Summative Assessment of the part ERDF funded Energy Low Carbon Housing Support Ellesmere Port and Neston

ERDF Project Ref: 03R18P02422

Cheshire West and Chester Council

European Union
European Regional Development Fund

ForHousing

Cheshire West and Chester

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Contents

1 Executive Summary

1.1 Cheshire West and Chester Council have commissioned this evaluation and Summative Assessment to review the impacts of the Energy Low Carbon Housing Support Ellesmere Port and Neston (referred to in the Summative Assessment as the Low Carbon Housing project) across a range of economic, social and environmental outcomes and impacts.

1.2 This Summative Assessment report provides:

- An overview of the Summative Assessment process
- A review of final project performance and milestones
- An outline assessment of any financial savings tenants may be making
- An assessment of potential greenhouse gas reductions as a result of the project
- A review of value for money
- Lessons learnt, conclusions and recommendations

1.3 The Energy Low Carbon Housing Support project is a pilot scheme to reduce energy consumption and to generate low carbon electricity production and storage through installing Photovoltaic cells and in some projects battery storage, low carbon heating systems (although this element of the project ended up being removed) and external wall insultation on a cumulative 199 domestic Council owned properties in the Ellesmere Port and Neston areas of the Cheshire West and Chester Borough.

1.4 The project became operational in December 2018, with a proposed practical and financial completion date of 31st December 2019, although this was ultimately extended through a Project change Request to the end of December 2020. The project secured £500,000 of ERDF investment, which has been matched funded by £500,000 from Cheshire West and Chester Council's Housing Revenue Budget.

Table 1.1 Project Outputs

Output	Target to December 2019 – Full Application	Target to December 2020 – Project Change Request
(C31) Number of households with improved energy consumption classification	199	220
(C34) Estimated annual decrease of GHG	279 tonnes	180 tonnes

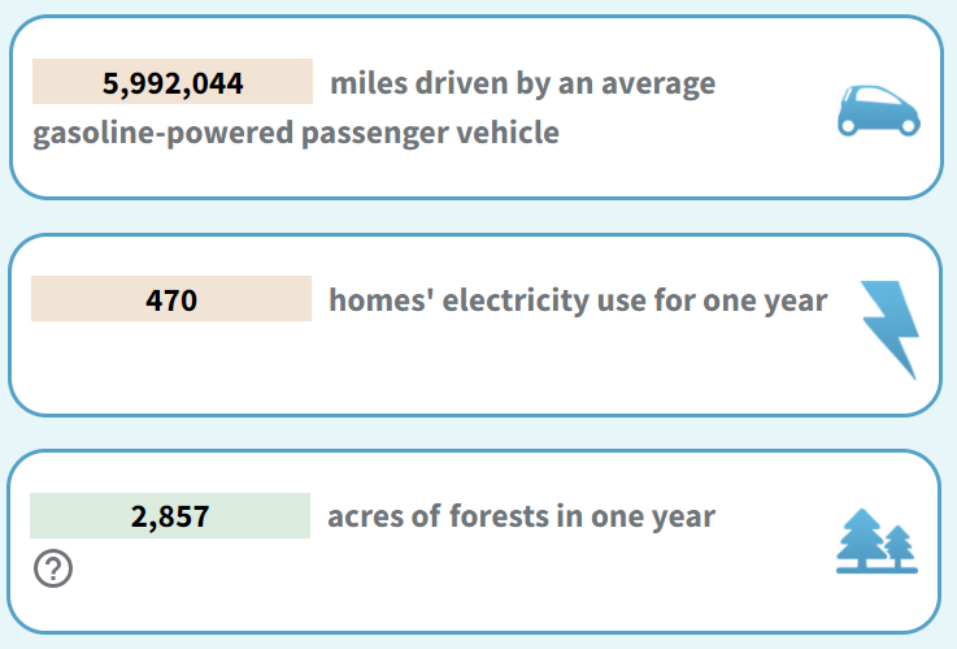
1.5 The project to the end of December 2020 met its C31 target (220 properties improved) and exceeded it C34 target by a third, supporting the overall reduction per annum of 240 tonnes of CO^2 equivalent Green House Gases. The project completed 22 installations external wall insulation and 198 properties have received a Photovoltaic system (with 20 including a PV/battery system).

1.6 The project has delivered a different profile to the full application – which originally included 27 properties to receive low carbon heating systems to upgrade from heating depending on either solid fuel or electric/gas fires and with no central heating. Ultimately there was no demand for this type of system, so this component of the project was reorientated towards installing more Photovoltaic systems.

1.7 In totality over the estimated 25-year period of the assets, the project will have facilitated a total of reduction of 2,414 tonnes of greenhouse gas emissions based on the Net Present Value of current reductions and the rate of future decarbonisation of the UK power network.

1.8 As shown in diagram 1.1 below, this is equivalent to the emissions of 5,992,044 miles driven in an average passenger vehicle, the total electricity consumption of 470 homes in a year or the CO^2 absorption from 2,857 acres of forest in one year[1].

Diagram 1.1 Equivalent Carbon Savings



Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

1.9 The Summative Assessment has also calculated that the savings to tenants through the project are expected to reduce the costs of electricity to tenants by an estimated 44% and this in turn would reduce the proportion of expenditure of some of the lower income households across Cheshire West and Chester from 4.12% of weekly income to 2.44% of weekly income. This percentage of expenditure on electricity costs is more in line with the UK average expenditure rate of 2.13%.

1.10 Overall, partners have stated that the project was relatively simple to deliver, and the fact that there were only three procurement exercises undertaken and three external contractors made the administration simpler to manage.

[1] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

1.10 Informal feedback from tenants was overwhelmingly positive in relation to the installation, with satisfaction rates amongst tenants record at 98%. Many stated they had seen noticeable reductions in their energy costs and houses that had received insulation were no longer damp or as cold.

1.11 There was an appetite to further address properties within Cheshire West and Chester that still had poor Standard Assessment Procedure Scores for energy consumption, and especially to widen the roll-out of Photovoltaic systems into additional rooves. The activity under the Low Carbon Housing project had helped to inform and support a 'whole house approach' that would be required for any future approach to the Social Housing Decarbonisation Fund.

1.12 Overall, the project was identified as offering very good value for money, both in terms of the unit cost per output against peer ERDF projects and also in terms of the unit cost of Photovoltaic installations, which formed the largest element of the budget and work programme.

Lessons Learnt

1.13 The timescales, although achieved, were challenging for project partners. As with many externally funded projects the timescales can drift or change and better preparation would assist in the early deployed of resources and would help specify procurement outcomes.

1.14 Whilst the installation phase was felt to be very successful, there were areas that could have helped the process run even more smoothly including more pre-engagement work with tenants (including some early property survey work and prioritisation of installs). This would have allowed for a more efficient installation process.

1.15 COVID-19 did cause issues for the installations, but the pandemic struck near the end of the process so its impact was less than it could have been. The pandemic generally highlighted the need for considering business continuity as part of any project development, contracting and project management as a range of external events (including disruptive weather, issues relating to individual tenants and workloads/staff shortages can all have a major disruptive effect).

1.16 There are a number of areas to consider in the monitoring processes for any future interventions. Firstly, to avoid complexity with ERDF funding, the project avoided any direct income from feed-in tariffs on behalf of the project partners. This in turn has meant remote off-site monitoring of the generation/consumption/export of power is not available and this data could have informed any future roll out and also helped to understand the savings tenants may have made.

1.17 Finally, data on tenancies only incorporated the lead tenant and missed a number of key demographic characteristics of the household and the socio-economic status of residents which again could be useful for wider roll out and to understand some of the impacts on energy savings

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. Cheshire West and Chester Council have commissioned this evaluation and Summative Assessment to review the impacts of the Energy Low Carbon Housing Support Ellesmere Port and Neston (referred to in the Summative Assessment as the Low Carbon Housing 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 covering property type, demographic characteristics of the tenants involved, estimated amounts of solar electricity produced, consumed and exported to the gird and a range of project financial data.

2.3 This report provides:

- An overview of the Summative Assessment process
- A review of final project performance and milestones
- An outline assessment of any financial savings tenants may be making
- An assessment of potential greenhouse gas reductions as a result of the project
- A review of value for money
- Lessons learnt, conclusions and recommendations

Overview of the Low Carbon Housing Project

2.4 The Low Carbon Housing project is a pilot scheme to reduce energy consumption and to generate low carbon electricity production and storage through installing Photovoltaic cells and in some projects battery storage, low carbon heating systems (although this element of the project ended up being removed) and external wall insultation on a cumulative 199 domestic Council owned properties in the Ellesmere Port and Neston areas of the Cheshire West and Chester Borough.

2.5 Cheshire West and Chester Council at the time of submission of the ERDF Application had a retained 5,500 Council-owned homes across the Borough and these are presently managed through a 10-year arms-length agreement with ForViva Group Ltd (branded as ForHousing) that runs until 2027.

2.6 The initial application aimed to deliver:

- 151 properties installed with a roof Photovoltaic System
- 27 properties with low carbon heating systems installed
- 21 properties installed with prefabricated wall insulation

2.7 An application for ERDF funding was submitted in April 2018, with formal approval coming in late 2018. The project has been funded under ERDF Priority Axis 4: '*Supporting the Shift Towards a Low Carbon Economy in All Sectors'* of the Cheshire and Warrington ERDF allocation. Specifically, the project was supported under Priority Axis 4C: '*Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector*'.

2.8 The project became operational in December 2018, with a proposed practical and financial completion date of 31st December 2019. The project secured £500,000 of ERDF investment. Which has been matched funded by £500,000 from Cheshire West and Chester Council's Housing Revenue Budget. The budget featured a £990,222 capital investment in the various works and a £9,780 revenue budget to cover staff and project management costs.

2.9 There was no initial allocation to undertake a Summative Assessment within the ERDF budget and the costs of undertaking this externally led process have been covered by Cheshire West and Chester Council.

Overview of the Low Carbon Housing Project

2.10 The project was developed in part to support the delivery of low carbon solutions to some of Cheshire West and Chester's housing stock. This was undertaken partly to use low carbon solutions to bring some properties up to Decent Homes standards and partly to reduce energy costs for a number of vulnerable tenants. The project was eligible to receive ERDF investment as it proposed to use innovative solutions as demonstrator projects of new technologies.

2.11 Within the Council owned housing portfolio, there were 21 properties that had solid walls (therefore unsuitable for Cavity Wall Insulation) and that were, at the time of submission, uninsulated. The proposal within the project is to utilise external wall insulation fabricated off-site on these properties. Most of the interventions of the project took place within the Ellesmere Port area, with some properties being located within Neston.

2.12 There were also 27 properties within the portfolio that did not have a central heating system installed – largely due to the sitting tenant at the time not agreeing to its installation at the time. These properties largely retained solid fuel heating or electric/gas fires and electric radiators/storage heaters. The proposal within the ERDF project was to revisit these properties and install a lower carbon and more efficient heating system. As identified later in the chapter, this element of the project was removed and the resources reallocated to additional PV units.

2.13 Finally, the project proposed to install a Photovoltaic system on 151 properties, with around 10% of these properties also having a battery system to store generated electricity. Tenant Liaison officers for the ForHousing Group identified a long-list of potential properties/tenants that would benefit most from the installation of these systems. Initial criteria included:

- The type of tenant – ensuring maximum onsite use of electricity generated and the most financial benefit accrued
- Issues related to safety, obstructions and capacity
- Roof condition (ensuring longevity of asset)
- Properties with split suppliers

2.14 Whilst Cheshire West and Chester is generally classed as a social or economically deprived Borough, ranking as the 183rd most deprived area out of 317 Local Authority areas in the 2019 Index of Multiple Deprivation. The Index of Multiple Deprivation covers measures of income, employment, education, health, crime, barriers to housing and services and the living environment.

2.15 Despite the relatively positive performance of Cheshire West and Chester, there are a number of Lower Super Output Areas that feature in the 10% most deprived parts of England in the Borough. A total of half of these (or eight in total) are located in Ellesmere Port[2].

2.16 Cheshire West and Chester, as of 2018, had 15,769 households being identified as in fuel poverty and having required fuel costs that are above the national median level and were they to spend that amount, they would be left with a residual income that would put them below the official poverty line. This definition applies to a total of 10.6% of all households within the Borough[3].

2.17 A total of 70,950 individuals within Cheshire West and Chester were eligible to receive Winter Fuel Payments, an annual tax-free payment to help older people with heating costs[4].

Project Objectives, Outputs and Outcomes

2.18 The project is a predominately capital investment and has a number of key aims including support the use of low carbon technology to demonstrate innovative ways of delivering decent homes, support some of the most vulnerable residents in Ellesmere Port and Neston to reduce their fuel costs and to identify ways that low carbon solutions and green energy production can be rolled out across the wider Cheshire West and Chester social housing stock.

[2] Index of Multiple Deprivation (2019) ONS
[3] English Housing Survey (2017 and 2018) source: https://www.gov.uk/government/statistics/sub-regional-fuel-poverty-data-2020 retrieved October 2020
[4] Winter Fuel Payment Statistics (2020) Department of Work and Pensions

2.19 The formal outputs for the project, identified in table 2.1 below, are relatively narrow in the context of the broad objectives for the project and relate specifically to the direct estimated reduction in Green House Gases and the number of properties that have improved energy consumption classifications. These two outputs were revised with the submission of a Project Change Request in February 2020.

Table 2.1 Project Outputs

Output	Target to December 2019 – Full Application	Target to December 2020 – Project Change Request
(C31) Number of households with improved energy consumption classification	199	220
(C34) Estimated annual decrease of GHG	279 tonnes	180 tonnes

2.20 The project also aims to deliver a decrease in annual primary energy consumption as a wider objective identified within the Logic Model.

Project Governance

2.21 Cheshire West and Chester Council were the applicant for the ERDF investment and the Accountable Body for the subsequent ERDF investment. However, day-to-day project management was undertaken by ForHousing, who manage current Local Authority residential property. ForHousing were a named partner within the ERDF submission.

2.22 Cheshire West and Chester Council have been responsible for the financial management of the project, progressing and approving claims and the procurement and payment of contractors delivering installations as part of the project.

ForHousing (part of Forviva Group Ltd)

ForHousing are a Salford based housing association (part of the wider Forviva Group Ltd). ForHousing have a portfolio of 24,000 properties under management, largely located in North-West England and including 5,500 properties in Cheshire West and Chester.

ForHousing provide a range of housing services including managing repairs and maintenance, housing allocations and tenancy support, tenant wellbeing services. ForHousing were procured under an OJEU tender to provide these services under a 10-year arms-length management agreement with the Local Authority, between 2017 and 2027.

2.23 ForHousing have led the day-to-day, on the ground management of the project, including identifying suitable properties, engaging with tenants, managing work programmes for the contractors and signing off completions.

Newly installed PV Panels

Project Change Requests

2.24 A Project Change Request (PCR) was submitted by Cheshire West and Chester Council in February 2020 that resulted in the practical and financial completion dates for the project being extended to the end of December 2020. The extension was required as there had been problems with external wall insulation at six of the properties that required additional works from Scottish Power Energy Networks, that delayed the installations.

2.25 The project also sought an extension to the PV programme, firstly because installation had ultimately come in at a lower average unit cost that anticipated which allowed for additional installations to take place (which needed relevant planning, surveys and programming of works). The PCR also re-orientated the resources allocated for the Low Carbon heating systems element of the project (which had proved to be unviable at delivery stage) into additional PV/battery systems.

2.26 The PCR increased the number of properties to be installed with a PV system to 198, with a total of 22 properties also receiving batteries as part of their installs. As the structure of the project changed, the formal outputs also changed. The C31 target moved to 220 properties and the C34 target (Green House Gas emissions reduction) reduced to 180 tonnes.

2.27 The extension as a result of the Project Change Request meant some of the installations were caught up in the COVID-19 lockdown of spring 2021 and some forms of ongoing restrictions until the extended practical completion date of 31st December 2020.

2.28 All the capital investment was defrayed, and the works completed by this revised completion date of 31st December 2020. The final task in completion of the project has been the completion of this Summative Assessment.

3 Strategic Contexts

UK Clean Growth Strategy

3.1 The UK Clean Growth 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 securing and lowering energy costs for consumers and businesses.

3.2 Domestic properties now account for 13% of the UK's carbon emissions (rising to 22 percent once electricity use is taken into account), although this has been falling since the 1990s[5]. Within the domestic sector, there is a drive to phase out the installation of high carbon fossil fuel heating in new/existing homes off the gas grid.

3.3 There is also a strong emphasis on supporting energy affordability across the board - but especially for the lowest income energy consumers. The government will target as many fuel poor homes as possible to upgrade their energy efficiency (as measures by an Energy Performance Certificate) to band C by 2030 in England. Solar energy production and storage can play a part in this process

3.4 The strategy notes the falling costs of many 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. Government want to see more people invest in in solar without government support.

3.5 The Clean Growth Strategy will guide £265m of investment into smart grid systems to reduce the cost of electricity storage, advance innovative demand response technologies and develop new ways of balancing the grid. There is a strong need for the UK to innovate in these areas as local renewable electricity production is a disruptive technology for the established grid system – with a small number of concentrated producers to a scenario where there are many thousands, including production from a large number of industrial and domestic sites.

Supporting Economic Recovery

3.6 The Build Back Better policy statement of March 2021 sets out a path to economic and social recovery after the COVID-19 pandemic. 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."*

[5] Clean Growth Strategy (2017) Department for Business, Energy and Industrial Strategy

Cheshire West and Chester Council Carbon Management Plan 2016-2020

3.7 In May 2019, Cheshire West and Chester Council declared a Climate Emergency and announced a target for the Authority to achieve carbon neutrality by 2030 and the wider Borough by 2045. The current Carbon Management Plan is the third iteration and focusses on switching to low carbon forms of energy, particularly moving away for gas, further improving the carbon efficiency of Council owned assets – using the latest technology and understanding how the impact of COVID-19 on work patterns has impacted on emissions.

3.8 One of the key areas of success from the previous Carbon Management Plan was the installation of PV panels on Council owned buildings and the development of the Low Carbon Housing project occurred in the immediate aftermath of the second Carbon Management Plan – which ran to 2016.

Cheshire and Warrington EU Structural and Investment Funds Strategy (EUSIF) 2014-2020

3.9 The EUSIF also identified prioritise against which the notional £12.9m over available investment within Priority Axis 4 (Supporting the shift towards a Low Carbon economy in all sectors) would be allocated. There were a number of key priorities within the EUSIF that are directly relevant to the Low Carbon Housing project. These include:

- The need to reduce Green House Gas emissions
- The need to increase the share of renewable energy
- The need to increase energy efficiency

3.10 A large scale approach to decarbonisation within local housing stock was identified as providing a range of opportunities for construction firms and social enterprises as well as acting as a catalyst to retrain and upskill a proportion of the workforce.

3.11 Activities that were described as eligible for support for ERDF investment included the development and deployment of a range of renewable technologies and the development of decentralised and off grid renewable energy schemes.

ForViva Group/For Housing Green Strategy 2019-2022

3.12 The ForViva Group (through ForHousing) as partners within the project are also committed to their own carbon reduction approaches. ForViva Group developed and published their own Carbon Reduction Strategy in 2019.

> *"The purpose of the Group's Green Strategy is to set out the strategic direction for carbon reduction and addressing environmental issues across the Group and its subsidiaries over the next three years, in order to protect the environment, deliver business benefits and positively impact tenants' wellbeing[6]."*

[6] ForViva Group Green Strategy 2019-2022, p2

3.12 Although the Green Strategy is focussed no activities in Greater Manchester, the principles within the strategy are equally as relevant to the management of housing stock within Cheshire West and Chester. Within the strategy, ForViva commit to:

- Providing quality, energy efficient homes that minimise their impact on the environment
- Reduce energy costs for tenants and improve wellbeing
- Maximise available external funding sources
- Reduce carbon emissions and waste associated with operational service delivery

Price Elasticity of Demand for Domestic Electricity

3.13 In the UK, the residential sector is responsible for about one third of overall electricity demand and up to 60% of peak demand. Peaks in electricity demand bring about significantly negative environmental and economic impacts as vast numbers of users are consuming electricity at the same time, which mean suppliers have to activate power plants that often have higher greenhouse gas emissions and higher system costs.

3.14 The way electricity is consumed and paid for means demand is price inelastic – that is the price of electricity does not necessarily determine level of demand. This is partly due to there being no real replacement or substitute for electricity, imperfect information with regards to cost and usage (although this has been improved recently with the advent of smart metering) and payment often being made for electricity utilised a while after its consumption. One of the main exceptions to this is where households are on pre-payment meters.

3.15 Demand for electricity has been falling within the UK, partly due to strides forward in energy efficiency. According to BEIS, demand for domestic electricity has fallen by 13% since 2010[7]. The explained inelasticity of demand (price increases do not choke off additional demand) and continuously increasing usage mean efforts to cut carbon emissions are largely focussed on generation.

Market Failure Context and recent events

3.16 Within the full application, Cheshire West and Chester Council identified a gap within investment to support low carbon interventions within both the Council's Housing Revenue Account and also within the criteria of Decent Homes. Utilising ERDF investment to test innovative new insulation, heating and renewables technology would allow properties and tenants in clear need of modernisation to support energy efficiency to have the work required and would also create the 'additionality' that ERDF projects are expected to identify. The lessons learnt from this approach could then be utilised by the Authority and ForHousing on other residential/non-residential projects across the Borough and beyond.

[7] Digest of UK Statistics (2020) Chapter 5, Electricity

3.17 Although occurring since the practical completion of the project, the COP26 conference and the energy crisis and the significant price spikes that have occurred (and are likely still to come) have made the findings and legacy of this project all the more important.

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."[8]

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 Energy Low Carbon Housing Support Ellesmere Port and Neston project.

4.2 The Summative Assessment study is being undertaken over 12 months after the completion of the capital works within the project. Performance of the project has been analysed to the end of December 2020 (representative of Claim 8 which was the final claim for the project).

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 in ongoing until the practical completion date.

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

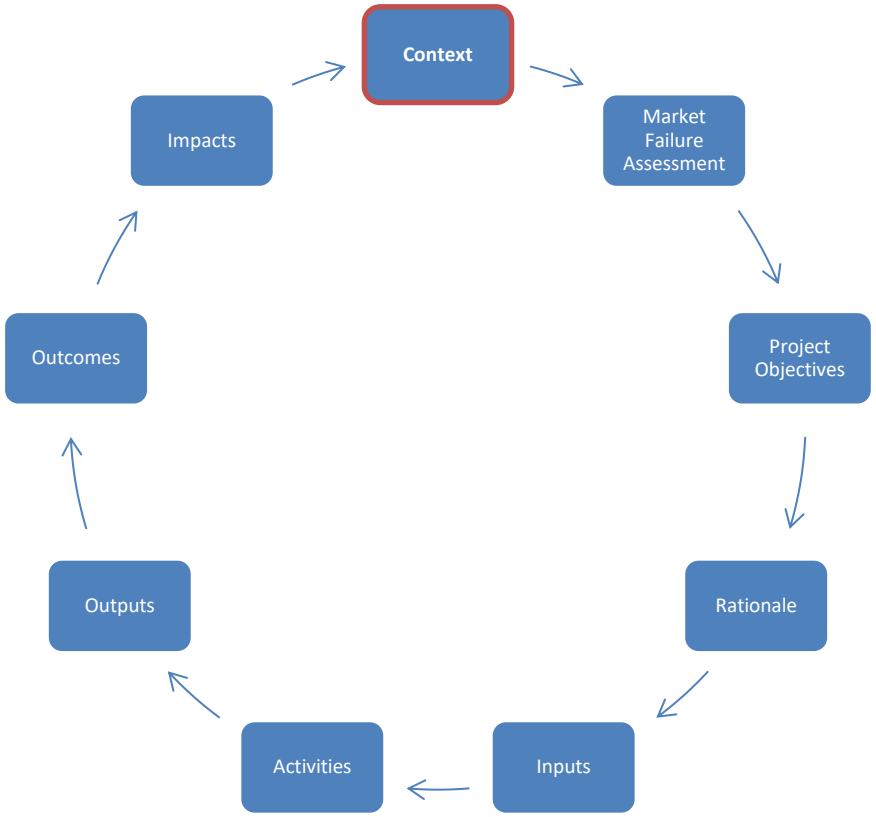
4.4 The process has drawn heavily from the latest (July 2020) ERDF Summative Assessment Guidance, assessing the following key components:

- 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.
- An assessment of the project's impacts on disadvantaged tenants

[8] Summative Assessment Guidance (August 2017) MHCLG page 3

4.5 The Summative Assessment process also draws from an underpinning logic model for the project, which 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 have been 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 learning and feedback is constantly 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 is included as an appendix, but the rationale behind the project was to focus resources on tenants and properties that were most likely to consume the most daytime electricity and have the highest heating costs needs, but that also had potentially the highest cost of instalments. The project provided a range of innovative solutions to mitigate these factors, reduce tenant's electricity and energy costs and ultimately reduce Green House Gas emissions.

4.9 The original C34 green house gas reduction output had an assumed output for each successful installation. The calculations were undertaken by the Local Authority Energy and Carbon Reduction team and focussed on the following calculations:

External Wall Insulation:

The heat loss factor of the building fabric x average dwelling annual gas consumption (kWh equivalent) x proportion of building fabric improved / 1,000 x BEIS Conversion Factors for gas (2018) + Transmission and Distribution – to generate the total tonnes of CO^2 equivalent.

Photovoltaic Panels:

Likely % of kWh used on site based on a 2kWp system / 1,000 x BEIS Conversion Factors for Solar Electricity (2018) – to generate the total tonnes of CO^2 equivalent

4.10 The requirements for the C31 target (Number of households with improved energy consumption classification) is simply a count of properties that will be expected to demonstrate an improvement in their energy performance[9].

Tenant Engagement

4.11 No interviews with tenants have taken place as part of the Summative Assessment process, but where feedback and consent were given to ForHousing, some quotations and feedback has been incorporated into the findings.

4.12 The methodology will work within the parameters of the General Data Protection Regulation (2018) as there is a range of personal data held as part of the evaluation relating to individuals, their demographics and personal circumstances and commentary on their energy usage.

4.13 As a result, all findings will be anonymised and no individual will be able to be identified through the reporting process (due to the large size of properties within the project). Data will be held securely by S4W Ltd for the process of the study. Within a month of the completion of the final Summative Assessment when the data will no longer be required it will be deleted and destroyed.

Impact Calculations

4.14 One the key elements of a Summative Assessment is to understand the range of economic impacts of ERDF investment. The key ERDF impact are net increases in Jobs and Gross Value Added as a direct result of the project intervention. Understanding the economic impacts is a relatively difficult process for the project as the beneficiaries are individual households and the project does not provide interventions such as back-to-work or skills development training. Any economic impacts are of an anecdotal nature and have been incorporated into section 7.

[9] To claim a property to have had improved energy efficiency, the property will need to increase their position on the Standard Assessment Procedure (SAP) scale. The SAP scale is expressed on a scale of 1-100 where a property with a rating of 1 has poor energy efficiency (high costs) and a property with a rating of 100 represents zero net energy cost per year.

5 Project Performance and Progress

5.1 The project completed its capital phase by December 2020 and all solar/battery systems became operational by this point. The delays and progress related to the installation phase were covered in detail elsewhere in the Summative Assessment, but a review of the Project Milestones is identified below.

Table 5.1 Project Milestones

Milestone	Planned Start Date	Actual Start date	Target Completion Date	Actual Completion date
Project start date	September 2018	January 2019		
Approval of project			January 2019	March 2019
Delivery	December 2018	March 2019	August 2019	November 2020
Financial Completion			December 2019	December 2020
Practical Completion			August 2019	December 2020
Summative Assessment completed			September 2019	March 2021

5.2 As shown above, the project met all of its revised key milestones (based on the Project Change Request of February 2020. The project overcame some of the earlier administrative delays to project approval and procurement. Within the capital installation process the team overcame challenges over property suitability and then COVID-19 restrictions. Physical delivery of the project was forecast to take around 15 months within the full application and ultimately took the same amount of time.

Project Financial Performance

5.3 As of the end of December 2020 when the final claim (Claim 8) was submitted the project had defrayed a total of £927,062.86 against its allocated budget of £1,000,003. This expenditure represents a total of 92.7% of the overall budget. The final submitted claim (Claim 8) for the quarter from 1st October to 31st December 2020 is still to be approved and paid and is for a total expenditure of £211,626.68.

Table 5.2 Project Expenditure

Capital/Revenue	Defrayed Claim 8	Budget	Variance
Capital	£927,062.86	£991,213	-6.47%
Revenue	0	£8,790	n/a
Total	£927,062.86	£1,000,003	-7.29%

5.4 The project spent a total of 93.5% of its capital budget, but ultimately did not claim for any of the £8,790 of allocated revenue expenditure – which was to be claimed against staff timesheets for working on the management of the project.

Project Outputs and Outcomes

5.5 Table 5.3 shows the final performance of the project to the end of December 2020 (based on Claim 8). The table shows that the project has met its C31 target and has exceeded it C34 target by 560 tonnes (or a third).

Table 5.3 Project Output Performance

Output	Target to December 2020 –	Achieved
(C31) Number of households with improved energy consumption classification	220	220
(C34) Estimated annual decrease of GHG	180 tonnes	240 tonnes

5.6 The project has completed a total of 220 installations of either external wall insulation (22 properties) of a Photovoltaic system (with 20 including a PV/battery system) which formed the majority of all properties (198 in total). The project has delivered a different profile to the full application – which included 27 properties to receive low carbon heating systems.

5.7 The heating systems were proposed to be installed in properties that operated in either solid fuel or electric/gas fires with no central heating. These properties had no central heating installed as tenants had originally refused these systems when offered. As part of the ERDF project, tenants were offered an upgraded low carbon heating system appropriate to their property. Again, all of the tenants declined the offer and this component of the project was reorientated towards installing more Photovoltaic systems.

5.8 A total of 22 properties received external wall insulation, which was delivered by lead contractor Guildmore Ltd. This was slightly higher than the proposed 21 properties to receive this intervention within the Full Application. Some of the properties also required work on their guttering and facades as a result of the insultation and ERDF allowed this expenditure to be eligible. This work was also undertaken by an external contractor, Thextons.

5.9 Within the original application, a total of 151 properties were proposed to receive PV systems. This figure was ultimately increased by a reallocation of resources from the Low Carbon heating systems and the unit cost of installations being lower than originally anticipated – allowing additional properties to be identified, surveyed and fitted with PV systems as a second phase of installation. The work was undertaken by Aberla Ltd.

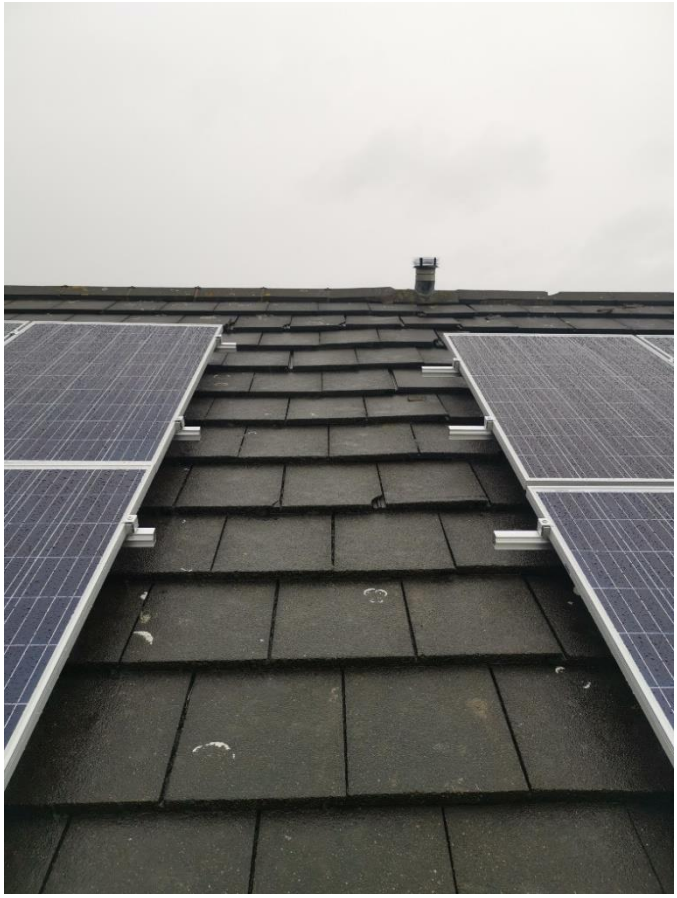
Houses that received External Wall Insulation

5.10 Data has been provided by ForHousing relating to the type of properties. This data only relates to the first 216 properties surveyed and some data was also inconclusive (although this represents a total of 98% of all the properties in the project). Whilst the table below is not the comprehensive list of properties with installations, it does give a good overview.

Table 5.4 Property Types and Installation

Property Type	Number of Properties	Insulation	Solar PV	Solar PV & Battery
1 bedroom bungalow	10		2	8
2 bedroom bungalow	37		27	10
2 bedroom terrace	8	2	6	
3 bedroom terrace	28	6	21	1
4 bedroom terrace	6		6	
2 bedroom semi house	19	7	12	
3 bedroom semi house	99	5	93	1
Other	1		1	
Sub total	208	20	168	20
Bungalow	47		29	18
House	161	20	139	2
Total	208			

5.11 As can be seen from the table above, all of the bungalows within the programme receive a PV system of some type. Almost all of solar/battery installation took place on bungalows – partly due to smaller roof sizes and higher relative consumption of electricity produced in the property. Terraced properties disproportionately received from external wall insulation compared to other stock. This largely due to the terraced stock in the Council's portfolio being built in the 1920s, although the semi-detached housing that was insulated was also built in this period.



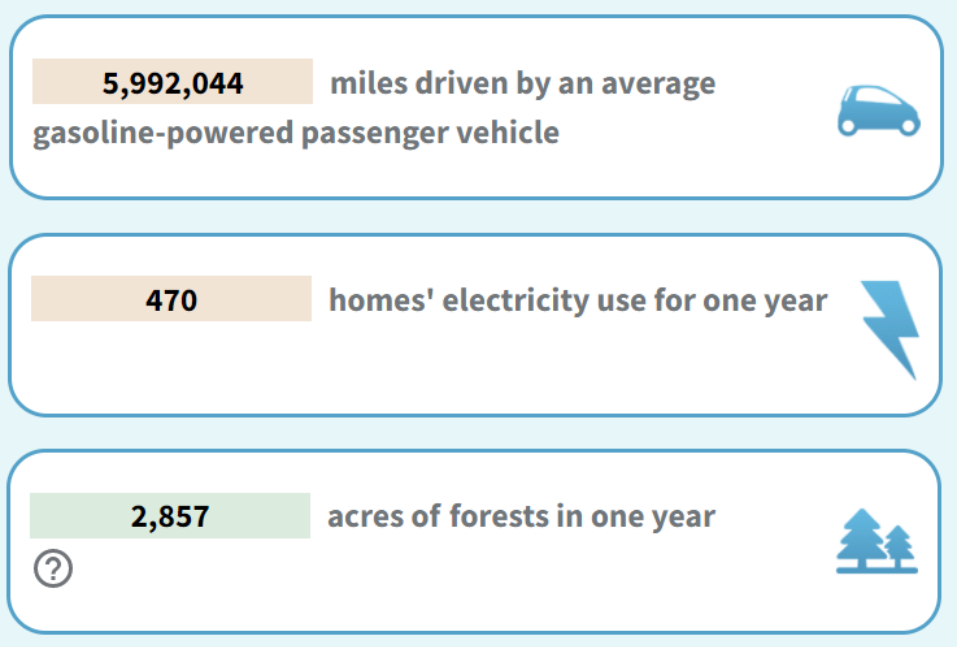
Solar PV Panels on one of the dwellings

5.12 The project is estimated to save a total of 240 tonnes of CO^2 equivalent per annum based on the calculation provided in section 4.9. The project has a likely asset life of 25 years over which period it can support ongoing carbon reduction. However, on annual basis the ongoing decarbonisation of the grid means the rate of carbon reduction reduces every subsequent year. The annual rate of reduction is presently around 9% per annum based on information in the BEIS Conversion Factors.

5.13 Whilst the calculations above are projections and subject to some potential change, in totality this suggests that over a 25-year period the project will have facilitated a total of reduction of 2,414 tonnes of greenhouse gas emissions based on Net Present Value.

5.14 As shown in diagram 6.1 below, this is equivalent to the emissions of 5,992,044 miles driven in an average passenger vehicle, the total electricity consumption of 470 homes in a year or the CO^2 absorption from 2,857 acres of forest in one year[10].

Diagram 6.1 Equivalent Carbon Savings



Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Wider Project Impacts

5.15 It is highly likely that most if not all of the beneficiaries of Cheshire West and Chester's tenants are within the two lowest deciles for household expenditure based on the 2020 Family Spending in the UK survey[11]. It has been well documented that rising energy costs are having an ongoing impact on living standards in the UK and those with the lowest income suffer disproportionately. The 2020 Family Spending in the UK analysis shows the average UK household spends £12.50 per week on electricity. This will now clearly be substantially higher given ongoing energy price rises, but is the latest available benchmark.

Table 5.5 Lowest Decile Household Expenditure on Electricity

Classification	Lowest Decile	Second Decile	UK Average
Average weekly spend on electricity (£)	10.10	11.20	12.50
% of weekly expenditure on electricity (£)	4.12%	3.9%	2.13%

Source: 2020 Family Spending in the UK (2021) ONS

[10] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
[11] A decile is a population divided into ten equal groups. Household expenditure has been drawn from the 2020 Family Spending in the UK (2021) ONS

5.16 In terms of electricity, the lowest income decile spent on average £10.10 per week on electricity costs. This is lower than the average weekly expenditure on electricity by all UK households of £12.50 per week. In terms of proportion of income spent on electricity however, the lowest decile spends on average 4.12% of their weekly income on electricity costs, with the second decile spending 3.9%. This compares to the UK average of 2.13%.

5.17 Based on the formula identified in section 4.9, it is anticipated that on average the PV system would provide the average property with 2,130 kWh of electricity. If 60% of this energy is consumed on site, then overall each tenant would save around 1,280 kWh of consumption of electricity from the grid. This figure excludes any income from feed-in-tariffs.

5.18 Based on data from OFGEM, the average UK household consumption of electricity is 2,900kWh – therefore the properties that have participated in the Low Carbon Housing project are likely to consume only 44% of the electricity from the grid that an average property would.

5.19 Whilst not an exact comparison, this would mean a reduction in energy costs for a household in the lowest decile (as in Table 5.5) would reduce to £6 per week (if 25% of costs are standing charges) from £10.10 per week. Proportionately, this would reduce expenditure on electricity from 4.12% to 2.44% which is more in line with the UK average expenditure rate.

Table 5.6 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)	£8,790	£8,790	£0	0%	£0	£0	
Capital Expenditure (£m)	£991,213	£991,213	£927,062	93.5%	£927,062	93.5%	
(C31) No. of households with improved energy consumption classification	199	220	220	100%	220	100%	
(C34) Estimated annual decrease of Green House Gases	279	180	240	133%	240	133%	

6 Qualitative Views on the Project

6.1 Interviews took place with project staff that had been involved in the project management, tenant liaison and installation processes of the Low Carbon Housing project. Discussions covered how ERDF investment had addressed market failure, the processes and management of the project, the impacts of the project overall and the legacy of its investment.

6.2 Overall, partners have stated that the project was relatively simple to deliver, and the fact that there were only three procurement exercises undertaken and three external contractors made the administration simpler to manage. Feedback from Scottish Power Networks (who own and operate the Cheshire distribution networks) was positive towards reducing demand within the network.

6.3 The process of identifying relevant properties to receive a Solar/PV system was undertaken by ForHousing, developing a long list of properties utilising property type, suitability and satellite surveys. The emphasis was on targeting houses that generally had to the lowest Standard Assessment Procedure score for energy efficiency and energy use.

6.4 After a number of technical assessments/ surveys including orientation/pitch and age of roof, split supplies, any obstructions and the likelihood of tenants to utilise any of the electricity generated in daylight hours, tenant approval was sort in order to formalise a work programme. Overall, around double the number of properties were surveyed than had solar PV installations completed.

6.5 It would have made the project easier to deliver if this process (or at least more steps on this process) had been completed in advance of the ERDF approvals – but some of the costs were incorporated into the installation process and therefore could not be started in advance of ERDF investment.

6.6 Generally, tenants were positive about the installation of PV systems and could see both the benefits in terms of environmental and also personal cost savings. Whilst the occupational and benefits status of tenants was not record as part of the process, ForHousing did state that many elderly and low-income tenants, including those who would be in receipt of Winter Fuel Payments, formed part of the cohort.

6.7 The management of the project worked well, with the two partners focussing on their key strengths. Cheshire West and Chester focussed on the management of the ERDF funds and the compliance of the project, whilst ForHousing focussed on engaging tenants, planning the housing capital programme and supervising the respective contractors. Both parties said it was a positive relationship and the additional of ERDF, whilst creating some additional administration, did not make the project and more difficult to plan and deliver.

6.8 The contractors had also work well within the constraints and timeframes of the project and the process to operationalise the project with the contractors had been smooth and the installation process of both the PV and Wall Insultation had largely passed without any major issues.

Installation of PV Panels in Ellesmere Port

6.9 The main operational issues related to the project were firstly the delays in agreeing approvals and a formal start date. This is turn had a knock-on effect on procurement, which delayed the start of the implementation process.

6.10 Engagement with tenants who had no full central heating systems was anticipated to solicit demand for installations of appropriate low carbon heating systems. However, as tenants in these properties were engaged, it became apparent there was no interest in this aspect of the scheme – which resulted in the submitted Project Change Request.

6.11 Within the properties that received External Wall Insulation, a number of properties also required additional work on guttering and fascias, which was an additional and unexpected cost to the project – but which was classed as eligible expenditure for ERDF purposes.

6.12 These issues and underspend on other PV installs meant there was some additional budget that was ultimately reallocated towards identifying and surveying more properties for PV. However, this delayed the final set of installations which meant that the project was ultimately affected by the COVID-19 lockdowns. No activity took place from March 2020 until the early summer of that year.

6.13 Time constraints meant the revenue funds were not drawn down, but this was only a small amount. In reality however, both Cheshire West and Chester and For Housing invested a significant amount of staff time on the project that was not accounted for.

6.14 Ultimately, Cheshire West and Chester Council will not be generating any income or selling excess power through Feed-in-Tariffs from the PV installations. This has meant the project has been eligible for ERDF investment, has kept the install and maintenance costs down and will mean the project will not be caught by ERDF Income Generation rules. However, it does mean that there is no central off-site generation/consumption/export data collected which means all the outputs have had to be estimated. This would have been a valuable source of data for any wider roll out of PV to other properties in the future.

6.15 Whilst a small number of tenants did reject the opportunity for PV panels, overall, there was an excess demand for PV systems across Cheshire West and Chester's social housing stock. The Local Authority and ForHousing have recognised the need to try and secure future investment in these areas going forwards to enable more properties to benefit from lower cost electricity.

6.16 Informal feedback from tenants was overwhelmingly positive in relation to the installation, with satisfaction rates amongst tenants record at 98%. Many stated they had seen noticeable reductions in their energy costs and houses that had received insulation were no longer damp or as cold.

6.17 There was an appetite to further address properties within Cheshire West and Chester that still had poor SAP Scores, and especially to widen the roll-out of Photovoltaic systems into rooves. The activity under the Low Carbon Housing project had helped to inform and support a 'whole house approach' that would be required for any future approach to the Social Housing Decarbonisation Fund.

6.18 Going forwards, hardware costs are expected to fall in price and increase in efficiency over time, which could have a significant bearing on any future roll out the roll out. Installation costs according to BEIS had fallen by 22% between 2013/14 and 2020/21[12]. Today's average commercial solar panel converts 17-19% of the light energy hitting it to electricity. This is up from 12% just a decade ago[13].

[12] Based on the latest Solar Photovoltaic Cost Data (May 2021) from the Department for Business, Energy and Industrial Strategy. Data is sourced from the Microgeneration Certificate Scheme and includes the cost of the solar PV generation equipment, cost of installing and connecting to electricity supply and VAT. The cost excludes any extended warranty or any other material or works.
[13] https://www.bbc.co.uk/news/business-51799503

6.19 Clearly operating on a larger scale with a roll out of several thousand properties, there may be opportunities to reduce equipment/installation costs through economies of scale through more efficient procurement and more cost-effective installation processes.

7 Cross Cutting Themes

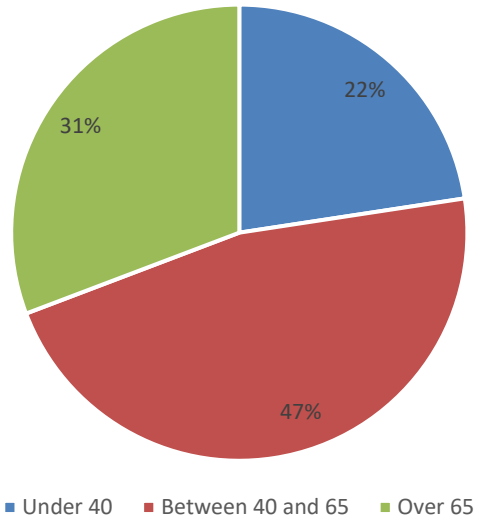
7.1 The incorporation of Equalities and Sustainable Development in the commissioning and delivery all ERDF projects is a mandatory requirement. Within the Full Application, the emphasis for Cheshire West and Chester Council was to reduce electricity consumption from the grid, improve the thermal efficiency of a number of poor performing dwellings and to ensure that a representation of the most in-need tenants had access to technology that would ultimately reduce their energy costs.

Equalities and Diversity

7.2 Demographic data was collected on the lead tenant in the property, but the total number of residents was not identified within the process. A total of 35% of properties had two bedrooms or less, and were less likely to be occupied by families with children, and 65% of properties had three bedrooms or more, and more likely to be occupied by larger family units with children.

7.3 From the baseline data, a total of 31% of lead tenants were aged over 65, 47% were aged between 40 and 65 and 22% were aged under 40.

Chart 5.1 Age category of lead tenants

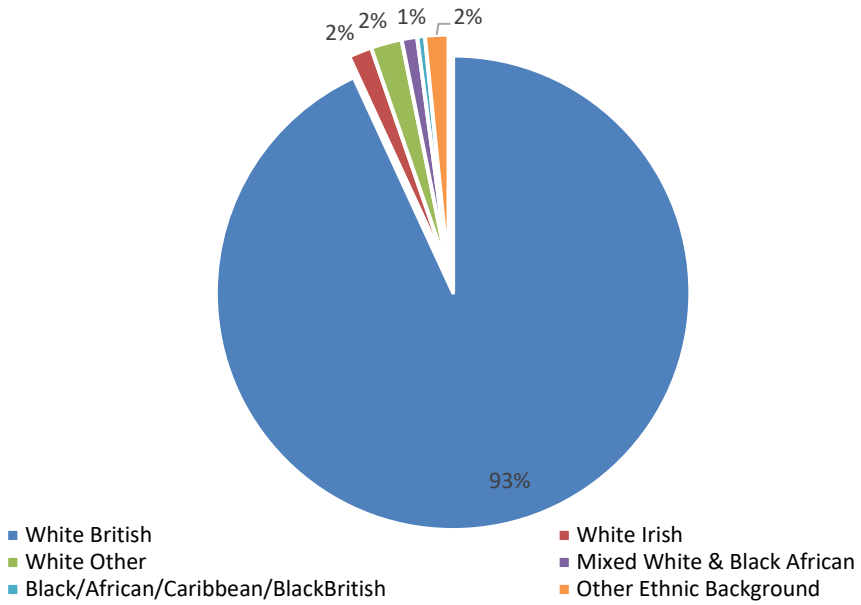


7.4 The scope for the installations was based around a mix of eligibility and characteristics of the property and a review of who the tenants of the property were. However, as the dwellings were all social housing units, many tenants were from the most disadvantaged backgrounds and both Cheshire West and Chester Council and ForHousing have worked to ensure selection of the beneficiaries for the pilot is property based and that no specific group/s are excluded.

7.5 The ForHousing team tried to develop a detailed understanding of why some tenants did not want to take advantage of the project to understand if there were any inadvertent equalities issues. Chief amongst the reasons was older tenants not wanting the hassle, change or disruption.

7.6 As part of the assessment process, the ethnicity of the lead tenant was identified. A total of 93% of all lead tenants were White British (which compares to 94.66 across the Borough – although this data is from the 2011 Census) and a further 1.6% were White Irish. Overall, the representation of ethnic minority groups was under-represented within the project.

Chart 8.1 Ethnicity of Lead Tenants



7.7 A potential explanation for this is the strong focus of the project on individuals who are most likely to use electricity in the daytime – especially those aged over 65. White British populations generally tend to have older age profiles than those that are from wider ethnicities. Across the White British lead tenants, over 31% were aged over 65 and over 78% were aged over 40. From those that were from other Ethnicities and White groups, the figures were 28% and 72% respectively.

7.8 In any future roll-out of Low Carbon installations across Cheshire West and Chester's housing stock, it is recommended that more detail is obtained on the ethnicity of all tenants to ensure opportunities are promoted and taken up by as wide a group of tenants as possible. It is also important that broader details of demographic and economic status of tenants is obtained – if tenants are to be part of the decision-making process on which properties are to be improved.

7.9 the project is clearly having a positive impact on sustainability, stimulating demand for green energy and reducing carbon emissions. As stated in Section 6, the project is ultimately likely to exceed its greenhouse gas emissions reductions target.

7.10 As the grid naturally decarbonises over a longer time horizon, the long term cumulative environmental benefits of solar energy generation will likely be less meaningful to greenhouse gas reduction. Green House Gas reduction 'Conversion Factors' data from the Department for Business, Energy and Industrial Strategy (BEIS) shows that in 2016 each kWh of electricity generated from renewable sources reduced Green House Gas emissions by 0.41205kg of CO^2 equivalent[14]. By 2021 for each kWh of electricity generated the figure for CO^2 equivalent saved had fallen to 0.2133kg[15].

7.11 Over the longer term, the success and benefits of this type of project are more likely to be about managing the cost of living increases and energy security for tenants than enabling substantial carbon reductions.

[14]BEIS (2021) Energy Prices: Domestic Prices
[15] BEIS (2021) Energy Prices: Domestic Prices

8 Value for Money

8.1 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.

8.2 There is no centralised benchmark for unit costs for Greenhouse Gas Emissions reduction per tonne 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.

8.3 This lack of common benchmark for Green House Gas reductions is partly due to the detailed output measure not being confirmed by MHCLG before the report was produced and partly due to the constantly changing proportion of fossil fuel production within the energy gird and the rapid speed of change in the capacity of low carbon technology.

8.4 Value for money has had to be determined by a review of the project against similar peer projects across the England ERDF programme.

8.5 To assess the value for money elements of Energy Low Carbon Housing Support Ellesmere Port and Neston, we have identified a range of other ERDF projects that plan to invest in low carbon technology and photovoltaic and battery systems in residential buildings.

8.6 The project spent a total of £927,062 on installing low carbon solutions in 220 residential buildings. These interventions are estimated to save a total of 240 tonnes of CO^2 equivalent per annum. The project has a likely asset life of 25 years over which period it can support ongoing carbon reduction. However, on annual basis the ongoing decarbonisation of the grid means the rate of carbon reduction reduces every subsequent year. The annual rate of reduction is presently around 9% per annum based on information in the BEIS Conversion Factors. This gives a Net Present Value of carbon reduction of 2,414 tonnes over the following 25-year period.

8.7 Based on the above calculations, this means the project has a unit cost of £4,214 per premises receiving a low carbon intervention and a likely unit cost per tonne of CO^2 equivalent saved of £384.

8.8 Coventry City Council have 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 arrays are larger (and therefore more efficient) than installation on housing and the project aims to provide a reduction of 4,000 tonnes of Greenhouse Gas emissions over 25 years (or 160 tonne reduction per year). Using a similar net present value calculation, the unit cost of 1,609 tonnes of greenhouse gas reductions over the asset lifespan is £783 per tonne.

8.9 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 so the scope is wider than Together Energy. The project aims to reduced 3,124 tonnes of Greenhouse Gas per annum, or a net present value of 31,426 tonnes over 25 years. This would suggest a unit cost of £547 per tonne of greenhouse gas reduction.

8.10 Also across Greater Manchester, the Homes as Energy Systems project, delivered by Procure Plus Ltd, is a £10.4m project to install solar panels and batteries on 700 properties across Greater Manchester. The unit cost for the project is £14,850 per install, which is significantly higher than Together Energy. However, the project is operating over a wider geography.

8.11 It is clear the project has offered very good value for money both in terms of the unit cost for installations and for Greenhouse Gas Reduction. According to BEIS, the mean cost per kW of system installed in 2020/21 was £1,628[16]. The typical size of systems installed as part of the Low Carbon Housing project was 2kW – therefore the average expected unit cost would be £3,256.

8.12 The average cost (which included some battery systems) for the Low Carbon Housing project against this benchmark was £3,561 based on a total direct expenditure of over £700,000 on the PV systems. This is clearly slightly higher than the BEIS benchmark, but average installation costs have been rapidly rising and the systems do include some battery units.

[16] Annual Cost of Small-Scale Solar Technology Summary (May 2021) BEIS

9 Conclusions and Lessons Learnt

9.1 The Energy Low Carbon Housing Support Ellesmere Port and Neston has met or exceeded its revised targets. With regards to C31 outputs (Number of households with improved energy consumption classification), a total of 220 properties have had low carbon solutions installed, which has met the project's target, but has exceeded the proposed number of premises within the original Full Application.

9.2 In terms of the C34 target (Estimated annual decrease of GHG) the project is forecast to exceed its target by a third, achieving an annual reduction of 240 tonnes. Over a 25-year period, this would equate to over 2,414 tonnes based on the Net Present Value of current annual savings.

9.3 This would be the equivalent of the emissions of 5,992,044 miles driven in an average passenger vehicle, the total electricity consumption of 470 homes in a year or the CO^2 absorption from 2,857 acres of forest in one year.

9.4 The project had a relatively simple design with limited procurement exercises and invoices which has helped to reduce the administrative burden that comes with more complex ERDF projects. This simplicity has helped the project ride out a number of complications during the delivery phase and the impacts of COVID-19.

9.5 The installation phase ran on the same timeframe as identified within the Full Application, albeit with a delayed start date. Ultimately, the project needed an additional 12 months to cover some of the administrative changes of the project and to manage the ERDF investment – but project delivery occurred as anticipated.

9.6 The project came in slightly under its proposed budget, partly due to the removal of low carbon heating systems from the project and lower than anticipated Solar PV installation costs. This contributed to the project's very good value for money.

9.7 The Summative Assessment has demonstrated that the installation of the Solar PV systems are likely to bring the proportion of expenditure of tenants on electricity down to near the UK average, whereas at present they are estimated to be around double this rate.

Lessons Learnt

9.8 The Summative Assessment has reflected on the delivery of the project and its processes with regards to planning, operational deployment, engagement with tenants and management and monitoring processes. From discussions with stakeholders and project staff, a review of project documentation and drawing from a range of data sources on the effectiveness of the project - a number of lessons learnt can be identified.

9.9 The timescales, although achieved, were challenging. With many externally funded projects the timescales can drift or change and better preparation would assist in the early deployed of resources and would help specify procurement outcomes.

9.10 Whilst the installation phase was felt to be very successful, there were areas that could have helped the process run even more smoothly. The first element covers more pre-engagement through tenants (potentially including some early property survey work) – that potentially could have identified some of the issues experienced with the low carbon heating systems and could have identified a pipeline and potential reserve list for PV installation. This would have allowed for a more efficient installation process. Identifying potential properties for PV systems as part of any ongoing condition surveys would also help fast track potential properties for any future phase.

9.11 COVID-19 did cause issues for the installation process, but the pandemic struck near the end of the installation process so its impact was less than it could have been. The pandemic generally highlighted the need for considering business continuity as part of any project development, contracting and project management as a range of external events (including disruptive weather, issues relating to individual tenants and workloads/staff shortages can all have a major disruptive effect).

9.12 There are a number of areas to consider in the monitoring processes for any future interventions. Firstly, to avoid complexity with ERDF funding, the project avoided any direct income from feed-in tariffs on behalf of the project partners – but this in turn has meant remote off-site monitoring of the generation/consumption/export of power is not available which could have informed any future roll out and also helped to understand the savings tenants may have made.

9.13 Data on tenancies only incorporated the lead tenant and missed a number of key demographic characteristics of the household and the socio-economic status of residents which again could be useful for wider roll out and to understand some of the impacts on energy savings.

Appendix A - Logic Model

Energy Low Carbon Housing Support - Ellesmere Port & Neston

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

The project delivers against Investment Priority 4C; supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector. This project supports these aims by - Encouraging people (tenants) to use less energy in the first place, convert to renewable energy where possible and to conserve energy they do use - Promoting the adoption of innovative low - carbon technologies to enhance the energy efficiency of households throughout the sub-region - Building upon the ESIF Low Carbon Action Plan for Cheshire and Warrington to address the identified gaps in delivery currently sought and help the LEP to grow the market for low carbon and environmental goods and services and reduce carbon emissions and contribute to mitigating the effects of climate change - Increase the energy efficiency of homes through the implementation of low carbon technologies and in doing so decreases the annual Green House Gases - Investing in building retrofit, energy efficiency measures, renewable and smart energy systems deployment, especially whole building or place solutions exemplifying next phase technologies which are near to market - Investing in domestic energy efficiency, renewable energy and smart construction techniques.

Market Failure Assessment

Edit

A reduction in the feed in tariff paid by Government has led to a reduction in the deployment of Solar PV in domestic properties. This reduction has been partly offset by reductions in the cost of installs, but further support in this area will help arrest the decline.
A reduction in Energy Company Obligation funding, alongside a general reduction in the number of suitable solid walls requiring insulation has also seen fewer properties insulated using this method in recent years. In order to sustain itself the industry is looking to be more efficient and using innovative new products and systems to reduce waste, time on site and expertise required. The council will be using these innovative products in relation to this scheme thereby supporting their development e.g. off-site fabrication.

Project Objectives

Edit

Provide advice and support to increase the use and take up of low carbon technologies, energy efficiency measures, renewable energy technologies and smart energy systems in housing stock and public buildings.
Support low carbon innovation in relation to the integrated 'whole place' energy management approach including energy waste and re-use.
Standard retrofit can be an eligible part of a project when used in conjunction with innovative technology or as part of a whole place approach which can include the way combined retrofit technologies are used to deliver the whole place approach.
Investing in domestic energy efficiency, renewable energy and

Rationale

Edit

The project will be delivered in social housing properties across Ellesmere Port (the council's retained housing stock of 5,500 properties.) A property address list has been developed and is appended to this application. The properties have been selected in the following ways: - Solar PV (151) – properties targeted include those with older and/or disabled occupiers who have a tendency to be at home during daylight hours and can therefore benefit most from this technology. These occupiers tend to be higher consumers of energy and therefore as a consequence they are households which emit more carbon. These types of occupiers are also on a fixed and low income, leaving them more vulnerable to increases in the price of electricity. This workstream therefore has the opportunity to reduce carbon emissions and help households meet their energy costs. - Heating system upgrades (27) – properties

Inputs

What	Value
Capital Installation	
Solar PV	717220
Battery Storage	45000
Heating Systems	81000
External Wall Installations	147000
Revenue	
Salaries	8503
Overheads	1275

Activities

What
Capital Installations
Solar PV
Battery Storage
ECO Radiators
Off Site External Insulation

Outputs

What	Value
ER/C/O/31	199
ER/C/O/30	151
ER/C/O/34	180

Outcomes

ID	Intended Outcome	How is it Measured?	Level	Baseline	Actual
1	Forecasting properties numbers has been established				
2	Decrease of the annual primary energy consumption				
3	Reduction in greenhouse gases has also been				
4					
5					

Intended Impacts

What
The project will deliver a significant reduction in carbon emissions with current estimates suggesting the following reductions per
151 Solar Photovoltaic (PV) systems – 233 tonnes
27 Heating system upgrades (provision of eco radiators) – 23 tonnes
21 External wall insulation installs (to uninsulated solid wall properties) – 24 tonnes