



Prepared by: Tom Paull
0800 567 7629
tom.paull@sphereenergy.co.uk

For: David
75 Watlington Street, Reading

Quote #: 3817059
Valid until: 7th March 2024



Solar Energy System Proposal

Dear David,

Thank you for the opportunity to present your Solar Energy System Proposal.

Best Regards,
Tom Paull
Sphere Energy Solutions Ltd

Recommended System Option

7.38_{kW}

System Size

£700

Estimated Annual
Electricity Bill Savings

£11,600

Total System Price

£11,600

Net System Price



Your Solution

Solar Panels

Aiko Energy

7.380 kW Total Solar Power

12 x 615 Watt Panels (AIKO-615-MAH72Dw)

6,002 kWh per year

Battery

PylonTech

9.6 kWh Total Battery Storage

2 x US5000

5G RHI Hybrid Inverter - 1PH DC (3-6k)

6.000kW of Inverter Power

SOLIS - Ningbo Ginlong Technologies

1 x RHI-6K-48ES-5G

5.0 -year Standard Warranty

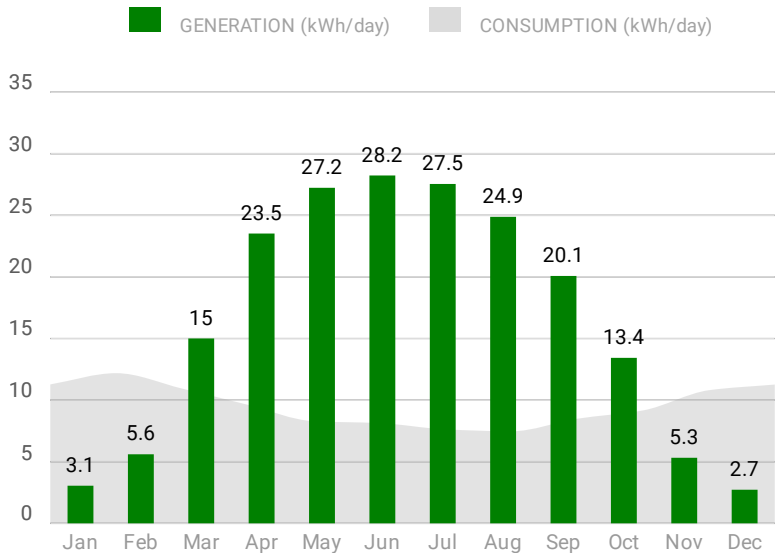


Warranties: 15 Year Panel Product Warranty, 30 Year Panel Performance Warranty, 5 Year Inverter Product Warranty



System Performance

171%
Energy From Solar



46%
Self-consumption

54%
Export to grid

System Performance Assumptions: System Total losses: 0%, Inverter losses: 0%, Optimizer losses: 0%, Shading losses: 13.4%, Performance Adjustment: 0%, Output Calculator: MCS. Panel Orientations: 12 panels with Azimuth 160 and Slope 20.

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 guidance only. It should not be considered as a guarantee of performance. The solar PV self-consumption has been calculated in accordance with the most relevant methodology for your system. There are a number of external factors that can have a significant effect on the amount of energy that will be self-consumed.

Shading will be present on your system that will reduce its output to the factor stated. This factor was NOT calculated using the MCS shading methodology, but we can confirm that the system as quoted, taking into account the shading present, will deliver at least 90% of the energy (in kWh) as set out in this performance estimate.

This system performance calculation has been undertaken using estimated values for array orientation, inclination, or shading. Actual performance may be significantly lower or higher if the characteristics of the installed system vary from the estimated values.

Important Note: The energy performance and benefits of EESS is impossible to predict with certainty due to the numerous functions a system can be programmed to perform. This estimate is based upon the standard MCS procedure and is given as guidance only. It should not be considered as a guarantee of performance.

A. Installation data		
Installed capacity of PV system - kWp (stc)	7.38	kWp
Orientation of the PV system - degrees from South	Group 1: 12 panels with Orientation: 20 °	°
Inclination of system - degrees from horizontal	Group 1: 12 panels with Tilt: 20°	°
Postcode region	1	



B. Performance calculations		
kWh/kWp (Kk) from table	Group 1: 939	kWh/kWp
Shade Factor (SF)	0.86	
Estimated annual output (kWp x Kk x SF)	6,002	kWh
C. Estimated PV self-consumption - PV Only		
Assumed occupancy archetype	In Half Day	
Assumed annual electricity consumption, kWh	3,500.00	kWh
Assumed annual electricity generation from solar PV system, kWh	6,002	kWh
Expected solar PV self-consumption (PV Only)	1,297.03	kWh
Grid electricity independence / Self-sufficiency (PV Only)	37.06	%
D. Estimated PV self-consumption - with EESS		
Assumed usable capacity of electricity energy storage device, which is used for self-consumption, kWh	9.12	kWh
Expected solar PV self-consumption (with EESS)	2,758.29	kWh
Grid electricity independence / Self-sufficiency (with EESS)	79.0%	%

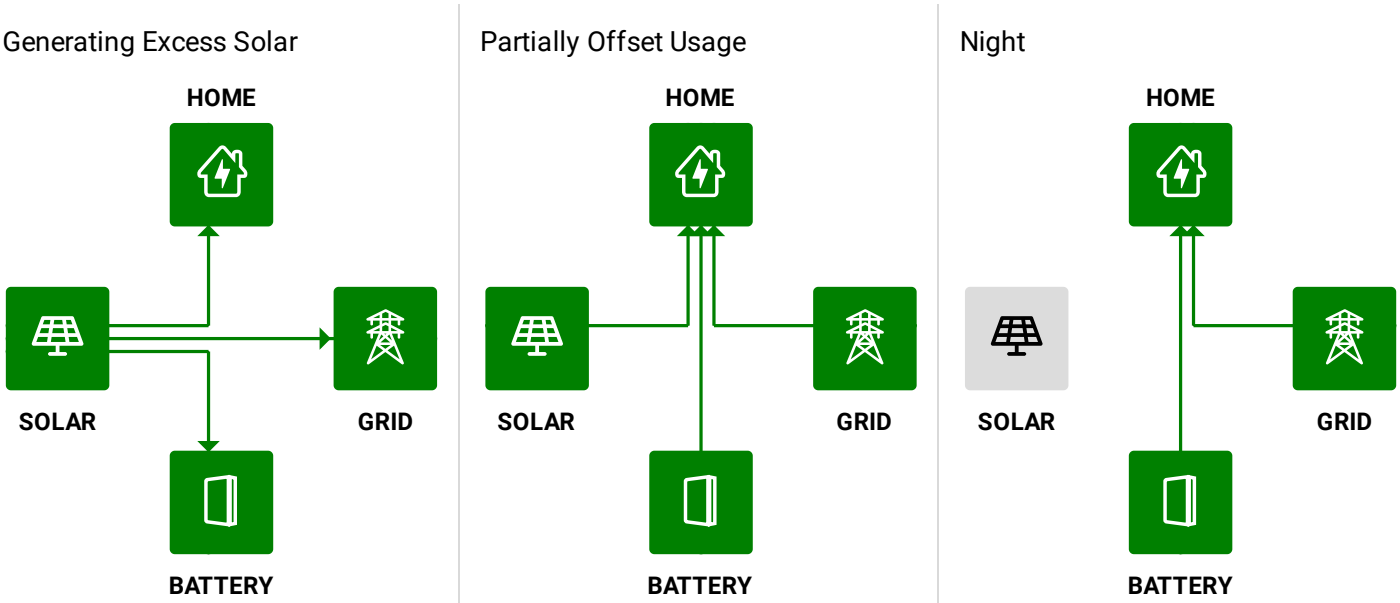
Environmental Benefits

Solar has no emissions. It just silently generates pure, clean energy.



Each Year		Over System Lifetime		
171%	2 tons	45,645	293	33
Of CO ₂ , SO _x & NO _x	Avoided CO ₂ per year	Car km avoided	Trees planted	Long haul flights avoided

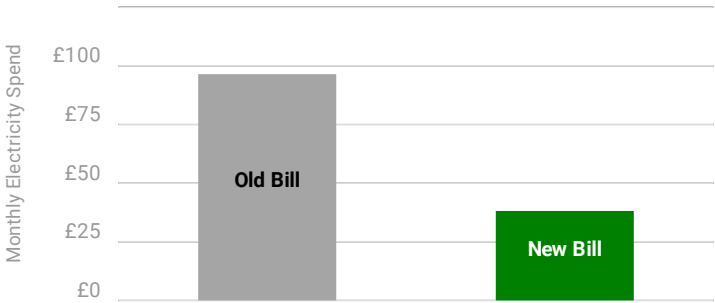
How your system works



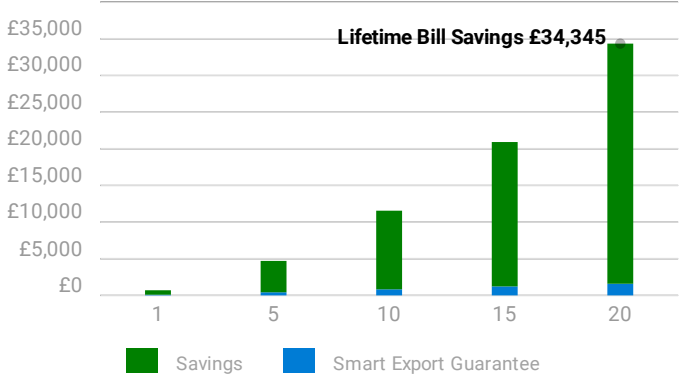


Electricity Bill Savings

First Year Monthly Bill Savings



Cumulative Bill Savings



Month	Solar Generation (kWh)	Electricity Consumption before solar (kWh)	Electricity Imported after solar (kWh)	Electricity Exported after solar (kWh)	Export Credit (£)	Utility Bill before solar (£)	Utility Bill after solar (£)	Estimated Savings (£)
Jan	95	350	258	0	0	112	88	24
Feb	157	341	191	0	0	110	70	40
Mar	465	339	3	100	3	109	19	91
Apr	706	289	0	399	12	96	18	78
May	844	257	0	574	17	87	19	69
Jun	847	244	0	591	18	84	18	66
Jul	854	236	0	606	18	82	19	63
Aug	771	232	0	528	16	80	19	62
Sep	602	255	0	333	10	87	18	69
Oct	416	284	0	113	3	94	19	76
Nov	160	324	167	0	0	105	63	42
Dec	85	349	268	0	0	112	90	22

Rate not specified specified, using Electricity based on location.

Your projected energy cost is calculated by considering a 7.0% increase in energy cost each year, due to trends in the raising cost of energy. This estimate is based on your selected preferences, current energy costs and the position and orientation of your roof to calculate the efficiency of the system. Projections are based on estimated usage of 3500 kWh per year, assuming Electricity Electricity Tariff.

Your electricity tariff rates may change as a result of installing the system. You should contact your electricity retailer for further information.

Proposed Tariff Details - E.ON Electricity (Scotland)	
Energy Charges	
Usage Charge All Day	£0.27 / kWh
Smart Export Guarantee	



Feed-In Credit <i>All Day</i>	£0.03 / kWh
Fixed Charges	
Fixed Charge	£18.29 / month

Quotation

Payment Option: Cash

12 x AIKO-615-MAH72Dw 615 Watt Panels (Aiko Energy) 1 x RHI-6K-48ES-5G (SOLIS - Ningbo Ginlong Technologies) 2 x US5000 (PylonTech) Tilt Racks (12 panels)	
Total System Price	£11,600.00 Excluding £0.00 VAT
Purchase Price	£11,600.00 Including £0.00 VAT

Price excludes Retailer Smart Meter should you want us to install your Smart Meter it will be an additional cost.
This proposal is valid until 7th March 2024.

Quote Acceptance

I have read & accept the terms and conditions.

Signature

Name

Date



Net Financial Impact Cash

£34,345

Utility Bill Savings

-

£11,600

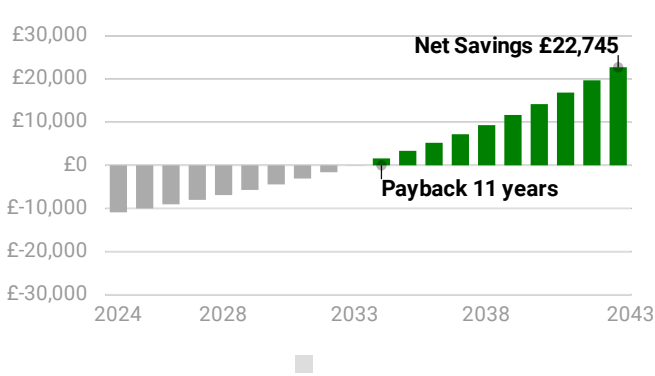
Net System Cost

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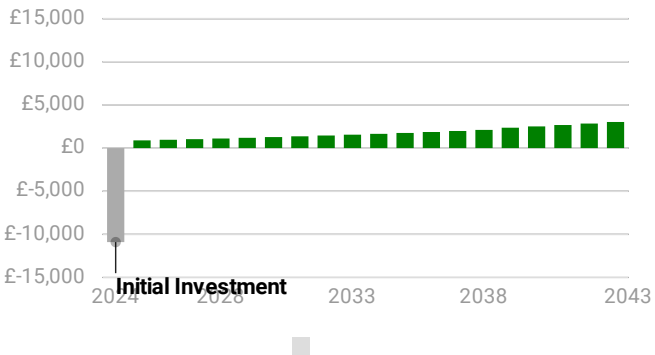
£22,745

Estimated Net Savings

Cumulative Savings From Going Solar



Annual Savings From Going Solar



£22,745
Net Present Value

10 Years
Discounted Payback
Period

196%
Total Return on
Investment

10.2%
Rate of Return on
Investment

Year	Electricity Consumption (kWh)	Solar Generation (kWh)	Utility Bill (before solar) (£)	Utility Bill (after solar) (£)	Annual Savings (from solar) (£)	System Costs (Net of Dealer Incentives) (£)	Customer Incentives (Upfront) (£)	Net Savings (£)	Cumulative Impacts (£)
2024	3,500	6,002	1,157	458	700	11,600	0	(10900)	(10900)
2025	3,500	5,981	1,238	344	894	0	0	894	(10005)
2026	3,500	5,960	1,325	361	964	0	0	963	(9042)
2027	3,500	5,939	1,418	382	1,036	0	0	1035	(8006)
2028	3,500	5,918	1,517	406	1,111	0	0	1111	(6895)
2029	3,500	5,897	1,623	431	1,192	0	0	1192	(5702)
2030	3,500	5,876	1,737	460	1,277	0	0	1277	(4425)
2031	3,500	5,855	1,859	493	1,365	0	0	1365	(3060)
2032	3,500	5,834	1,989	530	1,459	0	0	1459	(1601)
2033	3,500	5,813	2,128	573	1,555	0	0	1555	(45)
2034	3,500	5,792	2,277	625	1,652	0	0	1652	1606
2035	3,500	5,771	2,436	681	1,756	0	0	1755	3362
2036	3,500	5,750	2,607	741	1,866	0	0	1865	5227
2037	3,500	5,728	2,789	806	1,983	0	0	1983	7211



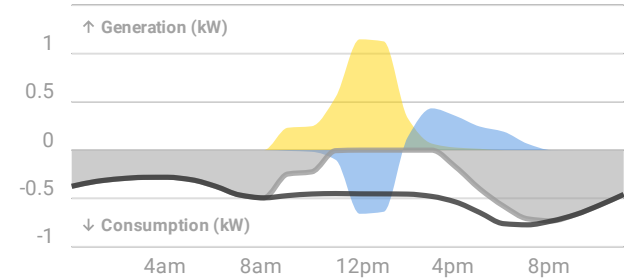
Year	Electricity Consumption (kWh)	Solar Generation (kWh)	Utility Bill (before solar) (£)	Utility Bill (after solar) (£)	Annual Savings (from solar) (£)	System Costs (Net of Dealer Incentives) (£)	Customer Incentives (Upfront) (£)	Net Savings (£)	Cumulative Impacts (£)
2038	3,500	5,707	2,985	876	2,109	0	0	2108	9320
2039	3,500	5,686	3,194	830	2,363	0	0	2363	11683
2040	3,500	5,665	3,417	903	2,514	0	0	2513	14197
2041	3,500	5,644	3,656	982	2,674	0	0	2674	16871
2042	3,500	5,623	3,912	1,067	2,846	0	0	2845	19716
2043	3,500	5,602	4,186	1,158	3,028	0	0	3027	22744

Estimates do not include replacement costs of equipment not covered by a warranty. Components may need replacement after their warranty period. Financial discount rate assumed: 0.0%

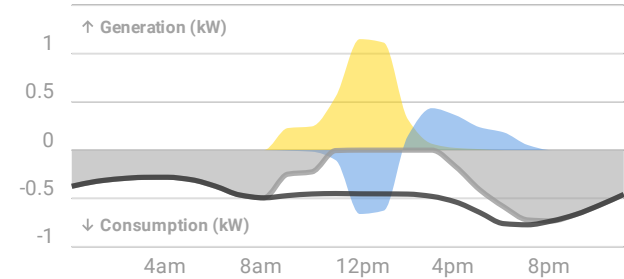
Daily Energy Flows

CONSUMPTION (kWh) GENERATION (kWh) BATTERY (kWh) NET CONSUMPTION (kWh) EXPORT TO GRID (kWh)

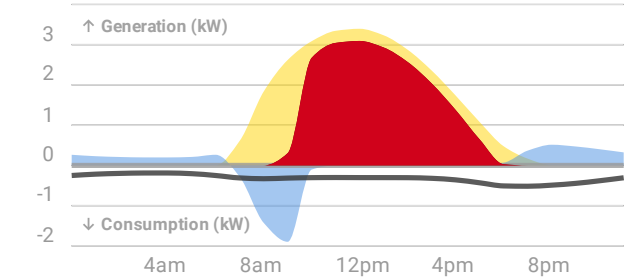
Winter Weekday



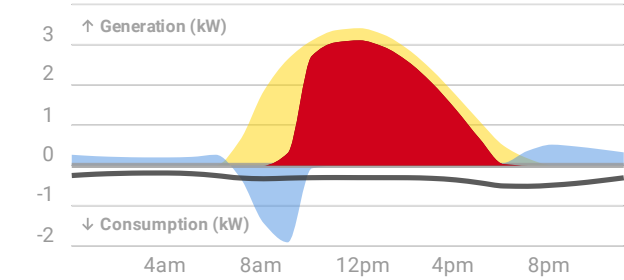
Winter Weekend



Summer Weekday



Summer Weekend



This proposal has been prepared by Sphere Energy Solutions Ltd using tools from OpenSolar. Please visit www.opensolar.com/proposal-disclaimer for additional disclosures from OpenSolar.

RHI-(3-6)K-48ES-5G

Solis Energy Storage Inverters



360 degree

Features:

- ▶ Uninterrupted power supply, 20ms reaction
- ▶ 5kW backup power to support more important loads
- ▶ With shifting and peak shaving capabilities friendly to grid
- ▶ Multiple working modes to make maximize self-consumption, increase benefit
- ▶ Higher charge-discharge efficiency, improving the economic benefits
- ▶ Compatible with lithium & lead-acid batteries, increased more choice in different markets
- ▶ Fanless design, long lifespan
- ▶ Intelligent BMS function, improving battery's reliability
- ▶ With high-frequency isolation technology, making system safer and long lifespan
- ▶ 24-hour fully intelligent energy management, Real-time grasp of PV plant status
- ▶ Remotely control & upgrade function, making digital power plant maintenance at your fingertips



Model:

RHI-3K-48ES-5G

RHI-3.6K-48ES-5G

RHI-4.6K-48ES-5G

RHI-5K-48ES-5G

RHI-6K-48ES-5G

Datasheet

Model Name	RHI-3K-48ES-5G	RHI-3.6K-48ES-5G	RHI-4.6K-48ES-5G	RHI-5K-48ES-5G	RHI-6K-48ES-5G
Input DC (PV side)					
Max. input power	7kW	7kW	8kW	8kW	8kW
Max. input voltage	600V				
Rated voltage	330V				
Start-up voltage	120V				
MPPT voltage range	90-520V				
Max. input current	11A/11A				
Max. short circuit current	17.2A/17.2A				
MPPT number/Max. input strings number	2/2				
Battery					
Battery type	Li-ion/Lead-acid				
Battery voltage range	42 - 58V				
Battery capacity	50 - 2000Ah				
Max. charging power	3kW	5kW			
Max. charge/discharge current	62.5A/62.5A	100A/100A			
Communication	CAN/RS485				
Output AC (Back-up)					
Rated output power	3kW	5kW			
Max. apparent output power	4kVA	6kVA			
Back-up switch time	<20ms				
Rated output voltage	1/N/PE, 220/230V				
Rated frequency	50/60Hz				
Rated output current	13A	22A			
THDv	2% (linear load)				
Output AC (Grid side)					
Rated output power	3kW	3.6kW	4.6kW	5kW	6kW
Max. apparent output power	3.3kVA	4kVA	4.6kVA	5.5kVA	6kVA
Rated grid voltage	1/N/PE, 220/230V				
Rated grid frequency	50/60Hz				
Rated grid output current	13A	15.7A	20.9A	21.7A	26.1A
Max. output current	15.7A	17.3A	23A	23.9A	26.1A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)				
THDi	<2%				
Efficiency					
Max. efficiency	>97.5%				
EU efficiency	>96.8%				
Protection					
Ground fault monitoring	Yes				
Integrated AFCI (DC arc-fault circuit protection)	Optional				
DC reverse-polarity protection	Yes				
Protection class/Over voltage category	I/II				
General Data					
Dimensions (W*H*D)	333*505*249 mm				
Weight	17kg				
Topology	High frequency isolation (for battery)				
Operating ambient temperature range	-25 ~ +60°C				
Ingress protecton/ Pollution degree	IP65/PD3				
Cooling concept	Natural convection				
Max. operation altitude	2000m				
Grid connection standard	EN50438, G98, G99, AS4777.2:2015, VDE0126-1-1, IEC 61727, VDE N4105, CEI 0-21,CE				
Safety/EMC standard	IEC62040-1, IEC62109-1/-2, AS3100, NB/T 32004, EN61000-6-2, EN61000-6-3				
Features					
DC connection	MC4 connector				
AC connection	Quick connection plug				
Display	7.0"LCD color screen display				
Communication	RS485, Optional: Wi-Fi, GPRS				