

# **Social Housing Net Zero Heat Fund Progress Report**

**Scottish Government Supported Social  
Housing Net Zero Heat Fund Projects –  
October 2024**

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## Introduction

This document produced by the Scottish Government's Directorate for Energy and Climate Change summarises the projects supported by the Social Housing Net Zero Heat Fund (SHNZHF).

The Social Housing Net Zero Heat Fund offers capital grant funding to support social housing landlords across Scotland to install clean heating systems and energy efficiency measures across their existing housing stock.

The document includes a series of one-page summaries for each of the projects supported by the Scottish Government through the Social Housing Net Zero Heat Fund.

For questions relating to the projects summarised in this document or Fund enquiries, please direct these to [netzerosocialhousing@gov.scot](mailto:netzerosocialhousing@gov.scot).

# Glossary

ASHP – Air Source Heat Pump

GSHP – Group Source Heat Pump

ESH – Electric Storage Heater

HHRSH – High Heat Retention Storage Heater

MVHR – Mechanical Ventilation with Heat Recovery

UFI – Underfloor Insulation

LITU – Loft Insulation Top Up

RIRI – Room in Roof Insulation

Solar PV – Solar Photovoltaic Panels

IWI – Internal Wall Insulation

EWI – External Wall Insulation

CWI – Cavity Wall Insulation

# **Project Title: Moray Council Off-Gas Electrification of Heat**

**Project Organisation:** Moray Council

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Multiple locations across Moray Council

**Grant Value:** £1,349,849

**Completion Date:** November 2023

**Project Headline:** Providing clean heating and microgeneration to 121 homes across Moray

## **Project Description:**

This project across Moray focused on renewable generation and electrification of heat with a holistic whole energy systems approach. 121 socially rented properties had a combination of measures installed depending on property size and archetype.

The low carbon technology combination replaced a range of inefficient heating systems including solid fuel (coal) back boilers, electric panel heaters and electric storage heaters and so had a significant impact in reducing the risk of fuel poverty with the communities and improved householder comfort.

The project aimed to address the problem of decarbonising heat in smaller, hard to treat domestic properties. Tenant advice and support as well as tariff and supplier switching support was provided to ensure householders understand the new systems and how to get the most out of them/advice on how the systems interact with each other and how to maximise PV generation and ensure maximum efficiency of the heating systems are provided through a range of communication methods.

# **Project Title: Carron Estate ASHP Heat Network Project**

**Project Organisation:** NG Homes

**Technology Type(s):** ASHP, Solar PV

**Location(s):** Springburn, Glasgow City Council

**Grant Value:** £3,695,187

**Completion Date:** July 2022

**Project Headline:** Installation of ASHP system to replace existing electric wet system in 314 homes in tower blocks.

## **Project Description:**

This project saw NG Homes install ASHPs into seven tower blocks in the Springburn area of Glasgow, North of Glasgow City Centre. There are four 16-storey high-rise tower blocks and three 9-storey tower blocks situated on the Carron Estate. The 314 dwellings within the blocks previously had a mixture of 'old' inefficient electric storage and electric wet systems, which are expensive to run.

The project installed a Commercial-Grade Mitsubishi Ecodan CAHV Monobloc Air Source Heat Pump (ASHP) system which is connected to an underground district heat network that will serve all seven blocks. The heat network has pre-insulated pipework connected to insulated steel risers through each of the blocks. Insulated copper pipework forms the lateral pipework into each of the dwellings. The system also benefits from the installation of solar PV onto three of seven blocks.

# **Project Title: Moray and Aberdeenshire Heat Pumps 2021**

**Project Organisation:** Osprey Housing

**Technology Type(s):** ASHP

**Location(s):** Multiple locations across Moray Council and Aberdeenshire Council

**Grant Value:** £342,441

**Completion Date:** May 2022

**Project Headline:** Providing clean heating to 61 homes across Moray and Aberdeenshire

## **Project Description:**

This project took place in 61 properties in Burghead, Aberchirder, Garmouth and Keith. Replacing inefficient storage and panel heaters with ASHPs, efficient radiator system and hot water cylinders. A radiator was installed in each room with its own thermostat and programmer. The new hot water cylinder is also heated by the ASHP. This helped to reduce fuel bills as the hot water was also heated with the off-peak electricity which was expensive to run.

These properties were selected for this project due to the concerns repeatedly raised by tenants regarding the effectiveness and the affordability of their previous heating systems. The housing association undertook monitoring of the properties to ensure the highest priority properties were being included in this project.

# **Project Title: Decarbonisation and Renewables Demonstrator Project**

**Project Organisation:** Dumfries and Galloway Housing Partnership

**Technology Type(s):** ASHP, Solar PV, Battery Storage

**Location(s):** Multiple locations across Dumfries and Galloway Council including: Annan, Dumfries, Canonbie, Castle Douglas, Dalbeattie, Gretna, Kirkcudbright, Langholm, Lockerbie, Moffat, Newton Stewart, Sanquhar, Stranraer, Thornhill

**Grant Value:** £1,481,340

**Completion Date:** January 2023

**Project Headline:** Project replaced solid fuel heating in 101 properties with combined measures including ASHPs, solar PV panels and battery storage.

## **Project Description:**

The project involved upgrading 101 solid fuel properties through the installation of ASHPs, solar PV panels and battery storage technology to decarbonise heat provision.

The project was designed to ensure those most likely to be in or at risk of fuel poverty and living in properties that were the least energy efficient were included. The tenant group largely comprised elderly individuals within rural and remote areas – a demographic that benefitted considerably from a reduction in utility bills and access to a greater discretionary income.

The insight gained from this pilot allowed Dumfries and Galloway Housing Partnership to take forward a long-term plan of decarbonisation.

# **Project Title: Hebridean Heat Pumps**

**Project Organisation:** Hebridean Housing Partnership

**Technology Type(s):** ASHP

**Location(s):** Multiple locations across Comhairle nan Eilean Siar

**Grant Value:** £708,611

**Completion Date:** April 2022

**Project Headline:** Replacing storage heating systems and inefficient electric boiler systems with new ASHP central heating systems.

## **Project Description:**

This project installed ASHPs to 192 properties which were previously heated by storage heating or inefficient electric boilers. The archetypes of the properties were a mix of flats and houses.

Both previous heating systems had issues with affordability, efficiency and user controllability. Those tenants that had storage heating were on restricted meters, which made it difficult to switch suppliers. The non-heating tariff was also too expensive to be a viable option.

By installing clean heating, the energy consumption was reduced, as well as carbon emissions. Tenants were also given more control over their heating and their fuel bills were reduced in cost.

# **Project Title: Falkirk Council – Off-Gas Villages – Energy Efficiency Programme**

**Project Organisation:** Falkirk Council

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Standburn, Torwood, South Alloa and Blackness, Falkirk Council

**Grant Value:** £298,273

**Completion Date:** November 202

**Project Headline:** Installation of ASHP, Solar PV and Battery storage into 28 properties in rural villages

## **Project Description:**

This project installed clean heating and microgeneration to 28 properties in Standburn, Torwood, South Alloa and Blackness across Falkirk Council.

The properties, which were of mixed archetype, received an ASHP, solar PV and battery storage.

The project estimated that fuel bills were reduced by half for tenants and thermal comfort was significantly improved.

# **Project Title: Rural Stirling Off-gas Electrification of Heat**

**Project Organisation:** Rural Stirling Housing Association

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Aberfoyle, Stirling Council

**Grant Value:** £486,357

**Completion Date:** July 2022

**Project Headline:** Providing clean heating to 30 properties in Aberfoyle

## **Project Description:**

The project focused on renewable microgeneration generation and electrification of heat with a holistic whole energy systems approach. 30 social rented properties around Aberfoyle received various energy efficiency measures, which varied depending on the property size and archetype.

The low carbon solution replaced a range of inefficient heating systems including solid fuel (coal) back boilers, electric panel heaters and electric storage heaters. The project was successful in reducing energy consumptions, carbon emissions, energy bills for tenants as well as improving thermal comfort in the homes.

The project's aim was to address the problem of decarbonising heat in smaller, hard to treat domestic properties and accelerated the decarbonisation of heating in off gas properties.

# **Project Title: 107 Niddrie Road Project**

**Project Organisation:** Southside Housing Association

**Technology Type(s):** ASHP

**Location(s):** Glasgow, Glasgow City Council

**Grant Value:** £128,618

**Completion Date:** July 2022

**Project Headline:** Retrofit of 8 tenement flats to Passive Haus (EnerPHit) standard

## **Project Description:**

This project applied EnerPHit principles to the retrofit of 8 pre-1919 sandstone tenements in the south side of Glasgow.

All 8 flats were acquired by Southside Housing Association and provided a unique opportunity to progress a deep retrofit in pre-1919 tenements. The project aimed to assess the scalability and replicability and share lessons learned for Scotland's wider pre-1919 tenement stock.

The project saw the installation of insulation and air tightness measures alongside triple glazed windows. ASHPs were installed in the 4 lower story flats with the upper 4 flats remaining on gas, with the project collecting data about how they compare. Wastewater heat recovery systems were also installed to capture and recycle the heat in water from baths, showers and the kitchen sink alongside mechanical ventilation with heat recovery.

To learn wider lessons for tenement retrofit, the project was evaluated by a research partnership resourced by the Scottish Funding Council.

# **Project Title: Clydebank Housing Association - Queen's Quay District Heating Network Extension**

**Project Organisation:** Clydebank Housing Association

**Technology Type(s):** District Heating Extension

**Location(s):** Clydebank, Glasgow City Council

**Grant Value:** £410,601

**Completion Date:** March 2024

**Project Headline:** The connection of 46 Social Houses on Dumbarton Road, Clydebank to the Queens Quay District Heating Network

## **Project Description:**

This project was designed to directly tackle fuel poverty within the properties as well as increase tenancy sustainability. The properties previous storage heating system resulted in high energy bills with a number of tenants reporting that they choose not to use the system at all due the affordability.

The properties were connected to the district heating system set up for the Queen's Quay development. This district heating system creates clean heat from the River Clyde and will allow Clydebank HA to tackle fuel poverty and minimise the carbon footprint of properties connected to it with regards to heating regimes. Properties had previously undergone insulation works (Cavity, Loft, Solid Wall Insulation) prior to considering heating replacement.

This project aimed to tackle fuel poverty and positively impacted the wellbeing of tenants through being able to heat their homes throughout the day, providing both physical and mental health benefits.

# **Project Title: DGHP Cavity Wall Insulation**

**Project Organisation:** Dumfries and Galloway Housing Partnership

**Technology Type(s):** CWI

**Location(s):** Multiple locations across Dumfries and Galloway Council including: Annan, Canonbie, Castle Douglas, Dalbeattie, Dumfries, Gretna, Kirkcudbright, Lockerbie, Moffat, Newton Stewart, Stranraer, Thornhill

**Grant Value:** £327,525

**Completion Date:** March 2023

**Project Headline:** This project involved installing Cavity Wall Insulation (CWI) across 397 properties in various locations across Dumfries and Galloway

## **Project Description:**

The project involved installing CWI to 397 properties with a range of current heating sources. The installation of measures led to reductions on tenant's fuel bills. The project was designed to ensure those most likely to be in or at risk of fuel poverty and living in properties that are the least energy efficient were included. The tenant group comprises vulnerable and elderly individuals within rural and remote areas and were located within areas with high levels of deprivation.

The program formed Phase 1 of a longer term program designed to improve the fabric of Dumfries and Galloway Housing Partnership's housing stock and ready the properties for future clean heating solutions.

# **Project Title: Waverley HA ESSH Fabric Upgrades Programme**

**Project Organisation:** Waverley Housing Association

**Technology Type(s):** CWI, FI, RI, Double Glazing, External Doors and LITU

**Location(s):** Edinburgh, Edinburgh City Council

**Grant Value:** £140,000

**Completion Date:** June 2022

**Project Headline:** Installation “fabric first” energy efficiency measures into 56 properties, enabling future investment in low carbon emission heating

## **Project Description:**

The project involved the installation of fabric improvement measures to 56 properties in multiple areas within Edinburgh Council. The homes were of a varied archetype and so the measures installed varied between properties.

The fabric measures that were installed, dependent on need/ suitability per property, were: Energy efficient double glazing, external doors, CWI, UFI, Flat/sloping roof insulation and Loft insulation/loft insulation top-up.

These properties were targeted as they were among the least energy efficient from the organisation’s stock, with an EPC rating of E or F. These fabric measures improved the EPC rating, reduced energy bills for tenants and improved thermal comfort for the tenants in their homes.

# **Project Title: Aberdeenshire Council - Steps to Net Zero for Hard-to-Treat Properties**

**Project Organisation:** Aberdeenshire Council

**Technology Type(s):** HHRSH, IWI, Solar PV

**Location(s):** Multiple locations across Aberdeenshire Council including: Aberchirder, Bridge of Marnoch, Fraserburgh, Huntly, Inverurie, Peterhead and Stonehaven.

**Grant Value:** £2,523,860

**Completion Date:** February 2023

**Project Headline:** Upgrading of 120 hard to treat properties with Internal Wall Insulation, High Retention Storage Heaters and Solar Panels

## **Project Description:**

The project scaled up an existing Aberdeenshire Council program that involved carrying out works to void properties, comprising a mix of houses and flats. These are all hard-to-treat properties, typically with stone cladding making both External and Cavity Wall Insulation unsuitable. Therefore, Internal Wall Insulation was deemed the most appropriate solution for these properties, alongside other insulation measures as required and where applicable.

The properties included were all vacant properties owned by Aberdeenshire Council, in various locations across Aberdeenshire. Due to the disruption IWI could cause to tenants the decision was taken to install the IWI and appropriate complimentary measures in the void period between tenancies, maximising efficiencies in terms of installs.

The properties had old heating systems that included a mix of electric storage heating and oil and gas fired central heating. Energy efficiency measures installed primarily included internal wall insulation, alongside a mixture of other measures which depended on the particular property. These measures include the following: loft insulation, under-floor insulation room-in-the-roof insulation and double or secondary glazing.

High Heat Retention Storage Heaters and Solar PV were also installed alongside the energy efficiency measures wherever the existing heating system required replacement. The project aimed to provide a significant step towards meeting climate change goals in hard to treat properties, avoiding increases in household energy bills and disruption to tenants.

# **Project Title: Net Zero Heat Project, Kirkbank, Auchmithie**

**Project Organisation:** Angus Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage and UFI

**Location(s):** Auchmithie, Scottish Borders Council

**Grant Value:** £550,149

**Completion Date:** May 2022

**Project Headline:** Providing Clean Heating and reduced energy bills to 36 rural properties in the Scottish borders

## **Project Description:**

The project provided clean heating to 36 properties in Auchmithie, Scottish Borders. The properties received an ASHP, solar PV and battery storage technology to decarbonise the heat provision in these homes and bring further benefits to tenants in terms of utility bill savings. The properties were heated by inefficient, traditional storage heating systems and twin immersion dual hot water cylinders, which all tenants had said were expensive to run.

The project had been designed to ensure those most likely to be in or at risk of fuel poverty and living in properties that are the least energy efficient are included. The homes selected for intervention were failing the Energy Efficiency Standard for Social Housing (EESH) and were located within a rural area; resulting in additional travel spend to allow householders to access vital amenities which further exacerbated the difficulties tenants faced in heating their homes. To ensure the newly installed heating systems perform as effectively as possible, underfloor insulation was also installed where required.

This project was the initial phase in Angus Housing Association's drive to contribute towards Scottish Government's fuel poverty and net zero targets. The insight gained from this pilot will allow them to take forward a long-term plan of decarbonisation, with tenant outcomes at the centre of their considerations.

# **Project Title: BISF properties Upgrade: Newarthill & Newmains**

**Project Organisation:** North Lanarkshire Council

**Technology Type(s):** EWI

**Location(s):** Newarthill and Newmains, North Lanarkshire

**Grant Value:** £275,500

**Completion Date:** March 2022

**Project Headline:** Installation of External Wall Insulation into 20 properties with poor energy ratings

## **Project Description:**

This project aimed to improve energy efficiency measures in non-traditional semi-detached hard-to-treat British Iron and Steel Federation (BISF) properties. The project involved 20 properties receiving external wall insulation improving the u-value of the walls to 0.17, properties also benefitted from solar PV, not installed as part of the SHNZHF grant funding.

BISF properties are steel constructed 3-bedroom semi-detached house types with steel frames and steel sitting within the wall cavity, and plasterboard lining to the internal walls. The original roof finish was profiled asbestos cement which had already been replaced as part of previous works by the local authority.

The property type was selected as it was recognised as suffering from poor energy efficiency with EPC recorded as low as band E and original external wall values assessed as being between 1.48-1.68W/m<sup>2</sup>k. The properties were all heated by gas condensing boilers with individual TRVs on radiators and house thermostat.

As well as pre and post EPCs, the project involved tenant liaison to ensure tenants were most effectively using their heating systems in addition to receiving advice on their energy tariff and advice on preventing condensation based on the increased energy efficiency of the properties.

# **Project Title: Mackenzie Gardens' Zero Emission Heating Project**

**Project Organisation:** Grampian Housing Association

**Technology Type(s):** Communal ASHP system, Solar PV, Battery Storage, CWI, LITU

**Location(s):** Turriff, Aberdeenshire

**Grant Value:** £306,534

**Completion Date:** August 2022

**Project Headline:** Project involved 23 properties through the connection to a communal Air Source Heat Pump system alongside the installation of solar photovoltaic panels and battery storage, and insulation.

## **Project Description:**

This project involved the installation of a communal air source heat pump system to supply low carbon heat to 23 social housing homes in Turriff, Aberdeenshire. Additional Energy Conservation Measures (ECMs) were also installed as part of a PAS2035 retrofit program including Solar PV Panels, Battery Storage, CWI and LITU.

Solar panels were installed so solar energy can be stored (in battery storage) and used to reduce energy costs for tenants, with any excess energy been fed back into the grid or provisioned for use in other Grampian Housing Association housing stock nearby.

The installation sought to not only reduce carbon emission but to reduce tenants' energy bills. In addition to the ECMs installed, a dynamic metering and billing system and thermostatic heat controls were also installed.

The system was also designed with the potential for adding additional properties in the future, with the ASHP system designed to allow heat pump modules to be added.

# **Project Title: Cairn Housing Association – Whole House Retrofit**

**Project Organisation:** Cairn Housing Association

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Wick, Highland Council

**Grant Value:** £92,813

**Completion Date:** November 2022

**Project Headline:** Whole house retrofit pathfinder of 2 homes in Wick

## **Project Description:**

This project was as a pilot project for the organisation, which will act as a pathfinder for future projects to upgrade their housing stock. The project took the whole house retrofit approach and installed clean heating and energy efficiency measures to 2 homes in Wick, Scottish Highlands. These properties were built in the 1950s of traditional construction but had irregular cavity width with previously no wall insulation.

The measures included as ASHP, solar PV, battery storage, EWI, UFI, Roof Insulation, Triple glazed windows, external doors, MVHR. The houses were previously heated by a mix of storage heaters and panel heating, along with a hot water cylinder in a cupboard upstairs which provides hot water via immersion.

The aim of the whole house retrofit was to bring the properties to Enerphit standard.

# **Project Title: Communal Ground Source Heat Pump - Social Housing Net Zero Heat Fund**

**Project Organisation:** Cairn Housing

**Technology Type(s):** Double Glazing, Upgraded Doors and Solar PV

**Location(s):** Blairgowrie, Perth and Kinross Council

**Grant Value:** £524,916

**Completion Date:** March 2024

**Project Headline:** Fabric First and microgeneration to 35 homes in Blairgowrie

## **Project Description:**

The project aimed to provide clean heating, microgeneration and fabric first measures to 35 properties in Blairgowrie, Perth and Kinross. There were a mix of property archetypes in this project; 28 one bed flats, 4 one bed mid terrace bungalows, 2 one bed end terrace bungalows and 1 three bed semi-detached house.

The proposed technologies included a communal GSHP to provide clean heating, and double glazing and new external doors to provide energy savings measures, to all 35 properties. Additionally, solar PV were installed to provide microgeneration to the 6 bungalows.

There were some issues with the feasibility for the GSHP that were not discovered until after the project started, so it did not go ahead. However the fabric first measures and microgeneration were installed, which provided tenants with improved thermal comfort and a reduction of fuel bills.

Cairn Housing Association subsequently withdrew the clean heating element from the project, with the intention to come forward again at a future checkpoint with a feasible plan for providing these homes with clean heating.

# **Project Title: Installation of High Heat Retention Storage Heaters, Solar Panels and Battery Storage to Cliffview Court Arbroath and St Drostan's Court Brechin**

**Project Organisation:** Angus Council

**Technology Type(s):** HHRSH, Solar PV and Battery Storage

**Location(s):** Arbroath and Brechin, Angus Council

**Grant Value:** £212,326

**Completion Date:** November 2022

**Project Headline:** Installation of clean heating and microgeneration to 26 homes in Arbroath and Brechin

## **Project Description:**

The properties were a mix of end and mid terraced bungalows in supported accommodation and were previously heated by inefficient electric storage heaters. The measures installed in this project included new high heat retention storage heaters, solar PV and battery storage to all properties.

The installation of new HHRSHs allowed for more control and usability of the technology for tenants. The upgraded heaters had smart controls that allowed for more accurate calculation of energy bills, and highly insulated cores which allowed heat to be released when required, thus saving energy and reducing energy bills.

By installing the upgraded heaters alongside solar PV and battery storage, this project ensured reductions in carbon emissions and reduction in fuel bills for the tenants, transforming these properties into zero carbon homes.

# **Project Title: ASHP Programme - 2022**

**Project Organisation:** Berwickshire Housing Association

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Multiple locations, Scottish Borders Council

**Grant Value:** £756,204

**Completion Date:** March 2024

**Project Headline:** Clean heating and microgeneration to 109 properties in the Scottish Borders

## **Project Description:**

This project installed clean heating and microgeneration to 109 properties across the Scottish Borders. All homes received ASHPs and those properties that did not already have Solar PV were given it where suitable depending on property archetype. The project was specifically designed to target tenants in rural areas who had inefficient or carbon-intensive existing heating systems, bringing the potential for energy bill savings while eliminating tenants' reliance on fossil fuels and electricity from the grid. A number of properties selected for inclusion in this project had existing solar PV panels which were connected to the ASHP technology which further improve outcomes for tenants in terms of reduced running costs, while bringing the properties closer to a net zero solution.

Berwickshire Housing Association developed insulation and airtightness strategies where required for the target addresses, ensuring that heat demand is sufficiently reduced in the properties to allow the heat pumps to work as efficiently as possible once installed.

# **Project Title: Decarbonisation Programme - Jedburgh and Newton St. Boswells**

**Project Organisation:** Waverley Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage and UFI

**Location(s):** Jedburgh and Newton St Boswells, Scottish Borders Council

**Grant Value:** £450,001

**Completion Date:** March 2024

**Project Headline:** Installation of clean heating and microgeneration to 32 homes in the Scottish Borders

## **Project Description:**

This project brought clean heating and microgeneration to 32 properties in Jedburgh and Newton St Boswells, in the Scottish Borders. All properties had ASHPs installed in combination with solar photovoltaic panels and battery storage technology where necessary in a number of properties including terraced, bungalows and four in a block housing archetypes.

The project targeted residents in Jedburgh and Newton St, Boswell who had inefficient or carbon intensive heating systems, bringing the potential for energy bill savings. Additional insulation measures were installed where required to achieve better energy efficiency. To maximise uptake, Waverley Housing Association proposed using the Q-Bot system for properties where underfloor insulation is recommended. Q-Bot is a robotically applied foam insulation system that reduces disruption and is particularly suitable for those tenants that are elderly and/or vulnerable.

# **Project Title: Hebridean 100**

**Project Organisation:** Hebridean Housing Partnership (HHP)

**Technology Type(s):** ASHP

**Location(s):** Multiple locations across Comhairle nan Eilean Siar - Isle of Barra, Isle of Benbecula, Isle of Lewis, Isle of North Uist, Isle of South Uist, Stornoway

**Grant Value:** £750,000

**Completion Date:** March 2024

**Project Headline:** Project involved installing 106 ASHP systems into homes across the Western Isles

## **Project Description:**

Homes were selected due to surveys indicating 48% of Hebridean Housing Partnership's tenants were in fuel poverty when utilising storage heating as their main heating source. The inefficient storage heating systems in 106 houses and flats were replaced with new ASHP systems, with system controls allowing tenants more control over their electricity use.

In HHP's experience efficient storage heating systems have proven problematic, costly and have issues with affordability and controllability for tenants. ASHPs were identified as suitable heating systems as they provide affordable warmth to tenants as well as delivering environmental benefits through reduced carbon emissions.

Hebridean Housing Partnership have also simplified the installation and use of the ASHP systems to ensure tenants require minimal input when utilising the provided wireless controller to increase or decrease temperature at a given point in time with the system reverting to set temperatures at the end of each day. Each system control allows the tenant to see the exact amount of electricity used per year, per month and per week for both heating and hot water. This allows tenants to budget in advance which is beneficial for those on prepayment meters.

All installed ASHPs have been fitted with Wi-Fi adapters to allow for weekly, monthly and yearly monitoring of costs by the tenant and the association with consent. HHP

have already installed over 1,000 ASHP systems with very high tenant satisfaction and continued this roll out with subsequent funding awards from the SHNZHF.

# **Project Title: Hebridean EWI**

**Project Organisation:** Hebridean Housing Partnership (HHP)

**Technology Type(s):** EWI

**Location(s):** Multiple locations across Comhairle nan Eilean Siar - Isle of Barra, Isle of Benbecula, Isle of Lewis, Isle of North Uist, Isle of South Uist, Stornoway

**Grant Value:** £330,750

**Completion Date:** March 2024

**Project Headline:** Project involved installing EWI to 23 Swedish Timber and Scan system houses which are of single skin timber frame construction and classed as hard to treat properties

## **Project Description:**

The properties selected under this project already had ASHPs installed as part of previous works funded by other project partners. The ASHPs were installed first to avoid damaging the new EWI system.

By installing EWI alongside the ASHPs, the insulation will help maximise the benefits of the upgraded clean heating systems, already installed. Alongside this, the upgraded fabric improvements will bring a new clean finish to the façade of the properties. This has not only greatly improved the u-values but the visual aspect of the properties. The installation of these measures will guarantee lower emissions and lower energy costs for tenants.

There are many similar timber frame houses throughout Scotland which are classed as hard to treat. This project aimed to create an exemplar project that could be replicated across the housing archetype.

# **Project Title: Dumbarton Road / Stone Repairs and Insulation**

**Project Organisation:** Dalmuir Park Housing Association

**Technology Type(s):** EWI and IWI

**Location(s):** Dalmuir, West Dunbartonshire Council

**Grant Value:** £278,054

**Completion Date:** March 2024

**Project Headline:** Fabric First approach to 31 pre-1919 tenements in Dalmuir

## **Project Description:**

This project provided fabric first energy efficiency measures to 31 flats in Dalmuir, which were flats in pre-1919 tenement blocks. All of the targeted properties were previously poorly insulated and consequently expensive to heat with EPC ratings of D. After installation of the measures, the aim was to achieve an EPC rating of B.

The measures which were installed included EWI and IWI. The entire building was enveloped and the insulation which also covered the close walls. The method of installation meant that the properties could be upgraded without the need for decanting tenants. The project was intended to reduce condensation, heat loss and CO2 emissions as well as reduce heating bills for tenants.

# **Project Title: BISF Properties Upgrade**

**Project Organisation:** North Lanarkshire Council

**Technology Type(s):** EWI

**Location(s):** Multiple locations across North Lanarkshire Council

**Grant Value:** £2,242,200

**Completion Date:** February 2024

**Project Headline:** Fabric First and microgeneration to 138 hard to treat properties in North Lanarkshire

## **Project Description:**

This project installed microgeneration and fabric first measures to 138 hard to treat properties across North Lanarkshire. The properties in this project are of the non-traditional British iron and steel federation (BISF) archetype, which are classed as hard to treat. The property type is recognised as suffering from poor energy efficiency with EPC recorded as low as band E and original external wall values assessed as being between 1.48-1.68W/m<sup>2</sup>k.

The grant funding was used to install EWI and solar panels to the properties. After installation measures the EPC rating rose to C.

The Council had in place Program Liaison Officers who visited tenants post installation to ensure that residents were aware of how to most effectively use their heating systems in addition to receiving their current energy tariff and the provision of advice on how to prevent condensation advice based on the increased energy efficiency of the properties.

# **Project Title: External Wall Insulation Upgrade 2022/23**

**Project Organisation:** Shire Housing Association

**Technology Type(s):** EWI

**Location(s):** Bellsbank and Cumnock, East Ayrshire Council

**Grant Value:** £412,155

**Completion Date:** October 2023

**Project Headline:** Fabric first measures to 54 social rented homes in multi-tenure project in East Ayrshire

## **Project Description:**

The project installed fabric first energy efficiency measures, in the form of EWI, to 54 socially rented homes across 21 4-in-block, multi tenure flats across East Ayrshire. The housing association accessed funding from the Energy Agency to fund the owner-occupied properties, allowing the full building to benefit from the EWI installation.

The EPCs of the properties varied slightly between bands D and E. The aim of the project was to bring the EPC to bands B and C.

The project applied PAS 2025 measures to achieve thermal efficiency and reduce tenant's heating bills significantly.

# **Project Title: Swedish Timber EWI Programme Dalry**

**Project Organisation:** Cunninghame Housing Association

**Technology Type(s):** EWI

**Location(s):** Dalry, North Ayrshire Council

**Grant Value:** £1,016,563

**Completion Date:** January 2024

**Project Headline:** Fabric First approach delivers fuel savings to tenants in to non-traditional hard to treat properties in Dalry

## **Project Description:**

This project delivered fabric first energy efficiency upgrades to 96 properties in Dalry, North Ayrshire. the properties of the project were of non-traditional construction, 95 of which were Swedish timber kit. The other 5 properties were of traditional construction.

The project installed EWI to these properties, which lowered tenant heating bills and providing readiness for future low carbon heating upgrades through a 'fabric first' approach.

The project brought the EPC of the properties up from band D to band C.

# **Project Title: Off-Gas Villages – Energy Efficiency Programme (Phase 2 Application)**

**Project Organisation:** Falkirk Council

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Various locations across Falkirk Council

**Grant Value:** £975,97

**Completion Date:** March 2024

**Project Headline:** Clean heating and microgeneration for 100 homes in Falkirk

## **Project Description:**

This project was phase 2 of Falkirk Council's off-gas villages energy efficiency project. This phase of the project installed clean heating and microgeneration to 100 properties across 9 villages in the Falkirk area. The properties varied in size and archetype.

Each property was fitted with an ASHP, solar PV and battery storage. This reduced the carbon emissions from these properties by 95% and reduced energy consumption from the grid. The microgeneration also reduced tenants fuel bills, taking them out of, or away from the risk of, fuel poverty and providing them with more thermal comfort and control of their heating systems.

# **Project Title: Triple Glazing Upgrade to North Lanarkshire Properties**

**Project Organisation:** Lanarkshire Housing Association

**Technology Type(s):** Triple Glazed Windows

**Location(s):** Multiple locations across North Lanarkshire Council

**Grant Value:** £454,040

**Completion Date:** November 2023

**Project Headline:** Triple glazing for 111 homes across North Lanarkshire reduced fuel bills and improved tenant's thermal comfort

## **Project Description:**

The project installed fabric first energy efficiency measures to 111 properties across North Lanarkshire. 102 of the properties were flats, and 9 were four-in-a-block cottages flats. All received new triple glazing.

The project upgraded the existing windows with a more energy efficient specification which improved thermal comfort for tenants and make their homes easier to heat, helping reduce energy demand and tenant's fuel bills. The project also had a positive impact on the EPC of the properties, bring them up from a band C to a band B.

# **Project Title: Osprey Housing Lofts and RIR 2022**

**Project Organisation:** Osprey Housing Association

**Technology Type(s):** LTUI and RIRI

**Location(s):** Multiple locations across Aberdeen City, Aberdeenshire and Moray Councils

**Grant Value:** £120,732

**Completion Date:** March 2024

**Project Headline:** Fabric first measures to 306 properties across Aberdeenshire, Aberdeen City and Moray

## **Project Description:**

This project installed fabric first energy efficiency measures to 306 properties of varying archetype, including flats, bungalows and houses and varying size, from 1 – 4 bedrooms. The project installed loft insulation top-ups for 297 of these, and room in roof insulation for 9.

Two thirds of these properties were early 2000s timber frame construction, with around 100-150mm of loft insulation in place. Topping up the existing loft insulation was the most straightforward way to increase the thermal efficiency of these properties. The other third of the properties were older, of various construction types and, where appropriate, these had already had cavity wall insulation and benefitted from increasing the loft insulation or installing room in roof insulation.

# **Project Title: From Rationing to Rationality – the Introduction of Whole House Heating and Ventilation**

**Project Organisation:** Lochalsh and Skye Housing Association

**Technology Type(s):** ASHP

**Location(s):** Skye and Lochalsh, Highland Council

**Grant Value:** £267,040

**Completion Date:** March 2024

**Project Headline:** Providing Clean Heating and reduced energy bills to 30 homes on the Isle of Skye

## **Project Description:**

This project provided clean heating to 30 homes across the Isle of Skye, of varied archetype. The properties were previously heated with either inefficient storage heating, solid fuel heating and oil boilers. All properties had their heating systems replaced with ASHPs.

The aim of the project was to alleviate fuel poverty and improve comfort levels in tenant's homes. The project also aimed to improve the EPC of the properties from band D to band C.

# **Project Title: Hillcrest Homes Fuel Poverty Heating Upgrade Scheme**

**Project Organisation:** Hillcrest Homes

**Technology Type(s):** HHRSH and Solar PV

**Location(s):** Arbroath in Angus; Dundee City in Dundee; Alyth, Blackford, Crieff in Perth & Kinross; and Newburgh in Fife

**Grant Value:** £1,709,847

**Completion Date:** March 2024

**Project Headline:** Clean heating and microgeneration to 466 homes across Dundee, Angus and Perth & Kinross

## **Project Description:**

This project installed clean heating and microgeneration to 466 homes across multiple locations including Dundee, Arbroath, Newburgh, Crieff, Alyth and Blackford. The archetypes of the properties varied among different sizes of flats and houses. All properties received new Quantum HRRSH and where suitable, and solar PV was also installed.

The new measures allowed the tenants more control and flexibility over their heating, and reduced fuel bills and increased thermal comfort. It is anticipated that tenants will save on average £430 per year.

# **Project Title: ACHA Social Housing External Fabric Programme**

**Project Organisation:** Argyll Community Housing Association

**Technology Type(s):** EWI

**Location(s):** Multiple Locations across Argyll and Bute Council - Bute, Cowal, Dunoon, Islay and Tiree

**Grant Value:** £1,092,750

**Completion Date:** April 2024

**Project Headline:** Project installed insulation measures, primarily external wall insulation (EWI) into 141 social rented properties across Argyll and Bute

## **Project Description:**

The main bulk of these 141 properties are in Dunoon and included various archetypes including post war late 1950s dwellings. Other properties benefitting from these measures were located across Cowal and Bute and included properties on the islands of Islay and Tiree.

These properties had already received ASHPs in previous packages of works and the installation of EWI would therefore maximise the benefits of these systems and ensure heat is not lost through the fabric of the buildings.

This project intended to alleviate fuel poverty and deliver continued energy efficiency works to help tenants who are the most in need.

# **Project Title: High Heat Retention Storage Heaters, PV Arrays and Energy Storage to 4no. Sheltered Housing Complexes**

**Project Organisation:** Angus Council

**Technology Type(s):** HHRSH, Solar PV and Battery Storage.

**Location(s):** Montrose, Forfar and Arborath, Angus Council

**Grant Value:** £783,851

**Completion Date:** March 2024

**Project Headline:** Clean heating and microgeneration to 106 homes across Angus

## **Project Description:**

This project installed clean heating and microgeneration to 106 properties across 4 sheltered housing complexes. The project took place across Angus, in Montrose, Forfar and Arbroath.

The measures installed were HHRSH, solar PV and battery storage technology so that surplus energy generated by the PV arrays will be stored. This directly reduces grid demand and allows for energy harvesting and use on site when no energy is being produced by the PV arrays.

The project aimed to improve the EPCs of the properties from band D to band B. The project was designed to reduce tenants fuel bills and improve thermal comfort.

# **Project Title: Danderhall Net Zero Upgrades, Phase 1**

**Project Organisation:** Midlothian Council

**Technology Type(s):** EWI, CWI and IWI

**Location(s):** Danderhall, Midlothian Council

**Grant Value:** £533,688

**Completion Date:** June 2024

**Project Headline:** Project delivered insulation upgrades as part of a whole house retrofit to 50 properties in the Danderhall area

## **Project Description:**

Properties selected for this phase of the project received EWI, CWI or IWI depending on the property archetype and existing insulation measures in place. Properties also received other measures not funded by this grant including roof insulation and high efficiency windows and doors, depending on the property itself.

This whole house retrofit delivery approach was designed to ensure a wide range of measures were implemented alongside each other to reduce the home energy consumption and to improve the fabric of the home before future clean heating solutions. Now that the fabric of the building has been addressed, it has readied these properties for the potential connection to a future clean heating system, such as a district heating network.

This is Phase 1 of a two-part projects, Phase 2 was awarded in financial year 24/25.

# **Project Title: East Ayrshire Deep Retrofit Pathfinder**

**Project Organisation:** East Ayrshire Council

**Technology Type(s):** PAS 2035 principles, EnerPhit retrofit and LETI Whole House Retrofit - including a mix of ASHP, HHRSHs, Solar PV, Battery Storage, Thermal Storage, EWI, CWI, UFI, RI

**Location(s):** Darvel Kilmarnock and Rankinston, East Ayrshire Council

**Grant Value:** £534,976

**Completion Date:** Projected December 2024

**Project Headline:** This 'Pathfinder' Project comprises of three separate approaches to deliver whole house retrofit in a single phase of works and to monitor outcomes

## **Project Description:**

This project involves the following three strands:

### **Strand 1 – PAS 2035**

Six flats in Kilmarnock have been identified to benefit from a whole house retrofit under the principles of PAS 2035 to minimise space heat demand and emissions. The flats are currently heated with mains gas boiler systems. Measures to be fitted include a mix of ASHPs, EWI, floor insulation, insulated roofing, solar PV, domestic hot water storage tank, battery storage and high retention storage heaters, where required.

### **Strand 2 – LETI**

Eight homes (a mix of flats and houses) in Rankinston have been identified to benefit from a LETI whole house retrofit. Rankinston is an off-gas area with a mix of old electric storage heaters, of oil and solid fuel. Measure to be fitted include a mix of EWI or CWI (as appropriate), floor insulation, solar PV, solar thermal, domestic hot water storage tank, battery storage and ASHPs.

### **Strand 3 – EnerPhit**

Four void flats in Darvel have been identified as ideal candidates for a retrofit to EnerPhit standard. The flats currently have gas central heating systems which will be replaced by ASHP alongside deep fabric improvements including insulation measures and microgeneration.

### Monitoring

In all three areas, monitoring equipment will be installed, and the building performance will be monitored for a period of three years. East Ayrshire Council will not only compare pre and post install data to evaluate the effectiveness of the system installed but also compare the three approaches in terms of cost, effectiveness and practicality and deliverability for roll out on a wider scale.

# **Project Title: North Heathery Park Heat Pump Retrofit**

**Project Organisation:** Hjaltland Housing Association

**Technology Type(s):** ASHP

**Location(s):** Gulberwick, Shetland Islands Council

**Grant Value:** £52,245

**Completion Date:** May 2023

**Project Headline:** This small scale project installed Air Source Heat Pumps and associated radiators to 8 properties in Gulberwick on the Shetland Islands

## **Project Description:**

The properties included a mix of detached and semi-detached dwellings that were originally heated by inefficient and expensive electric boilers with immersion heaters. Tenants had reported the high cost of their expensive heating systems and supported the change to a more affordable, energy efficient heating system.

The project was designed to assist Hjaltland Housing Association with increasing the energy performance of these properties and make a significant social impact on tenants by alleviating fuel poverty by reducing energy bills through the installation of clean, efficient heating systems.

Meter readings were taken when the heating systems were changed so that the performance of the new heating systems can be monitored, and fuel bills compared. Tenants feedback will also be used to monitor the success of the project and inform future potential projects.

# **Project Title: Kingdom Fabric First Project**

**Project Organisation:** Kingdom Housing Association

**Technology Type(s):** EWI, IWI, Roof Insulation, High Efficiency Windows and Doors, UFI

**Location(s):** Perth, Perth & Kinross Council

**Grant Value:** £1,144,370

**Completion Date:** April 2024

**Project Headline:** This project delivered Whole House Retrofit “Fabric First” measures to up to 86 social rented properties in Perth

## **Project Description:**

The project involved properties receiving a full range of insulation measures including external wall insulation and or internal wall insulation where appropriate, roof insulation, high efficiency windows and doors and underfloor insulation. Project utilised whole house retrofit to ensure a wide range of measures were implemented together to reduce the tenant’s energy needs considerably, while also improving the fabric of the home and reducing energy bills, before a clean heating solution is considered in the future.

Properties will continue to be monitored to demonstrate the impact of the measures, including energy consumption data, technical monitoring and pre and post comparative analysis.

# **Project Title: High St / Russell St Area Regeneration**

**Project Organisation:** Argyll Community Housing Association

**Technology Type(s):** Communal ASHP, Solar PV, Battery Storage, EWI, CWI, URI, LTIU, Triple Glazed Windows and Doors

**Location(s):** Rothesay, Isle of Bute, Argyll & Bute Council

**Grant Value:** £1,337,994

**Completion Date:** July 2024

**Project Headline:** Project enabled the regeneration of an area in Rothesay on the Isle of Bute to transform the energy efficiency and thermal performance of 3 buildings containing 20 social rented properties

## **Project Description:**

Argyll Community Housing Association (ACHA) undertook this project to renovate three housing blocks, containing 20 properties in total with 9 void properties in Rothesay. This project aimed to change the perception of the blocks and the area, thus making the energy efficiency upgrades part of a wider area regeneration. The energy efficiency works improved the thermal performance of the buildings, upgraded the external environment and provided an exemplar within ACHA's housing stock.

The SHNZHF funded elements of the overall project included the following: ASHP, solar PV, battery storage, EWI, CWI, UFI, LTUI, triple glazing and external doors.

The project was envisioned to act as a catalyst for positive change and regeneration to this part of Rothesay and complemented a wider external wall insulation program.

# **Project Title: New Scone Sheltered Housing Heating Upgrade**

**Project Organisation:** Hanover Housing Association

**Technology Type(s):** HHRSH, Solar PV, Battery Storage, EWI

**Location(s):** Scone, Perth & Kinross Council

**Grant Value:** £117,512

**Completion Date:** March 2024

**Project Headline:** This project involved energy efficiency upgrades to 25 social tenanted bungalows with very low EPC ratings due to lack of insulation and inefficient storage heaters

## **Project Description:**

The project installed high heat retention storage heaters with battery storage and solar PV, alongside EWI and roof replacement. The social housing tenants in these properties are vulnerable elderly people in a rural location largely in fuel poverty, and the project provided a micro-renewable based solution for these tenants. The provision of solar PV and battery storage has the potential to provide a large portion of self-consumption for these tenants.

Hanover Housing Association previously subsidised the heating costs of these tenants due to the very poor performance of the building and the energy efficient approach was designed to dramatically reduce heating bills for tenants and contribute to alleviating fuel poverty.

The project aimed to provide a model which is sustainable and cost effective for rollout throughout Hanover Housing Association's housing stock in Scotland.

# **Project Title: Prospecthill Cladding Project**

**Project Organisation:** River Clyde Homes

**Technology Type(s):** EWI, Triple Glazed Windows

**Location(s):** Greenock, Inverclyde Council

**Grant Value:** £1,647,535

**Completion Date:** September 2024

**Project Headline:** This project involves installing a complete rainscreen cladding system incorporating external insulation and new triple glazed windows to improve 90 properties thermal efficiency

## **Project Description:**

The works funded via the SHNZHF grant include the external insulation and new triple glazed windows to Prospecthill, a multi-story block in Greenock containing 90 flats. The project aims to achieve the AECB/LET Retrofit standard and achieve an energy demand of 40Kwh/pm<sup>2</sup>/pa for each property. The properties are currently heated by a biomass district heating scheme.

The project is envisioned to be the first of its kind within social housing in Scotland and learnings from the project will be offered to the sector more widely. The project aims to remove poor energy performance which is a driver for fuel poverty, aiming to lift the tenants out of fuel poverty, improve thermal comfort and reduce the properties carbon emissions.

Monitoring of the property will include monitoring of heat, temperature, Co<sub>2</sub> and humidity. Combined these indicators will provide information on the improvements to tenants and support further learnings from the project.

# **Project Title: Connected Response - Installation of "Connected Response" devices installed to control space and water heating**

**Project Organisation:** Wheatley Group

**Technology Type(s):** Connected Response – Smart Storage Heater Controls

**Location(s):** Glasgow, Glasgow City

**Grant Value:** £6,162,500

**Completion Date:** March 2024

**Project Headline:** Energy efficiency measures fitted to over 5,000 homes across Glasgow

## **Project Description:**

The project's aim was to install fabric first energy efficiency measures to 5,800 socially rented properties across Glasgow. The energy efficiency technology used in the project was Connected Response. The Connected Response units are designed to improve the performance and control of electric storage space and water heating for households. The system provides 'demand side management' control of storage through programmable timing, internal dwelling temperature sensor and forecast weather compensation; to avoid energy waste, improve household comfort, reduce carbon and mitigate costs.

The project reduced energy consumption and fuel bills for tenants as well as increased user controllability and thermal comfort of their home.

# **Project Title: Net Zero Homes - Whole House Retrofit of Low Efficiency and High-Carbon Intensity Homes**

**Project Organisation:** Wheatley Group

**Technology Type(s):** ASHP, Solar PV, Battery Storage

**Location(s):** Multiple locations across Dumfries & Galloway Council

**Grant Value:** £7,265,482

**Completion Date:** March 2024

**Project Headline:** Project involved a whole house retrofit to 250 low efficiency and high carbon intensity homes across Dumfries and Galloway

## **Project Description:**

Properties were previously heated with oil, coal, or inefficient electric storage heaters. The measures installed varied according to the property and existing heating solution in place and consisted of a mixture of the following technologies: EWI, ASHPs, solar PV, battery storage and Connected Response technology.

The project aimed to improve the energy efficiency of properties and provide tenants savings on their fuel bills while reducing the energy demand of properties.

This formed Phase 1 of a project with Phase 2 continuing into financial year 2024/25.

# **Project Title: Pre 1919 - Tenements - Retrofit up to 60 pre-1919 Sandstone Tenement Flats with a view to achieving EPC B rating**

**Project Organisation:** Wheatley Group

**Technology Type(s):** HHRSH, Double Glazing, IWI, RI, UFI

**Location(s):** Edinburgh, Edinburgh City Council

**Grant Value:** £455,868

**Completion Date:** March 2024

**Project Headline:** Project involved retrofitting 30 void pre-1919 tenement buildings to achieve an EPC 'B' rating using combined measures

## **Project Description:**

This project targeted void properties to allow a deep retrofit compared to when tenants are in place.

The measures installed varied according to the individual property and existing heating solution in place with measures including:

- Improvement of existing windows with double glazing
- Improvement and treatment to walls/roof/floor with insulation
- Deployment of air tightness measures
- Installation of an appropriate clean heating system, primarily high heat retention storage heaters

This project aimed to identify a method for retrofitting pre-1919 tenements and allow these learnings to be deployed more widely.

Phase 2 of this project was awarded in financial year 2024/25 with roll out to more properties in Edinburgh and Glasgow City.

# **Project Title: Hebridean Zero Emissions Heating 2023**

**Project Organisation:** Hebridean Housing Partnership

**Technology Type(s):** ASHP

**Location(s):** Stornoway, Isle of Lewis, Comhairle nan Eilean Siar

**Grant Value:** £778,768

**Completion Date:** March 2024

**Project Headline:** Project involved replacing 110 inefficient electric heating systems with new ASHP systems, with system controls allowing tenants more control over their energy use

## **Project Description:**

Hebridean Housing Partnership installed ASHPs in 110 houses and flats in Stornoway, the isle of Lewis, in the Outer Hebrides. Surveys in 2017/18 identified 48% of HHP tenants were in fuel poverty with inefficient electrical heating identified as a main cause.

Each ASHP system control allows the tenant to see the exact amount of electricity used per year, per month and per week for both heating and hot water. This allows tenants to budget in advance which is beneficial for those on prepayment meters. All heat pumps were fitted with Wi-Fi adapters to allow for weekly, monthly and yearly monitoring of the costs by the tenant and HHP with consent.

This project is a continuation of a similar project funded by Social Housing Net Zero Heat Fund the previous financial year.

# **Project Title: Orkney Housing Association - Fabric First Upgrades**

**Project Organisation:** Orkney Housing Association

**Technology Type(s):** Triple Glazing, High Insulation, LITU, Hot Water Cylinder Jackets

**Location(s):** Finstown, Rousay, Toab, Westray, Orkney Islands Council

**Grant Value:** £111,607

**Completion Date:** March 2024

**Project Headline:** This project installed energy efficiency measures in properties across the Orkney Islands

## **Project Description:**

This project included measures installed to a range of properties including a mix of flats and houses across the Orkney Islands and measures installed included triple glazed windows, loft insulation, hot water cylinder jackets and high insulation where required. Fuel poverty is particularly high on the Orkney Islands due to longer heating seasons caused by the colder, wetter and windier climate, therefore improving energy efficiency measures will fundamentally improve the quality of life for households and alleviate fuel poverty.

All of these works will efficiently retain heat and significantly improve the thermal performance of the properties. All tenants have been offered a home energy check and visit, supported by Orkney Housing Association, and new EPCs will be produced for each property.

# **Project Title: Arlington Street**

**Project Organisation:** West of Scotland Housing Association

**Technology Type(s):** Communal ASHP, Thermal Storage, Windows Replacement

**Location(s):** Glasgow, Glasgow City Council

**Grant Value:** £310,000

**Completion Date:** May 2024

**Project Headline:** This project included replacing current communal gas boilers with a communal ASHP system including thermal storage to maximise heat output and window replacement.

## **Project Description:**

This project on Arlington Street in Glasgow is a sheltered housing complex for elderly people consisting of twenty five flats spread across three floors, which was previously heated by a communal gas-fired boiler plant in the ground floor.

A communal ASHP was deemed the most effective clean heating solution with individual Heat Interface Unit (HIU) for each flat and a backup electric boiler. The HIU allows tenants to control and be billed for their heating and hot water use rather than being billed for the buildings heating demand, which could exceed their personal use.

The communal ASHP has reduced the carbon footprint of the building and offers reduction in energy bills for tenants with the support of fabric improvements, including thermal glazed windows.

# **Project Title: Fife Housing Group - Insulation Programme 2023**

**Project Organisation:** Fife Housing Group

**Technology Type(s):** EWI, CWI and LITU

**Location(s):** Dunfermline, Methil and Rosyth, Fife Council

**Grant Value:** £281,036

**Completion Date:** March 2024

**Project Headline:** Project involved energy efficiency measures to a number of non-traditional 'no fines' and empty cavity properties across Fife without any current wall insulation, adopting a fabric first approach

## **Project Description:**

The project involved the installation of EWI and CWI to a pipeline of 'no fines' and empty cavity properties, as part of Fife Housing Group's long term strategy to improve the energy efficiency of their housing stock. Works were complete to the PAS2035 standard and will contribute to a rolling program of investment works.

This project involved three phases of works taking place across various properties in the Rosyth, Dunfermline and Methil areas of Fife, involving a range of housing archetypes.

Tenants will benefit from reduced energy consumption and reduced energy bills as many of these properties did not have any insulation measures installed prior to this project.

# **Project Title: 2023/24 Non Trad. Retrofit Pilot Project**

**Project Organisation:** East Renfrewshire Council

**Technology Type(s):** CWI, EWI, Cold Roof Insulation

**Location(s):** Barrhead, East Renfrewshire Council

**Grant Value:** £218,060

**Completion Date:** March 2024

**Project Headline:** Pilot project undertaking Fabric First upgrades to 14 properties including a mix of end, semi and mid-terraced houses in the Barrhead area

## **Project Description:**

This project included energy efficiency upgrades including a range of the following measures: cavity wall insulation, external wall insulation, cold roof insulation and other measures funded by the local authority themselves. These other measures included roof works, ventilation measures and solar PV and battery storage.

The works were carried out in accordance with BSI PAS 2030:2019 – Specification for the installation of efficiency measures in existing dwellings and PAS 2035:2019 – Retrofitting dwellings for improved energy efficiency.

The works have made these properties more energy efficient and will result in a reduction of energy consumption for the tenants. The insulation will minimise heat loss with solar PV and battery storage offsetting electricity consumption and carbon emissions. The project aimed to improve the properties' EPC banding from EPC C and D to EPC band B.

# **Project Title: Pier View Tiree Energy Efficiency Project**

**Project Organisation:** West Highland Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage, Mechanical Ventilation with Heat Recovery, IWI, Loft Insulation, Windows & Door Replacement

**Location(s):** Tiree, Argyll & Bute Council

**Grant Value:** £1,055,296

**Completion Date:** April 2024

**Project Headline:** Project involved whole house retrofit to 16 semi-detached timber frame off-gas properties in Scarinish on the Isle of Tiree

## **Project Description:**

Properties were in receipt of a full suite of retrofit measures including replacing the current inefficient storage heating, which was expensive to run, particularly on a rural island location where weather has significant impact on energy use. The old heating system was replaced with ASHPs, aided by solar PV panels and integrated electric battery storage installed to provide zero carbon electricity to the dwellings, improving carbon performance and sustainability, and reducing energy costs.

Fabric first measures were installed including internal wall insulation, loft top up insulation, replacing windows and external doors, and improving thermal bridging performance and air tightness levels to reduce space heating demands and energy costs.

The combination aimed to take the houses from Band D to Band A EPC Rating. A post commissioning monitoring and evaluation assessment is being conducted to collect and analyse information on the effectiveness of the energy efficiency improvement measures and provide data that can inform future energy efficiency projects and be shared with other organisations. It is hoped that this work would help develop an archetype solution for the social rented sector and can be applied to WHHA's other rural stock with similar issues.

# Project Title: Smith Street Way Pilot

**Project Organisation:** Loreburn Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage, Triple Glazed Windows, Door Upgrades, Loft and Ceiling Insulation, Mechanical Ventilation Heat Recovery

**Location(s):** Beattock, Dumfries and Galloway Council

**Grant Value:** £402,107

**Completion Date:** March 2024

**Project Headline:** Project involved retrofitting 4 properties using different approaches to EPC Band B to evaluate and compare the measures involved

## **Project Description:**

This pilot project focused on achieving the best value for money in terms of retrofit measures with an aim to produce a viable strategy for Loreburn Housing Association's entire building stock with timber frame archetypes.

This involved retrofitting 2 properties to an EPC Band B satisfying the requirements of EESSH2 (the previous Energy Efficiency Standard for Social Housing Providers) and taking 2 properties to the AECB Carbon Lite standard, also to attain an EPC Band B. The works were carried out on two semi-detached houses and two semi-detached bungalows. The project aimed to also reduce the energy demand of properties and reduce tenants' energy bills.

The measures to achieve EESSH2 involved ASHPs, triple glazed windows and upgraded doors, solar PV, battery storage, loft and ceiling insulation and improved air tightness.

The measures to achieve AECB standard included ASHPs with mechanical ventilation heat recovery, internal wall insulation, triple glazed windows and upgraded doors, solar PV and battery storage and improved air tightness.

The project included monitoring via environmental sensors to collate data of temperature, humidity and CO2. The monitoring is continuing following the successful completion of the project and will also be used to identify tenants' experience of the technology and upgrades.

# **Project Title: Hawdene Zero-Emission Heating and Solar PV Energy Efficiency Project**

**Project Organisation:** Eildon Housing Association

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Broughton, Scottish Borders Council

**Grant Value:** £521,021

**Completion Date:** March 2024

**Project Headline:** Project involved the installation of ASHP, solar PV and battery storage into 31 properties, primarily inhabited by elderly tenants experiencing fuel poverty

## **Project Description:**

All 31 properties benefitted from the installation of these technologies which replaced inefficient electric storage heaters that were contributing to fuel poverty and poor carbon emissions. The tenants were primarily elderly in a rural area, experiencing fuel poverty.

The properties already had two types of insulation installed: cavity wall insulation and 270mm of loft insulation which helped to mitigate the transmission of heat through the walls of the property and through the roof. The ASHP and solar PV were effectively complimented by the battery storage to maximise fuel bill savings and provide an estimated 82% decrease in annual carbon emissions.

The project emphasised a tenant centered approach, incorporating an Affordable Warmth and Heat Impact Evaluation Assessment and intensive consumer engagement. Eildon HA will continue to monitor and actively respond to the specific needs and behaviours of the tenant's heat usage, district heating effects and behavioural responses to tariff changes.

# **Project Title: Houston Place Whole House Retrofit**

**Project Organisation:** Renfrewshire Council

**Technology Type(s):** ASHP, Solar PV, EWI, Double Glazing, External Doors, LITU, MVHR and Air Tightness Measures

**Location(s):** Johnstone, Renfrewshire Council

**Grant Value:** £254,015

**Completion Date:** Projected December 2024

**Project Headline:** Whole House AECB Carbonlife Retrofit to 8 terraced properties in Johnstone, Renfrewshire

## **Project Description:**

This project will take a whole house retrofit approach to 8 terraced properties in Johnstone, Renfrewshire. It will install lean heating and energy efficiency measures to the aim of the AECB Carbonlite retrofit standard. All properties currently have a combi gas boiler and an EPC of D.

With this funding, each property will receive an ASHP, solar PV and diverter which will ensure that no energy from the solar PV will be wasted, and instead will heat the water cylinder. Additionally, every property will receive EWI, MVHR, double glazing, external doors, air tightness measures, and loft insulation top up.

The project will bring the properties from EPC band D to A and will save tenants up to an estimated £400 per annum on their fuel bills.

# **Project Title: Cluny Court Net Zero Upgrades**

**Project Organisation:** Cairn Housing Group

**Technology Type(s):** HHRSH, Solar PV and Battery Storage.

**Location(s):** Blairgowrie, Perth and Kinross Council

**Grant Value:** £333,598

**Completion Date:** Projected December 2024

**Project Headline:** Clean Heating and reduced fuel bills for 35 homes in Blairgowrie

## **Project Description:**

This project will install clean heating to 35 properties in Cluny Court, Blairgowrie. The archetypes of the properties are varied, there are 6 terraced bungalows and 29 flats of varying size. The properties have previously benefited from Energy Efficiency measures such as double glazing, new external doors, cavity wall insulation and loft insulation where applicable.

This project will upgrade the existing inefficient storage heaters with new high heat retention Thermastore storage heaters with an improved user interface for improved user control. The flatted properties will also receive solar PV and battery storage. The project aims to bring all properties to an EPC band B and will save the tenants and estimated £1000 per annum on energy bills.

# **Project Title: Murkle Terrace and Towerhill Road Net Zero Upgrades**

**Project Organisation:** Cairn Housing Group

**Technology Type(s):** HHRSHd, Solar PV, Battery Storage and Allume Solshare Technology

**Location(s):** Thurso, Highland Council

**Grant Value:** £397,307

**Completion Date:** Projected December 2024

**Project Headline:** Clean Heating and reduced fuel bills for 35 homes in Thurso

## **Project Description:**

This project will install clean heating to 35 properties in Murkle Terrace, Thurso in the Scottish Highlands. The properties are flat of varying size, arranged in blocks of 6. They have previously benefited from energy efficiency measures such as double glazing, external wall insulation and loft insulation where applicable.

This project will upgrade the existing inefficient storage heaters with new high heat retention Thermastore storage heaters with an improved user interface for the tenants. They will also receive solar PV and battery storage along with Allume Solshare technology.

The project aims to bring all properties to an EPC band B and will save the tenants and estimated £1000 per annum on energy bills.

# **Project Title: Net Zero for Hard to Treat Homes**

**Project Organisation:** Aberdeenshire Council

**Technology Type(s):** MVHR, IWI, FI, Air Tightness Measures, Where appropriate to the archetype: LITU, Double Glazing, HHRSH, RIRI and Solar PV

**Location(s):** Multiple Locations across Aberdeenshire Council – Aberchider, Bridge of Marnoch, Fraserburgh, Huntly, Inverurie, Peterhead and Stonehaven

**Grant Value:** £2,442,129

**Completion Date:** Projected December 2024

**Project Headline:** Whole house retrofit to 108 void hard to treat properties in Aberdeenshire.

## **Project Description:**

This project will take a whole house retrofit approach to 108 void properties of mixed archetype in Aberdeenshire. These will be a mix of Urban, Rural and Remote Rural. Most, if not all, of the properties have a stone construction, making External and Cavity Wall Insulation unfeasible. Internal Wall Insulation is therefore the best way forward but requires the property to be empty. Additionally, each property will along with this, Mechanical Ventilation with Heat Recovery, Floor Insulation and Airtightness work will make up the core work present in all properties.

Following, depending on the archetype, there are a number of other measures which will be installed; Loft Insulation Top-Up, Room-in-the-Roof Insulation, Double or Secondary glazing and High Heat Retention Storage Heaters. Where High Heat Retention Storage Heaters are installed, Solar PV and Solar diverters.

This project aims to bring the EPC of these properties from an average D to A. It will also save tenants up to an estimated £2000 per annum on their fuel bills.

# Project Title: Hebridean ASHP 16

**Project Organisation:** Hebridean Housing Partnership

**Technology Type(s):** ASHP

**Location(s):** Stornoway, Isle of Lewis, Comhairle nan Eilean siar

**Grant Value:** £132,176

**Completion Date:** March 2024

**Project Headline:** Project involved replacing 16 inefficient electric heating systems with new ASHP systems, with system control allowing tenants more control over electricity use

## **Project Description:**

All properties are block cavity construction bungalows in Stornoway on the isle of Lewis. Hebridean Housing Partnership have been installing ASHP systems since 2012 and have vast experience in the utilisation of these in their social housing stock. The houses already had bead cavity insulation, full double glazing and 250mm plus of loft insulation installed.

Over the years HHP have simplified the installation and use of the system to ensure tenants only require minimal input using the provided wireless controller to increase or decrease temperature at a given point in time with the system reverting to set temperatures at the end of each day.

Each system control allows the tenant to see the exact amount of electricity used per year, per month and per week for both heating and hot water. This allows tenants to budget in advance which is beneficial for those on prepayment meters. All heat pumps will be fitted with Wi-Fi adapters to allow for weekly, monthly and yearly monitoring of costs by tenant and by HHP with consent.

This project is a continuation of a similar project funded by Social Housing Net Zero Heat Fund the previous financial year.

# Project Title: Net Zero Fund October 2023

**Project Organisation:** Orkney Housing Association

**Technology Type(s):** Triple Glazed Windows, High Insulated Doors, LITU and Hot Water Cylinder Jackets

**Location(s):** Kirkwall, St Margarets Hope, Orkney Islands Council

**Grant Value:** £64,926

**Completion Date:** March 2024

**Project Headline:** Project involved energy efficiency upgrades to 19 properties across the Orkney Islands

## **Project Description:**

The 19 properties were located across two of Orkney Housing Association's schemes that included some of the most remote areas of their estate. The properties are a mix of housing types and were completed in the late 1980s/early 1990s and are of an age and time of construction where the fabric components being addressed are inefficient in terms of energy performance.

The upgraded fabric components included high-energy efficiency triple glazed windows, replacement high insulated doors, loft insulation top ups and hot water cylinder jackets. These measures aimed to greatly improve the building performance and the tenant's experience of living in the properties.

All of these works aimed to efficiently retain heat and significantly improve the thermal performance of the properties. All tenants were offered a home energy check and visit, supported by Orkney Housing Association's team, and new EPCs will be produced for each property.

# **Project Title: Forth ASHPs and LTUs**

**Project Organisation:** Melville Housing Association

**Technology Type(s):** ASHP and LITU

**Location(s):** Forth, South Lanarkshire Council

**Grant Value:** £92,252

**Completion Date:** March 2024

**Project Headline:** Clean heating and fabric measures installed to 13 homes in South Lanarkshire to tackle fuel poverty

## **Project Description:**

This project comprised of the installation of ASHPs and LITUs across 13 properties in Forth, a rural area in South Lanarkshire. The target addresses were previously heated by inefficient and cost ineffective heating systems – either electric wet or oil – meaning that the installation of zero emission heating systems will result in reduced energy bills for tenants as well as a reduction in carbon emissions.

The properties were specifically selected due to their propensity for fuel poverty. The area is in the most deprived 20% in Scotland, with challenges relating to income and employment.

The properties were already well insulated, with external insulation having been installed through previous programs. As such, they were highly thermally efficient and ideally suited to benefit from zero emissions heating. LTUIs will be installed to ensure the heat demand of the properties is as low as possible prior to the installation of new heating systems.

# **Project Title: KHA Pleasance Road Renewable Heat**

**Project Organisation:** Kingdom Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage, Triple Glazed Windows, LITU

**Location(s):** Dunfermline, Fife Council

**Grant Value:** £88,695

**Completion Date:** March 2024

**Project Headline:** Project involved the installation of ASHPs, solar PV and battery storage to 6 properties in Dunfermline

## **Project Description:**

The properties are all two-bed, two-storey terraced houses of timber frame construction constructed in the 1990s. The properties were previously heated by inefficient electric storage heaters which were replaced with ASHP systems alongside solar PV, battery storage, triple glazed windows and loft insulation. The properties are all the same layouts which simplified the installation process and therefore allowing the same measures to be installed in each home.

The installation of the ASHPs, solar PV and batteries provide a renewable and stable energy supply for tenants allowing cost savings on energy bills. Fabric upgrades including the installation of new windows and loft insulation further improved the overall energy efficiency of the building fabric thereby reducing heat loss allowing for optimal performance of a low temperature ASHP heating system.

This project enabled a whole house approach to retrofit providing the most impactful way to provide carbon and cost savings rather than implementing upgrades over a phased approach.

# **Project Title: Smart Storage Heating Retrofit Project**

**Project Organisation:** Trust Housing Association

**Technology Type(s):** Connected Response

**Location(s):** Multiple Councils across Scotland: Argyll and Bute, Dumfries and Galloway, East Dunbartonshire, East Renfrewshire, Fife, Glasgow city, Highland, North Ayrshire, South Ayrshire, East Ayrshire, Scottish Borders, South Lanarkshire, West Dunbartonshire, Western Isles

**Grant Value:** £244,090

**Completion Date:** Projected February 2025

**Project Headline:** Upgrading existing Electric Storage Heaters to improve energy efficiency in 345 homes across Scotland.

## **Project Description:**

The project involves upgrading existing electric storage heaters to improve energy efficiency in 345 homes across Scotland. The project involves installing Connected Response HeatSage technology into each flat which remotely controls the charging of existing heaters using local weather forecasts to determine the most suitable charging times, increasing on colder days and reducing on milder days, moving the charge closer to tenants' needs. It can also be customised to set specific temperatures in different flats if required to take account of property size, potential solar gain and tenants' individual health needs. By re-purposing the existing heating and hot water systems and aligning charging with renewable energy the project will turn the existing storage heaters into zero emission systems.

The project has been designed to ensure those most likely to be in or at risk of fuel poverty and living in properties that are the least energy efficient are included.

The homes selected for intervention were failing the previous Energy Efficiency Standard for Social Housing (ESSH) and were located within a rural area; resulting in additional travel spend to allow householders to access vital amenities which further exacerbated the difficulties tenants faced in heating their homes.

# **Project Title: Mill Place, Thankerton: Energy Efficiency Works**

**Project Organisation:** Clydesdale Housing Association

**Technology Type(s):** ASHP, HHRSH, Solar PV, Battery Storage and Allume Solshare

**Location(s):** Thankerton, South Lanarkshire Council

**Grant Value:** £239,475

**Completion Date:** March 2024

**Project Headline:** Clean heating and microgeneration installed to 22 homes in Thankerton, South Lanarkshire

## **Project Description:**

This project installed clean heating and micro generation of electricity to 22 properties in Thankerton, South Lanarkshire. The properties were a mix of archetype, both flats and houses, of different sizes. The measures installed depended on the archetype of the properties, which were previously heated with old style storage heaters.

The houses received ASHPs and solar PV with a dual inverter that allowed the storage of the electricity into an installed 3kw battery. On the flatted properties of the development Solar PV with Allume solshare was also installed enabling the sharing of solar energy from a single rooftop solar system amongst multiple dwellings within the same building. This micro generation was coupled with the Elnur Smart high heat retention storage heaters. The smart Elnur solar high heat retention storage heater allows the use of energy from the solar panels to reduce heating costs, when there's not enough renewable energy production, it uses cheaper off-peak power to charge and top up the demand. The flatted dwellings did not receive a battery installed as the HHRSH acts as a battery. The measures that were installed will achieve up to a 60% saving on the energy costs for the tenants and future proof the assets for any future government driven targets for energy efficiency in social housing.

# **Project Title: B and C Listed Double Glazing and Insulation Works**

**Project Organisation:** Yorkhill Housing Association

**Technology Type(s):** Double Glazing Windows, LITU and Internal and External Door Draft Proofing

**Location(s):** Glasgow, Glasgow City Council

**Grant Value:** £364,454

**Completion Date:** Projected January 2025

**Project Headline:** Fabric First retrofit of 37 listed pre-1919 sandstone tenements in Glasgow

## **Project Description:**

This project will provide fabric first energy efficiency measures to 37 pre 1919 sandstone tenements in Yorkhill, Glasgow. All of the properties in this project are listed: 24 are B-listed and 13 are C-listed.

Each property will receive timber framed double glazed windows which will comply with Glasgow City Council's planning permission conditions which took Yorkhill Housing Association 8 years to achieve. Window upgrades will retain the traditional features of the listed buildings while reducing heat loss.

Loft insulation top-ups will be installed alongside draught proofing to internal and external doors to further minimise heat loss.

The installation of these measures will save tenants on energy bills, alleviating fuel poverty and providing thermal comfort for tenants as the properties currently have single glazed windows due the planning restrictions.

# **Project Title: Internal Cavity Wall Insulation Programme**

**Project Organisation:** Williamsburgh Housing Association

**Technology Type(s):** IWI, UFI, LITU

**Location(s):** Paisley, East Renfrewshire Council

**Grant Value:** £59,700

**Completion Date:** Projected January 2025

**Project Headline:** Project to install Internal Wall Insulation to 30 pre-1919 tenement properties in Paisley

## **Project Description:**

Properties consist of 30 flats in sandstone tenement properties. Two of the flats on the ground floor and all of the flats on the top floors will receive secondary fabric measures which include underfloor insulation for the ground floor and loft insulation top-ups for the top floor.

The installation of these measures is based on a recent pilot project which saw energy use reduce from 220 KWh/m<sup>2</sup>/year to 168 KWh/m<sup>2</sup>/year – demonstrating the benefits in relation to energy consumption by installing the measures.

A post commissioning monitoring and evaluation assessment will be conducted on a sample selection of properties to collect and analyse information on fuel usage and the effectiveness of the energy efficiency improvement measures. The data will be used to inform future energy efficiency projects within this stock archetype.

# **Project Title: Hill Road Net Zero Heat Project**

**Project Organisation:** West of Scotland Housing Association

**Technology Type(s):** ASHP, Solar PV and Battery Storage

**Location(s):** Cumbernauld, North Lanarkshire Council

**Grant Value:** £569,665

**Completion Date:** Projected March 2025

**Project Headline:** Project installing ASHPs, solar PV and battery storage to 36 sheltered housing properties in Cumbernauld

## **Project Description:**

The project includes a mix of single storey, semi-detached and terraced bungalows across a sheltered housing site built in 1993. Tenants are primarily over the age of 60 or living with a disability. The majority of tenants are experiencing fuel poverty and struggling to heat their homes.

The properties currently have expensive to run storage heaters and will benefit from clean heating via ASHPs for each individual property. The project will install solar PV panels and battery storage, which will enable the generation of zero carbon electricity to the properties, reducing the amount of electricity that needs to be imported from the grid, therefore lowering energy bills and reducing carbon emissions.

Properties already benefit from cavity wall insulation and loft insulation, all up the required standard. In addition, all properties are fully double glazed (with current windows installed in 2018) and have low energy lighting fitted across all fixed outlets. This makes these properties perfectly primed to install clean heating and maximise these benefits.

The project will include a wraparound package of support including energy and tariff advice designed to reassure tenants and ensure they are able to operate their new systems and optimise their overall efficiency.

# **Project Title: Hebridean EWI Plasterfield**

**Project Organisation:** Hebridean Housing Partnership (HHP)

**Technology Type(s):** EWI

**Location(s):** Plasterfield, Isle of Lewis, Comhairle nan Eilean Siar

**Grant Value:** £367,500

**Completion Date:** Projected March 2025

**Project Headline:** Project involving installation of external wall insulation into 30 detached properties in Plasterfield on the Isle of Lewis

## **Project Description:**

All properties are dense concrete block cavity construction and were built in 1948, there are known issues with these properties due to the construction restricting the ability to remove condensation. Due to this, external wall insulation has been deemed the most suitable form of insulation.

The project aims to contribute to reductions in fuel bills, reduce the energy demand of the properties, reduce carbon emissions and improve tenants' comfort, health and wellbeing.

As part of a separate parcel of works, Hebridean Housing Partnership will replace the existing heating with ASHPs and provide additional ventilation systems controlled by relative humidity controls to ensure improved air quality.

# **Project Title: Kelvin Court, Kirkintilloch, Energy Efficiency Retrofit**

**Project Organisation:** Hanover Housing Association

**Technology Type(s):** HHRSH, EWI, Roof Solar PV with Allume Solshare, Battery Storage, Triple Glazed Windows

**Location(s):** Kirkintilloch, East Dunbartonshire Council

**Grant Value:** £537,977

**Completion Date:** Projected March 2025

**Project Headline:** Project involving range of energy efficiency measures installed to 35 sheltered housing flats in Kirkintilloch

## **Project Description:**

Kelvin Court properties will benefit from various measures including EWI, roof solar PV via Allume Solshare, battery storage, Elnur high heat retention storage heaters and triple glazed windows.

The building envelope will be upgraded with EWI and triple glazed windows to minimise heat loss, enhance insulation and improve thermal comfort following PAS 2035 fabric first methodology. The installation of Allume Solsare will harness renewable energy, reducing reliance from the grid and distributing microgeneration to individual dwellings from a communal roof, with excess solar energy being stored in the battery storage systems for later use at off peak times. Updated storage heaters will integrate with the solar PV for precise temperature control and energy management.

The deep retrofit project at Kelvin Court has the potential to significantly alleviate fuel poverty for the tenants within the 35 flats by reducing energy consumption, generating renewable energy, improving thermal comfort, and lowering fuel bills. Calculations indicate that up to 60% saving on tenant energy cost will be achieved post retrofit.

# Project Title: Sandstone Tenement Archetype Solution

**Project Organisation:** Wheatley Homes

**Technology Type(s):** IWI, LI, UFI and HHRSH

**Location(s):** Multiple locations across Edinburgh City Council and Glasgow City Council

**Grant Value:** £960,000

**Completion Date:** Projected March 2025

**Project Headline:** Whole house fabric first retrofit approach to 48 sandstone tenement flats in Glasgow and Edinburgh

## Project Description:

The project is targeted at improving 48 sandstone tenements flats; focusing on full fabric insulation using solutions specifically tailored for this archetype. Works will be carried out at 'void' stage. This will allow multiple applicable measures to be installed.

Glasgow and Edinburgh have around 146,000 pre-1919 sandstone tenements. This archetype is one of the most challenging from a scalable retrofit and decarbonisation perspective because of their age, building materials, condition, listed status and multiple ownerships in a block.

The proposals cover sandstone tenements in Edinburgh and Glasgow, using a successful 'menu of measures' approach Wheatley Group have deployed from a previous project. This project resulted in achieving EPC 'B', from a typical starting point of 'D'. Space heating energy demand as low as 44kWh/m<sup>2</sup> has been achieved in one case, with typical levels of 70kWh/m<sup>2</sup>, from an average starting position around 137kWh/m<sup>2</sup>. This project is expected to achieve similar results.

# **Project Title: Rural Net Zero House Type – Deep Retrofit**

**Project Organisation:** Wheatley Group – Wheatley Homes South

**Technology Type(s):** ASHP, Solar PV, Battery Storage, EWI

**Location(s):** Multiple locations across Dumfries and Galloway Council

**Grant Value:** £3,156,344

**Completion Date:** Projected March 2025

**Project Headline:** This project will improve 116 homes to Net Zero Deep Retrofit standard through a combination of measures to low energy efficiency 'house' type properties in Dumfries and Galloway

## **Project Description:**

Measures include ASHPs, solar PV, battery storage and EWI, depending on the individual property's requirements, with the expectation to lift all properties to an EPC 'A'. Properties are currently heated through oil or coal systems and are a mix of conventional 2 storey or bungalow standard brick construction house type. Once the measures are installed the homes will be fully net zero.

Once upgraded the properties will have a typical space heating consumption of 70kWh/m<sup>2</sup>/yr and deliver an expected average saving per household, having had all works completed, to be an average cost saving of £987 per dwelling. Tenants will be offered a full 'wrap around' service ensuring they are provided with support and advice on their new technology and tariffs.

This project is the next phase of a previously successfully supported project.

# **Project Title: Danderhall Net Zero Upgrades, Phase 2**

**Project Organisation:** Midlothian Council

**Technology Type(s):** EWI, CWI, IWI

**Location(s):** Danderhall, Midlothian Council

**Grant Value:** £825,439

**Completion Date:** Projected March 2025

**Project Headline:** Project involving energy efficiency insulation upgrades to 130 properties in Danderhall

## **Project Description:**

119 properties will receive external wall insulation and cavity wall insulation, with internal wall insulation and cavity wall insulation installed to 11 properties. The majority of properties were built between 1950-1963 across a number of archetypes including bungalows, terraced housing, flats and 4-in-a-block.

Energy efficiency will be improved in the properties to reduce energy demand in the homes and futureproof homes to be fit for the transition from mains gas to low-carbon heating systems, principally through the planned extension of Shawfair district heating network.

This project is Phase 2 of a project funded in financial year 2023/24, with successful completion in June 2024.

# **Project Title: Arbroath Retrofit Project**

**Project Organisation:** Hillcrest Homes

**Technology Type(s):** ASHP, EWI, Solar PV and Battery Storage, Double Glazing and External Doors

**Location(s):** Arbroath, Angus Council

**Grant Value:** £682,353

**Completion Date:** Projected December 2024

**Project Headline:** Whole house retrofit pilot scheme in Arbroath brings 23 homes out of fuel poverty

## **Project Description:**

This project will take a whole house retrofit approach to 23 mid and end terraced houses in Arbroath, Angus. The properties are of solid wall construction and currently have gas central heating. The project is a proof-of-concept pilot scheme to further the Net Zero plans of the Housing Association and will utilise the PAS2035 framework and standard.

Every property will receive clean heating in the form of ASHP heating system with radiators and hot water cylinders, and microgeneration in the form of solar PV and battery storage. Additionally, energy efficiency measures will be utilised to maximise the cost savings to tenants, including EWI, double glazing and new external doors. The homes in the project were chosen for this pilot scheme as they are in one of the most deprived areas of Scotland. It will save tenants an estimated £1000 per year on fuel bills. The project will also bring the properties from an EPC C to B.

# **Project Title: 2024 NZH Project**

**Project Organisation:** Waverley Housing

**Technology Type(s):** ASHP, Solar PV, Battery storage and HHRSH

**Location(s):** Galasheilds, Hawick, Kelso, St Boswells and Earlston; Scottish Borders Council

**Grant Value:** £210,649

**Completion Date:** Projected December 2024

**Project Headline:** Tackling fuel poverty across the Scottish Borders with Clean Heating and microgeneration

## **Project Description:**

This project will deliver upgrades to 23 Urban and 3 Rural properties. Measures differ based on archetype but most of the homes are post WWII construction. Six properties will receive ASHPs, Solar PV and Battery storage. Four properties will receive high heat retention storage heaters, Solar PV and batteries. 16 properties, which are flats, will receive high heat retention storage heaters and 20 properties will be given connected response heat sage which improves the efficiency of existing storage heaters.

The homes were chosen for the project as the tenants having high energy bills due to the age or type of heating system currently installed, meaning all the homes are either living in, or at risk of falling into, fuel poverty. The properties have also already benefited from Energy Efficiency measures such as wall insulation, double glazing and loft insulation through other funding. This will maximise the benefits for the tenants and increase the carbon and financial savings. The project will give tenants an estimated annual saving of £500 and bring all homes to an EPC of C, from a mix of D, E and F.

# **Project Title: Fabric First Retrofit to Timber Kit**

**Project Organisation:** Hjaltland Housing Association

**Technology Type(s):** EWI, UFI, External doors, MVHR

**Location(s):** Virkie, Shetland Islands Council

**Grant Value:** £92,172

**Completion Date:** Projected March 2025

**Project Headline:** Project involving fabric first retrofit to 4 detached bungalow properties in Shetland

## **Project Description:**

This project is based on a successful pilot the housing association undertook to other similar properties, confirming the fabric first approach improves air tightness and results in less heating energy being required. The pilot saw an average 33% reduction in all energy use and a 45% reduction in off peak heating use.

Properties are all hard-to-treat timber kit properties circa 1976, currently heated by high heat retention storage heaters. Retrofit project will involve external wall insulation, underfloor insulation, new doors and side screens and mechanical ventilation heat recovery.

Tenants will receive technical instructions to ensure heating is programmed efficiently and temperatures will be monitored through already installed Aico environmental sensors.

# **Project Title: Glenmavis Crescent/Court, Carluke: Energy Efficiency Works**

**Project Organisation:** Clydesdale Housing Association

**Technology Type(s):** ASHP, HHRSH, Solar PV, Battery Storage and Allume Solshare

**Location(s):** Carluke, South Lanarkshire Council

**Grant Value:** £415,704

**Completion Date:** Projected February 2025

**Project Headline:** Clean heating and microgeneration installed to 33 homes in Carluke, South Lanarkshire.

## **Project Description:**

This project will install net zero measures to 21 houses in Glenmavis Court and 12 flats in Glenmavis Crescent, in Carluke, South Lanarkshire. The project's 21 houses will be fitted with ASHPs and the 12 flats will have HHRSH installed. All homes will receive solar PV and battery storage. Additionally, the 12 flats will benefit from Allume Solshare technology.

The homes in this project are ready for clean heating and microgeneration as they have previously benefited from EWI through other funding. This along with the solar PV, battery and Allume Solshare will allow the tenants maximum benefits from these measures.

The project is expected to bring the EPC of the properties from D to B. It will also significantly reduce fuel bills for tenants, by up to £1500 per annum.

# **Project Title: Net Zero Heat Demonstrator**

**Project Organisation:** Langstane Housing Association

**Technology Type(s):** ASHP, Solar PV, Battery Storage, EWI

**Location(s):** Aberdeen, Aberdeen City Council and Tomintoul, Moray Council

**Grant Value:** £262,992

**Completion Date:** Projected March 2025

**Project Headline:** Project involves installing clean heating systems and fabric first measures to 14 properties in Aberdeen City and Moray

## **Project Description:**

The project involves works to the following properties in Tomintoul and Aberdeen:

- 12 semi-detached, terraced and 2 storey flatted properties in Tomintoul will receive ASHPs, solar PV and battery storage.
- 1 gas-heated semi detached property in Aberdeen will receive an ASHP, EWI, solar PV and battery storage.
- 1 electric storage heated end-terraced property in Aberdeen will receive an ASHP, solar PV and battery storage.

The project has been specifically designed to reach tenants who have inefficient and carbon intensive heating systems, maximising the potential for energy bill savings while reducing tenants' reliance on fossil fuel. To ensure tenants can optimise the efficiency of their systems, a robust handover and end-to-end tenant support will be provided.

The project is intended to produce learnings on the impact of installing clean heating systems in Langstane's properties and evaluate the impact on tenants' energy bills and how easily the tenants' can operate their new systems.

# **Project Title: Dundee Net Zero Project**

**Project Organisation:** Home in Scotland (Home Group)

**Technology Type(s):** ASHP, Solar PV via Allume Solshare System, Triple Glazing, IWI, EWI, Insulated Doors

**Location(s):** Dundee, Dundee City Council

**Grant Value:** £489,982

**Completion Date:** Projected March 2025

**Project Headline:** Project involving 14 individual flats in Dundee in receipt of whole house retrofit including clean heating installation via innovative internal Air Source Heat Pumps.

## **Project Description:**

14 individual flats in adjoining semi-detached blocks in Dundee, blocks are traditional cavity wall construction c.1990. Project is looking at innovative way to find a solution for this property archetype through installing individual Air Source Heat Pumps into all properties. Solution is intended to be used as a 'blue-print' for a logical solution to other multi-occupied blocks with limited space for communal heating system, and that may have complications such as with private owners.

Project will also install Allume Solshare system, triple glazing, internal wall insulation, external wall insulation and insulated doors. Project anticipates at least 20% saving on tenant's bills, alongside this properties are currently EPC C & D – will take all to EPC A. Estimated annual energy savings of 62327.15 kwh. Home in Scotland will also undertaken extensive monitoring and evaluation of the project to determine replicability across housing stock.

# **Project Title: Katherine Street - Building Fabric Upgrade and ASHP Installation**

**Project Organisation:** Almond Housing Association

**Technology Type(s):** ASHP, EWI, Double Glazing

**Location(s):** Livingston, West Lothian Council

**Grant Value:** £418,427

**Completion Date:** Projected March 2025

**Project Headline:** Project will retrofit 25 flatted properties with ASHPs and energy efficiency upgrades including EWI and double glazing

## **Project Description:**

Reducing fuel poverty and the climate emergency are priorities for the Almond Housing Association and the project at Katherine Street presented an opportunity to deliver low carbon technologies and retrofit energy efficiency upgrades.

This refurbishment project will replace the existing mains gas fired boilers with new ASHP systems, providing space heating and hot water. The Association will use this project as a trial for installing ASHP in their properties. If successful, this clean heat will be considered in future development and refurbishment projects. The project aims to have a significant impact on tenant's energy bills and reducing fuel poverty.

To ensure the buildings are future proofed the project is installing Envirowall cladding and double glazing to improve the thermal efficiency and ensure the benefit of the ASHP is maximised. Ventilation measures and environmental sensors will also be installed by the Association to monitor air quality and ensure heat and ventilation benefits are being maximised.

# **Project Title: Balintore Mixed Tenure - Whole House Retrofit**

**Project Organisation:** The Highland Council

**Technology Type(s):** EWI, Double Glazing, Insulated Doors (other measures funded via other sources)

**Location(s):** Balintore, Cromarty, Ross and Tain, Highland Council

**Grant Value:** £962,000

**Completion Date:** Projected March 2025

**Project Headline:** This project involves whole house retrofit to 38 properties of Norwegian Timber Construction built in the 1970s

## **Project Description:**

31 properties will benefit from air source heat pumps, and all of the 38 properties will benefit from a suite of measures including: external wall insulation, loft insulation, under floor insulation, triple glazed windows, solar PV and battery, ventilation and windows. The SHNZHF requested will be used for the external wall insulation, double glazing, insulation doors and associated costs.

The remaining measures will be funded between ECO4 funding (which is already confirmed) and the Council's own budget. SHNZHF funding will contribute to this wider project to ensure properties are made energy efficient for the other measures installed to maximise benefits and savings for tenants.

All of the properties are off the gas grid so currently utilise electricity for heating, with many experiencing fuel poverty. All of the measures are designed to reduce each properties carbon emissions and reduce energy demand by adopting a whole house approach commencing with fabric first. All installations will be undertaken to PAS2035 standards.

# **Project Title: Energy Efficient External Wall Insulation**

**Project Organisation:** Calvay Housing Association

**Technology Type(s):** ASHP, EWI and CWI

**Location(s):** Barlanark, Glasgow City Council

**Grant Value:** £2,408,685

**Completion Date:** Projected June 2025

**Project Headline:** This project will deliver cavity wall insulation and external wall insulation to 36 blocks of flats, comprising of 267 properties

## **Project Description:**

The properties recently had energy efficient windows installed. This project will install external wall insulation and cavity wall fill on 267 flats across 36 blocks. The blocks are cavity brick render, and most are currently heated with gas boilers. The insulation measures will increase the thermal efficiency of the buildings, help to lower tenants' energy bills, increase tenants' comfort, and reduce carbon emissions.

The project will also pilot an innovative ASHP to one property to allow for an evaluation of its performance in a real world setting relevant to Calvay Housing Association's properties.

In order to measure the improvements, Calvay started monitoring properties in December 2023 and will continue monitoring during and for a 3-month period following the project completion. The ASHP will be monitored for at least 12 months following installation to evaluate the suitability of a wider roll out to all properties.



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Any enquiries regarding this publication should be sent to us at

The Scottish Government  
St Andrew's House  
Edinburgh  
EH1 3DG

ISBN: 978-1-83601-859-9 (web only)

Published by The Scottish Government, October 2024

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA  
PPDAS1505390 (10/24)