

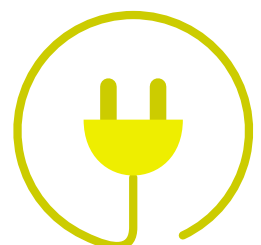
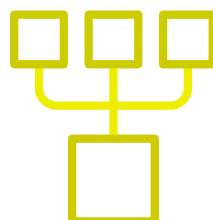
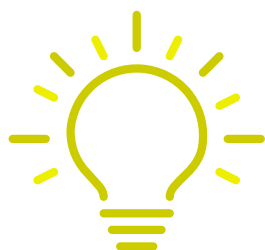
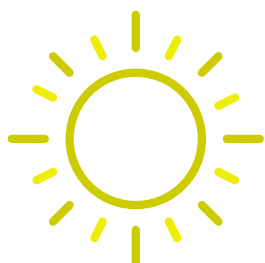


Project Name: Stonewick Lodge

Address: Stonewick Lodge, Warninglid Lane, Warninglid,
Haywards Heath, RH17 5TQ

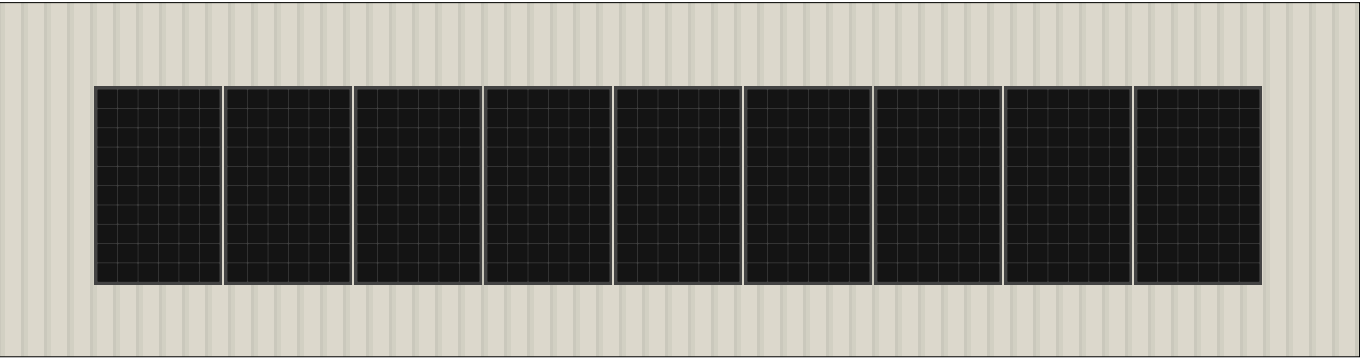
Date Created: 4th November 2025

Designer: Zak Trimmer

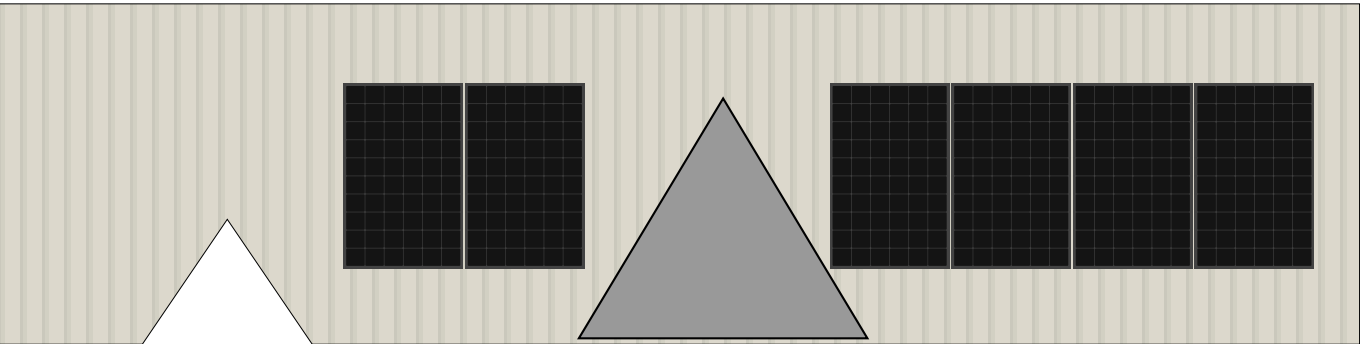


Roof Layout

Roof South



Roof South



Component list

Item	Quantity
Jinko 455W solar panel	15
HESS-HY-S-6.0K inverter	1
HOME-ESS-LV-9.4K	1
AC isolator - IMO - 32A 4-pole	2
IMO 25A DC Isolator 4-pole 2-string	2
MC4 4mm Connector Pair	4
50m reel of 4mm ² solar cable	1
NET Emlite Bi-directional Meter ECA2.n*	1
Label sheet	1
Viridian ArcBox	4
Battery Hazard Warning Label Pack	1
Battery Warning Label Stickers	1



Inverter checks

HESS-HY-S-6.0K

Panels

PV power 6825 Rated AC output 6000

Input 1: 6 Jinko 455W solar panels in 1 strings

Panels

Inverter

PV power	2730 W		
Open circuit voltage at -10° C	237 V	Max DC voltage	550 V
V _{mpp} at 40° C	176 V	V _{mpp} lower limit	40 V
V _{mpp} at -10° C	200 V	V _{mpp} upper limit	530 V
I _{mpp} at 40° C	15 A	Max DC input current	16 A

Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.



Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.



Input 2: 9 Jinko 455W solar panels in 1 strings

Panels	Inverter		
PV power	4095 W		
Open circuit voltage at -10° C	356 V	Max DC voltage	550 V
V _{mpp} at 40° C	264 V	V _{mpp} lower limit	40 V
V _{mpp} at -10° C	299 V	V _{mpp} upper limit	530 V
I _{mpp} at 40° C	15 A	Max DC input current	16 A

Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



Max power point range

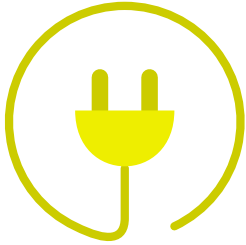
The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.



Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.





Electrical

HESS-HY-S-6.0K



AC Isolator

A AC isolator - IMO - 32A 4-pole has been specified for this input

Current

The rated isolator current (32A) is greater than the rated inverter current (27.3A)



Phases

The isolator is suitable for use on a single phase inverter.



Input 01



DC Isolator

A IMO 25A DC Isolator 4-pole 2-string has been specified for this input

Current

The isolator is rated for a current of 20A, which is more than the expected maximum current of 19.76A.



Voltage

At 20A the isolator is rated for a voltage of 800V, which is more than the expected maximum voltage of 260.71V.



Cable

10m of 4mm² solar cable has been specified

Voltage drop

Voltage drop at maximum power point at 40°C will be around **1.38 V** (0.79 percent)



Input 11



DC Isolator

A IMO 25A DC Isolator 4-pole 2-string has been specified for this input

Current

The isolator is rated for a current of 20A, which is more than the expected maximum current of 19.76A.



Voltage

At 20A the isolator is rated for a voltage of 800V, which is more than the expected maximum voltage of 391.07V.





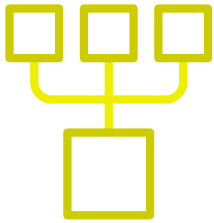
Cable

10m of 4mm² solar cable has been specified

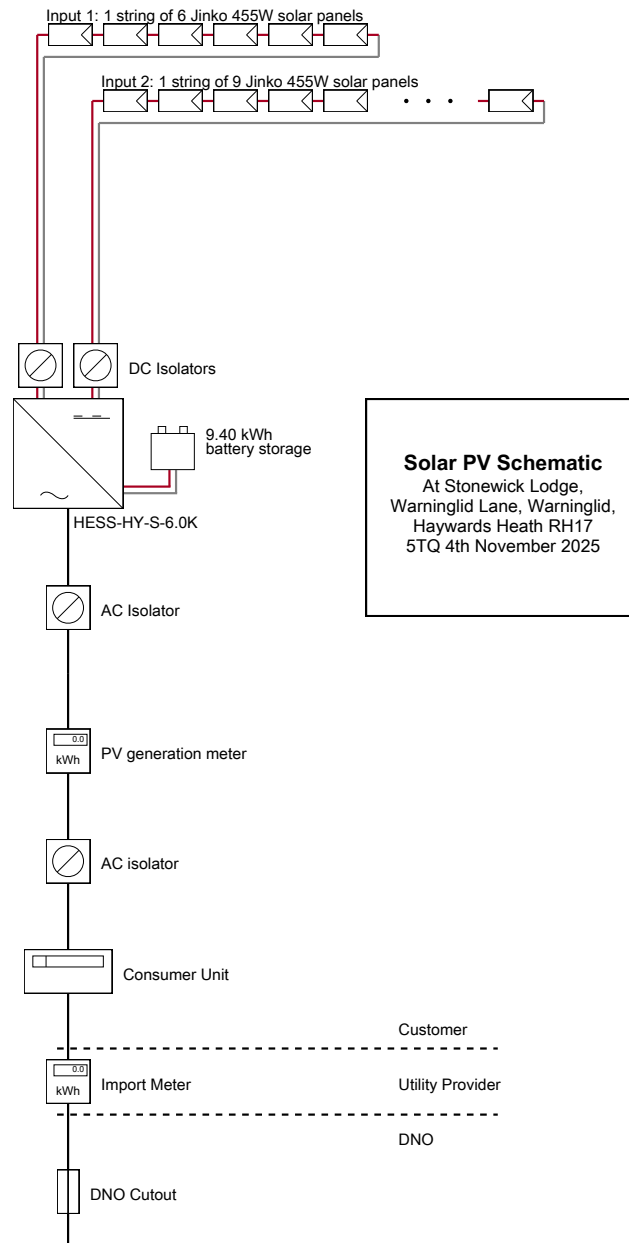
Voltage drop

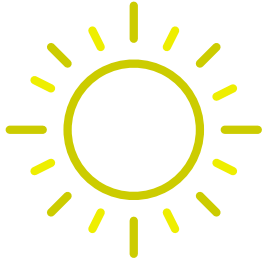
Voltage drop at maximum power point at 40°C will be around **1.38 V**
(0.52 percent)





Schematic diagram





Performance Estimate

Site details

Client

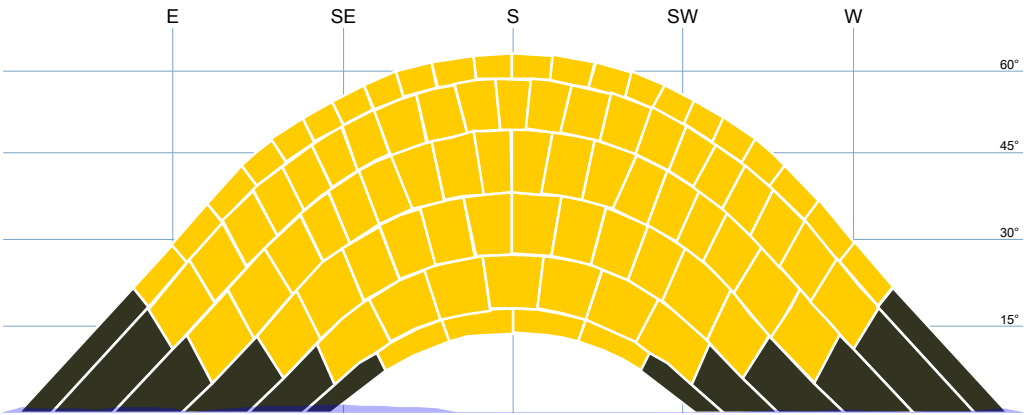
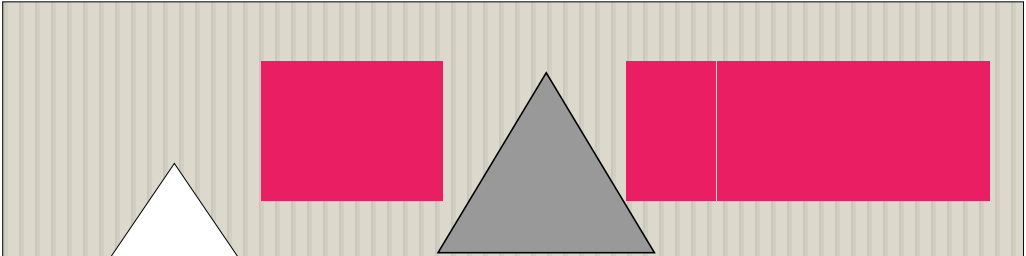
Address Stonewick Lodge, Warninglid Lane, Warninglid, Haywards Heath

The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn to represent the increased shading. Blocks of the sky that are shaded by objects on the horizon are coloured red, and a shading factor is calculated from the number of red blocks. The performance of the solar array is calculated by multiplying the size of the array (kWp) by the shading factor (sf) and a site correction factor (kk), taken from tables which take account of the geographical location, orientation and inclination of the array.

Inverter 1

HESS-HY-S-6.0K

Input 1



A. Installation data

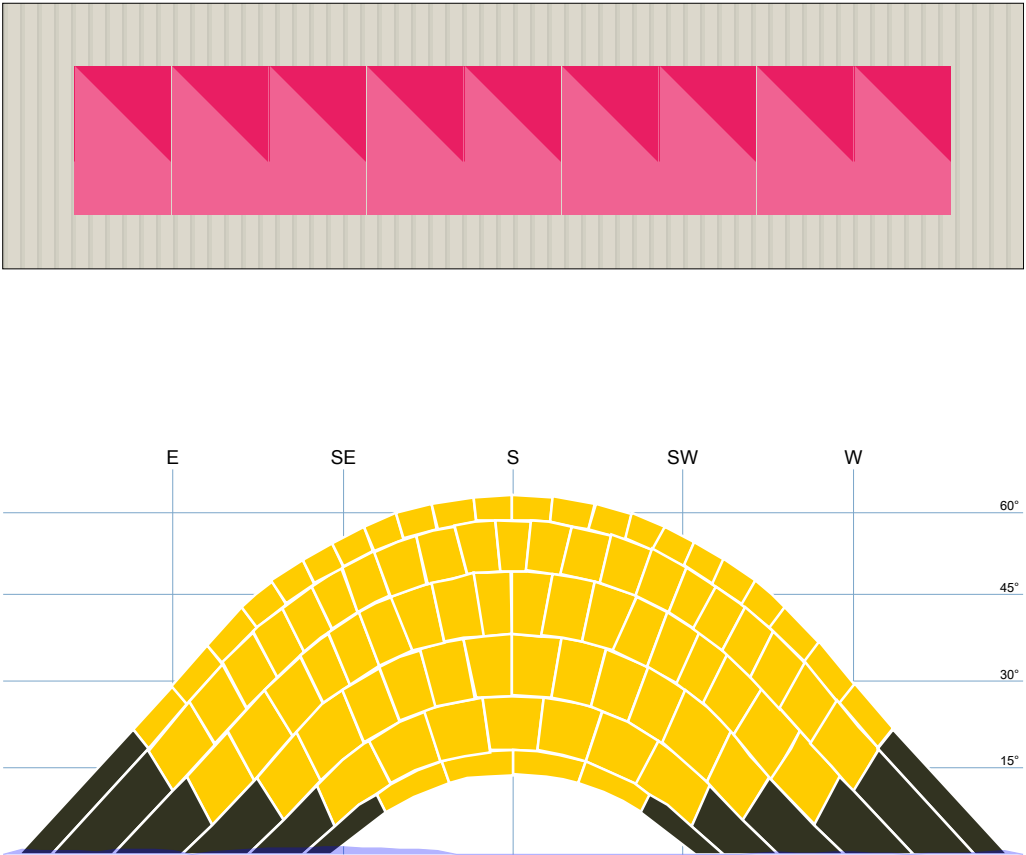
Installed capacity of PV system – kWp (stc)	2.730	kWp
Orientation of the PV system – degrees from South	4	°
Inclination of system – degrees from horizontal	38	°
Postcode region	2	



B. Performance calculations

kWh/kWp (Kk)	1131	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp × Kk × SF)	3088	kWh

Input 2



A. Installation data

Installed capacity of PV system – kWp (stc)	4.095	kWp
Orientation of the PV system – degrees from South	4	°
Inclination of system – degrees from horizontal	40	°
Postcode region	2	

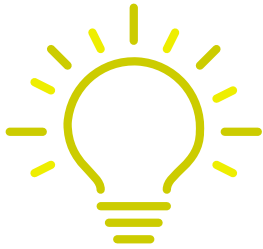


B. Performance calculations

kWh/kWp (Kk)	917	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp × Kk × SF)	3755	kWh

Performance Summary

A. Installation data		
Installed capacity of PV system – kWp (stc)	6.824999999999999	kWp
Orientation of the PV system – degrees from South	See individual inputs	
Inclination of system – degrees from horizontal	See individual inputs	
Postcode region	2	
B. Performance calculations		
kWh/kWp (Kk)	See individual inputs	
Shade factor (SF)	See individual inputs	
Estimated output (kWp × Kk × SF)	6843	kWh



Self consumption

We model here the performance of a solar PV system with battery storage 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 and the battery during the day, and from the storage battery back to the house at night – or from the grid to the house when the battery is empty or loads exceed the discharge capacity of the system.

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

Battery system specification

HESS-HY-S-6.0K Inverter with a HOME-ESS-LV-9.4K Battery

Charge rate is directly taken from the inverter specification; this value can be less depending on the type of battery connected.

Charge rate	5000 W
Inverter charge efficiency	95 %
Inverter discharge efficiency	95 %
Battery efficiency	95 %
Round trip efficiency	85 %
Battery bank capacity	9.4 kWh
Max discharge depth	95 %
Usable capacity	8.9 kWh



Consumption

3900 kWh

Electricity consumed in the property each year



Generation

6842 kWh

Electricity generated by the PV array each year



Self consumption

46 %

Proportion of PV generation used in the property



Independence

80 %

Proportion of electricity consumption provided by PV



Import / Export

783 kWh /
3447 kWh

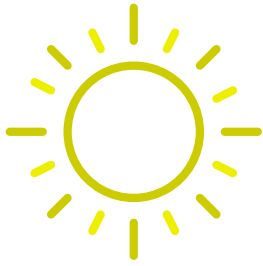
Electricity import / export each year from the property



Utilisation

57 %

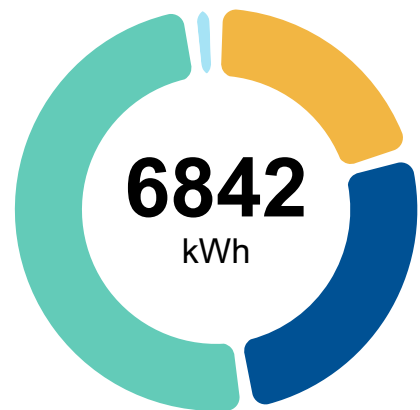
Average daily utilisation of the storage battery



Yearly generation

The solar PV array is expected to generate a maximum of 6842 kWh over a typical year. The graph shows whether the generated energy is used directly in the house, used to charge the storage battery, or exported to the grid.

20% (1397 kWh) of the electricity generated is expected to be used directly in the property. 29% (1998 kWh) is directed to the battery for later use, although 148 kWh of this is lost during battery charging, leaving 1850 kWh for use in the property. The remaining generation (3447 kWh, or 50% of the total) is exported to the grid.

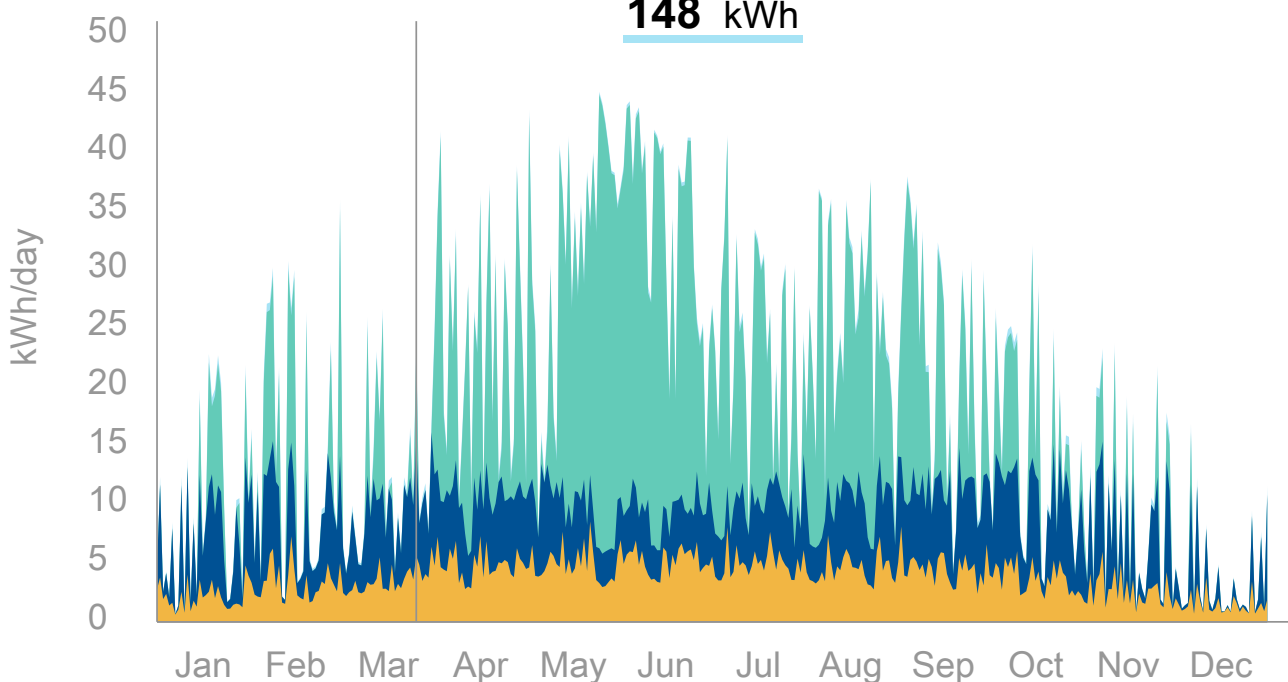


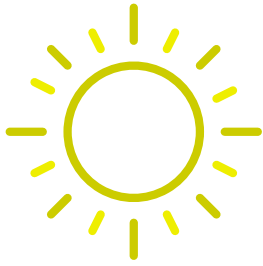
Direct use
1397 kWh

Via battery
1850 kWh

To grid
3447 kWh

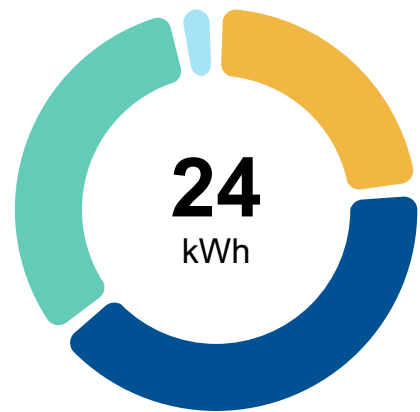
Lost charging
148 kWh





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 24 kWh. Of this, 5.6 kWh (23%) is used directly in the property, 9.8 kWh (41%) is stored in the battery for later re-use, and 7.8 kWh (33%) is exported to the grid.

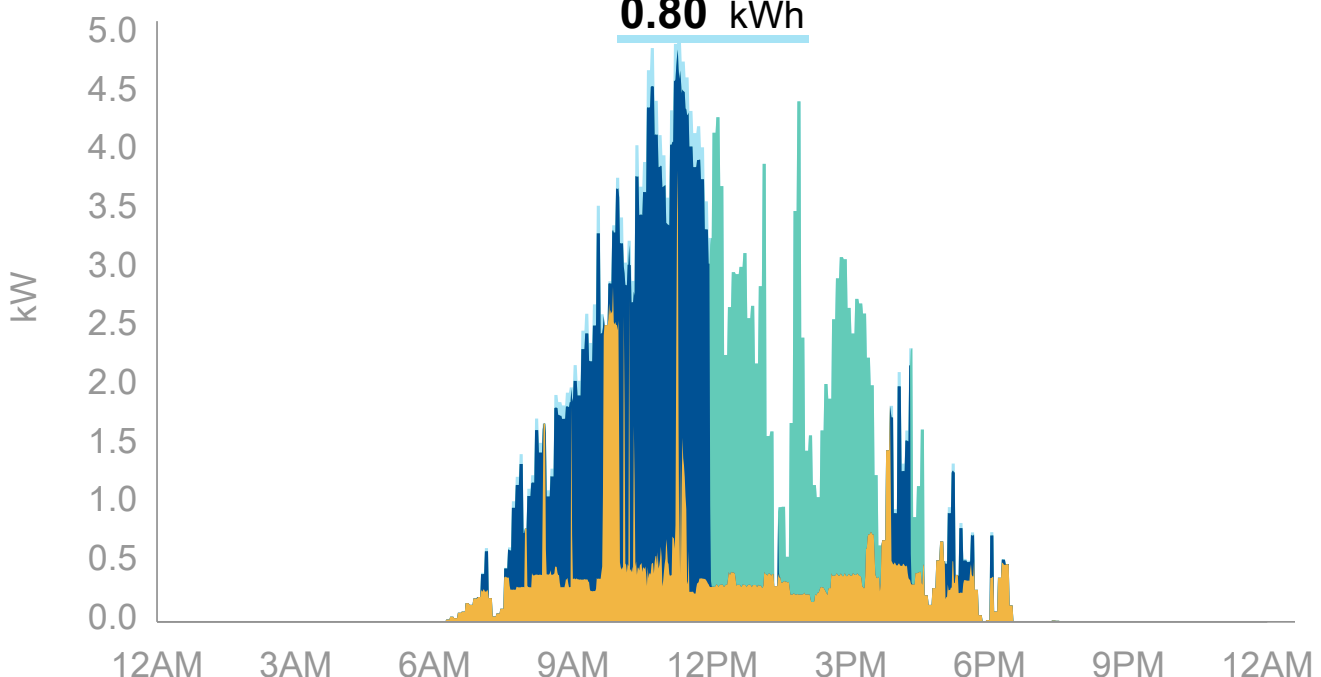


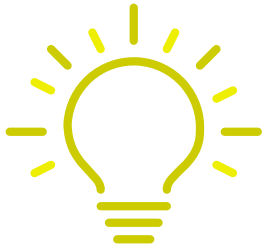
Direct use
5.6 kWh

Via battery
9.8 kWh

To grid
7.8 kWh

Lost charging
0.80 kWh

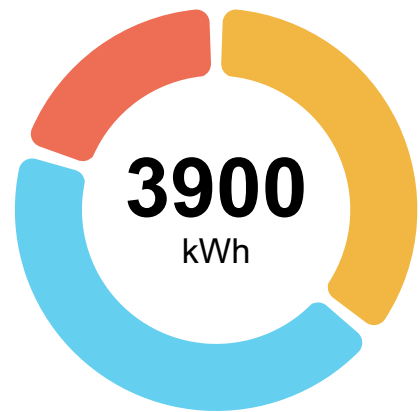




Yearly consumption

The property is expected to consume 3900 kWh of electricity each year. Around 36% of this (1397 kWh) is expected to be supplied directly by the solar array. Another 44% (1720 kWh) is supplied from the storage battery. The remaining 20% (783 kWh) is supplied from the grid.

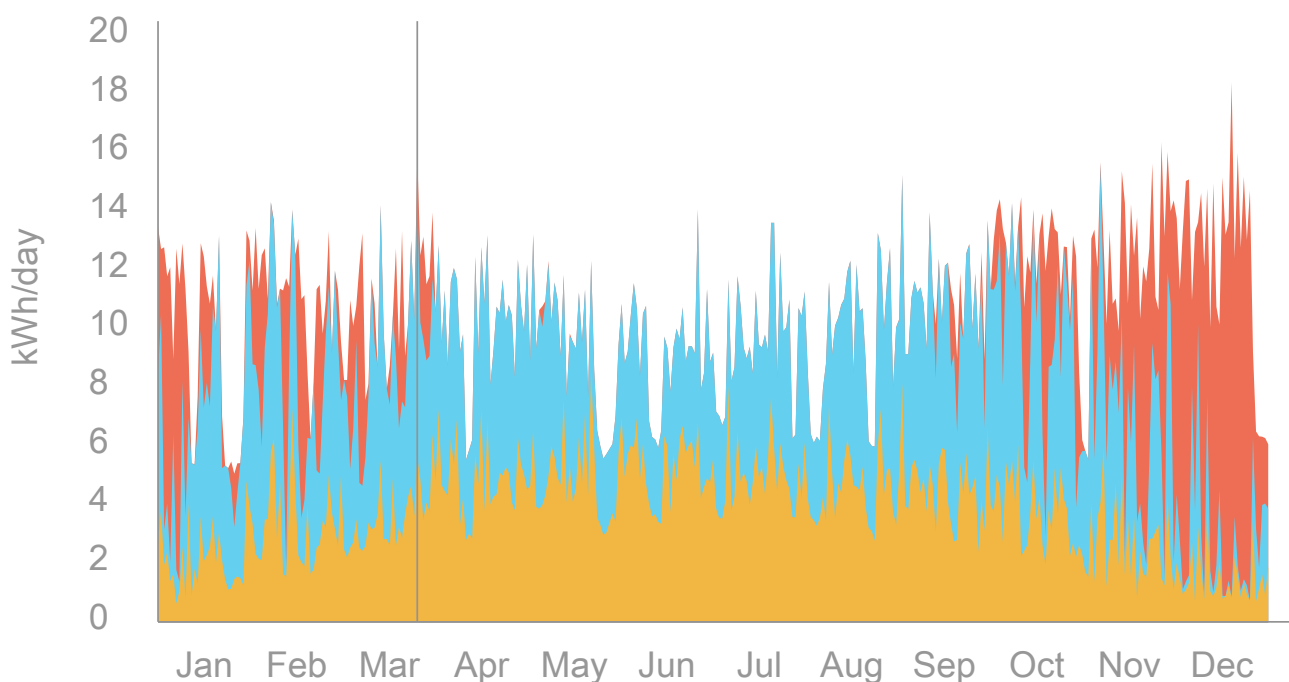
Overall, 80% (3117 kWh) of the electricity used in the property is expected to be supplied by the solar array and battery storage system. Without battery storage it would be 36% (1397 kWh).

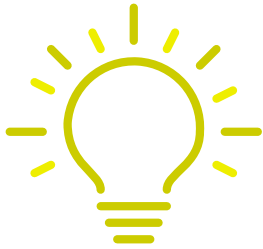


From solar
1397 kWh

From battery
1720 kWh

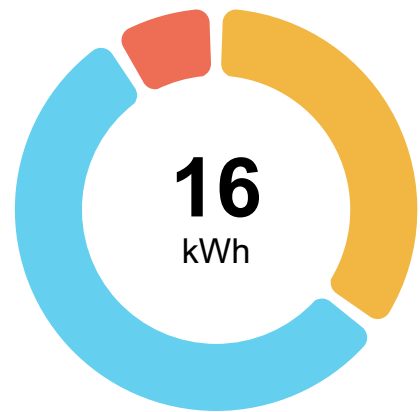
From grid
783 kWh





Daily consumption

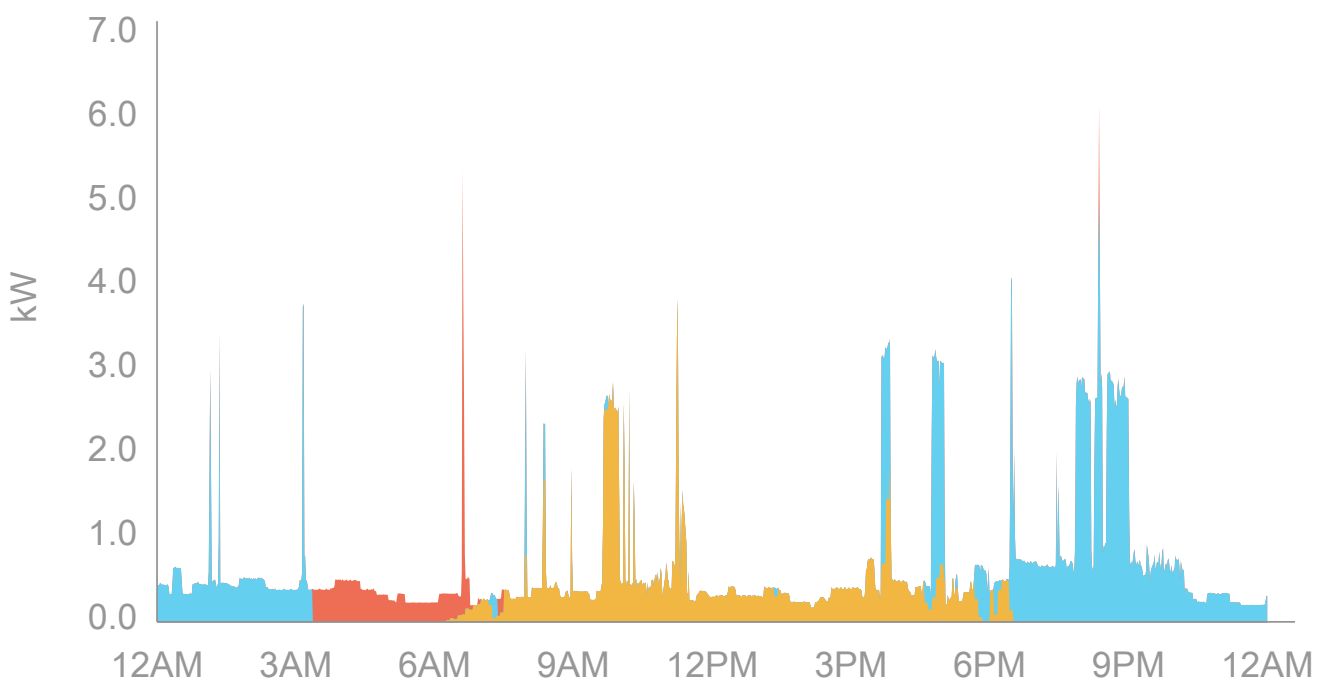
This graph shows modelled consumption data over the course of the selected day (March 27th). Total electricity consumption on this day was 15.9 kWh, of which 5.6 kWh (35%) is expected to be supplied directly by the solar array, and a further 8.9 kWh (56%) drawn from the battery storage system. The remaining 1.4 kWh (9%) is imported from the grid.

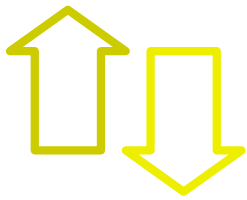


From solar
5.6 kWh

From battery
8.9 kWh

From grid
1.4 kWh





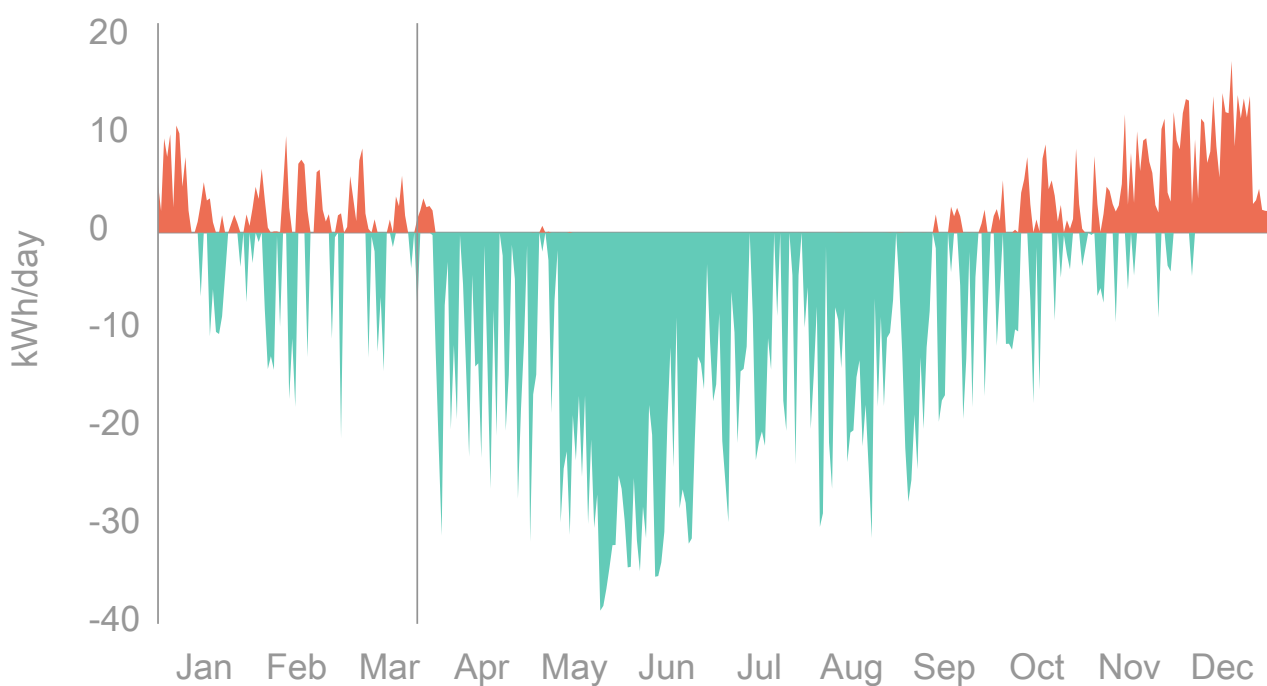
Yearly import and export

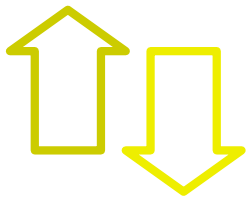
This graph shows modelled profiles of electricity imported and exported to and from the grid over the course of a year. The area above the horizontal axis represents imported electricity, and the area beneath the axis exported electricity.

Over the course of the year, a total of 783 kWh is expected to be imported by the property, and 3447 kWh exported back to the grid.

 Importing
783 kWh

 Exporting
3447 kWh



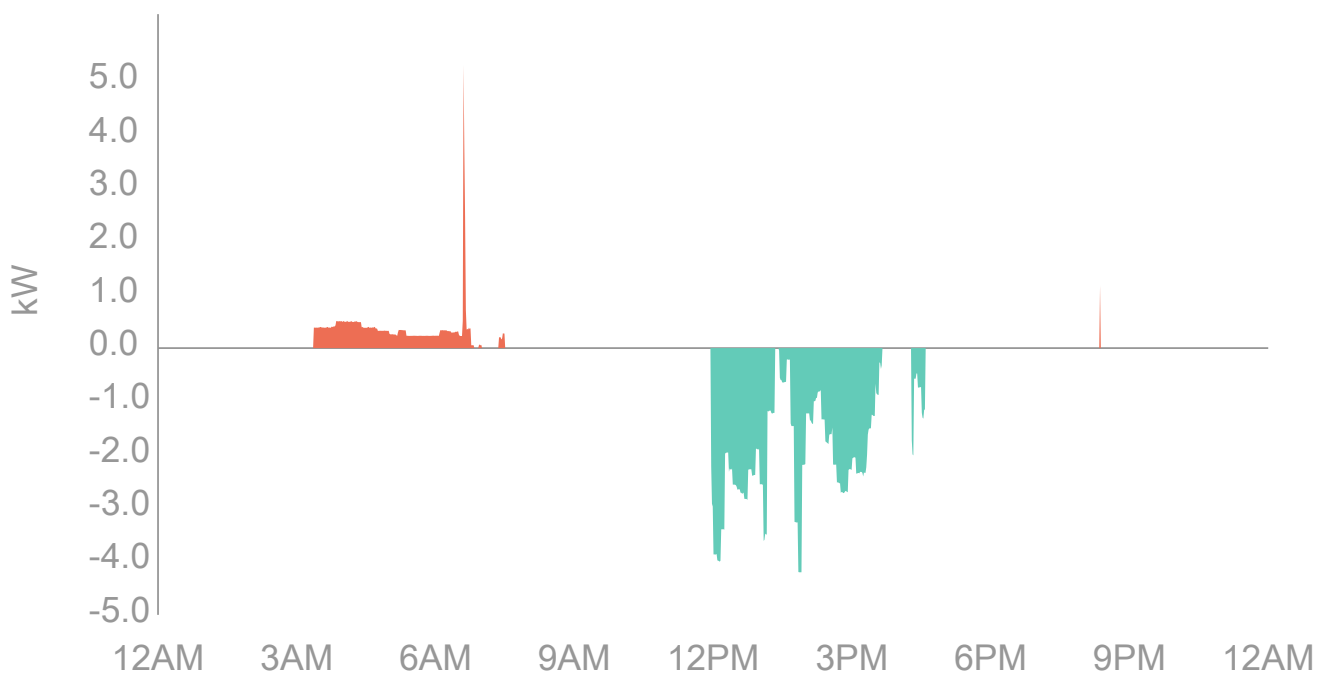


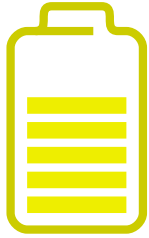
Daily import and export

This graph shows the modelled import and export of electricity over a selected day (March 27th). On this day 1.4 kWh is expected to be imported from the grid, and 7.8 kWh exported. At times when no import or export is shown the battery storage system is charging or discharging.

 Importing
1.4 kWh

 Exporting
7.8 kWh





Yearly battery utilisation

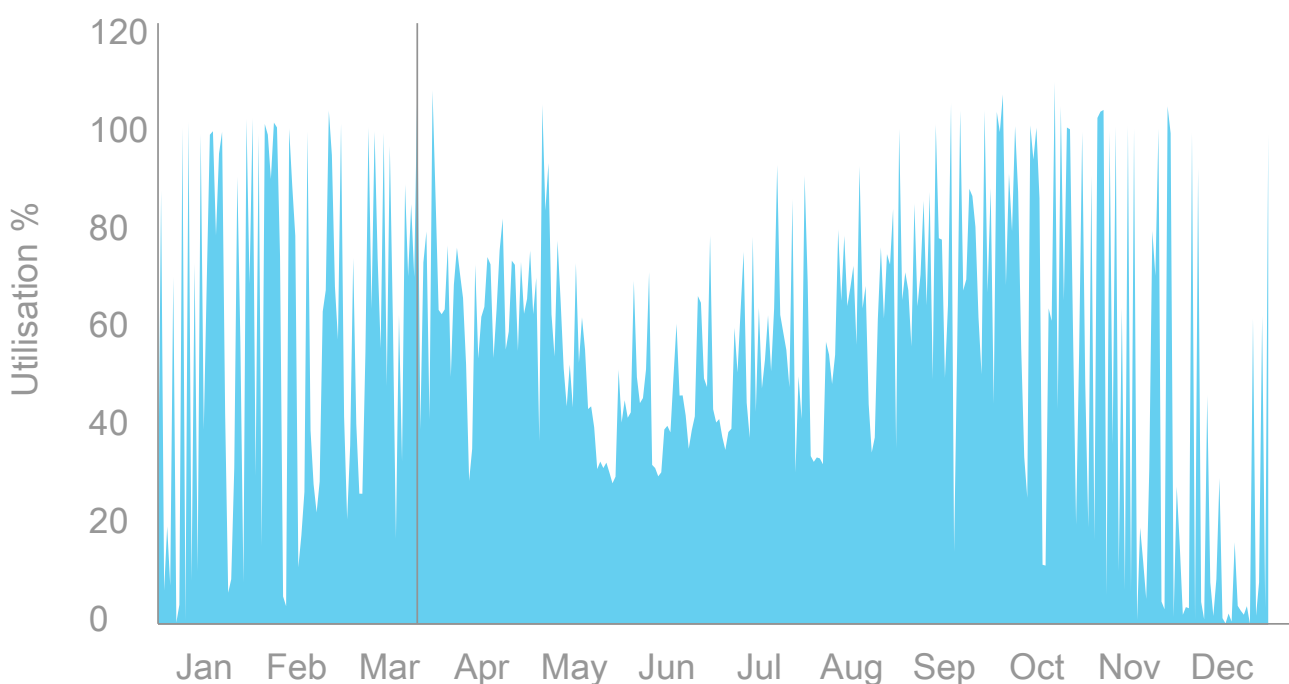
The graph shows the modelled utilisation of the battery over the course of the year – the fraction of the available battery capacity that is actually charged and discharged each day. Utilisation of over 100% is possible at times where a battery is charged and discharged more than once during a day.

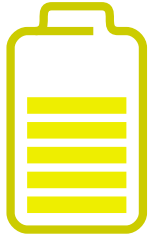
Low battery utilisation can be due to either insufficient spare PV generation to charge the battery (often the case in winter, or on cloudy days), or because loads are small overnight and the battery does not fully discharge.



57%

Avg Battery Utilisation





Daily battery utilisation

The state of charge of the battery over a selected day (March 27th) is shown in the graph below. The battery discharges overnight or when there is heavy demand during the day, and charges when there is excess solar PV generation during the day. On this day, 110.1% of the battery capacity was utilised.



110%

Avg Battery Utilisation

