

My Experience with Solar PV + Battery Storage

(The Numbers)

PMB, Version1, September 2021

The solar system

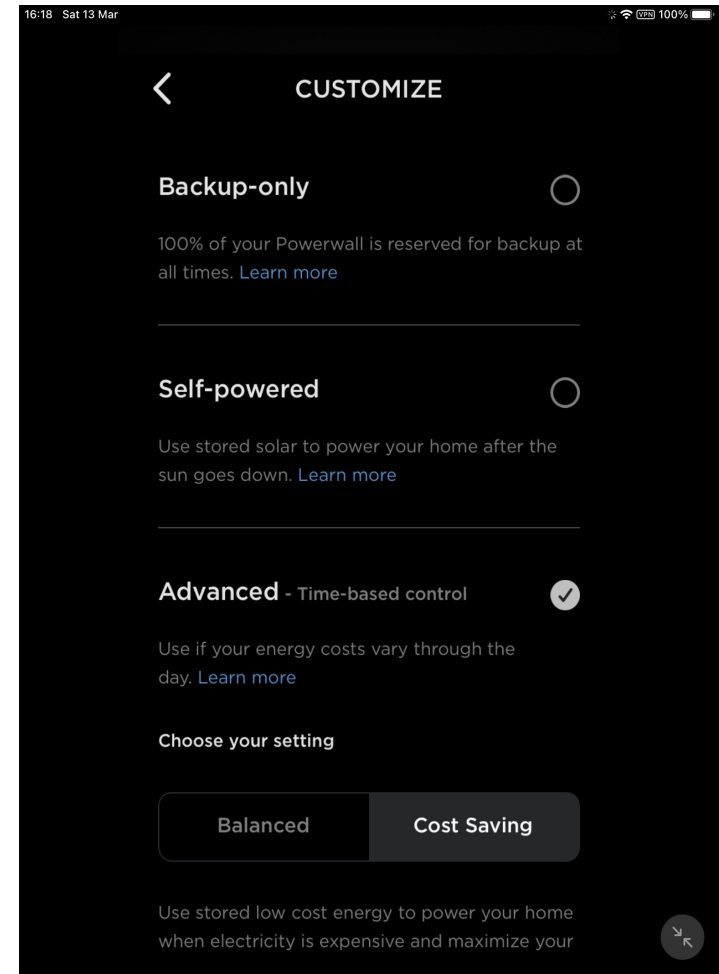
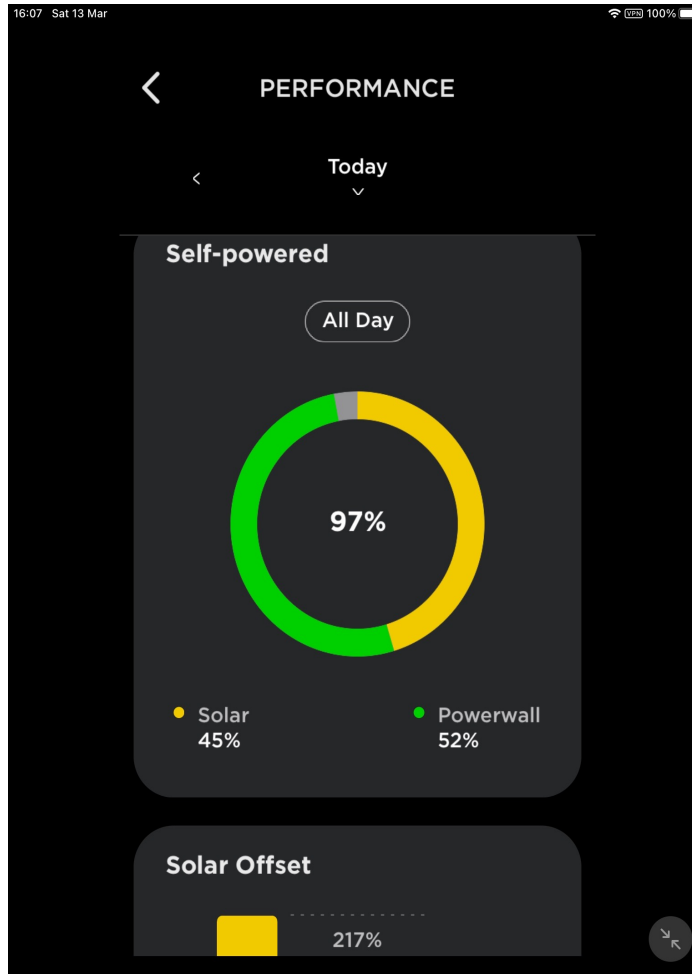
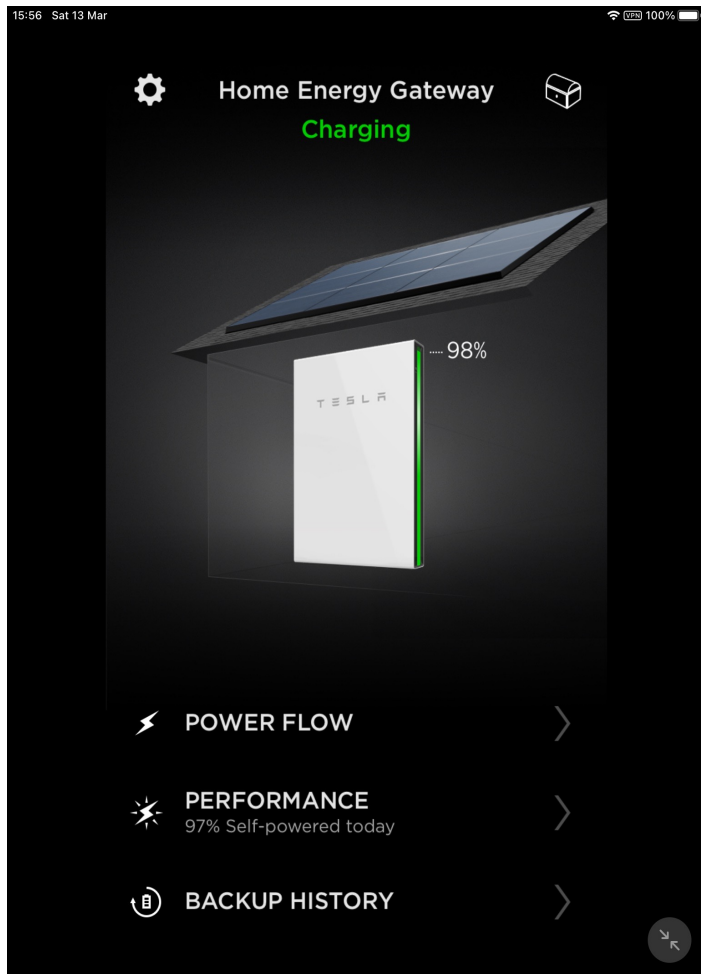
- Consumer unit
- Smart meter
- House fuse (80A)
- Grid isolator
- Ethernet ports for internet connections
- Gateway 2



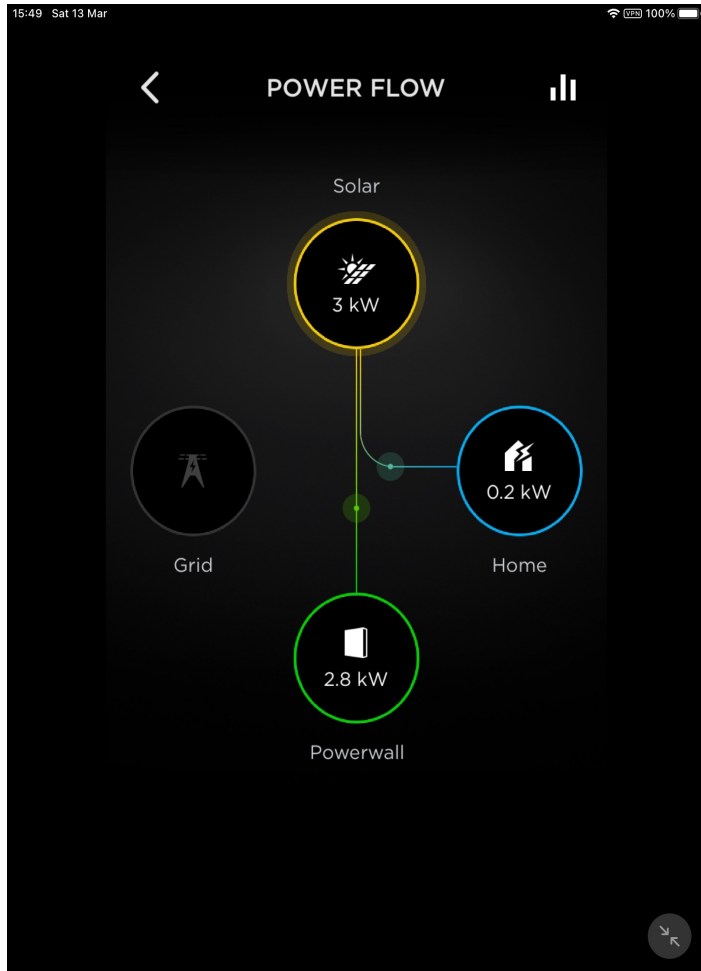
- myenergy eddi
Immersion controller
- 6kW Inverter fed from
6.4kWp 16 panel array
5.4kW export limit (UKPN)
- Solar system isolators
- 13.5kWH Powerwall 2
Battery module – can
supply 5kW (7kW peak)

Mean daily home
consumption 9.5kWH

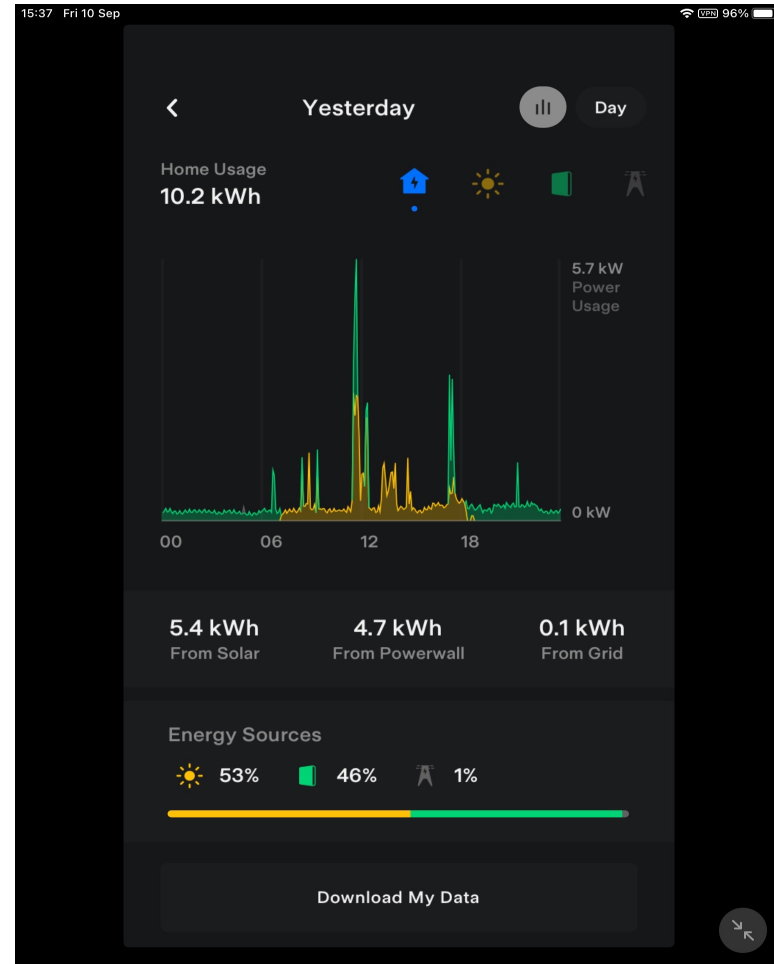
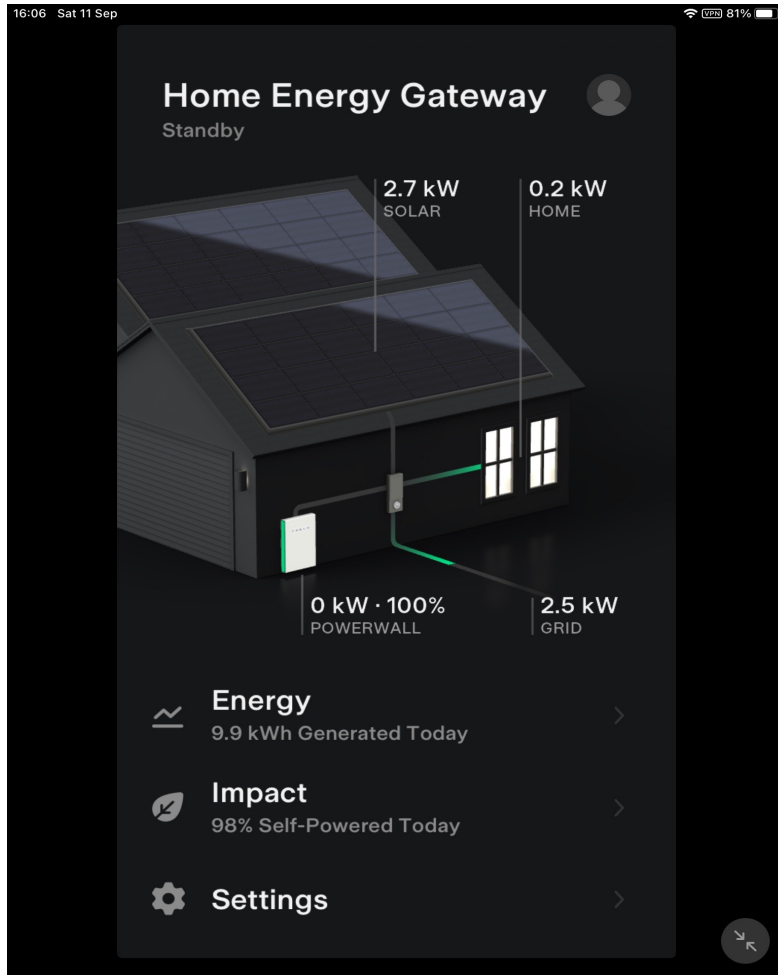
Mission Control - Tesla app



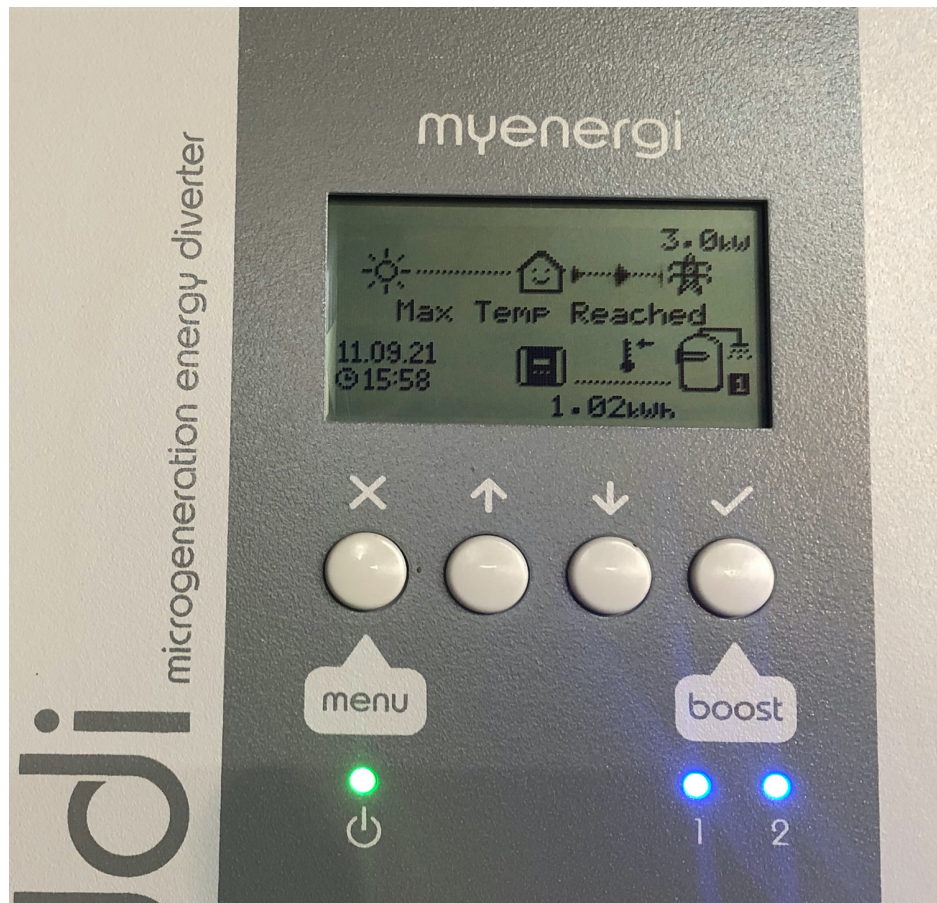
Tesla app (cont.)



Stop Press: New Tesla app September 2021



Eddi - Opportunistic water heating



When battery is full, surplus solar energy is exported

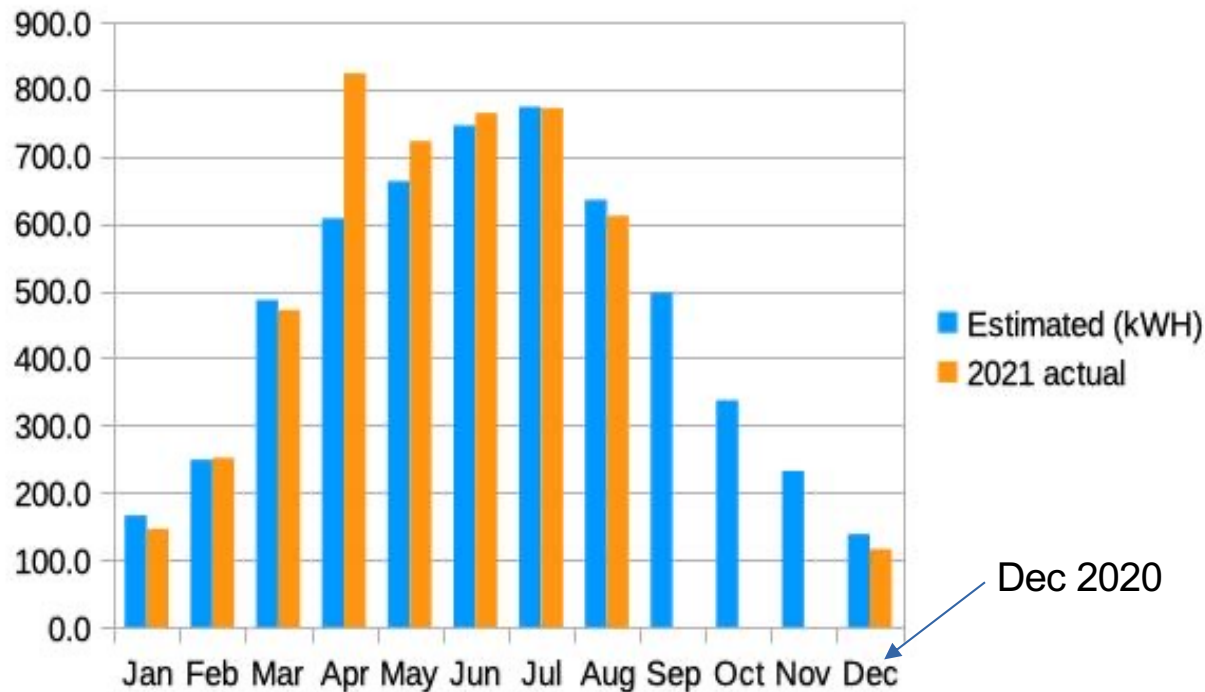
Eddi monitors energy export

Exported energy is diverted to immersion heater if required

Hot water topped up, 1.02kWH used

Generation profile

How much energy might we generate over a year?



Energy generation (kWh)

South facing roof

6.4kWp panel array

6kW inverter

Estimated annual: 5529kWh

Est. carbon impact: 1305kg
(@ 0.236kg/kWh*)

Cumulative January to August 2021:

Estimated: 4329kWh

Actual: 4566kWh

House use: 2283kWh

Sources:

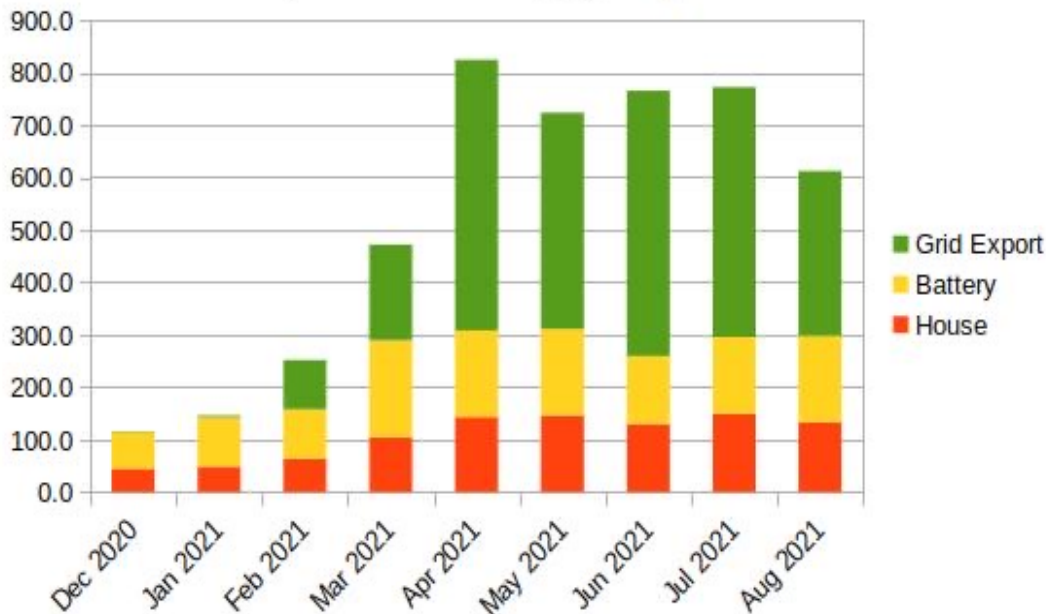
Energy Savings Trust calculator

Profile from In2gr8ted Solutions website calculator

*MyGridDB which monitors grid generation source mix and CO₂ intensity

Energy generation and consumption

Monthly Generated Energy (kWh) to Destination



December, January all generated energy consumed directly or via battery.

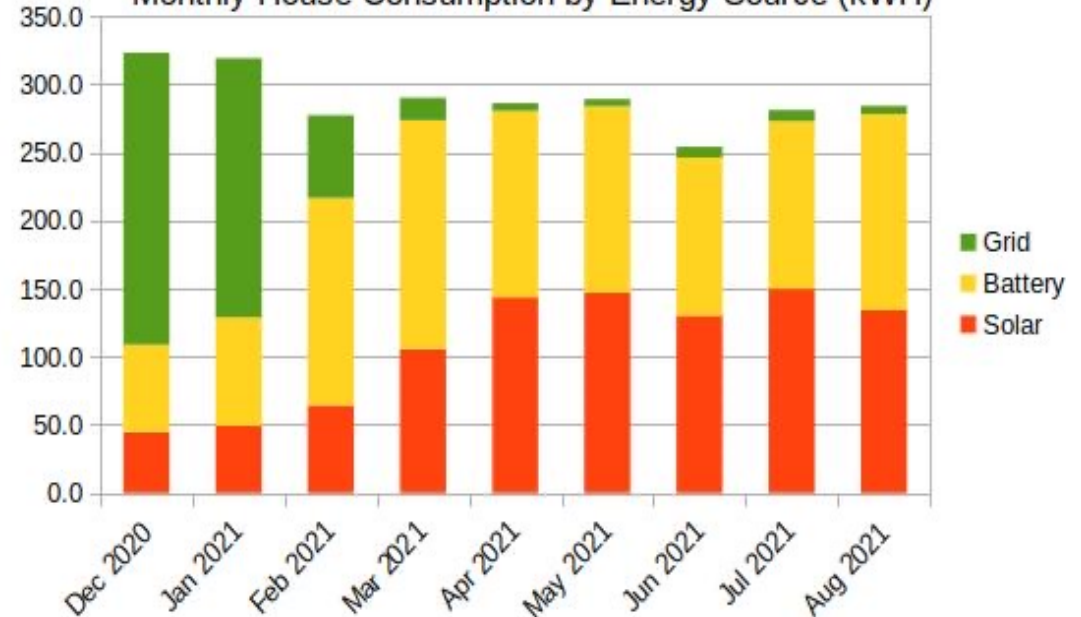
February onwards, surplus exported to grid

December-March solar is less than house demand

March onwards minimal grid import

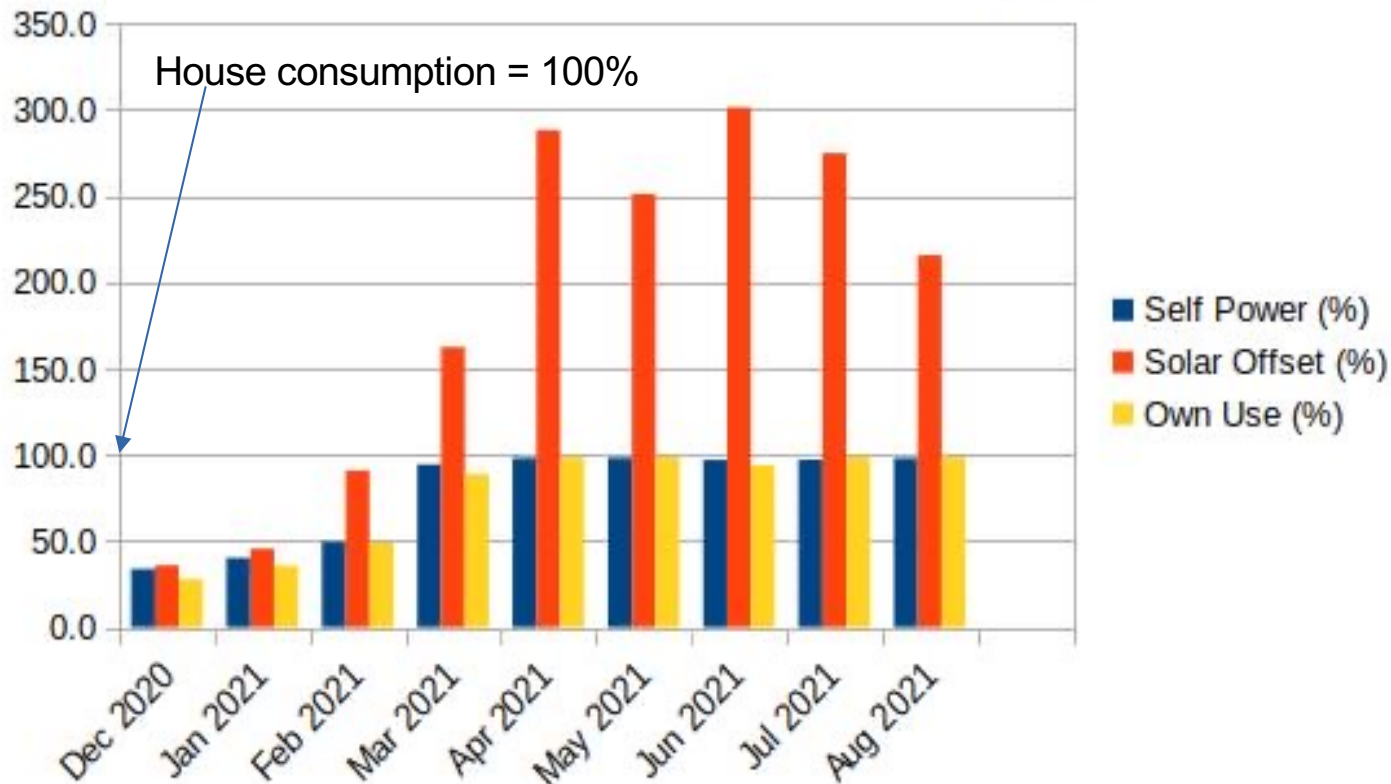
Battery at least doubles use of generated energy

Monthly House Consumption by Energy Source (kWh)



Performance summary

Monthly Solar Performance Summary (%)

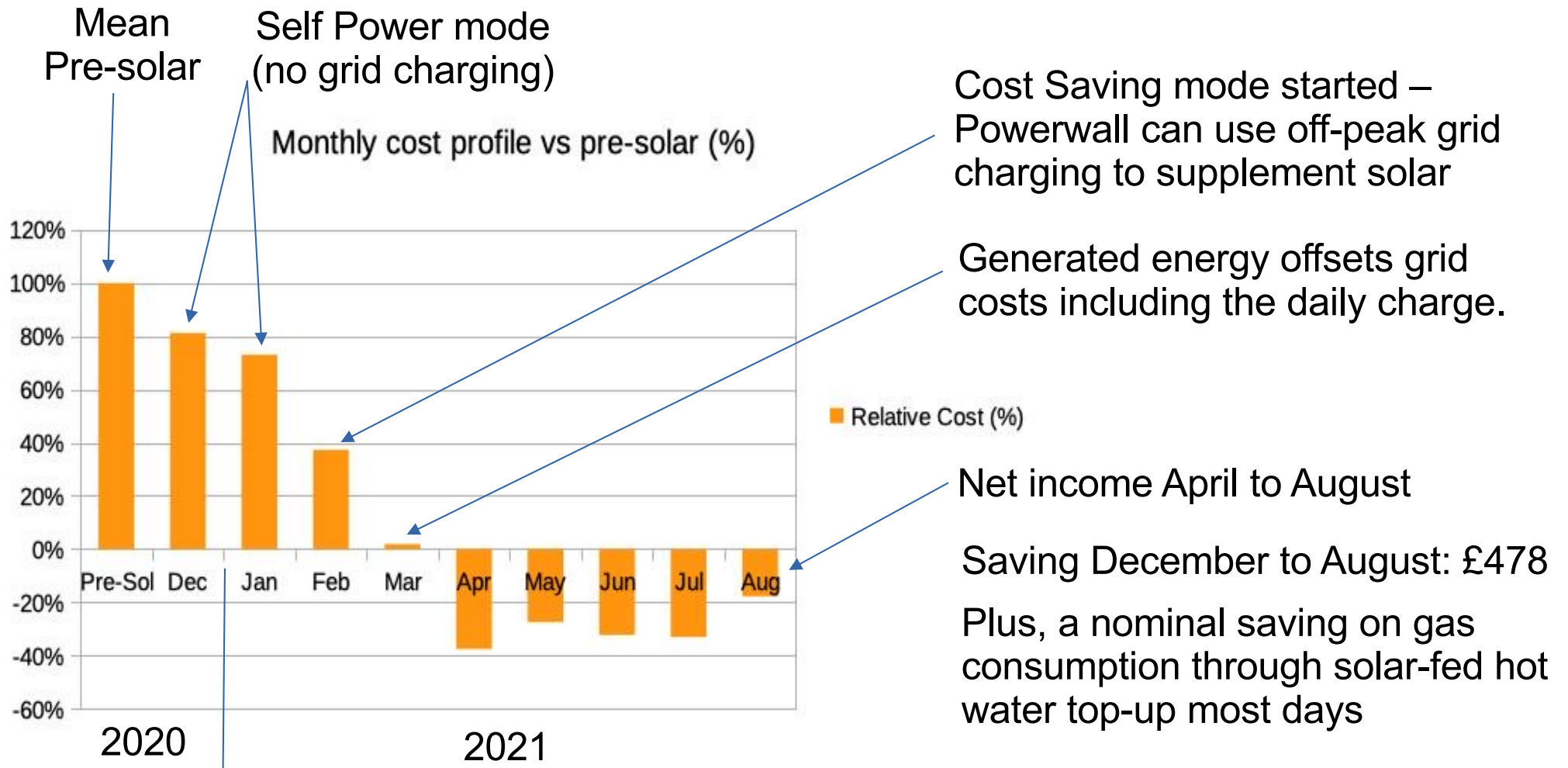


Self Power (Tesla rating):
percentage of house
consumption supplied by
solar + battery

Solar Offset (Tesla rating):
Generated energy as
percentage of house
consumption

Own Use (my rating):
Percentage of house
consumption from solar
only (direct or via battery)

Monthly energy costs compared with pre-solar



Observations and Thoughts

- Negligible grid import for 6 of 9 months
 - Exported roughly 50% of what we have generated
 - Max generation power observed about 85%-90% of specified peak capability
 - 5.4kW export limit reached on 30 days, 13 of those in April!
 - Power generation reduces as panel temperature rises – about 2.7% per 10 degrees C (It's a physics thing)
-
- Overall, impressed with the system
 - Powerwall has demonstrated its benefits
 - The Tesla Cost Saving predictive charging has proved effective

Internet Resources

Energy Savings Trust calculator:

<https://www.pvfitcalculator.energysavingtrust.org.uk/>

Generation profile from In2gr8ted Solutions website calculator:

<https://www.in2gr8tedsolutions.co.uk/>

MyGridDB which monitors grid generation source mix and CO₂ intensity

(<https://www.mygridgb.co.uk>)

Fully Charged Show for all things electric, especially electric cars and home energy

<https://www.youtube.com/user/fullychargedshow>