Our Journey towards a low carbon home pt. 3 Six months on:

The Eddi PV controller has proved very successful, diverting output from the PV array to the immersion heater. Even on cloudy days in summer hot water temperatures are more than adequate and the heat pump hardly ever needs to switch on. The order the PV output is used has been changed to a) house, b) car charging when required, c) immersion heater when required and then export. The fixed smart thermostat, (designed for the old gas boiler) proved to be an unsatisfactory companion to the air source heat pump and a Homely system installed. It learns how long the house takes to heat up and cool down. It then looks at internet weather forecasts and electricity prices to make sure the house is heated at the cheapest times to meet desired temperatures. It will overheat the house a couple of hours before expensive tariff periods by up to 2 degrees, the temperatures gradually dropping to those normally set. The heat sensor is wireless and kept in the living room but is moved if the log burning stove is lit. Should the internet or iPad, through which Homely is controlled, fail, the system remembers settings and times of the past 24 hours until services are restored. Homely can be controlled remotely so the heating etc. can be switched on or off away from home. Monthly energy records are being kept so running costs and emissions can be compared against the gas boiler in due course. We changed our energy supply to Octopus Energy Agile tariff once the Homely system was installed. Tariff rates vary every half hour and are known 24 hours in advance. Dishwasher, washing machine and electric car time clocks are now used much more to take advantage of lower price periods. During sunny days our P.V. output is generally sufficient for all our electricity needs other than the electric oven, (the gas hob has for the time been retained.) We are however exporting less. By knowing in advance what the variable tariff costs are (shown via a smart phone App) we are, when we can, more likely to avoid peak consumption times and therefore highest prices. With a variable rate supply, it is very noticeable that during cloudy and windless periods, tariff costs are high. This is offset by winter prices (when there is more wind) which can even be negative during periods of excess generation. Then we are actually paid to use electricity!

The system has now been in for a complete year and the energy figures below tell their own story!

Have we finished the journey? As far as home energy efficiency and reducing emissions is concerned, possibly. Insulation in the concrete floor may be a journey too far. As far as electricity consumption costs and responding to greater demands at peak times on the national grid are concerned, possibly not. Home battery storage or car to grid battery connections will possibly be the last piece in the jigsaw.

Reducing personal emissions, well that's another journey which is ongoing ….

Energy Consumption Figures Average before* and after** Heat Pump installation.

	Before	After
Electricity Import average	1733kW*	5576kW**
Electricity Export	2182*	1071kW**
Electricity consumption	2492*	7370**
Gas consumption	12584kW*	260**

Electricity consumption is up by 4878kW but gas down by 12342kW.

P.S. During the summer of 2021, there was less North Sea wind generation and the Octopus Agile tariff proved less agile – most times at the maximum price so we have changed to a variable day /night tariff, giving us 4 hours of lower price electricity between 00.30 – 04.30. It is straightforward to change the tariff setting in the homely system so we can change back in due course.

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