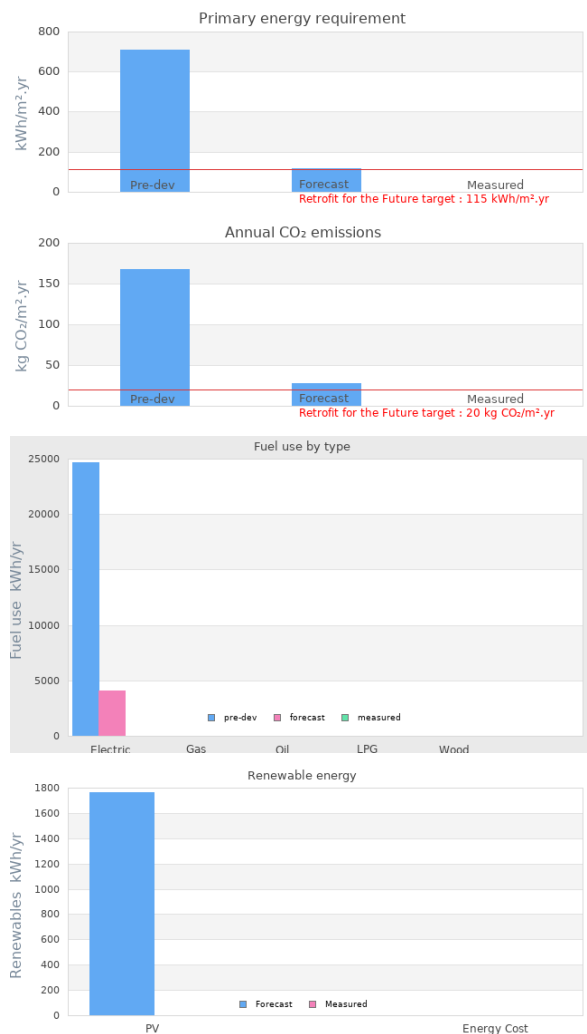


Project name Cottage retrofit, Chale Green, Isle of Wight

Project summary This project will focus on a dwelling typical for this area and will seek to establish a complementary and replicable set of measures which significantly reduce energy use and CO2 emissions associated with this particular type of property. The measures are intended to be carried out whilst the property remains unoccupied. It is intended that the findings will inform the remainder of SWHAs similar properties, and will also be widely applicable to other social landlords or building owners with similar stock, since there are around 7 million solid-walled properties in the UK.



Project Description

Projected build start date	01 Mar 2010
Projected date of occupation	25 Jul 2010
Project stage	Under construction
Project location	Chale Green, Isle of Wight, England
Energy target	Retrofit for the Future
Build type	Refurbishment
Building sector	Public Residential
Property type	Semi-Detached
Existing external wall construction	Solid Brick

Existing external wall additional information

Existing party wall construction	Solid Brick
Floor area	86.8 m ²
Floor area calculation method	PHPP

Project team

Organisation	ECD Architects
Project lead	Energy Conscious design, Studio 3, Blue lion Place 237 Long Lane, London SE1 4PU
Client	Southern Housing Group, PO Box 643 Horsham, West Sussex RH12 1XJ
Architect	Energy Conscious design, Studio 3, Blue lion Place 237 Long Lane, London SE1 4PU
Mechanical & electrical consultant(s)	Environmental Design Associates, 31 Wick Road, Teddington, Middlesex, TW11 9DN
Energy consultant(s)	ECD Project Services, Studio 3, Blue lion Place 237 Long Lane, London SE1 4PU
Structural engineer	Carter Clack Partnership, 49 Romney Street, Westminster, London, SW1P 3RF
Quantity surveyor	The Keegans Group, Studio 2, 193-197 Long Lane, London, SE1 4PD
Other consultant	Public Participation, Consultation and Research, Studio 2, 193-197 Long Lane, London, SE1 4PD
Contractor	TBC

Design strategies

Planned occupancy	Exisiting Tennants - Family
Space heating strategy	Heating will be provided by an Air source heat pump and new radiator system. Heat will be recovered from exhaust air via the use of mechanical ventilation with heat recovery unit.
Water heating strategy	Hot water will be provided by high efficiency flat plate solar collectors and large capacity thermal store with an air source heat pump as a backup.
Fuel strategy	Electricity
Renewable energy generation strategy	Onsite electric production by 2.52 kWp photovoltaic panels and heat production by solar thermal collectors.
Passive solar strategy	Window fenestration has been simplified in proposed replacement windows to maximise solar gain.

Space cooling strategy	HRV with summer bypass combined with natural ventilation for summer period. Night purging during heat waves.
Daylighting strategy	Window fenestration has been simplified in proposed replacement windows to maximise day light.
Ventilation strategy	Heat recovery ventilation and additional natural ventilation by opening windows during summer months as required..
Airtightness strategy	All existing vents and chimneys blocked up. New air barrier created by OSB board at ceiling level with taped joints and perimeters taped to masonry walls and plastered over. Service void created below this to eliminated penetrations. Windows, floors, junctions and all penetrations sealed with proprietary air tight tapes, membranes and grommets. All voids such as cavities filled to mitigate thermal bypass.
Strategy for minimising thermal bridges	Continuous insulation maintained throughout. Geometric thermal bridges minimised. Junctions assessed include: Ground floor junction, external corner, party wall, party roof, party floor, eaves, verge, window jamb, head and sill, door jamb, head and threshold.
Modelling strategy	Whole house modeling was undertaken in both PHPP and SAP, with the use of extension sheets for both. The results provided for existing energy usage were calculated in SAP, as this software is more suitable for modeling poor performing buildings. The proposed results were modeled in PHPP as this software is more accurate for predicating energy usage in high performing buildings.
Insulation strategy	- The solid ground floor slab will be left un insulated to minimise tenant disruption. - The existing walls will be clad externally with an insulated render system to give a U value of 0.15 w/m2K. - The existing windows will be replaced with high perf

Other relevant retrofit strategies

We propose to fit an intelligent heating controller designed to save energy and improve comfort in residential buildings. The system controls both central and water heating, reducing energy consumption by automatically monitoring and learning occupant behavior and preferences. It also provides an easy to use and simply user interface as well as covering all energy monitoring requirements.

Other information (constraints or opportunities influencing project design or outcomes)

South Wight Housing Association (SWHA) is a wholly owned subsidiary of Southern Housing Group following the merger of the two organisations in July 2002. In October 2005, they became the largest housing association on the Isle of Wight following their merger with the Isle of Wight Housing Association. They own and manages over 3000 homes and with the help of nearly 300 staff, provide over one-third of the Isle of Wight supported housing. Many of this stock, particularly to the west of the island, is not connected to mains gas and is constructed from solid brick walls, presenting particular issues with regard to fuel poverty.

Energy use

Fuel use by type (kWh/yr)

Fuel	previous	forecast	measured
Electric	24635	4053.56	
Gas			
Oil			
LPG			
Wood			

Primary energy requirement & CO2 emissions

	previous	forecast	measured
Annual CO2 emissions (kg CO2/m ² .yr)	168	28	-
Primary energy requirement (kWh/m ² .yr)	710	117	-

Renewable energy (kWh/yr)

Renewables technology	forecast	measured
PV	1765	
-		

Renewables technology	forecast	measured
Energy consumed by generation		

Airtightness (m³/m².hr @ 50 Pascals)

	Date of test	Test result
Pre-development airtightness	-	-
Final airtightness	-	3.17

Annual space heat demand (kWh/m².yr)

	Pre-development	forecast	measured
Space heat demand	-	69.9	-

Whole house energy calculation method

PHPP

Other energy calculation method

Predicted heating load

23.7 W/m² (demand)

Other energy target(s)

Building services

Occupancy	NULL
Space heating	NULL
Hot water	NULL
Ventilation	NULL
Controls	NULL
Cooking	NULL
Lighting	NULL
Appliances	NULL
Renewables	NULL
Strategy for minimising thermal bridges	NULL

Building construction

Storeys	
Volume	
Thermal fabric area	
Roof description	NULL
Roof U-value	0.00W/m ² K
Walls description	NULL
Walls U-value	0.00W/m ² K
Party walls description	NULL
Party walls U-value	0.00W/m ² K

Floor description	NULL
Floor U-value	0.00W/m ² K
Glazed doors description	NULL
Glazed doors U-value	0.00W/m ² K
Opaque doors description	NULL
Opaque doors U-value	0.00W/m ² K
Windows description	NULL
Windows U-value	0.00W/m ² K
Windows energy transmittance (G-value)	
Windows light transmittance	
Rooflights description	NULL
Rooflights light transmittance	
Rooflights U-value	0.00W/m ² K

Project images











