maden eco

Electrical & Renewable services

YOUR SOLAR QUOTE

Hi Shed 4.

Thanks for choosing us to provide a design for a solar PV system at , TD14 5AN.

We're delighted to supply the attached proposal for a 108.8 kW solar array.
We expect your system to generate 80,836 kWh of clean electricity every year, and save 17,164 kg CO2 of carbon.

There are full details on the following pages. We hope you enjoy the read!

Kind regards,

Conor Maden

Linlithgow Logs

Maden Eco

108.80 kW PV System

128 x 425W & 128 x 425W panels,
2 x Growatt 50KTL3 3ph

Expected payback 10 years. Estimated first year savings £4,253

80,836 kWh/yr

Annual CO2 savings of 17,164 kg

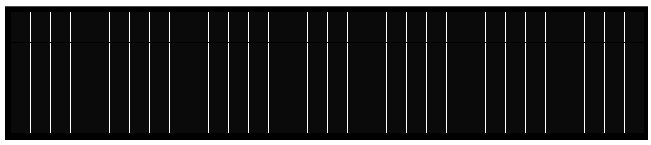
System Overview

Your system comprises **256 Trina Vertex S 425W Black Framed Mono (White Backsheet) solar panels** to collect sunlight and turn it into DC electricity.

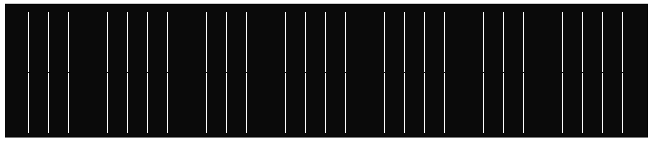
The panels will be connected to **2 Growatt 50KTL3 3ph inverters**, which convert the DC electricity into mains (AC) electricity.

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.

Roof 1



Roof 2



Solar Panels: Trina Vertex S 425W Black Framed Mono (White Backsheet) x 256

The Trina Vertex S provides a great balance of power, size and weight, offering 21.3% efficiency, with up to 65W more power for just an additional 6cm...

Model	TSM-DE09R.08
Power	425 watts
Dimensions	1134 x 1762mm

Inverter: Growatt 50KTL3 3ph x 2

Some of the most powerful Growatt inveters, the KTL3 offer offer lightning and fire protection as standard along with inbuilt diagnostics.

AC Power	50000 watts
Trackers	6

Mounting: Renusol Metasole mounting system

Renusol Metasol mounting system for sheet metal roofs comes with short, non-continuous rails to provide flexibility and save material along the way.

Designed for	Trapezoidal Sheet Metal 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

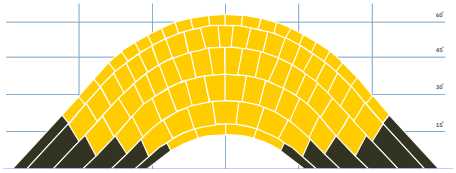
If you have trees, neighbouring buildings or nearby high ground that will shade your PV array, the output of the system will be reduced. We have used a 'sunpath diagram' that estimates how often sunlight will be blocked from reaching the panels.

Roof diagrams

Stringing diagrams indicate which solar panels are connected to which inverter inputs.

Full sunpath and stringing diagrams for this system are given on the following page.

Sunpath diagrams



Sunpath diagrams indicate where the sky as seen from the solar array is blocked by neighbouring buildings, chimneys, trees, or other obstructions.

We expect your system to generate

80,836 kWh per year

Installation data	
Installation capacity of PV system - kWp (stc)	109 kWp
Orientation of the PV system - degrees from South	See roof diagrams
Inclination of system (pitch) - degrees from horizontal	See roof diagrams
Postcode region	Zone 9S
Performance Calculations	
kWh/kWp (Kk)	See sunpath diagrams
Shade Factor (SF)	See sunpath diagrams
Estimated output (kWp x Kk x SF)	80836 kWh
Estimated PV self-consumption	
Assumed annual electricity consumption	328660kWh
Expected solar generation consumed in property	59903kWh

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.

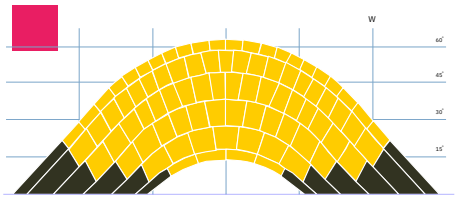
If shading is present on your system that will reduce its output to the factor stated. This factor was calculated using industry standard shading methodology and we believe that this will yield results within 10% of the actual energy estimate stated for most systems.

Roof diagrams

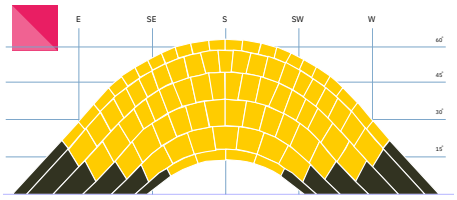
Roof 1 Orientation: 10° Pitch: 15°

Roof 2 Orientation: -135° Pitch: 15°

Sunpath diagrams



Shade factor: 1.00 Kk: 832



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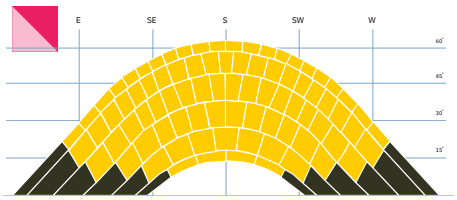

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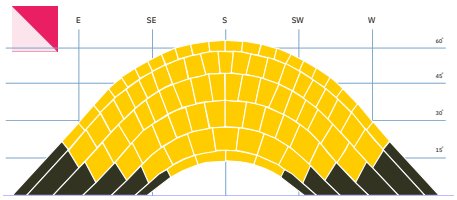

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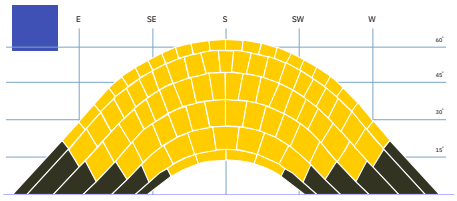
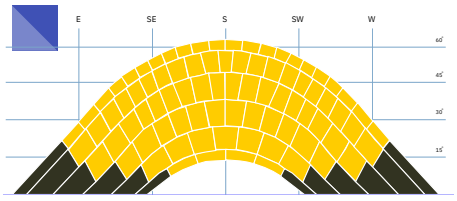


Shade factor: 1.00 Kk: 654



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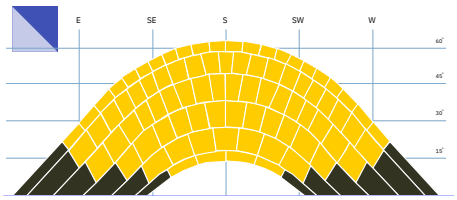

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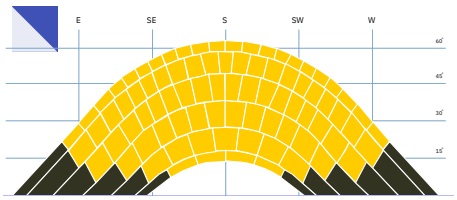


Shade factor: 1.00 Kk: 654

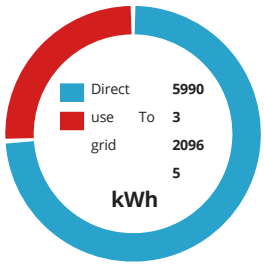
Your energy explained

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.

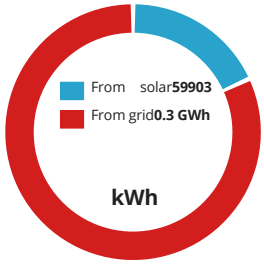
Smart Export Guarantee (SEG) information

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

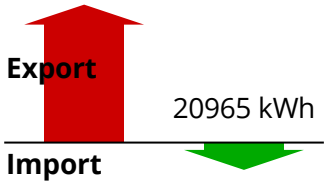
Annual Generation



Annual Consumption



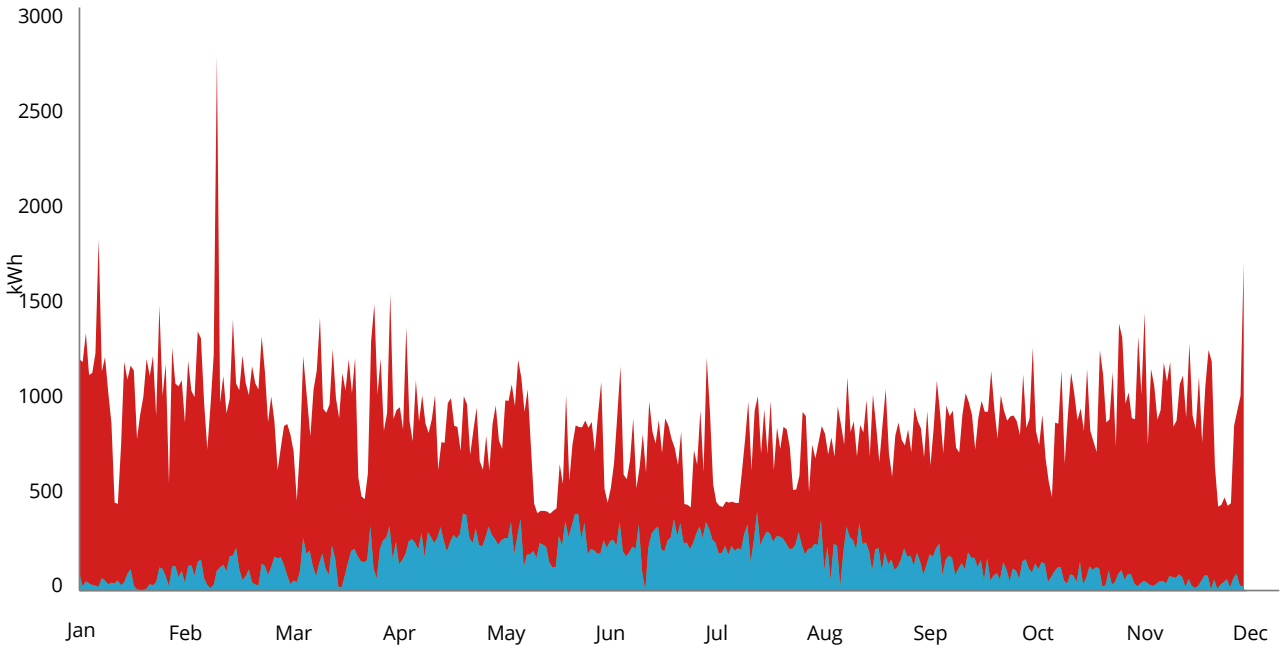
Annual Import/Export



270117 kWh

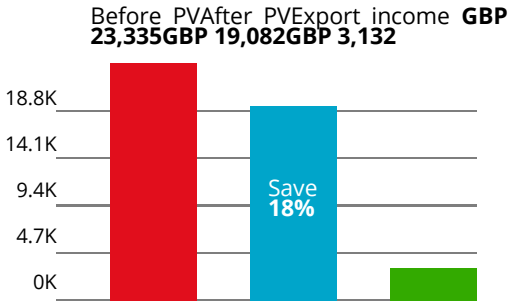
Where your electricity will come from in a typical year

Based on an electricity usage of 328,660 kWh per year, the graph below shows how much electricity used in the property is expected to come directly from the solar panels (blue) and how much is expected to be imported from the grid (red).



Financial Benefits

Based on our model we expect you to self consume 59,903 kWh of the 80,836 kWh of electricity the system should generate - providing 18% of the annual electricity consumption of 328,660 kWh in the property.



At an electricity tariff of £0.07/kWh, that's a saving of **£4,253** on your electricity bill - down from £23,335 at present! Your new bill could be **just £19,082 per year.**

20,880 kWh of excess solar energy will be exported to the grid. If you are paid by your supplier at £0.15 per kWh, **you will receive an additional £3,132 in income from them.**

Overall, your savings and benefits are expected to be around £7,385 in the first year after the system is installed.

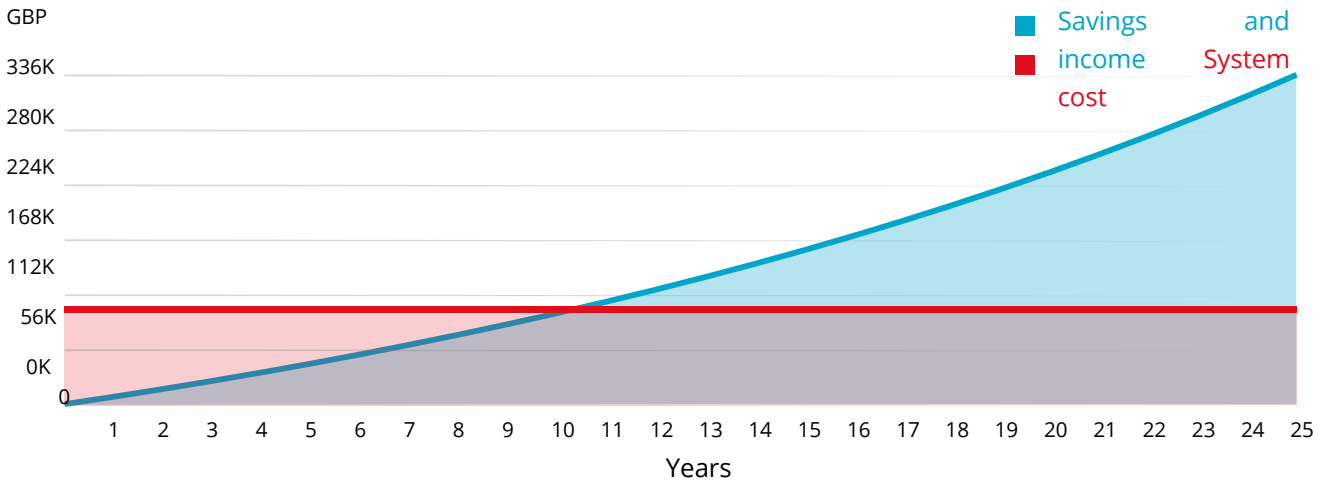
Payback

Using a more detailed model that also takes account of longer term factors such as inflation, gradual degradation in panel output over time and financial discount rates[1], **we expect the system to pay for itself in 10 years.**

Over a projected 25 year lifetime, we expect the system to have a **Net Present Value of £242,219.** A positive net present value is a good indication that an investment is financially worthwhile.

Disclaimer: Nothing in life is certain. Cloudy periods, growing trees, and even pigeon droppings can affect the output of your array. No-one really knows how electricity tariffs will change in the future, or what inflation will be in 10 years time. We have based our calculations on an inflation rate of 5%, electricity price that rises with inflation, a discount rate[1] of 0%, an import electricity tariff of 7.1p/kWh, and export payments of 15p/kWh. Returns are not guaranteed.

[1] Financial discounting is a method used to calculate the worth of future money in today's terms.



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 CO2 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

69,784 kg CO2 each year

18% will be supplied by solar, saving

12,719 kg CO2 each year

20,933 kWh will be exported, saving

4,445 kg CO2 each year

Total savings

17,164 kg CO2 each year

Your yearly CO2 reduction of 17,164 kg is equal to...

a car ride of 61,300 miles

absorCbOe2d by 787 trees

Disclaimer: We calculate and compare the likely annual CO2 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 CO2 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 CO2 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 CO2 absorbed by trees, we base this on a rate of 25kg per tree per year. Trees absorbs anywhere between 10 and 40kg of CO2 per year on average, depending on a whole host of factors including the species, location, planting density, and age.