Miss Evie Hawkes

Project Name: PV - 864

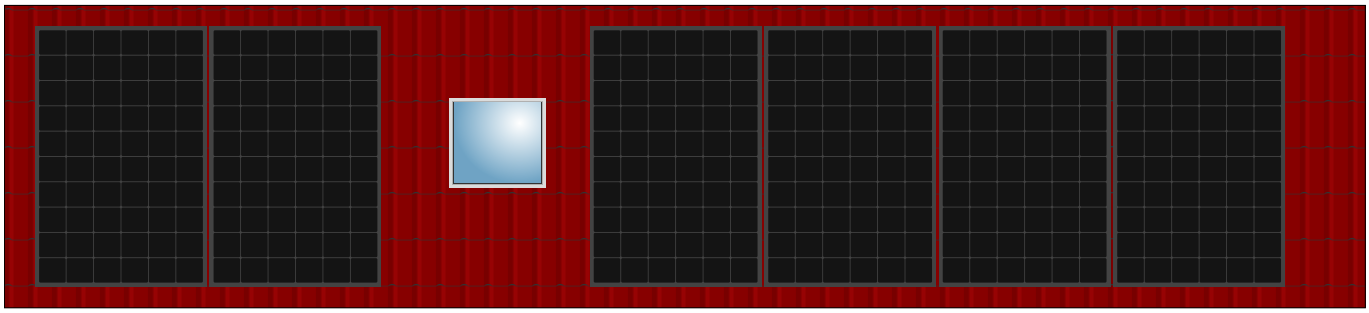
Address: 5 Holmesdale Road, Brundall, Norfolk, NR13 5LL

Date Created: 13th September 2023

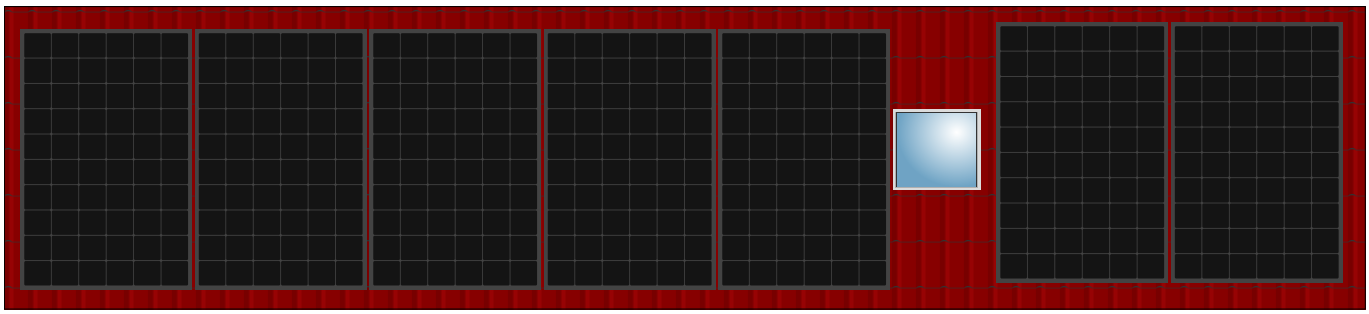
Designer: Myah Gilvey

Roof Layout

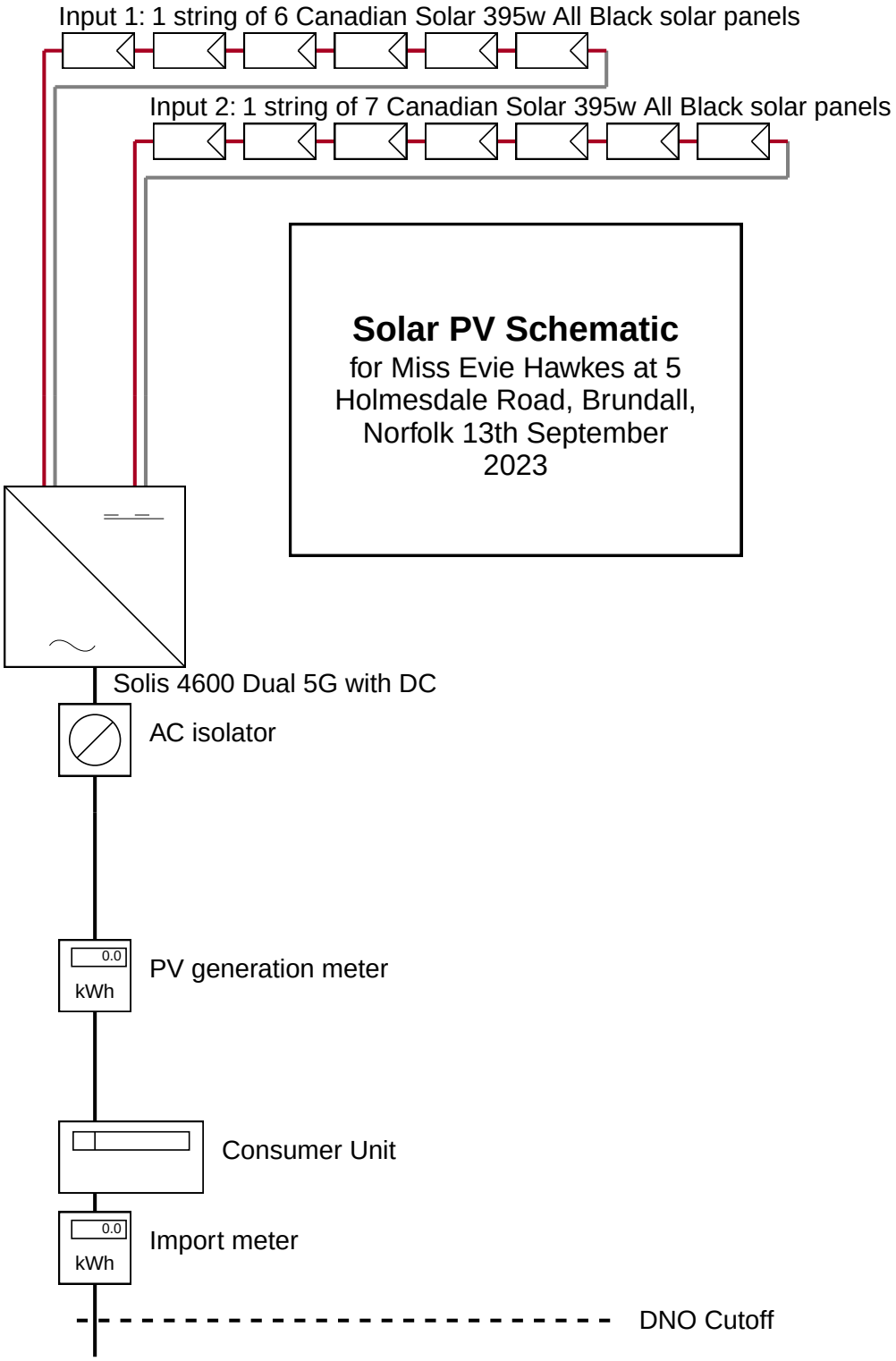
East Aspect



West Aspect



Schematic diagram



Self consumption

We model here the performance of a solar PV system over the course of a year, using high resolution minute-by-minute generation data for a typical PV system and consumption data for a typical house, and calculating the flow of energy from the solar panels to the house during the day, and from the grid back to the house at night.

We provide yearly profiles of generation, consumption and import / export, along with detailed profiles for a typical spring day.

Consumption

Electricity consumed in the property each year

2341 kWh

Generation

Electricity generated by the PV array each year

3984 kWh

Self consumption

Proportion of PV generation used in the property

22 %

Independence

Proportion of electricity consumption provided by PV

37 %

Import / Export

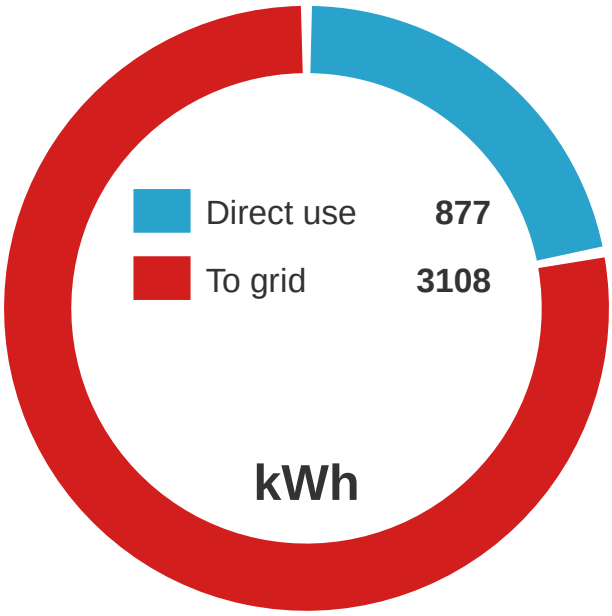
Electricity import / export each year from the property

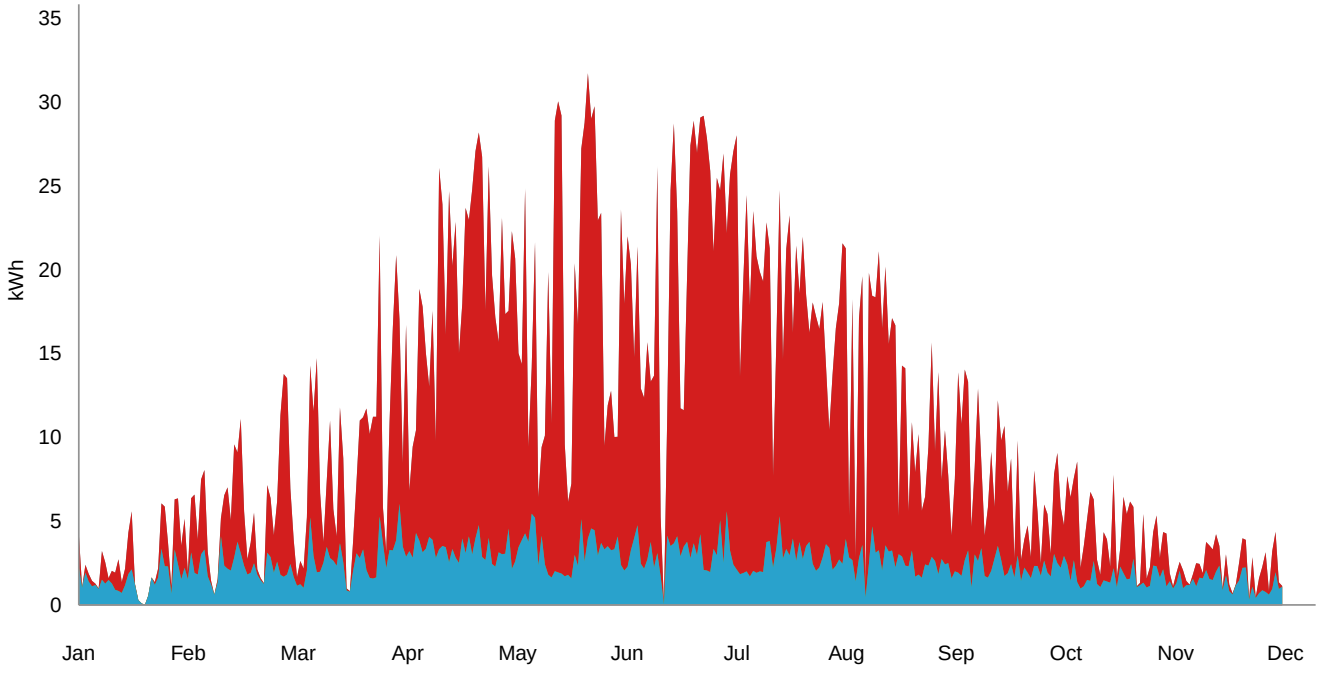
1469 / 3108 kWh

Yearly generation

The solar PV array is expected to generate 3984 kWh over a typical year. The graph shows whether the generated energy is used directly in the house or exported to the grid.

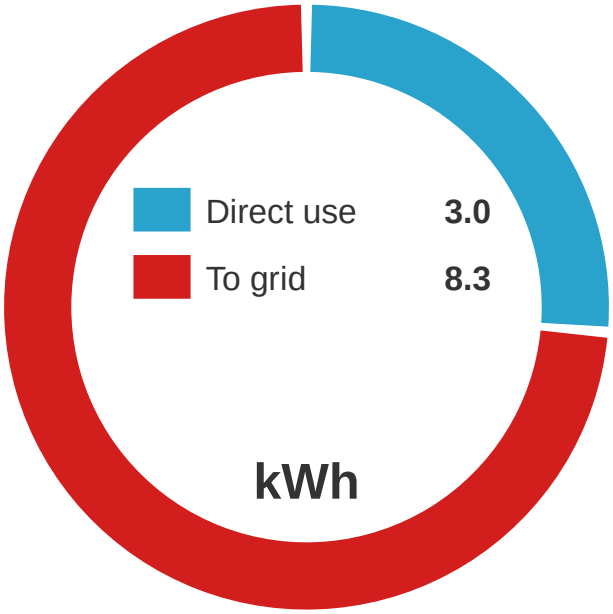
22% (877 kWh) of the electricity generated is expected to be used directly in the property. The remaining generation (3108 kWh, or 78% of the total) is exported to the grid.

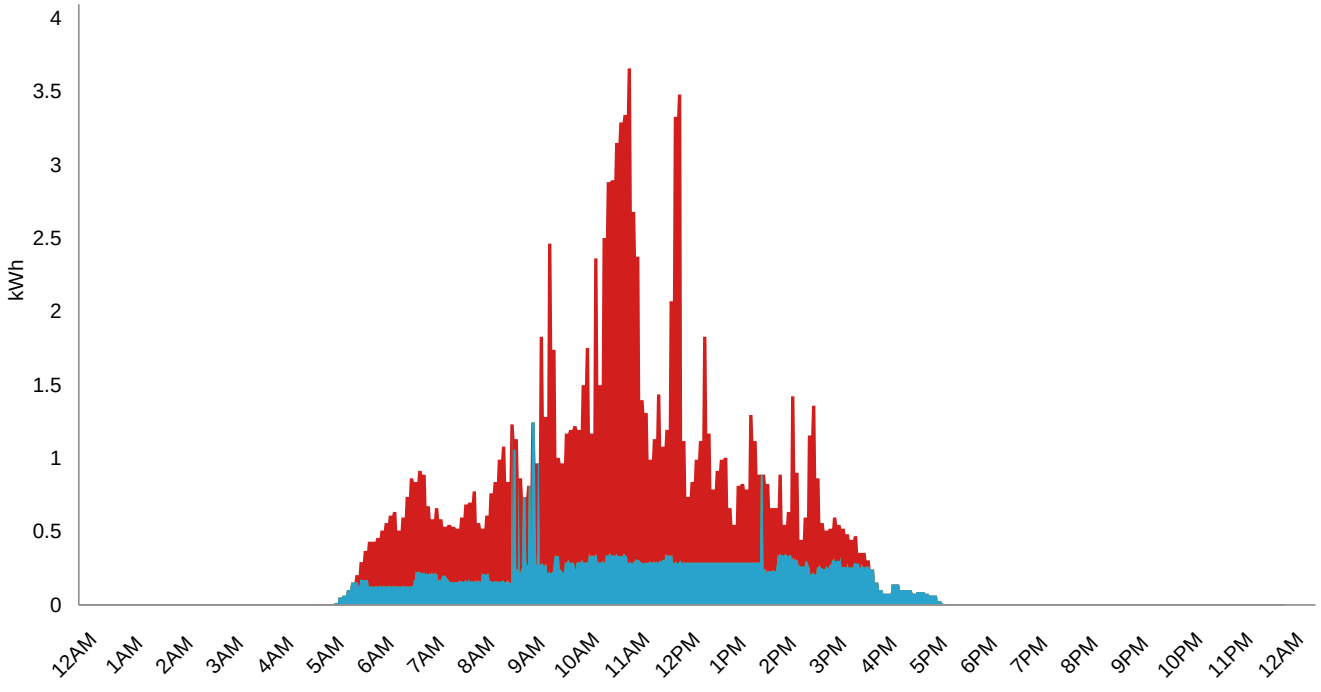




Daily generation

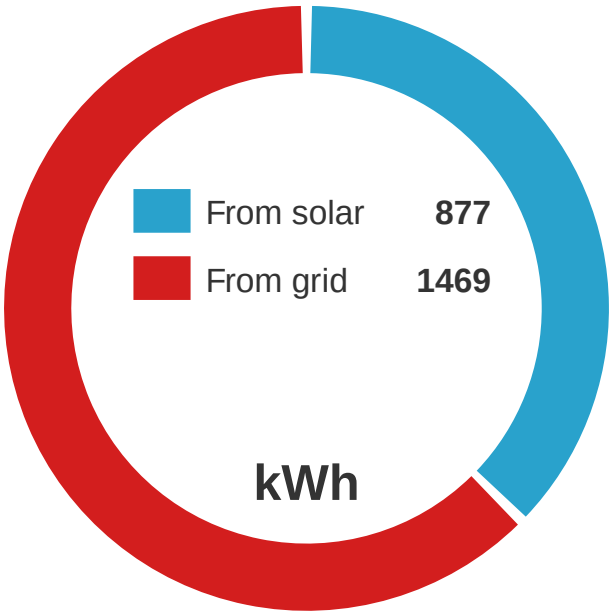
This graph shows the modelled profile of electricity generated by the PV array on a selected day (March 27th). On this day the PV system is expected to generate 11.2 kWh. Of this, 3 kWh (27%) is used directly in the property, and 8.3 kWh (74%) is exported to the grid.

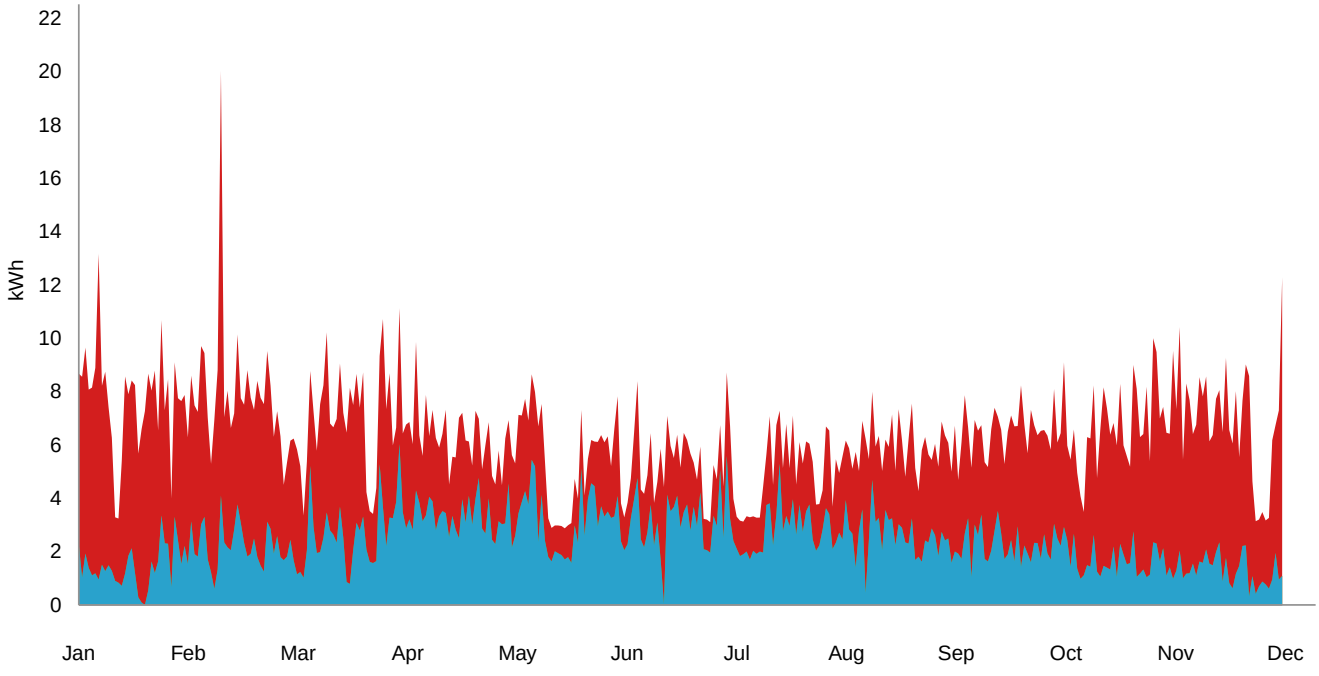




Yearly consumption

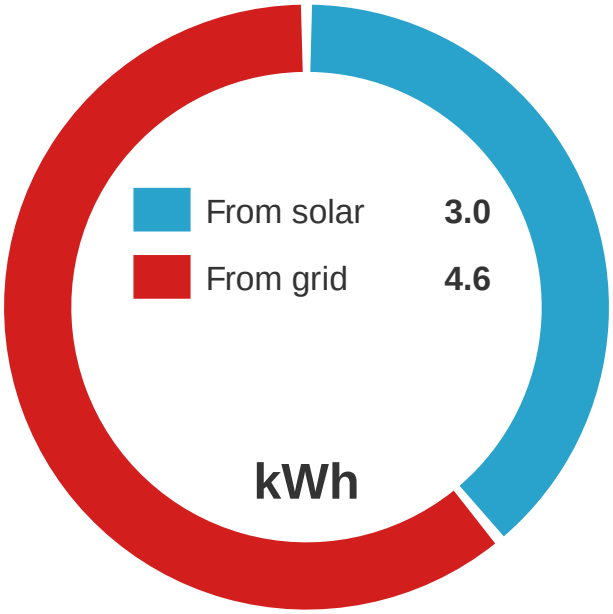
The property is expected to consume 2341kWh of electricity each year. Around 37% of this (877 kWh) is expected to be supplied directly by the solar array. The remaining 63% (1469 kWh) is supplied from the grid.

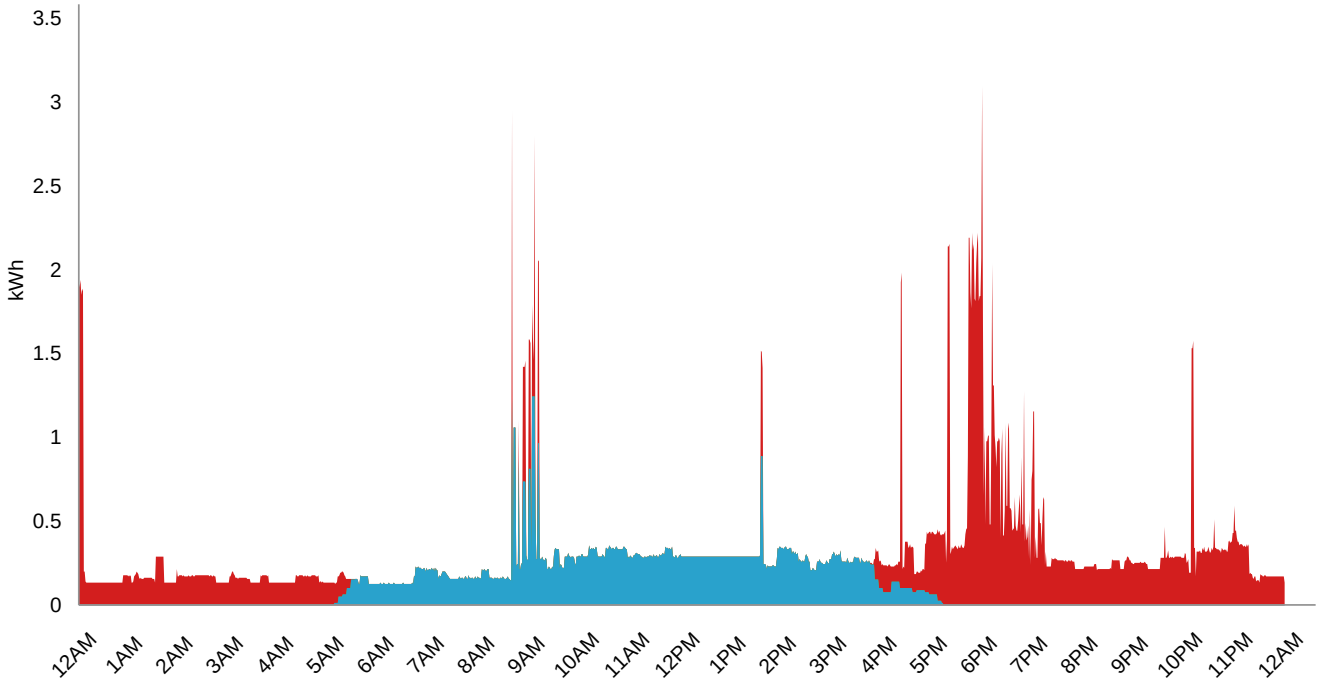




Daily consumption

This graph shows modelled consumption data over the course of the selected day (March 27th). Total electricity consumption on this day was 7.6 kWh, of which 3 kWh (39%) is expected to be supplied directly by the solar array. The remaining 4.6 kWh (61%) is imported from the grid.

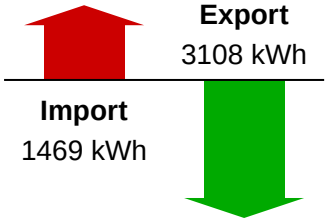


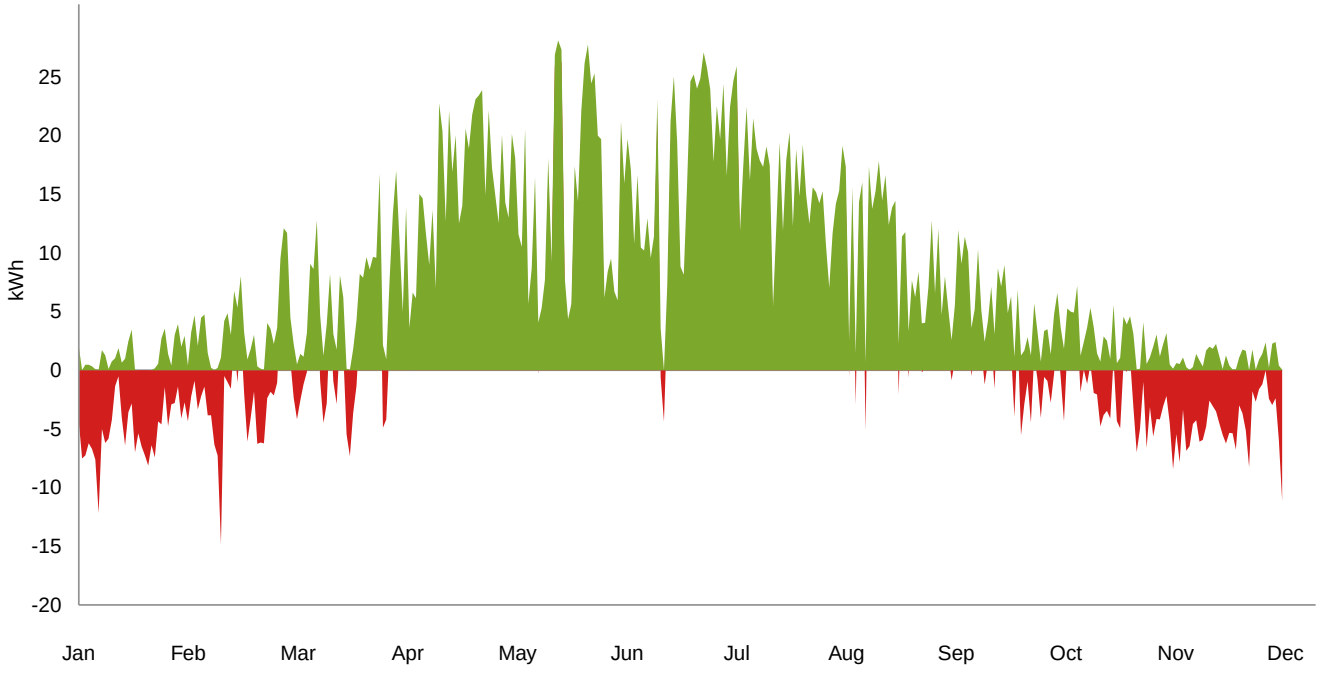


Yearly import and export

This graph shows modelled profiles of electricity imported and exported to and from the grid over the course of a year. The red area above the horizontal axis represents imported electricity, and the green area beneath the axis exported electricity.

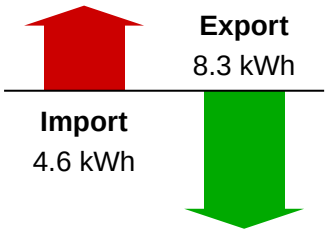
Over the course of the year, a total of 1469 kWh is expected to be imported by the property, and 3108 kWh exported back to the grid.

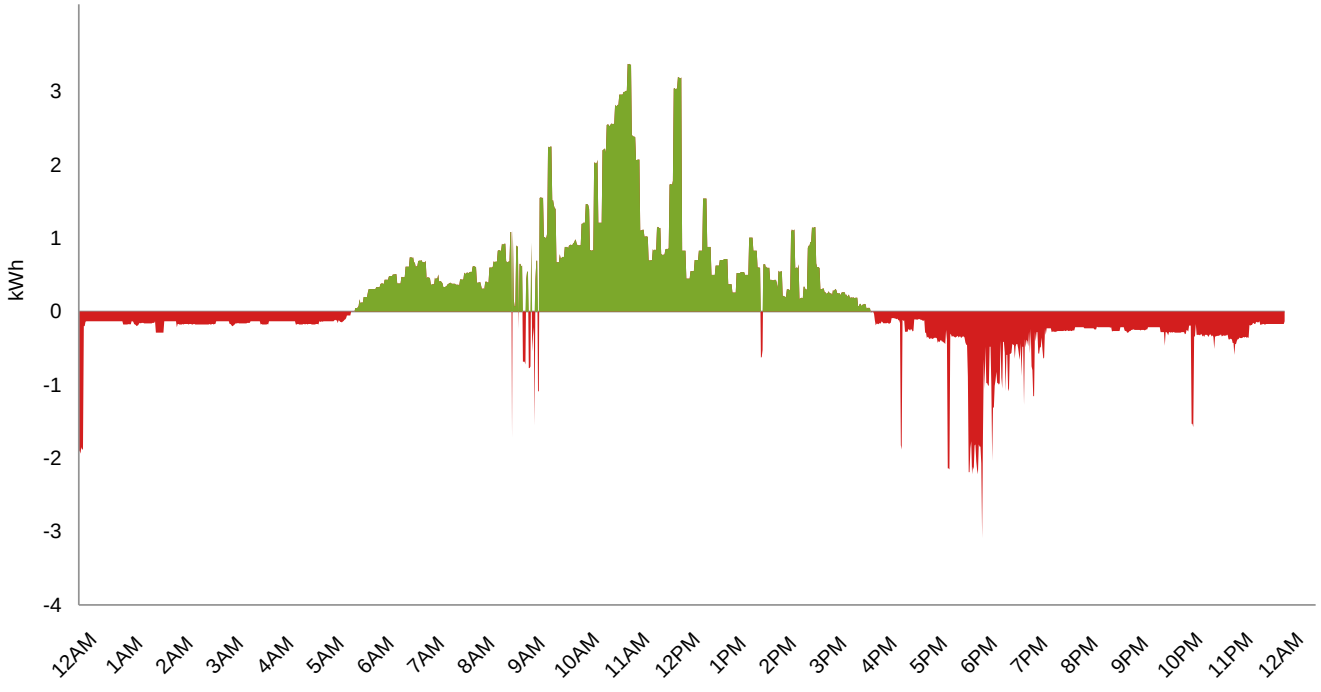




Daily import and export

This graph shows the modelled import and export of electricity over a selected day (March 27th). On this day 4.60 kWh is expected to be imported from the grid, and 8.3 kWh exported.





Equipment and Services

Equipment Costs	
13x Canadian Solar 395w All Black solar panel	£1,248.00
NET Emlite Bi-directional Meter ECA2.nv	£67.00
Label sheet	£1.77
AC isolator - IMO - 32A 4-pole	£14.41
4x Pair of MC4 connectors	£8.06
50m reel of 4mm2 solar cable	£28.35
16x Renusol black universal end clamp	£42.00
18x Renusol black universal mid clamp	£41.77
34x Renusol concrete tile roof hook	£234.55
4x Renusol rail splice	£13.57
2x Renusol pan head screw M6x80	£69.97
11x Renusol silver rail 3300mm	£192.42
Solis 4600 Dual 5G with DC inverter	£497.33
Total equipment cost	**£2,459.21**

Services Costs	
Design and Installation of Solar PV	£2,943.56
Design and Installation of Battery Storage	£0.00
MCS Certificate	£35.00
Structural Survey Certificate (Free of Charge)	£0.00
Electrical Installation Certificate	£25.00
Self Erected Tower Scaffolding (Free of Charge)	£0.00
Independent Warranty - 10 Years	£112.00
Wifi Monitoring (Free of Charge)	£0.00
Wifi Monitoring Not Included in Workmanship Guarantee	£0.00

Total services cost	**£3,115.56**

Totals

Total before tax	**£5,574.77**
VAT at 0%	**£0.00**
Total including tax	**£5,574.77**

Financial

Generation

The system is expected to generate 3985 kWh per year initially, decreasing gradually as the solar cells degrade. Over the 25 year term of this financial projection the total generation is expected to be 93636 kwh, of which 20601 kWh will be consumed on site and 73035 kWh exported.

94 MWh

Payback

After adjusting projected costs and benefits for inflation, and applying a discount rate of 2%, the initial system cost of £5,574.77 is expected to be recouped after 4 years.

4 years

Net Present Value

The total present value of future benefits and costs, using a discount rate of 2% per year, is £58,646.06. The cost of the PV system is £5,574.77. The net present value of the project is therefore £53,071.29. A positive net present value is a good indication that the project is financially worthwhile.

£53071.29

IRR

The Internal Rate of Return is a useful measure for comparing the relative profitability of investments.

24.3 %

Disclaimer

Our financial model calculates the benefits of a solar PV installation (such as savings in electricity, or payments for exported electricity) and costs (the initial purchase cost, and any future maintenance costs if entered), over the projected lifespan of the system. Values are corrected for inflation, system degradation, and discount rate - a measure that accounts for the fact that a promise of a monetary sum in the distant future is usually considered less valuable than the promise of the same sum in the near future.

A model is only as accurate as the assumptions it makes. You should consider whether the values chosen are appropriate for your situation. There are many variables that dictate the financial return of a solar installation and we cannot forecast how they may change in the future. This financial projection shows a likely scenario for future financial returns. Actual returns may vary significantly from this forecast.

Assumptions

Inflation rate	**8%**
Cost of electricity	**£0.35 /kWh** increases with inflation
System size	**5.135 kWp** degrades at 0.5% per year
Discount rate	**2%**
Projection length	**25 years**

Income and savings

The projected income from the system over the project lifetime in payments for generated and exported electricity, along with electricity savings, are shown in the table and graph below.

These figures assume an inflation rate of 8 percent.

	Export payments	Electricity savings	**Total**
Year 1	871	318	**1189**
Year 2	936	342	**1278**
Year 3	1005	368	**1373**
Year 4	1080	395	**1475**
Year 5	1161	425	**1585**
Year 6	1248	456	**1704**
Year 7	1341	490	**1831**
Year 8	1441	527	**1967**
Year 9	1548	566	**2114**
Year 10	1664	608	**2272**
Year 11	1788	654	**2441**
Year 12	1921	702	**2623**
Year 13	2064	755	**2819**
Year 14	2218	811	**3030**
Year 15	2384	872	**3256**
Year 16	2562	937	**3498**
Year 17	2753	1007	**3759**
Year 18	2958	1082	**4040**
Year 19	3179	1162	**4341**
Year 20	3416	1249	**4665**
Year 21	3671	1342	**5013**
Year 22	3945	1442	**5387**
Year 23	4239	1550	**5789**
Year 24	4555	1666	**6221**
Year 25	4895	1790	**6685**

£58840

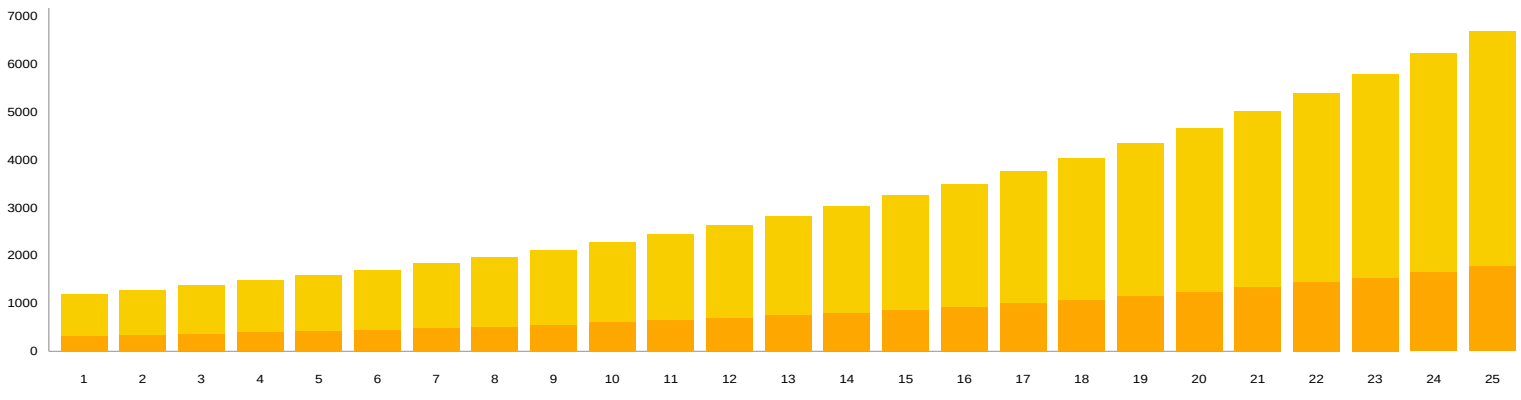
Total Export Payments

over 25 years

£21515

Electricity savings

over 25 years



The bottom line

The table and graph below show the discounted costs for the project (including the initial capital required for the installation), against the total discounted benefits from income and savings on electricity bills.

The system pays for itself in 4 years.

	Discounted benefits	Cumulative benefits	Discounted costs	Cumulative costs	**Cashflow**
Year 1	1177	1177	0	5575	**-4398**
Year 2	1240	2417	0	5575	**-3158**
Year 3	1305	3722	0	5575	**-1853**
Year 4	1375	5097	0	5575	**-478**
Year 5	1448	6545	0	5575	**970**
Year 6	1525	8069	0	5575	**2494**
Year 7	1606	9675	0	5575	**4100**
Year 8	1691	11366	0	5575	**5791**
Year 9	1781	13146	0	5575	**7572**
Year 10	1875	15022	0	5575	**9447**
Year 11	1975	16996	0	5575	**11422**
Year 12	2080	19076	0	5575	**13501**
Year 13	2190	21266	0	5575	**15691**
Year 14	2306	23573	0	5575	**17998**
Year 15	2429	26002	0	5575	**20427**
Year 16	2558	28560	0	5575	**22985**
Year 17	2694	31253	0	5575	**25679**
Year 18	2837	34090	0	5575	**28516**
Year 19	2988	37078	0	5575	**31503**
Year 20	3146	40224	0	5575	**34649**
Year 21	3313	43537	0	5575	**37963**
Year 22	3489	47027	0	5575	**41452**
Year 23	3675	50701	0	5575	**45126**
Year 24	3870	54571	0	5575	**48996**
Year 25	4075	58646	0	5575	**53071**