

Open Home Profile

### Homeowner Information

* **Name:Joe and Cathy Wentworth**
* **Contact (optional):Joe@joewentworth.co.uk**
* **Location:37 Seymour Road, Bristol, BS7 9HS**

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### Home Overview

* **Home Type:** terraced house
* **Year Built: 1870**
* **Size:** 1700sq ft – 4 bed.
* **Renovation History:**
  + double gazed windows ~2013
  + insulated suspended floor – 150mm glass wool ~2018
  + loft conversion to dormer 2018 upgrade to roof insulation to current building regs.
  + Basement kitchen slab replacement with 80mm PIR insulation, and wet underfloor heating 200mm spacing 16mm pipe with tile – 2020
  + Rear extension to basement - new insulated slab and UFH. Cavity walls with ~75mm PIR insulation. Flat roof insulated with 130mm PIR
  + Sept 2022 ASHP starts running.
  + Dec 2022 Solar PV installed.

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### Green Features

#### Energy Efficiency

* **Insulation:** internal 60mm wood fibre in front bedroom. 130mm PIR in roofs - plans for EWI on rear solid brick wall.
* **Windows and Doors:** double glazed argon filled, low E on half of them.
* **Heating System:** Vaillant 7kw Monoblock heat pump. Some existing Radiators some upgraded and basement UFH. Weisser heat controls - 2022
* **Cooling System:** N/A
* **Lighting:** LED lighting through out
* **Appliances:** not particularly.
* **Smart technologies**: Octopus Agile 30minute variable pricing and outgoing Octopus for exported energy from Solar PV
* **Solar Panels:** 7 panels 2.7kw peak power.3.4kw Solax inverter. With export tariff. 2022
* **Battery Storage:** N/A
* **Other Renewable Sources:** N/A

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#### Indoor Environmental Quality

* **Air Quality:** standard bathroom and kitchen extractors.
* **Ventilation systems** trickle vents
* **Natural Lighting:** multiple skylights.

#### Other useful information:

* Large rain water collection for garden use. (2000 litres) bike storage. Single potable induction used to supplement the built in gas hob.

#### Performance and Savings

* **Energy Savings:**
  + 9500kwh of gas use reduced to 150kwh. By removing combi boiler.
  + Electricity use by ASHP annually 2500kwh.
  + ASHP sCOP shows 5.5 but other measurements suggest 3.9. scop is not everything and its consumption that is more important.
  + Solar PV generation 2600kwh per year.
  + Domestic use about 3100 kwh excluding heat pump.
* **Carbon Footprint Reduction:**
  + Reduction of 9350kwh of gas equates to 1800kg of CO2 annually.
  + As the solar PV off sets the Air source heat pump usage pretty closely we can count this as ~ zero.
  + If we had just solar panels and no ASHP the CO2 saving for the Solar PV would be about 570kg per year.
  + If we had the ASHP and not Solar PV the saving would be about 1250kg CO2 per year compared to our combi boiler.
* **Financial Savings:**
  + solar will have a payback of ~8 years and should give 17years or more generation after payback.
  + ASHP PAYBACK :
    - Gas with combi would have been £650 per year.
    - With agile octopus we pay 17p/kwh average cost = £425 per year for the heat pump.
    - Saving £225 per year. Cost of ASHP was £8k after grant less the £3k we would have needed for a new combi boiler. So payback of (8000-3000) /225 = 22 years!
      * If we had had the current grant of 7.5k we would have payback of 11 years.

#### Challenges and Solutions

* **Challenges Faced:** Finding a company who installed R290 heat pump (I was not happy with the GWP of R32 units.)
* **Solutions Implemented:** lots of research and meeting several installer. This is less of an issue now as the industry seem to be moving to R290.
* **Challenges Faced:** the heat pump was installed fairly well, but the settings meant it had a far lower scop than it was capable of.
* **Solutions Implemented:**

Lots of reading and forums such as open energy monitor. Allowed me to tweak the settings to get the best SCOP I can from the system. Currently between 3.9 and 5.2 depending on the readings

#### Future Plans

* **Upcoming Projects:** rear EWI on the rear solid brick wall.

4 more PV panels facing west on the dormer flat roof. For an additional 1500watts.

Ripple wind turbine coop coming on line in a couple of years. To cover 3500kwh of our domestic electricity consumption

* **Long-Term Goals:** Continue to reduce consumption of meat and dairy. Eventual change to BEV, mileage is quite low for us at 5000miles per year.