

Project Chafeys – A Journey to an Efficient House



Early 2011

Project Chafeys – Contents

- [A journey in improving energy efficiency to cover:-](#)
- Insulation
- Solar PV
- Home Batteries
- House Ventilation
- Making the most of generation
- Car Charging
- EV ownership
- Future works
- Questions

Project Chafeys

- Purchased in April 2010
- EPC Rating D – room to improve.
- Traditional construction.
- Cavity walls, suspended floor, tiled roof
- Gas central heating
- Old UPVC windows
- 75 mm loft insulation

Project Chafeys

- Was there a plan? ----Sort of.
- Winter of 2010 was quite cold
- The house cooled very quickly
- There was mould in the 2nd bedroom
- In the loft cardboard boxes were going soft
- Action was required
- **Aim:** a warm, comfortable and cheap to run house.

Project Chafeys

- Cold House
 - Add more loft insulation
 - Add cavity insulation
- Mould and stale air
 - Whole House Ventilation and heat recovery.
- Cold floors
 - Can I insulate them?
- Bit of extra space
 - South facing conservatory

Project Chafeys



Nice south facing
conservatory. 2010.



Just a bit of insulation.
Reroofing 2021.

Project Chafeys

- Early in 2011 we started to sort out the problems
- Cavity wall insulation
- Loft insulation
- Conservatory adding space and warmth
- Whole House Ventilation and Heat Recovery Unit installed

Project Chafeys - Ventilation



Whole House Ventilation and
Heat Recovery Unit + ducting



All you see in the house.
Filtered fresh air is distributed through
the living & bedrooms and extracted
from kitchen and bathroom.
This air is filtered before passing through
the heat exchanger.

Project Chafeys - Ventilation

Inside the old unit



Intake filter

Extract filter



Project Chafeys

- As the 2011 New Year unfolds so does Redundancy.
- But also opportunity....a change. Time to make plans and give direction to the Project.
- Time to fill
- Work to do.

November
2011 first PV
install



Project Chafeys — 4 KW Solar PV



Since November 2011 these two arrays
Have generated c. 40,000 KW



The first PV array. 4 KW split between the east and west roof.

The first install of this type undertaken by our contractor.

Has exceeded UK Government estimates and the Feed in Tariff has offset the costs.

Project Chafeys – Floor Insulation



With time on my hands it was time to tackle the floors.

Having been helping on a shop fit I was asked how I wanted paying. Celotex please.

After a good days work my wife came home to find the lounge floor missing and insulation work commenced. All of the central heating pipes had to be insulated as they would no longer be warmed from above. New chipboard flooring and all sealed around the edges to stop the drafts.

This is hard work but the benefits long term. Warm floor.

Project Chafeys - Moving On.

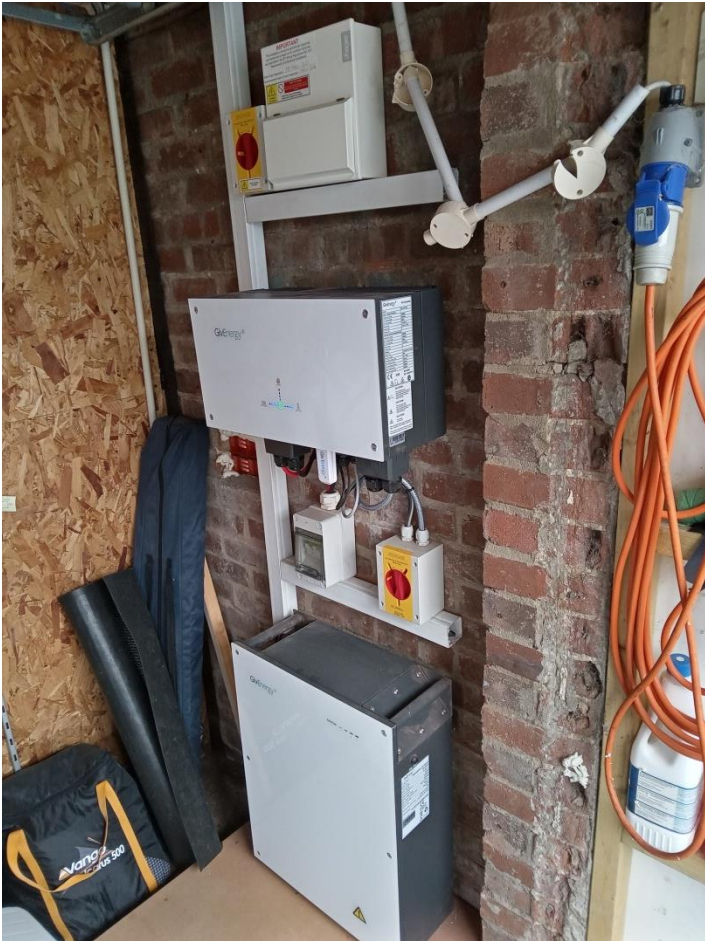
- March 2021.
- It was time to add more Solar PV and a battery. After chatting to our installer we found it was possible to have another 5 KW of PV with Scottish and Southern approval.
- Also an chance to replace the aging 1960's roofing.
- Combining these works saved VAT.

Project Chafeys - Time to re-roof



The solar and roofing contractor had worked together before and all went well. The 4 KW array all relocated on the east side and the new 5.2 KW on the west. All "In Roof".

Project Chafeys - Storing the power



The first of the batteries. 8.2 KW with a 3.2 KW inverter.

The inverter converts the DC battery power to AC for use in the house.

In September 2022 a second battery was added giving us 16.4 KW of stored power. 2024 battery 3 added, now have 24.6 KW.

This Givenergy system is expandable to 5 batteries giving a max stored power of nearly 48 KW using 9.5 KW batteries.

This system will charge at 3.2KW and provide Power to the house at 3.2 KW.

Larger capacity inverters are available to suit demand.

Project Chafeys — Making best use of the power.

- The PV dilemma.
- In the summer you generate too much.
- In the winter not enough.
- So how do we maximise all that generated power to our benefit?
- During 2023 we generated 7,700 KW

Project Chafeys - Making best use



Zappi smart car charger.

With 2 EV's each with a battery around 74 KW there is plenty of storage for our surplus generation.

From April through to early October we charge the cars for free.



Meet Eddi. A solar diverter that helps maximise the use of surplus generation. Connected to a hot water cylinder and a storage heater. As soon as the house batteries are charged the surplus is diverted to the water or heater.

These units are smart and communicate with each other.

Project Chafeys - the figures

- Oct 22 to Oct 23.
- Our first full year with 2 batteries and Zappi.
- Generated c.7500 KW
- Exported c.3500 KW
- Imported (Grid) c.1150 KW 600 KW down
- Consumed c.4950 KW 1000 KW up.
- Over the 12 months we have managed to use more of our generation and bought 600 KW less from the grid.

Project Chafeys – It can be fun Too



- Hot Tub Time
- 1300 litre water tank + insulation and a heater unit from inflatable tub
- . A bit of summer luxury!
- And all powered off the solar PV.
- My Lock Down project.

Project Chafeys – The EV Question

- After moving to a self charging hybrid and then a plug in we changed to a full EV in 2021
- In 2024 we now run two.
- EV charging mostly done at home with an EV tariff – this can also be used to charge the home batteries in the winter.
- On my current tariff 10,000 miles with home charging will cost c.£175 against c.£1500 for a diesel at 50 mpg. I just take the hit when travelling.
- The UK charging network is improving. If you own a Tesla they have developed their own charging network.

Project Chafeys – Where next?

- We now have an EPC rating of A but this is largely due to the floor and loft insulation, LED lighting throughout and our renewable energy. Next I would like to improve the thermal performance and improve the U value of the walls.

Maybe external wall insulation.

Yes installation planned for 2024



Project Chafeys — External Walls

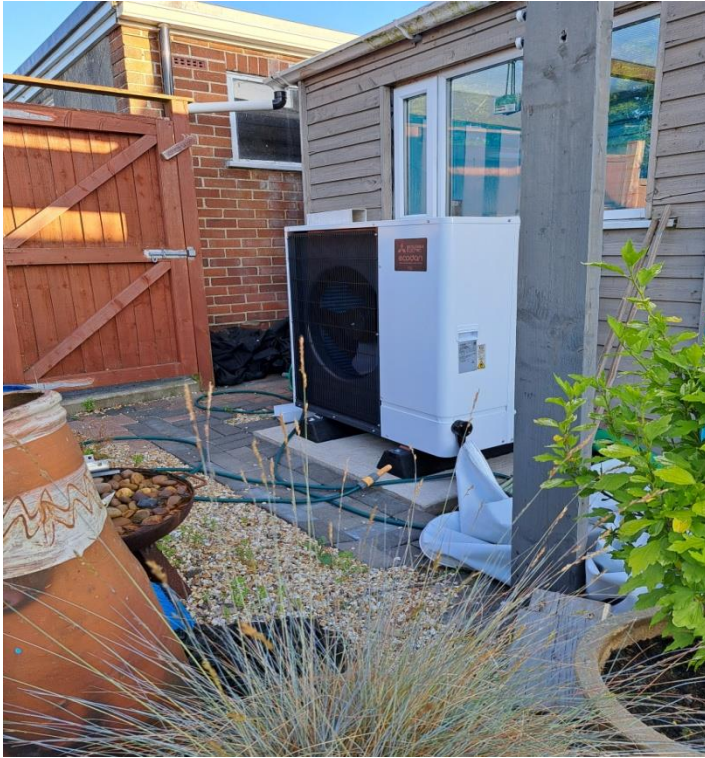


Project Chafeys Where next Mk 2



- The Heat Pump dilemma.
- My original thought was to go the Ground Source HP route. However, the costs are much higher than installing an Air Source.
- Development of ASHPs has progressed, as has the planning and design for their installation.
- Installation planned for 2024 and our gas connection removed.

Project Chafeys- Heat Pump



Project Chafeys — Suppliers and information

- Solar PV, Batteries, Eddi and Zappi Installer www.dorsetenergysolutions.co.uk
- Ventilation. www.systemair.com
- Battery Manufacturer. www.givenergy
- Eddi, Zappi and Libbi. www.myenergi
- Roofing. J Marks Roofing, Weymouth.
- Windows. . <https://polarglaze.com/>
- Heat Pump Installer. www.evergreensw.co.uk
- Heat Pump. Mitsubishi Ecodan.
<https://les.mitsubishielectric.co.uk/>
- Wall insulation. www.swliquidscreed.co.uk

Project Chafeys – Information and Advice

- Fully Charged and Everything Electric.
<https://fullycharged.show/>
- Open University. <https://www.open.edu/openlearn/free-courses/full-catalogue>
- Passive House Trust. www.passivhaustrust.org.uk/
- Heat Geek. <https://www.heatgeek.com/>
- Energy Saving Trust. <https://energysavingtrust.org.uk/>
- Centre for Alternative Technology. <https://cat.org.uk/>
- Start your search more will follow
- Project Chafeys can be seen here:-
<https://vimeo.com/856357350/46d2034474?share=copy>
- Dorset Greener Homes:-
https://www.dorsetcan.org/greener_homes

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- Questions and chat time.

