

Heat pumps, Battery storage and Solar PV: A case study & conversation for homeowners

Lucy Haden, Creating Shelter
Domestic Energy, Retrofit & Heat Loss Assessor



creating
shelter





Visit a heat pump Find a heat pump For hosts For

All hosts

This property is 0.8 miles away from you

Terrace property, hosted by Lucy

Vaillant air source heat pump in a 1965 - 1982 property



Joined the network in 2024

Upcoming events

This host doesn't have an upcoming event at the moment.

You can still message them to ask if you can visit or to ask questions about their experience.

Message me



About this property

Teddington, TW11



Terraced Air source heat pump

Lucy, South West London: lives in a 1970s two-storey, four bedroom terrace house

"It's the worker bee in the hive - providing heat to your hot water tank and space-heating system when these ask for it."

Read more ->



THE BOILER UPGRADE SCHEME

Up and running Lucy Haden's 5kW air source heat pump sits on the garage roof and the family don't notice any noise

Designed by the government to help home owners in England and Wales with the costs of a heat pump, the Boiler Upgrade Scheme (BUS) provides £7,500 towards the purchase and installation of an air source or ground source heat pump. To qualify, you must own your property (home or small business) and be replacing a fossil fuel heating system (like a gas or oil boiler, or electric panel heater). You can't apply directly - the installer, who must be registered with the scheme, does it for you. The installer will assess the property, confirm it is eligible for a grant and provide a quote. The installer applies for the grant on your behalf and Ofgem will then contact you to check the validity of the application before giving it the go-ahead.

A tale of warmth and peace

When Lucy Haden switched from gas boiler to heat pump, it led to reduced bills, lower emissions and so much more

Installing a heat pump is transformative in many ways, but for Lucy Haden, it not only elevated her home, it led to a personal change of direction. Lucy, her partner Tim, and two children, 18 and 11, live in an early 70s terrace house in Teddington which they have owned since 2009. In 2021 they decided it was due a uplift. "It was a 'love it list it' moment," says Lucy. "We wanted simple changes like altering the

hallway so the front door didn't freeze the ground floor when it was opened, and adding a utility room. Nothing flashy. "Then we discovered that we needed to replace part of the flat roof. It really snowballed when we realised the combi boiler was at the end of its life as well. That's when I decided to investigate heat pumps." At that time they were relatively new, but today they're seen as a

viable alternative to gas boilers. Heat pumps - air source or ground source - are three times more energy efficient than gas boilers and produce no direct emissions. According to the latest data from the Heat Pump Association, in 2024 98,468 pumps were sold, up from 60,244 the year before - it's a trend that's definitely growing. Lucy, an accountant, began to research heat pumps and crunch the numbers. She then asked some local suppliers for quotes - discovering that she was eligible for a Boiler Upgrade Scheme grant (see box) - and spoke with people who'd had them fitted. Satisfied that they were effective, would save the family money and would cut emissions, the couple stripped out their gas boiler, sold it for parts and put a 5kW air source heat pump on their garage roof. "They improved the insulation of the house and fitted underfloor heating. Simply upgrading their radiators would have worked too, but they decided they might as well make improvements while renovating. Now, the heat pump delivers warmth zonally around the bedrooms, living areas and bathrooms thanks to a digital

thermostat, and they are delighted with the results. "Would they do anything differently given the chance?" "Absolutely not, we have no regrets," says Lucy. "The temperature in the house has been fine all through winter. The pump is like a worker bee, it just gets on with it. We don't notice any noise and nor have we had any complaints about it." The crowning moment has been adding solar panels and a battery. This means the house - which no longer has a gas supply and hence no standing charge - generates a share of its own electricity. The family's energy bills went down by £100 a year with the heat pump fitted. Using solar means that they now pay about £65 a month for energy, and less in summer. What advice would she give to anyone tempted by a heat pump? "Removing fossil fuel heating is by far the most impactful change you can make to your home's carbon footprint, and most homes are suitable for heat pumps. "Use the Microgeneration Certification Scheme website to find a good local installer who will assess your home, because everyone's house is different." The final twist in the story is

"It's like a worker bee - it just gets on with it"

that Lucy is now no longer an accountant. She stepped back from the job when her second child was born but once she was planning to restart work she decided to switch careers and is now a retrofit assessor, advising others on how to upgrade their home energy. "I didn't start out with a green agenda," she says, "but having got to the end of the journey, I realised that heat pumps are the future - and I wanted to help as many people transition to them as possible."



For more information visit gov.uk/heatpumps



Visit a heat pump

Transitioning to Sustainable Energy in Surbiton

Dan Curran's Case Study



Surbiton House

5 beds

240m²

Original roof – self insulated

1994 Cavity
Insulation

1930 Solid Brick
No Insulation

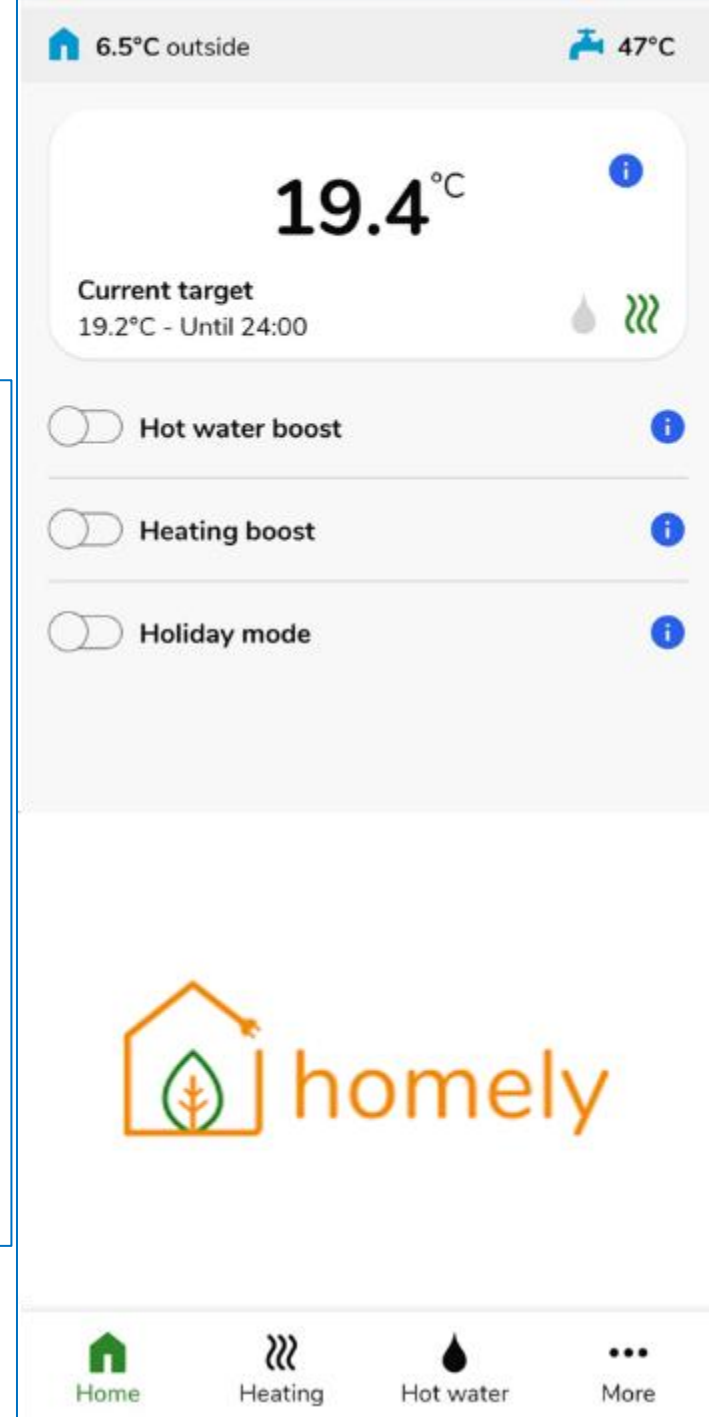
2010 Double Glazed
Windows & Doors



**Samsung
12kW R290 Mono
July 2024
(24,000 kWh gas)**



**No radiators
replaced!**

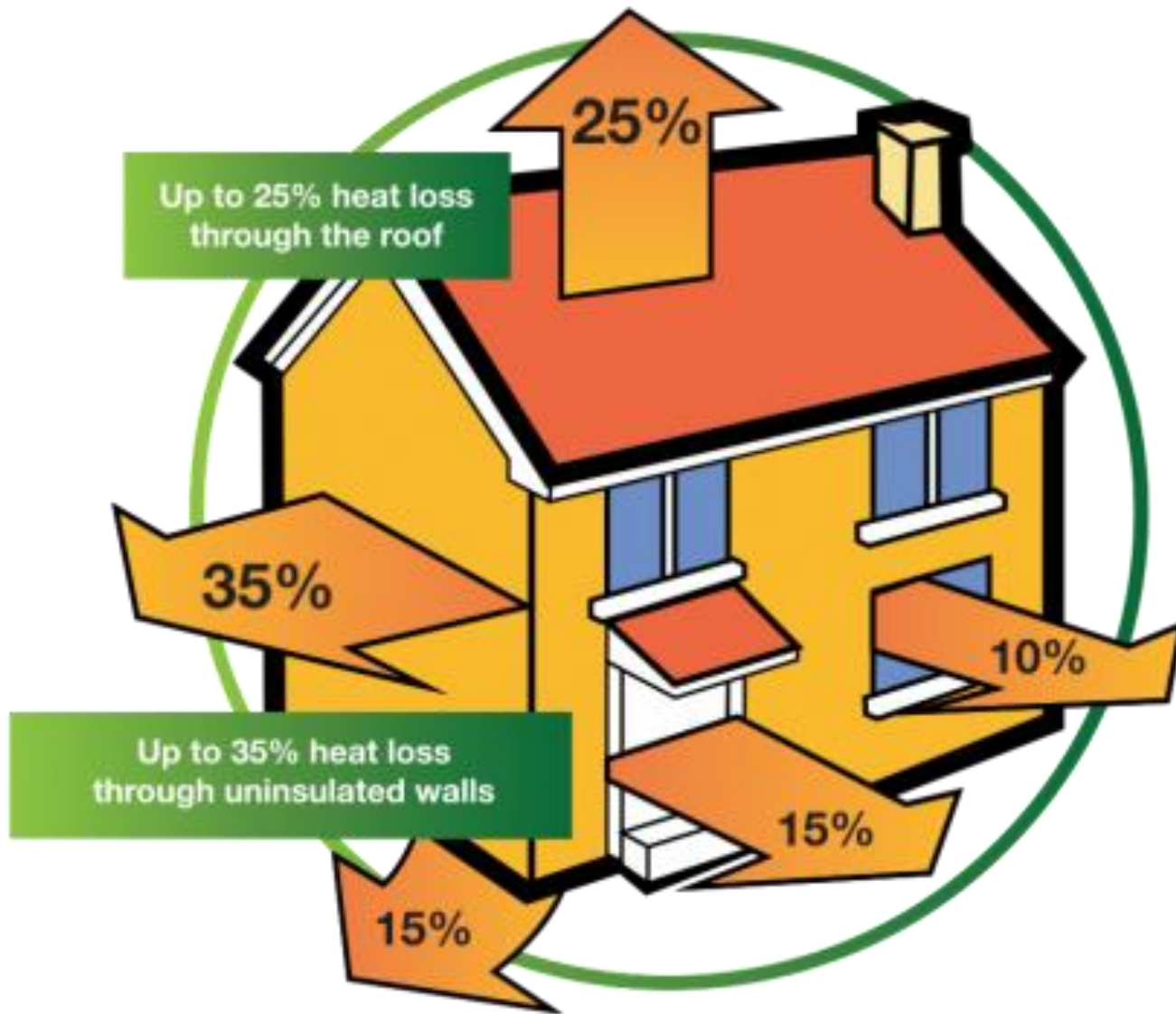




Installation
took 2
weeks



Heat Pump First – Probably!



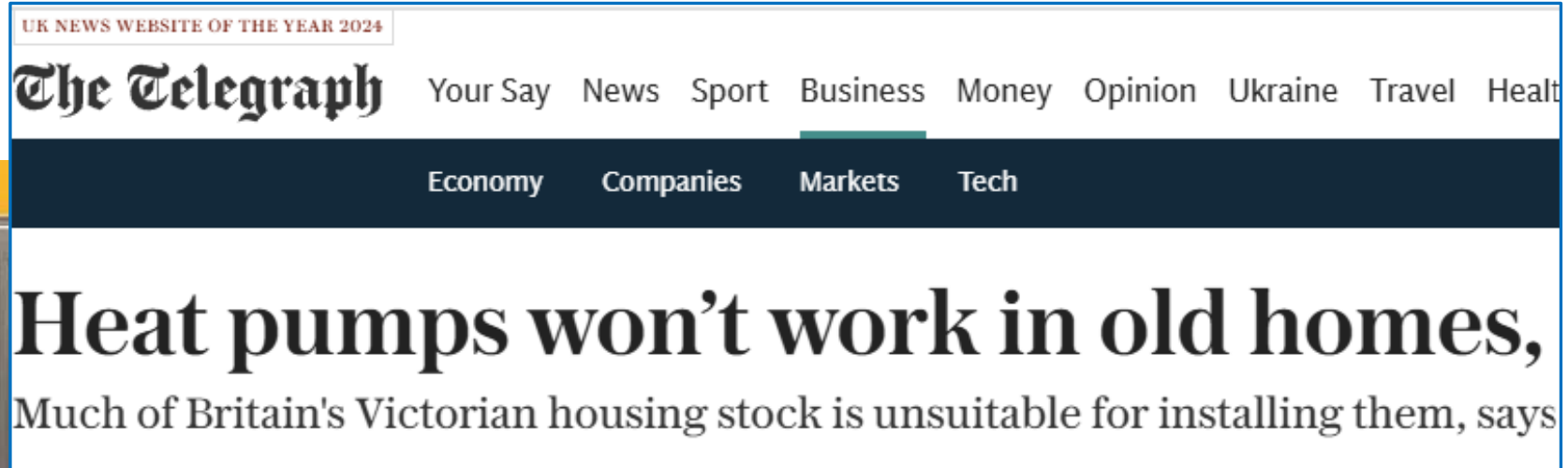
Energy rating and score

This property's energy rating is D. It has the potential to be B.

[See how to improve this property's energy efficiency.](#)

Score	Energy rating	Current
92+	A	
81-91	B	
69-80	C	
55-68	D	68 D
39-54	E	
21-38	F	
1-20	G	

Don't Believe the Heat Pump Myths!



**TOO
SMALL
FOR A
HEAT
PUMP!?!**



<https://energysavingtrust.org.uk/heat-pump-fact-check>



21 Solar Panels – 8.4kW
Nov 2024



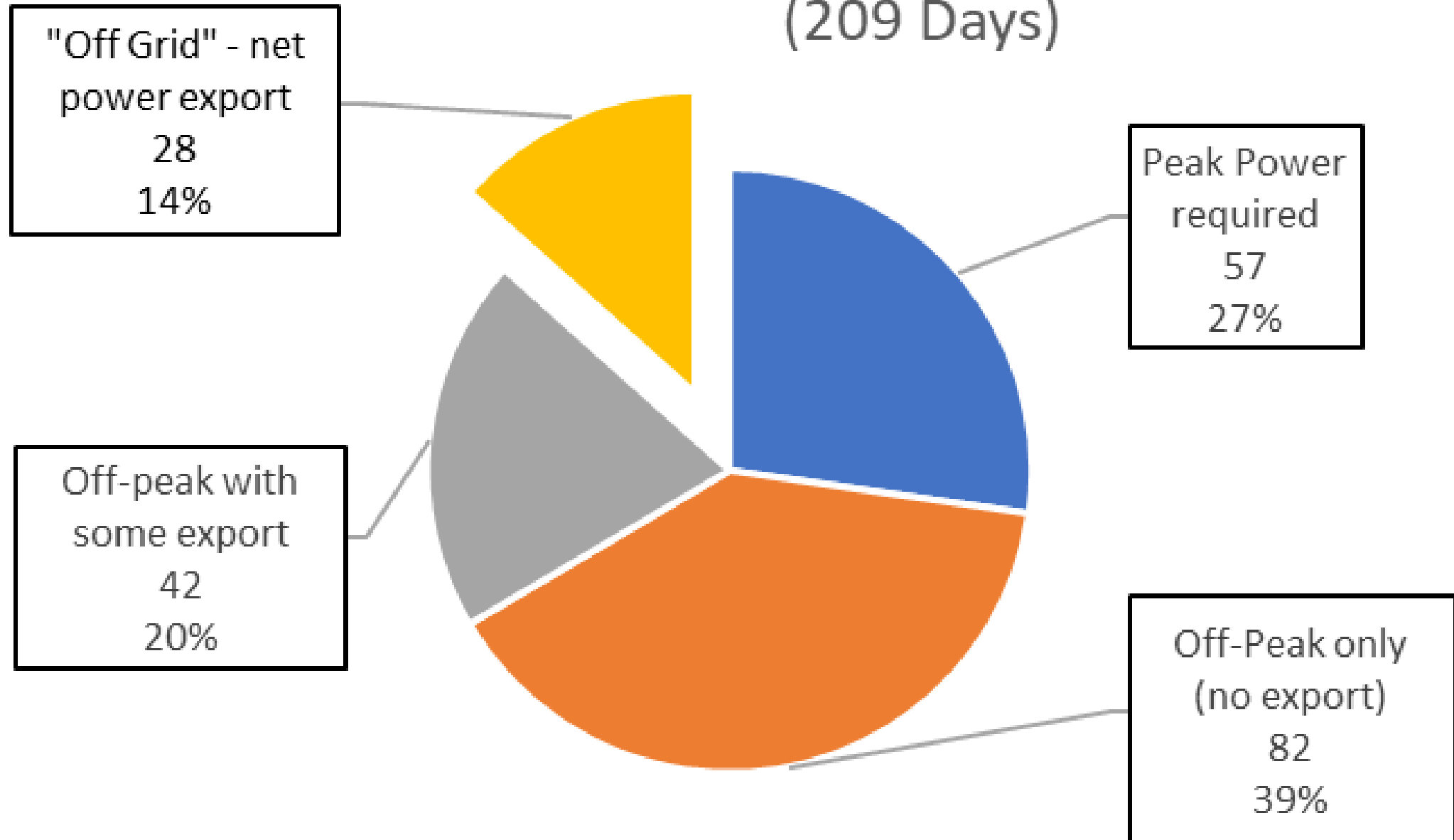
2 x 13kW
Batteries
Sept 2024

Living with Sustainable Energy

A photograph of a roof with solar panels installed on it, set against a clear blue sky. The solar panels are dark blue and rectangular, arranged in a grid pattern. The roof is covered with dark grey or black shingles. The sky is a clear, bright blue.

- **Nov-April 25% solar powered**
- **Fully off-grid from May to September expected**
- **Constant temperature 24/7: 19.2c**
- **Relatively low heat pump noise**

2024/25 Heating Season from start of October (209 Days)



Costs

- Heat pump efficiency SCOP = 4.1 vs boiler 0.9
- Octopus Go electricity 93% off-peak
- My average cost = 6.0p/kWh vs 7.5p gas
- **Expected savings of £3-4k per year**

- Cost of Heat Pump = £11k net of BUS
- Cost of batteries = £10k
- Cost of solar panels = £15k

Environmental Benefits

4 Tonnes of CO₂ saved

This compares to:

- Flying less 2T
- Electric car 1T
- Vegetarian diet 0.5T



<https://www.carbonfootprint.com/calculator>

Closing Thoughts

- 1. Research potential installation companies**
- 2. Calculate your approximate heat pump size**
- 3. Coordinate with other house redevelopment work**
- 4. Get windows and loft insulation sorted first**
- 5. Wall insulation is probably a waste of time**
- 6. Don't believe the myths about heat pumps**
- 7. Read my blog <https://thedglblog.substack.com>
& Michael de Podesta's <https://protonsforkbreakfast.wordpress.com>**

Comments & Questions Dan Curran

<https://thedglblog.substack.com>



Making the Gas Boiler to Heat Pump switch: an Illustration for the Typical Home

Home with a gas boiler

- 2,700 kWh electricity p.a.* (for appliances)
- 11,500 kWh gas p.a.* (for heating and hot water)



- Total typical energy use per annum: 14,200 kWh
- Estimated cost per annum: £1,755*
- Estimated CO₂ per annum: ~ 2.8 tonnes +

Home with an ASHP

- 2,700 kWh electricity p.a.* (for appliances unchanged)
- 3,220 kWh electricity to run the ASHP p.a.** (for heating and hot water)



- Total typical energy use per annum: 5,920 kWh
- Estimated cost per annum: £1,756***
- Estimated CO₂ per annum: ~ 0.8 tonne +



Lucy Haden FCA

creating shelter

Domestic Energy Assessment & EPCs

Retrofit Assessment & Advice

Lower Carbon Options Appraisal



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