Noemi Ripert

Project Name: Queens Hall, High Street, RH175EL. Parish Council

Phone: 01444 454 276

Address: Queens Hall, High Street, RH17 5EL

Date Created: 13th March 2024

Designer: Brian Bonner

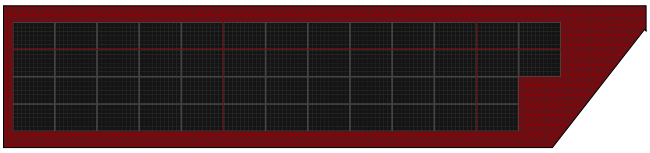
System Overview

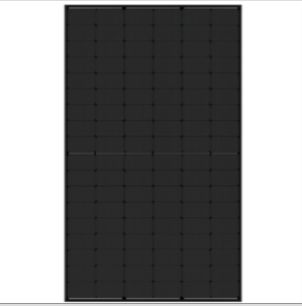
Your system comprises **50 Jinko Tiger Neo 440W N-Type All Black Mono solar panels** to collect sunlight and turn it into DC electricity.

The panels will be connected to **1 Growatt 25KTL3-X 3ph inverter and 1 SolaX X3 G4 15.0 FIT AC inverter** , which convert the DC electricity into mains (AC) electricity.

A SolaX Triple 5.8kWh LFP Battery battery storage system will allow you to store excess energy from sunny days, so that you can use your generated electricity at night too.

We include all the isolators, wiring and meters needed to connect the system safely to your electrical system. Your system will be installed and certified by our trained installation team.





Solar Panels: Jinko Tiger Neo 440W N-Type All Black Mono x 50

No description

Model	JKM440N-54HL4R-B
Power	440 watts
Dimensions	1134 x 1762mm

Inverter

Growatt 25KTL3-X 3ph

The new Growatt KTL-3 offers an easy to use OLED display, with a sleek new design which is 40% lighter and more compact than the previous model.

SolaX X3 G4 15.0 FIT AC

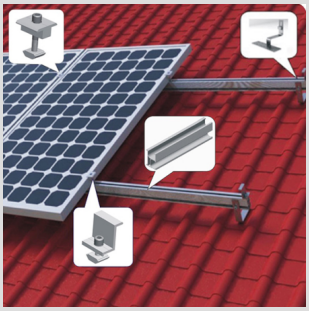
The SolaX X1 G4 FIT is the perfect retrofit ac charging solution for triple power batteries.

System components

Battery: SolaX Triple 5.8kWh LFP Battery x 2

With a 10-year warranty and 90% depth of discharge, the new Triple Power battery is a flexible, practical, high-performance energy storage.

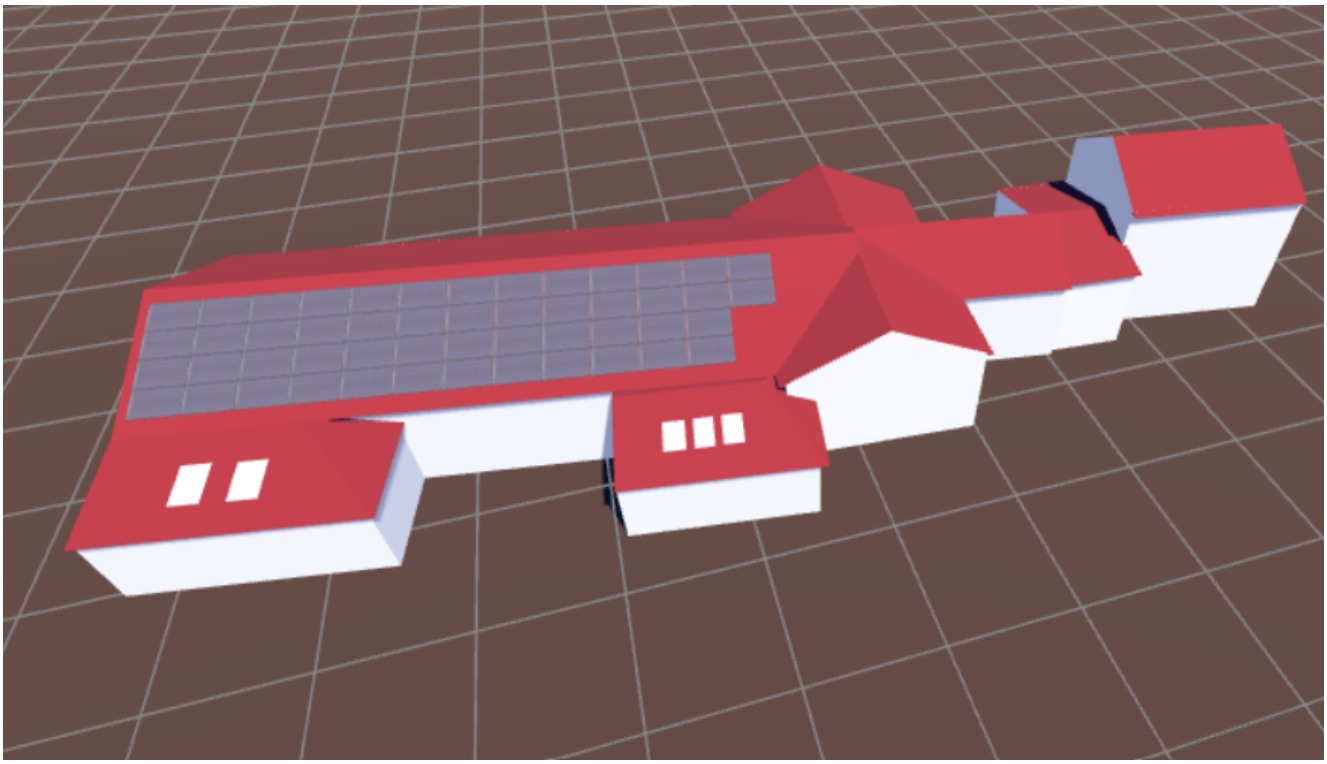
Capacity	5.800 kWh
Quantity	2



Mounting: Fastensol pitched roof mounting system

Fastensol are an excellent value, fully MCS accredited choice for pitched roof mounting systems, suitable for the majority of roof types.

Designed for	Plain Tile roofs
Colour	Not specified



System Performance

We have made an estimate of the annual energy generation of your system. This takes into account the following factors that affect the output of a solar array.

The location of the system

Sunlight is weaker near the poles than near the equator. We use data from a meteorological model of the intensity of sunlight over the course of the year in different locations all over the world.

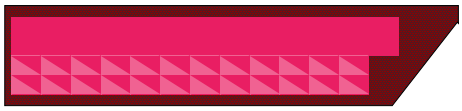
The orientation of the system

Solar panels that face south receive a little more sunlight than panels that face east or west. However, in diffuse light the orientation of the panels makes little difference, so the effect is less marked than many people imagine.

The degree of shading

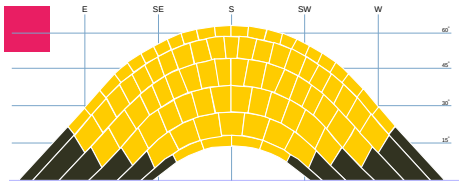
If you have trees, neighbouring buildings or nearby high ground that will shade your PV array, the output of the system will be reduced. We have used a 'sunpath diagram' that estimates how often sunlight will be blocked from reaching the panels.

Roof diagram

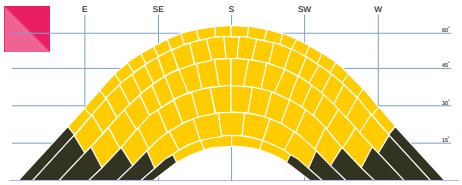


Roof South Orientation: 8° Pitch: 24°

Sunpath diagrams



Shade factor: 1.00 Kk: 1099



Shade factor: 1.00 Kk: 1099

We expect your system to generate

24,178 kWh per year

Installation data

Installation capacity of PV system – kWp (stc)	22 kWp
Orientation of the PV system – degrees from South	8°
Inclination of system (pitch) – degrees from horizontal	24°
Postcode region	Zone 2

Performance Calculations

kWh/kWp (Kk)	See sunpath diagrams
Shade Factor (SF)	See sunpath diagrams
Estimated output (kWp x Kk x SF)	24178 kWh

Important note: The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of sunlight from location to location and from year to year. This estimate is based upon a model that takes account of meteorological data at your location and makes an allowance for losses due to shading of the panels. This is a complex calculation however, and no model can be 100% accurate. It should not be considered a guarantee of performance.

If shading is present on your system that will reduce its output to the factor stated. This factor was calculated using industry standard shading methodology and we believe that this will yield results within 10% of the actual energy estimate stated for most systems.

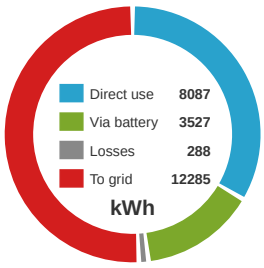
Your energy explained

In addition to the MCS calculation of system output we have run a more detailed model of your system to estimate how much of the electricity generated by the system you are likely to use yourself and how much will go to the grid.

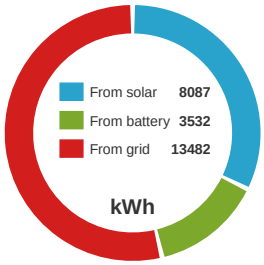
Smart Export Guarantee (SEG) information

The Smart Export Guarantee(SEG) enables Generators to receive payments from electricity suppliers for the electricity they export back to the National Grid, providing specific criteria are met. Your installation will be MCS accredited, which means that you should be able to apply for SEG payments from your electricity supplier. Further details on the SEG and its eligibility requirements, including how to apply, can be found online at ofgem.gov.uk

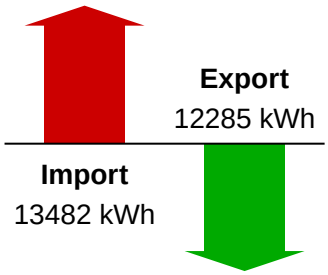
Annual Generation



Annual Consumption

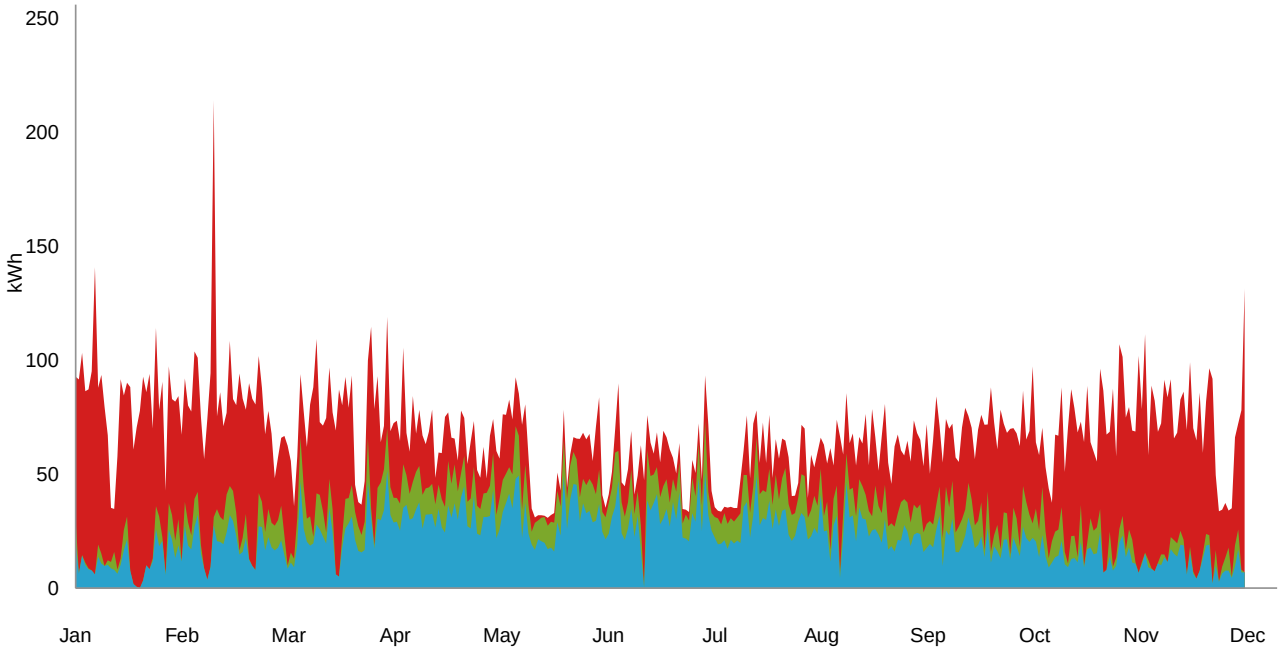


Annual Import/Export



Where your electricity will come from in a typical year

Based on an electricity usage of 25,000 kWh per year, the graph below shows how much electricity used in the property is expected to come directly from the solar panels (blue) , how much is expected to come from battery storage (green), and how much is expected to be imported from the grid (red).



Environmental Benefits

Your new PV system will supply your property with clean, green electricity - and in sunny periods some will also be exported back to the grid.

Overall you'll be making a big contribution to reducing CO_2 not just by lowering the carbon intensity of your own electricity, but by putting low-carbon electricity back in the grid for others to use too.

Your current electricity supply produces

5,308 kg CO_2 each year

44% will be supplied by solar, saving

2,340 kg CO_2 each year

13,158 kWh will be exported, saving

2,794 kg CO_2 each year

Total savings

5,134 kg CO_2 each year

Your yearly CO_2 reduction of 5,134 kg is equal to...

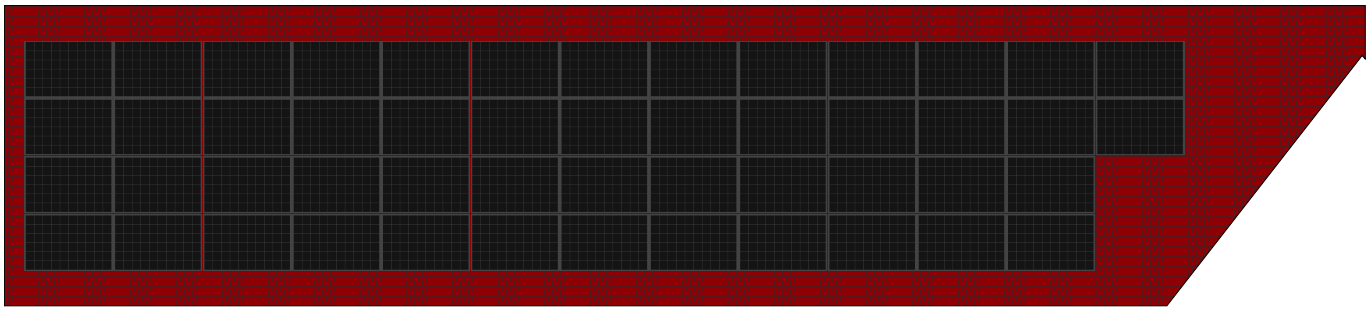
a car ride of 18,335 miles

CO_2 absorbed by 235 trees

Disclaimer: We calculate and compare the likely annual CO_2 emissions for your home based on your generation and usage with the solar PV system detailed in this document versus estimates for a property like yours using energy from the grid. Your actual CO_2 emissions will depend on lots of factors, like how much energy your solar panels generate, how much of this energy you use directly and how much energy you continue to use from the grid. To calculate what these savings equate to in miles driven, we base this on the CO_2 emissions of an average sized diesel car as outlined in the UK government's 'Greenhouse gas reporting: conversion factors 2022' (https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022). To calculate what these savings equate to as the average amount of CO_2 absorbed by trees, we base this on a rate of 25kg per tree per year. Trees absorbs anywhere between 10 and 40kg of CO_2 per year on average, depending on a whole host of factors including the species, location, planting density, and age.

Roof Layout

Roof South

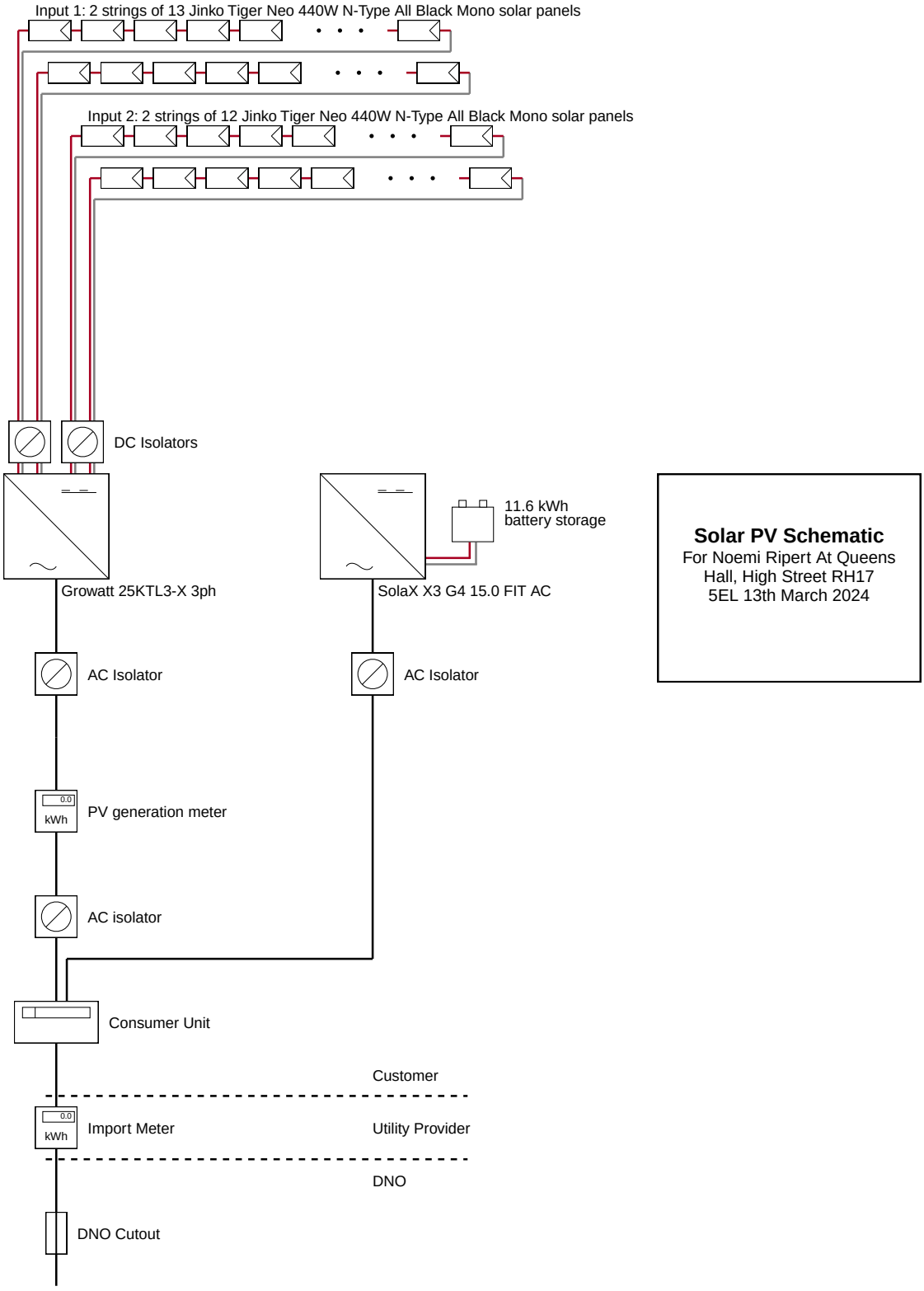


Component list

Item	Quantity
 Jinko Tiger Neo 440W N-Type All Black Mono solar panel	50
 Growatt 25KTL3-X 3ph inverter	1
 SolaX X3 G4 15.0 FIT AC inverter	1
 Emlite EMP1 3ph Meter	1
 Label sheet	2
 GivEnergy All-in-one to Ring Terminal Cable	1
 2 x Smoke Alarms	1
 AC isolator - IMO - 63A 4-pole	2
 K&N DC isolator - KGD40-3	2
 MC4 10mm Connector Pair	4
 MC4 16mm Connector Pair	4
 AC isolator - IMO - 32A 4-pole	2
 SolaX Triple 5.8kWh LFP Battery (Master Console)	1
 SolaX Triple 5.8kWh LFP Battery (Slave Console)	1
 100m reel of 10mm2 solar cable	2

	50m reel of 16mm2 solar cable	4
	Fastensol black universal clamp	108
	Fastensol black end cap	16
	Fastensol portrait flat tile roof hook	160
	Genius flat tile	160
	Fastensol rail splice	48
	BB200evo Reinforced BirdBlocker (30m)	2
	Fastensol silver rail 3550mm	52

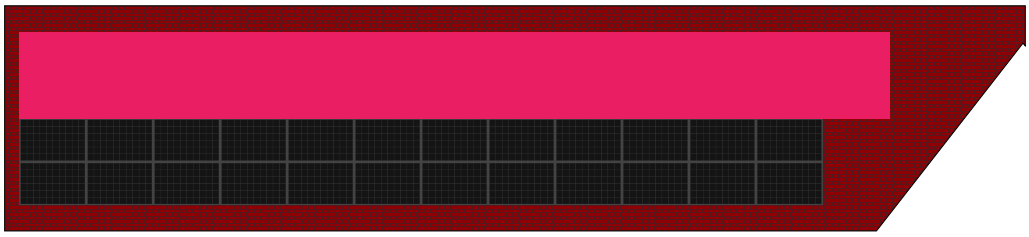
Schematic diagram

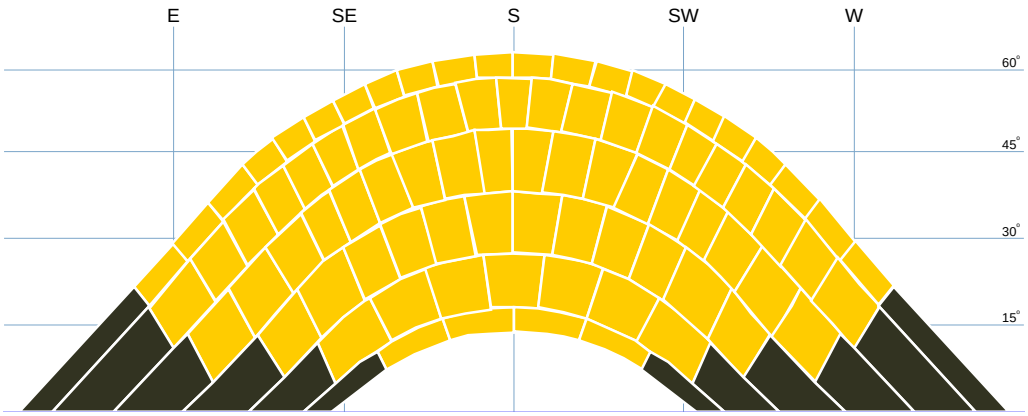


Inverter 1

Growatt 25KTL3-X 3ph

Input 1

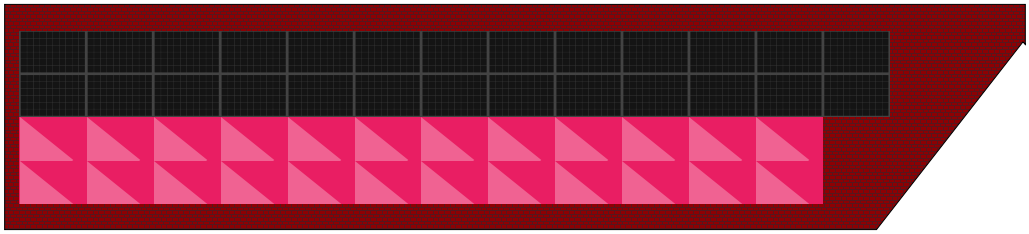


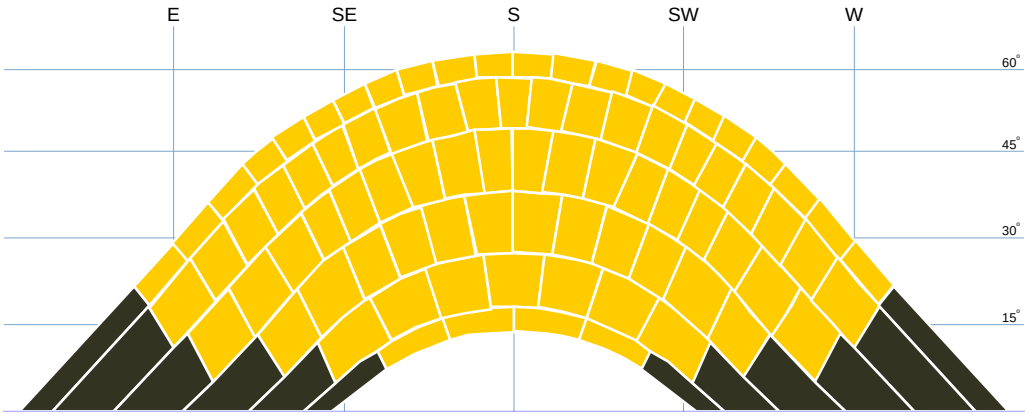


A. Installation data		
Installed capacity of PV system – kWp (stc)	**11.440**	kWp
Orientation of the PV system – degrees from South	**8**	°
Inclination of system – degrees from horizontal	**24**	°
Postcode region	**2**	

B. Performance calculations		
kWh/kWp (Kk)	**1099**	kWh/kWp
Shade factor (SF)	**1.00**	
Estimated output (kWp x Kk x SF)	**12573**	kWh

Input 2





A. Installation data		
Installed capacity of PV system – kWp (stc)	**10.560**	kWp
Orientation of the PV system – degrees from South	**8**	°
Inclination of system – degrees from horizontal	**24**	°
Postcode region	**2**	

B. Performance calculations		
kWh/kWp (Kk)	**1099**	kWh/kWp
Shade factor (SF)	**1.00**	
Estimated output (kWp x Kk x SF)	**11605**	kWh

Financial

Generation

The system is expected to generate 24178 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 558807 kwh, of which 558807 kWh will be consumed on site and 0 kWh exported.

559 MWh

Payback

After adjusting projected costs and benefits for inflation, and applying a discount rate of 4%, the initial system cost of £25,274.48 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 4% per year, is £131,138.09. The cost of the PV system is £25,274.48. The net present value of the project is therefore £105,863.61. A positive net present value is a good indication that the project is financially worthwhile.

£105863.61

IRR

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

25.9 %

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	**2%**
Cost of electricity	**£0.3 /kWh** increases with inflation
System size	**22 kWp** degrades at 0.5% per year
Discount rate	**4%**
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 2 percent.

£0

Total Export Payments

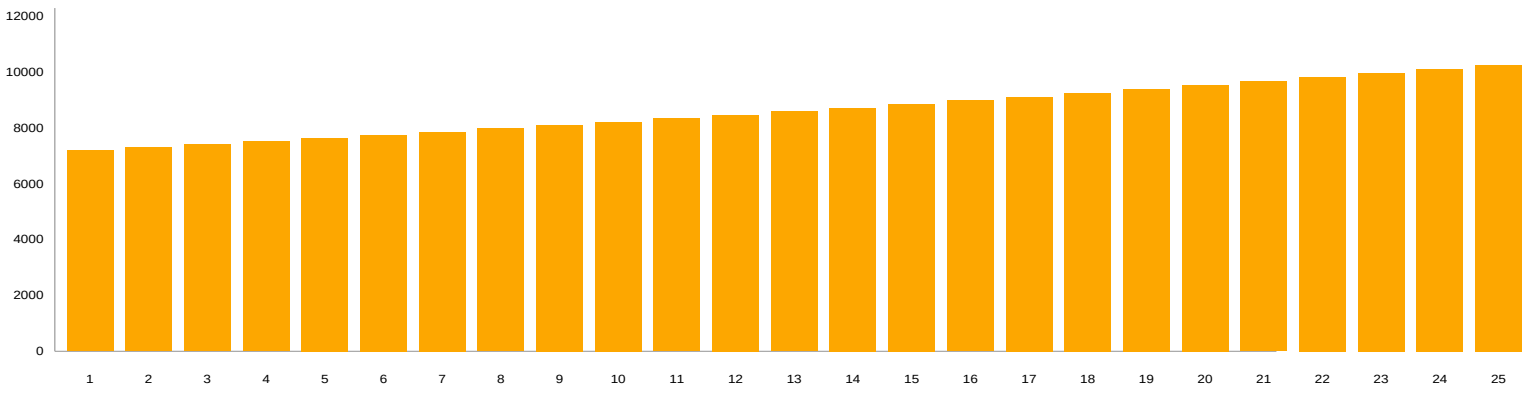
over 25 years

£215819

Electricity savings

over 25 years

	Export payments	Electricity savings	**Total**
Year 1	0	7188	**7188**
Year 2	0	7295	**7295**
Year 3	0	7404	**7404**
Year 4	0	7514	**7514**
Year 5	0	7626	**7626**
Year 6	0	7740	**7740**
Year 7	0	7855	**7855**
Year 8	0	7972	**7972**
Year 9	0	8091	**8091**
Year 10	0	8211	**8211**
Year 11	0	8334	**8334**
Year 12	0	8458	**8458**
Year 13	0	8584	**8584**
Year 14	0	8712	**8712**
Year 15	0	8842	**8842**
Year 16	0	8973	**8973**
Year 17	0	9107	**9107**
Year 18	0	9243	**9243**
Year 19	0	9380	**9380**
Year 20	0	9520	**9520**
Year 21	0	9662	**9662**
Year 22	0	9806	**9806**
Year 23	0	9952	**9952**
Year 24	0	10100	**10100**
Year 25	0	10251	**10251**

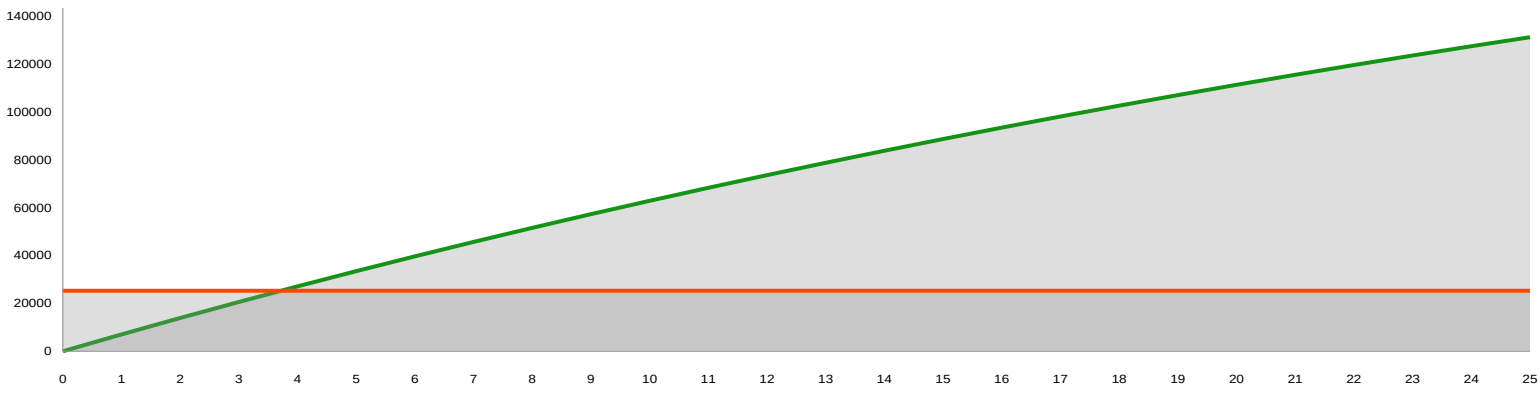


The bottom line

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	7044	7044	0	25274	**-18230**
Year 2	6863	13907	0	25274	**-11367**
Year 3	6687	20594	0	25274	**-4680**
Year 4	6515	27109	0	25274	**1835**
Year 5	6348	33457	0	25274	**8182**
Year 6	6184	39641	0	25274	**14367**
Year 7	6026	45667	0	25274	**20392**
Year 8	5871	51537	0	25274	**26263**
Year 9	5720	57257	0	25274	**31983**
Year 10	5573	62830	0	25274	**37556**
Year 11	5430	68260	0	25274	**42985**
Year 12	5290	73550	0	25274	**48276**
Year 13	5154	78704	0	25274	**53430**
Year 14	5022	83726	0	25274	**58452**
Year 15	4893	88619	0	25274	**63344**
Year 16	4767	93386	0	25274	**68111**
Year 17	4645	98030	0	25274	**72756**
Year 18	4525	102556	0	25274	**77281**
Year 19	4409	106964	0	25274	**81690**
Year 20	4296	111260	0	25274	**85986**
Year 21	4185	115445	0	25274	**90171**
Year 22	4078	119523	0	25274	**94249**
Year 23	3973	123496	0	25274	**98221**
Year 24	3871	127367	0	25274	**102092**
Year 25	3771	131138	0	25274	**105864**



Quote

Noemi Ripert
Queens Hall
High Street
RH17 5EL

Quote reference: 809489
Quote date: 14/03/2024
Quote by: Brian Bonner
Quote validity: 30 days

Description of goods and services	Price
Goods	
50x Jinko Tiger Neo 440W N-Type All Black Mono solar panel	
Growatt 25KTL3-X 3ph inverter	
SolaX X3 G4 15.0 FIT AC inverter	
Emlite EMP1 3ph Meter	
2x Label sheet	
GivEnergy All-in-one to Ring Terminal Cable	
2 x Smoke Alarms	
2x AC isolator - IMO - 63A 4-pole	
2x K&N DC isolator - KGD40-3	
4x MC4 10mm Connector Pair	
4x MC4 16mm Connector Pair	
2x AC isolator - IMO - 32A 4-pole	
SolaX Triple 5.8kWh LFP Battery (Master Console)	
SolaX Triple 5.8kWh LFP Battery (Slave Console)	
2x 100m reel of 10mm2 solar cable	
4x 50m reel of 16mm2 solar cable	
108x Fastensol black universal clamp	
16x Fastensol black end cap	
160x Fastensol portrait flat tile roof hook	
160x Genius flat tile	
48x Fastensol rail splice	
2x BB200evo Reinforced BirdBlocker (30m)	
52x Fastensol silver rail 3550mm	
Services	
Installation	
Scaffolding	
10% Community Building Discount	

Total before VAT	£25,274.48
VAT at 0%	£0.00
Total including VAT	**£25,274.48**

Order form

To proceed with this order please sign below to acknowledge that you have read and accept the information contained within this quote document and our terms and conditions.

Customersignature	Customemame	Date
_____	_____	_____