Project Name: longview

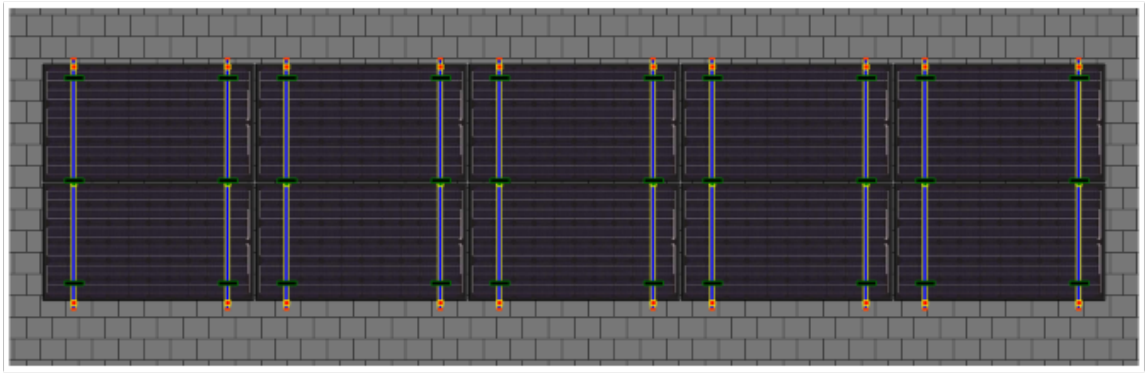
Address: longview, sy79ea

Date Created: 11th November 2021

Designer: Owen Thomas-Thorne

Roof Layout

Roof 1



Component list

Item	Quantity
 Jinko Tiger N-Type 395W Black Mono solar panel	10
 Growatt MIN 3600 TL-XE Dual MPPT single phase inverter with DC switch inverter	1
 Emlite ECA2 extended cover	1
 Label sheet	1
 AC isolator - KN Newbury 20A 4-pole	2
Pair of MC4 connectors	4
50m reel of 4mm2 solar cable	1
Renusol end clamp (black)	20
Renusol mid clamp (black)	10
Renusol end cap (black)	20
Renusol landscape slate roof hook	30
Renusol rail 3.3m black	0
Renusol rail 3.3m silver	10

Inverter checks

Growatt MIN 3600 TL-XE Dual MPPT single phase inverter with DC switch

Panels			
PV power	**3950**	Rated AC output	**3600**

Input 1: 5 Jinko Tiger N-Type 395W Black Mono solar panels in 1 strings

Panels		Inverter	
PV power	**1975 W**		
Open circuit voltage at -10° C	**251 V**	Max DC voltage	**550 V**
V_{mpp} at 40° C	**182 V**	V_{mpp} lower limit	**80 V**
V_{mpp} at -10° C	**209 V**	V_{mpp} upper limit	**550 V**
I_{mpp} at 40° C	**10 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: 5 Jinko Tiger N-Type 395W Black Mono solar panels in 1 strings

Panels		**Inverter**	
PV power	**1975 W**		
Open circuit voltage at -10° C	**251 V**	Max DC voltage	**550 V**
V_{mpp} at 40° C	**182 V**	V_{mpp} lower limit	**80 V**
V_{mpp} at -10° C	**209 V**	V_{mpp} upper limit	**550 V**
I_{mpp} at 40° C	**10 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

Growatt MIN 3600 TL-XE Dual MPPT single phase inverter with DC switch

AC Isolator

A AC isolator - KN Newbury 20A 4-pole has been specified for this input

Current

The rated isolator current (20A) is greater than the rated inverter current (16A)

Phases

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

Input 1

DC Isolator

Integrated isolator

This inverter contains an integrated DC Isolator.

Cable

10m of 4mm2 solar cable has been specified

Voltage drop

Voltage drop at maximum power point at 40°C will be around **0.85 V (0.47 percent)**

Input 2

DC Isolator

Integrated isolator

This inverter contains an integrated DC Isolator.

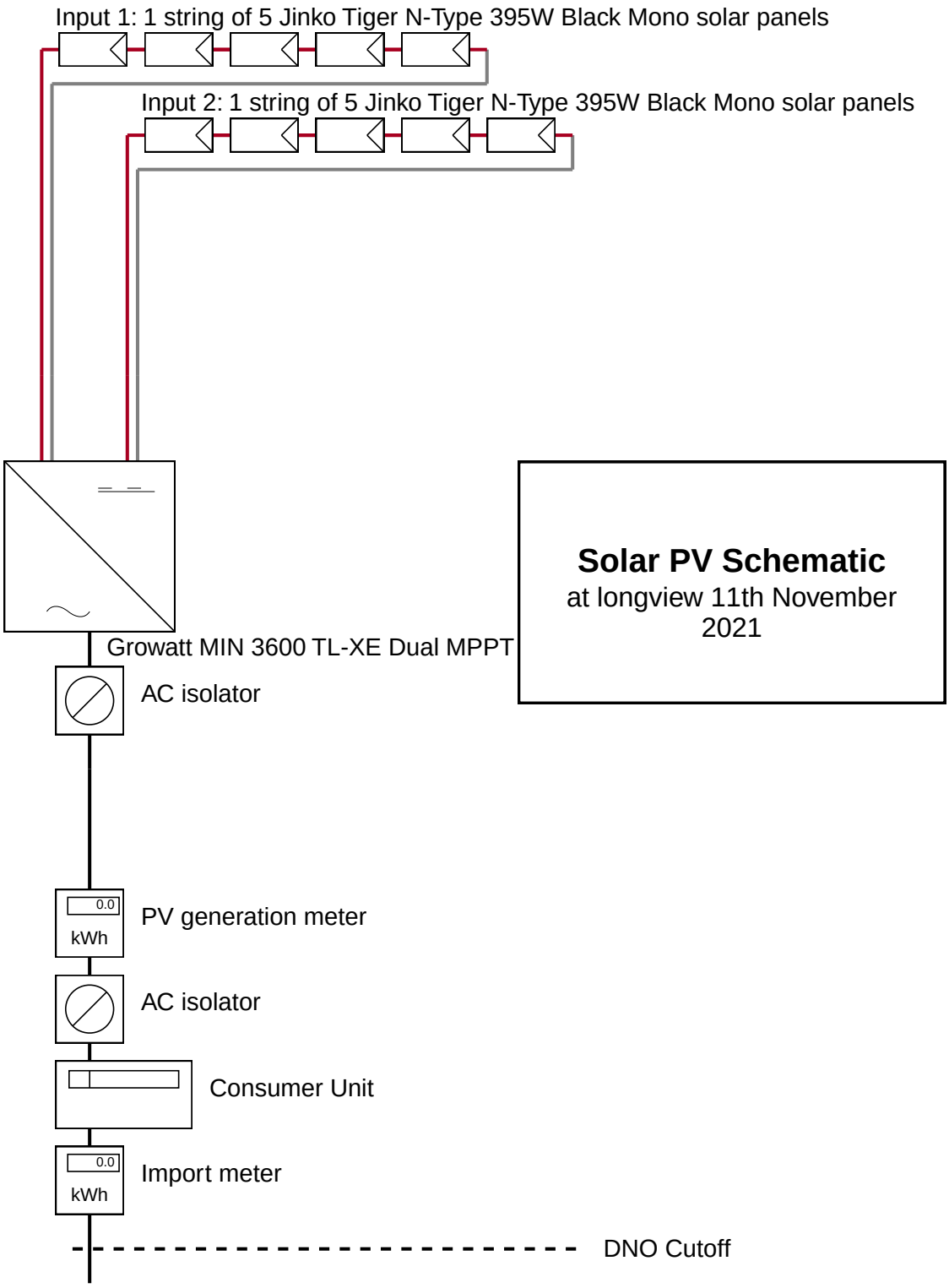
Cable

10m of 4mm2 solar cable has been specified

Voltage drop

Voltage drop at maximum power point at 40°C will be around **0.85 V (0.47 percent)**

Schematic diagram



Performance Estimate

Site details

Client

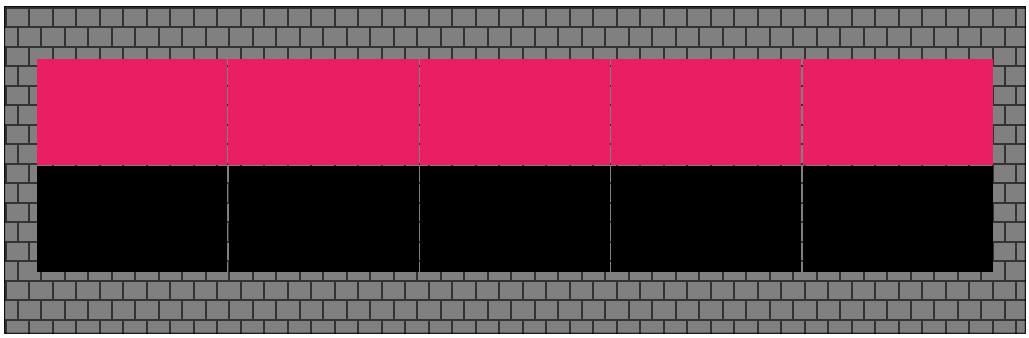
Address longview

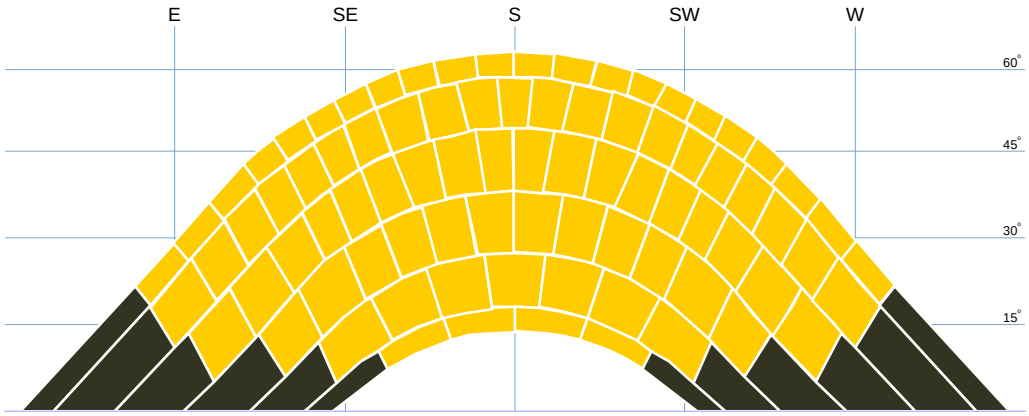
The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn 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

Growatt MIN 3600 TL-XE Dual MPPT single phase inverter with DC switch

Input 1

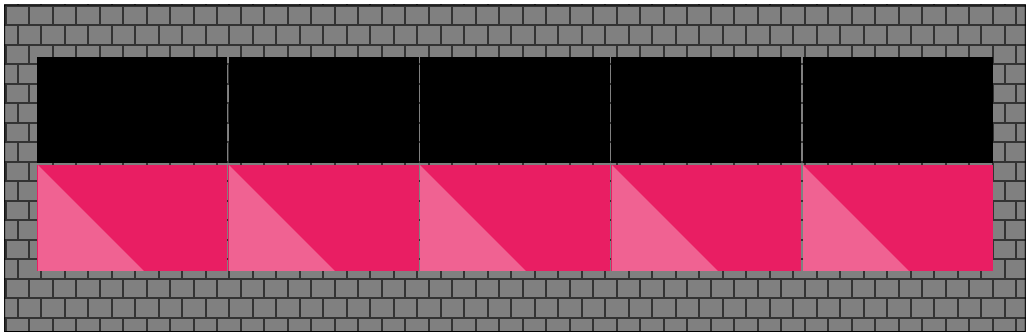


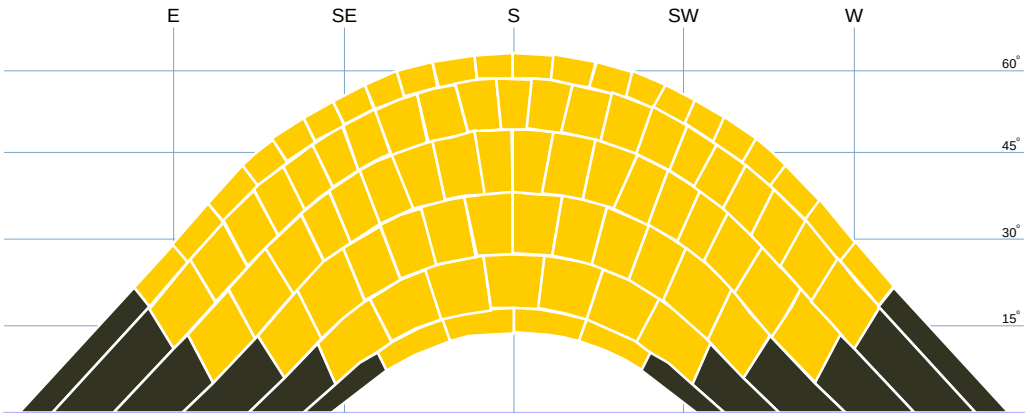


A. Installation data		
Installed capacity of PV system - kWp (stc)	**1.975**	kWp
Orientation of the PV system - degrees from South	**30**	°
Inclination of system - degrees from horizontal	**30**	°
Postcode region	**6**	

B. Performance calculations		
kWh/kWp (Kk)	**907**	kWh/kWp
Shade factor (SF)	**1.00**	
Estimated output (kWp x Kk x SF)	**1791**	kWh

Input 2





A. Installation data		
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B. Performance calculations		
kWh/kWp (Kk)	**907**	kWh/kWp
Shade factor (SF)	**1.00**	
Estimated output (kWp x Kk x SF)	**1791**	kWh

Performance Summary

A. Installation data		
Installed capacity of PV system - kWp (stc)	**3.95**	kWp
Orientation of the PV system - degrees from South	**See individual inputs**	
Inclination of system - degrees from horizontal	**See individual inputs**	
Postcode region	**6**	
B. Performance calculations		
kWh/kWp (Kk)	**See individual inputs**	
Shade factor (SF)	**See individual inputs**	
Estimated output (kWp x Kk x SF)	**3582**	kWh

Important Note: The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the standard MCS procedure is given as guidence only for the first year of generation. It should not be considered as a guarantee of performance.

Financial

Generation

The system is expected to generate 3582 kWh per year initially, decreasing gradually as the solar cells degrade. Over the 20 year term of this financial projection the total generation is expected to be 68166 kwh, of which 54533 kWh will be consumed on site and 13633 kWh exported.

68 MWh

Payback

After adjusting projected costs and benefits for inflation, and applying a discount rate of 4%, the initial system cost of £2,174.85 is expected to be recouped after 3 years.

3 years

Net Present Value

The total present value of future benefits and costs, using a discount rate of 4% per year, is £10,847.87. The cost of the PV system is £2,174.85. The net present value of the project is therefore £8,673.03. A positive net present value is a good indication that the project is financially worthwhile.

£8673.03

IRR

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

28.6 %

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	**£0.21 /kWh** increases with inflation
System size	**3.95 kWp** degrades at 0.5% per year
Discount rate	**4%**
Projection length	**20 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.

	Export payments	Electricity savings	**Total**
Year 1	95	606	**701**
Year 2	96	615	**711**
Year 3	97	624	**722**
Year 4	99	634	**733**
Year 5	100	643	**744**
Year 6	102	653	**755**
Year 7	103	663	**766**
Year 8	105	672	**777**
Year 9	106	682	**789**
Year 10	108	693	**801**
Year 11	110	703	**813**
Year 12	111	713	**825**
Year 13	113	724	**837**
Year 14	115	735	**849**
Year 15	116	746	**862**
Year 16	118	757	**875**
Year 17	120	768	**888**
Year 18	122	780	**901**
Year 19	123	791	**915**
Year 20	125	803	**928**

£2184

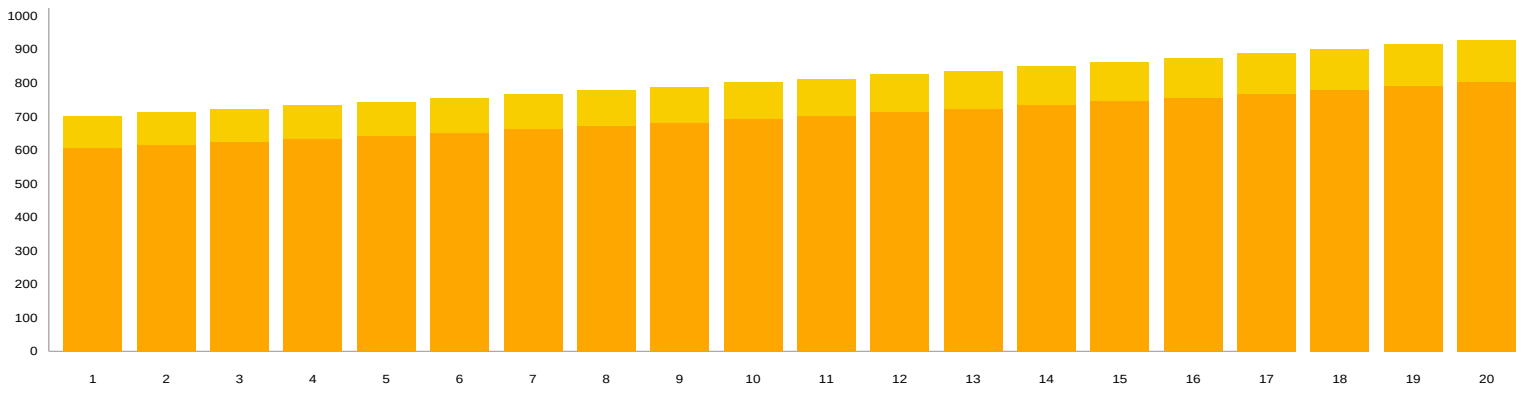
Total Export Payments

over 20 years

£14005

Electricity savings

over 20 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 3 years.

	Discounted benefits	Cumulative benefits	Discounted costs	Cumulative costs	**Cashflow**
Year 1	687	687	0	2175	**-1488**
Year 2	669	1356	0	2175	**-819**
Year 3	652	2008	0	2175	**-167**
Year 4	635	2643	0	2175	**468**
Year 5	619	3262	0	2175	**1087**
Year 6	603	3865	0	2175	**1690**
Year 7	587	4453	0	2175	**2278**
Year 8	572	5025	0	2175	**2850**
Year 9	558	5583	0	2175	**3408**
Year 10	543	6126	0	2175	**3951**
Year 11	529	6655	0	2175	**4481**
Year 12	516	7171	0	2175	**4996**
Year 13	503	7674	0	2175	**5499**
Year 14	490	8163	0	2175	**5988**
Year 15	477	8640	0	2175	**6466**
Year 16	465	9105	0	2175	**6930**
Year 17	453	9558	0	2175	**7383**
Year 18	441	9999	0	2175	**7824**
Year 19	430	10429	0	2175	**8254**
Year 20	419	10848	0	2175	**8673**