

## Case study 3

## Kerry Green, Bishops Castle

## Archetype

1945-1964 semi-detached house

## Landlord

South Shropshire  
Housing Association

## Description

The Kerry Green estate consists of semi-detached houses built in 1938. The houses are two bed and has a typical floor area of 76 m<sup>2</sup>. The properties are of standard masonry construction with a cavity wall of between 50 and 60mm. Floors are concrete screed on a raised slab.

A series of improvements have been made to the properties over the last twenty years, including double glazing, cavity fill and loft insulation. External doors are scheduled for replacement.

The town of Bishops Castle is not connected to the gas network and so space heating and hot water are provided using solid fuel. Coal fired stoves with back burners are currently installed. These are supplemented by electric immersion heaters which also supply wet radiators for space heating.

## Improvements to date

uPVC double glazing (without coating or gas fill), 1992

Solid fuel heating system (coal and wood) with electric immersion backup, 1997

Loft insulation (100mm), 1999

Cavity insulation (50-60mm) and top-up loft insulation (200mm), 2005

Kitchen replacement, 1996

Electrical testing, 2007

## Schedule improvements

External door replacement, 2011/12

Bathroom replacement, 2015/16

## Performance analysis

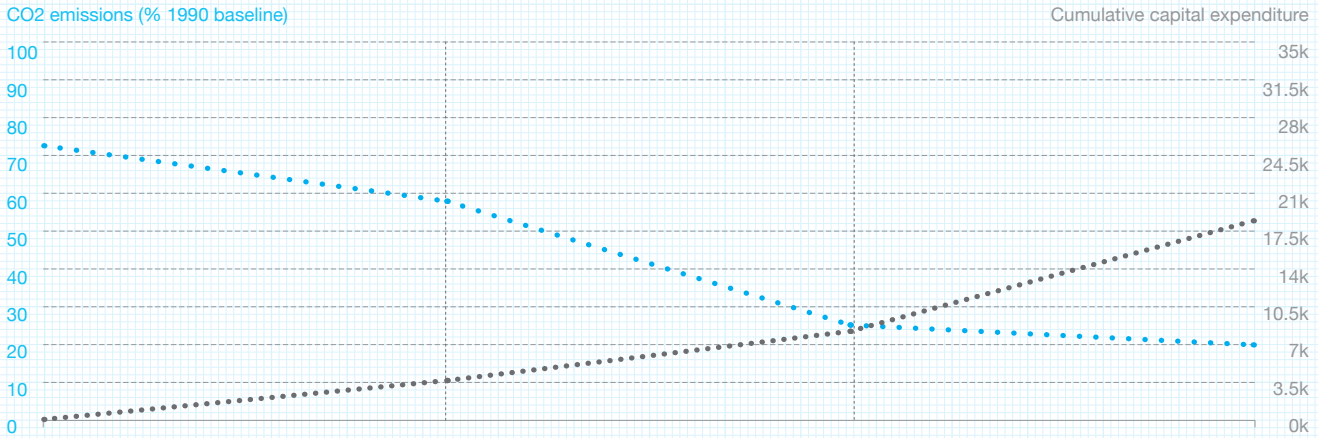
Capital cost	£18,581.70
by floor area	£244.50/m <sup>2</sup>

Performance metrics	1990	2009	2025
SAP rating	27 (F)	51 (E)	86 (B)
Fuel cost	£975.63	£681.54	£286.60
CO <sub>2</sub> emissions	5.2	3.8	1.0
% reduction	- 0%	-27%	-80%

Fabric U-Values	Baseline 1990		As of 2009		Target 2025	
	U Value W/m <sup>2</sup> K	Heat loss W/m	U Value W/m <sup>2</sup> K	Heat loss W/m	U Value W/m <sup>2</sup> K	Heat loss W/m
Windows	4.0	50.9	2.5	31.9	1.2	15.2
Doors	3.9	14.7	2.9	11.0	1.2	4.5
Floor	0.7	26.6	0.7	26.6	0.2	6.3
Walls	1.4	89.2	0.7	44.0	0.7	40.6
Roof	1.8	67.6	0.4	14.7	0.1	3.8

Energy and CO <sub>2</sub> emissions	kWh	CO <sub>2</sub> (tonnes)	kWh	CO <sub>2</sub> (tonnes)	kWh	CO <sub>2</sub> (tonnes)
Space heating	15,990	1.8	4,599	0.1	3,503	0.7
Hot water	5,262	0.6	1,768	0.0	1,218	0.2
Electricity	3,304	1.4	2,058	0.9	2,769	1.2

### Timeline for future investment



	Phase 1 (2010 - 2015)	Phase 2 (2016 - 2020)	Phase 3 (2021 – 2030)
<b>1. Fabric performance</b>	<p><b>Roof:</b> Top-up existing insulation (to 350mm);</p> <p><b>Doors:</b> Solid timber panel insulated doors;</p>	<p><b>Floors:</b> Installation of insulated timber flooring (10mm insulation, 25mm overall) over existing concrete ground floor;</p>	<p><b>Glazing:</b> Replacement of existing glazing units with high performance double glazing units;</p>
<b>2. Fit out</b>	<p><b>Lighting:</b> Switchover to compact fluorescent (subject to tenant agreement);</p> <p><b>Water fittings:</b> Replacement spray taps and/or flow restrictors, low flow shower heads as part of kitchen/bathroom works;</p>		
<b>3. Energy supply</b>		<p><b>Solid fuel heating with back boiler:</b> Installation of an efficient biomass fuelled heating stove with back boiler to provide hot water during the heating season;</p>	<p><b>Solar thermal:</b> Installation of evacuated tube and/or high performance flat plate collector with twin coil hot water accumulator tank and electric immersion (to provide backup);</p>
<b>4. Monitoring</b>			