VERIFICATION REPORT FOR "HOUSING DECARBONISATION IN THE UNITED KINGDOM"

Document Prepared by "SustainCERT S.A."

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Client	PNZ Carbon Limited
Prepared by	SustainCERT

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Summary:

A description of the verification of the project*:*

The verification of the project titled “Housing Decarbonisation in the United Kingdom”, VCS ID – 2649, has been undertaken by SustainCERT, with accordance to the relevant VCS standard, V4.7[/1/], VCS Program Guide, V4.4[/2/] and relevant requirements of the ISO 14064-2 and ISO 14064-3, as well applicable criteria for consistent project operations, monitoring and reporting have been applied for verification.

The project “Housing Decarbonisation in the United Kingdom” is centred around improving energy efficiency within the UK housing sector, a major source of carbon emissions. It encompasses a range of retrofitting measures such as improving insulation, enhancing air sealing, and upgrading central heating systems. These interventions are aimed at reducing the energy consumption of grid-connected appliances and overall energy use in homes. The decarbonisation activities result in real, measurable, and verifiable GHG emission reductions, which play a significant role in mitigating climate change by retrofitting homes with high energy efficiency standards.

Purpose and Scope of Verification:

Purpose:
The verification service provided by SustainCERT for the project activity "Housing Decarbonisation in the United Kingdom" is to perform an independent periodic verification for the monitoring period from 01/01/2023 to 31/12/2023 (including both days). The first and last days have been verified from the emission reduction calculation sheets and relevant project documentation. The verification is an independent review and ex-post determination by SustainCERT of the monitored reductions in GHG emissions achieved during this period, in accordance with the Verified Carbon Standard Version 4.7, the VCS Program Guide Version 4.4, the project baseline, and host party criteria.

Scope:
The scope of the verification is to establish and verify that:

- The project activity has been implemented and operated in accordance with the approved and registered Project Design Document (PDD).
- All physical components and features of the project, including energy efficiency measures such as insulation, air sealing, central heating system improvements, and monitoring equipment, are in place as specified in the registered PDD[/5/].

- The monitoring report and other supporting documents provided are complete and in compliance with the latest applicable version of the VCS Standard Version 4.7.
- The actual monitoring systems and procedures align with those described in the approved monitoring plan and methodology, including any applicable tools and standardized baselines, where relevant.
- The data recorded and stored for GHG emission reductions follow the requirements of the monitoring methodology, including any applicable tools or standardized baselines, ensuring accurate and verifiable emission reductions.

The Monitoring Period:

The project activity "Housing Decarbonization in the United Kingdom" is undergoing its 2nd verification for the monitoring period from 01/01/2023 to 31/12/2023 (both days included), as part of its crediting period from 01/07/2022 to 30/06/2029.

The Method and Criteria used for Verification:

Desk Review: A comprehensive desk review was conducted, including a verification of project information, the monitoring plan, and its key components. This included reviewing the monitoring frequency, data collection systems, metering equipment, calibration requirements, and the quality assurance and quality control system against the registered PDD and the applicable VCS Standard Version 4.7. The applied methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings" Version 1.1 was reviewed to ensure alignment with the registered PDD/5/ and to verify its proper application throughout the monitoring period.

Onsite Audit and alternative means (remote) audit:

- Interviews were conducted with relevant personnel to confirm the implementation of the project, with a focus on operational and data collection procedures, in accordance with the registered PDD and the applied methodology.
- A thorough cross-check was performed of the information provided in the monitoring report against relevant evidence such as data sources, and other documents referenced in Appendix 2 of the report.
- A detailed review of the calculations for estimating GHG emissions was carried out to ensure accuracy and compliance with the applicable standards.
- An evaluation of data management systems, as well as the quality assurance and quality control mechanisms, was conducted to assess their influence on the generation and reporting of emission reductions.

The number of findings raised during verification:
A risk-based approach was followed for the verification of the project. 03 CARs, 12 CLs, and 01 FARs were raised during the verification. All issues raised were successfully resolved, details of which can be found in Appendix 3 of the report.

Any uncertainties associated with the verification:
The assessment team thoroughly reviewed the monitoring report and the emission reduction

calculation sheet against relevant evidence and applicable VCS requirements, including VCS Standard Version 4.7 and VCS Program Guide Version 4.4. It was concluded that there are no remaining uncertainties associated with the project.

Summary of the Verification Conclusion:

The review of the monitoring report, the emission reduction calculation sheet, along with relevant supporting evidence, and the interviews conducted with relevant personnel during the site visit (held remotely on 20/08/2024 (verification happened using alternative means) and onsite from 21/08/2024 to 22/08/2024) have provided the assessment team with sufficient evidence to confirm compliance with the applicable criteria and meet a reasonable level of assurance. SustainCERT confirms that the project activity "Housing Decarbonisation in the United Kingdom" has been successfully implemented in accordance with the registered Project Design Document and the applied methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings, Version 1.1," meeting all relevant VCS requirements.

Based on the information reviewed and evaluated, we confirm that the monitoring period from 01/01/2023 to 31/12/2023 is in place and accounts for significant reductions in GHG emissions of 30,756 tCO2e by taking into account 39,927 individual PAIs as this is a group project, achieved through the implementation of energy efficiency measures in residential buildings. These reductions contribute to the overall decarbonisation of the UK housing stock, which is a key element in mitigating climate change. Note that there will be additional PAIs that will be continued to be added to throughput the lifetime of project.

The management of PNZ Carbon Limited is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions, as outlined in the project's Monitoring Plan and as per the registered Project Design Document/5/.

CONTENTS

1 INTRODUCTION

1.1 Objective

The verification of the project titled "Housing Decarbonisation in the United Kingdom," VCS ID – 2649, has been undertaken by SustainCERT, as requested by PNZ Carbon Limited for the monitoring period 01/01/2023 to 31/12/2023 (including both days). The verification of this project activity is the periodic verification for the crediting period 01/07/2022 to 30/06/2029 (renewable, twice), as verified from the VERRA Registry page (VCS search page). The purpose of the verification is to conduct an independent review of the project information and confirm:

- The project activity has been implemented and operated in accordance with the registered PDD.
- All physical components (energy efficiency measures, project equipment, monitoring, and metering equipment) are in place.
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, the approved methodology including applicable tools, and where applicable, the approved standardized baseline.
- The data collection procedures, records, and retention are in accordance with the monitoring methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings, Version 1.1," and the registered Project Design Document.

The verification followed the requirements mentioned in the VCS Standard, Version 4.7, and the VCS Program Guide, Version 4.4, ensuring the quality and consistency of the report.

1.2 Scope and Criteria

The scope of verification for this project activity involves an independent and objective review and ex-post determination of the monitored reductions in GHG emissions, as reported by the project proponent in the monitoring report, emission reduction calculation sheet, and other supporting evidence (as mentioned in Appendix 2 of the verification report) made available to the verification team for the monitoring period from 01/01/2023 to 31/12/2023. This verification has been carried out in accordance with:

- VCS Standard, Version 4.7
- VCS Program Guide, Version 4.4

- Applied methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings, Version 1.1"
- Other relevant rules and requirements, including host party requirements.

A risk-based approach was followed during the verification of the project activity, identifying and assessing high-risk areas to ensure the reliability of the reported GHG emission reductions. The verification process applied the principles of accuracy, completeness, relevance, reliability, and credibility, combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification considered both quantitative and qualitative information on emission reductions, ensuring compliance with all applicable standards. This verification does not provide any consultancy to the client. However, any clarifications, corrective actions, or forward actions requested during the process may serve as input for improvements in future monitoring activities.

1.3 Level of Assurance

The level of assurance achieved for the project verification falls under a reasonable level of assurance. The verification of the project activity is conducted by doing a thorough assessment of Monitoring report[/8/], Registered PD[/5/], emission reduction calculation sheet[/9/] and all the relevant documents mentioned in appendix 2 of the report.

Sufficient amount of evidence was gathered by the assessment team to reduce the risk associated with audit process. This means that there is some uncertainty arising from the use of sampling since it is possible that a material misstatement will be missed.

1.4 Summary Description of the Project

The project activity "Housing Decarbonisation in the United Kingdom" VCS 2649 is being implemented by PNZ Carbon Limited in the United kingdom, with the objective of reducing GHG emissions by improving energy efficiency in residential buildings across the UK. The project addresses one of the largest sources of carbon emissions in the UK—the housing sector—by installing energy efficiency measures such as insulation, air sealing, central heating system upgrades, and reducing electricity consumption from grid-connected appliances.

The decarbonisation activities cover a wide range of residential buildings, including social housing, private rental, and owner-occupied properties. The project's energy efficiency improvements are aligned with the methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings, Version 1.1,"[7] as described in the PDD[5]. These measures help to reduce the heating demand and overall energy use in homes, significantly lowering greenhouse gas emissions.

During this verification period, a field audit was conducted from 20/08/2024 to 22/08/2024 (remote audit on the first day and onsite audits on the subsequent two days) details for which can be found in section 2.3 and 2.4. Interviews with the Project Proponent and relevant personnel confirmed the proper implementation of the project activity. The review confirmed that all the energy efficiency measures have been implemented as planned, and data collection procedures for emission reductions have been followed in accordance with the registered monitoring plan[5]. The project involves total number of 39,927 PAIs, resulting in a significant reduction of GHG emissions of 30,756 tCO2e.

The start date of the project activity is 01/07/2022, as verified from the previous verification report and the crediting period for the project runs from 01/07/2022 to 30/06/2029 (renewable, twice). The information verified during the onsite audit was cross-checked with the monitoring plan, emission reduction calculation sheet, and other relevant documents, confirming compliance with all VCS requirements.

Based on the review of the monitoring report, emissions reduction calculation, and onsite audit, it has been verified that the project has achieved 30,756 tCO2e emission reductions for the monitoring period from 01/01/2023 to 31/12/2023. These reductions were achieved through the implementation of energy efficiency measures that align with the applied methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings." As a result, the assessment team confirms that the project activity has been implemented and is operational in accordance with the applicable standards, and a reasonable level of assurance has been met.

2 VERIFICATION PROCESS

The Registered Project activity has been undergoing 2nd Verification under Crediting period from 01/07/2022 to 30/06/2029 (renewable, twice), the approach adapted to ensure the quality and credibility of emission reduction is described in the following sections

2.1 Method and Criteria

The method and criteria used for verification consist of the following phases:

A risk-based approach has been applied for the process.

Desk review:

- To verify the completeness of the data and the information presented in the monitoring report, emission reduction calculation sheet/9/ and other evidence like Implementation records, contracts, retrofit studies including all the other evidence mentioned in Appendix 2 of the report were strategically reviewed and risk assessment was undertaken.
- Project activity sources contributing to the leakage as well as project emissions are assessed.
- Evaluation of the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

Onsite audit and remote call for the project was conducted from 20/08/2024 to 22/08/2024 to:

- Interview of the project representatives and to confirm the implementation and operational status of the project with respect to the registered monitoring plan/5/.
- Review the data flow for generating, aggregating and reporting the monitoring parameters,
- Confirm the correct implementation of procedures for operations and data collection,
- Cross-check the information provided in the MR documentation with other sources,
- Check the monitoring equipment against the requirements of the PD and the approved methodology, including calibrations, maintenance, etc.,
- Review the calculations and assumptions used to obtain the GHG data and ER,
- Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

Further, details regarding the process of onsite audit have been mentioned in sections 2.3 and 2.4 of the report. Resolution of all the issues and findings raised, and the final verification statement was issued.

2.2 Document Review

As part of the verification of the project, the primary activity performed was the strategic review and risk assessment of the documents submitted using a dedicated protocol. A detailed review of the Monitoring Report and the Emission Reduction calculation sheet was conducted to assess the following:

- The completeness of the information in reference to the registered Project Design Document.
- A review of the project information, particularly focusing on the monitoring plan, including monitoring frequency, metering equipment calibration requirements, and the quality assurance and quality control system, in alignment with the registered PDD and the applicable VCS Standard Version 4.7 and methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings, Version 1.1."
- An assessment of the QA/QC procedures to ensure that the project implementation follows the requirements outlined in the registered PDD.

All other supporting evidence reviewed is detailed in Appendix 2 of this report. Cross-checks were conducted between the information provided in the Monitoring Report, the VCS PDD, and independent sources, where available. The verification team also applied sectoral and local expertise to ensure the accuracy of the reported information and, where necessary, carried out independent background investigations to confirm compliance.

2.3 Interviews

In accordance with VCS standard, V4.7/1/, site visit requirements, "A site visit that includes a visit to facilities and/or project areas shall be conducted at verification under the following circumstances: 1) The first verification of the project after validation; 2) Verifications that include project baseline reassessments; and 3) Verifications that assess a project description deviation where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario." The project was currently undergoing 2nd verification, and it was the first time for SustainCERT to conduct the verification of this project. Therefore, there was a alternative means[1] followed using remote audit conducted on during this verification on 20/08/2024 onsite audit was conducted from 21/08/2024 to 22/08/2024[2], and desk review for the project was conducted between July to Sept 2024. During the onsite audit for this verification, interview of the relevant project personnel, implementation partners and local stakeholders were conducted verifying the implementation and operational status of the project, the similar information was also cross verified using the evidence submitted by PP (as mentioned in appendix 2 of the report). Detail of the personnel interviewed can be found in the table below:

Date of onsite/ remote Interview: 20/08/2024 to 22/08/2024				
S.No	**Name of the person**	**Affiliation**	**Details Discussed**	**Team member**
1	Darren Litherland	Delivery manager	Project implementation, Monitoring, and measuring system. Collection of measurements Observations of established practices for verification of monitoring parameters, Emission reduction calculation,	Muskan Chawla Shivraj Sharma

[1] Due to the challenging circumstances in the UK, including difficulties in connecting with end users via video conference and internet connectivity issues, an alternative method was employed on the first day of the visit (20/08/2024). The audit team conducted a detailed documentary review, which included the post- and pre-retrofit assessment reports and photographic evidence provided by the project team. This approach allowed the audit to continue effectively despite the logistical challenges, ensuring that all necessary evidence was thoroughly reviewed and considered in the assessment.

[2] Initially, the VVB decided to conduct an onsite visit for the project from 20/08/2024 to 22/08/2024. However, due to unforeseen travel issues, the auditor was unable to reach the site on 20/08/2024. As a result, the audit scheduled for that day was conducted remotely (as described in footnote 1). This change was communicated to VERRA by sending a revised NOVS on 19/08/2024 to reflect the updated schedule.

			environmental concerns, entities involved, property rights, benefit sharing.	Randulph Morales
2.	Simon Turek	Managing Director, PNZ carbon	Project implementation and involvement of PNZ in different aspects of project.	
3.	Mark Wright	PNZ carbon	Project implementation, Monitoring, and measuring system. Collection of measurements Observations of established practices for verification of monitoring parameters, Emission reduction calculation, environmental concerns, entities involved, property rights, benefit sharing.	

During on site visit interviews with end users were also conducted to verify the details of implementation of project activity. A number of 16 households were visited between 21/08/2024 and 22/08/2024, and 8 households were done using alternate method on 20/08/2024 with the means of photographs and documentary evidence and checklist filled with signature[3].

The information regarding the household visited and topics covered can be found in the table below:

S.No.	PAI	Improvement measure	Provider	Discussion	Onsite/ Alternative means

[3]As the project is implemented in the UK, precautionary measures were taken to ensure the privacy and sensitivity of household owners and their family members. Various approaches like review of the photographic evidence, pre and post energy assessment and detailed documentary evidences were adopted to guarantee that a reasonable level of assurance could be met. (News Link.)

1.	1002967	Boiler replacement	Poplar Housing and Regeneration Community Association Limited	Implementation and operational status of technology and grievance procedure	Onsite
2	1006236	Boiler replacement	Poplar Housing And Regeneration Community Association Limited	Implementation and operational status of technology and grievance procedure	Onsite
3	2039060	Cavity Wall Insulation	Poplar Housing And Regeneration Community Association Limited	Implementation and operational status of technology and grievance procedure	Onsite
4	2042444	Loft Insulation	Metropolitan Housing Group	Implementation and operational status of technology and grievance procedure	Onsite
5	2061880	Boiler Replacement	Poplar Housing And Regeneration Community Association Limited	Implementation and operational status of technology and grievance procedure	Onsite
6	2062390	Loft Insulation	Metropolitan Housing Group	Implementation and operational status of technology and grievance procedure	Onsite

7	2042443	Loft insulation	Metropolitan Housing Group	Implementation and operational status of technology and grievance procedure	Onsite
8	2014262	Loft Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
9	2023471	Loft Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
10	2023511	Loft Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
11	2024914	Boiler Replacement	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
12	2024917	Boiler Replacement	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
13	2037106	Boiler Replacement	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite

14	2060924	Cavity Wall Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
15	2061811	Cavity Wall Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
16	2061812	Cavity Wall Insulation	Saffron Housing Trust Limited	Implementation and operational status of technology and grievance procedure	Onsite
17	1000080	Boiler replacement	Rooftop Housing Group Limited	Implementation and operational status of technology and grievance procedure	Alternate method
18	1000864	Boiler replacement	Rooftop Housing Group Limited	Implementation and operational status of technology and grievance procedure	Alternate method
19	1000879	Boiler replacement	Rooftop Housing Group Limited	Implementation and operational status of technology and grievance procedure	Alternate method
20	2007860	Boiler Replacement	Hug Limited	Implementation and operational status of technology and grievance procedure	Alternate method

21	2009202	Boiler Replacement	Preserve First Limited	Implementation and operational status of technology and grievance procedure	Alternate method
22	2010446	Boiler Replacement	Torus62 Limited	Implementation and operational status of technology and grievance procedure	Alternate method
23	2015219	Boiler Replacement	Hug Limited	Implementation and operational status of technology and grievance procedure	Alternate method
24	2066861	Boiler Replacement	Preserve First Limited	Implementation and operational status of technology and grievance procedure	Alternate method

The assessment team has verified all the primary supporting material related to all the PAI visited and checked using alternate method. The photographs were only used as means of secondary cross check of the information verified from Primary sources. This is the 2nd monitoring period, therefore, all the information regarding the monitoring plan implementation as also checked during the first verification as well. Thus, a reasonable level of assurance is achieved.

2.4 Site Visits

Method and Objective of Site visit:
As discussed above, The site visit for the project was initially scheduled to be conducted entirely onsite from 20/08/2024 to 22/08/2024. However, due to unforeseen travel issues, the audit on 20/08/2024 was conducted remotely, and the remaining two days (21/08/2024 and 22/08/2024) were conducted onsite[4].
The primary objective of the site visit was to verify the implementation and operation of the decarbonisation measures outlined in the Monitoring Report. During the visit, the assessment team visited selected homes where energy efficiency measures, such as insulation, air sealing, and boiler upgrades, had been installed. The physical condition of the installed measures, the data collection systems, and the monitoring equipment were assessed. In addition, interviews were conducted with relevant personnel from PNZ Carbon Limited to confirm the accuracy of data collection and the operational status of the project (details for which can be found in section 2.3 of the report).

The organizational aspects of the project were also evaluated, including the data management systems, quality assurance, and quality control procedures. The team ensured that all elements aligned with the requirements of the registered PDD and the applied methodology "VM0008 – Weatherization of Single Family and Multi-Family Buildings."

VVB sampling Plan:
As the project does not apply a sampling plan within its monitoring system, the verification body adopted a sampling approach in line with relevant standards. The sampling was conducted following the principles outlined in CDM-EB50-A30-STAN “Sampling and surveys for CDM project activities and programmes of activities,” Version 09.0/29/, paragraph 27, which allows for a verification body to apply a sampling approach when one is not implemented by the project proponent.

A confidence level of 90% and a precision of 20% were used for the sampling approach. The sample group was selected using simple random sampling to ensure that it was representative of the population of PAIs.

Providing sample size and margin of error E are given by/33/:
X=Z(c/100) 2r(100-r)

n = N x/((N-1)E 2 + x)

[4] Please refer to footnote 2

E = Sqrt[(N - n)x/n(N-1)]
where N is the population size, r is the fraction of responses that you are interested in, and Z(c/100) is the critical value for the confidence level c

N= 69,991[5]

E= 20%
r=50%
Z(c/100) = 90%
Based on these inputs, a sample size of 17 PAIs was calculated. However, to ensure comprehensive coverage and considering one day of remote audit, the verification team decided to assess an additional 7 PAIs, making a total of 24 PAIs. The samples were divided into the following decarbonisation categories:

- 14 for boiler replacement
- 4 for external wall insulation
- 6 for loft insulation

This approach ensured that a reasonable level of assurance was achieved, even with the partial remote (alternative means) audit on 20/08/2024.

2.5 Resolution of Findings

As discussed above, a risk-based approach has been applied for the verification of the project activity. During the verification, the assessment team identified the issues which could impact the accuracy and the credibility of the emission reduction claimed by the project, The details analysis of the issues raised the approach used to resolve these issues can be found in Appendix 3 of this report.

A corrective action request was raised if:

- Modifications to the implementation, operation, and monitoring of the registered project activity have not been sufficiently documented by the project participants.
- Mistakes have been made in applying assumptions, data, or calculations of emission reductions that will impact the number of emission reductions.

A clarification request was raised if:

[5] 69,991 is the initial number of the PAI that were included in the project when MR, v1 was issued, later it was observed that some of the PAI are still pending with the government process therefore, the number of PAI were reduced, finding for the same was raised and can be check in appendix 3 of the report

- Information is insufficient or not clear enough to determine whether the applicable requirements have been met.

A Forward action request was raised if:

- If the monitoring and reporting require attention and/or adjustment for the next verification period.

During verification a total of 03 CARs, 12 CLs and 01 FARs were raised. The details of all the issues communicated to the PD can be found in the Appendix 3. The issues raised were closed successfully.

Forward Action Request raised: PP is requested to substantiate the long-term maintenance plan for the retrofit measures implemented. This should include detailed procedures for continuous monitoring, specifying the following:

- **Frequency of Inspections**: Provide a schedule for how often the retrofit measures will be inspected to ensure they remain effective over time.
- **Methodology for Assessment**: Outline the process and criteria that will be used to assess the continued performance of the retrofit measures.
- **Corrective Actions**: Describe the steps that will be taken if the performance of the retrofit measures declines or fails to meet expected standards.

2.6 Eligibility for Validation Activities

There is no validation activity undertaken as a part of current verification.

3 VALIDATION FINDINGS

3.1 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.2 Project Description Deviations

There is no Project Description Deviation identified during the current monitoring period.

3.3 New Project Activity Instances in Grouped Projects

The group project activity, VCS 2649, titled "Housing Decarbonisation in the United Kingdom," identifies each individual dwelling as a Project Activity Instance (PAI). During the current monitoring period from 01/01/2023 to 31/12/2023, a total of 39,927 PAIs have been considered. Out of these, 6,717 PAIs were included in the previous monitoring period, meaning that 33,211 new PAIs have been added during this verification period. A total PAI count of 39,927 is included, with 1 PAI removed from the PAIs onboarded during the first monitoring period. The section outlines the steps taken into consideration while validating the new PAIs added:

Evidence-Gathering Process for Validation of New PAIs: A comprehensive evidence-gathering process was conducted to validate the inclusion of each new Project Activity Instance. The steps involved:

- Installation Records: For new dwelling added to the project, installation records of the energy efficiency measures (e.g., insulation, boiler replacements, air sealing) were reviewed on sample basis, details for which can be found section 2.4 of the report. This ensured that all measures were implemented in compliance with the project's methodology.
- Site Visit Reports: Onsite inspections were carried out on 21/08/2024 to 22/08/2024 at selected dwellings to verify the physical implementation of the measures. These site visits confirmed that installations were carried out as documented, More details can be found in section 2.4 of the report .
- Monitoring Data: The monitoring systems were assessed to ensure that data related to energy consumption before and after the implementation of energy efficiency measures was accurate and traceable.
- Interviews with Project Personnel: Interviews were conducted with project managers and staff responsible for the implementation and data collection to confirm that operational procedures were consistent with the project's monitoring plan.

Number of New PAIs Added:

During this verification period, 33,211 new PAIs have been added to the project. This brings the total number of PAIs considered during the current monitoring period to 39,927, with 6,717 PAIs carried forward from the previous monitoring period.

Quality and Completeness of Evidence, Data, and Documentation: The evidence, data, and documentation provided for the new PAIs were thoroughly reviewed for quality and completeness:

- Completeness: All required documentation, including installation records, monitoring data, and compliance certificates, was provided for new PAIs on sample basis. No significant gaps were found.
- Quality of Evidence: The data was confirmed to be accurate and collected using calibrated equipment. Cross-checks were made with the PDD to ensure consistency with the project's requirements.
- Supporting Documentation: Additional documentation, such as and site photographs, supported the correct implementation of energy efficiency measures were also thoroughly reviewed.

Conformance with Eligibility Criteria:

Table below provides evaluation of against the eligibility criteria outlines in the PDD:

S.No	Eligibility Criteria	Project compliance	VVB assessment
1.	The PAI is located within the project boundary	The physical address is checked to ensure the PAI is located within the project boundary Documentation: a. the physical address and geodetic coordinates of the PAI as provided by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1. Documentation is maintained in the project activity files	The PAIs were assessed to ensure they are located within the defined project boundary, The PP provided KML/19/ files that clearly delineate the geographic boundaries of the project area inline with section 3.1 of VCS standard. These files were reviewed by the verification team to verify that all included PAIs fall within the specified boundary. Additionally, during the site visit, a total of 24 samples were visited, and In the United Kingdom, every property is assigned a Unique Property Reference Number (UPRN)/35/, which was used to further verify the location of each PAI. The UPRNs of the 24 sample

			PAIs visited during the site inspection were cross-checked to confirm that all sampled properties are located within the project boundary. The KML files and the site visit verification of 24 samples confirmed that all PAIs are located within the defined project boundary, meeting the eligibility criteria.
2.	The PAI is a single-family PAI	The address of the PAI is checked against the relevant Local Authority's register of "houses in multiple occupation" Documentation: a. Reports for each project activity instance are generated by the project proponent Documentation is maintained in the project activity files	The verification of this criterion was conducted through both site visits and documentation review. During the site visits, the project team inspected a sample of PAIs to confirm that they comply with the requirement of being single-family dwellings. Records related to the installation of energy efficiency measures were reviewed to ensure that these installations were carried out in single-family properties. In addition, discussions were held with the local implementation partner to further verify that the properties included in the project were correctly classified as single-family dwellings. The local partner provided insights into the housing characteristics of the sampled properties,

			confirming their compliance with this criterion. The properties were also assessed in accordance with the Housing Act 2004 (legislation.gov.uk) to ensure they do not fall under the classification of a “House in Multiple Occupation”. The site visits, discussions with the local implementation partner, and documentation review confirmed that the sampled PAIs are single-family properties and do not meet the criteria for a "House in Multiple Occupation" as defined in the Housing Act 2004. This validates that the PAIs meet the eligibility criterion for single-family dwellings.
3-5	The PAI is in the same income group (low-income) or same income group (middle-income)	Same income group (low-income): The status of the PAI is social housing stock under the Housing and Regeneration Act 2008[6]; or Household income up to £40,212 as defined by the Living Wage Commission as declared by the holder of the statutory, property or contractual right in the plant, equipment or	During the site visits, the verification team reviewed the declarations from the local housing partner/16/21/ and examined the provided documentation for a sample of both low-income and middle-income PAIs. For low-income PAIs, the properties were confirmed to be either social housing stock or located in deprived neighbourhoods, in line with the project's criteria. For middle-income PAIs, the

[6] Housing and Regeneration Act 2008, c. 17, section 68.

		process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1. or The PAI is in a neighbourhood identified as 'deprived' as defined by the Department for Levelling Up, Housing and Communities Same income group (middle-income): Household income above £40,212 and up to £70,004 as defined by the Living Wage Commission and Department for Education and as declared by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1.; or The PAI Is not In a neighbourhood identified as 'deprived' as defined by the Department for Levelling Up, Housing and Communities	records were cross-checked with property addresses, income declarations, and neighbourhood classifications to ensure proper classification. The validation process confirmed that the PAIs were accurately classified within the correct income group, either low-income or middle-income, based on the criteria defined in the Project Design Document and applied methodology. (CL 06 and CL 09 were raised to verify more information on income group – details can be found in appendix 3 of the report)
6.	Project ownership is accorded to the project proponent by a contractual agreement with the holder of the	Project ownership is accorded to the project proponent by the holder of the statutory, property or contractual right in the plant, equipment or	The verification team reviewed the project proponent contract, specifically the Contract for Provision of Verified Carbon Unit Services This contract

	statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions	process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1.	is signed between PNZ carbon (earlier Artic partners), HACT, and the holder of the statutory, property, or contractual right in the plant, equipment, or process responsible for generating the GHG emission reductions.[/21,22/] The contract clearly vests the ownership of the project and the associated emission reductions in the project proponent. The terms of the contract were thoroughly assessed to ensure that it aligns with the VCS Program requirements regarding project ownership. Based on this review, it was confirmed that the project proponent has the legal ownership necessary to claim GHG emission reductions, fulfilling the project ownership inclusion criterion. Therefore, The contractual agreement between the project proponent and the holder of the statutory, property, or contractual rights was verified, and it accords ownership to the project proponent, thereby meeting the inclusion criterion.
Criteria as per methodology			

1.	The condition of the PAI is adequate for project activities according to nationally recognised best practice standards Project activities do not result in a violation of health and safety, environmental, or other relevant regulations	Renovation of the thermal elements of a PAI and replacement of heat producing systems are regulated activities that must comply with the Building Regulations, which are the primary source of health and safety, environmental and energy conservation obligations Building Regulations are designed to make sure PAIs are safe to use and inhabit and include requirements that address the applicability conditions Building Regulations are legal requirements that must be followed by those responsible for carrying out the work Compliance is demonstrated by a Building Regulations Compliance Certificate, or a declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1., that work was carried out by a person registered with a competent person scheme or that work was	The verification team reviewed the documentation to confirm that all PAIs, whether social or non-social housing stock, meet the required health, safety, and environmental standards. The Contract for Provision of Verified Carbon Unit Services, which was signed between PNZ, HACT, and the holder of the statutory, property, or contractual rights. This contract further ensures that the dwellings remain compliant with all relevant standards throughout the duration of the project./21,22/. Further during site visit also these details were crosschecked in the sample households. Therefore, eligibility is found to be met.

		carried out by a person registered with a competent person scheme, or a certificate under Publicly Available Specification (PAS)40 or an equivalent standard, or a declaration by a regulated provider of social housing or public entity	
2.	The replacement of appliances replaces functioning appliances	Where the project activities include the replacement of appliances, a declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions as defined in VCS Standard v4.7, section 3.7.1.	The contract between the PP and the owner of the statuary property were cross checked on the sample basis./32/ That generates GHG emission reductions requires the confirmation and declaration from the owner that the replacement of appliances replaces functioning appliances. The contracts were reviewed and found meeting the criterion
3.	The PAI is occupied at the time of project activity. Vacancy is permitted on an intermittent basis for up to three months, or if the PAI is occupied seasonally on an annual basis.	Utility bills or mortgage statements relating to the PAI or other indicators such as mortgage deeds, the existence of a lease or license (such as a tenancy agreement), or a declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1	During the site visit, the verification team discussed the occupancy status of the dwellings with the project proponent and the local implementation partner to verify that each PAI was occupied at the time of project activity. These discussions confirmed that the dwellings were indeed occupied during the installations, with any vacancies being intermittent and falling within the allowed period of up to three months.

			Additionally, all the sample dwelling were occupied during site visit. In addition to site visit discussions, the verification team also reviewed the Contract for Provision of Verified Carbon Unit Services, which was signed between the project proponent and the holder of the statutory, property, or contractual rights. The contract explicitly mentions that the dwelling must be occupied at the time of the project activity, with the provision allowing vacancy on an intermittent basis for up to three months. Therefore, the condition is found to be met.
4.	The capacity of any replacement appliance or component of a central heating system satisfies the energy load (the sum of the heat load and the electricity demand) within the PAI	Renovation of the thermal elements of a PAI and replacement of heat producing systems are regulated activities that must comply with the Building Regulations which are the primary source of health and safety, environmental and energy conservation obligations Building Regulations are designed to make sure PAIs are safe to use and inhabit and include requirements that address the applicability conditions Building Regulations are	To verify that the capacity of any replacement appliance or central heating system component meets the energy load requirements of each PAI, the verification team reviewed a combination of Gas Safety Certificates/32/, detailed energy assessment reports, and declarations from regulated providers of social housing or public entities. For example, the Gas Safety Certificate for one of PAI**,** certifies the installation of a VIESSMANN Vitodens 050-W gas-fired boiler, confirming that the

		legal requirements that must be followed by those responsible for carrying out the work The installation of gas boilers must also be undertaken in accordance with the Gas Safety Regulations which are an additional source of health and safety, environmental and energy conservation obligations Compliance is demonstrated by a Building Regulations Compliance Certificate, or a Gas Safety Certificate, or a declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1., that work was carried out by a person registered with a competent person scheme, or a certificate under Publicly Available Specification (PAS)51 or an equivalent standard, assessment by an accredited energy assessor or a declaration by a regulated provider of social housing or public entity	installation was carried out by a Gas Safe registered engineer and complies with the Gas Safety (Installation and Use) Regulations as well as Sections 4 and 7 of the Building Regulations. This ensures that the installed boiler is safe, meets national regulations, and has the capacity to satisfy the dwelling's heat load and electricity demand. The verification team also reviewed the energy assessment reports, which provided detailed calculations for the energy load, including heat and electricity demand, confirming that the capacity of the installed appliances meets these requirements. Therefore, the eligibility criteria is found to be met.

5	In the case of heating systems that serve multiple PAIs, all residential PAIs connected to the system are included in the project	The type of heating system as identified by the pre-retrofit energy assessment, or as declared by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1	The verification team has confirmed that the Contract for Provision of Verified Carbon Unit Services and agreements with regulated social housing providers, confirm that all residential PAIs connected to the central heating systems are included in the project scope. These contracts ensure that any emissions reductions associated with the central heating systems serving multiple PAIs are accounted for in the overall carbon credit generation for the project. The reviewed contracts and site assessments confirm that the heating systems serving multiple PAIs include all relevant residential PAIs within the project, ensuring compliance with this eligibility criterion.
6.	The project activity is not mandated, or required by law or regulation	Analysis of the applicable legal framework is outlined in section 1.13 (Conditions Prior to Project Initiation) of the Project Description and as declared by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in	The verification team reviewed the relevant contracts, including the Contract for Provision of Verified Carbon Unit Services between the project proponent, PNZ, and social housing providers. the contract explicitly states that the energy efficiency measures implemented under the project, such as insulation, heating system

		VCS Standard v4.7, section 3.7.1	upgrades, and other retrofit activities, are voluntary and not required by any existing laws or regulations governing social housing providers. This assessment was further supported by cross-referencing the project's scope with the Regulator of Social Housing's requirements, which outline the minimum legal standards for housing providers in the UK. The energy efficiency improvements implemented under the project go beyond these minimum standards, confirming that the measures are not mandated by law or regulation but are undertaken voluntarily to achieve GHG emission reductions and generate VCU. There meeting the requirement.
7.	The PAI meets or exceeds the performance benchmark as calculated for the Same Building Stock	Additionality is checked to ensure the PAI meets or exceeds the performance benchmark	The Project Proponent has calculated the performance benchmark for each Project Activity Instance using a model that draws on data from both pre-retrofit and post-retrofit energy assessments. Using formaula: $(ELPre,i - ELPost,i\ /ELPre,i)$ × 100 ≥ X These assessments were conducted for every dwelling to ensure that the energy

			efficiency measures implemented achieved the desired performance improvements. The energy assessments were carried out by third-party accredited energy assessors certified either by a public authority or a private certification program recognised by a public authority. The assessments followed the Standard Assessment Procedure which is the Government-approved National Calculation Methodology for evaluating the energy performance of dwellings in the UK. The verification team reviewed a sample of PAIs and cross-checked the performance benchmarks reported in the VCS Project Design Document (Additionality threshold 5.0152 low income and 4.4992 for middle income)against the actual energy assessment data. The calculations for the sample PAIs were found to be accurate, and the post-retrofit performance improvements were verified to meet or exceed the established benchmarks. any dwelling that did not meet the performance benchmark was excluded

			from the emission reductions calculations, ensuring that only qualifying PAIs were included in the project's claims for GHG reductions, which can also be verified from the emission reduction sheet. Thus criteria is found to be met.
8.	The decarbonisation measures fall into one of categories A or B	The decarbonisation measures identified as installed by the Building Regulations Compliance Certificate, or Gas Safety Certificate, or a declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1., that work was carried out by a person registered with a competent person scheme, or a certificate under Publicly Available Specification (PAS)57 or an equivalent standard, or a declaration by a regulated provider of social housing or public entity or assessment by an accredited energy assessor	Category A involves Weatherization measures are directed at the enhancement of the Building Envelope, improving the efficiency of the central heating/cooling system, and reducing the energy consumption of Appliances. Category B involves Weatherization measures directed at enhancement of the Building Envelope and/or improving the efficiency of the central heating/cooling system. During the site visits, the verification team verified that the energy efficiency measures implemented in each PAI aligned with either Category A (building envelope improvements) or Category B (central heating/cooling system efficiency). The review of physical installations and supporting documentation confirmed that the project activities met the required conditions, ensuring the

			decarbonisation measures were compliant The cross-checking of the Contract for Provision of Verified Carbon Unit Services and the site visits confirmed that all PAIs were subject to energy efficiency measures that fall under Category A or Category B. therefore, the criteria is found to be met.
9.	The decarbonisation measures do not involve fuel switching	The decarbonisation measures use and apply electricity or another fuel source that was already a source of emissions in the PAI prior to project activity The fuel sources that were already a source of emissions in the PAI prior to project activity are identified by a certificate under Publicly Available Specification (PAS)60 or an equivalent standard, declaration by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1., or assessment by an accredited energy assessor	The verification team reviewed the Contract for Provision of Verified Carbon Unit Services , signed between PNZ, HACT, and the holder of the statutory, property, or contractual right in the plant, equipment, or process that generates GHG emission reductions. The contract and related documentation were cross-checked to confirm that the decarbonisation measures implemented in the PAIs did not involve fuel switching. The contract clearly states that the decarbonisation measures undertaken focus on improving energy efficiency through enhancements to the building envelope and the efficiency of the central heating and/or cooling system. There is no mention or inclusion of activities related to switching the fuel

			type used for heating or cooling systems. Additionally, during site visits, the verification team inspected the energy efficiency measures installed in a sample of PAIs and confirmed that the heating systems remained consistent with their pre-existing fuel types. No evidence of fuel switching was found, further validating compliance with this eligibility criterion. Therefore, the criteria is found to be met.
10.	In the case of "replacement" of a mobile home, the word "retrofit" shall be read to mean replacement throughout the methodology	Not applicable. Project activity is not initially conducted according to Category D of the VM0008 Methodology (replacement of mobile homes)	The verification team confirms that Category D which involves the replacement of mobile homes is not applicable in this project. The project activities are limited to retrofitting existing, fixed residential dwellings and do not involve the replacement of mobile homes. As the project does not include mobile homes or any related replacement activities, this criterion is not relevant to the scope of the project. All energy efficiency measures implemented pertain to the retrofit of permanent residential buildings, in line with Categories A and B of the

			methodology, which focus on building envelope improvements and heating/cooling system upgrades. Therefore, the criteria is found to be met.
11	The methodology may be applied in any geographic region, provided appropriate data exist to establish the level of the performance benchmark for the Same Building Stock of a Project's geographic region	The geographic areas included in the project are initially the physical boundaries of the United Kingdom, areas that qualify as part of the Same Building Stock as defined in the VM0008 Methodology. During the monitoring period, the 39,927 PAIs included in the project activity occurred within the project boundary. The Project Description sets the eligibility criteria for future project activity instances in Section 1.4 (Eligibility Criteria). These criteria are intended to ensure that new project activity instances have characteristics for additionality that are consistent with the initial instances for the specified project activity and geographic area.	The current project is confined within the geographic boundary of the UK. The PAIs applicable to the project consist of residential dwellings across the UK. The performance benchmark for these PAIs has been established using appropriate data sources that reflect the energy efficiency and performance standards of similar building stock within the UK. The Standard Assessment Procedure, the Government-approved methodology for assessing energy performance in UK dwellings, has been used to generate pre- and post-retrofit energy assessments. This ensures that the performance benchmark accurately reflects the energy consumption patterns and characteristics of the building stock within the project's geographic region. Therefore, the criteria is in compliance.

12	When sampling, the minimum number of PAIs to be sampled is the square root of the total number of PAIs i included in the project. Statistically sound sampling approaches are used. When the control group approach is utilised, the control group size is the square root of the total number of PAIs in the project but need not exceed 100 PAIs In any sampling approach, the following conditions must be met: 1) The sample is statistically valid and may be one of the following: a. Simple random sample b. Systematic sampling c. Stratified sampling within the Same Building Stock d. Cluster sampling. 2) The sample is representative of the population. 3) The data must come from an approved source, i.e., a certified energy auditor or a nationally recognised data source. 4) Actions	Sampling is conducted in accordance with the methodology. The pre- and post-retrofit audit approach is utilised to measure emission reductions, for which the methodology prescribes the size of the quality assurance sample group of PAIs is established by multiplying 0.6 by the square root of the total number of PAIs 39,927, which equals a sample group of 158. The quality assurance process was run across a sample group comprising 2,215 PAIs to enable multiple quality assurance tests (approximately 14 times).	The verification team reviewed the sampling methodology applied by the PP and cross-checked the calculations for the minimum required sample size. In accordance with the methodology, the project applied the pre- and post-retrofit audit approach to measure emission reductions. The minimum number of Project Activity Instances to be sampled was determined by multiplying 0.6 by the square root of the total number of PAIs. For the current monitoring period, the total number of PAIs is 39,927. The square root of this total is approximately 200, and multiplying by the 0.6 factor results in a required sample size of 158 PAIs. This calculation was verified by the VVB to confirm compliance with the sampling requirements outlined in the methodology. In practice, the project proponent selected a significantly larger sample group, comprising 2,215 PAIs, to conduct a more robust quality assurance process. This allowed for multiple quality assurance tests to be run, with a

	that may bias the sample will be avoided. Sampling will include PAIs that are dispersed geographically. Sampling will occur for each defined Building Stock included in the project activity. Criteria include region, PAI type, and income		sample group size approximately 14 times greater than the minimum requirement. The sampling approach used was simple random sampling, ensuring that the sample was statistically valid, representative of the overall population, and geographically dispersed. The details were also cross checked through sampling sheet. Therefore, the criteria is found to be met.

The inclusion of 33,211 new Project Activity Instances during this verification period is valid. The validation process, including document review, site visits, and interviews, confirmed that these new PAIs meet the eligibility criteria set out in the PDD and methodology. The evidence was found to be complete and accurate, ensuring a reasonable level of assurance regarding their inclusion.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

The project activity has not undergone any baseline reassessment during the current monitoring period.

4 VERIFICATION FINDINGS

4.1 Project Details

The group project activity, “Housing Decarbonisation in the United Kingdom”, is an energy efficiency project focusing on decarbonisation measures across homes throughout the UK. The project involves the implementation of measures aimed at reducing greenhouse gas emissions by decreasing reliance on fossil fuels. Currently, the project includes three major measures implemented across dwellings: boiler replacement, loft insulation, and wall insulation.
The project activity has been implemented according to methodology VM0008, v1.1. As per the methodology, the technologies and measures installed fall under Category A and Category B focused on improving the building envelope and heating system efficiency. These measures lead to significant reductions in energy consumption, contributing to GHG emission reductions. The measures implemented in each dwelling have been verified through site visits and pre- and post-retrofit energy assessments/32/.
The PP for the project activity is PNZ, who was interviewed during the onsite audit. Additionally, the local housing partners, have played a critical role in project implementation, contracts with whom has been verified. The project’s activities have been independently verified during site visits conducted from 20/08/2024 to 22/08/2024. It has been confirmed that all retrofitting activities align with the guidelines outlined in the PDD. The start date of the project activity is 01/07/2022, and this was verified during the audit, with references to previous monitoring and verification reports. The project is undergoing verification for the monitoring period from 01/01/2023 to 31/12/2023, during which the implemented energy efficiency measures across 39,927 PAIs have resulted in significant GHG emission reductions of 30,756 tCO2e.
It has been conformed through evidence and records submitted (can be found in appendix 2 of the record), including the emission reduction sheet that the project has retrofitted 39,927 PAI out of which 3,527 belongs to Category A and 36,400 belongs to category B of retrofitting as per the applied methodology guidelines.

The details and calculations of the GHG emission reductions have been verified and found to be in accordance with the VM0008, v1.1 methodology. The calculations align with the project’s Monitoring Report and the guidelines outlined in the VCS Standard. The input values used for the monitoring parameters were cross-checked against the data provided by the PP, including installation records, energy consumption data, and relevant documentation.
The project’s monitoring system is operational and fully compliant with the applicable quality standards. The energy assessments, conducted by certified third-party energy auditors, ensured that all installations met the required benchmarks for energy efficiency improvements. The data collection and metering procedures in place for this project were reviewed and verified during the onsite audit, ensuring that the reported GHG reductions are accurate and in line with the project’s methodology.
During the onsite audit, it was concluded that the project has been implemented as per the requirements of the registered VCS PD. Throughout the current monitoring period, no

unforeseen incidents or events were observed that could impact the operation or effectiveness of the project.

Item	Evidence gathering activities, evidence checked, and assessment conclusion:
Audit history	The project activity is undergoing its 2nd verification under its first crediting period from 01/07/2022 to 30/06/2029. The assessment team has verified the audit history using the Project webpage and reviewed the first verification for the project, which is also published under Verra. It has been concluded that the information provided in Section 1.2 of the Monitoring Report is accurate and appropriate for this verification period.
Double counting and participation under other GHG programs	The project activity is not registered under any other GHG and non-GHG program or registry. This has been confirmed by means of research on relevant applicable registries and available information in public domain. The assessment team has searched for similar projects having same nature, capacity and project proponent. The name of the owners mentions in the regulatory licenses are also matched and checked. It was concluded that no such projects having same location and geo-coordinates, technology or project/legal owners are registered in any of the various carbon schemes like CDM, GCC, and Gold Standard.
No double claiming with emissions trading programs or binding emission limits	The project activity has been thoroughly searched on the various websites of various emission trading programs. It has been found that project is not part of any emission trading scheme.
No double claiming with other forms of environmental credit	As discussed above the, the project has been thoroughly researched in all the currently active environment schemes and found that the project is not registered with any other environmental credits. Therefore, it can be concluded that the project is not claiming credits with any other schemes.

Supply chain (scope 3) emissions double claiming	Not applicable as project is a decarbonization project.
Sustainable development contributions	The project activity targets several Sustainable Development Goals (SDGs): 1. SDG 1 – No Poverty (1.5.1 Number of deaths, missing persons, and directly affected persons attributed to disasters per 100,000 population): The project has facilitated the retrofit of 27,341 low-income households, reducing the impact of fuel poverty during this monitoring period. Premature mortality related to fuel poverty is said to be responsible for 17,000 excess deaths per year. The assessment team verified that the retrofit activities implemented during the monitoring period have contributed to alleviating fuel poverty and improving living conditions. Contribution over project lifetime: 2. SDG 3 – Good Health and Well-being (3.0 Ensure healthy lives and promote well-being for all at all ages): During this monitoring period, the project delivered £19,248,714 of social value, representing the health and well-being improvements gained by residents through energy efficiency improvements, such as better insulation and heating systems. These upgrades have improved the thermal and energy efficiency of homes, positively impacting residents' health.

3. SDG 7 – Affordable and Clean Energy (7.1 Energy intensity measured in terms of primary energy):
   The project facilitated the retrofit of 39,927 homes, preventing the consumption of 146,927,376 kWh of energy during this monitoring period. The installation of energy efficiency measures, such as boiler replacements, wall insulation, and loft insulation, contributed significantly to reducing energy consumption.

4. SDG 9 – Industry, Innovation, and Infrastructure (9.4.1 CO2 emission per unit of value added):
   The energy efficiency measures provided £19,248,714 of social value while reducing CO2 emissions. The CO2 emission per unit of value added during this monitoring period was 0.00160 tCO2e per £1 of social value.

5. SDG 11 – Sustainable Cities and Communities (11.5.1 Number of deaths, missing persons, and directly affected persons attributed to disasters per 100,000 population):
   The project retrofitted the homes of 27,342 low-income households, contributing to a reduction in premature deaths related to fuel poverty. These retrofits helped improve safety and living conditions, reducing the number of excess deaths due to inadequate heating and insulation.

	6. SDG 13 – Climate Action (13.3 Improve education, awareness-raising, and human and institutional capacity on climate change mitigation): The project facilitated the completion of 39,927 PAIs. The project also raised awareness of the benefits of carbon finance and encouraged the installation of further decarbonisation measures. Over 140 social housing providers, local government authorities, and over 100 installers were engaged in this project. These partnerships have supported the widespread implementation of energy efficiency measures across social housing, owner-occupied, and private rental sectors. All the information replated to SDG have been verified in detail, CL 04 was raised and closed successfully, Calculation related to the impact made have been thoroughly cross checked with the ER sheet along with the evidences submitted.
Additional information relevant to the project	No commercially sensitive information has been excluded by the PP.

Based on the above information assessment team concludes:

1. There are no material discrepancies between project implementation and the project description provided in the registered PD/5/.

2. The monitoring plan is implemented completely and the monitoring system (i.e., process and schedule for obtaining, recording, compiling, and analysing the monitored data and parameters) is appropriate.

3. There are no material discrepancies between the actual monitoring system, the monitoring plan set out in the project description, and the applied methodology/7/.

4. The GHG emission reductions or removals generated by the project have not been included in an emissions trading program or any other mechanism that includes GHG allowance trading as verified through the independent research and through interview with PP.

4.2 Safeguards and Stakeholder Engagement

4.2.1 Stakeholder Identification

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Stakeholder identification	It has been observed and verified during the onsite audit that the project activity is in line with the monitoring plan. The stakeholder identification and engagement process remain consistent with the initial design phase of the project, and there have been no new stakeholder groups identified since validation. The stakeholder groups continue to include local community stakeholders, such as dwelling owners, residents, fuel poverty charities, decarbonisation measure installers, carbon credit buyers, data vendors, government and local authorities. The Project Proponent's collaboration with HACT/20.21/, a well-established charity in the social housing sector, ensures ongoing communication and alignment with stakeholder expectations, this has also been verified from the validation and verification of the project. The details regarding the invites has been verified using meeting invites and agendas submitted/24/.
Legal or customary tenure/access rights	It has been observed and verified during onsite audit that the project activity is in line with the monitoring plan/5/ and there are no new legal or customary access right.
Stakeholder diversity and changes over time	It has been observed and verified during the onsite audit that there has been no change in the stakeholder composition or engagement approach since the initial monitoring period. The project has expanded its reach across the UK, now involving over 140 social housing providers, local government authorities, and more than 100 installers in both rural and urban communities. However, the stakeholder categories remain consistent with those identified at the project's inception, including social housing organisations, local government authorities, delivery partners, and housing sector representatives. It was verified through the interviews conducted and onsite visit.
Expected changes in well-being	Based on the review of project activities and interviews conducted onsite, it is verified that the project effectively utilizes the UK Social Value Bank (details can be found in CL 04) details and the

	Wellbeing Valuation approach to assess and quantify the impact of housing decarbonisation on resident well-being. The Wellbeing Valuation method, which is endorsed by HM Treasury's Green Book, provides a robust framework for valuing improvements in health, energy efficiency, and thermal comfort in monetary terms. During this monitoring period, the project achieved a total social value of £19,248,714, reflecting significant well-being benefits for residents. The enhancements to thermal and energy efficiency are expected to contribute positively to residents' overall well-being, particularly in health and financial security, and this valuation aligns with nationally recognized standards for non-market value assessment. The assessment team confirms that the methodology and outcomes align with the monitoring plan, substantiating the expected well-being improvements.
Location of stakeholders	During the current monitoring period a on site visit was conducted for the project and it has been observed that the location of the project activity remains the same with in the boundary of UK. Therefore, there is no change in the location of stakeholders.
Location of resources	It has been observed and verified during onsite audit that the project activity is in line with the monitoring plan[/5/] and no new stakeholder has been identified and location of the resources remain same, despite considering the project has expanded significantly from the previous year.

4.2.2 Stakeholder Consultation and Ongoing Communication

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Ongoing consultation	The verification team has confirmed that the project proponent has maintained ongoing consultation efforts since the start of the project in March 2021, engaging over the project. Evidence supporting these activities includes consultation invites and agendas, site visit documentation, and records from the previous verification report, all of which substantiate the project's adherence to continuous and meaningful stakeholder engagement practices. This ongoing consultation aligns with the VCS Program requirements, demonstrating the project's

	commitment to transparent communication and collaborative implementation.
Date(s) of stakeholder consultation	PP has been continuously been engaged conducting stakeholder meeting, The list of the meeting has been mentioned in the respective section of the MR. The assessment team has verified the details of the meeting conducted with each of the organisation, details of which can be found in appendix 2 of the report/24/ (CL 04 was raised regarding this and has been closed successfully).
Communication of monitored results	Results of the original meeting were provided to the stakeholder and are also stored, during the current monitoring period there has been no new comments received.
Consultation records	There have been no new comments received during the current monitoring period, this has been verified by the details checked during onsite audit, records of comments received during stakeholder has been stored by the PP, there has been no negative comment been received by the PP
Stakeholder input	During onsite audit/10/, interviews with various end users were conducted details can be found in section 2.3 and 2.4. Based on the interview conducted, it has been concluded that all the procedures are implemented in line with registered monitoring plan/5/ and there is proper procedure in place for redressal of grievance received/17/. There has no negative comment grievances received from stakeholders was also asked regarding the onsite visit.

4.2.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Consent	The verification team has reviewed the Participant Agreements and supporting documents, including HUG - Participant Agreement, Retrofit Credits Agreement with various contractors/20/21/22/24/. These agreements confirm that social housing providers,local government authorities and installers have entered into contractual arrangements with PNZ Carbon. Under these agreements, PNZ Carbon, as the Project Proponent, is granted exclusive rights to all GHG emission reductions

	resulting from the Project Activity Instances, enabling PNZ Carbon to register and issue VCUs with the Verra Registry. This consent process confirms that PNZ Carbon holds overall control and responsibility for the project under the VCS, meeting standard requirement that only the principal holder of GHG rights can issue VCUs. Furthermore, HACT's role in evaluating and ascribing social value to each VCU ensures alignment with the project's social impact goals. This review confirms that all necessary consents and contractual frameworks are in place, supporting the project's adherence to VCS Program requirements regarding ownership and rights to emission reductions.
Outcome of FPIC discussion	The verification team has confirmed that the FPIC process was thoroughly implemented to engage Local Communities and customary rights holders in the project area. The FPIC process ensured that all relevant stakeholders were fully informed about the project's scope and potential impacts, enabling them to provide or withhold consent without coercion. As verified during the onsite audit, the project involved no encroachment on land, nor did it require the relocation of individuals or communities without explicit consent. The project's focus on retrofitting existing homes and improving energy efficiency respects existing property rights and avoids any physical or economic displacement. This approach aligns with FPIC principles by ensuring that project activities do not negatively impact local stakeholders or disrupt community livelihoods. The verification team concludes that the FPIC process was followed effectively, meeting VCS Program requirements and ensuring that the rights and consent of all relevant parties were respected.

4.2.4 Grievance Redress Procedure

Item	Evidence gathering activities, evidence checked, and assessment conclusion

Grievance received and steps taken to resolve the grievance including the outcomes of the resolution	During the current verification, an onsite audit[10] was conducted, it was observed that people can reach out to the concerned authority with any complaints and suggestions., It has been observed that there are no grievances received during the current monitoring period, details related to same were verified during onsite audit.
Grievance redress procedure	The verification team has confirmed that the project proponent has taken proactive steps to engage with residents and local communities impacted by the project. Throughout this monitoring period, the project proponent, in collaboration with HACT, has actively gathered and analysed resident feedback, using it to shape and improve the Retrofit Credits service. This approach emphasizes the project's commitment to listening to community needs, empowering residents, and fostering a culture of respect and collaboration. The verification team observed that the project proponent conducted engagement activities with social housing providers, local government authorities, and residents across the UK. These efforts were aimed at understanding effective engagement practices and strengthening relationships with stakeholders. This collaborative approach aligns with the project's resident engagement strategy, reflecting the values of open communication, shared decision-making, and continuous improvement. The verification team concludes that the project proponent has effectively implemented a community-focused engagement strategy, which aligns with the project's goals and enhances its positive impact on local communities. This approach satisfies the VCS Program's requirements for stakeholder engagement and supports the ongoing success of the project.

4.2.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion

No Comments were received during this monitoring period.	Not applicable, as there are no new comments received.	Not applicable, as there are no new comments received.

4.2.6 Risks to Local Stakeholders and the Environment

4.2.6.1 Management Experience

The verification team has interacted with PNZ Carbon's management team (details can be found in section 2.3 of the report) and confirms that their expertise aligns with the project's ambitious goals for decarbonising UK housing stock also based on the evidences provided by the PP. Their extensive experience in environmental, social, and economic initiatives equips them to address the challenges associated with financing housing decarbonisation. The verification team concludes that PNZ Carbon's management possesses the necessary depth and breadth of expertise to develop and implement innovative solutions, ensuring the project's ongoing success and alignment with the VCS Program requirements.

4.2.6.2 Risk Assessment

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Natural and human induced risks to stakeholders' wellbeing	The verification team has assessed the project's approach to mitigating natural and human-induced risks to stakeholders' wellbeing within the context of housing decarbonisation. The project proponent has implemented contractual agreements with household contractors to ensure that all retrofit measures are carried out safely, responsibly, and in line with established standards that prioritize residents' health and safety. These contracts, previously reviewed, specify compliance requirements for quality assurance, health and safety protocols, and risk management, which collectively minimize any potential adverse impact on residents and local communities. No significant natural or human-induced risks to stakeholders' wellbeing have been identified beyond those addressed through these contractor agreements. The verification team concludes that the measures in place, including the contractual obligations with household contractors, are adequate and effectively mitigate any identified risks, ensuring alignment with VCS Program requirements for stakeholder protection.

Risks to stakeholder participation	The verification team has reviewed the project's approach to addressing potential risks related to stakeholder participation, specifically the risk that stakeholders may lack understanding of the Voluntary Carbon Market and the value of high-integrity carbon credits. The project proponent, in collaboration with HACT, has established regular engagement initiatives aimed at educating and informing stakeholders about the project and the benefits of carbon credits/21/22/. Evidence provided includes consultation invites, agenda documents, and communication materials that serve as reference resources for stakeholders. Additionally, website content has been developed to further explain the project, ensuring that stakeholders have accessible information to understand the value proposition. These engagement activities demonstrate a proactive approach to mitigating participation risks by enhancing stakeholder knowledge and fostering greater project involvement. The verification team concludes that the project proponent has effectively addressed the risk of limited stakeholder participation by implementing comprehensive engagement and education strategies, in alignment with the VCS Program's requirements for stakeholder involvement.
Working conditions	The verification team has assessed the project's approach to ensuring that decarbonisation works are delivered to the required standards, minimizing the risk of substandard working conditions. The project proponent has implemented comprehensive measures, including contractual requirements with contractors, adherence to health and safety standards, and compliance monitoring through policies such as the Human Rights Monitoring Policy, Grievance Procedure, and Stakeholder Engagement Policy. The Human Rights Monitoring Policy outlines PNZ Carbon's commitment to safeguarding the rights and working conditions of all project personnel, including subcontractors, by actively preventing issues such as forced labour and ensuring compliance with fair work practices. Additionally, the Grievance Procedure provides a clear, accessible mechanism for all workers and stakeholders to report any concerns related to working conditions, further supporting transparency and accountability.

	The verification team concludes that the mitigation measures in place, as evidenced by these policies and documented protocols, are effective in upholding safe and compliant working conditions. These measures align with the VCS Program requirements for managing risks associated with working conditions in decarbonisation projects. No significant risks of substandard working conditions have been identified.
Safety of women and girls	The verification team reviewed the project's risk assessment related to the safety of women and girls and found that no specific risks were identified in this area. The project proponent has implemented policies that emphasize equality, respect, and non-discrimination, ensuring a safe environment for all stakeholders, including women and girls/19/. The Stakeholder Engagement Policy and Grievance Procedure provide additional safeguards by offering clear channels for reporting any concerns related to safety and well-being. In line with these policies, ongoing monitoring and community engagement are in place to uphold a safe and inclusive environment, ensuring that the project's activities do not negatively impact the safety of women and girls. Based on the evidence reviewed, the verification team concludes that the project's current practices and preventative measures are sufficient, and no significant risks to the safety of women and girls have been identified.
Safety of minority and marginalized groups, including children	The verification team has reviewed the project's risk assessment concerning the safety of minority and marginalized groups, including children, and confirms that no specific risks have been identified in this area. The project proponent has established comprehensive policies, such as the Human Rights Monitoring Policy and Stakeholder Engagement Policy, which emphasize inclusivity, equality, and non-discrimination/19/. These policies serve as safeguards to protect the rights and safety of all individuals involved in or impacted by the project, with particular attention to vulnerable groups. Additionally, the Grievance Procedure provides an accessible mechanism for any minority or marginalized group members to report safety concerns, ensuring that any potential issues are promptly addressed. Based on the evidence reviewed, the verification team concludes that the project's practices and preventative measures are effective in upholding a safe environment for minority and

	marginalized groups, including children, with no risks identified in this area. This aligns with the VCS Program's requirements for safeguarding stakeholder well-being.
Pollutants (air, noise, discharges to water, generation and release of hazardous materials and chemical pesticides and fertilizers	The verification team has assessed the project's approach to managing potential environmental pollutants, including air emissions, noise levels, water discharges, and the generation or release of hazardous materials. The project, focused on retrofitting existing housing for energy efficiency improvements, does not involve activities that would typically generate significant pollutants or hazardous discharges. During the review, no evidence was found of activities involving the use of chemical pesticides, fertilizers, or hazardous materials that could negatively impact air, water, or soil quality. Additionally, any potential noise impacts from retrofit activities are temporary, localized, and managed according to industry standards and project guidelines. Based on the evidence reviewed and the nature of the project activities, the verification team concludes that the project proponent has adequately minimized any potential environmental impact related to pollutants. The measures in place are sufficient, and no significant risks associated with air, noise, water discharges, or hazardous material generation have been identified. This assessment aligns with the VCS Program's requirements for environmental risk management in project activities.

4.2.7 Respect for Human Rights and Equity

4.2.7.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Discrimination	Evidence Gathering Activities: Reviewed Stakeholder Engagement Policy and Human Rights Monitoring Policy to assess measures against discrimination in hiring and operational practices. Evidence Checked: Policies outline non-discriminatory practices and emphasize equality in hiring and engagement with contractors and partners. Conclusion: The verification team concludes that sufficient measures are in place to prevent discrimination within the project.

	No evidence of discriminatory practices was found, in line with VCS Program requirements.
Sexual harassment	Evidence Gathering Activities: Examined project's grievance mechanism and policies on workplace conduct. Evidence Checked: Grievance Procedure provides a channel for reporting incidents of sexual harassment, ensuring a respectful and safe environment. Conclusion: The verification team concludes that the project has implemented adequate mechanisms to address and prevent sexual harassment, with no cases reported or identified during the review.
Gender equity in labor and work	Evidence Gathering Activities: Reviewed the Stakeholder Engagement Policy and interviewed project management to assess gender representation and equity in roles. Evidence Checked: Documentation and policy confirm equal opportunity practices, supporting gender equity in hiring and engagement with contractors. Conclusion: The project demonstrates a commitment to gender equity, with policies aligned to ensure equal opportunities. This meets the relevant VCS Program criteria.
Forced labor	Evidence Gathering Activities: Checked Human Rights Monitoring Policy for any policies or measures related to forced labor prevention. Evidence Checked: Policies explicitly prohibit forced labor, and contracts with partners outline standards for fair and voluntary labor. Conclusion: The verification team finds that the project proponent has enforced strict guidelines to prevent forced labor, and no evidence of forced labor practices was observed.
Child labor	Evidence Gathering Activities: Reviewed labor policies and contractual agreements with contractors to ensure compliance with child labor laws. Evidence Checked: Contracts and policies prohibit the employment of minors, and verification of contractor practices confirmed adherence. Conclusion: The project adheres to standards prohibiting child labor, and no incidents of child labor were identified. This meets VCS Program requirements.

Human trafficking	Evidence Gathering Activities: Examined Human Rights Monitoring Policy and grievance mechanisms to assess the project's stance and prevention measures against human trafficking. E vidence Checked: Policy documents explicitly state zero tolerance for human trafficking, and the grievance mechanism provides a means for reporting any concerns. Conclusion: The verification team concludes that the project has effective policies to prevent human trafficking, with no indications of related risks. These measures align with the VCS Program standards for safeguarding human rights.

4.2.7.2 Human Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Not applicable	The verification team has conducted a comprehensive assessment of potential risks related to the recognition, respect, and promotion of human rights, particularly concerning Indigenous Peoples, Local Communities, and customary rights holders, in accordance with international human rights standards. Evidence Gathering Activities: The verification team reviewed the Human Rights Monitoring Policy, Stakeholder Engagement Policy, and Grievance Procedure to ensure compliance with international human rights laws. The policies were cross-checked to confirm that they include provisions for protecting the rights of Indigenous and local communities. Evidence Checked: The reviewed policies indicate that the project proponent has established mechanisms to prevent human rights violations and to address grievances, should they arise. The Stakeholder Engagement Policy further supports continuous engagement with IPs and LCs, fostering transparency and trust. Conclusion: The verification team concludes that the project has effectively implemented measures to safeguard human rights. No specific risks to IPs, LCs, or customary rights holders were identified during this monitoring period. The project proponent's adherence to international human rights standards and continuous engagement practices provide assurance of

	compliance with the VCS Program requirements for human rights protection.

4.2.7.3 Indigenous Peoples and Cultural Heritage

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Not applicable	The verification team has reviewed the project's approach to addressing potential risks related to Indigenous Peoples, Local Communities, and cultural heritage, focusing on the protection of rights and prevention of disputes over territories and resources. The project proponent, PNZ Carbon, has contractual agreements with social housing providers, local government authorities and installers that clarify ownership and control over the plant, technologies, and processes implemented[/20,21,22/]. These contracts assign PNZ Carbon as the Project Proponent with exclusive rights to the GHG emission reductions resulting from project activities, which are issued as Verified Carbon Units under the Verra Registry. Evidence Gathering Activities: The verification team reviewed contractual agreements and documentation provided in the Mitigation and Preventative Measures section. This included participant agreements with social housing providers and local government authorities, which formally grant PNZ Carbon the exclusive license for all GHG emission reductions while ownership of assets remains with the housing providers and local authorities. Evidence Checked: Contracts were examined to confirm that PNZ Carbon holds all rights to the emission reductions, in alignment with Verra's requirements, while ownership of the physical assets stays with the original owners. No ownership disputes or encroachments were identified, and the project activities do not impact or displace Indigenous Peoples or local communities. Conclusion: The verification team concludes that the project proponent has effectively addressed any potential disputes over

	territory and resources by establishing clear ownership and control agreements. No risks to Indigenous Peoples' rights or cultural heritage have been identified, as the project activities occur within existing social housing or owner occupied infrastructures without impacting local or cultural heritage sites. This assessment aligns with VCS Program requirements, confirming that all protective measures are in place.

4.2.7.4 Property Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Not applicable	The verification team has reviewed the project's measures to respect and protect property rights, particularly concerning the roles of social housing providers and local government authorities. The project's design establishes clear guidelines for property ownership, access rights, and responsibilities, ensuring that property rights are upheld for all stakeholders involved. Evidence Gathering Activities: The verification team assessed the contractual agreements between PNZ Carbon and social housing providers/local authorities/installers, confirming that these documents grant PNZ Carbon the rights necessary to issue Verified Carbon Units (VCUs) while ownership of the plant, technologies, and housing units remains with the social housing providers and local authorities. Evidence Checked: The contracts explicitly state that PNZ Carbon has overall control and responsibility for the project under the Verified Carbon Standard. Furthermore, these agreements grant PNZ Carbon an exclusive license to claim GHG emission reductions, while all physical property rights remain with the housing providers and local authorities. This arrangement ensures that the project respects property rights while enabling PNZ Carbon to fulfil its role as Project Proponent. Conclusion: The verification team concludes that the project adheres to the principles of property rights protection. By establishing a clear division of rights and responsibilities, the

	project proponent has effectively mitigated any risk related to conflicting property rights. This structure aligns with VCS Program requirements, confirming that property rights are preserved and respected throughout the project's implementation and credit issuance processes.

4.2.7.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Summary of the benefit sharing plan	Evidence Gathering Activities: Reviewed the Benefit Sharing Plan as outlined in project documents and conducted interviews with project representatives to confirm the intended distribution of benefits. Evidence Checked: The plan specifies that revenues from VCU sales are reinvested in decarbonization activities aimed at improving housing thermal efficiency for low-income households. Additionally, HACT provides assessments of the social value created, which is subsequently communicated to stakeholders. Conclusion: The benefit-sharing plan is well-defined, targeting socio-economically disadvantaged communities by prioritizing the decarbonization of homes for low-income households. This aligns with the project's goals of social equity and environmental impact.
Benefit sharing during the monitoring period	Evidence Checked: Documentation shows that proceeds were allocated towards decarbonization retrofits for households in need, improving energy efficiency and reducing energy costs for residents. The records align with the plan and show active engagement with over 140 social housing providers and local government authorities. Conclusion: The verification team concludes that the benefit-sharing mechanism has been effectively implemented during the monitoring period. The project demonstrates a commitment to redistributing carbon finance for the public good, particularly in supporting vulnerable communities. This approach to benefit sharing is compliant with VCS Program requirements and effectively supports the project's social and environmental objectives.

4.2.8 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Impacts on biodiversity and ecosystems	Evidence Gathering Activities: The verification team reviewed environmental assessments and related project documents to evaluate potential impacts on biodiversity and ecosystems. Site visits and consultations with local environmental agencies were conducted to verify that project activities do not adversely affect local flora and fauna. Evidence Checked: Project reports and environmental management plans confirm that the project's activities focus on improving housing infrastructure without significant interference with surrounding biodiversity. Observations during site visits further corroborate that retrofitting activities are confined to residential areas with minimal ecological footprint. Conclusion: The verification team concludes that there is no risk to biodiversity and ecosystems from the project activities, as all procedures have been implemented in a manner that avoids negative environmental impacts.
Soil degradation and soil erosion	Evidence Gathering Activities: Soil management practices and monitoring protocols were reviewed to ensure that construction and installation practices comply with sustainable standards. Site inspections were performed to observe any signs of soil degradation or erosion due to project activities. Evidence Checked: Documentation confirms that the project does not involve significant earthworks or landscaping alterations that could impact soil integrity. Additionally, there were no indications of soil degradation or erosion at the sites visited. Conclusion: The verification team finds no evidence of soil degradation or erosion associated with the project. The project's implementation practices are environmentally responsible and compliant with relevant soil conservation standards country wise.

Water consumption and stress	Evidence Gathering Activities: The verification team reviewed the project scope and operational processes to assess any potential impact on local water resources. Interviews with project personnel and local stakeholders confirmed that water usage is minimal and primarily related to minor operational needs. Evidence Checked: The project does not maintain water usage records due to the negligible nature of water requirements for retrofitting activities. Observations and stakeholder feedback confirm that there has been no noticeable impact on local water resources. Conclusion: The verification team concludes that the project does not contribute to water stress or excessive water consumption. Given the minimal water requirements, the project's activities do not adversely affect the local water supply.

4.2.8.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Species or habitat	Evidence gathering activities included reviewing project documentation, particularly the benefit of retrofitting existing homes over demolition, which reduces adverse impacts on ecosystems. The evidence checked indicates no adverse impacts on rare, threatened, or endangered species habitats. The project's approach facilitates ecosystem preservation by minimizing embodied carbon and avoiding habitat disruption. The verification team concludes that there are no risks identified in relation to species or habitats.
Areas needed for habitat connectivity	The project documentation was reviewed to assess the impacts on habitat connectivity. The evidence indicates that the retrofitting approach chosen by the project avoids habitat fragmentation and minimizes ecological disruption compared to alternative construction approaches. This project's method facilitates better outcomes for local ecosystems by maintaining habitat connectivity. The verification team confirms that no adverse impacts on areas needed for habitat connectivity were identified, ensuring compliance with ecosystem health and biodiversity objectives.

	Evidence gathering activities, evidence checked, and assessment conclusion
Habitats for rare, threatened, and endangered species	The verification team reviewed project documentation to assess impacts on rare, threatened, and endangered species. The project approach of retrofitting existing homes, rather than new construction, minimizes potential adverse impacts on local ecosystems and biodiversity. The evidence confirms no identified risks to these species' habitats, ensuring project compliance with ecosystem preservation objectives.
Areas for habitat connectivity	Evidence gathering activities included reviewing project plans and assessments on habitat connectivity. The retrofit approach avoids fragmentation and preserves ecological continuity. Evidence indicates that by avoiding new construction, the project supports habitat connectivity, contributing positively to local ecosystem health. The verification team concludes that no risks were identified for habitat connectivity.

4.2.8.2 Introduction of Species

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	The verification team confirmed through project documentation and site visits that no species were introduced as part of the project activity. As the project involves retrofitting existing homes rather than new planting or habitat alteration, there are no concerns regarding species introduction or invasive species management. This section is therefore marked as not applicable.

Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion
NA	The verification team reviewed project documentation and conducted site visits, confirming that there are no known invasive species in the project area. Since the project involves retrofitting existing homes and does not include any land alterations or ecological modifications, there is no risk of invasive species spread or introduction. Therefore, no

	mitigation measures are necessary, and the project is in compliance with ecosystem health standards regarding invasive species.

	Evidence gathering activities, evidence checked, and assessment conclusion
Invasive species	The verification team reviewed the project documentation and conducted site assessments, confirming that no invasive species were identified in the project area. Given that the project activities focus on retrofitting existing housing infrastructure without ecological alteration, the risk of introducing or spreading invasive species is negligible. Consequently, no mitigation or preventative measures are required. This assessment confirms compliance with ecosystem health standards regarding invasive species.

4.2.8.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	The verification team reviewed project documentation, site visit reports, and satellite imagery to confirm that no land clearing or drainage of natural ecosystems occurred during the monitoring period. The project activities are confined to retrofitting existing housing infrastructure and do not involve any alteration of natural landscapes or ecosystems. Therefore, it is concluded that there has been no impact on natural ecosystems, demonstrating compliance with environmental safeguarding standards.

4.3 Accuracy of Reduction and Removal Calculations

The assessment team has verified the values and formulas used for the calculation of emission reduction for the current monitoring period from 01/01/2023 to 31/12/2023 (both days included). A detailed assessment of these values is provided in Section 4.4 of this verification report.
The equations and calculations applied are in line with the methodology 'VM0008, v1.1', as referenced in the project documentation. This includes the correct application of formulas, conversions, and aggregations as required by the methodology. Furthermore, an in-depth assessment of the ex-ante values is conducted and documented in Section 4.4.
The combined margin value used for emission reduction calculations aligns with the Methodological Tool 7, as validated during the initial project validation. This value has been consistent throughout the project's operational period and has been verified to remain accurate in this second verification.

The assessment team confirms that the calculation and data are authentic. The quality of the supporting documents submitted for verification is adequate. The assessment team has checked the quality and maintenance of the supporting documents during the on-site visit to confirm the authenticity of the documents and to verify the appropriate calculations. The assessment team confirms that proper evidence is available for the whole monitoring period, and the same is verifiable. The data collection system meets the requirements of the monitoring plan and the applied methodology according to the assessment carried out.

The primary data required for calculating emission reductions (i.e., pre- and post-retrofit heat load and electricity demand, etc.) are obtained from SAP assessments, and data is directly sourced from the data published by BEIS[30]. The data is considered reliable and verifiable. Further details for the sources of all parameters have been provided in Section 4.4 above. All evidence is either government-sourced data or from other reliable sources, thus ensuring that the quality of evidence is maintained. A verification opinion with a finding of 'reasonable level of assurance' has been achieved.

The assessment team thus confirms that the quality of evidence to determine the GHG reductions is satisfactory, and detailed information regarding roles and responsibilities has been provided in the monitoring report.

4.4 Quality of Evidence to Determine Reductions and Removals

The data and parameters recorded for the project are in compliance with the registered Project Description Document /5/ and the monitoring report. The assessment team has cross-checked all parameters used for calculating emission reductions against evidence provided by the PP, details can be found in appendix 2 of the report. It has been observed that all the sources provided are appropriate and acceptable.
The monitoring conducted for all parameters aligns with the applied methodology (VM0008, v1.1/7/), and thus, can be considered accurate and reliable. The equipment, including meters, complies with the appropriate quality standards relevant to the project's technology. This verification confirms that the data collection and monitoring systems in place meet the requirements of the monitoring plan and the methodology.

Data and Parameters Monitored: All the parameters applied in the project have been assessed:
1. Pre-retrofit energy load of PAI I, ELpre,i

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The pre-retrofit energy load is measured individually for each PAI based on assessments performed by accredited energy assessors using government-approved SAP methodology.

	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable, as the pre-retrofit energy load assessment is based on modelling rather than direct equipment measurements. The SAP methodology used is compliant with national standards.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable, as no direct measurement equipment is used; rather, the SAP model is applied by certified professionals.
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.

	If applicable, has the reported data been cross checked with other available data?	The retrofit certificates of the dwellings[/31/] were crosschecked on the sample basis and the data provided was comparable to project database details of the dwelling.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	CL 07 was raised and closed successfully	
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

2. Post-retrofit energy load of PAI ELpost, i

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The post

		-retrofit energy load is measured individually for each PAI based on assessments performed by accredited energy assessors using government-approved SAP methodology.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable, as the pre-retrofit energy load assessment is based on modelling rather than direct equipment measurements. The SAP methodology used is compliant with national standards.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable, as no direct measurement equipment is used; rather, the SAP model is applied by certified professionals.
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	The retrofit certificates of the dwellings were crosschecked and the data provided was comparable to project database details of the dwelling.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the post-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

3. Grid-connected electricity consumed in the year prior to project implementation in PAI i (baseline consumption)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined for same building stock and is fixed for the crediting period as provided below, based on the building stock that the dwelling is part of: Low-income single-family dwelling baseline consumption: 3,000 kWh annually Middle-income individual dwelling baseline consumption: 3,900 kWh annually
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable.

	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	Values have been cross verified from the PDD, as values determined are historic in nature.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the grid-connected electricity consumption parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

4. Pre-retrofit electricity demand for dwelling i, Edem,pre,i

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The value has been calculated a per the SAP model therefore applicable.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

5. Post-retrofit electricity demand for dwelling i (Edem,post,i)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The value has been calculated a per the SAP model therefore applicable.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the 5. Post-retrofit electricity demand parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

6. Fuel type j consumed in the year prior to project implementation for dwelling i (baseline consumption), (Fb,i,j)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	the value is determined for the same building stock and is fixed for the crediting period as provided below, based on the building stock that the dwelling is part of: Low-income single-family dwelling baseline consumption: 1,104 m3 annually Middle-income individual dwelling baseline consumption: 1,382 m3 annually
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable, as baseline consumption data relies on historical records, not direct measurement. Invoices and utility statements are assumed to meet local/national accuracy standards.

	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	Verification checks during the onsite audit included a review of documented historical fuel records to confirm the accuracy and validity of baseline consumption data.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of Fuel type j consumed in the year prior to project implementation for dwelling was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

7. Heat load pre-retrofit for dwelling i based on size of the dwelling and historical HDD for the region (Hload,pre,i)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The software applies the latest calculation as per the approved worksheets and conventions for SAP calculations as set out in the SAP manual. Therefore, the software's accuracy is acceptable.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

8. Heat load post-retrofit for dwelling i based on size of the dwelling and historical HDD for the region (Hload,post,i)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The software applies the latest calculation as per the approved worksheets and conventions for SAP calculations as set out in the SAP manual. Therefore, the software's accuracy is acceptable.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the post-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

9. Electricity correction factor for year y.

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined for same building stock annually, based on the building stock that the dwelling is part of: Low-income single-family dwelling baseline consumption: 0.9825 Middle-income individual dwelling baseline consumption: 0.9835
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	How were the values in the monitoring report verified?	The value for the first year of monitoring has been determined at the time of project registration from data published by the Department for Business, Energy & Industrial Strategy (BEIS)/19/. The value is applied to each dwelling based on the building stock it is part of. All social housing is considered low-income by default, whereas non-social housing dwellings are identified as either low-income or middle-income based on criteria established in the PD. The factor is only applicable when electricity consumption growth for the year is negative, compared to the average grid connected electricity consumption over a period of at least past 10 years,
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	

Conclusion	The assessment team confirms that the monitoring of the post-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.

10. Heating degree days for year y after project activity (HDDy)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA

	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	The value for the monitoring period has been determined from data published by the Department for Business, Energy & Industrial Strategy (BEIS)/19/. The values are obtained from the Nottingham weather station, which was considered appropriate considering the central location of the weather station. The value is calculated for each dwelling based on the days on which the project activity was in operation/ use.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings		
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

11. . Heating degree days for one year before project activity (HDDb)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined individually for each dwelling and reported in the emission reduction calculation sheet
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	The value for the monitoring period has been determined from data published by the Department for Business, Energy & Industrial Strategy (BEIS)/19/.

	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

12. . Number of fuel types (J)

Means of verification	Measuring /Reading /Recording frequency	The parameter is to be recorded once per dwelling prior to implementation of the project activity
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	The value is determined for each PAI individually on the basis of the SAP assessment, thus concluding which fuel is used in that particular dwelling.

	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The software applies the latest calculation as per the approved worksheets and conventions for SAP calculations as set out in the SAP manual. Therefore, the software's accuracy is acceptable.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	The SAP methodology considers various factors to determine the energy load of the dwellings. All these observations are added to the software which, based on the SAP methodology, provides the energy load of the dwellings. The energy load of all such dwellings is individually recorded by the Government of the UK. The specific reports generated for each household of dwellings picked through random sampling were checked to confirm the parameter value/33/. No discrepancies were observed in the data.
	If applicable, has the reported data been cross checked with other available data?	NA

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings	No finding raised.	
Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.	

13. Number of dwellings included in the pre- and post-retrofit energy assessment approach for the project (I)

Means of verification	Measuring /Reading /Recording frequency	As per the applied methodology and registered PD, the parameter is to be recorded annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.
	Monitoring value	39,927 dwelling in current MP

	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	How were the values in the monitoring report verified?	The value is determined from the project database and confirmed as 39,927 dwellings for the current monitoring period.
	If applicable, has the reported data been cross checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data management follows QA/QC protocols in line with the monitoring plan, ensuring data integrity and reliability in reporting.
	In case project participants have temporarily not monitored the parameter, has either deviation?	NA
Findings		

Conclusion	The assessment team confirms that the monitoring of the pre-retrofit energy load parameter was conducted in line with the registered monitoring plan and applied methodology, with reliable and verifiable data management practices ensuring data integrity.

Sampling approach:
The PP has adhered to the VM0008 Methodology's QA sampling standards to ensure accurate emission reduction calculations and representativeness in data collection. The PP used a statistically valid sampling approach, specifically a simple random sample, to ensure a robust representation of the population across the project's defined Building Stock categories. The methodology conditions outlined in Section 4.2 of VM0008 were followed to develop the sampling framework. These conditions include:
1. **Statistical Validity and Sampling Technique**: The sampling approach is statistically valid, employing a simple random sample, as per the methodology. This technique aligns with the requirement to avoid bias and achieve a representative sample.

2. **Representativeness of the Population**: The sample group is dispersed geographically and represents each defined Building Stock within the project activity. This was verified through random selection from PAIs from varied dwelling types.

3. **Certified Data Sources**: The energy assessments conducted on the sampled PAIs were carried out by accredited energy assessors, ensuring reliability and compliance with public authority standards.

4. **Avoidance of Bias**: The sampling method incorporates a range of Building Stock characteristics, such as region, PAI type, and income, to prevent skewing results in favor of particular characteristics.

For quality assurance, the minimum sample size was calculated by applying 0.6 times the square root of the total PAIs (39,927), yielding a requirement of 158 PAIs for effective QA sampling. Notably, a larger sample group comprising 2,215 PAIs was implemented, enabling multiple QA tests and improving reliability through additional data points. This extensive sampling effort supports the robustness of the QA process, as discrepancies in emission reduction data between directly metered and post-retrofit assessments were evaluated through comparative t-tests.

In conclusion, the QA sampling approach demonstrates alignment with the requirements of the applied methodology and reinforces the credibility of the project's emission reduction claims. The assessment confirms that the QA sampling process meets the methodology’s standards, supporting a reasonable level of assurance regarding the integrity and quality of the emission reduction data.

In accordance with the above details the verification team confirms that:

- A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under this of this report.
- The complete monitoring data is also presented in the corresponding ER sheet and final version of the monitoring report.
- The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under this of this report.
- The calculations of baseline emissions as presented in the corresponding ER sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan[/5/] and the applied methodology[/7/].
- All assumptions used in the emission calculations were found appropriate and therefore accepted.
- Appropriate emission factors and other reference values have been correctly applied.

4.5 Non-Permanence Risk Analysis

Not applicable as it is group project.

5 VERIFICATION OPINION

5.1 Verification Summary

The project activity VCS – 2649, “Housing Decarbonisation in the United Kingdom,” has undergone its 2nd verification with a monitoring period from 01/01/2023 to 31/12/2023 (including both days). PNZ Carbon is responsible for the overall project management, and HACT supports the analysis, aggregation, preparation (including conversion factors, assumptions, methodology, and calculations), and presentation of activities and related GHG data in public disclosures (such as the monitoring report, emission reduction calculation sheet, submitted documents, emails, and communications). The verification engagement is based on the assumption that the GHG data provided is complete, sufficient, accurate, and free from material misstatements.

SustainCERT applies its own quality management system and compliance policies for quality control, in accordance with ISO/IEC 17029:2019 – Conformity Assessment Requirements for Validation and Verification bodies providing environmental information (ISO 14065:2020) and greenhouse gas audit (ISO 14064-3:2019) standards, and maintains a comprehensive quality control system including documented policies and procedures to ensure compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

We have complied with the VCS standard/1/ and other applicable requirements during the verification engagement and maintained independence throughout. SustainCERT was not involved in preparing any statements, reports, or data except for this Verification Statement and Report. SustainCERT maintains complete impartiality with respect to all stakeholders interviewed during the verification process. SustainCERT has not provided any services to PNZ Carbon or its subsidiaries within the scope of verification that could compromise the independence or impartiality of our work. The verification was carried out from Aug 2024 to Nov 2024 by a team of qualified GHG auditors.

5.2 Verification Conclusion

The verification of the project titled “Housing Decarbonisation in the United Kingdom,” VCS ID – 2649, has been undertaken by SustainCERT, as requested by PNZ Carbon, the project proponent, for the monitoring period from 01/01/2023 to 31/12/2023 (including both days), as reported in the latest submitted version of the monitoring report. The project activity has been implemented in accordance with the registered monitoring plan in PD/5/. It is our responsibility to provide an independent verification statement on the reported GHG emission reductions from the project activity.

SustainCERT’s verification approach was based on understanding the risks associated with reporting GHG emission data and the controls in place to mitigate these risks. SustainCERT planned and conducted the verification by obtaining sufficient evidence, information, and explanations that we deemed necessary to provide reasonable assurance that the reported GHG emission reductions are accurately represented.

In our opinion, the GHG emission reductions reported for the project activity for the period 01/01/2023 to 31/12/2023 (including both days) are fairly stated in the latest submitted version of the project monitoring report. The GHG emission reductions were calculated accurately based on the approved baseline and monitoring methodology VM0008 Version 1.1 and the monitoring plan contained in the PD/1/.

Verification period: From 01012023 to 31122023

Verified GHG emission reductions and carbon dioxide removals in the above verification period:

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)
YEAR 2 (01-January 2023 – 31-December 2023)	-	-	0	30,756	0	30,756
Total			-	30,756	0	30,756

5.3 Ex-ante vs Ex-post ERR Comparison

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
YEAR 1 ((01-July 2022 – 31-December 2022)	2.928	0.220	-92.471%	The difference in Ex- ante and Ex post is due to difference in the implementation rate of decarbonization activity. CL08 was raised regarding it was successfully closed.
YEAR 2 (01-January 2023 – 31-December 2023)	2.928	0.7703	-73.692%	

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the monitoring report to be excluded in the public version.

Section	Information	Justification	Assessment method and conclusion
NA			

APPENDIX 2: TABLE OF REFERENCE

S. No	Document Title	Version	Date
1.	VCS standard *VCS Program Details - Verra*	4.7	21/03/2024
2.	VCS guidelines https://verra.org/wp-content/uploads/2023/08/VCS-Program-Guide-v4.4.pdf	4.4	29/08/2023
3.	Validation and Verification Manual https://verra.org/wp-content/uploads/2018/03/VCS_Validation_Verification_Manual_v3.2.pdf	3.2	19/10/2016
4.	VCS Project Webpage, VCS ID - 2649 https://registry.verra.org/app/projectDetail/VCS/2649	-	-
5.	Project Description https://registry.verra.org/app/projectDetail/VCS/2649	10.1	25/11/2022
6.	Validation report https://registry.verra.org/app/projectDetail/VCS/2649	01.1	10/11/2022
7.	Applied Methodology - “Methodology for Weatherization of Single and Multi-family Buildings” VM0008	1.1	-
8.	Monitoring report (01/01/2023 to 31/12/2023)	1.2	06/03/2025
9.	Emission reduction calculation sheet		Corresponding to MR
10.	Onsite audit	-	21/08/2024 to 22/08/2024
11.	Remote audit	-	20/08/2024
12.	1st Verification Report	1.1	29/09/2023
13.	Previous Monitoring report	1.2	28/09/2023
14.	Heating Degree days calculation sheet	-	-
15.	Energy consumption calculation sheet	-	-
16.	Sample Letter of intend for participation in retrofits	-	-
17.	Retrofit credit cycle and procedure	-	-

18.	KML files of the PAI locations	-	-
19.	PNZ Company policies: - Grivance procedure - Human rights Monitoring Policy - Stakeholder engagement policy	-	-
20.	Retrofit credits signed documents with partner organisations	-	-
21.	HUGL Participation aggreement	-	28/02/2024
22.	Retrofit photgraphic evidence	-	-
23.	Project Survey evidences	-	-
24.	Stakeholder engagement evidences: Meeting evidences Stakeholder identification overview report – including strategies to maintain the diversity	-	-
25.	PNZ supporting study documents- – conducted by PNZ Carbon and HACT- • Discovery Phase Evidence Report • Discovery Phase Webinars Report • Case study report details Financial model study	-	-
26.	Stakeholder identification overview report – including strategies to maintain the diversity	-	-
27.	Guideline: Sampling and surveys for CDM project activities and programme of activities	4.0	-
28.	Sampling and Surveys for CDM Project Activities and Programmes of Activities	9.0	-
29.	Complete project database	-	-
30.	Energy and gas consumption reports by Department of Business Energy and Industrial Strategy UK as part of the National Energy Efficiency Data Framework (NEED)	-	-

31.	Site visit documents (for all the sample household visited) - Retrofit measure survey - Site visit pictures - Safety measures	-	-
32.	Standard Assessment Procedure (SAP): National Calculation Methodology for assessing the energy performance of dwellings	-	-
33.	Sample size calculator http://www.raosoft.com/samplesize.html	-	-
34.	UK Living Wage for a household with two adults and two children aged 3-4 and 5-11 for 2020/21. See, N Cominetti, Calculating the Real Living Wage for London and the Rest of the UK: 2020-21, Resolution Foundation, November 2021. Upper earnings threshold for a household to receive financial support for full-time education for 2020/21.	-	-
35.	Records of UPRN of PAIs (sample basis)	-	-

APPENDIX 3: FINDINGS

Rule	Assessment Question	Findings/Comments (CL 1)	Developer Response
VCS Standard, v4.7 Monitoring report template	Total number of PAIs Installed	Section 1.1 of MR: In the section 1 of MR, PP mentions, "During this monitoring period, 78,003 individual Project Activity Instances (PAIs) were decarbonised between January 1, 2023, and December 31, 2023" However, the ER sheet submitted mention the database with only 69961 households. PP shall provide the entire database, which includes the Households geodetic coordinates (as mentioned in section 1.8 of MR) and dates of retrofit.	Please refer to the covering note for the ER Worksheet which highlighted that a revision to the MR v1 had occurred due to a delay in two participants signing their Participant Agreements. The retrofit works associated with these participants occurred during the monitoring period; however, these works will no longer be included in the MR because their expected timeframe for signing the Participant Agreement is later than the timeframe for the verification. The MR has been amended to remove the ERs associated with these participants and has been provided as MR v2 as part of PNZC Response 1.. The ER Worksheet accurately reflects the number of PAIs in the **amended Monitoring Report (v2)**.

Rule	Assessment Question	Findings/Comments (CL 1)	Developer Response
			Lattitude and longitude information has been added to the **ER Worksheet (v2)**. Please note that dates of retrofit can already be found in the **ER Worksheet (v2)** in column AA, entitled 'Completion Date'.
	Rd 2	PP submitted a revised ER calculation sheet, containing the complete database of all PAIs considered during this monitoring period. The number of PAIs for the entire Monitoring Period reported in the MR is now consistent with the ER sheet. Additionally, GPS coordinates for each PAI and the completion date of their retrofits have been added to the ER sheet. **Comment closed.** The section mentions, "During this monitoring period, 69,961 individual Project Activity Instances (PAIs) were decarbonised between January 1, 2023, and December 31, 2023, resulting in 37,877 tCO2e emission reductions, which is equivalent to an annualised 63,001 tCO2e." However, upon reviewing the emission reduction sheet, it has been observed that the Heating Degree Day Correction Factor (HDDCF),	Reported average or annualised emission reductions are for information purposes only and have no formal role in the crediting calculations or the submission to Verra for credit issuance. The Heating Degree Day Correction Factor (HDDCF) is not used to calculated the average (annualised) emission reductions but is applied to the average (annualised) emission reductions to calculate the Achieved Emission Reductions (ER), e.g., by reducing the average (annualised) emission reductions by the ratio between the number of HDDs in the 12 months prior to installation and the number of HDDs being recognised in the monitoring period. $ERy = \sum Fb,i,j \times I,J\ i,j=1\ HLF \times HDDCFy \times Calj \times FCO2 - Ly$

Rule	Assessment Question	Findings/Comments (CL 1)	Developer Response
		which is designed to adjust for variations in heating requirements due to temperature changes, has not been included in the calculation of Average Emission Reductions (ER) per year. The PP shall provide an explanation for the calculation method used for determining the average emission reductions per year. Specifically, the PP shall clarify why the HDDCF was excluded from these calculations and assess the potential impact of its exclusion on the reported annualised emission reductions.	For example, assume an installation achieves average or annualised emission reductions of 1tCO2e, e.g., 1 = $\sum Fb,i,j \times I,J\ i,j$=1 $HLF \times Calj \times FCO2 - Ly$ If the installation occurred on 31 st December 2023, then in the prior 12 months there were 1,999.6 HDDs and in the monitoring period 9.2 HDDs, e.g., $HDDCFy$ = 0.0046 So, the Achieved Emission Reductions (ER) being credited is equal to 1 tCO2e x 0.0046 = 0.0046 tCO2e.
	RD 3	The response provided by the PP clarifies that the HDDCF is not applied to the average (annualized) emission reductions, as those figures are for informational purposes and do not influence the formal crediting calculations. The HDDCF is only applied in the final step when calculating Achieved Emission Reductions, ensuring temperature variations are appropriately accounted for in the final credited emissions reductions. This approach aligns with the methodology's	

Rule	Assessment Question	Findings/Comments (CL 1)	Developer Response
		requirements and ensures accurate reporting. Therefore, the finding stands closed. # closed.	

Rule	Assessment Question	Findings/Comments (CL 2)	Developer Response
VCS Standard, v4.7 Monitoring report template	Location of the project	Section 1.8 of MR: In accordance with the methodological requirement and to verify the area of the same building stock, PP shall provide the following details: 3) For projects with multiple project activity instances (see Sections 3.6.4 –3.6.22) and grouped projects (see Section 3.6.10), either: a) A geodetic coordinate for each instance, provided in a KML file; or b) Geodetic polygon(s) provided in a KML file that: i) Encompass all instances in the project, and ii) Delineate the smallest administrative division of land for the local government (e.g., if the activity takes place within six villages, the six villages must each have their own polygon)	In accordance with demonstrating compliance with Rule 3.1.1, we are preparing KML files that will include details for the local government areas that have project activity. Please see: **PNZC – KML**

Rule	Assessment Question	Findings/Comments (CL 2)	Developer Response
		This is inline with section 3.11.1 of the VCS standard	
	Rd 2	The Project Proponent (PP) has submitted KML files as per the requirement, choosing option (b) to provide geodetic polygons that: i) Encompass all instances in the project, and ii) Delineate the smallest administrative division of land for the local government. Additionally, the PP has provided the exact latitude and longitude for each individual PAI in the Emission Reduction (ER) calculation sheet. Given that a site visit was also conducted during this monitoring period (MP), during which some of the PAIs were visited and verified, the requirement has been satisfactorily met. The finding stands closed. **#closed.**	

Rule	Assessment Question	Findings/Comments (CL 3)	Developer Response
VCS Standard, v4.7 Monitoring report template	Double counting	Section 1.10 of MR: In line with VCS standard, Version 3.23, PP shall provide a declaration stating that the project credits will not be double counting with any other GHG or non-GHG scheme.	Please see Clause 2.2.4 of the previously provided Issuance Representation: **VCS2649 – Issuance Representation Single PP v4**
	Rd 2	The Project Proponent (PP) has submitted the document titled "VCS2649 – Issuance Representation Single PP v4." Section 2.2.4 of this document explicitly states that the PP has not submitted the project and its emission reductions or removals to any greenhouse gas (GHG) programs other than the Verified Carbon Standard (VCS). This confirms that there is no double counting or overlapping submissions with other GHG programs. The finding stands closed. **#closed.**	

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
VCS Standard, v4.7	SDG impact assessment	In section 1.12 of MR: Group project activity targets SDG 1, 3, 7,	Please see the **amended Monitoring Report (v2)** for updated references relating to the SDG activity targets outlined.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
Monitoring report template		9, 11, 13 PP shall provide appropriate evidence substantiating each of the SDG claims made under this MP, for the verification by the assessment team. PP shall also mention the SDG 13 in the table and its contributions.	**For clarity of the claims made:** • **SDG 1.5**: Low-income households are defined as outlined in Section 3.3, Criteria 3-5 of the Monitoring Report: *Same income group (low-income):* *The status of the PAI is social housing stock under the Housing and Regeneration Act 2008[7]; or* *Household income up to £40,212 as defined by the Living Wage Commission[8] as declared by the holder of the statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1. or* *The PAI is in a neighbourhood identified as 'deprived' as defined by the*

[7] Housing and Regeneration Act 2008, c. 17, section 68.

[8] In the registered PDD, UK Living Wage for a household with two adults and two children aged 3-4 and 5-11 for 2020/21. See, N Cominetti, Calculating the Real Living Wage for London and the Rest of the UK: 2020-21, Resolution Foundation, November 2021.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
			Department for Levelling Up, Housing and Communities[9] This figure can be evidenced by filtering by the number of Low-Income Households in the ER Worksheet. • **SDG 3.0**: Health and wellbeing improvements are those calculated following the UK Social Value Bank following the method set out at Appendix 2 of the MR. Social value figures for each PAI have been added to the **ER Worksheet (v2)** in column AL. • **SDG 7.1**: the prevention of consumption of kWh of energy is calculated in the **ER Worksheet**. This figure can be evidenced by subtracting the sum of column J (*EDemPost (kWh))* from the sum of column H *EDemPre (kWh))* to give the reduction of consumption of electricity and adding this to the reduction of fuel calculated by subtracting the sum of

[9] In the registered PDD, located within the most deprived four deciles nationally using the published Indices of Deprivation 2019 for England, Ministry of Housing, Communities and Local Government; for Wales, Welsh Government or for Scotland, Scottish Government.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
			column S (*HLoadPost (kWh))* from the sum of column Q *HLoadPre (kWh))* in the ER Worksheet. • **SDG 9.4**: The tCO2e per £1 of social value is calculated by dividing total emission reductions achieved (as calculated in column Z of the ER Worksheet) by the total social value achieved (As calculated in column AL of the **ER Worksheet**). • **SDG 11.5**: Low-income households are defined as outlined in Section 3.3, Criteria 3-5 of the Monitoring Report: *Same income group (low-income):* *The status of the PAI is social housing stock under the Housing and Regeneration Act 2008*[10]*; or* Household income up to £40,212 as defined by the Living Wage Commission[11] *as declared by the holder of the statutory, property or contractual*

[10] Housing and Regeneration Act 2008, c. 17, section 68.

[11] In the registered PDD, UK Living Wage for a household with two adults and two children aged 3-4 and 5-11 for 2020/21. See, N Cominetti, Calculating the Real Living Wage for London and the Rest of the UK: 2020-21, Resolution Foundation, November 2021.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
			right in the plant, equipment or process that generates GHG emission reductions, as defined in VCS Standard v4.7, section 3.7.1. or The PAI is in a neighbourhood identified as 'deprived' as defined by the Department for Levelling Up, Housing and Communities[12] This figure can be evidenced by filtering by the number of Low-Income Households in the ER Worksheet. • **SDG 13.3**: The number of PAIs can be evidenced from the ER Worksheet.
	Rd 2	In accordance with the inputs provided for each of the SDG: **SDG 1.5:** The facilitation of 55,310 low-income households has been confirmed through the Excel sheet database and validated during the site visit conducted on a sample basis. This verification supports	SAP ratings are one output of the pre- and post-retrofit energy assessments that are undertaken to determine the Hload,pre,i , Hload,post,I, Edem,pre,I and Edem,post,i..

[12] In the registered PDD, located within the most deprived four deciles nationally using the published Indices of Deprivation 2019 for England, Ministry of Housing, Communities and Local Government; for Wales, Welsh Government or for Scotland, Scottish Government.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
		the project's contribution to SDG 1.5, specifically in reducing the impact of disasters by improving housing conditions for vulnerable populations. **#closed**. **SDG 3.0 :** The MR appendix 2 mentions that SAP ratings are improved as a result of retrofitting measures, with specific uplift values in life satisfaction attributed to these improvements. However, there is no detailed explanation of how the baseline and post-retrofit SAP ratings were determined, especially for the projected improvements rather than actual measured results. The Project Proponent should provide detailed justifications for the baseline and post-retrofit SAP ratings used in the Wellbeing Valuation calculations. Furthermore, the calculation of **Average SV per year** (as seen in Column AM of the Excel sheet) plays a critical role in determining the social value (SVy_{y}y) for each Project Activity Instance (PAI). However, the methodology and evidence supporting this calculation have not been sufficiently detailed.#open **SDG 7.1:** The value for SDG 7.1, which	These are undertaken by accredited energy assessors certified by a public authority, or a private certification program recognised by a public authority. Energy assessments are based on the Standard Assessment Procedure (SAP), the government-approved National Calculation Methodology, to assess the energy performance of PAIs. The SAP methodology considers a range of factors that contribute to energy efficiency, including materials used for the construction of a PAI, thermal insulation of the building fabric, air leakage characteristics of the PAI, efficiency and control of the heating system(s) and the fuel used to provide space and water heating. Energy assessments cover fossil fuel and grid-connected electricity consumption and may include physical inspection, diagnostic tests, and the use of energy modelling software that implements the latest approved worksheet and conventions for SAP calculations as set out in the manual describing the Government's

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
		focuses on ensuring access to affordable, reliable, sustainable, and modern energy, has been verified from the Excel sheet and the pre- and post-retrofit calculations. However, the PP needs to provide evidence of the pre- and post-retrofit studies that were conducted to reach the numbers mentioned in the Excel sheet. This evidence is necessary to substantiate the reported energy savings and improvements in energy efficiency, ensuring that the project's contribution to SDG 7.1 is based on verifiable data. #open **SDG 9.4:** The PP has provided the necessary calculations and supporting documentation to substantiate the reported value of 0.0017 tCO2e per £1 of social value added. Upon thorough review, the methodology used is found to be appropriate, and the data provided is consistent, accurate, and aligned with industry standards. As a result, this finding is considered resolved. **SDG 11.5**: The PP has provided sufficient evidence to confirm that the contributions to SDG 11.5 particularly in relation to the	Standard Assessment Procedure or apply building physics calculations. The baseline and post-retrofit SAP ratings are stored in the relevant datasets and have been provided to the VVB for the sample of homes visited as part of the site visit. The methodology for calculating the Average SV per year has been provided in extensive detail in Appendix 2 of the MR. Please see section 'Application to project activity instances'. By following these steps, the result is the Average SV per year. The calculations for the Average SV per year are stored in the relevant datasets and have been provided to the VVB for the sample of homes visited as part of the site visit. **For SDG 7:** Detailed documentation regarding the pre- and postretrofit assessments have been provided to the VVB for the sample of homes visited as part of the site visit.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
		retrofitting of 55,310 homes and the reduction of disaster-related health risks. The values and impacts reported have been checked against the database and are consistent and appropriately documented. As a result, this finding is considered resolved. **#closed.** **SDG 13:** In line with the information mentioned in Monitoring report, The PP should provide detailed evidence of the educational and awareness-raising activities undertaken, including: • Descriptions of training sessions or workshops conducted. • The number of participants and their roles (e.g., social housing providers, local authorities). • Feedback or assessment results to gauge the effectiveness of these activities. • Any materials or resources developed and disseminated as part of these efforts. Furthermore, the sections mentions "Facilitated the retrofit of 69,530 homes" – however, the total retrofits are 69961, PP shall clarify on the same. #open	Please see: 'Site Visits' folder in main SharePoint shared data room. **SDG 13**: The PP works closely with social housing providers, local authorities and private installers to promote the project and raise awareness of the retrofit works it supports. Training Sessions/Workshops: The PP and its project partner work closely with providers to explain the project and outline its potential benefits. These sessions are conducted through diverse channels, including stakeholder engagement events, such as industry conferences, and both online and in-person introductory meetings. These outreach efforts are designed to effectively communicate the objectives of the project and demonstrate its potential advantages to participants. During this monitoring period the project undertook significant research and educational engagement initiatives via its work with the Green Home Finance Accelerator (GHFA). Participants/Roles: The project addresses both social and private housing sectors, with the PP

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
			and its project partner actively engaging with provider from both market segments. This engagement ensures comprehensive outreach and fosters collaboration across different housing types and stakeholders. Feedback: To measure general effectiveness of any project educational awareness raising activities, the PP collects direct feedback from participants on a rolling basis, to help gauge their understanding and general satisfaction with the service. Feedback to date has been positive, with a significant number of social housing and private installer providers now onboarded with the service. Please see GHFA discovery phase webinar – housing webinar – HACT_PNZ v4 for an example of how engagement and feedback was encouraged during webinars about the project. Please also see GHFA Case Study_PNZ Carbon for a Discovery project case study overview.

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
			Materials/Resources: Both the PP and its project partner have developed explanatory materials to support initial conversations to educate about the project and raise awareness of its value. A good example of how feedback has been captured, analysed and recorded for future project education are awareness-raising can be found in the GHFA Discovery Phase Evidence Report for the project. Please see GHFADP37_ArcticaPNZ_DP_Report for the full report. Reflections on key project outcomes can be found at Page 5. Retrofit Figures – Clarification: these figures refer to homes and project activity instances. The figures have been revised in the updated Monitoring Report. Please see NEW VCS2649 01012023-31132023 PNZC – MR C1 v3.
	Rd 3	SDG 3: The PP has provided a comprehensive explanation of the	

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
		methodology used for calculating the baseline and post-retrofit SAP ratings, as well as the process for determining Wellbeing Valuation and Social Value for each PAI. The methodology follows the government-approved Standard Assessment Procedure (SAP) and incorporates industry-standard practices, including pre- and post-retrofit energy assessments conducted by accredited energy assessors. The explanation provided adequately addresses the calculation of average social value per year and demonstrates how life satisfaction improvements are quantified in monetary terms, as supported by HACT and Simetrica's Wellbeing Valuation approach. Therefore, the finding stands closed. SDG 7: The PP has provided the necessary evidence to support the pre- and post-retrofit studies, as requested, to substantiate the reported energy savings and improvements in energy efficiency for SDG 7.1. The detailed documentation has been verified by the assessment team.	

Rule	Assessment Question	Findings/Comments (CL 4)	Developer Response
		Therefore, the finding stands closed. SDG 13: The PP has provided detailed evidence regarding the educational and awareness-raising activities conducted during the monitoring period. This includes descriptions of training sessions, participant roles, feedback collection, and the development of educational materials. Therefore, the finding stands closed. #closed.	

Rule	Assessment Question	Findings/Comments (CL 5)	Developer Response
VCS Standard, v4.7 Monitoring report templat	Stakeholder identification	In section 2.1.1 of MR: **Under legal or Customary rights:** The PP should document any legal or customary tenure/access rights that may be relevant to the project, even if no conflicts or adverse impacts were identified. This should include: - A description of any legal or customary rights held by stakeholders.	The PP has considered, and not identified, any customary rights held by stakeholders.

Rule	Assessment Question	Findings/Comments (CL 5)	Developer Response
		- An explanation of how these rights were considered during the project planning and implementation. **Under Stakeholder diversity and change over time:** The Project Proponent (PP) should provide detailed documentation on: • The process used to identify and engage new stakeholders as the project scaled. • Criteria or strategies employed to ensure that the expanding network of stakeholders aligns with the project's goals and maintains consistent quality and impact across different regions.	
	Rd 2	The PP has provided clarification that no legal or customary tenure/access rights held by stakeholders were identified as relevant to the project. Additionally, no adverse impacts on local stakeholders were identified, as the project focuses on facilitating retrofitting over demolition, thus offering a sustainable solution with reduced environmental and social disruption. The explanation provided confirms that legal and customary rights were considered	

Rule	Assessment Question	Findings/Comments (CL 5)	Developer Response
		during project planning, ensuring no negative outcomes for local communities. Furthermore, by opting for retrofitting, the project contributes positively to both community wellbeing and the environment. Therefore, the finding stands closed. **#Closed.**	

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
VCS Standard, v4.7 Monitoring report template	Local stakeholder inputs	In Section 2.1.2 of MR: 1. Inline with the information in the section, "The project proponent engages regularly with decarbonisation measure installers, including regular meetings and site visits to educate them about the project. Project partner HACT regularly engages with social housing providers and local government authorities through bilateral engagement at public events, webinars, and sector-specific initiatives." PP shall provide the evidence of the regular	1. Please see the provided participant project information., containing: • **Retrofit Credits Pack – Providers 24.** An overview of how the project works for social housing providers. • **Retrofit Credits – Key Milestones** A simple overview showing the expected project timeline for social housing participants. • **Letter Of Intent – Providers 2024 (Template)** A template of the Letter signed by social housing participants when first engaging with the service

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		meeting (including the monthly meeting), events and webinars, and shall also confirm if any grievance has been received. Additionally, PP has provided some dates of the events and webinars in the same section, PP shall provide the evidence of those and how the stakeholders inputs were taken during these meetings. As the section specifically asks for the ongoing communication with stakeholders. In the column for stakeholders Inputs, PP shall mention in line with template guidelines, "*Describe how due account was taken of all input received during the consultation. Include details on any updates to the project design or justify why updates were not necessary or appropriate"* Inline with section 2.1.3 of MR: 2. PP shall provide a contract between housing providers, local authorities, and PNZ, related to the ownership and carbon credits. In section outcome of FPIC: 3. PP shall provide the explanation inline with the template guide, "*Describe the outcome of the FPIC process, the transparent agreement, and the*	Please see the following documentation/folders/website links: • PNZC x Project Partners - Meeting Evidence (A Folder Containing) A folder containing records for meetings with measure installers and housing providers: ○ PNZC 1 – Evidence – 2023 Provider Meetings – Together Net Zero ○ PNZC 2 – Evidence – 2023 Provider Meetings – Gipsil ○ PNZC 3 – Evidence – 2023 Provider Meetings – Yorkshire Housing ○ PNZC 4 – Evidence – 2023 Provider Meetings – Gravesham Borough Council ○ PNZC 5 – Evidence – 2023 Provider Meetings – Loreburn Housing Association ○ PNZC 6 – Evidence – 2023 Provider Meetings – Camden Borough Council ○ PNZC 7 – Evidence – 2023 Provider Meetings – Surrey County Council PNZC 8 – Evidence – 2023 Provider Meetings – L&Q Group ○ PNZC 9 – Evidence – 2023 Provider Meetings – Northamptonshire Partnership Homes

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		information disclosed prior to establishing a transparent agreement with those concerned, IPs, LCs, and customary rights holders. Provide assurance that the project has not encroached on land, relocated people without consent, and forced physical or economic displacement" Inline with section 2.1.4 of MR: 4. PP shall also demonstrate that the procedure of continuous grievance is easily accessible to stakeholders for ongoing consultation, in line with template guidelines. Inline with section 2.2.2 of MR: 5. PP mentions that there are several regulatory authorities associated with the project, which are helping with proper implementation of the project, therefore, PP shall substantiate the the procedure of PNZ contract with these bodies, are they aware of carbon credits scheme. PP shall also provide the contract. Inline with section 2.3.1 of MR: 6. In the section for assessment of human rights, PP has mentioned all the details	○ PNZC 10 – Evidence – 2023 Provider Meetings – Paradigm Housing Group • **PNZC – Retrofit Credits Steering Group – Evidence of Meeting and Attendees** A Microsoft Outlook calendar invite showing the monthly Steering Group meeting and the invited attendees. This is an updated invitation, issued in March 2023, occurring every 1 month. • **PNZC – Stakeholder Engagement Overview – Updated For PNZC Response 2** Explanation • **PNZC Stakeholder Engagement Policy** An external-facing document, detailing how Stakeholder input is encouraged for the project. This document is hosted on the PNZ website at the following link: http://www.thepnzgroup.com/pnzc-stakeholder-engagement-policy • **PNZC Grievance Policy** An external-facing document, detailing the Grievance Policy/Procedure for PNZ Carbon. The document is hosted on the PNZ website at the following link:

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		related to the activities that are performed for safeguarding of the human right, however, PP shall submit the appropriate evidence to the VVB, demonstrating that these activities are actually performed and practice on site for protection of human rights. Along with the monitoring plan in place for these activities.	http://www.thepnzgroup.com/pnzc-grievance-procedure PNZC can also confirm that no grievances have ever been received in relation to the project or any associated activity. 2. Please see Clause 2.1(C) (and Background clause D) of the Social Housing Provider Contracts, and clause 1 (and Background clause D and E) of the Non-Social Housing Provider Contracts , as previously provided for participants in the QA dataset. 3. In reference to establishing a transparency agreement with those concerned, please see the following documents, as provided during PNZC Response 1: ○ **Retrofit Credits Pack – Providers 24.** An overview of how the project works for social housing providers. ○ **Retrofit Credits – Key Milestones** A simple overview showing the expected project timeline for social housing participants. ○ **Letter Of Intent – Providers 2024 (Template)** A template of the Letter signed by social housing participants when first engaging with the service.

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
			PNZC can confirm that the project has not encroached on land, relocated people without consent or forced physical or economic displacement. 4. The PNZC Grievance Policy/Procedure is hosted on the PNZ website, with the link publicly available and accessible to all. Please see the following link: http://www.thepnzgroup.com/pnzc-grievance-procedure 5. To clarify this point, PNZC does not work directly with these regulatory bodies, instead we outlined that participants of the project are regulated entities. For example, social housing providers will be regulated by the Social Housing Regulator and installation contractors will be regulated by various accreditation bodies. 6. Please see the following document, which is hosted on the PNZ Group website: o PNZC Human Rights Monitoring Policy An external-facing document, detailing the PNZC approach to human rights protection and monitoring. This

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
			document is hosted on the PNZ website at the following link: http://www.thepnzgroup.com/pnzc-human-rights-monitoring-policy
	Rd 2	1. PP submitted the "Retrofit Credits Pack" document, which details their engagement with the households enrolled in the project. Additionally, the PP provided a folder that was intended to contain evidence of meetings held with stakeholders. However, upon review, the folder was found to be empty, with no records of meetings included. The PP is required to submit the missing records of meetings as evidence of stakeholder engagement. #open 2. PP has satisfactorily addressed the finding by referencing the relevant clauses in the Social Housing Provider and Non-Social Housing Provider Contracts, These clauses adequately clarify the ownership and carbon credit arrangements. As a result, this finding is considered resolved. **#closed.** 3. PP submitted documents detailing the process of enrolling households in the project, explaining to housing providers	The PP has reviewed this folder, and the documentation is visible (10 separate documents). This could be a syncing issue with SharePoint and thus the existing documentation has now been deleted and re-uploaded to the folder. Please review the folder again and the documentation should now be visible. Please advise if the documentation is still not able to be accessed and the PP will send the documentation via alternative means. 5. Detailed documentation or evidence showing that the required certifications and declarations have been obtained have been provided to the VVB for the sample of homes visited as part of the site visit. Please see: 'Site Visits' folder in main SharePoint shared data room. 6. There has not been an evaluation of the effectiveness of these policies during the

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		how the project works and its expected results. The documents also provide transparent information on how the project operates and its impact on enrolled households. **#closed.** 4. A continuous grievance mechanism is in place and publicly available on the PP's website, offering various channels (email, physical address, telephone) for submitting grievances or complaints. The PP is requested to submit a log of all comments, positive or negative, received through these channels for the entire monitoring period. The grievance handling process is also outlined in the document. **#closed.** 5. PP explained in the MR that housing providers in the UK are regulated by several bodies in order to reduce natural and human induced risks to stakeholders' wellbeing. The role of each regulatory body is also explained in the MR. As these are commonly national standards, PP does not necessarily need to have a contract with these regulatory bodies. However, The PP mentions that compliance with building regulations and standards is verified through various certifications, such as Building Regulations Compliance Certificates, PAS certifications, or declarations by	monitoring period. There were no incidents or third-party evaluations, and no case studies have been developed at this point. We note this is not a requirement of the VCS and will keep this suggestion in mind for future consideration.

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		regulated social housing providers. Therefore, PP shall provide detailed documentation or evidence showing that the required certifications and declarations have been obtained for the retrofit activities conducted during the project. #open 6. The PP submitted their "Human Rights Monitoring Policy," which outlines the safeguards in place to uphold human rights across the company. The document also includes a detailed monitoring plan that discusses the processes and protocols for ensuring the protection of human rights across all stakeholders, however, the policies are in place, the PP should provide evidence of the effectiveness of these policies in preventing slavery and human trafficking. This could be in the form of case studies, incident reports, or third-party evaluations. #open	
	Rd 3	1. The PP has re-uploaded the missing records of stakeholder meetings, which are now visible in the designated folder. The documents have been reviewed the issue stands closed. 5. The PP has provided the required	

Rule	Assessment Question	Findings/Comments (CL 6)	Developer Response
		certifications and declarations, which verify compliance with building regulations and standards for the retrofit activities conducted during the project. Therefore, the finding stands closed. 6. The Project Proponent has clarified that during the monitoring period, there has been no evaluation of the effectiveness of the human rights policies, nor have there been any incidents, third-party evaluations, or case studies related to slavery or human trafficking. Therefore, the finding stands closed. # Closed.	
		All the points stands closed.	

Rule	Assessment Question	Findings/Comments (CL 7)	Developer Response
VCS Standard, v4.7 Monitoring	Assessment of group projects:	In section 3.3 of MR: PP mentions, “To stimulate and reward PAI owners for their efforts to reduce emissions,	The PNZC Participant Agreements outline contractually that participants in the scheme

Rule	Assessment Question	Findings/Comments (CL 7)	Developer Response
report template		such as decarbonisation measures directed at enhancing the building envelope, improving the efficiency of the central heating/cooling system, and reducing the fossil fuel and grid-connected electricity consumption of appliances in PAIs." PP shall specify if there were any rewards that are provided to PAI owners till now, Also, specify, what kind of rewards are presented. Additionally, under each of the eligibility criteria, PP mentions some documents to verify the implementation/eligibility criteria, PP shall provide those documents to the VVB to verify the details. 1. database with location of PAI, to verify they are within the project boundary 2. Database to cross check the income group (on sample basis) 3. Declaration by the holder of the statutory, property or contractual right in	receive set income from their participation in the project. Please see Section 7 'Use of Proceeds' and 5.1(i) 'First Party Payment' in the Social Housing Provider Contracts and Section 7 'Use Of Proceeds' and '(c) Consideration' in the Non-Social Housing Provider Contracts . No 'rewards' were provided before this project was registered as it is the first carbon crediting project to be registered in the UK. 1. Please see the **ER Worksheet (v2)** which has latitude and longitude information added. 2. Low-income households are defined as outlined in Section 3.3, Criteria 3-5 of the Monitoring Report as including: *The status of the dwelling is social housing stock under the Housing and Regeneration Act 2008*[13] *as evidenced by the owner or operator being a regulated provider of social housing or public entity.*

[13] Housing and Regeneration Act 2008, c. 17, section 68

Rule	Assessment Question	Findings/Comments (CL 7)	Developer Response
		the plant, equipment or process that generates GHG emission reductions 4. substantiate If there has been any replacement of appliances during this MP , providing the Documents mentioned (under eligibility 2). 5. Substantiate the documents to meet the eligibility 3 of vacancy	*Where a PAI is social housing stock this is indicated with a 'Y' in column J of the QA Group tab of the ER Worksheet and the name of the housing provider is listed in column K. The relevant declaration can be found at Schedule 2(4)(c) of the Social Husing Provider Contracts provided for the QA dataset.* 3. Please see Schedule 2(3) of the Social Housing Provider Contracts and Schedule 1(3) of the Non-Social Housing Provider Contracts. 4. Please see the declaration at Schedule 2(4)(f) of the Social Housing Provider Contracts and Schedule 1(4)(e) of the Non-Social Housing Provider Contracts. 5. Please see the declaration at Schedule 2(4)(g) of the Social Housing Provider Contracts and Schedule 1(4)(f) of the Non-Social Housing Provider Contracts.
	Rd 2	PP has provide the explanation related to rewards mentioning that there were no rewards provided till now, However, PP shall the type and timing of rewards presented to PAI owners, as well as any	The PNZC Participant Agreements outline contractually that participants in the scheme receive set income from their participation in the project ('rewards').

Rule	Assessment Question	Findings/Comments (CL 7)	Developer Response
		future plans. #open The PP submitted a sample of PNZC Participant Agreements, which stipulate the types of projects that will be supported using proceeds from the sale of VCUs. 1. PP amended the ER sheet to include the GPS location of each PAI. The VVB cross-checked that all GPS locations provided are located in the boundary of the project. # **closed** 2. The VVB verified the contracts between the PP and their partner housing providers, specifically reviewing Schedule 2.4.c, which confirms that the dwelling is part of the social housing stock. Contracts with Non-Social Housing Provider were also submitted by the PP. Additionally doing onsite visit, provided with the sufficient evidence. **Comment closed.** 3. The VVB verified Schedule 2.3 of the contracts with social housing providers, confirming that the PP holds the statutory property or contractual rights in the Project Activity where GHG reduction or removal is generated. The same statement is found in Schedule 1.3 of the contracts with non-social housing providers. **Comment closed**.	Please see Section 7 'Use of Proceeds' and 5.1(i) 'First Party Payment' in the previously provided Social Housing Provider Contracts and Section 7 'Use Of Proceeds' and '(c) Consideration' in the previously provided Non-Social Housing Provider Contracts. The timing of payment is dependent on the timeframe for issuance of the VCUs by Verra and their subsequent sale (payment follows the issuance of VCCs by the Registry and receipt of payment from a VCC Buyer). The level of this income is determined by the market demand (the sale price) for the carbon credits (VCUs) and as such the future plans for this reward will depend on the sale price of the credits.

Rule	Assessment Question	Findings/Comments (CL 7)	Developer Response
		4. The VVB verified Schedule 2.4.f of the contracts with social housing providers, confirming that for appliance replacement measures, the PP ensures the replaced appliances are functioning. The same statement is found in Schedule 1.4.3 of the contracts with non-social housing providers. **Comment closed.** 5. The VVB verified Schedule 2.4.g of the contracts with social housing providers, confirming that households are occupied at the time of the project activity and intermittent vacancy is only allowed for up to three months for the duration of the project activity. The same statement is found in Schedule 1.4.3 of the contracts with non-social housing providers. **Comment closed.**	
	Rd 3	The PP has clarified that the rewards for PAI owners are outlined in the PNZC Participant Agreements. These agreements contractually specify that participants receive income from their participation in the project, dependent on the sale of VCU, As it is part of the contract therefore, the finding stands closed. **# Closed.**	

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
VCS Standard, v4.7 Monitoring report template	Data and Parameters	In Section 4.1 Data and Parameters Available at Validation: 1. Parameter Elec,co2: PP shall clarify how the value 0.000212 was obtained. From Table 12 of SAP Manual. The emission factor of electricity is 0.519 kgCO2 per kWh. Converting to tCO2e per kWh, the value should be 0.000519 tCO2e/kWh In Section 4.2 Data and Parameters Monitored 2. Parameter F,co2,j: Wood logs and Wood Pellets: PP shall clarify how this value was computed. From Table 12 of SAP Manual. The emission factor of Wood logs is 0.019 kg CO2 per kWh and the emission factor of Wood pellets is 0.0039 kgCO2 per kWh. Converting both emission factors to tCO2e / GJ the derived values are 0.0052 and 0.011, respectively. 3. Parameter EL,pre,i: Under Frequency of monitoring/recording, PP shall clarify how the energy load pre-retrofit can be	1. As set out in the **MR**, the PDD allowed the use of either the SAP value or the CO2 emission factor prescribed in the UK Government GHG Conversion Factors for Company Reporting dataset at table 'UK electricity'. The MR states that this value comes from the Conversion Factors for Company Reporting dataset. This value was validated at project validation and approved at project registration; there is no deviation from the approach and language of the PDD in this Monitoring Period. 2. Please see the **amended Monitoring Report (v2)** where the values for Wood logs and Wood pellets have been updated accordingly. 3. If a pre-retrofit energy assessment took place prior to implementation of the project activity the data from this assessment can be used at a later date to calculate the *ELpre,i*. This approach was validated at project validation and approved at registration; there is no deviation from the approach and language of the PDD in this Monitoring Period.

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		calculated after installing an energy efficiency intervention. 4. Parameter Elecb,i: PP shall demonstrate how the parameter was derived for each PAI, given that Table A12 of the household Natural Gas and Grid-Connected Electricity Consumption data only provides aggregated data, such as mean, standard deviation, and median, among others. PP is requested to submit a demonstration for a sample PAI from both low-income and middle-income dwellings. Additionally, in the ER sheet, PP shall clarify how PAIs under category A, which do not use "Electricity" as a main fuel, still contain values for this parameter. 5. Paramater Fb,i,j: PP shall demonstrate how the parameter was derived for each PAI, given that Table A11 of the household Natural Gas and Grid-Connected Electricity Consumption data only provides aggregated data, such as mean, standard deviation, and median, among others. PP is requested to submit a demonstration for a sample PAI from both low-income and middle-income dwellings. 6. Parameter ECFy: PP shall clarify which table of Annex F - Energy demand, greenhouse gas emissions, and	4. As described in section 4.2 of the MR, consumption for each PAI is calculated by applying the mean consumption determined from a sample of PAIs of the Same Building Stock (the sample may be normalized for size) to all PAIs included in the project activity. Low-income single-family PAI baseline consumption is 3,000 kWh annually. Middle-income individual PAI baseline consumption is 3,900 kWh annually. In cases where a PAI in the project activity has a unique energy load reported in the pre-retrofit energy assessment, the unique energy load is incorporated into the calculation of the baseline consumption. As described in section 5.1 of the MR, the energy is considered unique where it is at least the mean consumption determined for the Same Building Stock. In such a case, the unique energy load (electricity) is used in place of the mean consumption from the sample of PAIs of the Same Building Stock. Please Note: this approach was validated at project validation and approved at

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		electricity generation trends data, the values of 0.9825 and 0.9835 were derived from. Additionally, PP shall demonstrate how Table A12 and Annex F were used in the calculation of the parameter. 7. Parameter HDDb: PP shall either provide the data on annual trends in temperatures and heating degree days published on February 24, 2022, or update the MR to be consistent with the information from the document linked, which redirects to a document published on July 27, 2023. 8. Parameter HDDb: PP shall demonstrate how HDDb were computed for each PAI given that the data only provides annual data for the whole of Great Britain. 9. Parameter Hload,pre and Hload,post: PP is requested to submit a demonstration on how this parameter was derived for a sample PAI from both low-income and middle-income dwellings.	registration; there is no deviation from the approach and language of the PDD in this Monitoring Period. Please see column G of the **ER Worksheet v2** for the specific parameter for each PAI. For a worked example, please see row 17 of the 'MR Jan-Dec 23' tab for a Low-Income PAI (Ref number: 1000016) – the parameter *Elecb,I* can be seen as 3,000 kWh annually. Please see row 248 for a Middle-Income PAI (Ref number: 1000247)– the parameter *Elecb,I* can be seen as 3,900 kWh annually. Please see row 8,549 for a Low-Income PAI with a unique electricity load reported in the pre-retrofit energy assessment, this can be evidenced by reviewing column H for this PAI (Ref number: 2002437) which is greater than 3,000 kWh. Please see row 8,369 for a Middle-Income PAI with a unique electricity load reported in the pre-retrofit energy assessment, this can be evidenced by reviewing column H for this PAI (Ref number: 2002190), which is greater than 3,900 kWh.

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			Values are included for Electricity where one of the following criteria is satisfied: a) the PAI is in Category A (reducing the energy consumption of Appliances); ***or*** b) Electricity is the main fuel. Please note: this approach was validated at project validation and approved at registration; there is no deviation from the approach and language of the PDD in this Monitoring Period. 5. As described in section 4.2 of the MR, consumption for each PAI is calculated by applying the mean consumption determined from a sample of PAIs of the Same Building Stock (the sample may be normalized for size) to all PAIs included in the project activity. Low-income single-family PAI baseline consumption is 1,104 m3 annually. Middle-income individual PAI baseline consumption is 1,382 m3 annually. In cases where a PAI in the project activity has a unique energy load reported in the pre-retrofit energy assessment, the unique energy load is incorporated into the

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			calculation of the baseline consumption. As described in section 5.1 of the MR, the energy load is considered unique where it is at least the mean consumption determined for the Same Building Stock. In such a case, the unique energy load (fossil fuel) is used in place of the mean consumption from the sample PAIs of the Same Building Stock. Please note: this approach was validated at project validation and approved at registration; there is no deviation from the approach and language of the PDD in this Monitoring Period. Please see column P of the **ER Worksheet v2** for the specific parameter for each PAI. For a worked example, please see row 3 for a Low-Income PAI (Ref number: 1000002) – the parameter *F,b,I,j* can been seen as 1,104 m3 annually. Please see row 177 for a Middle-Income PAI (Ref number: 1000176) – the parameter *F,b,I,j* can been seen as 1,382 m3 annually.

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			Please see row 43 for a Low-Income PAI with a unique fuel load reported in the pre-retrofit energy assessment, this can be evidenced by reviewing column Q for this PAI (Ref number: 1000042), which is greater than 11,500 kWh (kWh is divided by 10.416667 to calculate *F,b,l,j* in m3). The value in column Q is 11,551 kWh / 10.416667 = 1,108 m3, which is the value in column P. Please see row 3,846 for a Middle-Income PAI with a unique fuel load reported in the pre-retrofit energy assessment, this can be evidenced by reviewing column Q for this PAI (Ref number: 1003845), which is greater than 11,500 kWh (kWh is divided by 10.416667 to calculate *F,b,l,j* in m3). The value in column Q is 16,303 kWh / 10.416667 = 2,345 m3, which is the value in column P. 6. Please see the **ECF Calculation Datasheet** and the associated 'Steps' tab which explains the calculations. The basis for these calculations is Table 12 of the Household energy consumption data published by the Department for Business, Energy and Industrial Strategy (BEIS). Annex F of the Energy demand,

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			greenhouse gas emissions and electricity generation trends data is not used in this calculation. 7. In the registered PDD, the source of the "HDDy" and "HDDb" parameters is 'a reputable regional or national meteorological organisation *such as* National data published by the Department for Business, Energy and Industrial Strategy (BEIS) as part of the 'Energy Trends' quarterly bulletin.' In this Monitoring Period, data on HDDs is provided by the Meteorological Office from its observation site at Nottingham Watnall (WMO ID 03354) hosting a suite of instruments including surface meteorological observations and laser ceilometer. The station is located 117m above mean sea level in Nottinghamshire, east UK. Since 1941 meteorological observations have been recorded on a 24hr basis, linking the station to the synoptic network of the Met Office Meteorological Service. 8. Please see supporting document: **HDD_Dataset** which provides the calculation for HDDb and HDDy for each PAI. As outlined in section 5.4 and the Data & Parameters tables of the MR, to

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			accommodate the periodicity of adding PAIs to the project, emission reductions are calculated per Heating Degree Day (HDD). Every PAI has a unique HDDb for one year before project implementation, and Net GHG emission reductions accrue based on the number of Heating Degree Days since the date of the completed installation of the decarbonisation measures. 9. A pre-retrofit energy assessment takes place for each PAI before the decarbonisation measures are completed and a post-retrofit energy assessment takes place for each PAI after the decarbonisation measures are completed. Energy modelling software that implements the latest approved worksheet and conventions for SAP calculations as set out in the SAP Manual. The SAP methodology considers a range of factors that contribute to energy efficiency including materials used for construction of a PAI, thermal insulation of the building fabric, air leakage characteristics of the PAI, efficiency and control of the heating system(s) and the fuel used to provide space and water heating. Energy assessments cover both fossil fuel and grid-connected electricity consumption and may include physical inspection, diagnostic tests, use energy modelling software that implements the latest approved worksheet and conventions for SAP calculations as set out in the manual

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
			describing the Government's Standard Assessment Procedure, or apply building physics calculations. Please see supporting document: **Assessed_Output** showing the outcome data from the pre-retrofit assessments for a sample of Low and Middle-Income PAIs. *HLoadPre* data can be found in column H. Please see supporting document: **Assessed_Output** showing the outcome data from the post-retrofit assessments for a sample of Low and Middle-Income PAIs. *HLoadPost* data can be found in column I.
	Rd 2	1. The parameter Elec,co2 was validated during the project validation stage, and is considered as a fixed ex-ante parameter. Additionally, the value used is also more conservative as compared to values derived from Table 12 of SAP manual. **Comment Closed.** 2. The PP revised the MR to align with Table 12 of the SAP manual. However, the PP is requested to amend the ER calculation sheet to reflect the same values. The PP must ensure consistency between the values in the MR and the ER sheet. For example, PAI	2. This has now been implemented. Please see ER Worksheet v3. 4. Documentation showing the energy assessment has been provided to the VVB for these homes. Please see 'Additional PAIs' folder for supporting documentation relating to the additional requested PAIs. 5. Documentation showing the energy assessment has been provided to the VVB for

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		2007258 uses wood pellets as its main fuel, but the F,co2,j value still uses the old value of 0.015 instead of 0.011.#open 3. As outlined in the PDD and MR, each PAI undergoes a pre-retrofit and post-retrofit energy assessment before and after decarbonization measures are implemented. The pre-retrofit energy assessment provides the value for the parameter EL,pre,i. Comment closed.**Comment closed.** 4. The PP is requested to submit a sample of pre-retrofit energy assessments for PAIs with unique energy loads (i.e., not following the standard Elecb,i values of 3000 kWh for low-income and 3900 kWh for middle-income) and demonstrate how this unique energy loads were obtained. Specifically, the PP is requested to submit the pre-retrofit energy assessments for PAIs 2023368, 2004304, 2022396, 2037143, and 2020758, where values are significantly higher than the standard values. **Item remains open**. 5. The PP is requested to submit a sample of pre-retrofit energy assessments for PAIs with unique energy loads (i.e., not following the standard Fb,i,j values of 1,104 m3 for low-income and 1,382 m3 for middle-income) and demonstrate how this unique energy loads were	these homes. Please see 'Additional PAIs' folder for supporting documentation relating to the additional requested PAIs. Conversion factor of 10.416667 Cubic meters (m3) used x calorific value ÷ kWh conversion factor (3.6) = kWh. 1. How many cubic meters of gas used, e.g., 1,537 m3. 2. Multiply this number by the calorific value (37.5) 3. Divide this figure by 3.6 to calculate gas usage in kWh. Cubic meters (m3) used x 10.416667 = kWh. 6.This was due to an error in the data field matched to lowincome, single-family PAIs. Updates have now been implemented in the revised ER Worksheet v3. 9. Detailed documentation regarding the pre- and postretrofit assessments have been provided to the VVB for the sample of homes visited as part of the site visit. Please see: 'Site Visits' folder in main SharePoint shared data room. 10. This value is only relevant for the adjusted consumption approach. During the Monitoring

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		obtained. Specifically, the PP is requested to submit the pre-retrofit energy assessments for PAIs 2023368, 2004304, 2022091, 2022396, 2012078, 2037143, and 2010910, where values are significantly higher than the standard values calculated. Additionally, PP is requested to discuss how the conversion factor 10.416667 was derived, and its appropriate unit. **Item remains open.** 6. The PP submitted the ECF Calculation Datasheet showing how the ECF value was obtained. However, the PP needs to clarify why a significant number of low-income, single-family PAIs have an ECF value of 0.9835, which is typically assigned to middle-income PAIs. **Item remains open**. 7. The PP used the "Average Temperatures and Heating Degree Days and Deviations from the Long Term Mean" dataset published by BEIS on 24 Feb 2022, as it contains the validated values for the project's crediting period. **Comment closed.** 8. The PP submitted the HDD_Dataset, showing how the parameter HDDb was chosen for each PAI. The HDDb values listed in the HDD_Dataset were cross-verified with a sample of PAIs in the ER	Period, the project used only the pre- and post-retrofit energy assessment approach. This parameter is not applicable during this monitoring period. 11. Detailed evidence of the HDD values for each calendar day in the monitoring period are included on the 'HDD Days' tab of the ER Worksheet. Detailed evidence of the HDD values for each PAI are included in the 'MR Jan-Dec 23' tab of the ER Worksheet.

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		sheet for consistency and accuracy. **Comment closed.** 9. PP submitted the Assessed Output datasheet showing the results from the pre and post retrofit assessments for a sample of Low and Middle-Income PAIs. Values in the Assessed Output datasheet were cross-verified to the data in the ER sheet for consistency and accuracy. However, PP is requested to submit sample screenshots of the results from the energy modelling software for a sample of low-income and middle-income PAIs. **Item remains open.** 10. For parameter, $F_{p,y,j,}$ PP shall correct the monitoring frequency inline with the PDD 11. For HDD_y , The excel sheet mentions the value for these parameters, for both HDDb and HDDY, which is use the calculate the value of 0.2469, PP shall mention the appropriate values used. Also, as there are lot of new PAI being installed the values shall be demonstrated	
	Rd3	2. The ER sheet values for Fco2 (tCO2e / GJ) has been corrected as per SAP manual, therefore the finding stands closed.	

Rule	Assessment Question	Findings/Comments (CL 8)	Developer Response
		4&5 PP has provided the additional PAI folder mentioning the information required. Therefore the finding stands closed. 6. The ER sheet has now been updated and corrected. 9. PP has provided the documentation, related to pre and post retrofit labels. 10. PP has provided the relevant explanation, therefore the finding stands closed. 11. The value of HDD y are mentioned in the ER sheet and have been crosschecked therefore the finding stands closed. **#Closed.**	

Rule	Assessment Question	Findings/Comments (CL 9)	Developer Response
VCS Standard, v4.7 Monitoring report template	Emission reductions difference	Section 5.4 of MR: The Monitoring Report indicates a significant increase in the ex-post average GHG emission reductions and removals per PAI between two monitoring periods. The ex-post average GHG emission reductions during the first six-month monitoring period were reported as 0.220 tCO2e per year, whereas, during the second twelve-month monitoring period, this value increased to 0.5808 tCO2e per year. This represents an increase of more than 2.6 times compared to the previous period. PP is requested to provide a comprehensive analysis explaining the significant increase in ex-post GHG emission reductions.	This increase is insignificant in the context of the ex ante estimated reductions which were calculated at project validation as being 2.928 tCO2e per year. The relevant question is why the ex-post average GHG emission reductions and removals per PAI remains so low (0.5808 tCO2e per year compared to 2.928 tCO2e per year). An explanation of these differences is already included in section 5.4 of the MR, namely the increase from 0.220 tCO2e per year to 0.5808 tCO2e (which has now been updated to 0.7703 in the latest ER) per year is due to more intensive decarbonisation work per PAI. The project has observed an increase in the proportion of multi-measure projects compared to single-measure projects, and the pace and scale of decarbonisation have improved as a result. Most measures installed during the monitoring period were ‘fabric first’ improvements to the thermal efficiency of the building envelope – measures that are an important first step in improving energy efficiency because they provide a foundation for improving the heating

Rule	Assessment Question	Findings/Comments (CL 9)	Developer Response
			system's efficiency later. The average GHG emission reductions and removals per PAI are expected to continue to increase as this project begins to scale its innovative delivery model and funding mechanism to make what can often be unattractive decarbonisation business cases fundable. 0.7703 tCO2e per year remains below the ex-ante estimated reductions which were calculated at project validation as being 2.928 tCO2e per year because the challenges of decarbonising homes in the UK are many, and they are complex. UK homes often have solid walls built from simple foundations and external spaces unsuitable for adding an external insulation later. Adding insulation to internal walls demands careful detailing to avoid bridging the damp course. It poses the risk that the external walls remain cold and saturated with condensation, affecting the external structure. Decarbonising a home to be energy efficient also means aligning the interests of multiple stakeholders. It also requires scale and volume to reduce transaction cost, create economies of scale and attract private finance. The first two monitoring periods of this project have demonstrated that carbon finance can play an

Rule	Assessment Question	Findings/Comments (CL 9)	Developer Response
			important role in helping the expedite the pace and scale of housing decarbonisation.
	Rd 2	The PP has provided a comprehensive explanation for the significant increase in ex-post average GHG emission reductions between the two monitoring periods. The increase is attributed to more intensive decarbonisation measures per PAI, including a shift from single-measure to multi-measure projects. The explanation also addresses the technical challenges associated with retrofitting UK homes, such as solid wall structures and insulation complexities, which have limited the reductions to below the ex-ante estimates. Therefore the finding stands closed. **# Closed.**	

Rule	Assessment Question	Findings/Comments (CL 10)	Developer Response
VCS Standard, v4.7 Monitoring	Site visit findings	1. PP shall substantiate the long-term maintenance plan for the retrofit measures implemented, detailing the procedures that will be followed for continuous monitoring. This	1. This will be considered as a Forward Action Request for the next monitoring period.

Rule	Assessment Question	Findings/Comments (CL 10)	Developer Response
report template		should include the frequency of inspections, the methodology for assessing the continued effectiveness of the measures, and any corrective actions that will be taken if the performance of the retrofit measures declines over time. The PP shall provide evidence of how these procedures will ensure the sustained performance of the retrofitted measures throughout the project's duration. 2. PP shall provide a detailed explanation of the methodology used to assign reference numbers to each PAI included in the project. This explanation should cover the criteria used for numberingemployed to differentiate between various types of PAIs, and how this system ensures the unique identification and tracking of each PAI within the project scope. 3. PP is required to provide the actual documentation of the pre-retrofit and post-retrofit studies conducted for the PAIs that were visited during the monitoring period. The studies should include detailed assessments of the energy performance of the PAIs before and after the implementation of decarbonization measures, as well as any relevant data used to	2. The methodology for assignation of reference numbers is does not differentiate by different types of PAI. To generate reference numbers, we first sort the dataset by 'Completion Date' from the earliest to the latest (the date on which the work was completed for the PAI). Each property is assigned a unique number. Properties in the Pilot (first monitoring period) phase start from 1000001 and increase sequentially, while properties in Cycle Two (our next monitoring period) start from 2000001, in order of completion date. There are some small gaps in reference numbers, primarily due to properties being removed from the dataset after the reference numbers were assigned. 3. Documentation showing the energy assessment has been provided to the VVB for the sample of homes visited as part of the site visit. Please see: 'Site Visits' folder in main SharePoint shared data room.

Rule	Assessment Question	Findings/Comments (CL 10)	Developer Response
		calculate the GHG emission reductions and removals.	
	Rd 2	1. A forward action request will be raised. Please refer FAR 1. 2. PP has provided a detailed explanation of the methodology used to assign reference numbers to each PAI included in the project. The numbering system is based on the completion date of each retrofit, with properties in the Pilot phase assigned numbers starting from 1000001, and properties in Cycle Two starting from 2000001, in sequential order. The explanation is found to be satisfactory, hence the finding stands closed. 3. PP has provided the documentation mentioning the details of pre and post retrofit therefore the finding stands closed. **#Closed.**	

Rule	Assessment Question	Findings/Comments (CL 11)	Developer Response
VCS Standard, v4.7 Monitoring report template	Site visit findings	1. For PAI IDs 2042443 and 2062390, the family income is listed as £50,100, while the Excel sheet database categorizes these as low-income families. PP is requested to clarify the basis for categorizing families into low-income and middle-income groups in alignment with the PDD. Additionally, please explain how the indices of deprivation or deprivation levels of the area play a role in this categorization. 2. For some PAI IDs, it has been observed that there is no significant difference between pre- and post-retrofit energy efficiency results. The Project Proponent is requested to provide an explanation for these cases.	1.) The income figure included in the site visit documentation was for background information (it was listed in a section called 'local demographics' and referenced as the 'average household income' (for the Census Output Area). Assignment of PAIs to a category of building stock is not undertaken based on this data point. PAIs are assigned to an income (low-income or middle income) according to the criteria established in the PD. All social housing is considered low-income by default, following which PAIs are identified as either low-income or middle-income based on whether they are located within the most deprived four deciles nationally using the published Indices of Deprivation 2019 for England, Ministry of Housing, Communities and Local Government; for Wales, Welsh Government or for Scotland, Scottish Government. This approach is more conservative as the low-income building stock category has a higher performance benchmark for additionality purposes. 2.) In cases where a property is already reasonably energy efficient, more intensive improvements are needed to achieve a meaningful improvement. This is because efficient homes demand larger, deeper retrofit works to significantly improve efficiency primarily due to

Rule	Assessment Question	Findings/Comments (CL 11)	Developer Response
			the exponential nature of the calculations that underpin SAP assessments.
	Rd 2	1. Based on the Performance Standards, middle-income households must achieve at least a 4.4992% savings, while low-income households are held to a higher standard, requiring at least 5.0152% savings in fossil fuel and electricity consumption to be considered additional. The use of Indices of Deprivation for categorizing low-income households applies a more conservative method than income-based thresholds alone, ensuring that the most deprived households meet the higher benchmark. The ER sheet review confirms the accurate application of these standards, providing confidence in the additionality assessment for both income groups. There for the finding stands closed. **#Closed.** 2. It has been observed that for some PAI IDs, there is no significant difference between pre- and post-retrofit energy efficiency results. While the PP	The expected energy savings were achieved in these cases. The following example illustrates this point: Assume a more efficient boiler is installed in six identically sized homes (e.g. 90 square meters), all with mains gas as the primary heating source. The baseline energy consumption differs for each home. The retrofit installation of a more efficient boiler results in a significant improvement in energy consumption for the less energy efficient homes but no significant improvement for the more energy efficient homes. Similarly, the energy efficiency score would show a significant improvement for the less energy efficient homes but no significant improvement for the more energy efficient homes. If the PAI was already reasonably energy efficient (retrofit band B), the expected energy savings would be minimal

<table>
<tr><th>Rule</th><th>Assessment Question</th><th>Findings/Comments (CL 11)</th><th>Developer Response</th></tr>
<tr><td></td><td></td><td>has explained that properties with higher baseline energy efficiency require more intensive retrofit works to achieve meaningful improvements, and the supporting documents have been provided, further clarification is required. PP is requested to provide a detailed analysis of why the expected energy savings were not achieved in these cases, despite the measures taken. Additionally, please confirm whether any further retrofit interventions are planned for these dwellings.</td><td>despite the measures taken. The result is as would be expected.
Illustrative Table:
<table><tr><th>Initial EPC Band</th><th>Pre kWh</th><th>Post kWh</th><th>kWh Change</th></tr><tr><td>B</td><td>1,617</td><td>1,488</td><td>129</td></tr><tr><td>C</td><td>9,196</td><td>8,462</td><td>734</td></tr><tr><td>D</td><td>14,189</td><td>13,058</td><td>1,131</td></tr><tr><td>E</td><td>17,558</td><td>16,158</td><td>1,400</td></tr><tr><td>F</td><td>24,759</td><td>22,784</td><td>1,975</td></tr><tr><td>G</td><td>42,962</td><td>39,536</td><td>3,426</td></tr></table>
As for whether additional retrofit interventions are planned, that would be a matter for the participant in our project to determine.</td></tr>
<tr><td></td><td>R3</td><td>PP has provided a detailed response, demonstrating that the energy savings achieved align with expected outcomes based on the initial energy efficiency levels of each dwelling. The PP's example illustrates that properties with higher baseline efficiency inherently exhibit limited potential for further</td><td></td></tr>
</table>

Rule	Assessment Question	Findings/Comments (CL 11)	Developer Response
		significant energy savings, thereby explaining the observed minimal improvements post-retrofit. This clarification meets the verification standards, showing that the retrofit measures have been implemented effectively, with variations in results accounted for by initial efficiency differences. The decision regarding any further retrofit interventions is noted as being within the remit of individual project participants, a position consistent with the project's operational framework. Based on the evidence and explanation provided, the finding stands closed. #Closed.	

Rule	Assessment Question	Findings/Comments (CL 12)	Developer Response
VCS Standard,			Earlier versions of the Monitoring Report and

Rule	Assessment Question	Findings/Comments (CL 12)	Developer Response
v4.7 Monitoring report template		1. PP shall clarify the reason for decrease/ change in the number of PAIs installed in this MP from 69,961 to 39,927.	ER Worksheet included a small number of participants that had not completed their full governance processes for participation in the monitoring period. The retrofit works associated with these participants did occur during the monitoring period, however these works have been removed from the final dataset for inclusion in this monitoring period as the expected timeframe for completing their board approvals is likely to be later than the timeframe for completion of verification by the VVB. The Monitoring Report and ER Worksheet were subsequently updated to remove the emission reductions associated with these participants.
	Rd 2	It has been noted that the number of PAIs installed in the Monitoring Period decreased from 69,961 to 39,927. While the PP has explained that participants who had not completed their full governance processes were removed from the dataset, further clarification is required. The Project Proponent is requested to provide additional details on the specific governance processes that is followed by	Participants in the Grouped Project are required to enter into a contractual agreement with the project proponent and implementing partner (the Social Housing Provider and Non-Social Housing Provider Contracts referred to as 'Participant Agreements'). Example copies of this agreement have been previously provided to SustainCert. Please refer to the covering note for the revised ER Worksheet which highlighted that a

Rule	Assessment Question	Findings/Comments (CL 12)	Developer Response
		the PAI to be included in the project and also provide the confirmation that all the PAIs now included in the project have completed the government process along with appropriate evidences. #open	revision to the MR had occurred due to a delay in some participants signing their Participant Agreements. The retrofit works associated with these participants occurred during the monitoring period; however, these works are no longer included in the MR because their expected timeframe for signing the Participant Agreement is later than the timeframe for completion of the verification. The MR has been amended to remove the ERs associated with these participants. The ER Worksheet accurately reflects the number of PAIs in the amended Monitoring Report. All PAIs included in the MR and ER Worksheet have a signed Participant Agreement in place.
	RD3	PP has provided a detailed response, confirming that all PAIs currently included in the MR and Emission Reduction ER Worksheet have completed the necessary governance processes, including entering into a Participant Agreement with the project proponent and implementing partner. This contractual agreement ensures compliance with the project's requirements for inclusion. The documents has already been checked on the sample basis.	

Rule	Assessment Question	Findings/Comments (CL 12)	Developer Response
		The explanation provided by the PP, along with the assurance that all included PAIs have signed Participant Agreements, satisfies the requirements for closing this finding. Therefore, the finding stands closed. #closed.	

Rule	Assessment Question	Findings/Comments (CAR 1)	Developer Response
VCS Standard, v4.7 Monitoring report template		Section 1.12: PP shall mention cumulative of the contribution made by the project over its lifetime, in the table column mentioning contribution over project lifetime. PP shall make the number of PAI installed is consistent through out the MR.	Please see the amended Monitoring Report (v4), where figures for cumulative project contributions have been added to Section 1.12 as appropriate.

Rule	Assessment Question	Findings/Comments (CAR 1)	Developer Response
	Rd 2	PP has make the required changes in the MR, the cumulative contribution of the project over its lifetime for each of the targeted SDG has been demonstrated in section 1.2 of the MR, therefore the finding stands closed. PP has made PAI consistent through out the MR, there fore the findings stands closed. CAR closed.	

Rule	Assessment Question	Findings/Comments (CAR 2)	Developer Response
VCS Standard, v4.7 Monitoring	MR Template guidelines	Template: 1. PP shall add the date of initial submission to the assessment team on the cover page.	1. Please see **amended Monitoring Report (v2)**.

Rule	Assessment Question	Findings/Comments (CAR 2)	Developer Response
report template		2. Page numbers are missing from MR template, PP shall not temper the template provided by VCS. 3. PP Shall correct the methodology mention in the entire document. 4. In section 2.1.1, PP shall mention if there has been any change in the stakeholder makeup since validation of the project. 1. *Where the stakeholder make up has changed since validation, or stakeholders were not identified at verification, use the table below to describe the stakeholder identification process.* 5. Date of current MP in section 1.2 is incorrect, PP shall revise the same.	2. Please see **amended Monitoring Report (v2)**. 3. Please see **amended Monitoring Report (v2)**, where some mentions of 'VM008' have been corrected to 'VM0008'. 4. Please see **amended Monitoring Report (v2)**, section 2.1.1. Stakeholder make up has not changed since validation. 5. Please see **amended Monitoring Report (v2)**, section 1.2. Date has been corrected within the 'Period' box for the current MP.
	Rd 2	The PP amended the relevant sections of the Monitoring Report to align with the VCS MR Template Guidelines. The VVB reviewed the revised MR and verified that it conforms to the VCS MR template. **All comments closed.**	

Rule	Assessment Question	Findings/Comments (CAR 3)	Developer Response
VCS Standard, v4.7 Monitoring report template		1. Section 1.1, PP shall also mention the total number of retrofits done till date in the project activity (including the one done in MP1 of the project). 2. Section 1.12, table, in the column of Contribution over project lifetime, PP shall mention the total contribution made by the project over its lifetime. 3. Section 2.2.1, PP mentions the name of 3 companies, PNZ Energy, which delivers domestic decarbonisation; PNZ Carbon, which generates verified carbon credits; and PNZ Consulting, PP shall also provide the weblinks for the same. 4. PP mentions the project follows UK best practice, PP shall provide the weblinks for the same and any other information related to the same. 5. In section 3.1, In line with the template guidelines, “PP shall also confirm if there has been any change in the project monitoring plan or any uncertainties seen.”	1. Please see **amended Monitoring Report (v2)**, section 1.1. An additional sentence has been added to confirm that the total number of PAIs is inclusive of all works completed in both monitoring periods. 2. Please see **amended Monitoring Report (v2)**, where the figures provided for contributions over the project lifetime in Section 1.12, Table 1, have been updated. 3. Please see **amended Monitoring Report (v2)**, section 2.2.1. Information on PNZ Carbon Limited has been simplified. 4. Please see **amended Monitoring Report (v2)**, for clarity some references have been removed and weblinks for some references have been added. 5. Please see **amended Monitoring Report (v2)**, section 3.1. To confirm, there have not been any changes to the monitoring plan.

Rule	Assessment Question	Findings/Comments (CAR 3)	Developer Response
	Rd 2	The PP amended the relevant sections of the Monitoring Report to align with the VCS MR Template Guidelines. The VVB reviewed the revised MR and verified that it conforms to the VCS MR template. **All comments closed.**	

Rule	Assessment Question	Findings/Comments (FAR 1)	Developer Response
VCS Standard, v4.7 Monitoring report template		FAR 1: PP is requested to substantiate the long-term maintenance plan for the retrofit measures implemented. This should include detailed procedures for continuous monitoring, specifying the following: 1. **Frequency of Inspections**: Provide a schedule for how often the retrofit measures will be inspected to ensure they remain effective over time. 2. **Methodology for Assessment**: Outline the process and criteria that will be used to assess the continued performance of the retrofit measures. 3. **Corrective Actions**: Describe the steps that will be taken if the performance of the retrofit measures	

Rule	Assessment Question	Findings/Comments (FAR 1)	Developer Response
		declines or fails to meet expected standards.	
	Rd 2		

APPENDIX 3: FINDINGS

CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon dioxide
FAR	Forward Action Request
EHS	English housing survey
EPC	Energy Performance Certificate
GHG	Green House Gas
MR	Monitoring report
MWh	Mega watt hour
PD	Project description
PP	Project Proponent
IP	Indigenous People
SAP	Standard Assessment Procedure
SPC	Southern Power Company
UNFCCC	United Nation Framework Convention on Climate Change
VCS	Verified Carbon standard

APPENDIX 5: COMPETENCY STATEMENT

COMPETENCY STATEMENT	
Name	Muskan Chawla
Years of Experience	2+
QUALIFYING ROLES	
Team Leader	Yes
Auditor	Yes
Country Expert	Yes, CE Region 1 (English) / CE Region 6 (Hindi)
Technical Expert	Yes (1.1, 1.2)
Financial Expert	No
Independent Reviewer	Yes
APPROVAL	
Approved by	Head of Quality and Compliance, SustainCERT
Date	05/09/2023

COMPETENCY STATEMENT	
Name	Shivraj Sharma
Years of Experience	19+
QUALIFYING ROLES	
Team Leader	Yes
Auditor	Yes
Country Expert	Yes, CE Region 1 (English) / CE Region 6 (Hindi)
Technical Expert	Yes (1.1, 1.2)

Financial Expert	Yes
Independent Reviewer	Yes
APPROVAL	
Approved by	Head of Quality and Compliance, SustainCERT
Date	15/07/2022

COMPETENCY STATEMENT	
Name	Randulph Morales
Years of Experience	1+
QUALIFYING ROLES	
Team Leader	No
Auditor	Yes
Country Expert	Yes, CE Region 1 (English) / CE Region 6 (Filipino)
Technical Expert	No
Financial Expert	No
Independent Reviewer	No
APPROVAL	
Approved by	Head of Quality and Compliance, SustainCERT
Date	04/08/2023

COMPETENCY STATEMENT	
Name	Indrapal Parmar
Years of Experience	15+
QUALIFYING ROLES	
Team Leader	Yes

Auditor	Yes
Country Expert	Yes, CE region 1 (English) / CE Region 6 (Hindi)
Technical Expert	Yes (1.1, 1.2, 1.6)
Financial Expert	Yes
Independent Reviewer	Yes
APPROVAL	
Approved by	Head of Quality and Compliance, SustainCERT
Date	15/07/2022