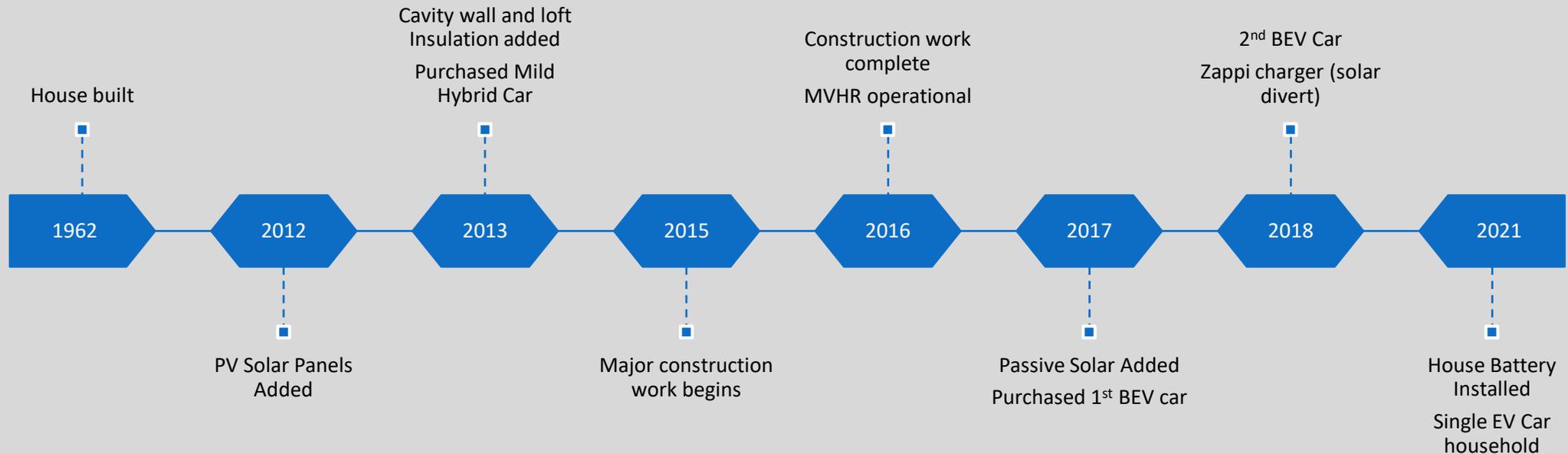




1960s Whole House Retrofit

An accidental Eco journey

Eco Journey Timeline



The story, and why...

- We added the solar PV within 3 months of purchasing the house. We wanted to reduce our electricity bill long-term, as we had 2 young children, and knew we would be in this house for decades.
- Within a couple of years we identified the need for another bedroom, as we became special guardians and took on another child. We knew we had to extend, or do some internal changes. So we made a plan....
 - We wanted to create a home that would benefit the whole family in terms of space, convenience, health, and that would also fulfil some of our goals to being more environmentally friendly.
 - Design: We were restricted on what we could do to extend, so we had to look at the whole house, and how we could adapt our footprint in place. As we were having to do major work, we decided to modernise the house, like re-wire etc, and wanted to vent damp and prevent mold (a personal target).
 - The Solar PV and first level Insulation had proven a great asset and hugely reduced our bills, but more importantly we noticed a significant improvement in comfort, so we were keen on looking at further ideas on how we could continue to create this health, environmentally friendly home.
 - We used local business such as CamPlans and MJ Salmon to help us tune our plans
 - Money: Things were taken on as money became available, hence we are still working on this!!

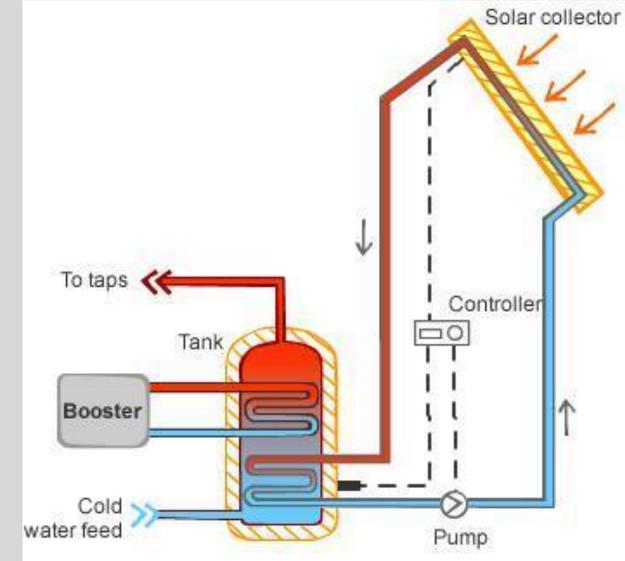
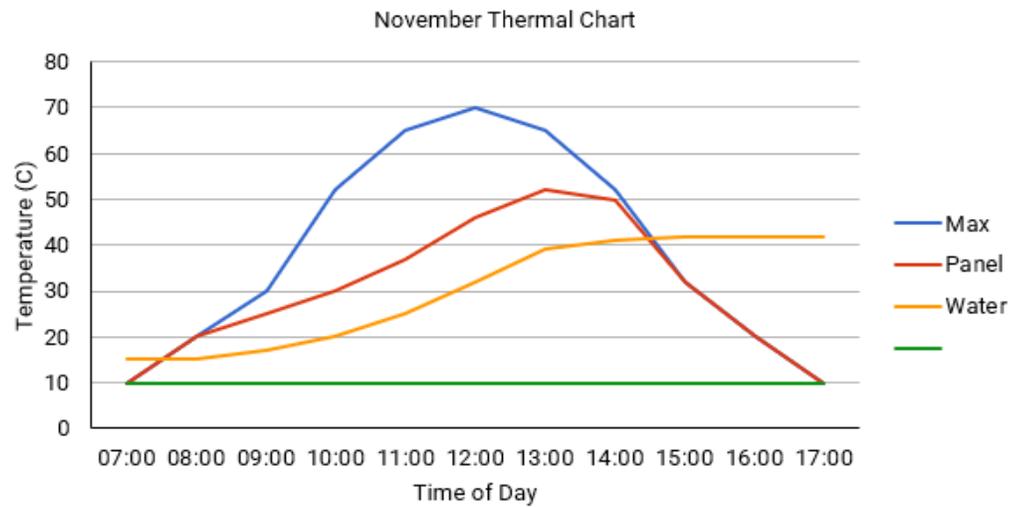
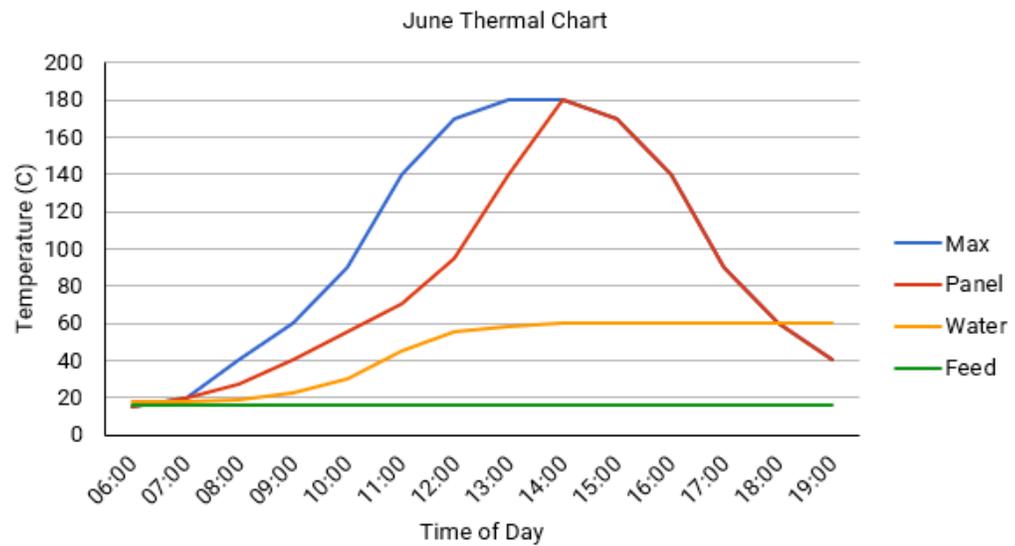
So what have we done....

- Restructured the house and grounds to better support our family life and modern technology
- Solar PV
- Solar Thermal
- MVHR
- Zappi EV charger with Solar divert
- Whole house Battery
- South facing Interglazed blinds double glazing
- Insulation – Cavity wall, solid foil backed form, glazing, wall paper, removed Chimneys
- Reduced waste by reusing materials where possible, grow veg, chickens, wormery
- Switched to Electric Vehicles
- *NOT covered today: Cat flaps, greenhouse heating and garden solar, concrete fibreboards, IT setups, garage sealing, thermal imaging, economic lighting and clever storage*



SOLAR

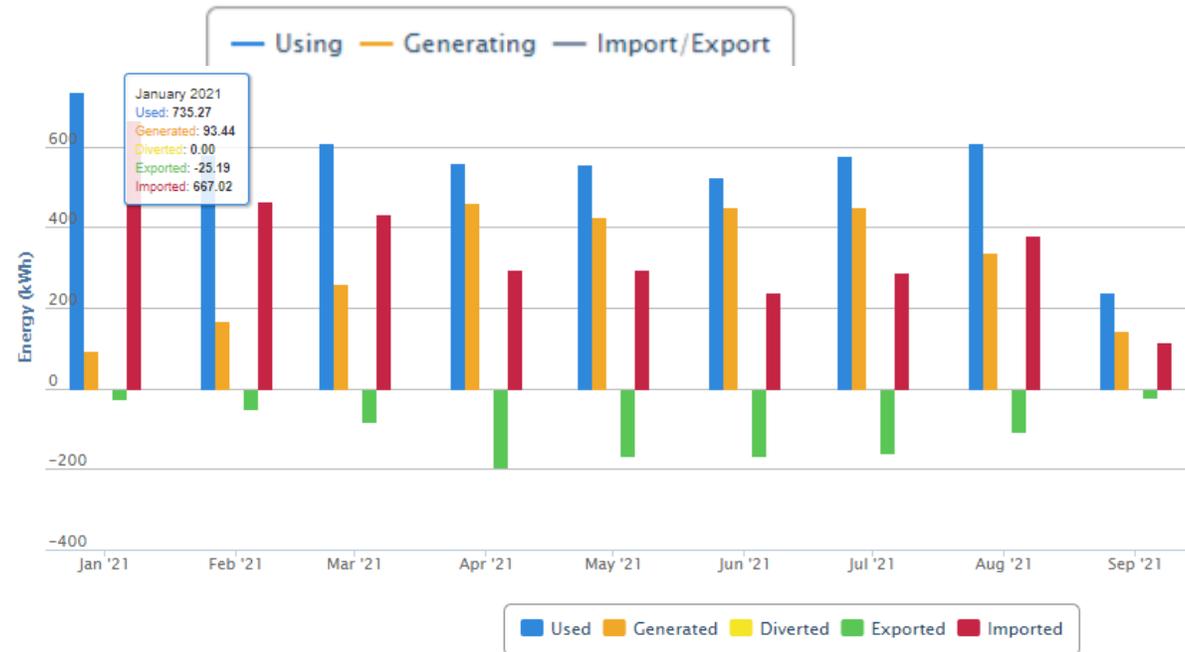
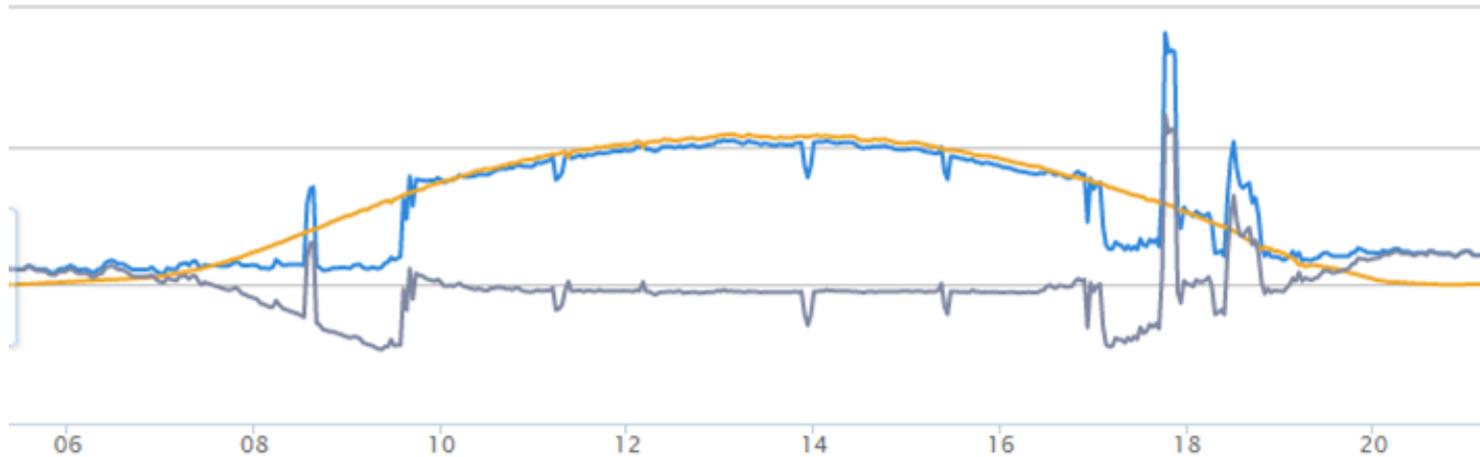
PV and tubes



Solar Thermal

- **Advantages:**
- Simple Technology
- Proven (been used on houses since 1970)
- Relatively cheap to install
- History: been about in various forms since 700BC !
- Effective, even in low light and low temperatures
- **Disadvantages:**
- Has an ongoing maintenance cost

◦ A day in July 2021



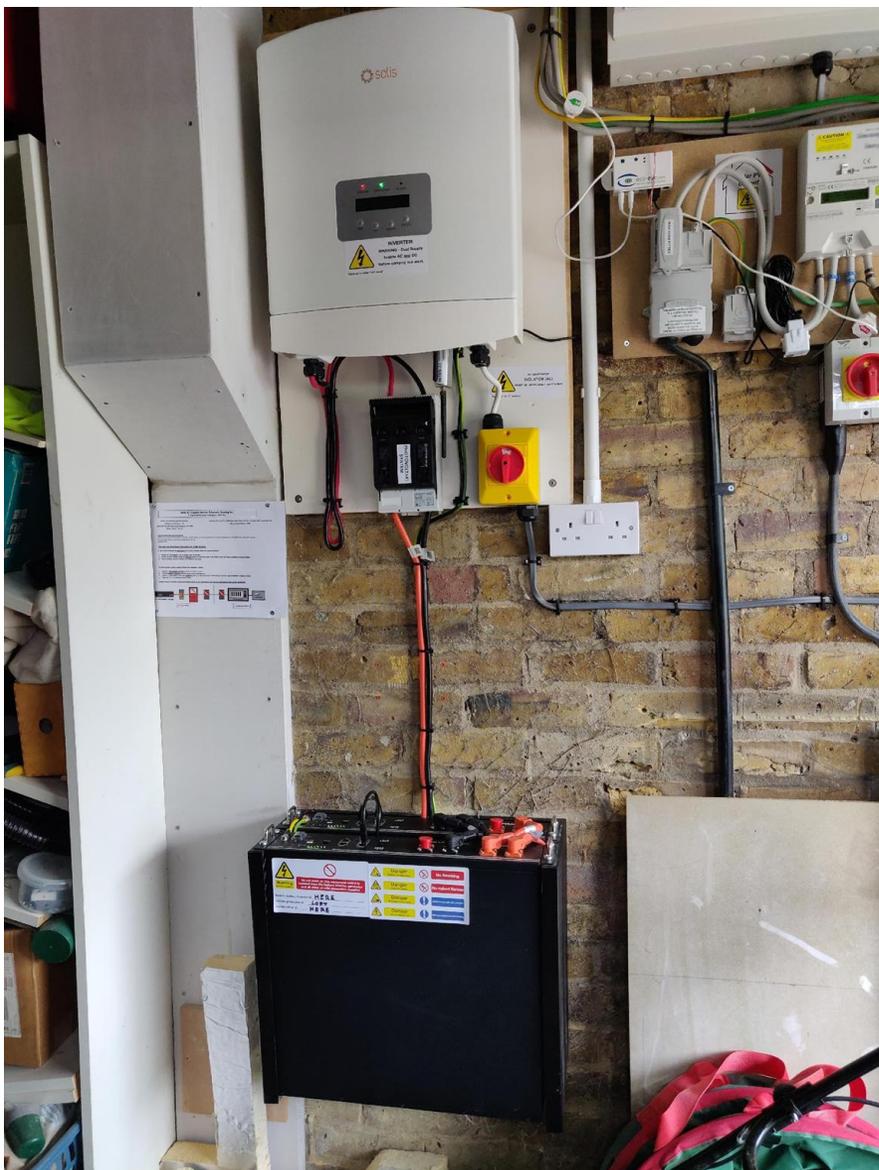
Photovoltaics

- 4.2KW system, installed under “lease your roof”
- You almost never get 4KW
- The Cars are charged from solar where possible
- House Battery now also charging (sept 2021)
- Our electric usage is higher, due to cooking and 2 electric cars.



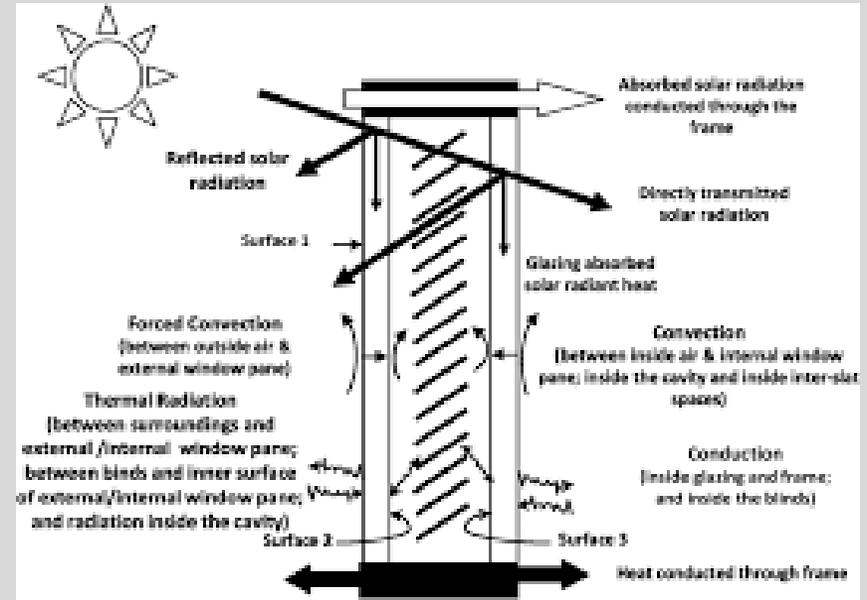
Ventilation

- Mechanical Ventilation and Heat Recovery (MVHR)
- We have found no issues or disadvantages.
- The impact on quality of life is massive
- We consider this the best change we added. We would not except another property without this now.
- **Notable Results:**
- No Mold anywhere – EVER!
- No smells
- Can dry clothes indoors
- Filtered air – allergens removed
- House temperature stabilized (cooled/warmed)



Power and Battery

- Very quickly after getting Solar PV, we realized there were many days we had plenty of spare power going into the grid for little to no return.
- Zappi EV charger can divert spare into the EV.
- House battery added to take further spare power.
- Small low wattage heaters also added.



GLAZING

To reduce solar gain, we had all south facing windows installed with blinds in-between the glazing.

This reduces maintenance, and increases thermal efficiency, whilst enabling patio doors and sliding doors.



INSULATION

Loft, chimney removal, cavity, fascia, thicker wall paper
Power sockets on internal walls or lined

Heating need per unit floor area



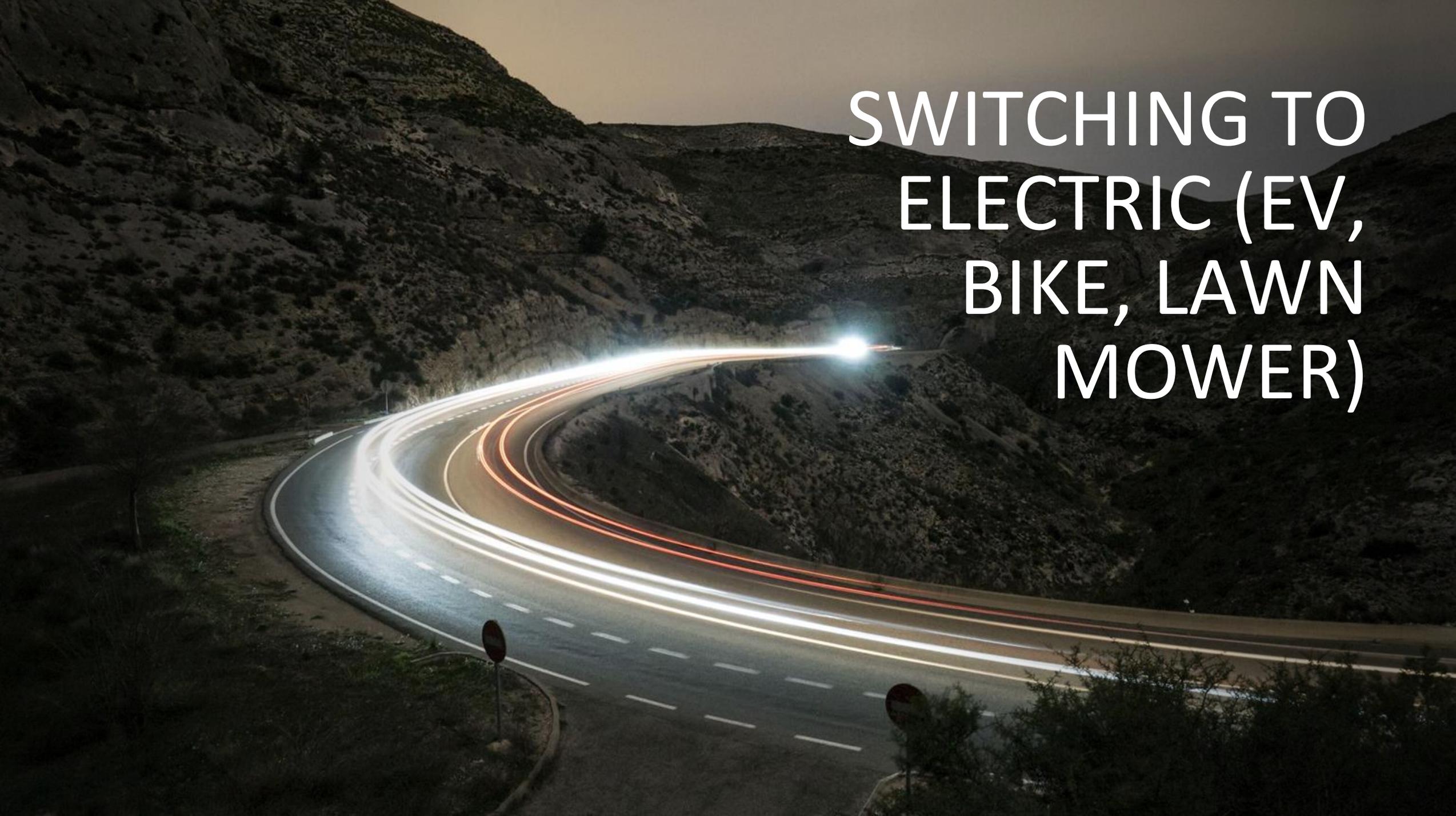
How our house now compares (Heating)

- According to government figures (2017), new builds in the UK are using **125KW/m²**
- Based on the last 2 years data, we are using **60KW/m²**, and that is with an entire family working from home



REUSE OF MATERIALS

Garden, greenhouse, brick reuse in main house.



SWITCHING TO
ELECTRIC (EV,
BIKE, LAWN
MOWER)

	Day	Night	Gas
KWH	3500	1800	11000
Approx costs	£600	£170	£360

The Annual Figures

5 bed house

Figures based on last 2 years

Eco Item	Cost	Savings	Incentive	Ongoing costs	Notes
Solar Thermal Collectors	£5,000	£200	£420	£75	
PhotoVoltaics	n/a	£200	0	0	Leased
MVHR	£8,500	£100	0	£50	was not about savings
Battery	£3,100	£430	0	0	Estimates on savings
Electric Car (Leaf)	£22,000	£3,200	£3,000	0	Actuals based on our 1st BEV
Cavity Wall insulation	£50	£200	0	0	Government install scheme
Zappi charger	£750	£200	£500	0	Government grant

Hinde Sight – What we would do different?

- Not add Solar Thermal, the maintenance cost reduces any payback and there are better options when we all have to replace our gas boilers with heat pumps
- More consideration to thermal bridging, my Thermal camera has identified areas I can improve things more.
- More air tightness sealing, as above
- More Solar PV
- Roof setup/insulation
- Location of plant kit.
- Easier technology operation

Going forward

- Replacing Gas heating (Heat pumps)
- Additional Solar PV
- House cooling (possibly with Heating)
- Thermal bridges
- Additional insulation
- Ridgeblades, wind power generation



Next steps

- Please give quick feedback: form.jotform.com/211853362329052
- Make a donation: cambridgecarbonfootprint.org/donate/
- Share on social media: #OpenEcoHomes

Thank you for your support!



Further Resources

- Find out how you can [get started with your retrofit](#)
- [Book another tour or talk](#)
- [Case Studies](#): Research our past homes
- [Borrow a thermal imaging camera](#) and get training
- Use Transition Cambridge's [personalised home energy advice tool](#)
- Take political Action e.g. [Households Declare!](#) and their [resources](#)

