 20/02/2023. As such, the tracker can be viewed as up to date.

- Out of a total of 54 projects, 41 have been funded which included 31 Stage 1 grants with 10 progressing to Stage 2.

- Only 11 of the funded projects have potential CO₂e savings reflected within the project tracker when reviewed.
- The majority of funded projects are solar PV. Other funded project types include deep geothermal and heat networks.
- Almost all funded projects are in the York & North Yorkshire or North East LEP areas, with a very small number of projects in the remaining LEP areas.

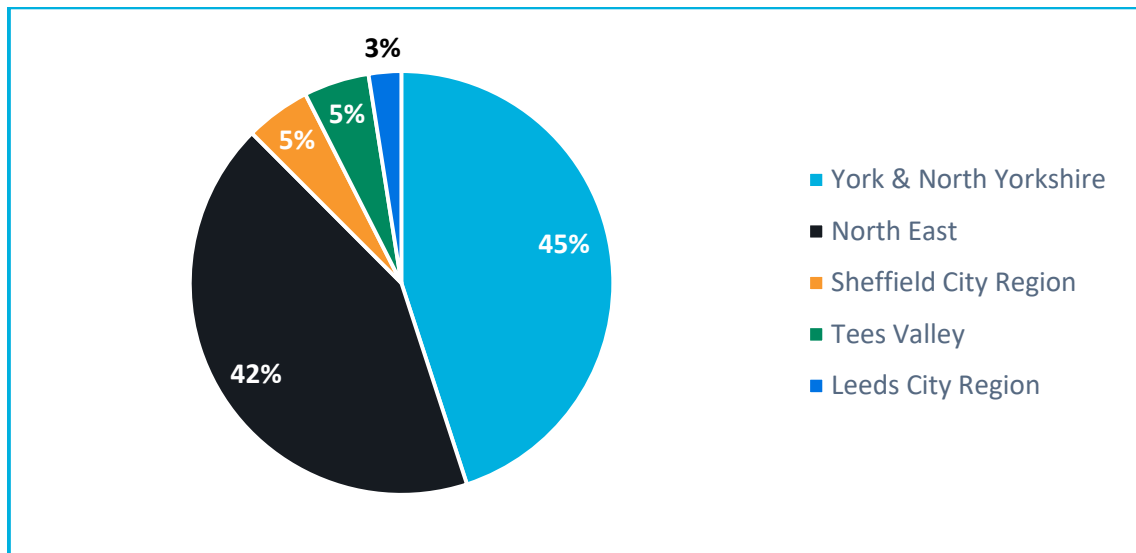
3.2 A total of £2.1m funding was applied for, of which £1.7m was awarded. The majority (26) of grants were between £20k-£40k.

Figure 3-1: Profile of Stage 1 & 2 Projects funded by RCEF in the North East and Yorkshire Net Zero Hub Region



Source: Steer-ED visualisation of data from the North East and Yorkshire Net Zero Hub Region BEIS Tracker, 2023

Figure 3-2: Geographical Distribution of Stage 1 & Stage 2 Projects funded by RCEF in the North East and Yorkshire Net Zero Hub Region

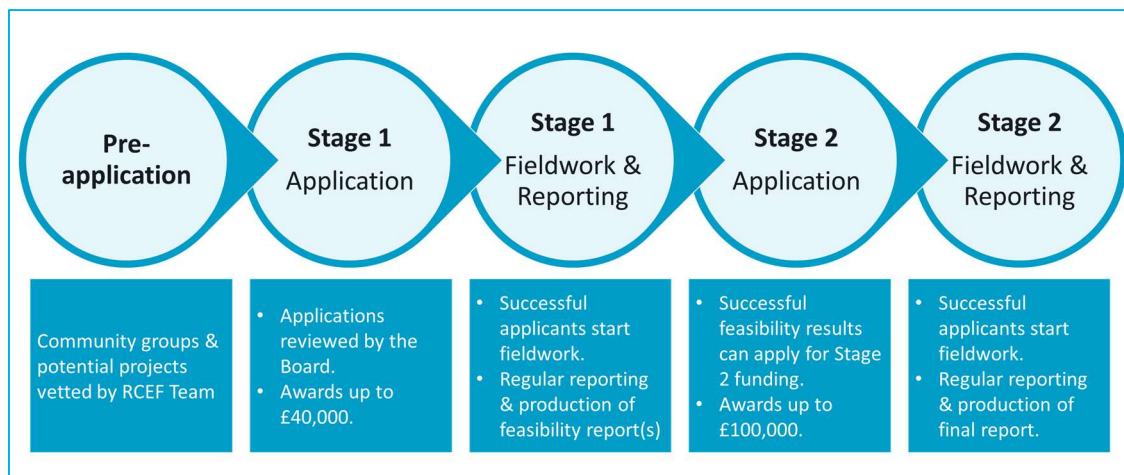


Source: Steer-ED visualisation of data from the North East and Yorkshire Net Zero Hub Region BEIS Tracker, 2023

Project characterisation

- 3.3 The key stages of the RCEF process are outlined in Figure 3-3. This process diagram has been developed through consultations with seven representatives from community groups who received Stage 1 and/or Stage 2 funding.

Figure 3-3: RCEF Process



Source: Steer-ED, 2023

Pre-application and Initial engagement with RCEF

- 3.4 The RCEF Project Manager (who was also working on other programmes within the Net Zero Hub) employed a range of approaches to engage with community groups in the early stages of the RCEF timeline. These activities were mostly led by the RCEF Programme Manager. Internal stakeholders stated that the community energy sector within the region was “non-existent” at the start of the RCEF programme. Indeed, according to Northern Powergrid’s 2019 report on the community energy sector in the region, since 2016, there has seen significantly lower community energy activity in the North East and Yorkshire region than in other parts of the country, both in terms of organisation numbers and numbers of new low carbon projects.³³ Given this, the RCEF team had to adopt a proactive approach to generate interest and awareness. This was considered a challenging task as the existing community energy landscape environment was described as lacking a degree of professionalisation. Furthermore, existing projects in this area tended to be hydro-focused, adding the challenge of encouraging a diversity of technologies, but without the active visibility of what might be possible or achievable in the region.
- 3.5 Specifically, the RCEF team took the initiative to actively seek out and engage with community groups who might be interested in developing energy projects. This involved approaching community groups to understand potential ideas, providing guidance and advice, and encouraging group members to understand the wider benefits of community energy activity. Furthermore, the team made efforts to identify potential partners, such as landowners, businesses, and factories that could benefit from involvement with community energy projects.
- 3.6 Three consultees from our sample were made aware of the RCEF through their networks rather than directly from the NEY Hub directly, demonstrating the Hub’s efforts in promoting

³³ <https://www.northernpowergrid.com/sites/default/files/2021-12/5674.pdf>

the programme across the sector. For instance, one group had an ongoing relationship with a consultant who suggested developing activities through the RCEF process.

- 3.7 Unfortunately, at least two community groups felt that they were “late to the party,” having commenced their activities later in the RCEF timeline. As a result, one project, in particular, was only able to start its activities in late 2020, which meant they had to navigate various restrictions due to the COVID-19 Pandemic from the outset, adding a layer of complexity to this project’s operations. This illustrates that network building takes time, particularly within a sector that had a limited foundation on which to build on, but also that awareness of the RCEF programme grew as Hub’s visibility and networks become more established.
- 3.8 Several consultees interviewed also highlighted an increase in awareness of the net zero agenda – potentially the result of the UNFCCC COP26 hosted in Glasgow that led to a heightened coverage of the net zero agenda across mainstream media, and wider Net Zero Hub activities. This meant the relevance of RCEF may have only become interesting to some groups as their strategic priorities changed in line with a wider cultural narrative. For example, one church in our sample established a Net Zero agenda in 2020, which means that the RCEF only became relevant to their activities after this time period.

Support with the application process

- 3.9 Approval of RCEF applications in the North East and Yorkshire region followed a structured approach involving key stakeholders such as representatives from BEIS, the RCEF team, and the Net Zero Hub Board. The Board consisted of representatives from each of the LEPs/ Combined Authorities and BEIS (now Department of Energy Security and Net Zero, DEZNZ). Whilst the Board did not have individuals with specific expertise in the community energy sector, they did have access to support from the RCEF officer for technical clarification when required.
- 3.10 Consultations with the RCEF team suggested that the initial pre-application support provided to some community groups was crucial to the success of their application. Here, the RCEF team acted as a “critical friend” to develop robust applications. Several community groups, particularly those lacking experience in applying for public sector grants, required “hand-holding” during this stage. For example, one group stated that initially, “we didn’t know what we were doing because everything was new to us.” Whilst another community group felt that the dialogue with the RCEF team had helped simplify their Stage 1 goals, which had initially been overambitious, thus ultimately making the successful delivery of the project more likely.
- 3.11 It is worth noting, however, that the level of support required by community groups at the application stage varied greatly across the sample. This was primarily due to the professional and technical expertise embedded within the community group. For example, one group had a member who had already had experience of the RCEF through previous project experience. They were, therefore, able to draw on their knowledge to support the community group as they navigated the RCEF process. Another group submitted two separate grant applications to the RCEF. As such, they had a good level of understanding of the RCEF process by the second project. In contrast, one group that was inexperienced in application development had initially “splintered” objectives that needed support from the RCEF team to streamline and refine them into clear and actionable goals.

Stage 1 Applications

- 3.12 Once a Stage 1 application had been approved, community groups followed a fairly standardised process. Stage 1 of the RCEF process required community groups to procure appropriate consultants or specialists to carry out a study that investigated the feasibility of developing a community-scale renewable energy installation in their chosen site(s).
- 3.13 The community groups in our sample reported undertaking a diverse range of activities, with projects varying greatly in scope and focus. The activities involved combinations of specific and more generalised projects, such as a multi-technology project that explored specifically the feasibility of both solar and wind technology, versus another project, which was a heating study that sought to identify suitable technologies for a range of community buildings. Interestingly, despite hydro projects being reportedly the most common form of community energy projects in the region, only one project in our sample was focused on this technology, which was then deemed to be unfeasible.
- 3.14 Out of the seven community groups who were consulted, only two were unable to progress to Stage 2. For one project that partially focused on using on-shore wind to support a heating system, the unfavourable policy environment of this particular technology made it difficult to implement an on-shore wind scheme, leading the group to shift their focus to other energy projects. The other project that stalled at Stage 1 was a hydro energy project. The feasibility study had shown that the flow of mine water was not sufficient enough to make it economically viable.

Stage 2 Applications

- 3.15 The Stage 2 process was reported to be much more challenging for community groups compared to Stage 1. While some community groups reported that the advice provided by the RCEF team was critical to success at this stage, others report that the RCEF team was actually “less hands-on” in Stage 2. Internal consultees, however, highlighted this was possibly linked to capacity issues within the Hub, such as the loss of the North East RCEF officer and additional responsibilities of the then RCEF Project Manager. Nevertheless, overall, the degree of support from the RCEF team in Stage 2 was primarily driven by the level of support that the individual community groups needed. This suggests that community groups had to be more proactive in identifying and seeking the support required from the RCEF Project Manager.
- 3.16 During Stage 2, community groups were required to formalise their organisation, as shown in Figure 2-1. Naturally, this was not a challenge for organisations in our sample who were already established with a legal form. One newly-formed community group, however, faced the task of bringing together members with varying levels of experience and understanding of community activity to agree on the key elements involved in becoming a community group. Establishing objectives and priorities was a significant focus, as it ensured alignment on values, roles, and responsibilities. The group emphasised the significance of this process, stating that they “couldn’t undervalue” how important this was.
- 3.17 Notably, some community groups in the sample encountered a lack of continuity with their primary point of contact at the Hub. This turnover of personnel had ramifications for some groups. Two groups observed that they heavily relied on the guidance and strategic advice offered by the initial Programme Manager during the Stage 1 process, and the nature of their relationship changed following the change in personnel. One of these groups reports that between Stage 1 and Stage 2 in their project, where this change in personnel took place, this relationship morphed from more “hands-on” to being more “monitoring and paperwork-

driven.” Nonetheless, the Programme Manager’s position remained a valuable resource for most, providing dependable support, guidance, and assistance.

Post-Stage 2

3.18 The current status of five community projects that were able to progress to Stage 2 are summarised below:

- A solar PV project is currently finalising design and legal agreement work to determine the placement of solar panels on a range of community buildings;
- A second solar PV array project that is currently seeking additional funding to complete their Stage 2 activities as the RCEF grant³⁴ was not able to fund the full amount;
- A study to identify electric and heat energy solutions for a range of community buildings was able to receive wider grant funding for the refurbishment and development of one site;
- One multi-technology (solar and wind) project has mixed messages regarding the likelihood of securing a grid connection. The group was initially informed by the DNO (District Network Operator) that a grid connection would not be possible as the nearest substation was at capacity. The latest response from the DNO was that a grid connection would be possible in 2032. Additionally, the RCEF grant was insufficient to cover the full amount of funding required for Stage 2 activities, so further funding is being sought to cover this. Limited success has been met so far, an application to the Hub’s highly competitive Energy Project Enabling Fund (EPEF) was unsuccessful. Whilst other funding opportunities were explored, the project was not sufficiently advanced to meet eligibility criteria.; and
- A solar PV project, led by an SME, is finalising its Stage 2 activities. As a result of the community engagement activities related to their RCEF project the SME has also been able to complete the installation of an air source heat pump and a demonstrator home, with a live-in resident that uses renewable technology.

3.19 Whilst there has been some success in leveraging additional resources from the initial the RCEF programme, the status of Stage 2 projects suggests that community groups seeking to progress their projects may require more enduring support, particularly with the development of bids and funding applications.

Summary

3.20 Overall, the experience of the RCEF process for the majority of community groups depended on their existing capacity and embedded expertise, with less established/ experienced groups required more support. Some have required enduring support to be guided through the process from the outset, whereas others are able to navigate the process independently with ease. As they required minimal assistance from the RCEF team, beyond the standard reporting procedure, this team’s main source of contact was with the Claims and Monitoring Officer within the TVCA.

³⁴ We note that some projects were funded using national underspend. According to internal stakeholders, this was distributed as fairly and widely as possible. As such, toward the end of the RCEF programme, smaller grants were made to ensure as many groups could be supported as was feasible with the remaining budget.

Governance & partnerships

- 3.21 In this section we focus on the oversight of the RCEF process. Specifically, this involves providing an understanding of the key stakeholders involved, their roles and responsibilities, and the effectiveness of the functions of these roles. This information has been collected through consultation with stakeholders within the RCEF process, including members of BEIS and former and current members of the RCEF team.
- 3.22 The RCEF Programme and Project Managers pre-vetted and scored applications against a scoring matrix comprising around 15 key factors before they were sent to the Board for approval. These included:
- Key technical elements;
 - Suggested timeline;
 - Social value;
 - Finances; and
 - Value for money.
- 3.23 Broadly the Board accepted the recommendations made by the RCEF Project Team. Although discussions were held regarding whether the project would go through as is, whether the application needed changes, refinement, additional information, or whether it did not fit the necessary criteria of RCEF. A technical advisory panel comprising 3 technical experts from within the Hub also provided expert input into the decision-making.
- 3.24 In the first 6 months of the RCEF scheme, the barrier of entry was quite low, with most organisations that applied successfully receiving funding for Stage 1. Some internal consultees felt that this low barrier of entry was, in part, due to the low level of technical expertise on the decision-making panel. Rather than being guided by the capability of the proposing community group as at this point, or the technical viability there was a view that Board members tended to advocate for schemes within their area. Although one internal consultee stated that there was a 'nervousness about who would be in a position to deliver, as even established organisations were struggling.' However, if a group demonstrated a high-level of commitment and organisations, they would tend to be supported.
- 3.25 A potential improvement described by consultees would involve reviewing applications based on the capability of community groups to carry out their proposed project. We note, however, that given the underdeveloped community energy landscape at the time, there was likely a smaller pool of established and experienced community groups to draw on and thus impacting the quality of the applications and capacity to deliver. This was corroborated by an internal consultee who suggested that the emergent nature of the sector may have been a core reason why a high proportion of applications for Stage 1 at the start of the RCEF process were not considered to be up to standard. Whilst the RCEF fund has played an important role in developing the community energy sector in the region (as discussed below), an understanding of the ability to deliver may have enabled more targeted support to embryonic groups and the identification of key capacity gaps earlier.
- 3.26 However, responding to this concern (and the difficulties of identifying suitable consultants to carry out the feasibility and development work) the Hub developed a procurement framework for a specialist consultancy within the first six months of the RCEF launch. There were approximately 9 bids for the framework, and three potential candidates were interviewed. Loco₂gen was awarded the framework contract, and as part of the social value offer, the

consultancy offered one-hour consultations with prospective RCEF grantees to provide advice on the proposed projects to enhance the quality and viability of proposals.

- 3.27 The RCEF lead at BEIS played a supervisory role within the RCEF programme delivery and was not involved in the delivery of projects. The three main ways in which the BEIS lead was able to keep track of key information about projects were through:
- A monthly group meeting with the RCEF Programme Managers;
 - Regular calls with individual Programme Managers to discuss the region's RCEF programme and the project tracker; and
 - An internal project tracker (BEIS Tracker) that relied on Programme Managers from each region regularly documenting various aspects of project activity, such as the total spend to date, and key milestones of projects.
- 3.28 BEIS used the internal tracker as the primary source of information regarding the RCEF project activity, with one internal consultee stating that a lot of weight was put on the information, but it wasn't clear who was actually scrutinising the information. Despite the importance of the internal tracker from the perspective of BEIS, there were a number of difficulties that can be attributed to the incompleteness of the trackers.
- Initially there was no formal tracker, the RCEF team had had 'light' discussions with regarding outcomes, but other than KPIs identified within the Memorandum of Understanding between TVCA and BEIS, there was no formal guidance for reporting and no reference to the programme logic model (see Figure 1-1) which had not been updated from the first round of RCEF funding delivered by WRAP.
 - Second, the BEIS tracker was shared approximately 12 months into the RCEF funding period, with a re-launch toward the later stages of the programme. The re-launch was catalysed by a change in personnel within BEIS. Internal stakeholders also highlighted there was also limited guidance on how to complete the tracker. For example, according to one stakeholder, some of the projects were quite complex and trying to capture this on a spreadsheet was challenging. Given the point in time the BEIS tracker was launched, the RCEF team had to populate the tracker with data from their internal tracker supplemented with information from the feasibility studies. As such, some of measures and metrics already captured by the RCEF team did not align with BEIS's requirements. Further, the tracker was reconfigured several times after its launch, including the addition of metrics.
 - Third, the tracker was stored on a SharePoint site and shared as a single Excel Workbook with Worksheet for each Net Zero Hub team. Users were unable to update the tracker if it was being updated by another user. This created difficulties in practically updating the Worksheet, as it would often be 'locked for editing' for several days.
 - Finally, the North East and Yorkshire Hub faced changes in personnel throughout the lifecycle of RCEF leading to a variability in the frequency that the tracker was updated. A potential consequence may have meant that monitoring and reporting duties to retrieve the necessary data from the groups were pushed down the list of priorities so that other, more pressing matters faced by community groups could be addressed. If this is the case, it may have had the effect of reducing the regularity and quality of the quantitative reporting. Internal stakeholders, however, highlight that there was very limited resource available for the RCEF project as a whole.
- 3.29 Drawing on interviews with the community groups and internal stakeholders, the RCEF was considered to be broadly flexible with altering timescales to suit community group needs.

Broadly, community groups faced similar issues. The most frequently cited challenge related to delays was caused by the following external factors:

- COVID-19 limited the community groups' access to suppliers, volunteers, and the ability to access sites.
- A number of community group consultees also cited that the sense of under-delivery was enhanced by the need to navigate wider issues that were outside of the direct control of the RCEF team. For example, internal stakeholders mentioned that in one case it took 6 months to procure a consultant, resulting in vast delays and the eventual cancellation of the project.
- Another common delay was the time taken to receive a grid connection offer from the DNO. This is an essential requirement in order to raise capital, but it is also a well-known risk for renewable energy projects seeking to export to the grid.

3.30 The RCEF team responded to project delays by granting extensions and providing enhanced support from the Programme Manager and establishing a procurement framework for consultancy support. Despite these extensions, however, the scale of the delays meant that some groups felt they had not fulfilled the potential of the project by the end of the delivery period. As stated by one community group – “more time would have helped”. There are a number of reasons for under-delivery caused by delays including:

- The finite duration of the RCEF programme;
- Projects starting later in the RCEF programme, subject to the same finite programme period; and
- Potentially an underestimation of the time required to undertake the projects by the community groups and the Board approving applications, including the risk of delay from receiving a grid connection offer.

3.31 For a majority of the community group consultees, the scope of the RCEF-funded projects followed a similar process. Stage 1 allowed community groups to build an understanding of what is possible in the area and technology of investigation iteratively. Stage 2 then followed the conclusions of Stage 1. As such, all projects evolved in scope from pre-application to Stage 2 completion. From the perspective of several community groups, the RCEF Programme Manager was able to make a significant impact and add value to projects by assisting in clarifying the scope of projects and streamlining the activities to align with the capacity constraints of community groups.

3.32 Most community groups consulted were well-informed about the way in which RCEF funds could be spent and that this was a decision beyond the remit of the regional RCEF team. Despite this awareness, funding still played a key challenge in a number of ways for the community groups in our sample.

- First, the RCEF funding did not cover capital expenditure. This meant that if projects had funding needs that fell outside of the RCEF rules, they needed to identify other sources of funding. Some community groups who had limited business literacy faced confusion around what could or could not be expensed.
- Second, navigating the financial system generally was considered to be a drain on capacity. While most of the RCEF process is described as being relatively straightforward, the claims process was seen as a frustrating element from the perspective of community groups. For instance, confusion around invoicing meant that one group attempted to claim

expenditure for refreshments for a community consultation. Several others found this process similarly “tricky” or “clunky”.

Delivery of the programme

Objectives of RCEF

- 3.33 Consultations with interviewees revealed that the RCEF programme in the North East and Yorkshire was instrumental in addressing several prominent issues in the region. First, interviewees identified that the area had historically lacked access to central-government funding opportunities for the development of full-scale community energy projects. Whilst there were nascent dialogues among some community groups regarding local regeneration, they often lacked the vehicle or expertise to translate these ideas into community action. RCEF, therefore, provided specific funding opportunities for groups interested in developing community energy projects in the region. Specifically, with the support from the RCEF team, it helped to refine “fuzzy but interesting ideas” into potentially commercially viable projects that were attractive investment opportunities.
- 3.34 A second key goal of the RCEF programme was to foster the creation of new organisations and support existing organisations in branching out into community energy activities. The region was found to have a limited number of organisations actively involved in community energy. Furthermore, the existing community energy landscape was dominated by hydro projects, given the abundance of natural hydro resources in the region. However, the need for a broader range of technology types was identified as crucial for the expansion and diversification of the community energy sector capabilities.
- 3.35 While just one community group in our consultation sample was technically “newly formed”, the reality is that pre-existing organisations in our sample faced very similar challenges in developing their capacity. For example, one existing group that represented a cluster of churches gained valuable institutional knowledge, that can now be shared with the wider church community. Prior to this RCEF involvement, the church community had experienced significant failures in installing unsuitable technologies in their infrastructure, resulting in the loss of significant capital funding from their limited reserves. Through the RCEF process, this organisation was able to gain a “safety blanket” of knowledge, evidence, and confidence, from Stage 1 and 2 activities. This will allow them to move forward with a sense of assurance and potentially encourage others in the community to make similarly well-informed decisions.
- 3.36 The RCEF programme in the North East and Yorkshire also addressed the critical need for energy resilience in the region. Consultees highlighted that there were circumstantial factors that “amplified the need for projects.” More specifically, the cost-of-living crisis combined with the energy crisis led to an increased awareness of the need for community-led small-scale energy projects. As such, several community groups identified that while at the inception of the RCEF-funded project, the main driver of activity was the focus on renewables, over time, the priority has veered more towards the cost of living. Additionally, for several projects in our sample, the local area had faced significant weather events had led to significant power outages. This meant that these contextual factors have reinstated the importance of projects that encourage energy security in the region, which further help to engage and garner the support of the wider community.
- 3.37 Consultees highlighted, however, that organisations with the capital to invest are reportedly hesitant to invest in implementing even basic infrastructural amenities such as broadband, due to the limited returns that these projects generate. This lack of appetite for investment

extends to renewable technologies, such as solar and wind, which are seen as essential for building energy resilience in the North East and Yorkshire. The wider policy environment and closure of the FiT programme has exacerbated this issue. For example, with the closure of the FiT scheme, funding opportunities for even highly viable projects have diminished. As a result, RCEF has played a crucial role in providing opportunities for projects that carry more risk, in addition to projects that can no longer be supported by the FiT scheme.

Issues affecting the delivery of projects

- 3.38 Several community groups in our sample reported challenges in finding available and qualified consultants to assist with their community energy projects. This issue was particularly pronounced during Stage 2. For example,
- Two groups note facing “supply chain issues,” with one being unable to continue working with their preferred consultant, whom they had used in Stage 1.
 - Another group mentioned that while the procurement process was relatively easy due to the support provided by the RCEF team at the Net Zero Hub, often more appropriate and qualified consultants were located in Scotland and were not able to visit the site. This meant that they needed to rely on remote support – although the COVID-19 pandemic made this approach less problematic due to the nationwide shift to remote working.
 - A third community group encountered difficulties in “trying to get consultants to do the work,” which hindered the project’s progress during Stage 2.
 - A further community group that had procured two consultants during the Stage 1 process, found that one was doing the majority of the work. For less experienced groups, who relied heavily on consultants for guidance, these challenges were particularly stressful. Despite the assistance provided by the RCEF team, the shortage of skilled consultants in the field of community energy projects remained a key concern for many community groups.
- 3.39 Community groups faced a range of external challenges that had significant impacts on project delivery, which were beyond their control. These included:
- Capacity issues of planning authorities, delaying decisions on planning applications;
 - The slow process involved in establishing a grid connection with the DNO; and
 - The COVID-19 pandemic placed restrictions on movement but also created a cascade of other challenges to local communities. For example, one community group which operated as a hub for the local community, faced several competing priorities during the pandemic, with the local community relying on them for integral services such as the provision of food and shelter.
- 3.40 These external factors had a material impact on project timelines and capacity, with several groups reporting that timelines became particularly challenging during Stage 2. Despite this, community groups noted that the RCEF team had been helpful within the boundaries of what they could do.
- 3.41 The delivery of projects was also impacted by a range of ‘internal’ factors that exacerbated existing capacity issues within community energy projects. These included:
- The considerable project management time and resource needed to plan, manage consultants and volunteers, manage budgets and finances, and oversee project activities placed significant strain on key community group leads who, who often had other roles and responsibilities outside of the RCEF involvement.

- One community group highlighted that with hindsight, their outlined timescales in the initial Stage 2 application forms were unrealistic, making it difficult to meet project goals.

- 3.42 While the RCEF team provided support by adjusting goals during the RCEF process and allowing for an extension of Stage 2 projects from December 2022 to March 2023, the absolute time limits of the RCEF programme meant that many groups of varying scopes were subject to identical timescales. Despite these challenges, the RCEF team did their best to accommodate the needs of community groups within the limits of the programme.
- 3.43 A final limitation, from the perspective of internal stakeholders in our sample, was the view that the overall rules and restrictions of the RCEF fund was “too rigid.” Whilst community groups were clear on how their allocated funds could be spent, the restrictions for capital expenditure were detrimental to some projects. One internal stakeholder noted that, for some projects, being able to use a proportion of the funding for capital expenditure such as scaffolding on-site would have benefited projects immensely.

Support provided by the RCEF team

- 3.44 According to community groups, the RCEF team and Programme Manager offered a range of valuable support to the community groups in our sample. This included direct support during both application and delivery stages (including monitoring and reporting), facilitating connections with key stakeholders, signposting consultants, and identifying post-Stage 2 funding opportunities.
- 3.45 Community groups interviewed that already had in-house expertise and technical knowledge, cited that the RCEF team mainly provided support with the requisite monitoring and reporting. The majority of consultees praised the relationship with the RCEF team, describing it as open, honest, and transparent, which allowed for concerns to be raised early. One group even felt a close and strong connection with the Project Manager, an essential factor in building confidence among community groups facing challenges.
- 3.46 Despite changes in personnel during their involvement with the RCEF process, most interviewees felt the support provided was consistent. For example, one group stated that, while there was a “churn of people” within the RCEF team, this did not impede their project, and the designated point of contact was an extremely helpful support system. Both of these consultees emphasised the crucial role of the RCEF team in the development of their projects, providing equally valuable support during both Stage 1 and Stage 2. During Stage 1, the RCEF team provided crucial information and understanding of the various processes involved, and during Stage 2, they were instrumental in refining and providing feedback on the project application. As mentioned earlier, however, two less experienced groups felt the support shifted from “hands-on” to being more “monitoring and paperwork-driven.”
- 3.47 When some groups were struggling to procure a consultant, the RCEF team provided valuable signposting to potential contacts. While some groups found better results through their networks, they appreciated the RCEF team's efforts.
- 3.48 A particular innovative way the RCEF team supported access to quality consultancy services was the establishment of framework agreement with ‘Loco₂gen Consulting’ an international consultancy with technical and commercial expertise to support the development, design, build and operation of renewable energy projects. The framework was put out to competitive tender with a view that the framework partner would provide technical and financial support to community groups applying for feasibility funding under The Fund. Loco₂gen subsequently

provided consultancy services for around 40% of feasibility studies. Part of Loco2gen's framework agreement also included the provision of pro bono technical advice to all community groups at the initial enquiry stage and as part of their social value offer. TVCA had an explicit social value requirement (under the Public Services (Social Value) Act, 2012) within the Framework Agreement which suggested a potential way to satisfy this would be, 'a willingness to commit a set number of hours to advise Community Groups at a very early stage of identifying sustainable projects on the likelihood of their project being viable'.

- 3.49 The RCEF team also facilitated connections and networking with key stakeholders. In particular, several projects from our sample were introduced to Community Energy South (CES), an organisation dedicated to supporting local community energy groups and promoting sustainable, low-carbon businesses in the South of England via a contract with the Net Zero Hub. CES was procured by the RCEF team through a competitive procurement process drawing on underspend and other savings to deliver a specific piece of exploratory work into optimal delivery models for community energy schemes within the North East and Yorkshire. Although and advisory role was not the core focus of this work, one community group was able to gather ideas for an exclusivity agreement with the landowner, which was initially proposed by CES.
- 3.50 For community groups who were largely self-sufficient in their day-to-day activities, however, there is a sense that RCEF could have provided more networking opportunities. One group stated that they would have appreciated the chance to talk to other community groups doing similar projects, which unfortunately was not available. This observation highlights the importance of anticipating the diverse needs of community groups, with those who need less help perceiving the relationship as more "hands-off."
- 3.51 The RCEF team also enabled some community groups to access further funding opportunities. For example, they brokered a meeting with officials from the Mayoral Green Deal Fund, which proved to be a suitable next step for one group's project. However, despite these efforts, several projects expressed a need for further funding to fully implement their programs. Groups emphasise that, particularly within rural community groups, often there are just a few members who hold the initiative together. Even though Stage 2 of the RCEF fund does move projects closer to implementation, there is a significant element missing to accommodate the inherent capacity issues that will be amplified as projects move closer to this point.
- 3.52 The North East and Yorkshire RCEF team also secured RCEF underspend from other regional Net Zero Hubs, enabling this to be redistributed in the North East and Yorkshire region. One community group in our consultee sample was able to benefit from the additional funding through a Stage 2 grant award. Although the full £100,000 was not available to them, they were able to receive around £35,000, which helped to commence efforts to seek a grid connection in Stage 2.

Mitigating risks

- 3.53 There are several key approaches the North East and Yorkshire RCEF team took to managing and mitigating risk. These included developing trusted relationships with the community groups, signposting advice and trusted consultants, and attempting to address potential barriers to delivery.
- First, the close relationship experienced by some groups created an environment in which the RCEF scheme was "more than just a grant". This personal touch, and highly involved experience with the Programme Manager (e.g., providing in-depth feedback for their

Stage 1 or Stage 2 applications), created a sense of trust between community groups and the RCEF team. It is clear from the consultation evidence that the relationship that formed between groups and the RCEF team not only embedded confidence within projects but also ensured a continuous and open dialogue.

- Second, the RCEF Programme Manager established contacts with trusted consultants and specialists, thus demonstrating an understanding of the issues that groups may potentially face. Later in the process, the team was able to similarly procure the support from Loco₂gen who were particularly helpful to several community groups within our sample. However, one ‘internal’ stakeholder mentioned that, in hindsight, procuring Loco₂gen’s services at an earlier stage would have created significantly more impact as many early RCEF applicants were not able to benefit from the high-quality support provided by the consultancy. The RCEF team also procured CES to carry out exploratory work on innovative and optimal community energy delivery models in the region, with a view to draw on experience within the community energy sector and develop recommendations for developing the sector in the future and once the RCEF programme had come to a close.
- Third, early activity by the RCEF team sought to minimise the risk of under-utilisation of the fund. As discussed earlier, the early Programme Manager proactively went to potential community hubs, as well as landowners, businesses, or small factories to generate interest and enthusiasm for the fund.

- 3.54 Broadly, the portfolio of activities demonstrates an awareness of the potential risks to RCEF delivery. Additionally, it was noted by an internal stakeholder that the marketing strategy for the RCEF has developed alongside the lifecycle of the fund. In the beginning, there was a limited understanding of how to reach out to groups online, there is now a mailing list with good coverage of groups in the region, developed with a team at the University of Leeds.
- 3.55 Lessons learned from the WRAP iteration of the RCEF programme would have been useful at the start of the Net Zero Hub’s tenure. Through consultation with stakeholders from the RCEF team as well as the RCEF lead in BEIS, there is no evidence that suggests that key learnings from WRAP had been shared. Rather, despite RCEF being a pre-existing scheme that was inherited by BEIS, it was a programme that had to, in many ways, start from scratch. A deeper understanding of the WRAP programme’s experiences could have offered invaluable insights into managing risks, identifying, and resolving challenges, and streamlining processes to support community-based projects. As such, it is critical that learnings from this iteration of the RCEF and evaluation are reflected in future community energy funding programmes, but also key messages are distilled and disseminated across the community energy sector using a range of approaches such as online material, webinars, and so on.
- 3.56 The view that a process for embedding institutional learning was lacking, was supported by all internal stakeholders consulted. For example, one consultee stated that whilst efforts were made by BEIS to connect Programme Managers from all areas in a monthly call, there is potential for better processes to be put in place to cultivate relationships between the regional Programme Managers and the BEIS team.
- 3.57 Additionally, with the benefit of hindsight, a few community groups in our sample expressed that the opportunities for them to network did not help them capacity build to the extent they were expecting. For example, one consultee stated that while online sessions they were invited to (organised by another RCEF region) were “interesting,” unfortunately the content and learning shared did not apply to their situation. This demonstrates a potential mismatch or lack of strategic planning behind networking opportunities.

3.58 Overall, the North East and Yorkshire RCEF team has demonstrated some success in managing many of the anticipated and associated risks associated with community energy projects. Consultations with internal stakeholders and community groups indicate that the team was adept in navigating risks within the limitations of the wider RCEF structures. However, it is worth noting that a significant proportion of the applications that submitted Stage 1 applications were successful, which has raised concerns among some internal stakeholders regarding the capacity of the community group to deliver. They believe that some projects that lacked a strong delivery team should have either been denied funding or provided with more extensive coaching to enhance the team's robustness.

Key success factors

3.59 Consultations with the North East and Yorkshire RCEF team and the community groups highlighted the significant role that consultants play in the success of projects. Many community groups in our sample, especially during the Stage 1 process but also Stage 2, relied heavily on their consultants to carry out successful feasibility studies, but also to upskill the associated community groups simultaneously. The ways in which the RCEF team was able to leverage these networks, which ultimately bolstered the support received by community groups, played a large part in driving success within projects. The RCEF team was able to develop a relationship with consultancy firm Loco₂gen, and a wider list of trusted consultants to provide consultancy services to the community groups. The beneficiaries of this approach were predominantly community groups lacking technical expertise. Those who were able to sustain their projects with existing resources, however, did not feel that the RCEF team provided them with new leads but were content with the resources they received regardless.

3.60 While the RCEF team was able to mitigate some of the risks involved with procuring consultants, some community groups felt they could have further benefited from guidance on how to procure the right consultants such as questions to ask, and experience to look for. Even though many of the communities interviewed were able to bypass this stage by accessing the consultancy Framework, they felt they would have benefited from more guidance, particularly for commissioning consultants for similar activities in the future.

3.61 A key success factor that community groups have reflected on is the largely positive working relationship between the RCEF team and project teams. For example, one community group representative expressed that at the start of their RCEF experience, they were unclear about what they could realistically achieve within the budget and timescales. Despite this lack of confidence or experience, they describe the role of the RCEF team as being highly supportive and optimistic, stating that “no one has ever said to us that this will never work.” This experience was echoed by several community groups in our sample, who expressed that the role of the RCEF team has had strong confidence-building impacts. Additionally, consultees mention that all information provided to community groups was clear and easy to follow. For example, the website, the grant offer, and feedback on their applications. This meant that even more inexperienced members were able to easily follow guidance and recommendations.

3.62 Finally, a key factor contributing to the success of a project is the extent to which project leads consider replicability as part of the RCEF process. Several community groups in our sample, across the spectrum of experience strategically considered ways in which they could document their process and experience in order to use them for future knowledge transfer opportunities. For example, one less experienced community group looked to previous failures of similar community organisations retrofitting historic buildings as a core motivating factor to

use the RCEF grant to develop a more technical understanding and evidence-based approach. From the outset, the community group aimed to share the work more widely so it could be utilised in the future. Similarly, a more experienced and established community group has positioned their solar PV and wind project as a simple project that is replicable within the region, using the RCEF programme as a platform for sharing their approach.

4 Impact & Value for Money

Key messages & overall assessment

- CO₂e savings for the 41 funded projects were estimated from data extracted from feasibility studies.
- Benchmarks were developed for cases where CO₂e savings or CAPEX were not reported in the BEIS tracker or feasibility studies, using data from other similar projects or desk research.
- Two approaches were adopted to calculate CO₂e savings from power generation projects: the HM Treasury Green Book's advice and a 'static' BEIS 2021 CO₂e emissions associated with electricity generation and transmission.
- CO₂e savings for projects are in the range of 48 tCO₂e to 54,550 tCO₂e across the projects, with an average of 5,890 tCO₂e across the lifetime of a project.
- RCEF activities have produced significant wider benefits and strategic added value. This includes enhanced process and technical capacity, increasing carbon/Net Zero literacy, well-being, and development of replicable models for community-led low carbon solutions.
- However, there are also a number of anticipated barriers to fulfilling the intended impact of community group activities. This includes the prospect of raising insufficient capital to lead to implementation, the challenges associated with gaining a grid connection and uncertainty caused by fluctuating external factors.

Key methodological considerations

- 4.1 Value for Money has been estimated by calculating the Benefit Cost Ratio (BCR) from the grant funding received through the RCEF and the monetised value of the CO₂e savings associated with that project. We have also calculated value for money using both RCEF grant funding and CAPEX. The CO₂e savings and CAPEX from projects that were cancelled or shown to be unfeasible in their proposed configuration (and had not been revised) were not included in the calculations. However, the RCEF grant funding associated with these projects is included within the overall BCR calculations.
- 4.2 Our calculations draw on a combination of data from the BEIS project tracker (viz., CO₂e savings and installed capacity (kW)), data extracted from commissioned feasibility studies and CO₂e savings and CAPEX benchmarks for the full range of technologies investigated through the RCEF. We note there is no CAPEX column in the BEIS tracker. The benchmarks were developed by the Steer-ED project team and details of the benchmarks and methodology for their development are presented in Appendix D.
- 4.3 Benchmarks were adopted under the following circumstances:

- **Where CO₂e savings were not reported in the BEIS tracker or the feasibility study.** Benchmarks for load capacity were developed using most recent load factors reported by BEIS (solar, wind and hydro). Benchmarks for Anaerobic Digestion (biogas generation only), ASHP/GHSP and heat networks using a range of heat sources were developed through a combination of desk research and data from other similar projects supported by the Midlands and North East and Yorkshire Net Zero Hubs.
- **Where CAPEX was not presented in the feasibility study.** Using data from BEIS and desk research we developed benchmarks for £/kW for solar (from small to commercial scale), wind (medium scale), heat networks and heat pumps (ASHP/GSHP), hydro, and Anaerobic Digestion, which we have applied to reported installed capacity (kW) or generating capacity (kWh) for each technology and for each project to calculate the CAPEX.

4.4 In order to test the consistency of CO₂e savings reported across the portfolio, we also calculated the CO₂e savings for each technology using developed benchmarks.

Carbon (CO₂e) Savings Calculations

4.5 The monetisation of CO₂e savings has been calculated using the central series of the BEIS monetary values for CO₂e savings³⁵. These values have then been applied to the lifetime CO₂e savings for each project, to estimate the total monetary value of CO₂e savings across the project lifetime. The lifetime of projects was taken from feasibility studies, but where no lifetime has been reported we have assumed a lifetime of 20 years. The average lifetime across all projects is 21 years.

4.6 To estimate CO₂e savings for the 40 funded projects in the BEIS tracker, we initially looked at projects where a figure had been reported for either project size/installed capacity, energy generation, or potential CO₂e savings. This was the case for a total of 12 projects. For the remaining 28 projects in the tracker, we reviewed the feasibility studies to draw out key information that could be used to quantify CO₂e savings. This included:

- The type of technology being supported;
- Installed capacity;
- Energy generation;
- Carbon savings;
- CAPEX;
- Conversion factor;
- Project lifetime; and
- Non-quantifiable co-benefits

4.7 There was only one project we did not receive a feasibility study for. We also removed figures for projects where there was a Stage 2 funded project, to avoid duplication of any benefits. Once these steps had been taken, we quantified CO₂e savings for 26 of the projects in the tracker. This number is lower than the number of funded projects due to there either being insufficient information in the feasibility studies, or the information was removed to avoid duplication.

³⁵ <https://www.gov.uk/government/publications/valuing-greenhouse-gas-emissions-in-policy-appraisal/valuation-of-greenhouse-gas-emissions-for-policy-appraisal-and-evaluation#annex-1-carbon-values-in-2020-prices-per-tonne-of-co2>. Monetised carbon values were adjusted to 2023 prices using a GDP deflator. The values have been discounted each year by 3.5% compared to an index of 1 in 2023 and in line with HM Treasury Green Book guidance.

4.8 It is important to note that our calculations of potential CO₂e savings, quantify all projects shown to be feasible from Stage 1; however, these projects would still require financing and implementation to realise any of the CO₂e potential savings calculated. As such, it is highly unlikely that 100% of the portfolio will move forward to delivery and so our calculated carbon savings are likely an overestimate.

4.9 Furthermore, we also varied the approach to calculating CO₂e savings from power generation projects.

- The HM Treasury Green Book advises the use the long-run marginal (domestic) electricity CO₂e emissions factors to 2100 as the counterfactual to low-carbon electricity generation (e.g., Solar PV).³⁶ These emission factors vary over time and reflect changes in emissions that would result from a small, but sustained change in electricity consumption. The emission factors draw on modelling undertaken by BEIS using the Dynamic Dispatch Model (DDM) and consider changes in the power sector required to meet the UK’s targets for National Determined Contributions (NDC) in 2030, Carbon Budget 6 in 2033-37, and net zero in 2050. As such, low carbon generation will increase significantly both as a proportion of total and marginal generation with the marginal emissions factors for domestic households declining from 0.26 kgCO₂e/kWh in 2022 to 0.02 kgCO₂e/kWh by 2039, where they then stabilise until 2100. This means CO₂e savings from a low-carbon electricity generation intervention decline over time until 2039 where they then stabilise.
- We also adopted a ‘static’ BEIS 2021 CO₂e emissions associated with electricity generation and transmission across the lifetime of the project³⁷. While HM Treasury advises long-run marginal (domestic) electricity emissions factors, we also recognise that projects similar to those supported by the RCEF will be responsible for achieving the forecast grid decarbonisation.

4.10 Given this we have calculated the BCR for 2 scenarios, each with four variations. These are presented in Table 4-1 below. In addition, we calculated the BCR for all Stage 1 and 2 projects using grid decarbonisation factors and Steer-ED developed benchmarks only to test the sensitivity of the benchmarks.

4.11 We have not reported carbon savings for EVs/EV charging points due to complexities and potential inaccuracies associated with calculating CO₂e savings. This only applied to four of the projects in the tracker. As such, their inclusion would unlikely affect the final CO₂e savings figure by a significant amount. We also didn’t include benefits arising from battery storage, which applied to two projects.

Table 4-1: BCR Scenarios

Variation	Scenario	BCR component	CO ₂ e calculation
1	Best case (Stage 1 & 2 projects) *	All RCEF grant-funding only	Grid decarbonisation factor
2			Static CO ₂ e emissions factor for grid electricity
3		RCEF grant-funding & All estimated CAPEX	Grid decarbonisation factor
4			Static CO ₂ e emissions factor for grid electricity

³⁶ See Table 1 from the Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal Data Tables 1 to 19 - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1129255/data-tables-1-19.xlsx

³⁷ <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>

1	Worst case (Stage 2 projects only) ⁺	All RCEF grant-funding only	Grid decarbonisation factor
2			Static CO ₂ e emissions factor for grid electricity
3		RCEF grant-funding & All estimated CAPEX	Grid decarbonisation factor
4			Static CO ₂ e emissions factor for grid electricity

Notes

* A BCR for all projects shown to be feasible from Stage 1.

+ A BCR capturing the benefits reported from Stage 2 projects only, while still including the initial costs of all Stage 1 feasibility studies produces a “worst case” BCR, depicting a scenario where no projects apart from those already completed at Stage 2 will provide CO₂e savings.

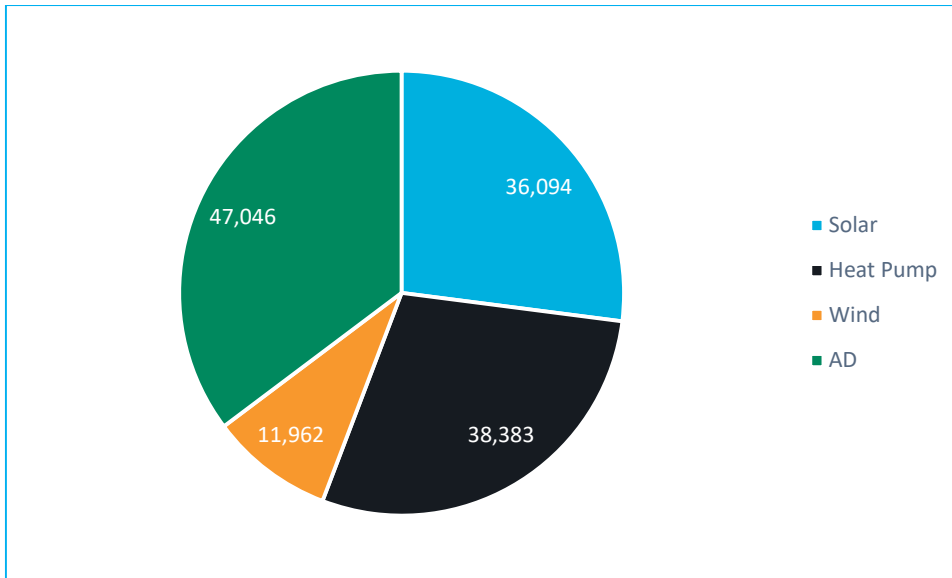
Source: Steer-ED, 2023

Quantified portfolio benefits

CO₂e Savings

- 4.12 After completing the work to fill gaps in the tracker and to calculate CO₂e savings, we calculated a total of **223,819 t CO₂e** saved across project lifetimes (using BEIS long-run marginal (domestic) electricity emissions factors). 127,348 tCO₂e of this was extracted from values reported in feasibility studies, and 96,472 tCO₂e came from values taken from the tracker. CO₂e savings for individual projects are on average 5,890 tCO₂e across the lifetime of a project, with a range from 48 tCO₂e to 54,550 tCO₂e.
- 4.13 The technology being supported that leads to the largest carbon savings figure is Anaerobic Digestion, with a combined potential saving of 47,046 tCO₂e. Wind has the lowest potential carbon savings with only 11,962 tCO₂e across the project lifetime. It is important to note that all CO₂e savings from AD reported above come from a single project with much greater CO₂e savings than seen through other projects, while those recorded as being produced from wind come from four projects and are the least due to the small number of projects utilising wind technology, rather than that wind produces considerably less CO₂e savings per project than other technologies (excluding AD). **Figure 4-1** shows the split of estimated CO₂e savings by project type, showing that with the exception of wind, the estimated CO₂e savings are fairly equally spread across solar, heat pump, and AD projects.

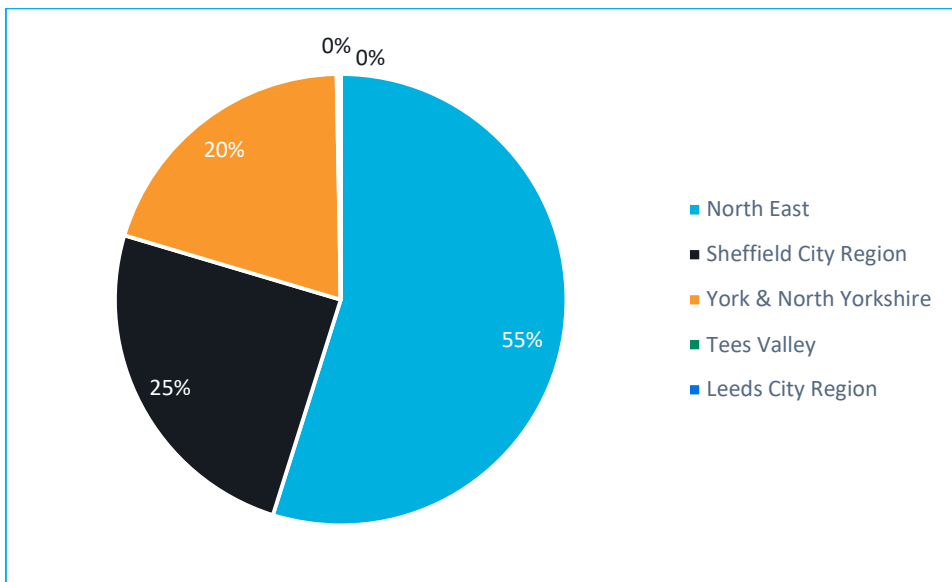
Figure 4-1: Estimated total lifetime carbon savings for the portfolio, split by technology type



Source: Steer-ED, 2023

4.14 The majority of the estimated CO₂e savings are for projects in the North East LEP area, with a total quantified savings of 122,770 tCO₂e. The smallest amount of CO₂e savings in a LEP area is in the West Yorkshire Combined Authority, which only accounts for 48 tCO₂e saved across the project lifetimes. Figure 4-2 below shows the split of estimated lifetime carbon savings across the different LEP areas, showing the potential carbon savings are concentrated around the North East, South Yorkshire Mayoral Combined Authority and York and North Yorkshire. This concentration is expected given 86% of projects take place in the North East or York & North Yorkshire areas.

Figure 4-2: Estimated total lifetime carbon savings by project geography

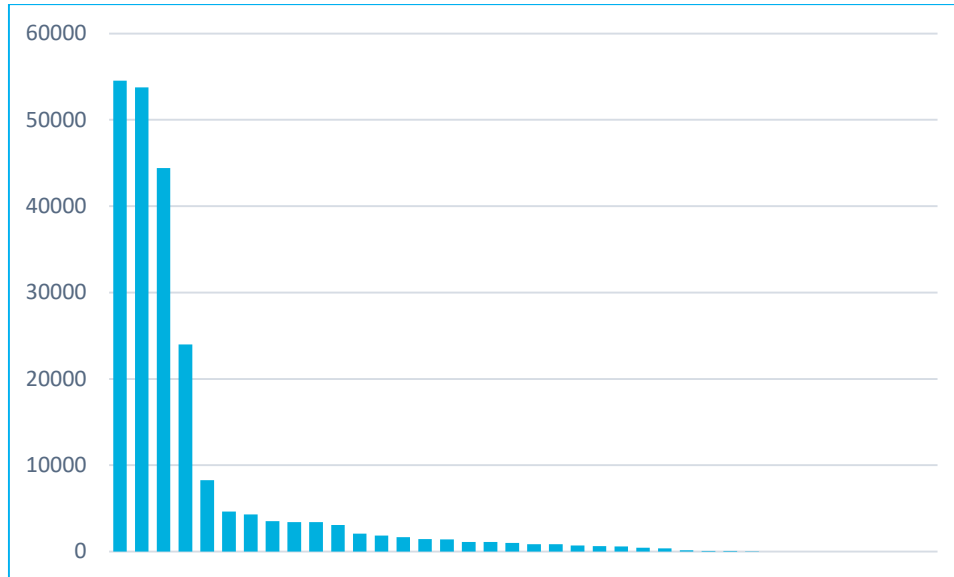


Source: Steer-ED, 2023

4.15 The majority of CO₂e savings are being delivered by a small number of projects. The project with the highest CO₂e savings accounts for 24% of total carbon savings, with the next top four

highest CO₂e savings projects accounting for a further 58%. This means the largest five projects account for 83% of total CO₂e savings across the whole portfolio of projects. Figure 4-3 shows the CO₂e savings that have been delivered by each project, and clearly shows the large difference in CO₂e savings being delivered across the different projects.

Figure 4-3: Carbon savings being delivered by individual projects.



Source: Steer-ED, 2023

Value for Money conclusions

Inputs: RCEF grant funding and CAPEX

4.16 Value for Money calculations have been calculated using the RCEF grant funding for Stage 1 and Stage 2 projects (£1,712,545) vs. the monetised values of the CO₂e savings associated with each project. We have also calculated value for money using both RCEF grant funding and CAPEX. Where the CAPEX has been given in the feasibility studies, we have used this in the value for money calculation. Where CAPEX has not been given in the feasibility studies, we have estimated the CAPEX for each project using benchmarks for each type of technology. We note that CAPEX is assumed to be funded by private sector investors, communities, loans or other, but not by the RCEF programme.

4.17 The total CAPEX reported for projects taken from the feasibility studies is £18,985,880 for 17 projects and the total calculated using benchmarks is £36,987,736 for 25 projects. We used the CAPEX extracted from feasibility studies, where available, before using benchmarked CAPEX. Therefore, the total CAPEX for all 28 projects was £ 39,271,765. For the 12 projects where no CAPEX has been calculated, this is either because it has been removed as it is a Stage 1 project that progressed to Stage 2, and therefore would result in double-counting, or no installed capacity or energy generation was reported in the feasibility study preventing an estimation with our benchmarks.

Benefits: Monetary value of carbon savings

4.18 The final monetary value of CO₂e savings, based on the total CO₂e savings figure of 223,819 tCO₂e, was £47,081,007 across 30 projects. Where there was incomplete data, namely projects that had a CAPEX reported but no CO₂e savings, or CO₂e savings but no CAPEX, the project was

removed from the final BCR calculation, so as not to skew the results. Accounting for the data gaps, resulted in a total CAPEX of £39,271,765 for 27 projects, and a monetary value of CO₂e savings of £44,148,136 based on total savings of 197,739 tCO₂e for these same 27 projects.

BCR calculations

4.19 Table 4-2 below presents the BCR calculations across the two core scenarios (“best case” and “worst case”) and the 8 variations across each scenario.

Table 4-2: BCR Calculations

Scenario	BCR component	CO ₂ e calculation	CO ₂ savings (tCO ₂ e)	Monetised CO ₂ e savings (£)	CAPEX	BCR
Best case (Stage 1 & 2 projects) *	All RCEF grant-funding only	Grid decarbonisation factor	223,819	£47,081,007	N/A	28.57
		Static CO ₂ e emissions factor for grid electricity	232,079	£48,802,429	N/A	29.61
	RCEF grant-funding & All estimated CAPEX	Grid decarbonisation factor	197,739 ++	£45,869,559	£39,271,765	1.09
		Static CO ₂ e emissions factor for grid electricity	221,719++	£48,802,429	£39,271,765	1.42
Worst case (Stage 2 projects only) +	All RCEF grant-funding only	Grid decarbonisation factor	30,250	6,447,598	N/A	3.91
		Static CO ₂ e emissions factor for grid electricity	31,732	£6,763,609	N/A	4.10
	RCEF grant-funding & All estimated CAPEX	Grid decarbonisation factor	30,250	6,447,598	£8,092,760	0.80
		Static CO ₂ e emissions factor for grid electricity	31,732	£6,763,609	£8,092,760	0.84

Notes

- * A BCR for all projects shown to be feasible from Stage 1.
- + A BCR capturing the benefits reported from Stage 2 projects only, while still including the initial costs of all Stage 1 feasibility studies produces a “worst case” BCR, depicting a scenario where no projects apart from those already completed at Stage 2 will provide CO₂e savings.
- ++ Four studies were removed due to the lack of CAPEX data

Source: Steer-ED, 2023

4.20 We have also completed some sensitivity testing by calculating a BCR over the project lifetimes using only Steer-ED benchmarks. We calculated the CAPEX and carbon savings for each project using the information from the tracker or feasibility studies on installed capacity (kW) and applied our CAPEX and carbon saving benchmarks to the solar, wind, heat pump, hydro, and anaerobic digestion projects. The outputs of this sensitivity testing are shown in Table 4-3. Our sensitivity test shows that the CO₂e emission estimates are significantly lower than the CO₂e savings reported using data within the BEIS tracker and completed feasibility studies, giving rise to lower BCRs. As such, where benchmarks have been used to fill data gaps, it is likely the calculated CO₂e savings are conservative. We attribute the conservative nature of the benchmarks due to the more complex low carbon technologies (e.g., heat networks, heat pumps and anaerobic digestion) which have a higher degree of variability in their configuration and, therefore, benchmarking is more challenging (see Appendix D for further discussion).

Table 4-3: Sensitivity Testing of Steer-ED Benchmarks (“best case” scenario & grid decarbonisation factors only)

BCR component	CO ₂ savings (tCO ₂ e)	Monetised CO ₂ e savings (£)	CAPEX	BCR
All RCEF grant-funding only	133,484	£27,899,212	N/A	16.93
RCEF grant-funding & All estimated CAPEX	133,484	£27,899,212	£37,982,654	0.73

Source: Steer-ED, 2023

- 4.21 **In summary, a total of £1,712,545 was invested by the RCEF programme through Stage 1 and Stage 2 projects, potentially unlocking £39,271,765 of investment and generating 223,819 tCO₂e savings.**

Wider benefits & strategic added value

- 4.22 Our stakeholder consultations revealed that the benefits of the RCEF activities go beyond the quantifiable CO₂e savings and include process and technical capacity building (noting some community groups expressed they would have benefited from procurement guidance for future projects), increasing carbon/Net Zero literacy, well-being, and development of replicable models for community-led low carbon solutions, all of which would have been unlikely to occur in the absence of the RCEF. Our sample of consultees highlighted that without RCEF funding, they would have no other means of realising their projects. For example, for pre-existing organisations already involved in community activities, self-funding feasibility and development activities were seen as both challenging and hard to justify. As one community group representative aptly stated, "the people who need the most support are the people constrained by where they live." This highlighted the significance of the RCEF scheme within a policy environment that is not favourable to rural communities.
- 4.23 **The most significant co-benefit reported by community groups interviewed is the sector-shaping effect of capacity building – increasing their technical know-how and process literacy necessary for carrying out community energy projects.** A majority of consultees highlighted the procedural and organisational skills they gained through participating in the RCEF project. According to internal stakeholders, this was a significant barrier that prevented several early community energy projects from progressing. To overcome this, it would have been beneficial to establish a more concrete coaching or mentoring process at the outset that provided applicants with a comprehensive understanding of potential experiences and expectations. Nonetheless, those who managed to progress went through a significant learning curve. As one community group consultee noted, given a group of people "with no particular expertise can achieve this - the potential is endless." Going through the RCEF process equipped community groups with a deeper understanding of technology and experience in applying for and using grant funding, negotiating with contractors, and navigating procurement practices. This experience can provide them with the confidence to conduct similar activities in the future.
- 4.24 Another widely recognised wider benefit of RCEF activities was the dissemination of information and increasing carbon and Net Zero literacy of the wider community. For example, community organisations such as parish councils or church group representatives were able to utilise their networks as trusted members of these communities to share information about practical solutions to achieving net zero. Beyond their communities, some community groups

partnered with CES, participating in webinars, and presenting their findings and activities within the RCEF programme to interested audiences throughout the country.

- 4.25 The RCEF programme has also supported community well-being. Many community groups have successfully brought people together, including volunteers, businesses, and members of the public. As a result, members of the community have been given the opportunity to coalesce around a shared goal, which is particularly notable from the perspective of one consultee, “in a community where incomes are tight.” As a result, communities who have a high appetite for renewable energy education but would otherwise struggle to seek it, have been equipped with literacy as well as long-term vision and ambition.
- 4.26 Several community groups in our sample were pursuing their activities with the intention of developing a replicable model for other community organisations to adopt. For example, one experienced community group deliberately chose accessible technologies such as solar PV as a gateway project to develop a partnership model involving local land and building owners. If successful, this approach will not only be replicable across other communities within the NEY and beyond but also enable the group to harness their experience and reinvest their revenues to expand into other technologies, such as EV charging.

Barriers to impact

- 4.27 Community groups interviewed anticipated several barriers in implementing their renewable energy projects. The most significant barrier is securing funding, for several reasons.
- First, the process for applying for grants and funding can be time-consuming and complex, especially for groups who may not have much experience in this area. While the community groups who are established charities may have personnel who need little support and existing institutional understanding of where to find funding options – others may experience this as a barrier and prevent some groups from the attempt to apply for funding.
 - Second, there is a risk that projected returns from financial models may become rapidly outdated due to the volatile nature of the current energy environment. This means that some community groups fear losing the interest of potential investors or business partners, who are perceived as often being “profit-oriented,” and may not value the significance of community-level activity as much as the community groups themselves.
- 4.28 Community groups have identified potential capacity issues as another barrier to achieving their goals. Maintaining a sustained level of active team members or volunteers is crucial for the continuity of community activities. However, a few community groups, particularly those run by severely limited personnel who have other roles outside of their community energy activity, fear that if the national conversation around sustainability wanes, general interest in these initiatives may subside too. This poses a potential risk to the longevity and sustainability of community energy activity, particularly for rural communities with a limited population. To compound this issue, one project group states that the COVID-19 Pandemic has had severely negative consequences on community activity, stating that many active members of the community who would have otherwise may be at the forefront of these projects, are now having to shelter to protect their health.
- 4.29 The involvement and support of key stakeholders such as community members, local businesses, landowners, local governments, parish councils, and other wider organisations, play a crucial role in the success of community energy projects, but gaining their support can be a potential barrier to impact. One community group faced significant challenges in

navigating the complex politics of a local parish group and identified gaining the support of certain key members as essential to smooth project operation. In contrast, two other community groups noted that gaining the "blessing" of their parish council was an advantage to their project's overall success. This highlights the need for community-based initiatives to navigate complex and unfamiliar territories to gain stakeholder support, which may be outside their control.

- 4.30 Navigating unfamiliar processes can pose significant barriers for consultees, which may be largely beyond their control. For example, one project in our sample identified establishing a grid connection as one of their most prominent anticipated risks. The success of this project relies heavily on the availability of grid connection, which remains uncertain and outside of their control. Another community group faced initial negative feedback from the DNO but was able to leverage their consultants' professional networks and wider lobbying efforts by other organisations to potentially secure a formal offer for a grid connection. This underscores the importance of access to knowledge and professional networks.
- 4.31 Finally, consultees noted a range of community or project-specific barriers that could prevent their projects from achieving their anticipated impact and force them to rely on the strained capacity of other organisations and industries. For example, one community group mentioned that receiving planning permission was their main barrier to impact. They stated that planning authorities in the region were currently under severe capacity issues, resulting in delays in receiving application decisions. This delay meant that the community group could not submit their grid applications until they received the planning permission decision, creating a string of delays and further exacerbating existing capacity issues. Another solar PV project identified that the biggest anticipated risk to implementation was sourcing a specialist supplier to provide installation services. The group noted that installation service providers were at full capacity, with rapidly increasing prices, which posed the risk of this organisation becoming outpriced.

5 Conclusions & Recommendations

Conclusions

5.1 In response to the study's five core research questions (shown in Table 1-1, in the opening chapter of this report), we present below our conclusions, organised by theme, drawn from the material presented throughout this report.

Delivery of the RCEF programme against the original project objectives

5.2 The RCEF was launched in July 2019 with the objective of supporting rural communities by removing the barriers to investment in small-scale, rural low carbon energy projects by providing grant funding for feasibility, planning and preparation necessary for their investment and eventual deployment. Until the fund closed for applications in March 2022, the North East and Yorkshire region received 54 applications. As of February 2023, a total of 41 projects were awarded funding through the RCEF which included 31 Stage 1 grants and ten Stage 2 grants.

5.3 Of the ten projects that received Stage 2 funding, no project is yet operational. However, some projects are moving forwards in their progress, and a few towards implementation. The overall impact of the North East and Yorkshire Net Zero Hub's administration of the RCEF added significant value to project teams across the board. Specifically:

- Consultees note a wide range of benefits as a result of the RCEF, including capacity building, network development, enhanced personal skillsets, and information-sharing and learning opportunities;
- One third of Stage 1 projects progressed to Stage 2, and the majority of Stage 2 projects engaged with were persevering with their projects beyond Stage 2 (discussed below) albeit having to navigate a number of barriers; and
- The RCEF team played a pivotal role in leveraging RCEF resources within the region as a whole. The team secured underspent funds from other Net Zero Hubs to reinstate a further round of funding and identified areas in the region where RCEF funding was lacking.

5.4 In the event that the Stage 2 projects become operational many of the RCEF objectives are likely to be met. Specifically, by:

- Enabling communities to access the economic benefits associated with renewable energy schemes such as revenue streams from the projects; and
- Contributing to the Government's net zero ambitions.

5.5 The community energy sector was not well-developed within the North East and Yorkshire region. At the launch of the programme, the RCEF Project Manager carried out a significant amount of engagement to encourage community groups to apply and provided support to progress their applications. The team also made efforts to identify potential partners, such as landowners, businesses, and factories, that could benefit from involvement with community energy projects.

- 5.6 Community groups had varying levels of interaction with the RCEF team. Some have required enduring support to be guided through the process from the outset, whereas others are able to navigate the process independently with ease.
- 5.7 Both internal and external consultations suggest that without the grant funding and enduring support provided by the RCEF team over the project lifecycles, these projects would have been unlikely to have occurred. The North East and Yorkshire region had historically lacked access to central-government funding opportunities for the development of full-scale community energy projects. Whilst there were nascent dialogues among some community groups regarding local regeneration, they often lacked the vehicle or expertise to translate these ideas into community action.
- 5.8 There have been a number of barriers to impact such as COVID-19, the availability of consultants, access to finance to progress the project beyond Stage 2 and grid connectivity:
- **COVID-19** caused a range of challenges for project delivery. The RCEF team responded by granting extensions and support within their remit;
 - **Availability of skilled consultants** to carry out the Stage 1 and Stage 2 works. The North East and Yorkshire responded this challenge by establishing a framework agreement for consultant support with Loco₂gen Consulting, who overall were responsible for 40% of the studies funded by RCEF;
 - **The degree of knowledge and expertise embedded within the community group.** This was particularly significant with the leap from a Stage 1 feasibility study to the more complex and demanding requirements of Stage 2;
 - **Grid connection offers.** For projects seeking to export power to the grid, the aging infrastructure in the region and low rate of grid reinforcements slowed progress or even stalled some projects completely. It is widely acknowledged that obtaining a grid connection can be a difficult and expensive process that can be a determining factor between the success and failure of a project. This led to the stalling of a number of projects at Stage 2, delays during Stage 2 or the requirement to consider alternatives such as private wire networks. The latter can prove very challenging for voluntary-based community energy organisations due to the significant capital investment required for cabling, the need to identify suitable customers, and the legal complexity; and
 - **Delays to planning decisions.** Capacity issues of planning authorities, leading to delayed decisions on planning applications.

The effectiveness of the administration and delivery model in mobilising community energy activity

- 5.9 The RCEF team had differing levels of involvement with teams, depending on the level of support that was required from them. This included direct support during both application and delivery stages (including monitoring and reporting), facilitating connections with key stakeholders, signposting consultants, and identifying post-Stage 2 funding opportunities.
- 5.10 The support provided by the RCEF team was characterised as open, honest, and transparent, which allowed for concerns to be raised early. Specifically, the types of support provided were described as:
- Application advice and support including in-depth feedback on Stage 1 or Stage 2 applications;
 - Consultant procurement support, responding to supply chain issues through a framework agreement with Loco₂gen;

- Providing flexibility with timescales where needed;
- Widening networks, including procuring the services of CES with provided several community groups with support with specific challenges and provided a platform to share details of projects and learning and experience from involvement with the RCEF; and
- Signposting Stage 2 projects to potential funding opportunities to progress their projects to implementation.

5.11 Consultations also revealed ways in which the RCEF team could potentially enhance their support to mobilise community energy activity:

- Being more pre-emptive and intentional in providing support, particularly during Stage 2;
- Setting expectations and guidance for community groups at the outset;
- Providing mentoring and peer-to-peer opportunities earlier on, and support that was tailored and relevant to the North East and Yorkshire;
- Being more realistic about what can be achieved in RCEF timeline; and
- Including an allowance for project management time (which would support capacity building). It is noted, however, this would require change to the fund architecture by BEIS.

Difficulties encountered by community organisations in delivering their RCEF projects, and the level of support received to overcome them

5.12 The North East and Yorkshire RCEF team has demonstrated that risks associated with community energy projects were managed successfully over the lifecycle of Stage 1 and Stage 2 projects. In particular, they were responsive to challenges as they arose. This included:

- Minimising risk of under-utilisation of the fund by proactively approaching organisations and potential partners and developing targeted marketing to encourage engagement with the RCEF fund;
- Providing oversight, support, and guidance to ensure strong applications were submitted;
- Providing a framework agreement with Loco₂gen and development of a list of trusted consultants; and
- Providing ongoing support where needed.

5.13 Improvements that could be made to mitigate risk include the following:

- Offering networking opportunities as early as possible, to help make connections with useful stakeholders;
- Providing more support and guidance for the procurement of consultants;
- Learning from administration of the WRAP programme; and
- Level of involvement with project teams tailored to their specific needs, with enduring support for community groups with limited experience and/or embedded expertise.

Evidence of resources leveraged as a result of RCEF activities:

5.14 At the point of consultation, no project was in a position to report on the economic value from the project, as none had yet reached operationalisation. Several community groups are, however, progressing beyond the RCEF Stage 2 grant, including attracting further investment.

5.15 For projects that advanced past Stage 2, securing adequate funding poses a significant challenge. However, there are also several other risks to consider, many of which are highly contextual to each project. These might include navigating legal and contractual challenges, cooperating with landowners, and operating in an environment with a lack of available community funds.

5.16 In addition to the progression of multiple Stage 2 projects, the wider community benefits were well documented during the consultation process. These include:

- Education and ability to navigate the community energy space;
- Replicability of projects; and
- Growth of knowledge networks at both the regional, national, and global level.

Overall impact of the RCEF programme

Carbon Savings

5.17 In terms of overall impact, the study encountered various challenges around quantification of project impact.

- There was no initial contractual requirement for community groups to report carbon savings, and the BEIS tracker was incomplete.
- Carbon savings were derived from completed Stage 1 and Stage 2 studies; however, as this was not consistently reported we developed a set of benchmarks to fill data gaps based on installed capacity. Where CO₂e savings were reported, the methodology was often not reported or was inconsistent between projects. As such there is variation between CO₂e savings reported on a CO₂e saved/ kW installed, for example.
- Carbon savings are highly uncertain for projects that have yet to be delivered.

5.18 Given this we developed two scenarios – a “worst-case” scenario, where only completed Stage 2 projects realise carbon emission savings, and a “best-case” scenario where all completed Stage 1 projects or Stage 2 projects were assumed to deliver CO₂e savings, in addition to performing a sensitivity test of calculated CO₂e savings based on derived benchmarks.

5.19 For the “best-case” scenario, the final monetary value of CO₂e savings (adopting BEIS grid decarbonisation factors), based on the total savings of 223,819 tCO₂e, was £47,081,007 across 30 projects with a total CAPEX of £ 39,271,765.

5.20 When applying our benchmarks to the installed capacity we calculated a total saving of 133,484 tCO₂e, which becomes a monetised benefit of CO₂e savings of £27,899,212 and a total CAPEX of £36,987,736.

Value for money

5.21 The BCR analysis suggests that RCEF-supported projects are expected to deliver an estimated BCR of 28.57 when considering all RCEF grants against all CO₂e savings. This calculation used the BEIS long-run marginal (domestic) electricity emissions factors (accounting for grid decarbonisation). Using the static 2021 BEIS emission factor for electricity generation and transmission (removing allowances for grid decarbonisation) resulted in a BCR of 29.61. Using CO₂e savings and CAPEX derived from Steer-ED benchmarks, the BCR is 16.93 (using BEIS grid decarbonisation emission factors).

5.22 Moreover, we completed a BCR calculation excluding the potential CO₂e savings of projects at Stage 1, while still including their initial grants for feasibility studies. The resulting BCR is 2.44 (using BEIS grid decarbonisation emission factors)

5.23 The BCR calculations imply that the RCEF programme represent value for money, even when excluding the potential CO₂e savings from Stage 1 feasibility projects that did not progress to Stage 2. We note, however, there are two points to further consider:

- First, the potential revenue streams generated from the projects are not considered. Due to the volatility of energy prices, we have not attempted to calculate this.
- Second, the co-benefits (capacity building, increased literacy, wellbeing impacts, wider economic impacts – reduced energy costs, potential employment) have not been considered. We hypothesise, however, that the net employment impacts are likely to be small given the scale and number of projects. Although there is no guarantee these would be realised within the North East and Yorkshire region, let alone the community itself, evidence does suggest that small-scale community-led renewable schemes tend to procure local suppliers where available.³⁸

Recommendations

5.24 Below we present our final recommendations, which flow from the findings presented throughout the report.

Support available for grant beneficiaries

5.25 Whilst stakeholders interviewed widely praised the support provided by the RCEF team, our research suggests there are several areas for improvement:

- Establishment of processes to encourage peer-to-peer support, networking, and mentorship. This includes recognising the importance of learning from this and previous rounds of RCEF and providing accessible documentation on how to succeed. Whilst this was enabled to a degree, a more coordinated effort, in collaboration with the other RCEF delivery regions, would have significant benefits in terms of capacity building. In effect, the RCEF team could act as an intermediary, brokering relationships within and between regions to support the delivery of projects and encouraging other communities to consider applying for funding; and
- Despite the North East and Yorkshire initially being considered to have limited community energy activity prior to the RCEF programme, the capabilities of the community energy sector are reflected in the diverse range of technologies that have successfully proceeded to Stage 2. Technologies that are less novel (e.g., ground-mounted, or roof-top solar PV), however, could be seen as a “gateway” for some community groups, particularly those with limited experience. If the right support system exists to support more innovative or complex technologies (e.g., heat networks) such as access to experts (external or embedded within the community group), local institutions like universities, and so on, then these projects have a higher likelihood of success. However, when considering innovative approaches, the capability of the community group should be carefully considered. This, therefore, makes a strong case for the need for a support system – including funding – that continues to drive innovation in the sector. As well as funding, this should deliver opportunities to access experts, link with academic institutions, and partner with private and local government organisations to deploy innovative projects.

Enduring support for RCEF Stage 2 projects

5.26 Despite the success of a number of Stage 2 projects, being in a position for deployment is more an exception than a rule. We note, however, RCEF sought to get Stage 2 projects to a point that they were ‘investment ready’. As such, this isn’t surprising. Many teams are not yet

³⁸ UKERC (2020) op. cit.

in a position to attract interest from private investment. Given this, there is potentially a role for:

- **A Stage 3 to RCEF**, that includes extended support from the RCEF team including guidance on or access to finance experts to support the development of innovative finance models and potentially a small grant to cover project management. Access to finance or further funding opportunities are currently limited in scope, and several community groups have found this to be a significant barrier to progressing beyond Stage 2, either because of the complexity of applications or the requirement to submit several applications to cover the capital required. Early-stage finance is of little use unless community groups can access finance from the private sector or self-fund their own projects. 'Stage 3' may not be required by all community groups, but the availability would provide the opportunity for those requiring more support – technical or financial – to move their project to implementation; and
- **Exploration of the potential 'bundling' of Stage 2 projects into a portfolio in a region or sub-region** for an investor/ developer (this may include a municipal energy company) or establishing a partnership with a peer-to-peer lender (e.g., Abundance Energy) to raise capital. It is also worth noting that research has identified that community groups that were able to raise significant sums of community finance tended to be located in areas with relatively low-deprivation indices.³⁹ This may imply that high-deprivation communities (or rural areas with small populations) may be limited in terms of what can be raised locally. Early-stage finance schemes such as RCEF may have the objective of supporting rural (or less affluent) communities, but without a supporting financing infrastructure realisation of the benefits from operational projects may be limited. Recommendations for enhancing the financing architecture are discussed in more detail below.

Monitoring and reporting

5.27 We identified there was a weakness in governance in terms of the monitoring and reporting processes. This impacts the ways in which projects can be tracked by BEIS, and how the overall progress and success of the RCEF programme can be tracked. All parties need to be able to see the value in this, in order for this process to be effective. Given this:

- **There should be a careful review of defining success of a project.** Only 20% of projects progressed to Stage 2 (we note, however, this well exceeds the KPIs outlined within the initial Memorandum of Understanding which required that at least two Stage 2 projects to be funded). There were, however, multiple co-benefits experienced by communities such as enhanced sustainability, literacy of the community, enhanced capacity and process literacy of the community group which can provide a strong foundation to build on in relation to low carbon projects and wider community development. Capacity and capability gaps are critical to the growth of the community energy sector, and the RCEF programme has provided an opportunity to bridge these gaps, preparing communities to take advantage of development opportunities, capital grants or a more favourable policy environment when it arises (e.g., Local Energy Bill). As such, the value of capacity building should not be underestimated, particularly in the North East and Yorkshire where the community energy sector started from a low base; and

³⁹ Hannon et al. (2023) Carrots, sticks and sermons: Policies to unlock community energy finance in the United Kingdom. *Energy Research & Social Science*, 100, p.103086.

- **Whilst a core objective of the RCEF fund, decarbonisation is one of many benefits experienced by community groups.** This implies that there should be some adaptation of the tracker to capture additional key co-benefits. The methodology should be led by DESNZ (formerly BEIS). At a project level, there is also a potential to work with community groups at the application stage, or at project inception to agree on a set of indicators that best captures the impact they expect to generate and agree a process to monitor and report on these over the duration of the project. In particular, a mechanism for charting the unexpected benefits of community capacity building would be useful. Community energy researchers, highlight that benefits that accrue from community energy funding has not been adequately researched.⁴⁰ As such a mechanism for capturing the longitudinal impacts would not only be beneficial for capturing the full impacts of community energy funds to inform future support, but also enhance the wider evidence base.

Alignment with wider policy environment

- 5.28 As discussed previously, the recent political climate and frequent changes to renewable energy policy has created a challenging environment for community energy schemes, particularly with the closure of the FiT and RHI schemes to new entrants. These schemes have underpinned the community energy sector by providing price stability, de-risking community energy projects for citizen investors and allowing smaller projects to be funded by low-cost citizen finance. The de facto moratorium on onshore wind is also limiting the potential for local community wind schemes. In particular, it is widely understood that local opposition can be mitigated through community ownership whereby communities in close proximity receive tangible benefits from hosting such schemes. Since, the de facto moratorium in 2016, England has experienced an 80% fall in approvals, yet the potential for currently un-tapped onshore wind to meet the UK's Net Zero targets is significant.⁴¹
- 5.29 The FiT scheme was particularly important for community share offers, where people are investing their own money into a scheme. Research by the University of Manchester conducted in 2020 into the community energy sector identified that, although 90% of the community energy projects surveyed made a financial surplus in a single-year snapshot, this falls to 20% after removing income from the FiT scheme; and just 11% after discounting projects with special circumstances. Whilst the FiT scheme closed to new projects in 2019 and has been replaced by the Smart Export Guarantee, the new scheme is more complex and offers less security than FiTs.⁴²
- 5.30 Moreover, even during the years of RCEF operations pre-2019, changes to government policy hindered the efficacy of the fund, such as alterations to tax relief policies which affected the financial feasibility of projects and the uncertainty that came with being unable to confirm rate of returns and funding costs due to wholesale electricity and gas price volatility.
- 5.31 The current regulation for energy distribution has created a barrier for the UK's community energy sector to grow. This is in part due to the lack of consideration afforded to the wider decarbonisation benefits of community energy schemes not being more considered in policy decisions leading to, for example, high grid connection costs and access charges which limit

⁴⁰ Professor Matt Hannon, pers. comm. (May 2023)

⁴¹ <https://theconversation.com/onshore-wind-farm-restrictions-continue-to-stifle-britains-renewable-energy-potential-147812>

⁴² <https://blog.policy.manchester.ac.uk/posts/2020/03/power-from-the-sun-money-from-the-crowd-community-energy-offers-low-cost-finance-for-renewables/>

revenues and wider socio-economic benefits. This issue has been recognised within a number of local energy strategies within the region and by Hub internal stakeholders. Nevertheless, this is still a significant barrier to community energy schemes progressing to implementation.

5.32 Whilst this evaluation has shown that the RCEF programme has provided value for money, this is predicated on the deployment of projects that have completed Stage 2. As such, the right financing architecture is necessary to ensure these projects progress to deployment. A recent study made several recommendations in this respect.⁴³ These include:

- **A detailed review of community energy related to State Aid.** Currently securing state finance is contingent on how much of the project's cost are being covered by private finance. However, broadly, the finance sector lacks familiarity with community energy and the appetite for large-scale projects. The study concludes that with the removal of revenue payment schemes (e.g., FiT and RHI), there is no longer a risk of 'double subsidy' and this means there is an opportunity for new low or zero-interest finance to be provided that could be counted as State Aid and administered through, for example, the UK's Infrastructure Bank. The Public Works Loan Board and Salix are also cited as potential vehicles for providing zero or low-interest loans for community-owned or shared-ownership energy projects.
- **The state could provide a junior debt facility.** Here the state is considered a lower priority for repayment when recouping any debt owed compared to senior private lenders. An existing example is the Scottish Government's Energy Investment Fund.
- **The state could provide loan guarantees for community energy bodies,** which would make it easier for communities to secure private finance.

5.33 The RCEF programme should be considered within the existing policy context, recognising that the environment needs to be more supportive of decentralised and small-scale schemes, in order to reach a scale that will have a considerable impact on the UK's Net Zero targets.

⁴³ Hannon et al. (2023) Carrots, sticks and sermons: Policies to unlock community energy finance in the United Kingdom. *Energy Research & Social Science*, 100, p.103086.

6 Appendices

A Documents Reviewed

Table A-1: Core Documents Reviewed

Document Type	Reference
Policy	Community Energy Strategy (Department of Energy and Climate Change, 2014)
	Clean Growth Strategy (Department for Business, Energy, and Industrial Strategy, 2017)
	The Sixth Carbon Budget – the UK’s path to Net Zero (Climate Change Committee, 2020)
Other relevant documents and literature	The Evolution of Community Energy in the UK (UK Energy Research Centre, 2018)
	Community Energy (House of Commons Library, 2021)
	Technological Innovations and Climate Change inquiry: Removing the barriers to the development of community energy (Philip Dunne MP, 2021)
	Promoting the renewable energy generation in rural areas – The role of the Rural Community Energy Fund (Energy Evaluation Europe, 2020)
	Brummer, V (2018) Community energy–benefits and barriers: A comparative literature review of Community Energy in the UK, Germany and the USA, the benefits it provides for society and the barriers it faces. Renewable and Sustainable Energy Reviews, 94, pp.187-196.
	Bauwens et al. (2016) What drives the development of community energy in Europe? The case of wind power cooperatives. Energy Research & Social Science, 13, pp.136-147.
	Bray et al (2019) Policy and Regulatory Barriers to Local Energy Market (University of Exeter, Energy Policy Group)
	DECC (2014) LEAF Evaluation (DECC)
Community Energy England (2022,2021,2020) Community Energy State of the Sector	

Source: Steer-ED, 2023

B RCEF Evaluations Aide Memoire

Consultation Details

Consultation Details	
Consultee number:	
Date of consultation:	

Introduction

[Introduce yourself & your role, then introduce this work and the purpose of today's interview, using the following:]

Steer Economic Development is an independent economic development consultancy, which has been commissioned by the North East and Yorkshire Zero Hub and the Department for Business, Energy & Industrial Strategy to conduct an evaluation of the Rural Community Energy Fund.

The purpose of the evaluation is to review the governance and delivery of the RCEF programme, alongside enabling activities to engage communities and the resulting pipeline of low carbon projects. The study will also explore the opportunities, challenges and regional circumstances encountered within the North East and Yorkshire Net Zero Hub area to provide a nuanced understanding of impact.

This regional evaluation will feed into a national evaluation of the RCEF programme, to be completed by the end of March 2023.

As part of Steer-ED's qualitative and quantitative research to inform the evaluation, this interview is one of a number of consultations we are conducting with North East and Yorkshire Team, RCEF delivery team and relevant partners to look into:

- *The **context** for the RCEF, the Hub's role and what it is seeking to achieve;*
- *The **activities** that the Hub is undertaking to deliver RCEF, and your perspectives on the **design and delivery** of this activity;*
- *The **impact and added value** of activity to date, including any evidence there is at this stage of successes; and*
- *Whether there are any **key lessons** to be learned at this stage that can be fed back to help shape future activity.*
- *The consultation call will last no longer than 1 hour and will not be recorded. I will be taking notes throughout, but any notes made will be anonymised before feeding into reporting.*

Questions

Introduction

Question	Stakeholder	Response
Introduction		
Please provide an outline of the project(s) you are involved in that have been supported by the RCEF programme.	External	
Did the project require the formation of a community group / partnership agreement or emerge from an existing arrangement?	External	
Please outline your role in relation to the RCEF funded project	External	
Please outline your role in relation to the RCEF programme and the <i>North East and Yorkshire</i> [Probe for experience with/relationship to the Hub and RCEF programme manager where relevant]	Internal	
Context, Rationale & Objectives		
In your view, was there a need for community renewable energy support through the RCEF programme in the local area (rural context)? [Probe for why]	All	
How would you say the wider context within which the RCEF programme is operating has changed since it was first conceived? [Prompt if necessary: regional, local, policy/institutional factors / other exogeneous factors such as energy prices, COVID recovery etc. Probe for key points in time.]	All	
Have any external factors impacted delivery? What were these, and how did they impact the delivery? [Prompt if necessary regional/local politics, government programme delivery, national and international landscape factors]	All	

(energy prices, COVID recovery, availability of resources or skilled consultants).]		
<i>Inputs & Activities</i>		
How would you describe the role that the RCEF programme and RCEF programme manager fulfils?	All	
How has the RCEF programme supported your project? [Prompt with the following if necessary] <ul style="list-style-type: none"> • Grant funding for feasibility studies (Stage1) • Loans for Stage 2 • Technical advice, capacity building • Facilitation of relationships? • Anything else? 	All	
Of the activities identified, in your view, which activities are most and least effective? [Probe for why]	All	
Are there further activities that the RCEF could have provided, but didn't? What were the reasons for this?		
What has been the process for engaging with applications to the RCEF fund? [Prompt if necessary: promoting the RCEF fund, its objectives, and activities, facilitating the development of and accelerating projects at various stages in the project lifecycle?]	Internal	
Which projects would you point towards as most or least successful and why? [Probe for key projects]	Internal	
How effective has RCEF been in <u>leveraging resources to advance the project's activity</u> , for example unlocking investment for renewable energy technology in a rural	All	

setting, building local community capacity. [Probe for how this might have occurred, or if anticipated rather than achieved]		
How effective has the Hub (and/or RCEF programme manager) been in working with local stakeholders and fostering collaboration?	All	
Have there been any difficulties encountered by community organisations in delivering their RCEF projects? What support was the RCEF project manager/ Hub able to provide to overcome these difficulties?	Internal	
Did you experience any difficulties in delivering your RCEF project(s)? What support was the RCEF project manager/ Hub able to provide to overcome these difficulties?	External	
Have there been any missed opportunities, and are there specific further opportunities, for partnerships to be established?	All	
<i>Programme Management and Governance</i>		
Please describe the project management arrangements for your project.	External	
Please describe the programme management arrangements for the RCEF programme.	Internal	
What works well in the context of the RCEF operating model and programme management?	All	
What has worked less well and in what ways, if any, could the operating model be improved?	All	
To what extent are the Hub's wider governance processes and structures fit for purpose	Internal	

in relation to RCEF, such as the role and representation on the Board?		
In what ways, if any, could governance arrangements be improved?	Internal	
<i>Outputs, outcomes, and impact</i>		
<p>What outputs, outcomes and impact have been achieved across the Hub geography through RCEF-delivered activity?</p> <p>What further impact is anticipated moving forward? [Probe for specific project evidence where appropriate]</p>	Internal	
Which projects do you expect to generate the largest carbon savings (in total, across the project lifetime)? Please name three.	Internal	
Taking into consideration both the carbon benefits and the other wider benefits, which projects do you expect to generate the largest overall impact? And why Please name three.	Internal	
In relation to your project, have there been any carbon and energy savings achieved to date? If so, what are these. [interviewer to precheck the BEIS tracker/ documents]	External	
Have you estimated the carbon and/or energy saving potential of your project? [interviewer to precheck the BEIS tracker/ documents]	External	
<p>Beyond carbon and energy savings, what outputs, outcomes and impact have been achieved in relation to your project through Hub-delivered and RCEF funded activity?</p> <ul style="list-style-type: none"> • Production of feasibility studies (Stage 1) • Undertaking pre-planning research (Stage 2) 	External	

<ul style="list-style-type: none"> • Preparation for planning applications (post Stage 2) • Carbon savings, local employment opportunities 		
<p>Specifically in relation to the <u>community within which the project occurred</u>, what outputs, outcomes and impact have been realised through RCEF activity. Probe for:</p> <ul style="list-style-type: none"> • Formation of a project specific community group; • Expanding scope of existing community group; • Wider community participation in project • Engagement with wider community • Knowledge sharing and exchange. • Development of capacity – e.g., • knowledge and skills (increased competence, engagement, purpose), • increased autonomy and control in decision making. • community capacity (evidence through further activity beyond RCEF grant/ project) • Community ownership/ formalised governance arrangements for community group. 	External	
<p>What further impact is anticipated moving forward? [Probe for specific project evidence where appropriate]</p>	External	
<p>In fully realising intended impact, what are the main risks and issues the project is facing and that you anticipate the project to face going forward?</p>	External	
<p>In fully realising intended impact, what are the main risks and issues the projects as a whole face and that you</p>	Internal	

anticipate them to face going forward?		
Are there specific projects more risk than others?		
<i>Conclusions and lessons learned</i>		
Are there any key lessons learned at this stage? E.g., Suggested improvements for the RCEF programme going forward, or particular successes to note?		
Is there anything else we have not yet discussed that you would like to add?		

Outro

Thanks very much for your time in answering our questions today to feed into the evaluation's research.

END OF INTERVIEW

C Case Studies

North East and Yorkshire Rural Community Energy Fund Evaluation: Case studies

- C.1 To showcase the ways in which community groups supported by the RCEF were mobilised, enabled, and assisted within their RCEF journey, Steer-ED has developed three case studies of projects. These were co-nominated by the RCEF programme team.
- C.2 Consultations were held with three community groups to understand how their involvement within the RCEF has affected their projects, what obstacles they have faced, and the overall impact of their activities to date.
- C.3 This document presents a summary of the three case studies reporting the experiences of project leads including their relationship with the RCEF programme team, the impact of the project so far, overall lessons learned and critical success factors.
- C.4 The case studies show a diverse range of experiences, demonstrating the range of factors that can impact the overall success of projects.

Projects overview



1. Energise Barnsley

Stage 2, Solar technology

Summary: a project undertaking development work to implement solar panels on the roofs of five Private Finance initiative (PFI) schools.

Barriers: due to changes in personnel changes within the active organisations, this project was deprioritised during the pandemic, and has since stalled completely. However, it has the potential to be picked back up.

Key takeaway: this project demonstrates the importance of motivated and proactive leadership to drive projects forward.

2. Malton and Norton Mixed Feedstock AD

Stage 2, Anaerobic digester technology

Summary: the core idea of this project is to use food waste produced in the region to fuel an anaerobic digester, in order to help create the first circular economy market town in the UK.

Barriers: the main barrier to implementation will be to raise the needed capital, estimated to be around £3.9m.

Key takeaway: by understanding the key elements holding individuals and businesses back from creating renewable energy impact, M&N have been able to collectivise highly knowledgeable experts to mobilise achievable goals.



3. Bishop Auckland Deep Geothermal Energy

Stage 2, Deep geothermal technology

Summary: The RCEF grant provided the charity an opportunity to understand the promising geothermal capabilities within the area. As such, this project is progressing well, with the group now setting out to understand the equipment that can be installed as a result of the positive feasibility understanding.

Barriers: this project faced few barriers due to the capabilities of this well-equipped charity.

Key takeaway: RCEF provided the crucial stepping stones towards implementation of a project that would not have otherwise gone ahead.

1. Energise Barnsley - Post Fit Solar Schools

Energise Barnsley and Barnsley Metropolitan Borough Council

Overview and objectives

Barnsley Metropolitan Borough Council partnered with Energise Barnsley, a community benefit society, to develop and deliver community-owned renewable energy and heating projects across the borough. They had previously worked together on a project focusing on solar provision and decided to collaborate to deliver this RCEF project.

When Barnsley Council had previously looked at the energy consumption of the overall Barnsley Council estate, they found that carbon emissions were significantly high in schools. This was a key motivator in prioritising implementing renewable energy in schools - which could be a single “*relatively simple*” measure that could make a significant reduction in their overall carbon emissions as an organisation.

These schools, which are predominantly new developments, are largely energy efficient.

This meant that, unlike more complex older buildings which might have needed additional retrofitting elements, the addition of solar technology to the five schools would have been easy to accomplish with few foreseeable barriers. The total funding received for this project was £99,300 – which covered the costs for 5 schools.

Specifically, this project aimed to explore the development work to implement solar panels on the roofs of five rural Private Finance Initiative (PFI) schools. The council occupies the schools as tenants, so the council is not the legal owner of the assets – despite this potential obstacle, the landowners were receptive and engaged.

Most parts of the project were initially considered to be relatively straightforward. It required no capital costs (as the project was solely focused on developmental activities) and, had it reached implementation, the installation of simple technology could have been a “*quick win*” in reducing emissions in the council’s carbon budgets.

Additionally, Energise Barnsley is an experienced organisation, with extensive prior experience in these types of projects. Most

recently, they had successfully implemented a project using the same model and lease agreements, which ensured a degree of familiarity, replicability, and assurance in the confidence of the project.

To ensure an element of community benefit, the team created a financial model for the project which would create a community trust fund that could be accessed by the schools to create an educational benefit.

The project, however, faced significant barriers during the COVID-19 pandemic. The project team reports that due to a number of factors, such as a change of priorities among key stakeholders in the council, and the need to redirect capacity and resources to COVID-19 support, the activities within this solar PV project was effectively halted.

The project team state that this project still has the potential to be picked back up. However, the council has faced changes in personnel since the inception of this project. This means that many of the individuals who were invested in pushing this project forward have moved on, so reigniting the activities would require individuals with similar strong motivation and perseverance to lead the way.

The impact of RCEF

The consultees stated that *“sometimes you’ll get an idea, and you’re just waiting for the right opportunity to get it to work,”* which was the case for the RCEF. This funding opportunity aligned well with the community group’s project objectives and the proposed scale. With other funding opportunities, the team had found that they were often considered too *“advanced”* as an organisation.

The project team was made aware of the RCEF by an early RCEF Project Manager, who had held a talk at a climate seminar organised by Energise Barnsley. This established the initial connection between RCEF and the community group, which then led to a discussion about how RCEF might be able to assist with the council’s goals using RCEF funding. As the team had delivered a similar project previously, there was a high degree of confidence in this project.

Overall, the perspective of the project team was that RCEF were just the funders, whose key responsibilities were to administrate and distribute funds. The project team has the operational capacity to drive the project onward initially, however, due to a change in

personnel as noted previously, this status changed.

Governance & decision-making

Governance and decision-making were more of an issue within their own organisations, rather than with the funder. For example, a key issue was that amid slow progress, Barnsley Council had a change in priorities. Council personnel needed to be invested in the project to direct resource towards its activities. Previously, there had been key individuals involved who were invested in the project and utilising the council’s wider network to enable progress. But as a result of changing personnel and shifting priorities, this project was de-prioritised and ultimately halted and has not been picked back up since.

Another degree of complexity within this project was that the buildings were owned, maintained, and used by different entities. This provided an added layer of challenge to navigate the roles and responsibilities of a web of stakeholders.

Impact of the project so far

Despite a promising and straightforward project conceptualisation, as Energise Barnsley

had carried out similar projects in similar spaces before – unfortunately, it severely limited impact. The project was ultimately deprioritised by the Council during the COVID-19 pandemic – as the interviewee puts it candidly, *“this project stopped due to personnel.”* Decisions were made within the council to funnel resource into more pressing activities.

While the project could in theory be revived at any point by the council, the relationships that existed previously would need to be re-developed – ultimately *“starting from scratch a bit.”* At the time of consultation, the links that were there at the start of the project – with the funder, the asset manager at the asset management company, the key governor of the Board of Trustees, etc. – are no longer.

Lessons learnt & critical success factors

For this project, the dynamics of personnel were key in pushing the project forward. For example, the project team did a lot of pre-work to *“convert people internally who were initially sceptical about the project, to being quite enthusiastic about it.”* This demonstrates that while negative attitudes can be a

challenge, they can change. However, this requires sustained effort and highly motivated individuals to do so.

Additionally, the group also notes that while solar projects do have some hindrances (visual concerns, maintenance costs to consider, etc.) ultimately, they're one of the most widely publicly supported renewable energy generation methods.

2. Malton and Norton Mixed Feedstock Anaerobic Digester

Malton and Norton CIC

Overview and objectives

Malton and neighbouring Norton are located in North Yorkshire along the River Derwent. Malton is a market town with a population of circa 5,000 and is separated from Norton (population circa 7,500) by the River Derwent.

Circular Malton and Norton aim to create the first circular economy market town in the UK. Their core strategy is to find town-wide initiatives that engage the public, the residents, and the local businesses. The group felt that while most people may want to get involved in tackling climate change at a local level, there are several barriers in the way for regular individuals to enact change. This project overcomes many of these barriers by allowing individuals to contribute in any capacity that they can.

The concept of this project was partially based on the local context. This area in North Yorkshire is known as Yorkshire's food capital, and because of that, a significant amount of

waste is produced. Hence, the concept of the anaerobic digester, which can process food waste, brings forth the concept of a circular economy in a tangible and relevant way.

Stage 1 for this project involved producing a feasibility report to set the context about how food waste from the town could be utilised, put into an anaerobic digester, and used to power the town. The results provided an optimistic direction, and the project was able to progress to Stage 2 and development – involving in-depth planning, design, and further community engagement to progress toward the implementation of an anaerobic digester.

When the project started, the team was a small volunteer group of three core individuals. By Stage 2, this had developed into a community interest company (CIC). At this point, two anaerobic digester experts were procured to join the team, adding significant expertise, and strengthening the overall team profile.

At the point of consultation, the project was in its final month of the development stage. The project team were waiting for planning outcomes and starting to explore options for

financing and commercialisation, which is beyond the remit of the Stage 2 RCEF funding.

The team aims to raise capital from a combination of avenues, including public funds, private investments, the development of a community share ownership scheme, local council support, and sponsorship from local companies. In total, they are hoping to raise around £3.9m in capital.

The group hopes the success in creating collective noise about the project amongst the immediate and wider community, and the financial viability and income generation model outlined in the business plan, will eventually encourage investment as a result.

The Impact of RCEF

The project team stated that RCEF recognised the vast barriers and challenges that are faced by rural communities. At the time of application, there were very few opportunities that provided funding for rural energy-based projects that had a strong element of community activity. As such, these core elements made the RCEF a rare and “*perfect fit*” for the objectives of this project.

For this project team, consultation with the RCEF team was crucial to the success of the project. Specifically, the RCEF team provided high-quality oversight over each milestone, which ensured that key targets were being met with intentional merit, rather than having to complete activities as a tick-box exercise *“just for the sake of it.”* This personalised approach suited the needs of this project team – they did not require the day-to-day support of perhaps less experienced community groups, and rather, were able to utilise the oversight of RCEF as a confirmation that the project was headed towards the right direction.

The RCEF team also provided wider support where needed. For instance, the Hub was able to provide a letter of support to present to the planning authorities, which added weight and validity to the overall application.

Ultimately, had the RCEF not been an option, this project would not have been able to reach its current stage with other funding sources or private investment. At this stage, although there is a clear indication of a financial return post-implementation, the priority of the group lies in optimising the design and engaging the

community, rather than ensuring cost-effectiveness or ensuring high profitability – which is where private sector investment motivations may lie.

Moving forwards, the group will be applying for further grants. They state that what they have been able to gain from RCEF is a rich body of supporting evidence for the viability of the project, which will be used to build a case to apply for further funding.

Governance & decision-making

The RCEF team was able to accommodate timeline changes and grant extensions where necessary. This flexibility was particularly important for this group. They reflect that when there are multiple stakeholders involved (i.e., a landowner, developers, feedstock providers, and contractors) the project management duties and overall time to complete components can be uncertain. Additionally, this was amidst the COVID-19 pandemic, which led to many time leakage issues just in itself.

Overall, the project team describes the role of RCEF as a *“supportive and light-touch funder to help us realise our goals.”* The RCEF

provided a solid template for activities and a quarterly reporting structure for the project team to follow that *“wasn’t too onerous”* and helped keep the project on track, despite the circumstances of COVID-19. This combination provided a well-balanced approach to reporting while being able to make progress between touchpoints with the RCEF team.

Impact of the project so far

An ongoing community engagement and dialogue with the residents has been a core facet of the project. Initially, education around the technical understanding of anaerobic digestors was inaccessible to regular individuals. However, Circular Malton and Norton was able to, through community engagement such as holding conversations through Facebook Live, accessible, interesting, and relevant material and outreach and educational activities to locals.

In addition to individuals being able to ask questions and continue the dialogue, Circular Malton and Norton has also been able to commission independent research to encourage press coverage and wider circulation of their activities. As a result of disseminating this to the wider community, it

has led to opportunities to be able to talk about this technology at events such as national industry conferences.

A further key motivation and intended impact of this project's activities, is encouraging mass behaviour change within the region and further afield. Conversations with experts, academics, and residents have led to discussions around the development of an education and innovation hub focussing on the circular and bioeconomy, which can serve as a highly innovative central hub and information base for interested individuals and organisations.

As a result of the project activities, Circular Malton and Norton has been able to build legitimacy and profile in the region. Their achievements have led to involvement within the region's climate change strategy, and their ideas are actively being referenced in third-party documents.

In addition to the carbon savings from the anaerobic digester and its associated food waste feedstock, there are wider benefits that will be anticipated. For example, the project's successful implementation will lead to cost benefits for the farmer as the waste that will

be used to process within the anaerobic digester will not be needed to be transported. The project also aims to create local employment, particularly at the innovation and education centre, which could also encourage young people to take an interest in climate change and STEM careers.

At this stage, the group reflects that more advice around securing finances going forwards would be the most advantageous resource. They state that this service is most likely beyond the remit of RCEF.

Lessons learnt & critical success factors

Having the right team and expertise was crucial to the success of this project. Through the consultant recruitment process, Circular Malton and Norton were able to foster new relationships that have strengthened over time. The community engagement element has also led to exponentially more opportunities to showcase their achievements to the rest of the UK. This combination of factors has resulted in a strong team profile, as well as a vast network of engaged individuals and organisations.

RCEF has provided the project with an important structure to follow but has been light-touch and flexible enough to let the team make substantial progress with activities between touchpoints.

3. Bishop Auckland Deep Geothermal

The Auckland Project

Overview and objectives

Bishop Auckland in Waddell sits on a unique geographic position encompassing fault lines that can create a source of underground heat. It's hotter closer to the surface compared to other areas of the UK, which makes it a potentially prime location to utilise this constant source of geothermal energy.

The Auckland Project is a not-for-profit charity that was started by a philanthropist and intended as a regeneration charity to pump economic benefits back into the community.

The recent history of the region shows a significant loss of jobs and level of deprivation, and more recently, the charity has developed aims to realise its low-carbon ambitions. These factors make this community energy mission highly significant.

As such, funding received from Stage 1 of RCEF was used to commission a study to explore different geothermal energy generation possibilities in and around Bishop Auckland.

The study examined the potential of different types of infrastructure, which could then be used to drive turbines to create a small power station. Remaining 'waste' heat could also be used within a heat network to heat buildings.

The feasibility laid out recommendations for their next steps. Now, a separate consultancy is putting together a more focussed feasibility study to understand small-scale units that can be installed. This opportunity provides the potential to reduce the overall energy costs of large-scale infrastructure by around 10%, reducing its carbon footprint, requirement for fossil fuels, and reliance on ageing energy infrastructure.

The Impact of RCEF

Without the RCEF, there is a high likelihood that the activities within Stage 1 of this project would never have gone ahead. After completing Stage 1, the group states that funding opportunities became more accessible as they were then equipped with a more detailed understanding of what the group was trying to achieve, and therefore were able to articulate this to wider funders.

The activities have provided the charity with a highly valuable opportunity to develop an evidence base to understand the opportunities of deep geothermal energy in a nuanced and sophisticated capacity. Rather than relying on theoretical information, Stage 1 provided a feasibility study enabling the charity to understand a wide range of recommended options for future activities, which then set the tone and direction for Stage 2.

Combined with the RCEF funds, the charity has utilised expertise from their existing networks, including appointing a professor from the Durham Energy Institute (Durham University), to sit on the project's Strategic Advisory Board. This close connection, alongside several other highly knowledgeable key advisors, provides a wealth of knowledge and adds considerable benefit to the overall pace, direction, and quality of the project.

Governance & decision-making

The key points of contact between the project team and the RCEF team were through a quarterly progress report. They describe the relationship as positive. As the charity is well-resourced with a highly capable project team

and wider networks, they have not needed to lean on the RCEF team for any significant advice or opportunities.

Impact of the project so far

As a leader for this unique opportunity and technology type, the research developed in Stage 1 and Stage 2 of this project can be used to replicate similar heat network installations across the country. This means that the lessons learned in this project can be taken forwards, and “almost copy and pasted” anywhere in the UK.

Additionally, if this project can progress to implementation, it has the potential for significant expansion to use the energy centre to connect to additional buildings.

As this project is approaching the end of Stage 2, the project team is considering their options to secure funding. Fortunately, as a well-resourced charity, they have a good relationship with a wide range of private companies which may yield in investment interest in the project.

However, the project team is also open to public sector funding opportunities which can be explored through their relationship with

the North East Local Enterprise Partnership (NE LEP) and other institutions, who could “point them in the right direction.”

If this project can be successfully implemented in the chosen community buildings, there may be an opportunity to replicate this model in more challenging buildings, such as housing developments.

In addition to setting the precedent for replicability, the charity has ambitions to create a centre of excellence in the Northeast for geothermal technology. This could result in the creation of jobs – not just at the centre, but also in its demand for key skills needed for installation, management, and maintenance.

Lessons learnt & critical success factors

The project team state that community engagement and education is a highly important part of this project if it reaches implementation. There is a risk that the public may associate geothermal installations with other more disruptive activities such as fracking, therefore, proactive, and sustained community consultations will be needed to gain and sustain community support.

In-house expertise and access to knowledgeable stakeholders have been a key enabler for success – especially for a project oriented around highly specialist technology. If the project had not had as many technical experts around the table, there would have been significantly more barriers to success.

D Benchmarks

- D.1 This technical note has been developed to share Steer Economic Development's (Steer-ED) proposed approach for increasing the count of carbon (CO₂e) savings data for projects supported by RCEF Stage 1 & 2 funding.
- D.2 After an initial review of the **BEIS tracker** provided to Steer-ED by the North East and Yorkshire RCEF project manager, it was found that the coverage of carbon emissions savings associated with proposed projects was incomplete.
- D.3 In our initial methodology we proposed an approach which involved a 'dip-stick' approach of selecting a random sample of projects. This random sample would then undergo a detailed review/quality assurance of the carbon savings calculations. The findings from this appraisal would then guide a whole portfolio adjustment of reported carbon savings.
- D.4 Due to gaps in the data, however, this sampling approach is not possible. As such we have reconfigured our proposed methodology. Instead, we are collating data from the feasibility studies across the following metrics (where they are available), which we will then use to estimate project-by-project carbon savings and CAPEX to capture a programme level carbon savings and drive an overall Value for Money (VfM) assessment. These include:
- Carbon emissions saved;
 - Installed capacity (kW);
 - Generating capacity (kWhe/ kWhth);
 - CAPEX;
 - Location; and
 - Technology type(s).
- D.5 Where carbon savings are not reported within the feasibility study our preference will be to calculate emissions savings from the anticipated generating capacity (kWh). Where these data are not available, we will use installed capacity (kW) and CAPEX by order of preference.
- D.6 Drawing on metrics reported within the feasibility studies we propose to calculate emissions using standards for:
- Capacity/ load factors (Feed-in Tariff load factor analysis: 2021/22 (BEIS, 2022));
 - Lifespan of each technology (20-years in most cases);
 - BEIS 2021 conversion factors; and
 - For renewable/ low carbon electricity generation counterfactuals, we will adopt the HM Treasury Green Book guidance on assumptions on the decarbonisation of grid electricity.
- D.7 Where CAPEX has not been reported, we will also adopt CAPEX benchmarks to enable a more complete VfM assessment of the portfolio of projects for each region.
- D.8 We note the following advantages of the proposed approach:

- Because we are adopting a whole portfolio approach and using the same benchmarks across all, project carbon savings will all be comparable/on a like for like basis.
- It will be straightforward to conduct sensitivity testing of the impact of various assumptions on final outputs if required.

D.9 In contrast, there are two key limitations of our approach:

- We will not be in a position to 'quality assure' carbon savings, which was our initial intention. Instead, we are allocating our budgeted resources to concentrate on gathering data which has been produced by others and converting it to carbon savings (where not done already).
- For technologies where we have CAPEX and installed capacity, we expect to be able to get reasonably good estimates of carbon savings. However, some technologies lend themselves better to the benchmarking approach (e.g., solar PV, wind micro-hydro). In contrast, retrofit programmes, heat pumps, and heat networks carry high-levels of uncertainty as they can be viewed as 'system approaches' with multiple variables such as type of retrofitting intervention, size of heat pump, size of heat network, heating demand and building fabric. We also note that where AD is adopted, we have assumed the plant produces biogas only (i.e., we are not assuming this is a CHP plant) and have estimated emissions on the basis of substituting natural gas.
- In relation to heat pumps, if the Stage 1 and Stage 2 report has not provided detail on the counterfactual (e.g., initial electricity/ space heating demand) we will draw on median per household space heating demand assuming the heat pump is displacing a condensing boiler with a coefficient of performance (COP) of 85% as is industrial standard practice.

D.10 The proposed benchmarks/ conversion factors are presented in the sections below. These include benchmarks for

- Solar PV
- Onshore wind
- Heat networks
- Heat Pumps
- Anaerobic digestion
- Micro-hydro

Solar PV

Description	Benchmark	Source/notes
Average capacity factor for the UK (10-year mean)	10.24%	Feed-in Tariff load factor analysis: 2021/22 (BEIS, 2022) ¹
CAPEX: Solar farms (0-4 kW installations) £/kW	1,876	(BEIS, 2022) Solar photovoltaic (PV) cost data ² . Note, cost data is more up to date than DECC, 2015 small-scale generation costs).
CAPEX: Solar farms (4-10 kW installations) £/kW	1,605	See Footnote 2

CAPEX: Solar farms (10-50kW installations) £/kW	1,132	See Footnote 2
CAPEX: Solar farms (large-scale) £/kW	£443	Global utility-scale solar PV benchmark (Statista, 2021). <i>Annual average Spot exchange rate, USD to GBP (2022) 1.376, Bank of England Exchange Rate Database (2023)/ Electricity generation costs: key data assumptions for generation technologies (BEIS, 2020)</i> ³
[Counterfactual] Grid electricity (kg CO ₂ e/ kWh) conversion factor (2021)	0.23112	Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal time series of grid factors, to account for grid decarbonisation. ⁴
Solar PV conversion factor (kg CO ₂ e/ kWh)	0	

Onshore Small-Scale Wind Generation

Description	Benchmark	Source
Average capacity factor for the UK (10-year mean)	26.3%	See Footnote 1.
CAPEX costs Small-scale wind (~224kW) £/kW (2020 prices)	£2,547.5	The development cost data points are primarily made up of costs relating to turbine supply and installation, grid connection costs, civil engineering works and planning fees. ⁵ (Cost data is more up to date than DECC, 2015 small-scale generation costs).
[Counterfactual] Grid electricity (kg CO ₂ e/ kWh) conversion factor (2021)	0.23112	See Footnote 4.
Wind PV conversion factor (kg CO ₂ e/ kWh)	0	

Heat Networks

Description	Benchmark	Source
Average kgCO ₂ saved/£ spent (Mine GSHP)	0.003	Steer-ED Benchmarking (NEY & Midlands NZH)
Average kgCO ₂ saved/£ spent (River SHP)	0.003	Steer-ED Benchmarking (NEY & Midlands NZH)
Average kgCO ₂ saved/£ spent (ASHP)	0.012	Steer-ED Benchmarking (NEY & Midlands NZH)

Heat Pumps

- D.11 Heat pump scales relevant to the benchmarks presented in this section are shown in Table 01 below.

Table 6-1: Heat Pump Scale Definitions

Scale	Definitions
Small scale/individual heat pumps (0-20kW)	These heat pumps are individual installations (e.g., in each dwelling).
Medium scale/communal heat pumps (20-170kW)	These heat pumps can be the heating system of a non-domestic building (e.g., school or office building) or the communal heating system of an apartment block. They include individual heat pumps working off a shared ground loop
Large scale/district heat pumps (>170kW)	These heat pumps can serve large non-domestic buildings (e.g., office buildings) or be integrated into the energy centre of a district heating network

Source: Carbon Trust, 2020.

Description	Benchmark	Source
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Air Source Heat Pumps (ASHP)

Base CAPEX ASHP (individual, assume annual space heating demand 11,00kWh/8kW heat pump) (£/kW installed)	£900	Analysis on abating direct emissions. from ‘hard-to-decarbonise’ homes, with a view to informing the UK’s long-term targets (Element Energy, for Climate Change Committee, 2019) ⁶
Median SPF (seasonal performance factor) ASHP	2.44	Final Report on Analysis of Heat Pump Data from the Renewable Heat Premium Payment (RHPP) Scheme (UCL, 2017) ⁷ (median SPFH4)
Median annual carbon savings relative to natural gas boiler counterfactual (kg CO ₂ e/kW) installed	112.5	Based on median gas consumption data from the NEED table creator and 85% efficiency to estimate heat demand for three house types (and allowing for an average of 2% gas used for cooking): Detached 14232 kWh, Semi-detached 10747 kWh, and Terraces 9047 kWh. See Footnote 7.
CAPEX communal ASHP (domestic, flats ~95) £/kW installed	£1,179	Heat Pump Retrofit in London (Carbon Trust, 2020) ⁸

Annual carbon savings relative to natural gas counterfactual (kg CO ₂ e /kW installed, domestic, flats ~95, 30-year lifetime)	438	See Footnote 8.
CAPEX ASHP (non-domestic, medium scale) (£/kW installed capacity)	1,019	See Footnote 8.
Annual carbon savings relative to natural gas counterfactual (kg CO ₂ e /kW installed, non-domestic, medium scale, 30-year lifetime)	123	See Footnote 8.
CAPEX ASHP (non-domestic, large-scale scale) (£/kW installed capacity)	973	See Footnote 8.
Annual carbon savings relative to natural gas counterfactual (kg CO ₂ e/ kW installed, non-domestic, large scale, 30-year lifetime)	326	See Footnote 8.

Ground Source Heat Pumps (GHSP)

CAPEX GSHP (individual, assume annual space heating demand 11,00kWh/8kW heat pump) (£/kW installed)	1,416	See Footnote 6.
Median SPF (seasonal performance factor) GSHP	2.71	See Footnote 7, (median SPFH4)

Median annual carbon savings relative to natural gas counterfactual (kg CO ₂ e /kW installed)	125	Based on median gas consumption data from the NEED table creator and 85% efficiency to estimate heat demand for three house types (and allowing for an average of 2% gas used for cooking): Detached 14232 KWh, Semi-detached 10747 kWh, and Terraces 9047 kWh. See Footnote 7.
CAPEX communal GSHP (domestic, flats ~95) (£/kW)	1680	See Footnote 8.
Annual carbon savings relative to natural gas counterfactual (kg CO ₂ e/ kW installed, domestic, flats ~95, 30-year lifetime)	454	See Footnote 8.
CAPEX GSHP (non-domestic, medium scale) £/kW installed capacity	1877	See Footnote 8.
Annual carbon savings relative to natural gas counterfactual kg CO ₂ e/ kW installed (non-domestic, medium scale, 30-year lifetime)	130	See Footnote 8.
CAPEX GSHP (non-domestic, large-scale scale) £/kW installed capacity	1704	See Footnote 8.
Annual carbon savings relative to natural gas counterfactual kg CO ₂ e/ kW installed (non-domestic, large scale, 30-year lifetime)	333	See Footnote 8.

Anaerobic Digestion

Description	Benchmark	Source
Average CAPEX of an AD with Electricity to Grid (50-500kW CHP capacity) £/kW	6,300	http://staging.adbioresources.org/docs/Biomethane_-_Pathway_to_2030_-_Full_report.pdf
Annual biogas production kWh/kW installed capacity	8,837	A preliminary assessment of industrial symbiosis in Sodankylä (2020) ⁹
Annual carbon savings kgCO ₂ e/kWh installed capacity	1,611	Government conversion factors for company reporting of greenhouse gas emissions (BEIS, 2022). See Footnote 4. ¹⁰

Micro-hydro

Description	Benchmark	Source/notes
CAPEX: Small-scale hydro (100-500 kW installations) £/kW (2015 prices)	4,150	Central case, Small-scale generation cost update (DECC, 2015) ¹⁴
Median hydro capacity factor for the UK	38.1%	Feed-in Tariff load factor analysis: 2021/22 (BEIS, 2022) ¹⁵
[Counterfactual] Grid electricity (kg CO ₂ e/kWh) conversion factor (2021)	0.23112	Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal time series of grid factors, to account for grid decarbonisation. ¹⁶
Micro-hydro conversion factor (kg CO ₂ e/kWh)	0	

Worked Example (solar PV, installed capacity of 69kW/ £78k CAPEX)

Type of installation	CAPEX Benchmark £/kW	Installed capacity (kW)	CAPEX	Annual kWh generated (10.24 % capacity factor)	Carbon savings (kgCO ₂ e) Y1	Carbon savings (kgCO ₂ e) 20-year Lifetime
Solar farms (10-50kW installations)	1,132	69	£78,108	61,895	41,784	139,960

E Net Zero Policy Context

- E.1 Across the UK, greenhouse gas (GHG) emissions are estimated to amount to a total 377,680kt CO₂e (carbon dioxide equivalent⁴⁴), which equates to 5.6tCO₂e per capita⁴⁵. In order to meet targets aligned with the Balanced Net Zero scenario within the Climate Change Committee's Sixth Carbon Budget⁴⁶, per capita emissions will need to fall by 30% relative to current levels. To deliver effective decarbonisation, transformative innovations are, therefore, required in government strategy and markets, across services and sectors.
- E.2 Following publication of the Sixth Carbon Budget, the UK Government published the Net Zero Strategy in 2021. The Strategy aims to deliver on legislated commitments to achieving net zero by 2050.⁴⁷ The document presents a set of objectives in relation to the UK's net zero transition.
- E.3 To meet medium-term (interim 2030) targets and long-term targets of Net Zero by 2050, the UK Government has developed a suite of policies and interventions to enable the Net Zero transition. The Local Net Zero Hubs Programme is one such intervention and was launched in 2017 following the government's Clean Growth Strategy. Five Local Net Zero Hubs (formerly Local Energy Hubs) were established to develop local energy strategies and intervention plans; and to support the development of pipelines of local net zero energy projects up to the point of commercial investment. A map of the five Local Net Zero Hubs is shown in Figure E-1 below.
- E.4 The objectives of the Net Zero Hubs include:
- Increasing the number, quality and scale of local energy projects being delivered;
 - Raising local awareness of opportunity for and benefits of local energy investment; and
 - Enabling local areas to attract private and/or public finance for energy projects.
- E.5 Also within the remit of the Net Zero Hubs was the deployment of significant national programmes including retrofit schemes and administration of the RCEF programme. One of the first national programmes to be delivered by the Net Zero Hubs was the RCEF programme.

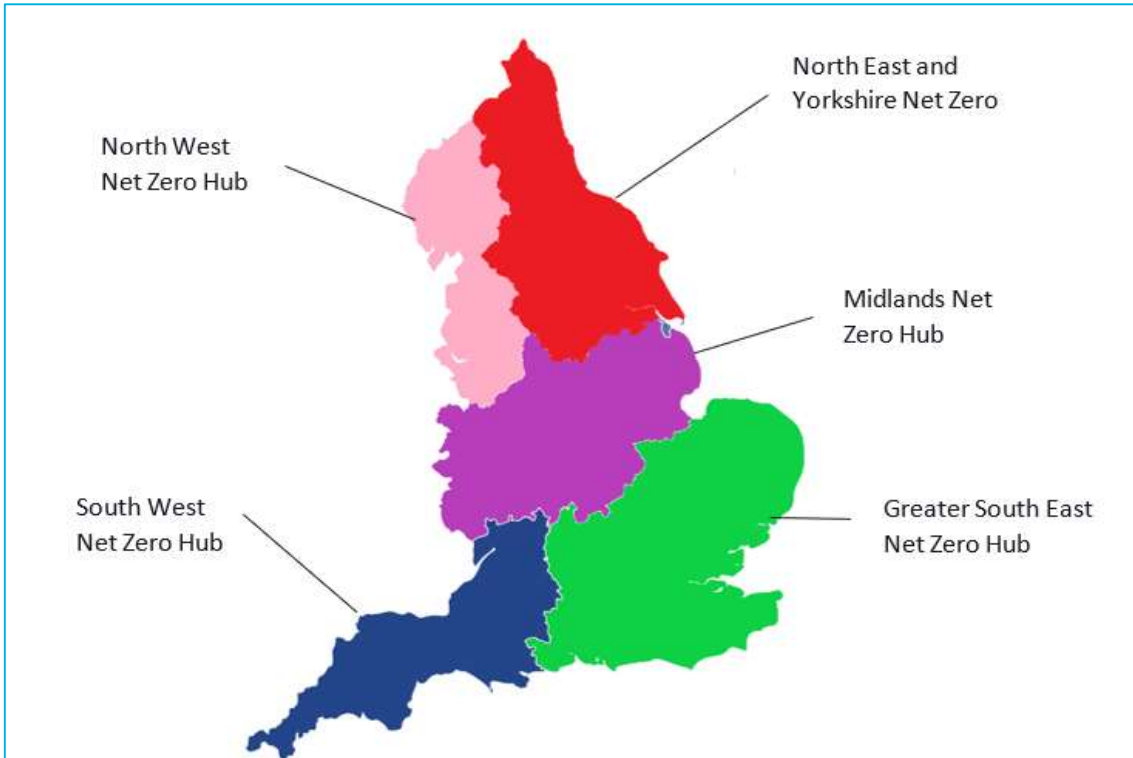
⁴⁴ Greenhouse gases are converted to carbon dioxide equivalents by multiplying each gas by its 100-year global warming potential value: the amount of warming one tonne of the gas would create relative to one tonne of CO₂ over a 100-year timescale.

⁴⁵ BEIS UK Local Authority & Regional Greenhouse Gas Emissions National Statistics (2022)

⁴⁶ <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

⁴⁷ UK Net Zero Strategy (2021) <https://www.gov.uk/government/publications/net-zero-strategy>

Figure E-1: Map of the five Local Net Zero Hubs



Source: Other Hub Regions - Greater South East Net Zero Hub (gsenetzerohub.org.uk)

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