

Summative Assessment of the part ERDF funded Smart Energy Grid Demonstrator Project for St. Ives Park and Ride

ERDF Project Ref: 13R16P0332

Cambridgeshire County Council



European Union

European Regional
Development Fund



Cambridgeshire
County Council

October 2023



0115 8559 983



info@s4w.org.uk



www.s4w.org.uk

Contents

1:	Executive Summary.....	3
2:	Introduction and Project Background.....	7
3:	Strategic Contexts.....	13
4:	Methodology and Summative Assessment approach.....	18
5:	Project Performance and Progress.....	22
6:	Wider Project Impacts.....	28
7:	Qualitative Views on the Project.....	34
8:	Case Studies.....	42
9:	Cross Cutting Themes.....	43
10:	Value for Money.....	44
11:	Conclusions and Lessons Learnt.....	46

Appendix A: Logic Model

1 Executive Summary

- 1.1 Every European Regional Development Fund (ERDF) Grant Funding Agreement places a requirement on all grant recipients to undertake a Summative Assessment. Cambridgeshire County Council have commissioned this evaluation and Summative Assessment to review the impacts of the *Cambridgeshire Smart Energy Grid Demonstrator Project for St. Ives Park and Ride* project across a range of economic, social and environmental outcomes and impacts.
- 1.2 This report provides:
- An overview of the Summative Assessment process
 - A review of the final project performance
 - A qualitative review of the implementation of the project
 - An assessment of greenhouse gas reductions as a result of the project
 - A review of value for money
 - Lessons learnt and conclusions
- 1.3 The Smart Energy Grid demonstration project has been a £4m project to develop a low carbon demonstrator project that generates renewable energy from solar power. This provides power for EV charging, private wire to a local onsite customer, battery storage and an advanced control system to manage the flow of electricity around the microgrid which will prioritise the flow of electricity to maximise carbon emissions reductions and revenue.
- 1.4 This is situated at Cambridgeshire County Council's St. Ives Park and Ride site. The solar canopies are designed to cover 426 parking spaces in the two central segments of the car park, with a total of 3,180 solar panels, generating a total of 1 MW.
- 1.5 The supporting battery and control system will help to manage supply and demand within the micro-grid system and ensure low carbon power is available when needed and not dependent on prevailing weather conditions or supply capacity. The Smart Energy Grid will provide power to an initial 10 Electric Vehicle charging points within the Park and Ride site, providing power for site based lighting and CCTV and to a neighbouring business, with a link to the wider grid for those times when solar power is at its lowest generation and demand exceeds generation.
- 1.6 As part of the ERDF investment, Cambridgeshire County Council also commissioned a business support programme. Deyton Bell, working with environmental charity Peterborough Environment City Trust (PECT), were successful in response to a tender to develop the business support offer.
- 1.7 Cambridgeshire County Council originally secured £2,006,837 of ERDF investment against a total project budget of £4,013,675. The construction of the project started in the summer of 2021, with an initial activity end date of 30th June 2023 and a proposed practical and financial completion date of 30th September 2023. The activity end date was also subsequently extended to 30th September 2023 to accommodate a necessary change to the project.

- 1.8 Project delivery is still active whilst the Summative Assessment is being completed, both on site at the St. Ives Park and Ride and across the Low Carbon Business Support programme.
- 1.9 As of the end of June 2023 when Claim 7 was submitted, the project had defrayed a total of £3,571,972 against its allocated budget of £4,013,675. This expenditure represents a total of 70.3% of the overall budget. Cambridgeshire County Council have stated that by the submission of the final claim in October 2023, the project will have defrayed all of its £4,013,675 budget.
- 1.10 Table 1.1 below shows that to date the project has partially claimed some of its outputs as of June 2023, notably around the business support programme. By the final claim, the project will have supported 26 businesses against its target of 34 (or 79% of the target), with none being new enterprises. The Low Carbon Business Support programme in total attracted 78 enquiries and received 55 successful applications to join the programme.

Table 1.1 ERDF Project Outputs and Projected Performance

Output	Outputs PCR Dec 2022	Performance Claim 7 - (June 2023)	Projected Performance (Sept 2023)
(C1) Number of Enterprises Receiving Support	34	20	26
(C5) Number of new enterprises supported	1	0	0
(C30) Additional capacity for renewable energy production	1,017.6 kW	0	1,017.6 kW
(C34) Estimated annual decrease of GHG	90.11 tonnes	0	90.11 tonnes

- 1.11 The project has yet to claim its C30 output, but the calculations undertaken at the point of submitting the Full Application still stand and the forecast for the additional capacity of renewable power generation should be 1,017.6 kW.
- 1.12 The 1,017.6 kW capacity should result in an annual reduction of carbon dioxide equivalent CO₂e of 462 tonnes. Two things impacted this delivery including (i) a delay energising the scheme from the end of December 2022 to September 2023 and (ii) the Power Purchase Agreement to sell electricity to a local supplier and offset their carbon emissions will not become effective until up to November 2024. At this point, the full decarbonisation benefits will be felt.
- 1.13 A Project Change Request was submitted in December 2022 with the revised carbon emissions downwards to 90.11 tonnes reflecting the delays discussed above. The project will not be energised on 30th September, the Practical Completion Date, which means there is no actual reduction in greenhouse gas emissions at this point, however it will commence imminently.

- 1.14 The Project Team have estimated that within the first two years of the scheme energising, the average of CO₂e avoided per annum would be 175 tonnes. This would ultimately increase once Mick George Ltd connects and the project starts to offset a diesel generator. It is anticipated overall that this target would have been met.
- 1.15 The proposed lifetime reduction in CO₂e is the equivalent of 1,167 homes' electricity use for a single year, 1.7 wind turbines operating for a year or the equivalent of 99,211 tree seedlings grown for a 10 year period.
- 1.16 No business supported by the Low Carbon Business Support programme stated they had received any previous support from any external source to help to reduce their carbon emissions. Only 13% of businesses measured their carbon emissions on joining the programme. On completion of the programme, all businesses stated they were now measuring their carbon emissions, which is a 100% success rate.
- 1.17 There were a number of areas identified where the Low Carbon Business Support Programme has had a strong impact on businesses. A total of 75% of businesses stated there had been a strong positive impact or positive impact on creating a positive marketing narrative about the business. Other areas of strong impact included reducing utilities and energy costs (62.5% strong positive or positive impact), reducing waste (62.5%) and improving productivity and profitability (50%).
- 1.18 Overall 74% of businesses stated the support from the programme will help them to reduce their carbon emissions, of which 12% said it would be transformational. A further 13% of businesses stated the support will play a small role in helping the business to reduce their carbon emissions. Only 13% of businesses stated there would be no impact from the support they received.
- 1.19 Overall, the capital project has been well managed and has been able to navigate through a range of challenges, issues and risks including the legacy of the COVID-19 pandemic, supply chain issues, changing design requirements, Power Purchase Agreement customer changes and an operational site.
- 1.20 It is estimated that the project will generate a total of 60.24 construction jobs and the project team aimed to use local contractors and sub-contractors wherever this was possible.
- 1.21 The project has been billed as a demonstration project to review whether this type of canopy based solar system and connected low carbon technologies are financially viable, interact technically without unintended consequences and add benefit to microgrid system. The aim is to replicate this microgrid model on other sites in Cambridgeshire and elsewhere for both public and private carparks. The Summative Assessment has demonstrated that a balance needs to be struck between costs and return on investment, disruption and capacity.

- 1.22 Any future projects need to be able to operate at scale and potentially may need either a reduction in capital costs or an increase in energy value to be viable. Project viability and, in some ways cost certainty, depends in tying down end users to Power Purchase Agreements much earlier. This could be better enabled through regulatory mechanisms to connect to local clean energy supplies where possible.
- 1.23 There have also been challenges around the Low Carbon Business Support programme, including a delayed start, relatively high dropout rate and challenges engaging businesses. Businesses rated the quality of the support they received very highly and found the project relatively easy to navigate through. Most of the businesses that engaged on the Low Carbon Business Support programme were at a relatively early stage of considering how they could reduce their carbon emissions.
- 1.24 There are two major lessons from the Low Carbon Business Support programme, ensuring there are suitable timeframes to deliver a flexible service that meets business's needs and trying to develop a programme in the future that has business grant funding attached, which can help businesses.
- 1.25 Finally, as a programme, the addition of a small grant fund would have added considerable value – both in terms of attracting more businesses to engage with the programme and also helping businesses to overcome some of the financial and non-financial barriers to implementing some of the measures covered in the programme.
- 1.26 The project has offered reasonable value for money overall, accepting that construction costs include for solar canopies which are expensive when compared to ground or roof mounted solar schemes, but take up no additional land use when compared to ground mounted solar.

2 Introduction and Project Background

- 2.1 Every European Regional Development Fund (ERDF) Grant Funding Agreement places a requirement on all grant recipients to undertake a Summative Assessment. Cambridgeshire County Council have commissioned this evaluation and Summative Assessment to review the impacts of the *Cambridgeshire Smart Energy Grid Demonstrator Project for St. Ives Park and Ride* project across a range of economic, social and environmental outcomes and impacts.
- 2.2 This Summative Assessment builds on the monitoring process undertaken as part of the delivery of the project and draws from the project's completed Logic Model (explained further within the Methodology section). The Summative Assessment has been co-ordinated by S4W Ltd, drawing on a range of data from Cambridgeshire County Council covering solar panel installations, businesses supported and ERDF project documentation.
- 2.3 This report provides:
- An overview of the Summative Assessment process
 - A review of the final project performance
 - A qualitative review of the implementation of the project
 - An assessment of greenhouse gas reductions as a result of the project
 - A review of value for money
 - Lessons learnt and conclusions

Overview of the Smart Energy Grid Demonstrator project

- 2.4 The Smart Energy Grid demonstration project has been a £4m project to develop a renewable energy demonstrator project, generating solar power and utilising battery storage technology at the Local Authority St. Ives Park and Ride site. Energy solutions are being retrofitted onto an existing and functioning 1,000 space Park and Ride site, which was also a former landfill site.
- 2.5 The project is designed to cover 426 parking spaces within the two central segments of the car park with canopies, with a total of 3,180 solar panels, generating a total of 1 MW. This will reduce the land area required to generate power, but the additional carport structures make the project more expensive than ground mounted or roof mounted solar projects. The supporting battery system, with three 79kWh battery racks, will help to manage supply and demand within the micro-grid system and ensure low carbon power is available when needed and not dependent on prevailing weather conditions or supply capacity.
- 2.6 The Smart Energy Grid will provide power to an initial 10 Electric Vehicle charging points within the Park and Ride site, providing power for site based lighting and CCTV, along with an original proposal to supply low carbon electricity to two neighbouring businesses on the adjacent industrial estate under Power Purchase Agreements.

- 2.7 This was subsequently changed to supply electricity to only one business as the second business was investing £20m into their site – which was creating delays for designing and connecting to the smart energy grid. This resulted in the project needing to apply for its own connection to the grid part way through the construction programme which has created delay to the original practical completion date. The long term plan is assuming that the number of EV charge points will increase as demand increases over time.



Initial Designs for the St. Ives Park and Ride site

- 2.8 Cambridgeshire County Council signed a design and build contract and an operations and maintenance contract with Bouygues Energies and Services Ltd under the established Greater London Refit 2 Framework Contract. The use of this procurement contract and the delivery approach, using an energy performance guarantee, was approved in advance by MHCLG (now DLUHC).
- 2.9 As part of the ERDF investment, Cambridgeshire County Council also commissioned a support programme to operate across what was previously known as the Greater Cambridgeshire and Greater Peterborough Local Enterprise Area to provide free support to businesses to reduce their carbon emissions. The Low Carbon Business Support Programme had also promoted the production and distribution of energy derived from renewable sources using the Smart Energy Grid as a case study.
- 2.10 Deyton Bell, working with environmental charity Peterborough Environment City Trust (PECT), were successful in response to a tender to develop the business support offer. The Low Carbon Business Support programme commenced in early 2022 and was planned to complete in the first quarter of 2023. The programme was subsequently extended to September 2023.

Low Carbon Business Support Programme

The Low Carbon Business Support programme aimed to assist all businesses, no matter where they were on their low carbon journey, to reduce energy use and costs and prepare for a low carbon future. The programme has responded to the challenges currently facing businesses and has mainly focussed on helping businesses with energy management.

After an initial application and eligibility process, the support offer began with an optional in-depth business diagnostic, which will help identify key areas of support required and opportunities to reduce carbon. This was followed up by an intensive 2 day in person workshop programme or series of six online workshops to help businesses to develop a Low Carbon action plan. There was also a range of one-to-one support and networking available including a showcase event and site visit to the Smart Energy Grid.

The programme had its own website, <https://lowcarbon.deytonbell.com/>¹ which provided information on the programme, an eligibility guide and updates on the St. Ives Park and scheme.

¹ Please note that as the programme concluded the website will be searchable until 05 October 2023 only.

- 2.10 A Full Application for ERDF funding was resubmitted in April 2021, with the Grant Funding Agreement signed in July 2021. The construction of the project started in the summer of 2021, with an initial activity end date of 30th June 2023 and a proposed practical and financial completion date of 30th September 2023. The activity end date was also subsequently extended to 30th September 2023.
- 2.11 Cambridgeshire County Council originally secured £2,006,837 of ERDF investment against a total project budget of £4,013,675. The project balance was funded directly by Cambridgeshire County Council via a Public Works Loan Board (PWLb). A breakdown of the eligible ERDF project budget is shown in Table 2.1 below.

Table 2.1 ERDF Project Budget

Expenditure	Project Budget
Total Capital	£3,783,505
Total Revenue	£230,170
Total	£4,013,675

- 2.12 The project has been funded under ERDF Priority Axis 4: *‘Supporting the Shift Towards a Low Carbon Economy in All Sectors’* of the Greater Cambridgeshire and Greater Peterborough sub-regional ERDF allocation. Greater Cambridgeshire and Greater Peterborough is a More Developed area¹, which can receive a maximum intervention rate of 50%.

¹ More Developed Areas have GDP per capita above 90% of the EU average

Project Objectives, Outputs and Outcomes

2.13 The project has a number of key aims including:

- Reducing greenhouse gas emissions
- Generating an income stream through developing micro-grid electricity sales to local businesses
- Building resilience into the local energy grid
- Improving the park and ride site
- Improving the uptake of Electric Vehicles
- Demonstrating the effectiveness and interaction challenges of a range of connected low carbon technologies as part of a Smart Energy Grid

2.14 The formal outputs for the project are identified in Table 2.1 below. The two first outcomes relate specifically to the business support programme, in terms of supporting 40 local businesses and three early stage new businesses (subsequently reduced to 34 and 1 respectively). The other two outputs include the development of at least a megawatt of generating capacity and the annual reduction of 462 tonnes of greenhouse gases (again subsequently reduced).

Table 2.1 Project Outputs

Output	Original Target to September 2023	Revised Outputs PCR Dec 2022
(C1) Number of Enterprises Receiving Support ²	40	34
(C5) Number of new enterprises supported ³	3	1
(C30) Additional capacity for renewable energy production ⁴	1,017.6 kW	1,017.6 kW
(C34) Estimated annual decrease of GHG ⁵	462 tonnes	90.11 tonnes

Project Governance

2.15 At an operational level, the project has been led by the Climate Change and Energy Service, which sits within the wider Place and Sustainability Directorate at Cambridgeshire County Council. The Energy Project Team consists of a Delivery Manager, Senior Project Managers and an Assistant Project Manager, drawing from other staff resources such as finance and legal as needed by the project. This evolved over the project lifetime and a Senior Project Manager was appointed to take on the management of the construction project in the delivery team.

² The ERDF project has provided evidence of either 2 days (12 hours) active consultancy support or Grant or Loan/Risk Finance Investment of at least £1,000 (ERDF Output Guidance – p11)

³ A new business is one which has been registered at Companies House or HMRC for less than 12 months before support is provided or is a business locating in the England programme area for the first time (ERDF Output Guidance – p23)

⁴ The increase in energy production capability of facilities using renewable energy resources, measured in Megawatts drawn from the manufacturers specification

⁵ Measured in tonnes of Carbon Dioxide equivalent (CO₂e) in any given year. Carbon savings need to utilise BEIS Conversion Factors when converting primary energy savings.

- 2.16 The overall governance for the project sits with the Environment and Green Investment Committee of the Local Authority. This committee receives reports on progress and has been the ultimate decision making body on the project.
- 2.17 Through the Environment and Green Investment Committee, implementation and delivery decisions were delegated to the Executive Director of Place and Sustainability, in consultation with the Executive Director of Finance and Resource and the Chair and Vice-Chair of the Environment and Green Investment Committee. Regular updates on progress and risk reports were provided to members at the Green Investment and Utilities Advisory Group
- 2.18 Planning permission for the Park and Ride scheme was granted in July 2017 with a number of pre-construction conditions attached that were all met. The Park and Ride site is located on contaminated land and required additional site surveys alongside submission to the Cambridgeshire County Council Minerals and Waste Planning team.
- 2.19 As previously stated, the project has two main delivery contractors, Bouygues Energies and Services Ltd, to deliver the design and construction contract and subsequent operations and maintenance, and with Deyton Bell to lead the Low Carbon Business Support programme. There were a number of smaller contracts to provide legal services, contract administration including health and safety and quantity surveyor services plus a contract to complete the Summative Assessment.
- 2.20 It was initially intended to enter into two Power Purchase Agreements with the two local businesses adjacent to the site. At the commencement of the project, a Memorandum of Understanding, was signed with both Marshalls Mono Ltd. and Mick George Ltd. to enter into future Power Purchase Agreements. However, during construction it was evidence that Marshall Mono Ltd priorities sat with their £20million investment programme and it was agreed to change this agreement to allow the ERDF project to proceed to delivery in time for the programme.

Project Change Requests

- 2.21 The project only submitted one formal Project Change Request (PCR) to DLUHC, in September 2022, which was subsequently revised in December 2022. The PCR wished to increase the project budget to £5,079,298.52 due to rising costs. As the project is income generating, ERDF investment had to remain capped at a maximum amount of £2,006,837, so the original budget has been reported on.
- 2.22 The Project Change Request also revised the structure of the onward energy sales to the two local businesses. Marshall Mono, as part of their own wider investment in their site, installed their own solar array. This investment led to an end to their commitment into the project. The second business, Mick George, delayed their connection as they purchased a new generator without consulting the Council, which ultimately proved to be incompatible with the Smart Energy Grid.

- 2.23 Mick George Ltd are still committed to the project but are delayed connecting until a compliant generator is installed. It was agreed to extend the timeline for connection to the microgrid until December 2024 to allow them time to rectify their generator issues. This meant delaying the detailed design work on their connection and delaying some key milestones.
- 2.24 Increasing energy costs have made a direct grid connection for the project commercially viable and will allow for direct sales of power generated back to the grid when there is an excess and also to draw down additional power if needed. The project will have a direct connection to the grid to sell excess clean energy and a connection to Mick George to sell the majority of their clean energy generation.
- 2.25 The Project Change Request also revised the project outputs. This included delaying the delivery of the claiming of the C30 output from December 2022 to September 2023 due to delays on site (although the output remained the same). The PCR also significantly reduced the annual decrease of greenhouse gas emissions reductions to 90.11 tonnes due to delays in activating power generation. It should be noted that the overall long term GHG emission savings for the project have not changed but have been reprofiled beyond the project's timelines.
- 2.26 The project also reduced the outputs for the number of businesses supported by the Low Carbon Business Support Programme to 34 and the number of new businesses supported to one. The project had a delayed start and businesses, with a wider set of direct pressures recovering from COVID-19 and dealing with the cost-of-living crisis, did not engage to the level anticipated.
- 2.27 The PCR also extended the milestone for completing the business support programme to the end of September 2023.

3 Strategic Contexts

UK Clean Growth Strategy

3.1 The UK Clean Growth Strategy was the primary sustainable economic plan in place at the time the project was developed. The strategy demonstrates how the UK economy can transition towards ensuring future economic growth whilst meeting the challenge of reducing carbon emissions by 80% by 2050. The strategy centres upon increasing efficiency, delivering energy security and lowering energy costs for consumers and businesses.

3.2 Although the public sector overall accounts for only 2% of all UK carbon emissions⁶, the strategy notes the role the public sector, both nationally and locally, must play to drive carbon reduction.

“Since 1990, the public sector – including central and local government, health, education and emergency services – has reduced its emissions by 40 per cent.”⁷

3.3 The delivery of the Net Zero target by 2050 means activities across the public sector can contribute to its achievement. The strategy highlights the role of the public sector as a leader in driving down carbon emissions both in their own organisations and supporting the wider carbon reductions in their area. Overall, the ambition is to reduce energy bills for everyone – something which has grown in importance in recent times. This includes stimulating demand for low carbon products and innovation.

“The public sector...has a key role to play in demonstrating best practice, promoting transparency over emissions reporting and catalysing markets in energy efficiency by implementing measures at scale.”⁸

3.4 The Clean Growth Strategy also highlighted the importance of leading the transition to electric and ultra low emissions vehicles, spearheaded by the development of one of the best electric vehicle charging networks in the world. In 2016, one in five battery electric cars driven in Europe was built in the UK and the cost of electric vehicle battery packs has tumbled by over 70 per cent since 2010⁹.

3.5 The strategy notes the falling costs of many wider low carbon technologies globally, coupled with accelerating momentum in the deployment of these technologies to reduce emissions. This has been particularly visible in the solar power sector, where investment is now possible without significant government support. Long term, government want to see more people invest in solar without subsidy.

⁶ Clean Growth Strategy (2017) Department for Business, Energy and Industrial Strategy, p9

⁷ Clean Growth Strategy (2017) Department for Business, Energy and Industrial Strategy, p113

⁸ Clean Growth Strategy (2017) Department for Business, Energy and Industrial Strategy, p115

⁹ Clean Growth Strategy (2017) Department for Business, Energy and Industrial Strategy, p7

- 3.6 There is a strong need for the UK to innovate in these areas as local renewable electricity production and associated low carbon technologies are together disrupting the established grid system, moving from a small number of concentrated producers to a scenario where there are many thousands, including production from more industrial and domestic sites.

Wider UK Strategic Context

- 3.7 The Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project was developed in the context of the UK Industrial Strategy, which has subsequently taken a policy back seat as focus switched to the Levelling Up agenda.
- 3.8 The UK Industrial Strategy set out a long-term plan to boost the productivity and earning power of people throughout the UK. It aims to help industry create higher-paying jobs in every part of the UK through investment in the skills, industries and infrastructure of the future. The White paper published in November 2017 highlights the importance of the ability to innovate – to develop new ideas and deploy them.
- 3.9 Within the Industrial Strategy are a number of ‘Grand Challenges’ facing the UK economy, one of which is ensuring future long term clean growth – overseeing a growth in productivity and green jobs whilst transitioning away from fossil fuel and non-renewable resource driven growth. The transition to clean growth is seen as a major opportunity for the UK to secure long term economic growth.

*“The UK’s clean economy could **grow at four times the rate of GDP**¹⁰”*

- 3.10 The driver for clean growth was seen as accelerating the adoption of low carbon technologies, which is at the heart of the project. The drive to develop a market for new technology, including renewable energy and electric vehicles, is also a key strategic objective.
- 3.11 The Build Back Better policy statement of March 2021 sets out a path to economic and social recovery after the COVID-19 pandemic and saw the UK’s economic policy move on from the Industrial Strategy. The statement reaffirmed the UK’s commitment to meet its climate change commitments, including the commitment to achieve net zero in electricity production by 2035 and achieve overall net zero emissions by 2050. The statement aims to ensure:

“The UK will continue to be at the forefront of tackling climate change and is already a world leader in clean growth. We will take action to fulfil our commitment to be the first generation to leave the natural environment in a better condition than we found it.”¹¹

¹⁰ UK Industrial Strategy: Building a Britain Fit for the Future (2017) BEIS, p144

¹¹ Build Back Better: Our Plan for Growth (2021) HM Government, p27

- 3.12 The project is also taking place during a change in the regional growth agenda, with EU investment and policy no longer the main driver for local action. The **Levelling Up** agenda sets out the vision for overcoming a range of geographical imbalances and inequalities across the UK, set out in the White Paper of February 2022. The plan aspires to ensure that socio-economic opportunity is spread across all corners of the country.
- 3.13 The Levelling Up White Paper reflects on the fundamental economic change the now legal requirement to achieve Net Zero by 2050 will have on the UK and the opportunities and threats this will pose to regional economies. The greatest opportunities will be for areas to build on existing strengths.
- 3.14 The project was developed in advance of the COP26 **UN Climate Change Conference** in Glasgow in 2021, but has partly been delivered in its shadow, especially in the final stages of delivery. COP26 expressed a series of desirable outcomes to enable deeper cuts in greenhouse gas emissions to ensure global temperature rises do not exceed 1.5 degrees. Those with relevance to this project include encouraging investment in renewables and adapting to protect communities and habitats from climate change.
- 3.15 The COP26 outcomes are reflected in **the UK Government's Net Zero Strategy** of December 2021 (Build Back Greener). The strategy is a further step on the way to the UK become Net Zero for carbon emissions by 2050, whilst also supporting sustainable economic growth.
- 3.16 The Strategy is planned over a relatively long-term time horizon, in some cases decades, and will be delivered through a 10-point plan. Planned investment and regulation through the Strategy aim to create 440,000 green jobs by the end of 2030.
- 3.17 Key actions within the 10-point plan including decarbonising the electricity grid by 2035, transitioning from natural gas to other fuel sources (including increasing the use of hydrogen), transitioning to zero emissions vehicles and lower carbon forms of sea and air travel, supporting lower emissions buildings and protecting the natural environment.

Local Economic and Carbon Reduction Plans

- 3.18 The original Strategic Economic Plan from 2014 for Greater Cambridgeshire and Greater Peterborough was the key strategic document during the development of the Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project. The Plan noted the importance of supporting businesses to operate within the low carbon sectors and the challenges of developing more sustainable transport, albeit based more around public and active travel measures than supporting the early growth of electric vehicles.
- 3.19 The current Cambridgeshire and Peterborough Economic Growth Strategy was adopted by the Cambridgeshire and Peterborough Combined Authority and partners in 2022 - as the St. Ives project was live. The strategy has identified that climate change poses a serious threat to the region but the Net Zero transition also presents opportunities for local people and businesses.

- 3.20 The emphasis within the current Growth Strategy is on achieving 'Good Growth', balancing a range of environmental, social and inclusion within a wider approach to double the size of the economy by 2040 and create more good jobs.
- 3.21 The strategy also notes that the Cambridgeshire and Peterborough Independent Commission on Climate Change released their first full report in October 2021 and were due to release an Action plan to follow in 2022, which would have implications for steering local growth.
- 3.22 Cambridgeshire County Council declared a Climate Emergency in 2019 and subsequently set out a plan to reach Net Zero by 2045. The 2022 Climate and Environment Strategy sets out the practical and leadership steps the Authority will take to reduce its carbon emissions, both those directly under the control of the Authority and those over which the Authority indirectly has an influence.
- 3.23 The Strategy reiterated the ambition to ensure the County reaches Net Zero by 2045, but to ensure that the Local Authority itself is carbon neutral by the earlier date of 2030. One of the three strands of activity is to prevent or reduce carbon emissions, ensuring that Cambridgeshire is powered by 100% renewable energy by 2045.
- 3.24 There were a number of strategic objectives highlighted, drawing from activity the Authority had already undertaken. This included developing new funding models to invest public money into reducing carbon, using land in the ownership of the Local Authority to sequester carbon emissions, working with local businesses to reduce their emissions and enabling the use of low carbon transport.
- 3.25 In 2022 as the project was live, the Cambridgeshire and Peterborough Combined Authority developed a Climate Action Plan (2022-2025) on the back of the findings of the Cambridgeshire and Peterborough Independent Commission on Climate Change.
- 3.26 The commission identified that the levels of greenhouse gas emissions in the Combined Authority region are 25% higher per person than the UK average, which is partly due to transport emissions as a result of the area's rurality and high car ownership. In terms of the scale of both challenge and opportunity, there are 500,000 cars in the region that will need to be zero emissions vehicles by 2050.

Greater Cambridgeshire and Greater Peterborough EU Structural and Investment Funds Strategy (EUSIF) 2014-2020

- 3.27 One of the key priorities within the Greater Cambridgeshire and Greater Peterborough EUSIF is to drive carbon reduction measures across the sub-regional economy and deliver sustainable and inclusive growth. The Strategy aimed to create an economy with 80,000 businesses and 100,000 new jobs by 2025, in an internationally significant low carbon, knowledge-based economy.
- 3.28 The drive behind the EUSIF with regards to carbon reduction was to reduce Greenhouse Gas emissions by 34% compared to 1990 levels, increasing the share of renewable energy to 15% and enhancing the energy efficiency of homes, businesses and transport by 2020.

- 3.29 The EUSIF highlighted a number of challenges the area had to work to overcome to achieve these levels of emissions reductions. Most notable were challenges linked to the transport, associated with being a predominately rural area with less opportunities to agglomerate around public transport. There was also the early identification of capacity issues around the energy grid.

“Growth in the GCGP area is also dependent on access to sufficient, affordable low carbon energy supplies and a network distribution infrastructure that accepts decentralised energy and distributes energy to where it is needed¹².”

- 3.30 A key area of opportunity was to accelerate the growth of renewable energy production, if some of these operational constraints can be overcome.
- 3.31 The strategy is keen to see the development of a low carbon sector across Cambridgeshire and Peterborough, supporting businesses with decarbonisation plans and promoting innovation in low carbon products and services.

Market Failure Context and recent events

- 3.32 Within the full application and Logic Model, Cambridgeshire County Council identified a range of issues holding back the adoption of low carbon technology and renewable energy generation. The main barrier to the development of local renewable energy production is due to capacity issues on the local power grid, which either cannot take additional generation capacity or consumption, or the costs and revenues make projects unviable.
- 3.33 Within Cambridgeshire and Peterborough small and medium sized energy generation projects have been able to demonstrate the localised delivery and sale of energy to customers via Smart Energy Grids due to the costs and timescales for connections.
- 3.34 There is also a lack of awareness amongst businesses as to how to deliver carbon reduction whilst improving growth and productivity. The linking of business support with a clear demonstration project was deemed to add value overall.

¹² Greater Cambridge Greater Peterborough EU Structural and Investment Funds Strategy (2018 revision) Cambridgeshire and Peterborough Combined Authority, p58

4 Methodology and Summative Assessment approach

“...Summative Assessments are intended to provide insights into project performance to enhance their implementation, reliable evidence of their efficiency, effectiveness and value for money, as well as insights into what and why interventions work (or not) and lessons for the future.”¹³

- 4.1 This Summative Assessment report is the cumulation of a process that began early in the project delivery cycle to understand the impacts and lessons learnt from the Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project.
- 4.2 The Summative Assessment study is being undertaken towards the end of the installation period so the delivery of the project is still active. Performance of the project has been analysed to the end of June 2023 (Claim 7) and projected to suggest what the final outputs may consist of.
- 4.3 A Summative Assessment process is based around three phases, which are:

Stage 1 - Summative Assessment planning including the completion of a logic model and the summative assessment plan using templates provided by the managing authority. This process has been completed.

Stage 2 – Data collection and reporting on the ERDF programme’s monitoring requirements and to support the final Summative Assessment. This process is ongoing until the practical completion date.

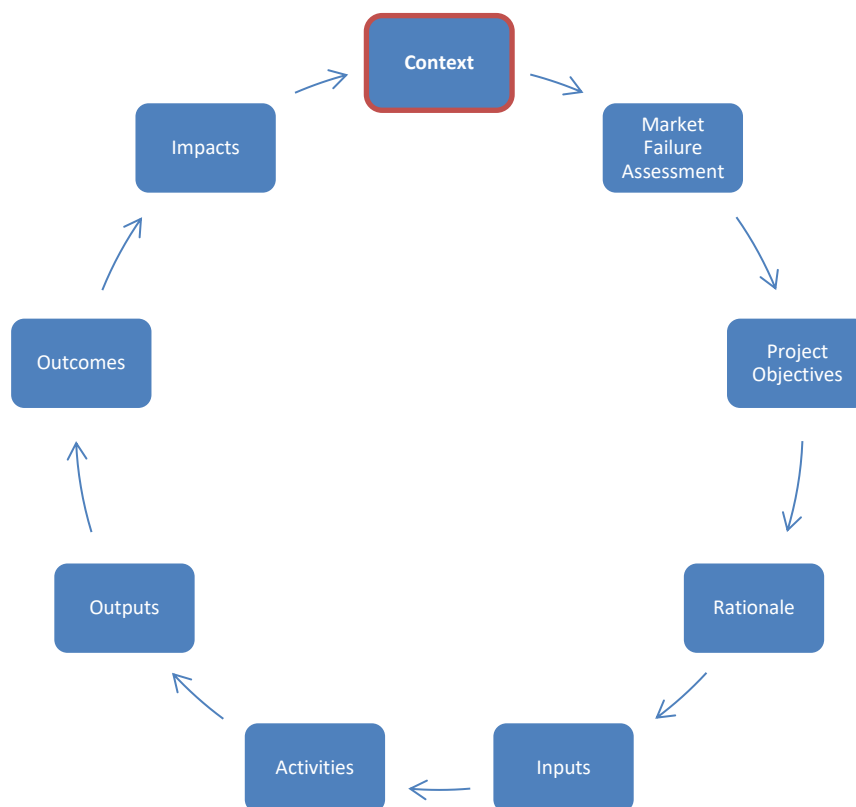
Stage 3 - The completion of the Summative Assessment and its summary template provided by the Managing Authority.

- 4.4 The process has drawn heavily from the latest (July 2020) ERDF Summative Assessment Guidance, assessing the following key components:
- The progress of the project against contractual targets
 - The experience of delivering and managing the project
 - The impact of the project on ERDF cross cutting themes
 - The cost-effectiveness of the project and its value for money.
 - Lessons learnt, conclusions and recommendations

¹³ Summative Assessment Guidance (August 2017) MHCLG page 3

- 4.5 The Summative Assessment process also draws from an underpinning Logic Model for the project. The Logic Model encourages projects to consider in project design, delivery and implementation how activity within the project can be measured and what type of outcomes and impacts the project will deliver.

Diagram 4.1 Summative Assessment Logic Model



Source: MHCLG – Summative Assessment Logic Model

- 4.6 Diagram 4.1 identifies the ‘theory of change’ driven logic model for the project development, delivery and final Summative Assessment. The Logic Model involves understanding the context within which the project will operate and the market failure(s) it will try and address. From these contexts, a set of objectives are set for the Summative Assessment to identify how planning and implementation are clearly linked to achieving a set of outputs, outcomes and impacts.
- 4.7 The Logic Model is a key mechanism for ensuring that learning and feedback is incorporated into the delivery of the programme, how it effectively engages and supports beneficiaries, the quality of services it delivers and how it measures impact.
- 4.8 The Logic Model for the project is included in Appendix A. The rationale behind the project was to develop a new business model for projects that would allow renewable energy generation projects to be developed and connect to the grid, but with much lower costs.

- 4.9 The demonstration of the Smart Energy Grid business case is to inform investors and build their confidence to investing in projects that use multiple low carbon technologies, overcome market failures such as the cost of grid connections and engage local customers in the buying and selling of electricity.
- 4.10 This programme of capital investment was also to inform a business support programme to help local businesses network with others, reduce their carbon emissions and move along their own transition to becoming Net Zero.

Output Calculations

- 4.11 At the point of completing the Summative Assessment, the project has not claimed any ERDF outputs related to the capital investment, so the Summative Assessment will have to forecast the likely outputs of the project.
- 4.12 The requirements for the C30 target (additional capacity for renewable energy production) are based on the specifications for the maximum capacity of the solar/battery system to be installed on site. It is effectively a fixed output based on the system installed and is not forecast to change at the point of reporting.
- 4.13 The original C34 greenhouse gas reduction output was based on an assumed completion and energising date of the final quarter of 2022 and was based on expected actual power generation data for the period from completion to the end of September 2023.
- 4.14 The delays to the project and the changes to the Power Purchase Agreements mean the final output for CO₂e reductions on an annual basis will have to be modelled based on likely power output and the current BEIS Conversion Factors for 2018.
- 4.15 Businesses supported, both established and new, are based on the range of evidence provided by Deyton Bell and projected to the project completion date based on input from the project team.

Impact Calculations

- 4.16 One of the key elements of a Summative Assessment is to understand the range of economic impacts of ERDF investment. The key ERDF impact measures for all Summative Assessments are net increases in Jobs and Gross Value Added as a direct result of the project intervention, even though these measures are more relevant to some projects than others.
- 4.17 Understanding the economic impacts is a fairly difficult process for the project, but an assessment of construction jobs and wider impacts has been covered in section 7.

Business Engagement

4.18 The Summative Assessment also draws from the results of business surveys distributed to all businesses supported by the project, to which 9 responses were received to the survey distributed between July and September 2023. The survey covered a range of different subjects with beneficiary businesses including:

- Business background, activities and location
- The role of carbon reduction in the business strategy
- Referral processes, motivation for joining, quality of service received
- Focus of efforts to reduce carbon emissions
- Impacts of support on a range of business processes
- Attribution of the project to achieving the business impacts
- Future barriers to carbon reduction and support needs

5 Project Performance and Progress

- 5.1 Project delivery is still active whilst the Summative Assessment is being completed, both on site at the St. Ives Park and Ride and across the Low Carbon Business Support programme. All delivery will be completed by its activity end date of the end of September 2023.
- 5.2 The project has been subject to a number of delays that have had an impact on the planning and timely delivery of installations. This is partly due to COVID-19 and its legacy on supply chains, partly the cost of living crisis and the impact of BREXIT and partly due to issues related to the completion of the design and coordination process as a result of changes to the Power Purchase Agreements and the connection to the grid. Similarly, the business support programme was commissioned later than anticipated and due to a range of factors has had a relatively slow traction with local businesses.

Progress on Site

- 5.3 As of the end of July 2023 the solar carports had been installed, along with the 220kW of battery storage capacity and the associated transformers. The initial 10 electric vehicle charger units were installed during August 2023.



Completed solar canopies

- 5.4 In line with the changes submitted within the Project Change Request, work has now been completed on building the UK Power Networks sub-station to connect the facility to the national grid. The energisation process has commenced and is ongoing.
- 5.5 Overall completion on site is anticipated to be achieved during Autumn 2023 and there may be some final tasks outside of the scope of the ERDF project that will be completed beyond the proposed Practical Completion Date. This will include final landscaping measures and tree planting, commissioning and testing the Smart Energy Grid and completion of the connection to Mick George Ltd.

Low Carbon Business Support programme

- 5.6 At the point of completing the Summative Assessment a total of 20 businesses have been supported on the Low Carbon Business Support programme, with one last 2 day session held in mid-September.
- 5.7 A major showcase event was held in May 2023 in St. Ives, which concluded with a visit to the Park and Ride site. The event included a range of businesses and specialists providing advice across a range of low carbon technologies including LED lighting, solar PV/battery storage, Electric Vehicles, Heat Pumps and heat recovery.



Low Carbon Business Support showcase event, May 2023

Project Expenditure

- 5.8 As of the end of June 2023 when Claim 7 was submitted, the project had defrayed a total of £3,571,972 against its allocated budget of £4,013,675. This expenditure represents a total of 70.3% of the overall budget. A breakdown of expenditure to date is shown in Table 5.1 below.

Table 5.1 ERDF Project Budget and Expenditure

Expenditure	Budget	Expenditure to 30 th June 2023
Total Capital	£3,783,505	£3,366,404
Total Revenue	£230,170	£205,569
Total	£4,013,675¹⁴	£3,571,972

- 5.9 Cambridgeshire County Council have stated that the final claim will be submitted in October 2023. The Authority are anticipated to claim a total of £4,013,675 of the budget, although the actual expenditure will be higher. As previously stated, there is a limit on the amount of ERDF that can be claimed as the amount is effectively capped by the income generating aspect of the project.

¹⁴ DLUHC will complete a minor project change request once final claim submitted to account for slight changes to capital (£3,715,452.98) and revenue (£298,222.02) costs.

- 5.10 The project has been built during a difficult time for capital projects coming out of the COVID-19 pandemic, with delays, increases in costs and supply chain issues and wider challenges like BREXIT– which have had a bearing on the capital budget. Ultimately the wider project will likely overspend (even over and above the revised budget), but this will have no bearing on the costs relating to the ERDF project and will be completed outside of scope.

Project Outputs and Outcomes

- 5.11 Table 5.2 below shows that to date the project has partially claimed some of its outputs as of June 2023, notably around the business support programme. By Claim 7 the project had supported a total of 20 businesses for a minimum of 12 hours, although none of these businesses have been less than a year old.

Table 5.2 ERDF Project Outputs and Projected Performance

Output	Outputs PCR Dec 2022	Performance Claim 7 - (June 2023)	Projected Performance (Sept 2023)
(C1) Number of Enterprises Receiving Support	34	20	26
(C5) Number of new enterprises supported	1	0	0
(C30) Additional capacity for renewable energy production	1,017.6 kW	0	1,017.6 kW
(C34) Estimated annual decrease of GHG	90.11 tonnes	0	90.11 tonnes

- 5.12 By the end of September 2023, the project supported a total of 26 businesses against its target of 34, or 79% of the target. This means that overall, the project is expected to fall short of its target. There are a number of reasons why the project has been unable to meet its target.
- 5.13 The first attempt to secure a contractor in 2021 ended with no bids being received and Deyton Bell were procured on the second attempt in early 2022. This resulted in a delay in commencing the programme and a delay in engaging businesses which has put additional pressure on delivery later in the programme.
- 5.14 The programme was initially run online, offering six 2hr workshops. The programme subsequently moved to a two-day face-to-face workshop to try and increase attendance and reduce drop-out rates. The offering of two full and consecutive days of support was a structure that was always going to be suitable for some businesses and less so for others.
- 5.15 There has been a stronger emphasis on flexibility as the programme developed, including using more one-to-one support to work around some of the time and resource issues businesses had and to work with a number of businesses to move them over 12 hours. Ultimately, the 12 hour ERDF target has been a major constraint on the business support programme and a lower threshold would probably have seen a much higher uptake.

- 5.16 As of the end of September 2023, the Low Carbon Business Support programme had attracted 78 enquiries, received 55 successful applications to join the programme and had supported 26 businesses with over 12 hours. At the conclusion of the programme, there were a further eight businesses that have between 1.5 and 10.25 hours of support. The drop-off rate from enquiries to completion has been higher than 50%.
- 5.17 The increasing cost of energy has helped recruit businesses later in the programme and demand and interest have increased, but there is now no scope to extend further to try and attract additional cohorts of businesses.
- 5.18 The project is also forecast to fall short of its target to support new businesses, registered at Companies House or with HMRC for less than a year. The offer of the project, with its focus renewable energy, is less relevant to early stage businesses that are less likely to operate in premises, are less likely to be high consumers of energy, and in the list of priorities and improving productivity, reducing carbon emissions is less likely to be a business priority.
- 5.19 In terms of the energy and carbon reduction outputs, the project has yet to claim its C30 output. The calculations undertaken at the point of submitting the Full Application still stand and the forecast for the additional capacity of renewable power generation is based on the following:
- 3,180 solar panels installed on canopies above 426 parking spaces (including disabled parking spaces)
 - Each panel based on the manufacturers specifications producing 320w
 - A cumulative total of 1,016.7 kW.
- 5.20 Bouygues Energies and Services Ltd have confirmed the above has been installed on site, in line with the original plans, therefore the project is forecast to meet its final target when the final claim is submitted. It was initially anticipated that this output would initially be claimed in the final quarter of 2022.
- 5.21 In terms of greenhouse gas emissions reduction, the project stated that the 1,016.7 kW capacity would result in an annual reduction of carbon dioxide equivalent CO₂e of 462 tonnes. This has broadly been dependent on the scheme being energised as of the end of December 2022.
- 5.22 This has to be revised downwards to 90.11 tonnes when the Project Change Request was submitted in December 2022. Ultimately, the project will not be energised by the Practical Completion Date, therefore there will be no actual reduction in greenhouse gas emissions at this point. As the greenhouse gas emissions were shifted beyond the Practical Completion Date, they were ultimately reduced.

- 5.23 Cambridgeshire County Council and Bouygues Energies and Services Ltd have estimated that within the first two years of the scheme energising, the average CO₂e avoided per annum would be 175 tonnes of CO₂e. This would ultimately increase once Mick George Ltd connects and the project starts to offset a diesel generator. Over the project's asset life, this would reduce greenhouse gas emissions by approximately 6,000 tonnes of CO₂e.
- 5.24 The proposed lifetime reduction in CO₂e is the equivalent of 1,167 homes' electricity use for a single year, 1.7 wind turbines operating for a year and the equivalent of 99,211 tree seedlings grown for a 10 year period¹⁵.
- 5.25 In terms of verifying these projections, the capacity of the system at 1,017.6 kW and using the average hours of sunshine per day from the Monk's Wood climate station (1,555.15 hours per annum, 4.25 hours per day), the system would generate annually 1.67 MW.
- 5.26 Using the latest BEIS Conversion Factors (2022) each kWh of UK electricity generated produces 0.19338kg of CO₂e and the transmission of this electricity would be responsible for a further reduction of 0.01769kg, totalling 0.21107kg per kWh. This would result in annual savings of CO₂e of 352,487kg or 352 tonnes. This is more in line with the original targets – although each year the UK electricity grid decarbonises, carbon savings from electricity generation diminish. The output can change considerably depending on which year is chosen as the baseline.
- 5.27 The electricity grid has been decarbonising on an annual basis and over the period 2018 to 2022 CO₂e emissions per kWh has reduced by around a third, or 8% per annum. If this rate continues over a 25-year period this would suggest an overall net present value of CO₂e emissions of around 3,900 tonnes.
- 5.28 Given the variabilities of the project and the methodology utilised to calculate the reduced levels of emissions within the project change request, it is difficult to assess what the final output will be that the project will report. The Summative Assessment's conclusion is that the target will be met – as the model demonstrates it will exceed this projection on an annual basis.
- 5.29 Table 5.3 below is a summary of the project's performance against its overall spend and output targets.

¹⁵ <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Table 5.3 Achieved Expenditure and Outputs

Indicator	Targets		Performance at Time of Evaluation		Projected Performance at Project Closure		Overall Assessment
	Original	Adjusted (if relevant)	No.	% of Target	No.	% of Target	
Revenue Expenditure (£m)	£0.23m	£0.23m	£0.21m	58%	£0.23m	100	
Capital Expenditure (£m)	£3.78m	£3.78m	£3.34m	71%	£3.34m	100	
(C1) Number of Enterprises Receiving Support	40	34	20	58.8	26	26	
(C5) Number of new enterprises supported	3	1	0	0	0	0	
(C30) Additional capacity for renewable energy production	1,017.6kW	1,017.6kW	0	0	1,017.6kW	100	
(C34) Estimated annual decrease of Green House Gases	572	90.11	0	0	90.11	100	

6 Wider Project Impacts

- 6.1 At the time of completing the Summative Assessment the project has yet to complete on site. The business support programme has only very recently delivered to its last cohort. Despite this, there are a number of wider impacts from the project that are likely to be delivered.
- 6.2 An increase in charging capacity and the development of a new location at a critical commuter location will be a key enabler for residents and visitors to utilise electric vehicles. Bouygues have stated that over 30 years the project will provide 5.5 GWh of capacity to charge electric vehicles, which in turn would power between 18m and 22m miles.
- 6.3 It is not clear what overall impact the project will have on both electric vehicle ownership or usage within Cambridgeshire and this is not an outcome that the project has stated it would measure.
- 6.4 Clearly, uptake would need to grow exponentially to ensure there is demand to keep expanding the number of charging on site. As of 2022, electric vehicles had increased to a 16.6% market share and for the first time there were more than a million electric vehicles on UK roads. Demand is growing, and the fact that people can charge their car at St Ives Park and Ride may support some people to switch to electric vehicles sooner.
- 6.5 Any increase in electric vehicle usage will assist with carbon reduction, but will also have an impact on localised air quality.
- 6.6 As a demonstration project, there are clearly lessons that can be learnt but also an example to follow at future Park and Rides or renewable energy sites and projects within Cambridgeshire and Peterborough. Cambridgeshire County Council, again working with Bouygues Energies and Services, has plans in place to implement a similar project at the Babraham Road Park and Ride site in Cambridge.

Babraham Smart Energy Grid

Cambridgeshire County Council, working with Bouygues Energy and Services Ltd, are developing a 2.5 MW solar generation project for the Babraham Park and Ride site.

The project will expand local renewable energy generation, provide additional charging points for electric vehicles and enable off-grid energy sales to a local public institution. This project could enable key public transport routes to move away from fossil fuels, a known contributor to poor air quality. Planning permission for the project was received in late 2020 and work began in late 2022. Construction is estimated to be completed during 2024.

- 6.7 When the ERDF application was submitted, there was also a long list of alternative sites that were considered and are potential for future projects including Park and Ride sites at Trumpington and Longstanton.

- 6.8 There are also proposed wildlife and biodiversity benefits. The use of canopies instead of ground mounted solar panels means no additional land is required, which in turn also reduces the localised ecological impact of the scheme (especially as the Park and Ride is on a reclaimed brownfield site). This ecological impact has been augmented by additional landscaping, the installation of wood piles and planting of trees and hibernaculum.



Landscaping on the site

- 6.9 The installation of the solar/battery system has also provided a catalyst for wider improvements to the Park and Ride site including new lighting, a revised CCTV network accommodating the changing layout, the pre-mentioned landscaping and some resurfacing as required.



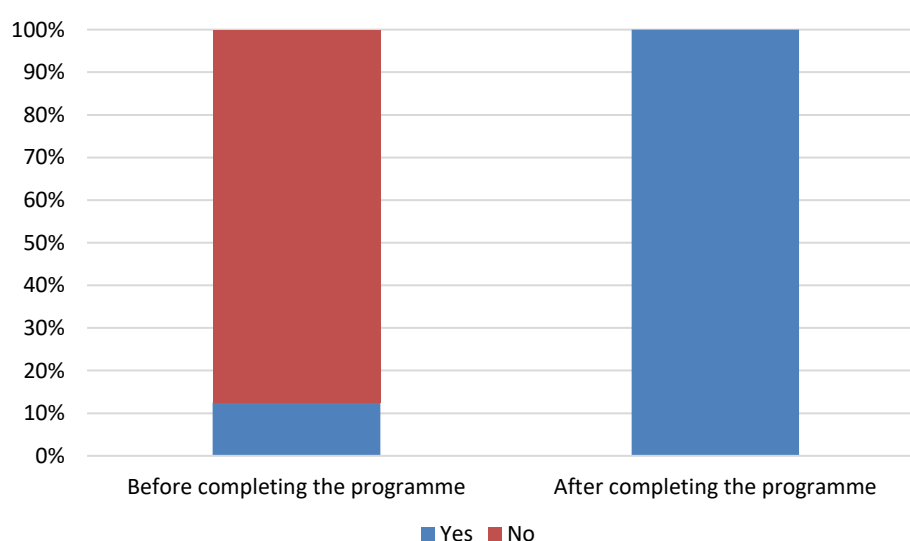
St Ives Park and Ride project before construction

- 6.10 Finally, the power generation will provide a long term, sustainable income that will pay off the debt borrowed by Cambridgeshire County Council and the small surplus can support other services for local residents.
- 6.11 The capital ERDF project, at a budget of around £4.8m, is sufficient to generate a number of construction jobs during the build process. The estimate for construction jobs is based on a methodology developed by the Scottish Futures Trust, which uses data on direct and indirect employment per £1m spend¹⁶.
- 6.12 The methodology draws from data in 2015/16 and utilises an employment deflator to ensure spend is relevant to this baseline year. As the project cost was around £4.8m, it is estimated that a total of 60.24 construction jobs were created over the period of construction. The wider project team aimed to use local contractors wherever possible.

Impacts of the Low Carbon Business Support Programme

- 6.13 The Low Carbon Business Support Programme has had a wide range of outcomes that has resulted from support to businesses that engaged with the support offer.
- 6.14 Firstly, no business supported by the programme stated they had received any previous support from any external source to help to reduce their carbon emissions. This demonstrates the assumed market failure in the provision of impartial and effective support for business to reduce their emissions remains relevant and also that the programme has been effective in directly engaging businesses that needed support to reduce their emissions.
- 6.15 Within the business survey, beneficiaries were asked to identify whether, on joining the programme, they measured their carbon emissions. Businesses were also asked if they then measure their emissions after completing the support of the Low Carbon Business Support programme.

Chart 6.1 Did you measure your carbon emissions?



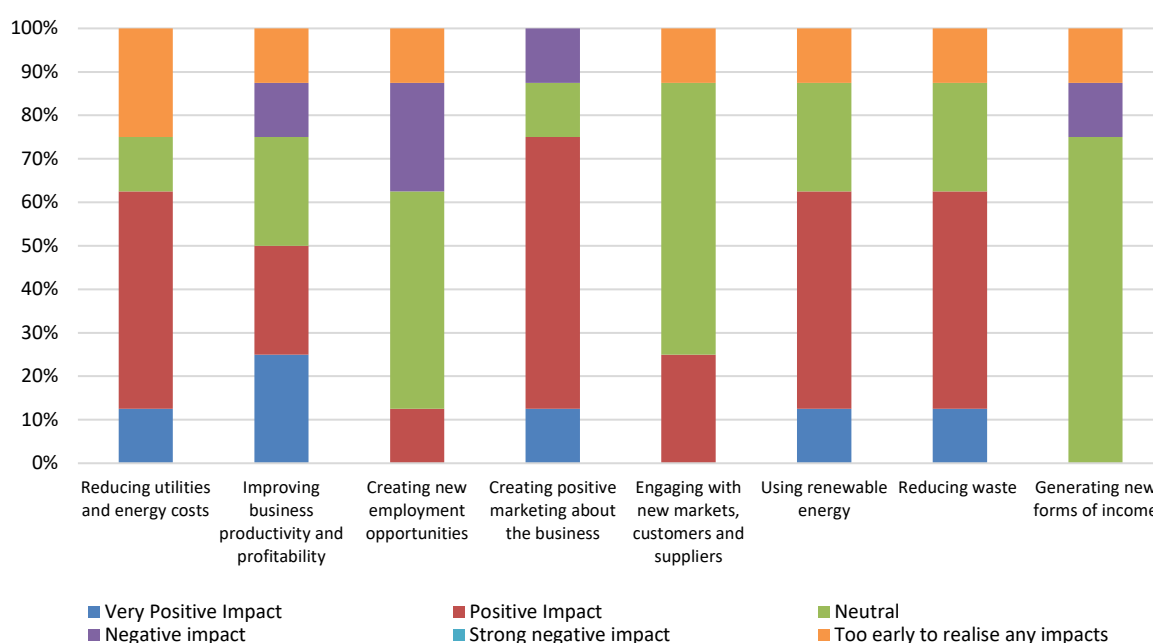
¹⁶ SFT Construction Jobs Methodology (2021) Scottish Futures Trust

Source: Low Carbon Business Support Programme Business Survey (2023)

6.16 As shown in Chart 6.1 overleaf, only 13% of businesses measured their carbon emissions on joining the programme. On completion of the programme, all businesses stated they were now measuring their carbon emissions, which is a considerable increase and a 100% success rate.

6.17 Chart 6.2 below, drawing from the completed business surveys, identifies the impacts of the support from the Low Carbon Business Support programme has had across a range of business processes and outcomes. These are self-defined by the business leaders who completed the survey rather than based on any empirical measures.

Chart 6.2 Impacts of Low Carbon Business Support on business outcomes

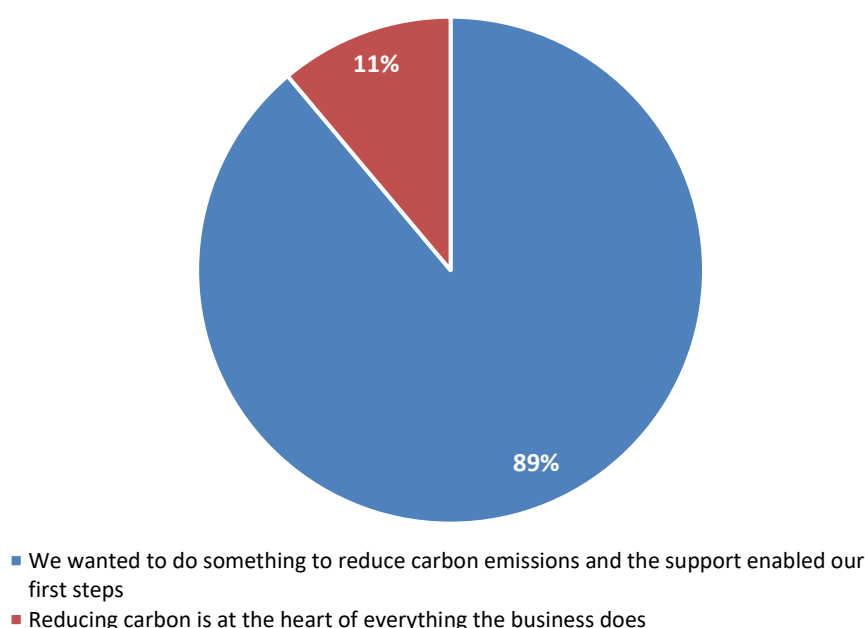


Source: Low Carbon Business Support Programme Business Survey (2023)

6.18 There were a number of areas identified where the Low Carbon Business Support Programme has had a strong impact on businesses. A total of 75% of businesses stated there had been a strong positive impact or positive impact on creating a positive marketing narrative about the business. Other areas of strong impact included reducing utilities and energy costs (62.5% strong positive or positive impact), reducing waste (62.5%) and improving productivity and profitability (50%).

6.19 There were areas where the project had a very limited impact including generating new forms of income, which no business stated the project had had an impact, creating new employment opportunities, to which just 12% of businesses saw a positive impact and engaging with new markets, customers and suppliers, where 25% of businesses stated a positive impact.

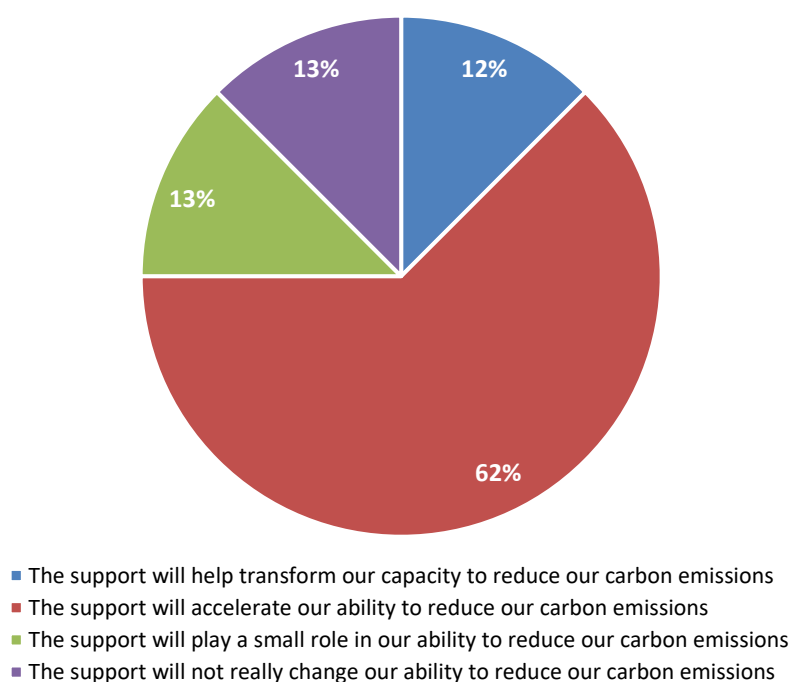
Chart 6.3 Stage of carbon reduction levels within supported businesses



Source: Low Carbon Business Support Programme Business Survey (2023)

6.20 Chart 6.3 above shows the stage of their carbon reduction journey that supported businesses were at when joining the Low Carbon Business Support programme. The overwhelming majority of businesses were at a relatively early stage of considering how they could reduce their carbon emissions, with the programme providing exploratory support, whilst only a single business already had established plans to reduce carbon that were at the heart of the business.

Chart 6.4 Attribution of Impacts of Low Carbon Business Support programme



Source: Low Carbon Business Support Programme Business Survey (2023)

- 6.21 Chart 6.4 above highlighted the views of businesses in terms of the role the support from the Low Carbon Business Support programme will play in terms of the businesses capacity and ability to reduce carbon emissions going forward. It is a measure of 'deadweight' identifying what may have happened anyway without the input from the project.
- 6.22 Overall 74% of businesses stated the support from the programme will help them to reduce their carbon emissions, of which 12% said it would be transformational. A further 13% of businesses stated the support will play a small role in helping the business to reduce their carbon emissions. Only 13% of businesses stated there would be no impact from the support they received.
- 6.23 Considering the programme did not offer any financial incentives or grants to businesses to implement or invest in practical measures to reduce carbon emissions, this is a very positive outcome.
- 6.24 As part of the business survey, beneficiaries were also asked if there had been any wider impacts on the businesses, examples of which are included below:
- "In the medium to long term our profitability should improve because of better energy efficiency."* Mepal Village Hall
- "NHS aims to be net Zero by 2045, so part of the procurement process needs us to be working towards this now for us to sell to the NHS."* Aseptika Ltd
- "We are sourcing raw materials and products from sustainable partners. We understand we can also influence our supply chain to improve with us."* Le Mark/Gaffertape.com

Future Low Carbon Business Support Needs

- 6.25 Businesses were also asked what their barriers were to further reduce their carbon emissions and what packages of support they would find most valuable. Unsurprisingly cost was the highest barrier – sometimes in terms of affordability, other times in terms of building an investment case.
- 6.26 Almost all the businesses that completed the survey stated they would have valued a capital grant to help to implement the financing of their carbon reduction plans. Some businesses were in older premises that both made the installation of carbon reduction approaches and technology more expensive, but also meant it would operate at a sub-optimal level – which made private investment unviable.
- 6.27 Businesses were also aware of some of the external factors that inhibit their ability to reduce their emissions, including commuting and transporting goods and sourcing raw materials.
- 6.28 In terms of the Low Carbon Business Support programme, there were very few suggestions for improvement. There were suggestions to provide more post project peer-to-peer networking so that businesses could carry on appraising and assessing how they could further reduce their emissions.

7 Qualitative Views on the Project

- 7.1 Interviews took place with project staff at Cambridgeshire County Council, Deyton Bell and Bouygues Energies and Services Ltd that had been involved in the development and delivery of the capital project and the planning and delivery of the Low Carbon Business Support project.
- 7.2 Discussions have covered how ERDF investment had addressed market failures identified within the logic model, the processes and management of the project, the likely impacts of the project overall and on the businesses the project has supported, and the potential legacy and lessons learnt of the ERDF investment.
- 7.3 The partnership between Cambridgeshire County Council and Bouygues Energies and Services Ltd has been ongoing as part of the Refit 2 framework agreement. The project has been undertaken on a live and busy Park and Ride site and the delivery of the project has had to work around keeping some capacity open over the duration of works.
- 7.4 Overall, the partnership has worked well and there was deemed to be a fair balance of risk across the implementation and management of the project. The project has been delivered as a partnership rather than on a standard client/contractor basis – which has allowed challenges to be overcome in a collaborative manner.
- 7.5 The addition of ERDF funding, whilst creating some additional administration and process requirements, did not in itself make the project more difficult to plan and deliver. It was felt the funding and governance requirements that ERDF brought were proportionate to the level of investment received.
- 7.6 Similarly the relationship between Deyton Bell as contractor for the Low Carbon Business Support programme and Cambridgeshire County Council as client were positive. Both parties worked diligently and flexibly to overcome some of the challenges the programme faced and shared the responsibility for stakeholder engagement and marketing of the programme.

Low Carbon Business Support programme

- 7.7 In terms of the Low Carbon Business Support programme, there were a number of challenges that the programme has had to overcome. The delays in starting the programme placed a considerable time pressure on Deyton Bell and PECT to design and deliver the programme in a condensed timeframe.
- 7.8 Early in the process, Cambridgeshire County Council identified that they did not have the capacity or expertise to run a business support programme of this nature in house and needed to procure a contractor. The first procurement process had no responses and Deyton Bell were secured on the second tendering exercise.

- 7.9 The programme initially offered six separate workshops over a short period of time to deliver the 12 hours output, but this was subsequently changed to two full consecutive days, which suited some businesses and not others. The final cohort in September was well attended and resulted in six additional C1 outputs claimed, but across the board, drop-out rates were high.
- 7.10 The programme did try and offer flexibility to meet individual business needs, but time and resource constraints made it hard to mix the delivery approach with too many short sessions, networking and events and flexible one-to-one support.
- 7.11 Many businesses that engaged on the programme were at an early stage of exploring their carbon reduction strategies and often did not need or want to commit to 12 hours of support on a subject that was not always their highest pressing issue. The C1 output has ultimately not been all that suitable for the programme.
- 7.12 Those that attended the sessions and completed their 12 hours received great value from the support and the programme was able to support and engage a wider profile of businesses than the ERDF outputs suggest, with 78 enquiries in total.
- 7.13 In order to increase the uptake on the programme, Deyton Bell looked to engage organisations that were operators of community buildings or social enterprises. This approach was relatively successful and a number of these organisations signed up for the programme.
- 7.14 Some of the businesses that engaged on the programme were very strongly focussed on energy cost reduction, which was covered as part of the programme. However, the subject matter was much wider and carbon reduction and energy efficiency, whilst there is overlap, are not the same thing. Some businesses found elements of the programme less relevant to their needs and circumstances.
- 7.15 Whilst there was some flexibility in what the programme could offer, the focus has to be built upon lowering carbon emissions and the programme was not a generic business support programme. It was not always possible to provide some of the wider aspects that businesses wanted to cover, such as raising finance or securing new customers.
- 7.16 Deyton Bell and PECT used tried and tested advisors in the delivery of the programme, which was a critical factor in delivering a programme of quality. The output of the Action Plan on completion of the programme included developing a process for measuring current and future carbon emissions and some quick wins for the business to implement.
- 7.17 Across many other low carbon programmes for business, there is usually a grant programme attached that is used to engage businesses. This includes examples such as the Norfolk and Suffolk Road to Net Zero programme, the Net Zero and Energy Support programme across the Southeast, Midlands and the Green Belle programme across Leicestershire.

- 7.18 The Low Carbon Business Support programme did not have this offer to provide capital investment after support and advice, which may have made the programme more attractive and is highly likely to have reduced the attrition rate.
- 7.19 It is important to note that the programme filled a gap across Cambridgeshire and Peterborough with regards to offering support on carbon reduction to businesses and without the programme the support offer in this arena would have been far more limited and based more on a postcode lottery.

St Ives Park and Ride site

- 7.20 In terms of the capital works at the Park and Ride site, it has been a relatively long standing ambition of Cambridgeshire County Council to develop renewable energy capacity at key Council owned sites, including Park and Ride sites, across the County. The St. Ives site had been deemed as a clear opportunity for several years, with an initial public consultation taking place in 2019 around a set of early plans.
- 7.21 Overall, the project has been relatively challenging to implement. Firstly, throughout the implementation phase the Park and Ride site remained open for use, which the works had to accommodate. The scale of site was generally large enough to accommodate maintaining some operational capacity – but the lessons from the project suggest other, smaller sites may not be able to maintain their operations during the build.
- 7.22 The development took far longer than anticipated, which created more off-project costs and reduced capacity (and therefore income) as the site was only semi-operational for far longer than planned.
- 7.23 Cambridgeshire County Council and Bouygues Energies and Services Ltd had worked around these issues, including trying to minimise disruption on site. At the time of completing the Summative Assessment, the project was approaching the completion of most of the renewable technology on site, with an overall handover planned for December 2023.
- 7.24 Bouygues Energies and Services Ltd started on site in February 2022 and forecast completing the majority of works by October 2022. The timelines have ultimately slipped, partly due to changes with design works for the initial two onsite customers and their Power Purchase Agreements and the replacement of one customer with the application for a direct connection to the distribution network. This resulted in a shifting set of timelines for completion.
- 7.25 Of the two businesses that initially indicated they would be prepared to sign a Power Purchase Agreement, one remained committed although created a problem through the purchase of a non-compliant diesel generator and the other customer focus had to remain on their business and £20 million local investment. This meant changes were flet on the project around scheme design and income generation models.



The site nearing completion, August 2023

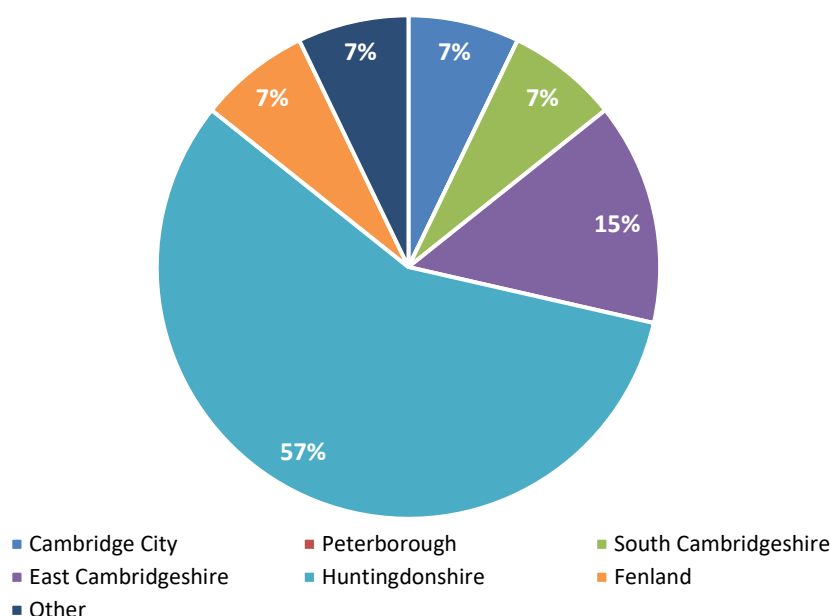
- 7.26 Marshalls Mono are in the middle of expanding their site and upgrading their own grid connection. These works ultimately delayed any design work to install the Private Wire Network connection to the Smart Energy Grid. The delays in design work for Marshalls Mono in turn had an impact on the wider project design.
- 7.27 As part of the wider site re-development, Marshalls Mono also subsequently chose to install 1MW solar array on the roof of their new plant. A mutual position was agreed with Marshalls Mono to withdraw from the project but with the opportunity to join at a later point if it made business sense to do so.
- 7.28 Mick George Construction Group purchased a used generator to temporarily expand their power capacity, but this generator is incompatible with the Smart Energy Grid. Mick George subsequently signed a revised contract variation to the Power Purchase Agreement, with the requirement to purchase a compliant generator and to connect to the Smart Energy Grid within two years of the end of December 2022, although initial works on the connection began in May 2023.
- 7.29 As previously stated, in the short term the project is no longer offsetting the carbon emissions of a diesel generator, which has had an impact on the project's C34 outputs but within 2 years it is scheduled to offset the diesel generator emissions when joined to the scheme.
- 7.30 These delays and challenges have demonstrated the market barriers in developing projects that incorporate businesses or end users that have different short term energy needs and projects that are several years in the planning, complex to implement and involve partnerships with utilities operators and contractors.

- 7.31 Ultimately as part of the risk management approach in response to these delays, the Smart Energy Grid project has been able to secure a national grid connection through UK Power Networks. This will improve the overall resilience of the smart grid and allow for low cost and clean energy to be utilised and stored outside of peak hours. UK Power Networks proposed a connection date of September 2023, although much of the power infrastructure needed to be redesigned and a new sub-station built.
- 7.32 As is often the case with smaller projects that require civil engineering solutions from major utilities providers, timeframes quickly move out of the control of the project. Whilst the sub-station is now complete, there are still some outstanding tasks to complete the grid connection with UK Power Networks and there are outstanding tasks to connect Mick George Ltd to the Smart Grid. It is likely some activity (although out of scope of the original ERDF project) may well extend beyond the end of the ERDF investment.
- 7.33 Although the project is neither signed off or fully operational, the scalability of the project is becoming clearer. Whilst some additional long-term sites have been identified and considered thanks to the demonstration project at St. Ives, there have been lessons learnt for the operational model. This will be deployed on the next Park and Ride site to be developed at Babraham Road in Cambridge, which is now under development.
- 7.34 Longer term, viability on other sites will depend on likely economic returns in terms of energy prices and on-site demand and a relative reduction in the price of installing the canopy mounted solar panels. It is not clear how much further across the portfolio of car park sites that viable low carbon energy generation project can be rolled out.
- 7.35 The St Ives site was a relatively new site, which has made it easier to adapt to hosting canopies and solar panels, EV charging, battery storage and a sub-station. Other sites may not be able to incorporate this level of infrastructure without losing parking spaces.
- 7.36 The investment has future proofed the St Ives Park and Ride site to be able to incorporate future ducting and capacity to increase the number of Electric Vehicle chargers on site as demand grows. This has all been achieved without losing any parking spaces and significantly improving the environment on site.

Business views on the Low Carbon Business Support Programme

- 7.37 The views of businesses on their experiences of the Low Carbon Business Support programme is drawn from the responses to the business survey. Some of the responses were quantitative and some were qualitative in nature.
- 7.38 In terms of the location of businesses that completed the survey, as shown in Chart 7.1 overleaf. Most businesses were located in Huntingdonshire, but there was a good spread of businesses from across Cambridgeshire (although some businesses were located within multiple Districts).

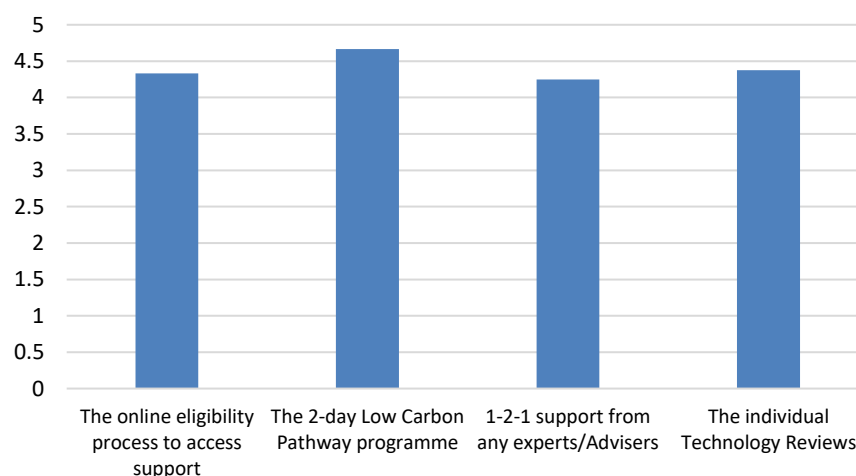
Chart 7.1 Location of businesses completing the survey



Source: Low Carbon Business Support Programme Business Survey (2023)

- 7.39 Businesses were asked where they first heard of the Low Carbon Business Support programme. A third of business stated they had received direct contact from Deyton Bell, with other businesses sourcing other referral organisations including Cambridgeshire ACRE and Huntingdon District Council.

Chart 7.2 Scores out of 5 for each element of Low Carbon Business Support



Source: Low Carbon Business Support Programme Business Survey (2023)

- 7.40 In terms of the quality of the offer of the Low Carbon Business Support programme, businesses were asked to rate the quality of any support they received from the different strands of the project they engaged with out of 5 (as shown in Chart 7.2 above). All the strands of the project received high quality feedback from businesses, but of particular note was the 2-day Pathway programme at 4.66, individual Technology Reviews, scoring 4.37 and the online eligibility check process at 4.33

- 7.41 Below is a sample of comments received from supported businesses related to both the processes involved in the Low Carbon Business Support programme and the quality of its offer to businesses.

“For small businesses it is difficult to gain support and cost-effective resources to match our aspirations.” Metal Office Equipment Ltd

“The programme equipped us very well for medium and long-term decision-making with a view to carbon emission reduction from our premises and activity, though the scope for immediate action is limited.” Mepal Village Hall

“NHS aims to be net Zero by 2045, so part of the procurement process needs us to be working towards this now for us to sell to the NHS.” Aseptika Ltd

“I found the six sessions really informative and well-structured. There was a lot of detail in there but it always felt engaging and manageable. The small group size meant any questions could be answered quickly where relevant to the group or followed-up afterwards if not.” Hunts Forum

“One of the best training courses we have been on and this will help the 360 Group reduce Carbon emissions path going forward.” 360 Coms Ltd

“Great two days with lots of information. Looking forward to working closer with local support to help us deliver our goals of Carbon Neutrality.” Webtec Products Ltd.

“I believe it was presented in a highly informative way by two extremely knowledgeable people. Packed with information and statistics that made sense. Extremely pleased we were able to attend.” Le Mark /Gaffertape.com

- 7.42 Finally, businesses were asked, based on their experiences of the support they received from the programme, what future support they may need to reduce their carbon emissions. Almost unanimously businesses stated they required capital funding to help them invest in the technology and processes that would reduce their emissions – which had become increasingly unobtainable coming out of COVID-19, the war in Ukraine and high energy prices.

Lessons Learnt

- 7.43 It has been acknowledged that for the maximum return of impacts from the project to be achieved, further work would be needed, especially raising awareness of the additional Electric Vehicle charging facilities on the site. The long-term potential of the St Ives site depends on growing demand to build out the remaining charger capacity.
- 7.44 One of the challenges from the installation of canopies has been their operational capacity with regard to risks associated with high wind speeds. Above a certain windspeed, there may be health and safety issues with the canopies that may result in full or partial closure of the Park and Ride site.

- 7.45 In terms of key lessons learnt for future projects, there is a clear need to tie down potential end users much earlier in the process and secure Power Purchase Agreements in advance of the development where possible. Trying to negotiate with end users whilst on site provides too much commercial advantage to the end user and all the commercial exposure to the energy producer.
- 7.46 The project has been run in a relatively transparent manner and communication has been constant throughout all stages of the scheme. Whilst the appointment of a third-party Clerk of Works was helpful from a quality and process perspective, it did mean fewer visits to site from the project team at Cambridgeshire County Council. This meant there were sometimes discrepancies in the detailed understanding of the on-site implications of decisions being made on both sides.
- 7.47 There could also have been more contingency plans in place for managing the supply chain, especially when key sub-contractors do not perform as expected. The wider market conditions meant there were skills shortages in certain key trades – which became a challenge for delivering the project.
- 7.48 In terms of the Low Carbon Business Support programme, there has been two major lessons learnt. The first is that the timeframes for delivering the activity were condensed which had a major impact on what could be delivered and how. A longer timeframe would have allowed for more flexibility and the ability to tailor the offer more to individual business needs.
- 7.49 Finally, as a programme, the additional of a small grant fund would have added considerable value – both in terms of attracting more businesses to engage with the programme and also helping businesses to overcome some of the financial and non-financial barriers to implementing some of the measures covered in the programme.

8 Case Studies

Case Study: Walters



<https://www.walters.co.uk/>

Walters are an office supplies furniture and interiors firm, part of the Ethos Group of Companies, based in Peterborough.

Walters joined the programme to look at how, as a business, they could incorporate environmental benefits at the core of their business decision making. Walters also wanted to identify measures to reduce their energy consumption.

Lisa Mawditt, Accreditations Manager at Walters Ltd, stated:

"We learnt so much. The subject matter of sustainability and being a responsible employer in terms of the environment is such an overwhelming topic because there is so much to it.

We were able to define key topic areas and bite them off in small chunks was a massive help to us as a business."

Walters initially undertook an energy audit and identified areas where the business and premises were haemorrhaging energy and money. The programme helped them identify ways to reduce their energy use, supporting costs and the environment.

Lisa added, *"the programme has helped us take our sustainability to the next level for our stakeholders, customers and for our workforce.*

"It was a fantastic opportunity to learn and meet new people."

Case Study: Hunts Forum



<https://huntsforum.org.uk/>

Hunts Forum of Voluntary Organisations is an independent, non-profit making registered charity based in Huntingdon, Cambridgeshire. The charity was established in 1994 and manage the Maple Centre on the Oxmoor Estate, working with six other frontline organisations. The forum support over 120 organisations across Cambridgeshire with support, advice and training.

Hunts Forum joined the Low Carbon Business Support programme to help the organisation take early steps to reduce its carbon emissions.

Development Officer Oli Bachini attended the programme workshops on behalf of the organisation. Oli stated:

"I found the sessions really informative and well-structured. There was a lot of detail in there but it always felt engaging and manageable. The small group size meant any questions could be answered quickly where relevant to the group or followed-up afterwards if not."

The project has helped the forum to reduce their utilities costs, reduce waste and generate a positive narrative about their carbon emissions.

As an organisation that exists to support other organisations, mainly small charities, the programme has helped to create in-house knowledge that can be passed to other members.

9 Cross Cutting Themes

- 9.1 The incorporation of Equalities and Sustainable Development in the commissioning and delivery all ERDF projects is a mandatory requirement. Within the Full Application, the emphasis for Cambridgeshire County Council was producing low carbon, renewable energy and supporting the development of electric vehicles within the County.

Equalities and Diversity

- 9.2 The requirement to embed equalities and diversity has been passed on to the project in the way it engages businesses, the way the project has delivered its services, the way the capital project has been designed and delivered and the way it has monitored its outcomes and impacts.
- 9.3 Within the Grant Funding Agreement, Cambridgeshire County Council stated the programme would ensure no beneficiaries would be excluded on the basis of their characteristics and a range of needs will be considered during the design of the programme. This was also adhered to by the other partners who in turn passed on the requirement through procurement processes to their contractors.
- 9.4 The Park and Ride site at St. Ives is open access and will help rural inclusion, supporting people living in rural communities nearby to access public transport and employment. The project has covered a number of disabled parking spaces and some of the lighting and public spaces have been improved as a result, which should have an impact on safety, usability and accessibility.

Sustainability

- 9.5 The project is clearly having a positive impact on sustainability as highlighted elsewhere within the Summative Assessment, generating low carbon renewable energy and longer-term improving air quality and promoting electric vehicle use.
- 9.6 As the energy grid naturally decarbonises over a longer time horizon, the long term cumulative environmental benefits of any future roll outs drawing from this model will likely be less meaningful to greenhouse gas reduction.
- 9.7 However, the asset will be a key tool to support the transition to Electric Vehicles. As there is no consumption data for the Electric Vehicle chargers on site, it is not clear the extent to which this is occurring.

10 Value for Money

- 10.1 Ensuring value for money for European Union Structural and Investment Funds is a key component of the current ESIF programme and also of the Summative Assessment guidance.
- 10.2 The first measure of value for money is the unit cost for the project to support businesses. The projected revenue expenditure for the project is £230,000, which is anticipated to support 26 businesses at a unit cost of £8,846 per business (although this includes all the project revenue cost). Although the revenue costs are wider than just the Low Carbon Business Support Programme, the staff resources paid for by the funds did support the wider implementation.
- 10.3 In 2013 Regeneris undertook a benchmarking exercise on the anticipated costs per output across the 2014-20 ERDF programme¹⁷. The unit costs for a medium intensity business support intervention have a median cost of £10,200 and a mean cost of £34,000. The unit cost for the Low Carbon Business Support programme is between the mean and median unit costs – although the intervention is relatively low intensity.
- 10.4 There is no centralised benchmark for unit costs for reduction per tonne of Greenhouse Gas Emissions within the England ERDF Programme: Output Unit Costs and Definitions (2013) by Regeneris Consulting. This document provides a range of anticipated unit costs per output across the 2014-20 ERDF programme.
- 10.5 This lack of a common benchmark for Greenhouse Gas reductions within the range of ERDF benchmark costs is partly due to the detailed output measure not being confirmed by DLUHC before the report was produced. It is also partly due to the constantly changing proportion of fossil fuel production within the energy grid and the rapid speed of change in the capacity of low carbon technology.
- 10.6 Value for money has had to be determined by a review of the project against similar peer projects from across the England ERDF programme. To assess the value for money elements of Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project, we have identified a range of other ERDF projects that plan to invest in a range of low carbon energy generation and efficiency technologies.
- 10.7 By the final claim, the project is forecast to have spent a total of around £4m on installing low carbon solutions and these interventions are estimated to save a total of 352 tonnes of CO₂ equivalent per annum using the projections within the Summative Assessment.
- 10.8 Over a 25-year period, at a Net Present Value of carbon reduction of 3,900 tonnes is forecast. Based on the above calculations, this means the project has a unit cost per tonne of CO₂ equivalent saved of £1,025.

¹⁷ Regeneris Consulting (2013) England ERDF Programme 2014-20 Output Unit Cost and Definitions

- 10.9 Coventry City Council secured a 50% ERDF contribution towards a £1.26m project (Coventry City Council Solar PV Self-Supply) to install roof mounted PV cells on 39 Council buildings. The project aims to reduce Greenhouse Gas emissions by 160 tonnes reduction per year. Using a similar net present value calculation, the unit cost of 1,750 tonnes of greenhouse gas reductions over the asset lifespan is £734 per tonne, slightly lower than the St. Ives project.
- 10.10 The Unlocking Clean Energy in Greater Manchester project, delivered by Energy System Catapult, is a £17.2m project to produce 10MW of solar and hydro-electric generation, coupled with battery storage. The project also includes EV charging. The project aims to reduce 3,124 tonnes of Greenhouse Gas per annum, or a net present value of 34,000 tonnes over 25 years. This would suggest a unit cost of £506 per tonne of greenhouse gas reduction – again slightly lower than the project.
- 10.11 The Sefton RetroFIT for the Future project initially received around £2.4m of ERDF investment to improve the energy classification of around 500 dwellings through improving thermal performance, delivering a combined CO₂e reduction of 294 tonnes. The proposed unit cost per tonne of CO₂e saved was £750 tonnes. The project has subsequently been expanded but a revised set of unit costs could not be calculated.
- 10.12 The Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project is largely recording slightly higher costs than some of the proposed peer projects. However, it was stated within the application that the costs are likely to be higher due to the inclusion of the canopies, which are an extra cost compared to roof mounted or ground mounted solar power. Within the original budget around £1m was allocated towards the cost of constructing the canopies, which is around 20% of the overall revised budget. This would effectively reduce the unit costs to around £770 per tonne, more in line with the comparator projects.

11 Conclusions

- 11.1 At the time of completing the Summative Assessment, the Smart Energy Grid Demonstrator Project for St. Ives Park and Ride project is anticipated to have defrayed just over £4m of its budget and as a result will draw down almost all of its ERDF allocation.
- 11.2 The capital project has been well managed and has been able to navigate through a range of delays and risk factors including the legacy of the COVID-19 pandemic, supply chain issues, changing design requirements and an operational site. Whilst the project still has some outstanding tasks to complete and has not drifted beyond its completion date, the project should still meet its main objective of micro-generation of 1MW of electricity to support the power needs of the site and enable electric vehicle charging, support power provision to an adjacent business and to export excess capacity to the grid. The investment will also improve the physical environment at the Park and Ride site.
- 11.3 Longer term it is hoped the investment will help people in Cambridgeshire to switch to electric vehicles and demonstrate to businesses that low carbon energy can help to overcome some of the constraints on the electricity grid across Cambridgeshire.
- 11.4 It is estimated that the project will generate a total of 60.24 construction jobs and the project team aimed to use local contractors and sub-contractors wherever this was possible.
- 11.5 The project has been billed as a demonstration project to review whether this type of canopy based solar system is viable to utilise on other sites in Cambridgeshire and elsewhere. The Summative Assessment has demonstrated that a balance needs to be struck between costs and return on investment, disruption and capacity.
- 11.6 Any future projects need to be able to operate at scale and potentially may need either a reduction in capital costs or increase in energy value to be viable. Project viability and in some ways cost certainty depends in tying down end users to Power Purchase agreements much earlier. These are all lessons that are being applied to the next development site for developing a smart energy grid at the Babraham Road Park and Ride site.
- 11.7 There have also been challenges around the Low Carbon Business Support programme, including a delayed start, relatively high dropout rate and challenges engaging businesses. Despite this, the project has offered a high quality and well valued service, although to fewer businesses than anticipated. A total of 26 businesses received.
- 11.8 The business support project enabled a considerable uptick in the proportion of businesses that were enabled to measure their carbon footprint and for a majority of businesses has had a positive impact on the marketing narrative for the business, reducing utilities and energy costs, reducing waste and improving productivity and profitability.

- 11.9 Businesses rated the quality of the support they received very highly and found the project relatively easy to navigate through. Most of the businesses that engaged on the Low Carbon Business Support programme were at a relatively early stage of considering how they could reduce their carbon emissions.
- 11.10 The project had been designed and delivered well, but some businesses did not need or want 12 hours of support on a relatively specific subject matter, which had an impact on the completion rate.
- 11.11 There are two major lessons from the Low Carbon Business Support programme, ensuring there are suitable timeframes to deliver a flexible service that meets business's needs and trying to develop a programme in the future that has business grant funding attached, which can help businesses.
- 11.12 Finally, as a programme, the additional of a small grant fund would have added considerable value – both in terms of attracting more businesses to engage with the programme and also helping businesses to overcome some of the financial and non-financial barriers to implementing some of the measures covered in the programme.
- 11.13 The project has offered reasonable value for money – but the construction costs have incorporated the cost of canopies, which make the project more expensive than ground or roof mounted solar panels, but take up no additional land use when compared to ground mounted solar.
- 11.14 The project overall has been well received and will have a positive impact on supporting long term carbon reduction across Cambridgeshire, both promoting the use of electric vehicles and the use of low carbon energy. The project has also had a positive impact on the Authority's desire to reach Net Zero by 2045.

Appendix A - Logic Model

Project

Cambridgeshire's Smart Energy Grid Demonstrator Project for St. Ives Park and Ride

Click on the arrows to navigate around the model. Tables can be edited directly in the model. To edit free text, click Edit under each title

Context

Edit

Cambridgeshire has the technical potential to deliver 28% of its energy needs from renewables and contribute to the delivery of the UK Renewable Energy Roadmap.

Cambridgeshire's geography, topology and rural nature means the majority of renewable energy projects are smaller scale and therefore more expensive to finance.

Cambridgeshire's businesses can deliver the UK local and national energy and low carbon ambitions but need business support to bring complex projects together.

Market Failure Assessment

Edit

The local grid is at capacity and decentralised energy can not connect. This is a barrier to green growth and delivering national and EU policy objectives and targets.

There is an absence of projects that (1) demonstrate the business case for how to deliver local energy generation and then sell the energy directly to customers as part of a smart grid and (2) share financial and policy benefits across transport and energy sectors.

Access to finance incentives as part of Electricity Market Reform, Contracts for Difference or capacity markets favours large projects, making small projects difficult to finance.

Business don't always know where to access impartial support as to how to reduce their carbon emissions and access low carbon technology

Project Objectives

Edit

- Deliver 906.3 kW of solar renewable energy per annum. (Reference: UK Solar Energy Roadmap 2013).
- Demonstrate solar energy generation and its interaction with supportive technologies such as battery storage, control systems and electric vehicle charging
- Identify business case solutions to overcome local grid constraints and access to energy markets for smaller schemes.
- Support capacity and capability building in the supply chain through knowledge transfer from the demonstration project.
- Support the delivery of the Cambridgeshire Renewables Infrastructure Framework (CRIF 2012) adopted by the

Rationale

Edit

The grid constraint in Cambridgeshire is now so acute that no decentralised energy can connect in some areas. The SEG Project is a direct result of the UK struggling to bring innovations into commercial reality coupled with passive network management. The value of the project is through demonstrating what can be done on the ground at the small scale to build new business models, partnerships and networks that can work together to find better solutions to the network challenges faced locally, nationally and across Europe.

Businesses, especially SMEs don't have the capacity and finance to take on projects like this on their own to test and innovate new business models or try out technology combinations. Cambridgeshire County Council, by leading this project and the business support programme will provide the opportunity to build capacity and skills locally in the supply chain for smart grids; network

Inputs

What	Value
ERDF grant	£1,812,255
Public sector finance	£1,812,255
Assets: Cambridgeshire County Council St Ives P&R site	
Business Support Programme	

Intended Impacts

What
• Increase number of small sites generating renewable energy (including PV)
• Create / safeguard jobs in the clean tech sector resulting from market failures
• Make electric vehicles more attractive due to availability of local charging facilities
• Keeping energy spend in the local economy
• Managing cost of living (affordable energy)

Outcomes

ID	Intended Outcome	How is it Measured?	Level	Baseline	Actual
1	Changes to the skills and competencies of business	businesses measure and provide evidence			
2	Avoidance of CO2 emissions	KWh generated by PV and KWh grid electricity avoided			
3	Increase the provision of EV chargepoints with low carbon	Number of KWh charged via the EV chargepoints			
4	Two local businesses directly connected to clean energy	Supply meter readings can be recorded and sent through			
5	Better business understanding of low carbon options	Business survey			

Outputs

What	Value
• C1 - 40 businesses receive 12 hours of support	
• C5 - 3 new businesses supported	
• C30 - 906.3 kW electricity generation capacity	
• C34 - 2,590 tonnes CO2-e emissions reduced over 25 year	

Activities

What
Capital investment - Demonstrator project for small scale renewable
Revenue Investment - business support programme"