

# **Home Solar -Pecket Well**

**Why? What we bought? How is it going?**

**Dave Chugg, 31 July 2024**

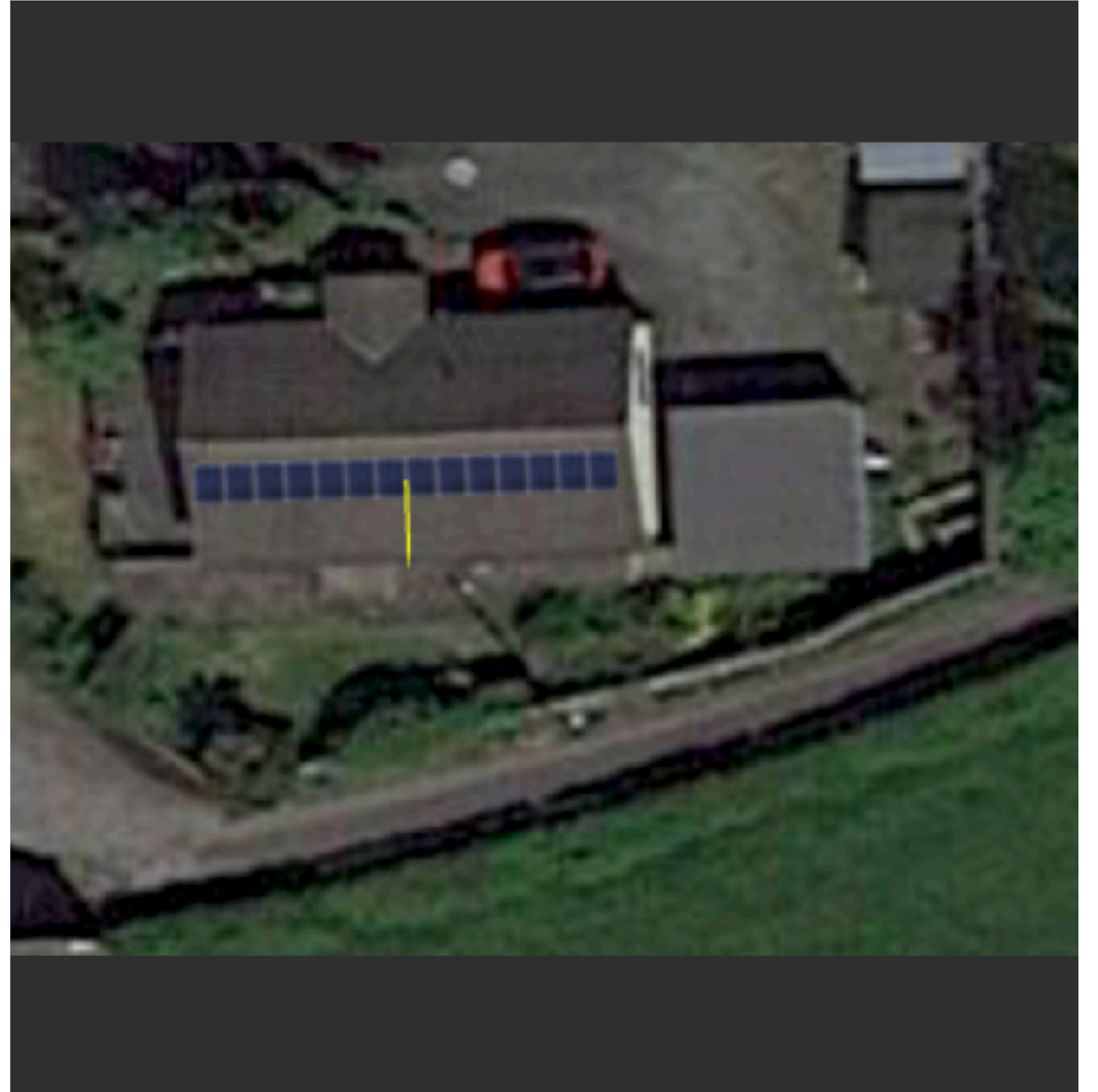
# June 2020

## Why?

- Wanted to do our 'bit' to be green
- Had a specific amount to not spend over
- Wanted to provide some energy price security
- Was considering a plug in car, as my Motability lease was in the last 6 month period. Charging at home was a major motivation

# Our Property

- South facing roof
- Bungalow
- Ideal aspect - south facing and unshaded and easily accessible roof ( scaffolding costs avoided).



# System Specifications

## Most typical basic UK installation

- To avoid needing specific extra approval steps the basic UK system is generally around 4kW of solar panels on the roof and an inverter system that is no more than 3.68kW - in other words the maximum possible export to the grid, within G98 approval
- We also wanted a battery because our usage does not always coincide with when the sun shines. Most cost effective battery size at the time, given our useage seemed to be 5kWh

# How did we decide who to use?

## Internet research

- We looked at various installers that advertised and researched into their customer feedback, Trustpilot reviews, Google reviews etc.
- West Yorkshire based Ecocute looked to have a decent reputation and value for money.
- Remote survey based on Google Earth, and information form filled. No site visit.

## Quote for a 4.27kWp Solar PV System (14 panels) with a 5kW Battery

| Description of Goods                 | Qty | Product Model  | Certification Number | VAT | Total Price    |
|--------------------------------------|-----|----------------|----------------------|-----|----------------|
| Vikram Solar (e) 305 Watt Panels     | 14  | VSMBB60 - 300W | BB 0093/1688         |     | £ 3,795        |
| Solis Inverter                       | 1   | IP3.6K-4G      | DQ190104             |     | Incl           |
| Clenergy Mounting Kit                | 1   | PV-EZ Rack     | BBA 0140 / 02        |     | Incl           |
|                                      |     |                |                      |     | £ -            |
|                                      |     |                |                      |     | £ -            |
| Soltaro SOL5 (5kWh) Battery System   | 1   |                |                      |     | £ 4,450        |
|                                      |     |                |                      |     | £ -            |
|                                      |     |                |                      |     | £ -            |
| Other additions/deductions as agreed | 1   |                |                      |     | -£ 250         |
| No VAT Offer                         | 1   | No VAT Offer   |                      |     |                |
| <b>Goods Total</b>                   |     |                |                      |     | <b>£ 7,995</b> |

| Description of Services      | Qty | Notes / Additional Information      | VAT | Total Price   |
|------------------------------|-----|-------------------------------------|-----|---------------|
| Booking Fee                  | 1   | Fully Refundable on Completion      |     | £ 195         |
| Installation Registration    | 1   | Flexi-Orb, Building Control, DNO    |     | Incl          |
| Hies                         | 1   | Insurance Backed Warranty Inclusive |     | Incl          |
|                              |     |                                     |     |               |
|                              |     |                                     |     |               |
|                              |     |                                     |     |               |
|                              |     |                                     |     |               |
| <b>Balance on Completion</b> |     |                                     |     | <b>£7,800</b> |

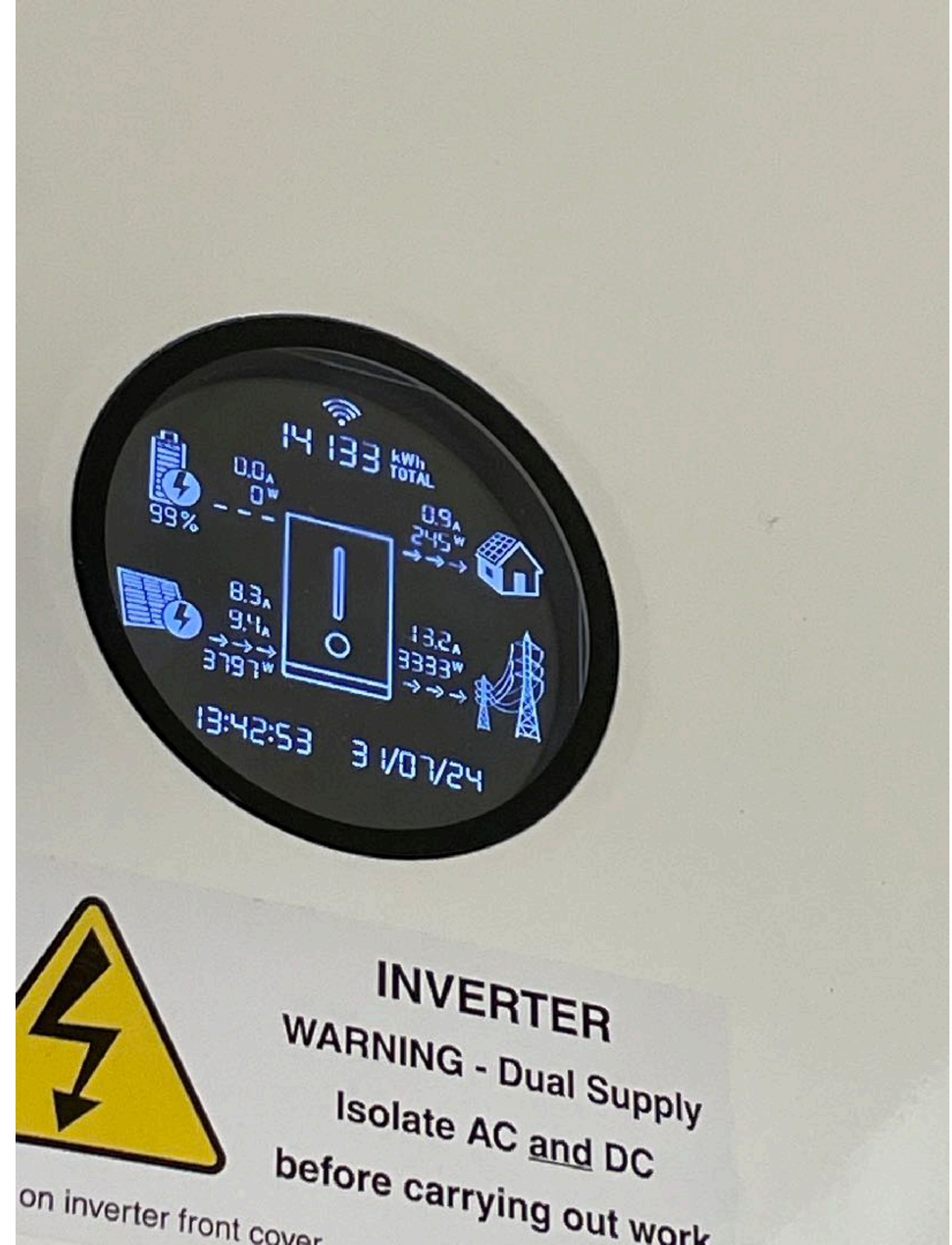
| Guarantees and Warranties       | Warranty Period  |
|---------------------------------|------------------|
| Photovoltaic Panels             | 27 years         |
| Inverter                        | 10 Years         |
| Battery Storage Cycles          | 10,000 @ 90% DOD |
| Clenergy Mounting               | 10 Years         |
| Workmanship                     | 2 Years          |
| Hies Insurance backed guarantee | Free             |

The above quotation unless otherwise stated is based on a maximum 2 storey, portrait array, single roof installation and with standard roof tile with no conservatory or access obstructions.

All electrical work is completed to current 18th Edition standards and all registrations will be made by us to all appropriate governing bodies.

# Installation

- Ours was a 2 day install - roofer came first day to install racks and panels, second day on site electricians to install wiring, inverter and battery.
- Battery technology is LFP - the least volatile current battery tech with high number of cycles ( long life)

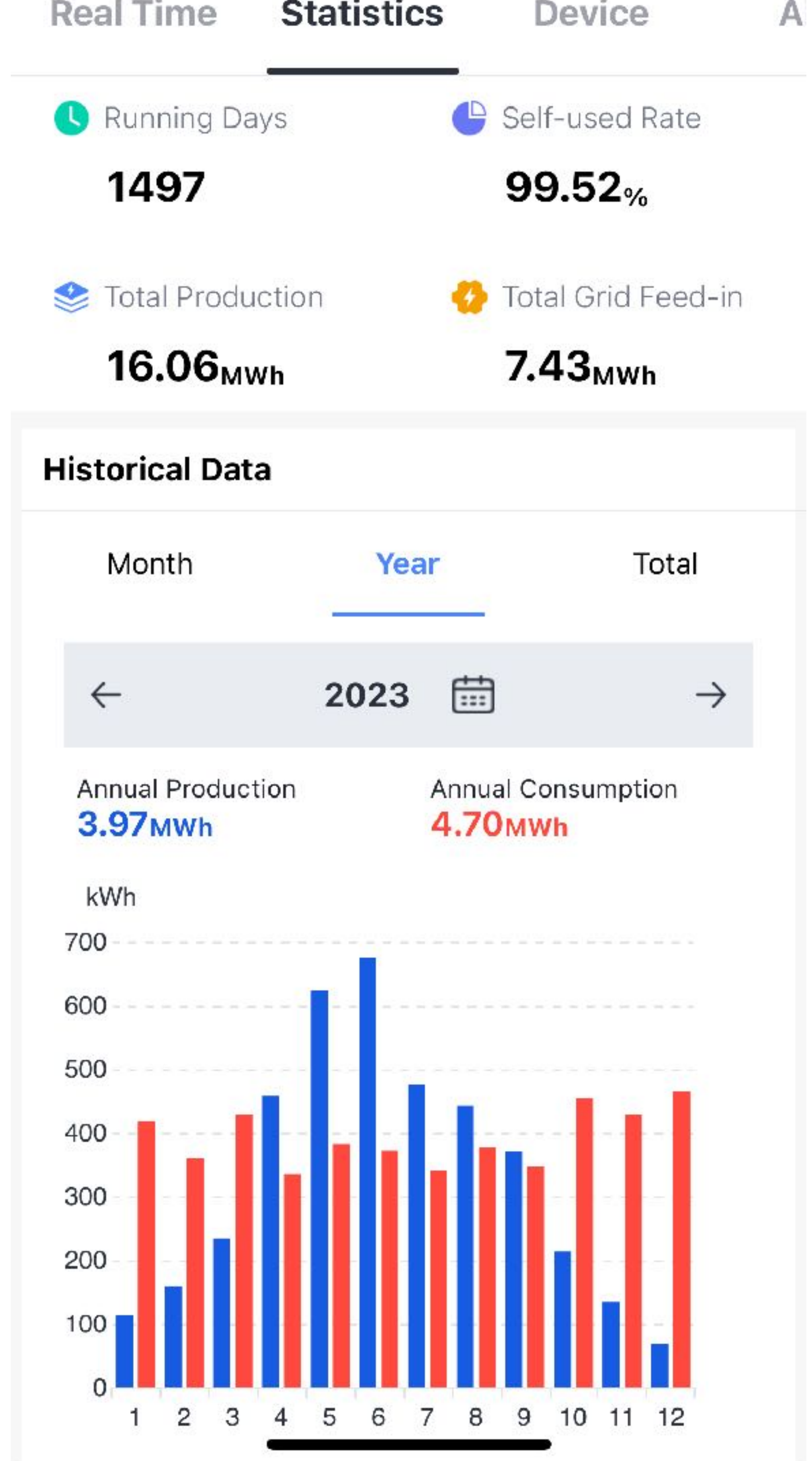




# System Performance

## How has it done?

- In the 4 years from June 2020 to June 2024 our system has produced: 15,553kWh (15.5MWh) of electricity
- In the same period our consumption of electricity was 20MWh



Production so far:

In the final 6 months of 2020 we produced: 1,650kWh

In 2021: 3,870kWh

In 2022: 4,163kWh

In 2023: 3,970kWh

In first 6 months of 2024: 1,900kWh

So over 4 years our roof has produced: 15,553kWh from the roof.

In very simplistic terms, and at current prices now, a kWh costs around 20pence if you had to buy it from the National grid. So you could say that so far we have generated £3,110 'pounds worth' of electricity.

Obviously that way of looking at it is not exactly scientific because (a) the cost of electricity has not always been 20p per kWh over that time period, and (b) with panels you are not in control of being able to always use your own solar at the time it is generated.

Using the "pounds worth" rule of thumb though we would get to a total system payback period of about 10 years. This is not the whole story though!!

# Financials

## The importance of Tariffs

- In our first 18 months of ownership we were very careful to try and use every bit of solar that we could as exporting to grid only yielded a pitiful 4.5pence per kWh, while every kWh we bought from the grid was much more expensive - so this is where the battery storage was helpful and also the car. We would store as much in the car and the house battery as we could.
- **ALL CHANGE!** In the most recent period EV tariffs have encouraged us to turn this on its head

## Time of Use Tariffs

### IMPORTS

We are currently on a tariff (IOG) that has two separate rates:

1. 22.28pence per unit we buy in the hours of 5.30 am to 11.30pm
2. 7pence per unit that we buy in the hours between 11.30pm and 5.30 am

### EXPORTS

For every kWh of electricity that we export we are paid 15pence.

### How This Benefits Us

We ALWAYS charge our house battery to full overnight, regardless.

We ALWAYS charge our car overnight.

We use the electricity from the battery and solar during the day.

This minimises the need to buy any electricity at peak price.

Octopus charge us for electricity we buy and tell us what our effective price per kWh (that we bought from them) has been each month.



## THE IMPORTANCE OF THE BATTERY SYSTEM WITH TIME OF USE TARIFFS

If you have a battery system then this can effectively allow you to run your whole house at a much cheaper average rate than the standard variable rate. Fill up your house battery during the cheap period and then using that electricity at high rate times.

To get an indication of how much this can help you reduce bills my average rates per kWh is given to me each month in my bills.

My bills in last 6 months:

May-June 2024 Energy imported from the grid: 275kWh @ 8.38p/kWh = £23.04

April - May 2024 366.3kWh @ 9.13p/kWh = £33.44

Mar-April 2024 297.8kWh @ 8.22p = £24.48

Feb - Mar 2024 414.1kWh @ 9.87p = £40.88

6 Feb - 12 Feb 78.9 kWh @ 9.64p = £7.61

23 Dec - 5 Feb 588.9kWh @ 12.73pence = £74.99

So my 6 month electricity imported from the grid ( ignoring standing charge) was £204.44

If instead that electricity was charged at a fixed rate of 20p per kWh then this would have costed:

2,021kWh @ 20 pence = £404.20.

**Essentially then time shifting has saved £200 over a single 6 month period. So, it's reasonable to say that over a year the saving just from this aspect is around £400.**

Another change in the last year or so is that on the new tariffs I am now being paid 15pence for every kWh that I can export to the grid.

So this means that it is now more economically favourable to directly sell my electricity to the grid when I can and use my battery to fill up every evening at the low rate of 7p per kWh.

My export rewards in the last 6 months have been: £55.62 + £51.17 + £28.91 + £13.18 + £6.49 + £5.02 = £160.59.

**As an estimate yearly export to the grid is worth around £350.**

Manipulation of the battery system then to export and import efficiently on my current tariff is worth around £750 per year.

# So what is the payback time?

- We looked at the 'pounds worth' model of what we get off the roof ( and therefore don't need to buy) - roughly £780 pounds per year
- We looked at how we can reduce the cost of what we need to buy from the grid - saving £400 a year on the cost per kWh of electricity bought by time shifting with the battery
- We looked at how much we have been paid back by Octopus for the electricity we sent to them - about £350

# BOTTOM LINE

## What does it all mean?

- There is a bit of overlap between looking at these different ways in which we save and make money, so it's not a straightforward calculation. However, the combination of generation (panels), time-shifting (battery) and export measures give us somewhere between £1000 and £1,500 a year - call it £1,250 - benefit per year.
- Return on Investment looks like around 6 to 7 years

# Added Benefits - The Controversial EV

## Never visit a petrol station again

- We now have a full EV. The cost per mile using cheap night rate is about 2 pence per mile, compared to a diesel or petrol at an average of 15 or 20 p per mile.
- We do around 10,000 miles per year and rarely exceed the stated range so a year of motoring costs us around £200. Let's however say we need also to charge occasionally away from home so double that to £400.
- At a conservative estimate, by running an EV, we have saved around £1,600 per year.



# Would we do it again?

## What would I do differently

- I would get a bigger more intelligent battery system
- More modern batteries can provide automatic trading with the grid to reduce price to rock bottom and can provide whole home backup. These systems are getting much more affordable.