Case study 2

Buckley Road, Wolverhampton

Archetype
Pre-1945 semi-detached house

Landlord
Wolverhampton Homes

Description

The Buckley Road properties form part of an estate of semi-detached housing built during the inter-war period. They are four and five bed and the largest floor area is 226 m². They are traditional masonry construction with, for the most part, rendered external walls. Floors are concrete screed on a slab.

The properties are characterised by large pitched roofs and deep overhanging eaves. The external walls were constructed with a small cavity of 25-30mm which has subsequently been filled with insulation.

Double glazing was installed in the later 1990's. An investment programme has upgraded the heating systems of the properties, with modern condensing gas boilers installed. Loft insulation has also been topped up from 100mm to 250mm.

Improvements to date
Double glazed uPVC windows (without coating or gas fill) and cavity insulation, 1999
Condensing boiler and radiators, 2008

Schedule improvements
Re-roofing, 2010
Kitchens, bathrooms and electric rewiring, 2011/12

Performance analysis

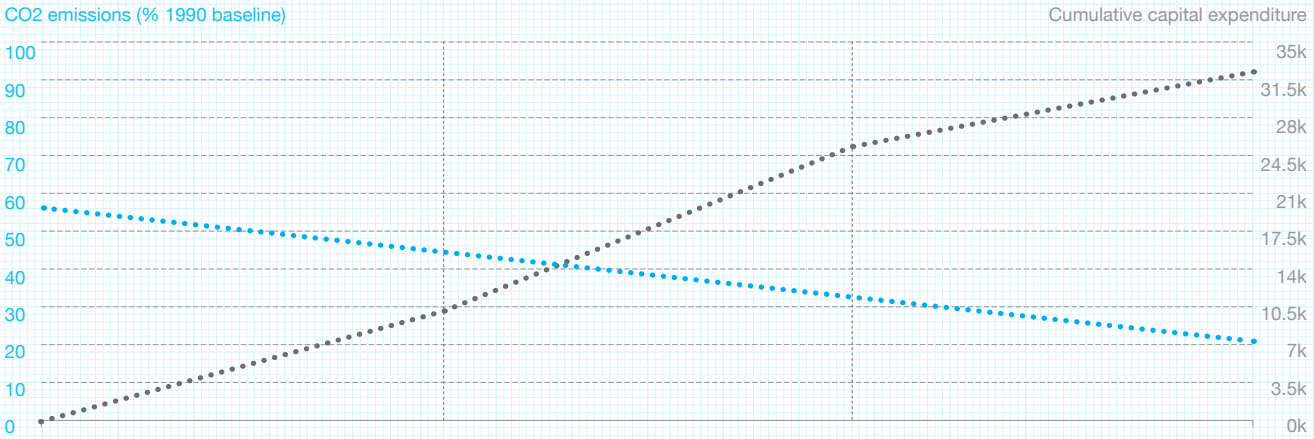
Capital cost	£32,170.56
by floor area	£142.35/m²

Performance metrics	1990	2009	2025
SAP rating	69 (C)	78 (C)	93 (A)
Fuel cost	£860.40	£669.09	£308.10
CO_2 emissions	10.1	5.5	2.1
% reduction	- 0%	-45%	-79%

	Baseline 1990		As of 2009		Target 2025	
Fabric U-Values	U Value W/m²K	Heat loss W/m	U Value W/m²K	Heat loss W/m	U Value W/m²K	Heat loss W/m
Windows	4.0	61.8	2.4	36.5	0.7	10.8
Doors	2.8	10.0	2.8	10.0	1.2	4.3
Floor	0.7	72.8	0.7	72.8	0.4	45.1
Walls	1.4	97.3	0.7	48.0	0.2	14.0
Roof	2.0	98.4	0.4	17.2	0.1	5.0

Energy and CO_2 emissions	kWh	CO_2 (tonnes)	kWh	CO_2 (tonnes)	kWh	CO_2 (tonnes)
Space heating	36,371	7.1	15,216	3.0	3,503	0.7
Hot water	6,351	1.2	5,075	1.0	1,218	0.2
Electricity	4,249	1.8	3,779	1.6	2,769	1.2

Timeline for future investment



	Phase 1 (2010 - 2015)	Phase 2 (2016 - 2020)	Phase 3 (2021 – 2025)
1.Fabric performance	**Roof:** Top-up of existing loft insulation (to 350mm);	**Walls:** Overcladding of external walls with rendered external insulation system (150mm), with detailing to incorporate replacement windows; **Windows:** Replacement of existing frames and glazing units with high performance triple glazing; **Doors:** Solid timber panel insulated doors;	**Floors:** Installation of insulated timber flooring (10mm insulation, 25mm overall) over existing concrete ground floor;
2. Fit out	**Water fittings:** Replacement spray taps and/or flow restrictors, low flow shower heads as part of kitchen/bathroom works; **Appliances:** A+ rated washing machines and fridge/freezers (subject to tenant agreement); **Lighting:** Switchover to compact fluorescent (subject to tenant agreement);		
3. Energy supply	**Solar thermal:** Installation of evacuated tube and/or high performance flat plate collector with hot water accumulator tank, supplementing primary heating system; **Upgrade of condensing boiler** controls to feed solar accumulator tank.		**Ventilation heat recovery:** Whole house system with heat recovery in the roof void, drawing warm air from kitchens and bathroom;
4. Monitoring			**Internal heating systems:** Fitting of thermostatic controls and timers for each heating zone; **Low temperature heating:** Replacement skirting radiators (utilising existing pipework), or underfloor heating alongside floor insulation;