

Case Study - Simon & Katy

Title:

Simon & Katy power their heat pump with solar PV

- **Home:** Semi-detached, 4 bedrooms, built 2004
- **Insulation:** Existing cavity wall and loft insulation. Garage roller door upgraded to new insulated model.
- **Heating:** Air Source Heat Pump installed (7kW Vaillant Arotherm+) and most radiators upsized
- **Solar PV:** 5.1kW capacity
- **Battery:** 9.5kWh capacity with a 5kW hybrid inverter



Overview – Downend House

Simon and Katy moved to Downend in the Spring of 2016, needing somewhere with more room for their growing family.

Their new home had cavity wall and loft insulation already in place, and at the time they had no plans to retrofit energy measures – although they'd had some experience with this, having added external wall insulation to their previous house.

When they moved in the home had its original 2004 gas boiler, which they knew didn't have much life left in it. Having had a boiler fail in their previous home one particularly

cold December, they didn't want to have to go through the experience again – and so replacing the boiler was increasingly a priority.

Switching to a Heat Pump

Simon began looking into heat pumps in 2020, but an installer who came round told them an Air Source Heat Pump wouldn't work with their microbore pipes, and that they'd have to have the entire house re-piped if they wanted one installed.

Luckily, a couple of years later they heard about [Heat Geek](#) through the [Fully Charged Show](#). Heat Geek were launching their scheme where if you used an installer accredited by them, they would ensure your ASHP would run at a certain efficiency (known as the Seasonal Coefficient of Performance or SCOP), returning and adjusting it for free if it wasn't.

Simon and Katy found a local ASHP installer who was accredited with Heat Geek – Craig from [C Brookes Plumbing and Heating](#), also part of the [Retrofit West Trusted Trades Directory](#) – who said that an ASHP would work with their microbore pipes if they installed a buffer tank with the system.

The [Boiler Upgrade Scheme \(BUS\)](#) had recently been launched, and Simon and Katy were able to make use of a £5000 grant towards the cost of the ASHP and installation.

So in October the 7kW Vaillant ASHP was installed, most of their radiators were also upsized, and Simon and Katy moved from gas to a central heating system that would cut their carbon emissions.

They've seen a SCOP of 4.6 (460% efficiency) on their ASHP, which has made it cheaper to run than gas, though Simon adds:

“Your gas boiler is never going to pay you back, no one thinks of it in that way. So it doesn't make sense to think of your heating paying you back for something, rather than it's doing a good job.”



Adding Solar and Improving the Home

Two years later Simon and Katy decided to install solar panels (5.1kW capacity) and a battery in order to further cut their carbon emissions and help power their ASHP with renewable, home-made energy – lowering their bills in the process.

A thermal imaging survey from [the CHEESE Project](#), also showed that Katy's study was colder than it should be because of the un-heated garage beneath the room. So when the garage door needed replacing they took the opportunity to upgrade it to a thermally insulated model.

“Having the Heat Pump made the solar a no-brainer really”



The Challenges

The microbore pipes

The first installer they spoke to said an ASHP wouldn't be feasible with their existing microbore pipes and that the house would need to be completely re-piped.

Their Heat Geek-accredited installer, however, suggested using a buffer tank to make the heat pump work with the existing pipework.

Disruption during installation

Disruption from installing the ASHP and changing the radiators created some challenges for Katy, as she was working from home and looking after their two young children after school.

However, she says it was manageable, with the installation taking around a week.

The Results

Simon and Katy are really happy with their ASHP and solar PV.

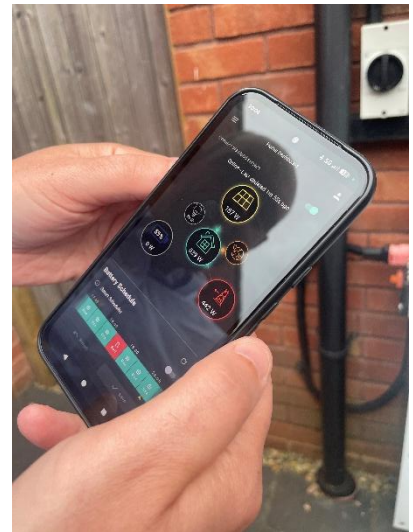
At first it took some time to find the balance between heating the house and using hot water without it running out.

It was also *'a mental change, because you can't just go 'oh I'm a bit cold, lets whack the heating up'*. But having worked from home for a number of years, they were already familiar with the ['low and slow' heating method](#).

They also started managing their ASHP with an app during periods they were away, so that the system would have time to get their house back up to temperature by the time they returned.

Installing solar PV made them more aware of how and when they were using energy. They particularly enjoyed making the most of the periods when they could use the electricity generated by their panels - on a sunny day their battery is full by 9am!

After combining the ASHP with solar panels, they've seen a noticeable reduction in their energy bills compared to when they were using a gas boiler.



Install bird netting with the solar panels

Simon and Katy wish they had installed bird netting when their solar panels were fitted. They had problems with pigeons nesting underneath the panels, including eggs rolling down their steep roof.

They have since had netting retrofitted, which has made a significant difference. However, they are still considering additional deterrents because the pigeons have started using a small ledge created by the netting as a perch.

Choose a larger battery

They chose a 3.5kWh battery because of the increase in price for the next size up. In hindsight, they would have chosen a larger battery. They believe the additional cost would have been paid back more quickly because a larger battery would have allowed them to export more electricity to the grid.

Choose a larger battery inverter

They would also choose a larger inverter for the battery. The inverter controls how much electricity can flow into and out of the battery at any one time.

Their current inverter has a 5kW capacity, while their ASHP can use 3.5kW. This means that when they are using both the ASHP and the oven, they sometimes need to draw electricity from the grid even when there is enough stored in the battery to power both.

Research the battery company

Since installing their system, GivEnergy Ltd, the company behind their battery, has gone into administration and ceased trading. As a result, the manufacturer warranty they expected to have is no longer available to them.

While GivEnergy seemed like a reliable company at the time, they would still recommend researching the manufacturer as carefully as the battery itself, including how established the company is and how likely it is to be around to provide support in the future.



Next Steps

The thermal imaging survey also identified a small section of cold ceiling at the back of the house, where part of the ground floor extends into the garden beneath an uninsulated section of roof.

Simon and Katy are considering insulating this area in the future to help reduce heat loss.