

Dorset Greener Homes – Project Chafeys

Weymouth, Dorset

The June 2024 Sit Rep:

67 is a traditionally built 1960's bungalow with cavity walls, suspended floors and tiled roof.

Purchased in 2010 the property had gas central heating, old uPVC windows, minimal loft insulation.

WHOLE HOUSE VENTILATION AND HEAT RECOVERY SYSTEM

During the winter of 2010 problems occurred with mould forming in the unused bedroom and generally the air quality in the house was not good. Research into house ventilation led me to Whole House Ventilation and eventually to a unit from Systemair <https://www.systemair.com>

In a bungalow this was a straight forward job and within the capability of any good DIY'er.

Unit installed VR 250 ECH/B. Now replaced with a VTR 150/ B.

Purchased as a complete kit and installed in 2 days. The only maintenance required is an annual filter change, the unit's operation is automatic.

From the time it was switched on we noticed an improvement in air quality and sufferers of hay fever do well in the house.

CONSERVATORY

In early 2011 a south facing gable end conservatory was constructed and adds good solar gain and warmth in mid winter.

SOLAR PV

November 2011 saw the installation of a 4 KW PV system by Dorset Energy Solutions <https://www.dorsetenergysolutions.co.uk/>. Our installation was their first installation on both an east and west facing roof and has exceeded the Government's figures for this type of array.

In March 2020 we had the system upgraded and the bungalow reroofed. The original 4 KW system was relocated to the east facing roof and a new 5.2 KW system installed in the west facing roof. In addition to this new array an 8.2 KW battery was installed to store our surplus PV generation for use later in the day. <https://www.givenergy.co.uk/>

The house is now at the maximum potential export level our electricity supplier will permit (around 8 KW). Both arrays are now "in roof".

September 2022 another 8.2KW battery was added to the system giving us 16.4 KW.

June 2024 a 3rd 8.2 KW battery added, the system is now 24.6 KW.

INSULATION

Cavity wall insulation has been installed.

The loft originally had just 75 mm of insulation this is now nearer 500 mm.

The suspended ground floor has been insulated using 100 mm of Celotex. This was a major job involving the removal of the flooring. Not for the faint hearted.

2024: 90 mm of external wall insulation installed on the east, north and west elevations of the bungalow. This work has more than halved our heat loss through these walls and also given the building a facelift.

Work was undertaken by a local contractor. <https://www.swliquidscreed.co.uk/>

WINDOWS

Changed to A++ windows supplied by Polar Glaze. <https://www.polarglaze.com/>

LIGHTING

LED lights are used through the house and have been upgraded as better lights have come available.

RAINWATER HARVESTING

All of our rainwater is collected in 2 x 1100 litre IBC's and then pumped to supply garden watering and car cleaning. Future upgrade would be connection to the toilet for flushing.

TRANSPORT

Having owned a self charging hybrid for 4 years we took the plunge and went for full EV in 2020.

Four years on and now both our cars are EV's.

The car charger was upgraded to a smart charger in September 2022. A Myenergi Zappi

<https://www.myenergi.com/> This charger enables us to use our surplus PV generation to charge the cars. The amount of charge varies depending on the available PV generation and demand from the house but on a good summer day a maximum charge of 7KW can be achieved. With the EVs we are able to get a special EV tariff which provides electricity at a discounted rate at certain times of the day. Locally we cycle using electric bikes.

WATER and SPACE HEATING

Over the previous 2 years I have been looking at the various ways we can heat the house and supply hot water. There are now a good number of systems available to replace a gas boiler and in the end we opted for an Air Source Heat Pump (ASHP). A Mitsubishi Ecodan 6 KW unit

<https://www.les.mitsubishielectric.co.uk/> has been installed <https://www.evergreensw.co.uk/> along with a 220 litre hot water tank. The house became gas free in June 2024.

An ASHP works well with the 9 KW of PV and this means the house can be heated for "free" on the sunny days during spring and autumn. Mid winter we do not generate enough power but are able to buy in using an off peak tariff and storing this in the 3 batteries for later use.

The EDDI solar diverter <https://www.myenergi.com/> is connected to the water cylinder making the best use of our surplus power to heat the water.

THE FUTURE / PROJECT SUMMARY

June 2024 saw the end of the major house upgrades with the external wall insulation and ASHP install.

In September 2022 we achieved an EPC of A with a score of 108. In June 2024 this has risen to nearly 118, unfortunately the EPC scoring still rates solar thermal despite having a solar diverter to heat our water.

The retrofit has taken 12 years and is a sum of its various parts which can be taken as a whole or parts and applied to any house.

The major parts of this retrofit have been completed although having spoken to Givenenergy, I can see an upgrade for the inverter to supply 6KW to the house.

The video below was filmed in 2023 before the external wall insulation and ASHP

VIDEO of Project Chafeys:- <https://vimeo.com/856357350/46d2034474?share=copy>