



Home Energy Case Study

Changing to an air source heat pump in a 1970s 3 bed end terrace

About the home

A small three bed end terrace home, built in the 1970s with cavity filled brick walls and roof insulation. We had previously installed 7 solar panels on our SE facing roof, with a 5.2kWh battery the year before. We are now with Octopus Energy.

What had to be right for the pump to go ahead?

- Space for the outdoor unit outside for the heat pump unit itself as our house had limited garden size close to neighbours so this was a key consideration. Our install required a front garden and step reconfiguration to fit the heat pump – otherwise it would have to be sited on a wall.
- Room for the hot water tank which having a combi-boiler was a new space requirement but we didn't want to lose storage space. We considered using the SunAmp heat battery and various different locations for a water tank.
- In the end we were able to convert an existing brick bin shed attached our house into a water tank utility room which proved to be an easier installation due to its proximity to the existing boiler location and pipework.
- Bin shed conversion involved fitting a new insulated 'garage' door and insulating the walls ourselves. It needed a new door anyway due to wood rot and the roof had been recently replaced so was already watertight.

The cost of installation and operation

The heat pump, installation, new hot water tank, monitoring system and 8 new radiators cost £14,435 (April 2024). The government grant was £7,500 in 2024. So, we paid £6935.

Having a heat pump and solar + battery has enabled us to move to an Octopus Cosy Tariff through which we get 3 lower cost periods each day. Over winter we charge our battery which covers a more expensive 4-7pm period. Our net energy costs and use (in kWh) presented below over 3 years:

Year	Energy Equipment	Net cost	Net kWh
2022-23	Gas only	£1424	8144
2023-24	Gas + Solar + Battery	£571	5320
2024-25	Solar + Battery + ASHP	£482	2322

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What motivated the retrofit?

The main motivation was to reduce our CO2 emissions and remove gas in our heating, hot water and cooking. Our old combi gas boiler was also at the end of its life, so didn't want to replace this. We also wanted to improve our front steps/garden and replace our old bin shed doors which we were able to do all together on this project.

Our air source heat pump installation

A 5 kW Vaillant air source heat pump was installed for heating our radiators and providing hot water to the tank in the insulated bin-shed at a 40C flow temperature design. System runs with weather compensation and in one whole year has achieved 392% efficiency (SCOP). This did require 8 new (in some cases larger) radiators to cope with the lower flow temp but as some were old or under performing and so this helped anyway.

We had to remove a set of steps and reconfigure their alignment. This involved landscaping our front garden, which took a bit of planning, but we were very happy with the results compared to the ugly grass lawn before!

Before:



After:



Heat pump:



At a glance...

No more direct fossil fuel use reducing CO2
Small end terrace house with minimal garden and storage space but still able to install by use of an outbuilding for the water tank which saved space and reduced install complexity. Garden refurbishment was required but enhanced our property as part of process.

So quiet – we can barely hear our pump!

A nice warm home with constant 20c temps

A lower energy bill combined with our solar array, battery storage and the right tariff.

Get started with your home energy transformation