**Domestic Renewables –** *requires research to identify solutions and seek the necessary approvals*

(May require Planning and/or Building Control approvals – some loans and grants available via EST)

<https://www.homeenergyscotland.org/about-us/>

**The Problem –** *some help available from Home Energy Scotland (EST)*

We faced the usual dilemma about replacing our 25-year-old central heating boiler and, with the cost of living going up, we wanted to reduce our ongoing bills for heating oil. We have had some Solar PV on the roof since the original feed-in-tariff and that had been working well for us. Unfortunately there is no mains gas near us. We have an oil tank.

**Options –** *important to decide on the best system for your circumstances*

There are a number of options available to consider for domestic heating :

* Replace our existing boiler with a new energy efficient boiler
* Install a direct Electric heating system
* Air source heat pump or combined system
* Solar thermal panels
* Ground Source Heat Pump
* Home energy efficiency measures, wind, biomass, geothermal, etc

**Pros and Cons –** *based on key objectives and remaining life**for the system*

Replace our **existing boiler** with a new energy efficient boiler – at best a short term solution and unlikely to be best for the planet in the long run. Would require home efficiency measures and who knows what will happen to the oil price in future?

Install a direct **Electric heating system** – fails to make use of existing radiator system and will be expensive to run on mains electricity or requires a massive array of solar PV to support electric heating during the dark winter months

**Air source heat pump** or combined system – generally regarded as providing 3 units of heat for every unit of electricity put in [COP=3] but is a tidy solution where space is in short supply and where modest noise levels are unlikely to cause concern. ASHP and efficient boiler combinations are on offer and may provide a solution for some consumers where the output is adequate and where the back-up boiler provides additional reassurance.

**Solar thermal panels** – can provide a good solution for domestic hot water where space is available for (additional) panels or can be achieved with a so called diverter to channel surplus electricity from Solar PV panels to immersion heater(s) but may have compatibility issues with some ‘SMART’ battery/gateway systems.

**Ground Source Heat Pump** - generally regarded as providing 4 units of heat for every unit of electricity put in [COP=4] but requires a large area and significant groundworks. Vertical drilled systems are available where space is limited. Can increase electricity bills based on consumption during winter months.

**Our solution –** to support a GSHP with additional Solar PV with battery storage to allow for time shifting between daylight hours and peak evening demand without drawing excessive amounts of electricity from the grid. Generates surplus electricity to grid in summertime. Necessitated careful draughtproofing and additional boundary wall insulation to provide the necessary reduction in heat load for the property. Required Grant application, DNO approval, ‘SMART’ meter installation and planning permission for ground array. Upgraded heating controls provide greater flexibility of operation and new DHW tank. Most domestic renewable solutions should proceed on the basis of deemed planning consent.