Belper ECO Open Homes Week

Type of Property:

20 Bank View Rd

Nether Heage

DE56 2AY

1960’s Brick built, detached, 3 bedrooms.

Work prior to energy system upgrades:

1. Loft insulation increased to 350mm
2. Cavity wall insulation
3. Double glazing has been improved over a number of years
4. House EPC rating - B

Solar (PV) Panel installation:

Installation carried out in several stages:

1. 3.8Kw (max) of panels, 5Kwh storage.
2. Storage capacity increased to 10Kwh.
3. Additional panels added when boiler removed increasing maximum output to 4.5Kw
4. 2.25Kw of panels added to northwest corner of house plus additional 5Kwh storage.

Notes

Initial installation limited by presence of gas boiler flue through roof.

Storage increased because even in February the original single cell was filling almost every day.

The house is about 20 degrees off east – west and so power generation dropped off after 3 pm. Although the “north” facing panels will be dormant in the winter they have increased the daily total output dramatically during the rest of the year.

Air Source Heat Pump Installation:

Considerations before starting:

1. Insulation level of house.
2. EPC rating / boiler upgrade scheme
3. Pipework – can be limiting factor
4. Radiators – can be a limiting factor
5. Positioning of external unit
6. Space needed for water tank.
7. Cold water feed required.
8. How/where to connect into the existing pipework

Notes:

1. Property already had insulation upgrades and so was eligible for grant.
2. Property has 15mm copper piping and so was adequate.
3. It was recommended that some of the radiators would need increasing in size – it was decided to replace all of them as this was a relatively small additional cost.
4. External unit positioned at the back of the house.
5. Tank, pumps and control system installed in the garage.
6. An insulated cowl was required to bring pipework into house via bathroom (location of gas boiler)

Cost Comparisons / Energy Use

Energy Costs with PV		
DATE	£ ENERGY / Electricity	£ ENERGY / Gas
Jan-23	74.49	
Febuary	60.58	
March	58.25	300.29
April	29.57	
May	22.94	
June	24.67	155.64
July	29.01	27.21
	£299.51	£483.14
ACTUAL COST = £782.65		
ENERGY GENERATED - EXPORTED = 1560KWh		
24p/unit = £374.40 (costed at grid rate)		
"Total"Cost = £1157.05		

Energy Costs with PV and HEAT PUMP	
DATE	£ ENERGY / Electricity
Jan-24	204.48
Febuary	150.78
March	109.69
April	44.41
May	27.99
June	20.44
July	22.53
	£580.32
ACTUAL COST = £580.32	
ENERGY GENERATED - EXPORTED = 1437KWh	
24p/unit = £344.88 (costed at grid rate)	
"Total"Cost = £925.20	

Notes:

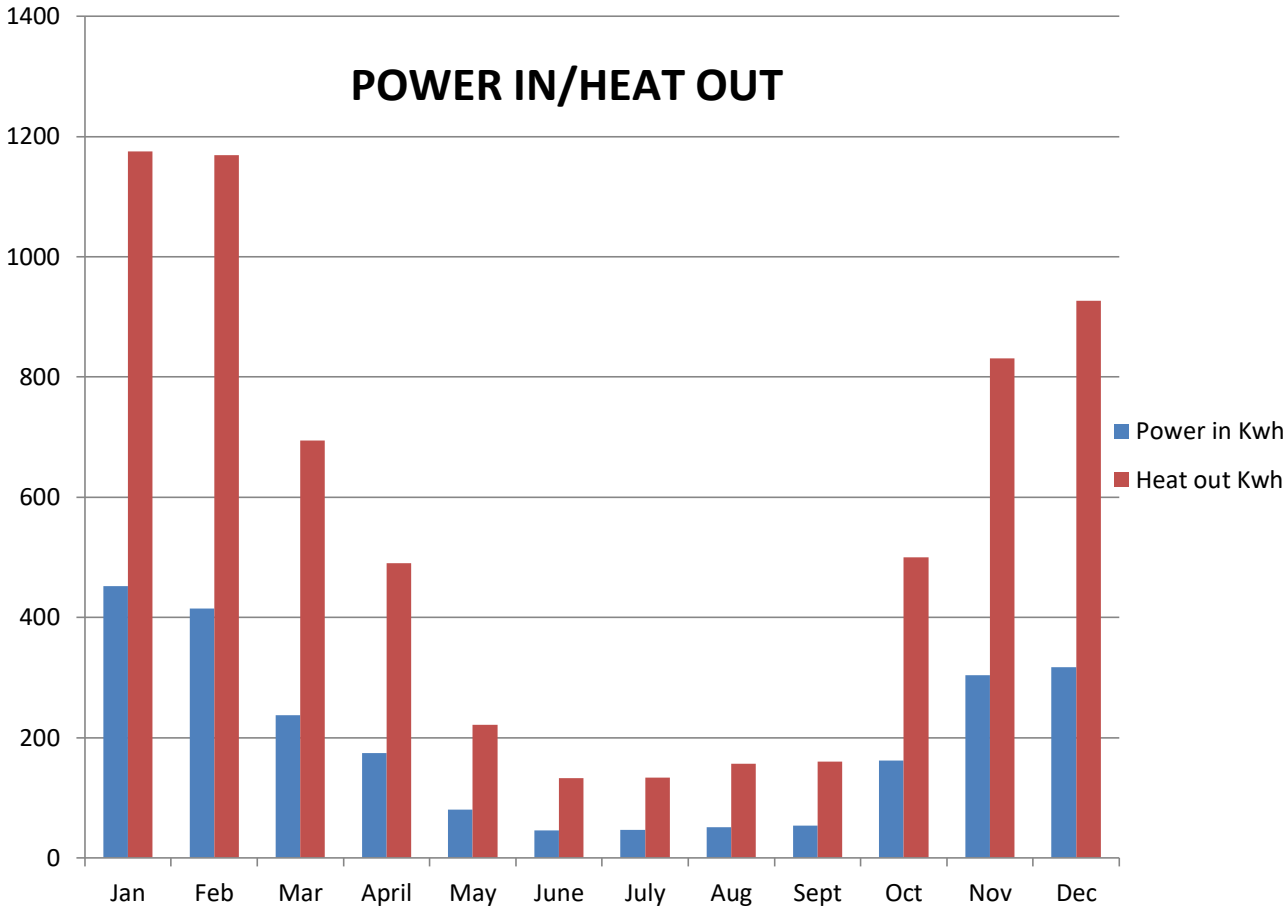
1. Unfortunately I only have 6 months of comparative data
2. The heat pump has reduced energy costs when compared to electricity/gas mix. (estimate £4-500/year)
3. The new radiators are much more efficient than the originals.
4. Energy export to grid worth £3-400 /year

Energy with PV			
DATE	ENERGY USED / Electricity	ENERGY USED / Gas	ENERGY GENERATED
Jan-23	183.81	1829.5	150
Febuary	145.59		190
March	134.30	518.5	250
April	44.68	700.2	410
May	22.67	43	520
June	29.56	45.6	560
July	45.51	77.1	450
	606.12	3213.9	2530
			minus exported 1560
	Total 5380Kwh		

Energy with PV and Heat Pump		
DATE	ENERGY USED /	ENERGY GENERATED
Jan-24	673.77	160
Feb-24	485.69	170
Mar-24	335.43	320
April	116.16	450
May	44.73	520
June	15.30	800
July	23.87	590
	1,694.95	3010
		minus exported 1437
Total 3132Kwh		

Notes:

1. The total energy used (Kwh) has been dramatically reduced. (See energy profile of heat pump below)



Further Work:

1. Gas has been disconnected.
2. Chimney has been removed (it needed repair anyway!)
3. Considering external wall upgrades such as rendering and possibly external wall insulation (EWI).
4. May consider increasing size of inverter (presently 3.6kw).