
Case Study

Kevin Ryan Court

Merthyr Housing
Association, Wales

ambion



Case Study: Kevin Ryan Court



Customer: Merthyr Tydfil Housing Association (MTHA)

This case study examines the lifetime costs of Ambion Low Carbon Heat Panel space heating in a real-life situation, and compares this with the lifetime costs of other electric heating systems had they been installed in the property. Real operational data for an Ambion Low Carbon Heat Panel system in one of the flats is used to compare its energy performance with conventional heating technology.

LOCATION

Heol S.O. Davies, Georgetown, Merthyr Tydfil, Mid Glamorgan, CF48 1EE. The Georgetown area of Merthyr Tydfil is within close proximity to the town centre.

BUILDING DESCRIPTION

Kevin Ryan Court consists of 42 self-contained flats and is a retirement home. It offers a communal lounge, kitchen, laundry facility, hairdressing salon and IT suite, as well as enclosed gardens and car parking.

It also includes wheelchair access. Many of the daily activities take place within the communal lounge. The home is supported by resident management staff and Careline alarm service.

Problem

MTHA wanted an improvement on the existing storage heaters with lower running costs and an improved heating experience for residents. MTHA wanted a direct heating system. Heat pumps were not considered appropriate given the nature of the building.

Solution

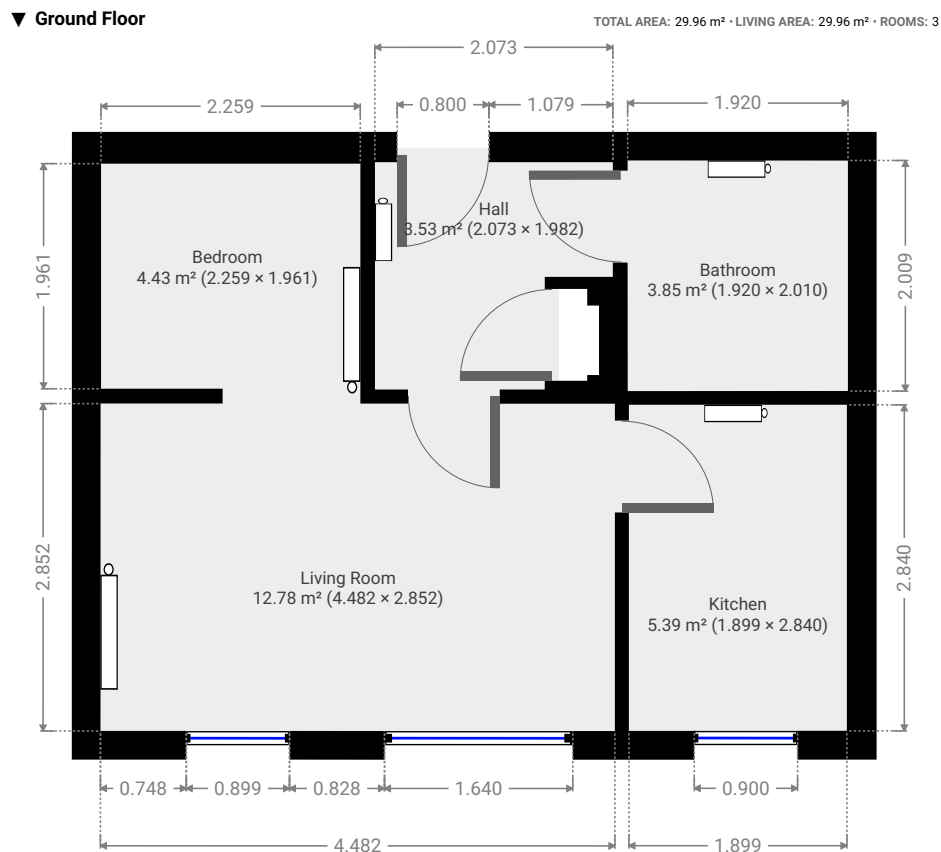
Each flat has been fitted with the Ambion Low Carbon Heat Panel system except a final 9 flats where tenants held out for the pre-existing storage heaters. These flats are being converted to the Ambion Low Carbon Heat Panel system as they become void.



ambion

Example Flat

The lifetime costs calculation relates to a typical flat within the property.



Key Facts

- One-bedroom top-floor flat.
- Total area: 31.9m²
- Annual space heat demand – 6,112 kWh (SAP/EPC calculated)
- EPC rating – C75

Lifetime Costs and Emissions Analysis

The lifetime costs calculation relates to the above flat, which is typical of the property.

The model calculates the lifetime costs to landlord, tenant and combined, and compares them with alternative electric systems.

KEY FINDINGS

A table of data is set out at appendix A, and key points may be summarised as follows:

- **For the landlord**

At £3,385 (£106.15/m²), the installed upfront cost of the Ambion system is 17% cheaper than a storage heater system (£4,069 or £127.79/m²), but more than conventional a panel heater system (£2,180 or £63.86/m²).

- At 0.3 tonnes pa, the Ambion system has carbon emissions 61% lower than both a panel heater system and a storage heater system.
- The Ambion system has no maintenance costs as there are no moving parts, and no water-based delivery system.

- **For the tenant**

At £457pa, the Ambion system has energy costs 62% lower than a panel heater system (£1,200 pa) and 37% lower than a storage heater system on Economy-7 (£723 pa).

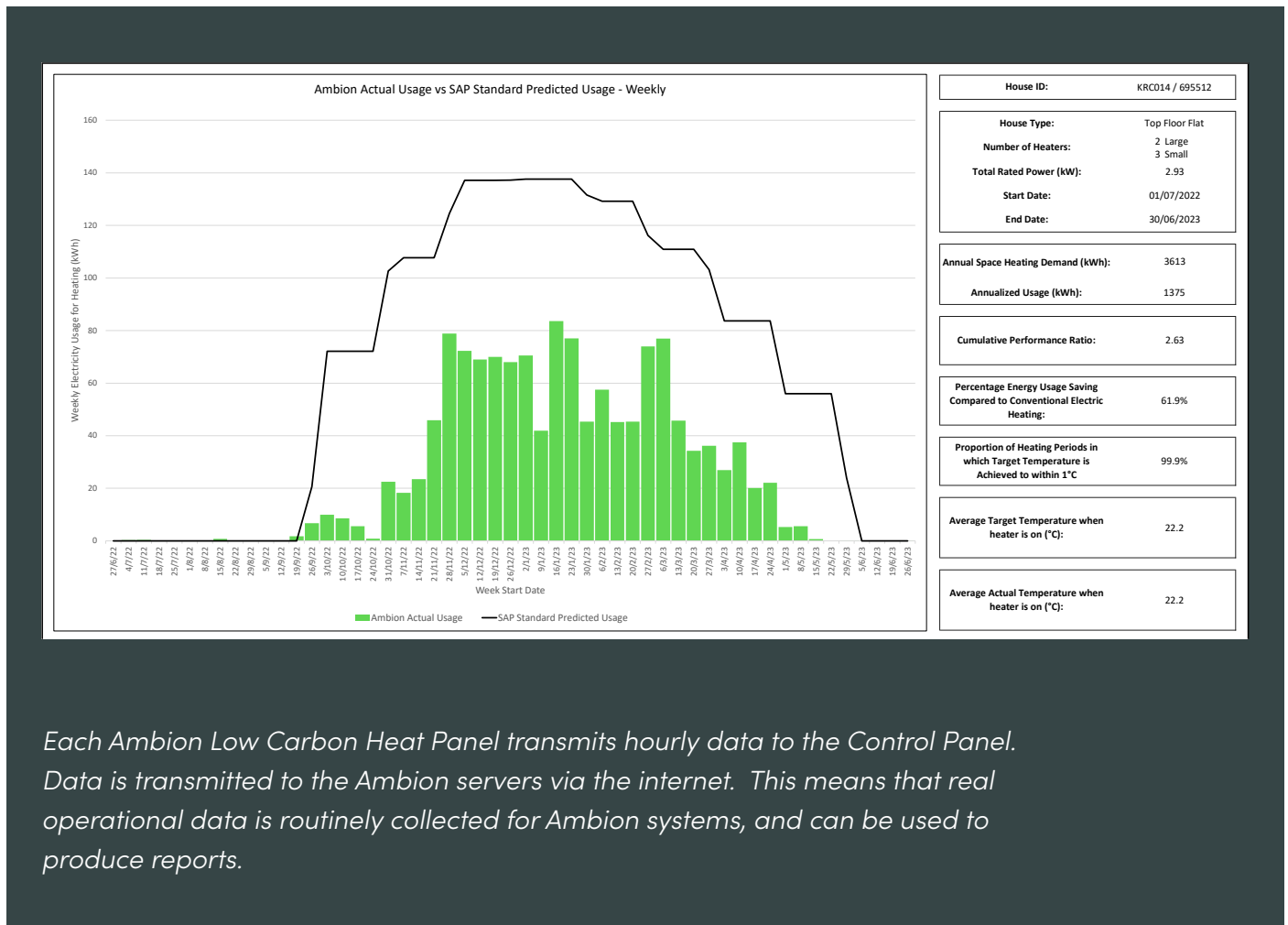
- **Total 15-year costs and payback**

The Ambion system has the lowest 'total costs over 15 years' of all the systems. At £10,233, the Ambion system has total costs 49% lower than a panel heater system (£20,713) and 31% lower than a storage heater system on Economy-7 (£14,908).

- Compared with the cheaper panel heater system, the Ambion system has a payback period of just 1.6 years given its markedly superior energy performance.

Real Performance Data

Set out below is the 'dashboard' for the flat in this property, showing the actual energy usage.



In the graph, the black line represents the predicted annual energy use for heating, using the standard SAP calculation, for this particular flat. This equates to expected energy usage with conventional electric heating technology at 100% efficiency. The green bars represent the

actual energy used by the Ambion system in this flat – a saving of 62% in this example. This equates to a Performance Ratio of 2.63.

About Ambion Low Carbon Heat Panel system

The Ambion Low Carbon Heat Panel system has a unique control system which uses constant dynamic pulsing - rather than a 'zoning' on/off approach used by other direct heating systems - to dramatically reduce energy usage and maintain the property's temperature within 0.1 °C of its target, 24 hours a day.

The system uses infrared heat panels because building materials absorb and store infrared, releasing it between pulses, making it the perfect partner for the pulsing approach.

Control of the system is achieved by a single Control Panel which contains all customer settings (temperatures per heater etc.), orchestrates the pulsing of the heat panels and provides full operational data across the system.



SPECIFICATION

Ambion advised on the exact specification of the Low Carbon Heat Panel system, as summarised in the table and as set out on the floor plan (on page 4).

Ambion	No.	Power kW
Large panel	2	0.82
Small panel	2	0.43
Small panel IP	1	0.43
Total panels	5	
Control panel	1	
Total space heating		2.93
Total per m2		0.09

KEY ASSUMPTIONS

The model from which the above table is extracted uses the following key assumptions:

- Lifetime costs are over 15 years (in line with industry norms). Please note the lifetime of the Ambion Low Carbon Heat Panel is over 20 years, and Ambion offers a 10-year warranty, which can be extended to a 20-year warranty.
- Installation costs cover electrical works to replace previous storage heating.
- The Ambion Low Carbon Heat Panel system has an average Performance Ratio of 2.69 across all house types; and varies across house-types. The actual Performance Ratio of 2.63 for this flat has been used in this case study.
- The Performance Ratio of all other technologies is set at 1.0 (100% efficiency).
- Source of tariffs and carbon factors is Energy Saving Trust, April 2022.
- All product costings are at RRP.
- Sources of all third-party electric products costings is BEIS.

Lifetime Costs and Emissions Table

	ELECTRIC		
	Panel Heaters	Storage Heaters	Ambion
Up-front costs			
System	£1,830	£3,769	£2,885
Install	£350	£300	£500
Space heating (installed)	£2,180	£4,069	£3,385
Upfront cost per m2	£68.36	£127.59	£106.15
Ambion savings %	-55%	17%	
Energy usage pa			
Annual heat demand of property kWh	3,613	3,613	3,613
Performance Ratio	1.00	1.00	2.63
Annual energy consumption kWh	3,613	3,613	1,375
Ambion savings %	62%	62%	
Energy usage pa			
Unit cost of energy per kWh	£0.332	£0.200	£0.332
Energy costs pa	£1,200	£723	£457
Ambion savings	£743	£266	
Ambion savings %	62%	37%	
Carbon emissions			
CO2 emissions kgCO2e/kWh	0.211	0.211	0.211
Carbon emissions Tonnes pa	0.8	0.8	0.3
Ambion savings %	62%	62%	
Total costs over 15 years			
Upfront costs (installed)	£2,180	£4,069	£3,385
Energy costs	£17,993	£10,839	£6,848
Total costs	£20,173	£14,908	£10,233
Ambion savings	£9,940	£4,676	
Ambion savings %	49%	31%	
Ambion payback vs panel heaters			
Difference in upfront costs	£1,205		
Ambion savings pa	£743		
Payback period (years)	1.6		