Switched on to smarter energy

Infinity
ENERGY SERVICES

Proposal for Solar PV System

Martin Burton

29 May 2024

System size: 19.14 kWp

prepared by Joe Hew, Infinity Energy Services Ltd
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CONTENTS

Why trust Infinity Energy Services with your solar panel project?

We are delighted you have asked us to prepare a proposal for you. The following pages contain a comprehensive analysis of your needs, together with our recommended solution.

There are many solar and battery companies out there, so why choose us?

Highly Experienced

We've been designing and installing renewable energy systems since 2011. We've got plenty of in-house expertise and represent a safe pair of hands for your energy project.

Multi-Award-Winning

We are Winners of the Energy Efficiency South East Solar PV Installer of the Year 2023 Award, placed Second in the National Solar PV Installer of the Year 2023 Award, and were given a Performance Excellence Award 2023 by Tesla Energy.

No Sub-Contractors

All of our installation engineers are permanent employees and fully trained up in the latest renewable energy systems, ensuring the highest possible installation standards.

Local

From our Southampton and Bath branches, we are never more than about an hour away from your property. Being local – and having a local reputation to uphold – we will always go the extra mile to make sure you are 100% happy on completion.

One-Stop-Shop

In addition to solar panels and battery storage, we are also specialists in heat pumps, air conditioning, and electric vehicle chargers. We can advise you on how all of these technologies can best work together to save you money and lower emissions.

Here For The Long Term

We were founded over a decade ago when solar panels were first introduced to the UK. We've weathered all of the subsequent ups and downs of the industry. We're a strong, resilient company, with over 50 employees, and will be around in the future in case you need our help.

What are our customers saying?

"Professional and efficient. I thought my installers in my last property were top notch but Infinity are Premier League." – Colin M, 25 January 2024

"Every member of the team was helpful, knowledgeable and friendly. All questions were answered and quotes updated no matter how many questions were asked. The installation team were clean, neat and professional. Could not have wished for a better company to deal with. Highly recommended."
– Adrian P, 24 January 2024

"Wow! What a team - Infinity from start to finish have been amazing. Every person from the team I've dealt with has been helpful, professional and responsive. These guys are the experts and really care about the work they do." – Lucy B, 5 September 2023

Check out our handy explainer videos

Discover how we install solar panels on your roof

https://youtu.be/mY5_jhONkaM?si=P2X8EDVdRYj80V1j

Learn all about Infinity Energy Services

https://youtu.be/zYaL2crVCz4?si=yb2Z4MEqsyWGl55q

Design Overview

Further to my survey of your home, we have produced this report for a suitable solar PV and battery system.

We recreated your roof in our solar CAD software. In addition to the 3D functionality, these CAD software also: a) Pulls in weather data from a local weather station, in order to improve the accuracy of its prediction of how much electricity your solar panel system will produce; b) Knows your exact location on the map, in particular the latitude, which dictates how much sun you are exposed to throughout the year; and c) Incorporates other relevant inputs such as your energy demand profile, how much you pay per unit for your electricity, any shading objects, and so on. You will find the full design report, together with visualisations, in the Appendix.

We have placed 44 'all black' solar panels on your South and East facing roofs (see graphic below). These are 435W panels made by Jinko and further panel details can be found on the next page and in the data-sheet in the Appendix. This creates a 19.14 kWp solar panel system.

We then connect the panels to a 17 kW inverter made by SolarEdge. Full details about the choice and importance of the inverter can be found on page 6, and a data-sheet is in the Appendix.

The panels are 'embedded' with S500B SolarEdge Power Optimisers which make each panel independent of all the others, helping to maximise power output per panel, mitigating against the effects of any shading, and providing very detailed performance data for each panel. This is very much a state-of-the-art, future-proof system.

A Solar iBoost has also been included in the design, maximising your solar consumption, the data-sheets for this system is included in the Appendix.

System Components, Project Costs & Benefits

We will supply, install, and commission all of the following components:

44 x Jinko 435W mono-crystalline solar panels
Renusol Variosole On-roof mounting system (10-Year Warranty)
1 x SolarEdge 17kW solar inverter
44 x SolarEdge S500B Power Optimisers
2 x Marlec Solar iBoost
If on-roof, 1 x Bird Protection
MID-approved generation meter
All DC and AC isolators, cabling, trunking, etc.

Our system price also includes (Subjected to change if any additional work is required based on survey):

Roofing labour
Electrical labour
Scaffolding and access equipment
MCS Certificate (Solar aspect only)
5-year insured workmanship warranty (Solar aspect only)
Grid connection notification

Total fee for Solar Panel System:	**£20,254.00**	**inc. 0% VAT**
Total fee for immersion heater:	**£1,100.00**	**inc. 0% VAT**
Our total fee, including all of the above, is:	**£21,354.00**	**inc. 0% VAT**

Price valid up to 30 days

* Please note if you are paying through business we will have to charge VAT on it.

Here are the key data concerning system electricity output in kWh, predicted incomes and savings, assumptions, etc.:

Electricity bill saving by using solar electricity directly in the home:	£1,032	per year
Bill saving from diverting solar electricity to heat your water:	£90	per year
Electricity bill saving from storing solar electricity in a battery:	£0	per year
Electricity bill saving from charging your EV with solar electricity :	£0	per year
Income from the Smart Export Guarantee (see page 7):	£1,724	per year
Total Annual Gain:	**£2,847**	**per year**
Estimated Payback Time:	**6.3**	**Year(s)**

(Based on 5% yearly inflation)

In compiling these figures, we have assumed:

Overall solar array system size:	19.14	kWp	
The price you currently pay for your electricity:	24.5000	p	
The amount of electricity you need per year:	11,511	kWh	
The total amount of solar electricity that will be generated per year:	16,708	kWh	100 %
Solar electricity used directly in the home:	4,214	kWh	25.2 %
Excess solar electricity diverted to heat your water:	1,000	kWh	5.99 %
Excess solar electricity stored in a battery for later use:	0	kWh	0 %
Solar electricity used to charge your electric car:	0	kWh	0 %
Solar electricity exported to the grid:	11,494	kWh	68.8 %
Generation losses in system:	0	kWh	0 %
Solar Fraction – how much of your total energy bill will met by solar:	37	%	
Smart Export Guarantee Rate (assumed – see page 8):	15	p	

Solar Panels & Mounting System

Solar photovoltaic (PV) panels convert sunlight into electricity. The type of electricity produced is known as Direct Current or 'DC'.

Often with technological solutions, 'ROI' and 'quality' are mutually exclusive – you can have one or the other, but not both. This maxim used to be true in the world of solar as well. Nowadays, due to mass production of solar panels in brand new, gleaming factories in Asia, and with the financial muscle of huge conglomerates behind R&D and after-care, you can secure very high
quality equipment, at a keen price, in the knowledge that were the worst to happen, the warranty will be backed up in full, far into the future.

We have access to all the solar panels currently available in the UK market and continually assess the key factors such as price, build quality, efficiency, warranty, manufacturer size, UK support, and so on. At the moment, for your project, we recommend the following panel:

Manufacturer:	**Jinko**
Panel Rating:	**435W**
Type of Silicon:	**mono-crystalline**
Product Warranty:	**25 years**
Model Number:	**JKM435-N-54HL4-B**
Number of Panels:	**44**
Solar PV System Size:	**19.14 kWp**

JinkoSolar Holding Co., Ltd. is currently the world's largest solar panel manufacturer, shipping 11.4 GW of modules in 2018. Headquartered in Shanghai, China, the company started out as a wafer manufacturer in 2006 and went public on the New York Stock Exchange in 2010.

JinkoSolar distributes its solar products and sells to a utility, commercial and residential customer base in China, the United States, Japan, Germany, the United Kingdom, Chile, South Africa, India, Mexico, Brazil, the United Arab Emirates, Italy, Spain, France, Belgium, and other countries and regions.

We work with all the major **mounting system** manufacturers. For your installation, we recommend:

Manufacturer:	**Renusol**
Type:	**On-roof mounting system**
System:	**Variosole**
Country of Manufacture:	**Germany**
Product Warranty:	**10 years**

Inverter

The solar panels are then connected to an **inverter**. The inverter converts the DC electricity from the panels into Alternating Current or 'AC' electricity which can then be used to power devices, lighting, etc.

An AC electricity cable then runs from the inverter to your fuse-box (consumer unit).

At various points between the panels and the fuse-box, we place **isolators** which allow either parts of the system, or the entire system, to be shut down safely.

We also install a **generation meter** which records how much solar electricity has been generated.

For the solar PV system size mentioned on the previous page, we recommend the following inverter:

Manufacturer:	**SolarEdge**
Inverter Rating:	**17kW**
Model:	**SE-17000H-NET**
Warranty:	**20 years**
Number of Inverters:	**1**
Total Inverter Capacity:	**17kW**

You can find a data-sheet of the inverter in the Appendix.

The total inverter capacity in kW is usually less than the total 'peak' solar panel capacity in kWp. This is because solar panels only reach their peak, or full, output capacity when the sun shines at exactly 90 degrees to the panel surface and in ideal temperature conditions. For most of the year, and at most times of the day, solar panels do not output at their full rated capacity. For this reason, inverters are often 'under-sized' in relation to the solar panels – basically it helps the whole electricity generation system run more efficiently.

SolarEdge Power Optimisers and inverters are a great way to get the most out of shaded or complicated arrays. Optimisers track and modulate the performance of each module in order to overcome any differences resulting from shading, orientation or module mismatch.The SolarEdge also includes module-level monitoring via an online portal which is compatible with smartphone apps. The SolarEdge optimisers carry a 25 year warranty!

Optional Extras and Other Products we offer

Certain devices can complement a solar PV array (see below). Please let us know if you are interested in any of these.

Heat your water with solar electricity

If you have an immersion heater in your water tank, you can heat your water for free with excess solar electricity.

There are various devices on the market, and the one we recommend is the Solar iBoost or the MyEnergi Eddi. It's relatively inexpensive and easy to install.

Manufacturer
Marlec

Warranty
2 years

Cost
£550.00

Manufacturer
MyEnergi

Warranty
3 years

Cost
£650.00

The iBoost or Eddi is usually fitted in your airing cupboard next to the immersion. We then install a clamp / transmitter where the main electricity cable comes into your home. When the clamp senses you have surplus solar electricity, it turns your immersion on and, hey presto, you get free hot water.

Charge your electric car with sunshine

Manufacturer
MyEnergi

Warranty
3 years

Charge Rate	Cost	
7 kW (single phase)	£1,000	at 0% VAT
22kW (three phase)	£1,500	at 0% VAT

Solar electricity is also the most environmentally friendly way of charging an electric car.

If you already have an electric car – or are thinking you might get one in the future – we recommend a 'smart' home chargepoint like the Zappi.
The Zappi has a setting that guarantees you can charge your car with free solar electricity only, if you wish to. It also allows you to make use of cheap, overnight tariffs, such as Octopus Go.

* All prices are valid for 30 days from the date of quotation and then would be subjected to change.

Store excess solar energy in a home battery

Another way of capturing excess solar electricity from your panels is to charge a home battery. The stored solar electricity can then be used when the sun isn't shining, e.g. in the evenings or at night.

The most advanced batteries, such as the Tesla Powerwall, also (i) provide emergency power in a power-cut and (ii) can be charged with cheap, off-peak electricity to supplement solar energy in the winter.

Please find below our most commonly installed battery details with cost for comparison:

Manufacturer - Tesla

Model
Powerwall 2 AC

Storage Capacity
13.5 kWh

Warranty -10 years

Cost
£7,367 at 0% VAT
Cost per kWh
£545.70

Manufacturer - SolarEdge

Model
SolarEdge Home battery

Storage Capacity
10 kWh

Warranty -10 years

Cost
£7,199 * at 0% VAT
Cost per kWh
£719.90

* excludes inverter cost

Manufacturer - AlphaESS

Model
Smile-B3-AC-5.04

Storage Capacity
5.04 kWh

Warranty -10 years**
Cost
£4,399 at 0% VAT
Cost per kWh
£872.82

Model
Smile-B3-AC-10.08

Storage Capacity
10.08 kwh

Warranty -10 years**
Cost
£4,499 at 0% VAT
Cost per kWh
£446.33

Manufacturer - GivEnergy

Model
GIV-AC3.0-5.2

Storage Capacity
5.2 kWh
Warranty -12 years**
Cost
£5,099 at 0% VAT
Cost per kWh
£980.58

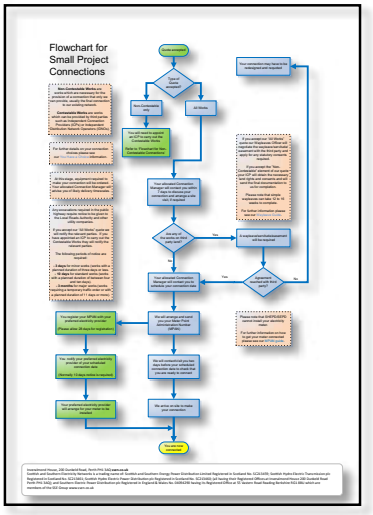
Model
GIV-AC3.0-9.5

Storage Capacity
9.5 kWh
Warranty -12 years**
Cost
£5,449 at 0% VAT
Cost per kWh
£573.58

*Please note all prices at the date of the quote sent, this is subjected to change with time.
**The battery inverter is at 5 years
*** No Whole house back up for batteries apart from Tesla Powerwall and Giv All-in-One

Grid Application & Smart Export Guarantee

Grid Application



In order to connect solar inverters greater than 3.68 kW on a single phase to the national grid, you need prior permission from the local electricity company, known as the 'DNO'.

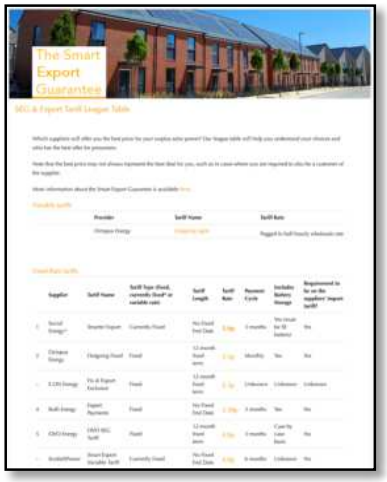
Your DNO is:
Scottish and Southern Electricity Networks

Your inverter capacity is:
17.00 kW

Per phase, if your combiend inverter size is greater than 3.68 kW an application to the DNO is required. This process will take 8-9 weeks and we will undertake all the paperwork.

If the aggregate capacity is greater than 13.8kW/ph using a fully type tested inverters, these will require a witness test will be included.

Smart Export Guarantee



The Smart Export Guarantee (SEG) scheme started on 1 January 2020.

You are paid for every kWh (unit) of solar electricity you export to the grid.

You will need to sign up with a participating energy supplier and have a suitable smart meter installed (free of charge). Please note the possibility of installing a smart meter in your area will have to be assess with your electricity supplier.

The rate you are paid per kWh varies from supplier to supplier. We suggest you contact your energy supplier to see if they offer the SEG and what their rate is.

At the moment, we recommend Octopus Energy which pays 15p per kWh on its Outgoing Fixed tariff, but you would need to check with Octopus if you can access this deal.

Roof Structural Assessment & Planning Permission

Roof Structural Assessment

A typical solar panel weighs 21 kg and has a surface area of 1.9m^2. Each panel, together with the associated mounting equipment, will impose a load on your roof. It is highly likely your roof can easily tolerate this additional loading.

Nonetheless, we will carry out a structural analysis of your roof to guarantee the extra load is within tolerances.

Planning Permission

Most domestic solar panel installations do not require planning permission, as long as they are designed appropriately. The UK law in this area is as follows (taken from the government statutory instrument '2015 No. 596' which relates to the Town and Country Planning Act):

"A.1 Development is not permitted by Class A if—

(a) the solar PV or solar thermal equipment would protrude more than 0.2 metres beyond the plane of the wall or the roof slope when measured from the perpendicular with the external surface of the wall or roof slope;

(b) it would result in the highest part of the solar PV or solar thermal equipment being higher than the highest part of the roof (excluding any chimney);

(c) in the case of land within a conservation area or which is a World Heritage Site, the solar PV or solar thermal equipment would be installed on a wall which fronts a highway;

(d) the solar PV or solar thermal equipment would be installed on a site designated as a scheduled monument; or

(e) the solar PV or solar thermal equipment would be installed on a building within the curtilage of the dwellinghouse or block of flats if the dwellinghouse or block of flats is a listed building."

We have designed the system such that clauses (a), (b) and (c) are met in full. In addition, your house is not sited on a scheduled monument, therefore clause (d) does not apply.

It is our opinion, therefore, that planning permission is not required as long as your house is not listed or within the boundary of another listed building (clause (e)).

Ultimately, planning issues are the responsibility of the building owner and/or tenant, and independent advice should be sought in case of any doubt.

Accreditations, Warranties & References

Accreditations

We hold all the necessary accreditations to be able to install solar panel systems in the UK. These accreditations mean you are entitled to receive any subsidies that might be available, and also protect you as a consumer. Here are our certificate and membership numbers:

MCS Certificate Number:	NAP 14896
RECC / MCS Membership Number:	00048808

The Microgeneration Certification Scheme, **MCS,** certifies microgeneration products, such as solar panels, used to produce electricity and heat from renewable sources. MCS also certifies installation companies to ensure the microgeneration products have been installed and commissioned to the highest standard for the consumer.

As members of the Renewable Energy Consumer Code, **RECC**, we agree to abide by the Consumer Code. It covers all the factors that contribute to a high standard of consumer service, before, during and after a contract is agreed.

Warranties & Guarantees

The main components of the installation come with solid **product warranties** of at least 10 years. The exact product warranty lengths for the equipment we recommend are as follows:

Solar panels:	25 years
Solar Inverter(s):	20 years

In addition, Infinity Energy Services provides a free 5-year **insurance-backed guarantee** on our workmanship. In the first instance, if you are not 100% satisfied with our workmanship, you should contact us on 0800 909 8882 and we will come out and rectify it, free of charge. If our company is no longer trading, you would contact the insurance company, IWA, who will send a qualified company out to fix the problem, again free of charge.
The insurance policy also guarantees your deposit, such that if anything happens to us before installation, you can recover your deposit in full.

References

Infinity Energy Services has been installing solar PV systems since 2011. We are technically-led and put great emphasis on excellent electrical design, creating solar panels systems that produce the maximum amount of electricity possible in any given location.

We also pride ourselves on outstanding customer service; before, during, and after installation. We are happy to put you in touch with previous customers so you can hear their feedback direct. In the meantime, please refer to our Checkatrade web:

www.checkatrade.com/InfinityEnergyServicesLtd/Reviews.aspx

The Next Steps

We trust our careful, detailed approach to your project is what you are looking for and that our overall fee is competitive.

If you have any questions at all, about any aspect of the design or equipment choice, please do not hesitate to ask.

If you did wish to progress with us, the next steps would be:

1. Finalise the design for the solar PV system.

2. Agree an installation date.

3. We send you an order confirmation form which you sign and then pay us a 25% deposit.

4. We place orders for all the equipment.

5. 14 days prior to installation you will be asked to pay us 35% stage 2 deposit.

6. We install and commission the solar panel system on the agreed date.

7. You pay us the balance on completetion.

8. We notify the DNO that the system has been energised.

Best regards

Kathryn Coviello, Infinity Energy Services

Phone: 01489 533503
Email: kathryn.coviello@infinity-energy.co.uk

The Appendix

Infinity Energy Services Ltd.
Unit 6, Swanwick Business Centre, Bridge Road
Hampshire, SO31 7GB

St Francis Church
Martin Burton
St Francis Church
Warwick Road
Keynsham
BS31 2PW

Contact person:
Joe Hew
Phone: 01489 533 500
E-Mail: joe.hew@infinity-energy.co.uk

Project Name: St Francis Church-19.14kWp-Jinko435W-SE17kW

29/05/2024

Your PV system from Infinity Energy Services Ltd.

Address of Installation

St Francis Church
Warwick Road
Keynsham
BS31 2PW

Project Overview

Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Aberdaron (Auto), GBR (2001 - 2020)	
Values source	Meteonorm 8.2	
PV Generator Output	19.14	kWp
PV Generator Surface	87.9	m²
Number of PV Modules	44	
Number of Inverters	1	

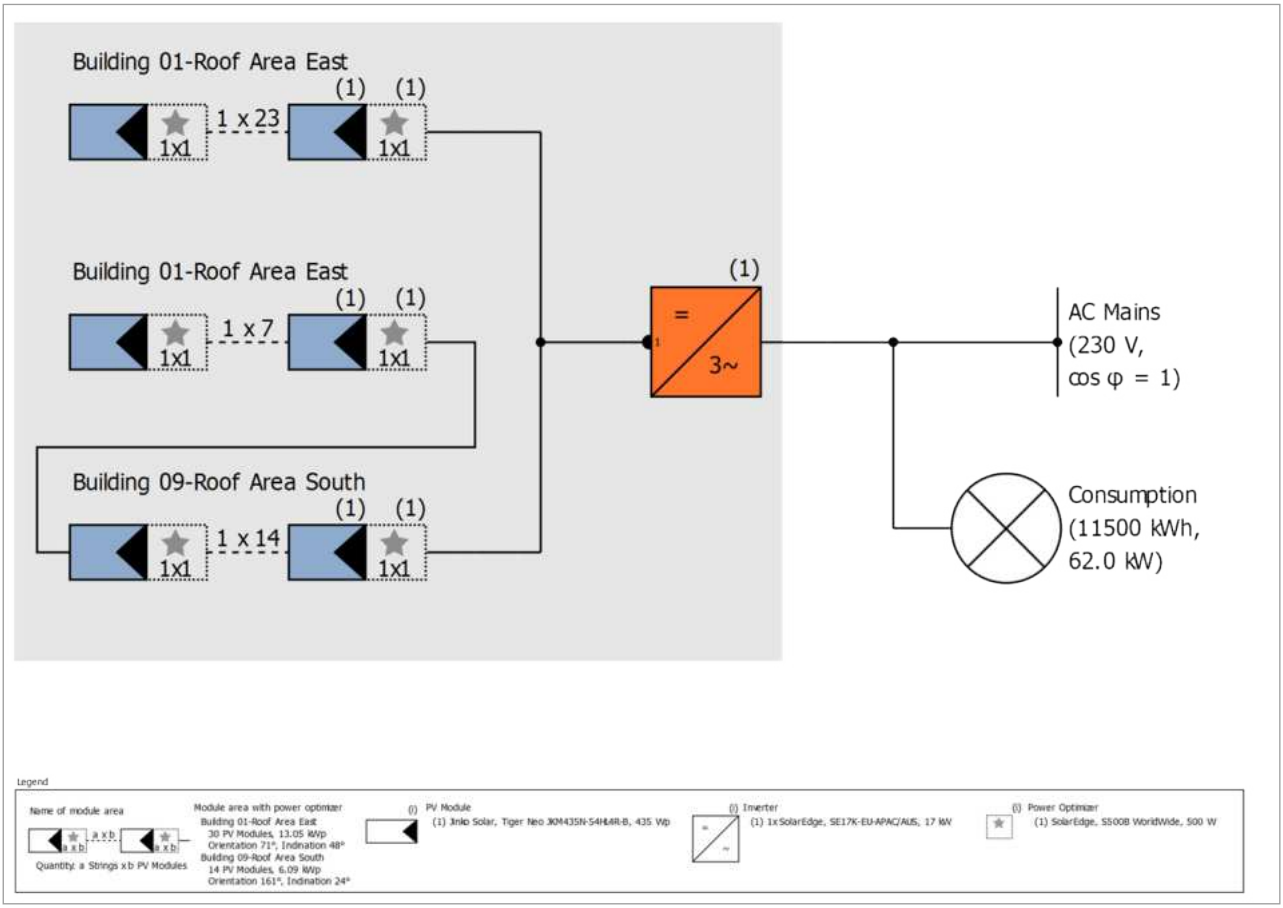


Figure: Schematic diagram

Production Forecast

Production Forecast		
PV Generator Output	19.14	kWp
Spec. Annual Yield	872.38	kWh/kWp
Performance Ratio (PR)	90.76	%
Yield Reduction due to Shading	3.9	%
PV Generator Energy (AC grid)	16,708	kWh/Year
Own Consumption	4,214	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	12,494	kWh/Year
Own Power Consumption	25.2	%
CO_2 Emissions avoided	7,848	kg / year
Level of Self-sufficiency	36.6	%

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System with Electrical Appliances

Climate Data

Location	Aberdaron (Auto), GBR (2001 - 2020)
Values source	Meteonorm 8.2
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	11500 kWh
Household, seasonal pattern comparable with standard profile	11500 kWh
Load Peak	62 kW

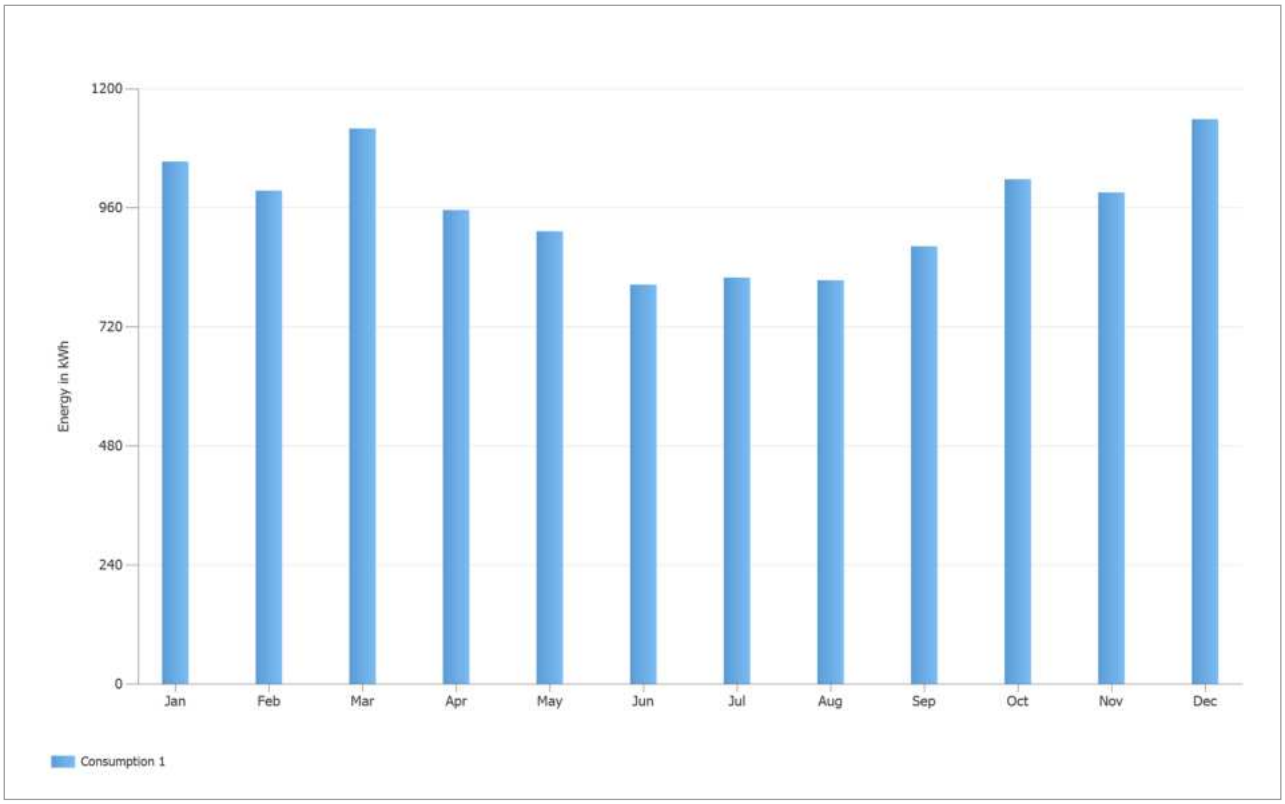


Figure: Consumption

Module Areas

1. Module Area - Building 01-Roof Area East

PV Generator, 1. Module Area - Building 01-Roof Area East

Name	Building 01-Roof Area East	
PV Modules	30 x Tiger Neo JKM435N-54HL4R-B (v2)	
Manufacturer	Jinko Solar	
Inclination	48	°
Orientation	East 71	°
Installation Type	Roof parallel	
PV Generator Surface	59.9	m²

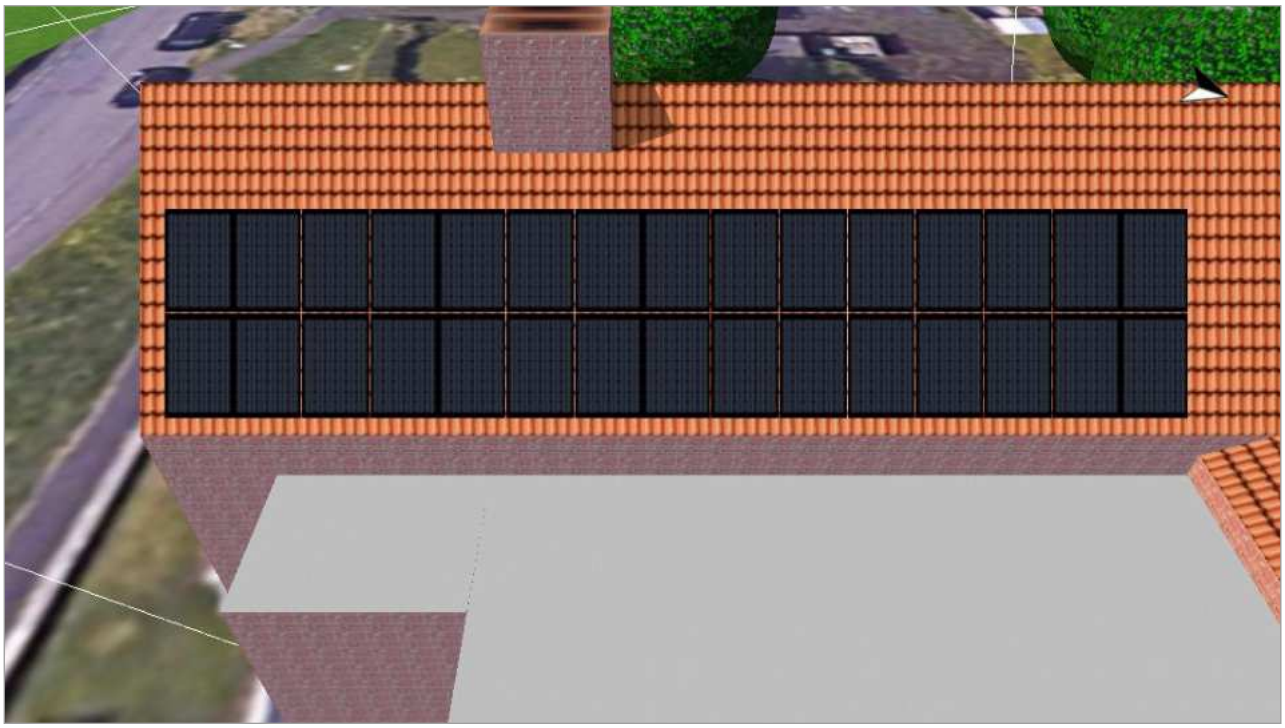


Figure: 1. Module Area - Building 01-Roof Area East

2. Module Area - Building 09-Roof Area South

PV Generator, 2. Module Area - Building 09-Roof Area South

Name	Building 09-Roof Area South	
PV Modules	14 x Tiger Neo JKM435N-54HL4R-B (v2)	
Manufacturer	Jinko Solar	
Inclination	24	°
Orientation	South 161	°
Installation Type	Roof parallel	
PV Generator Surface	28.0	m²

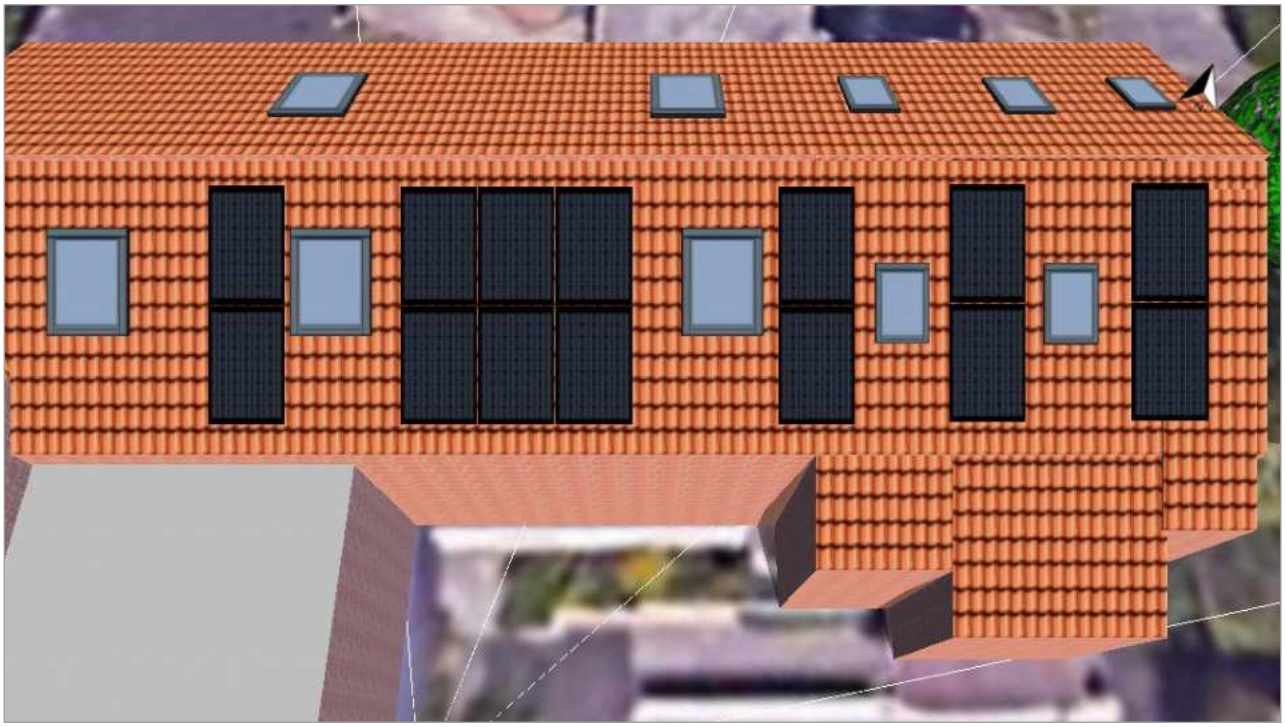


Figure: 2. Module Area - Building 09-Roof Area South

Horizon Line, 3D Design

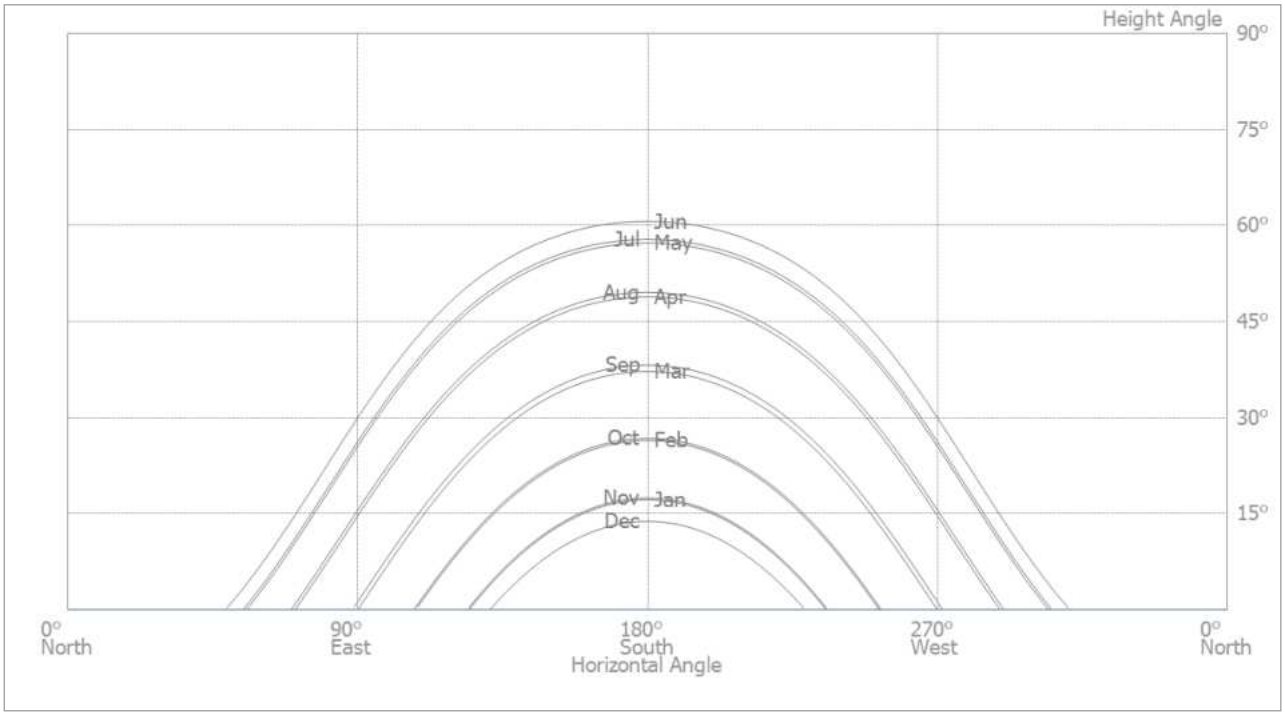


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1	
Module Areas	Building 01-Roof Area East + Building 09-Roof Area South
Inverter 1	
Model	SE17K-EU-APAC/AUS (v2)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	112.6 %
Configuration	MPP 1:
	1 x 23☆ [1 x 1] ||
	1 x 7☆ [1 x 1] + 1 x 14☆ [1 x 1]
Power Optimizer	44x SolarEdge, S500B WorldWide (v3)

AC Mains

AC Mains	
Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System

PV Generator Output	19.14	kWp
Spec. Annual Yield	872.38	kWh/kWp
Performance Ratio (PR)	90.76	%
Yield Reduction due to Shading	3.9	%
PV Generator Energy (AC grid)	16,708	kWh/Year
Own Consumption	4,214	kWh/Year
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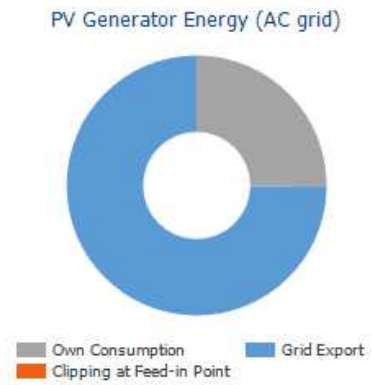
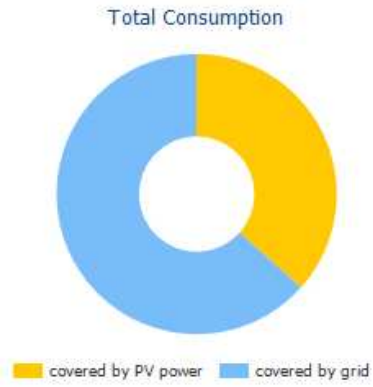


Appliances

Appliances	11,500	kWh/Year
Standby Consumption (Inverter)	11	kWh/Year
Total Consumption	11,511	kWh/Year
covered by PV power	4,214	kWh/Year
covered by grid	7,296	kWh/Year
Solar Fraction	36.6	%



Level of Self-sufficiency

Total Consumption	11,511	kWh/Year
covered by grid	7,296	kWh/Year
Level of Self-sufficiency	36.6	%

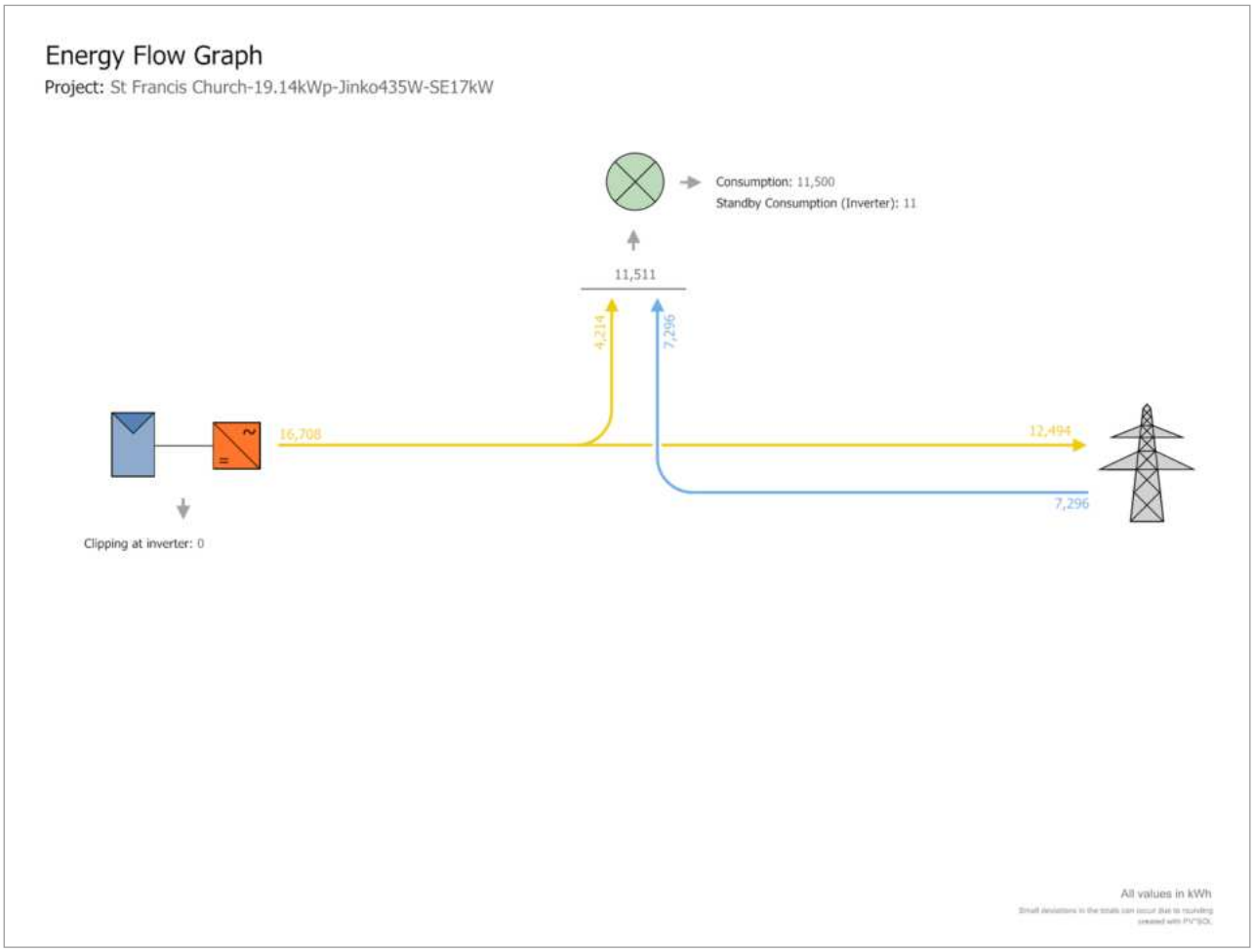


Figure: Energy flow

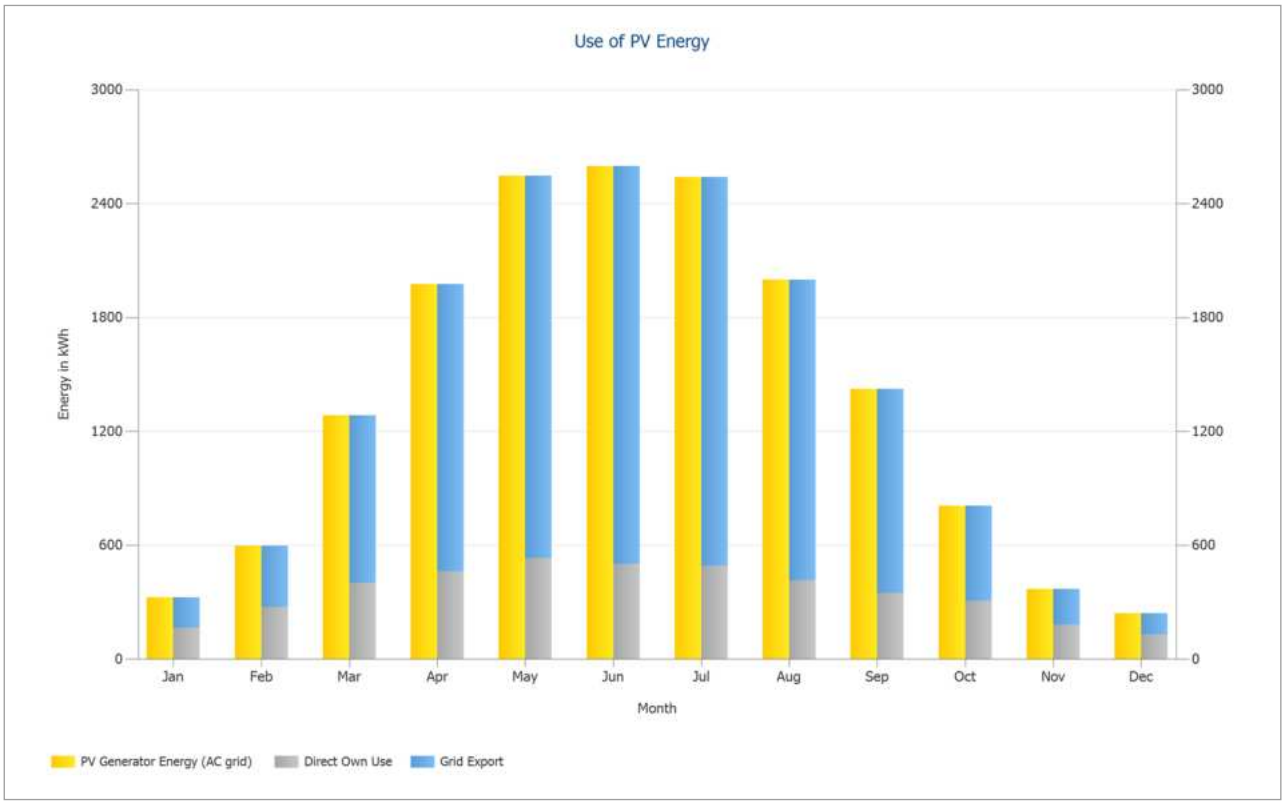


Figure: Use of PV Energy

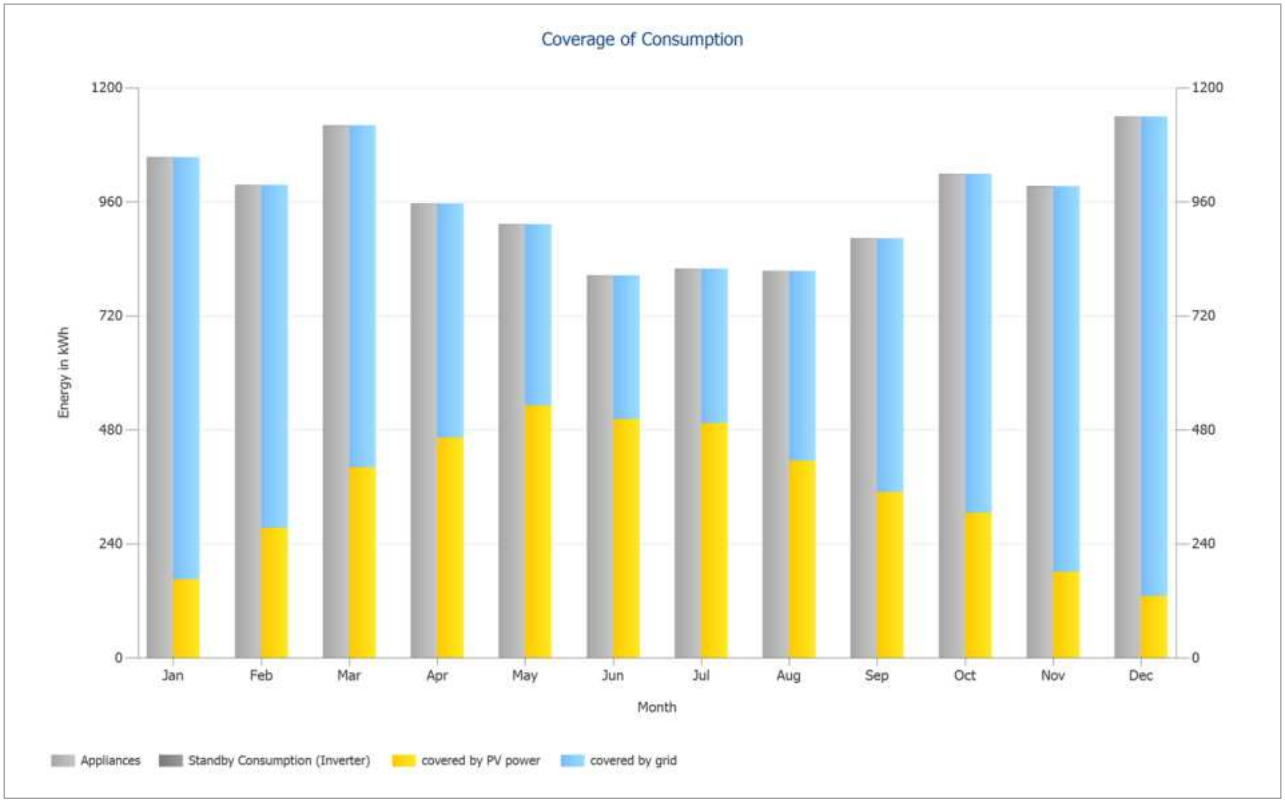


Figure: Coverage of Consumption

Plans and parts list

Circuit Diagram

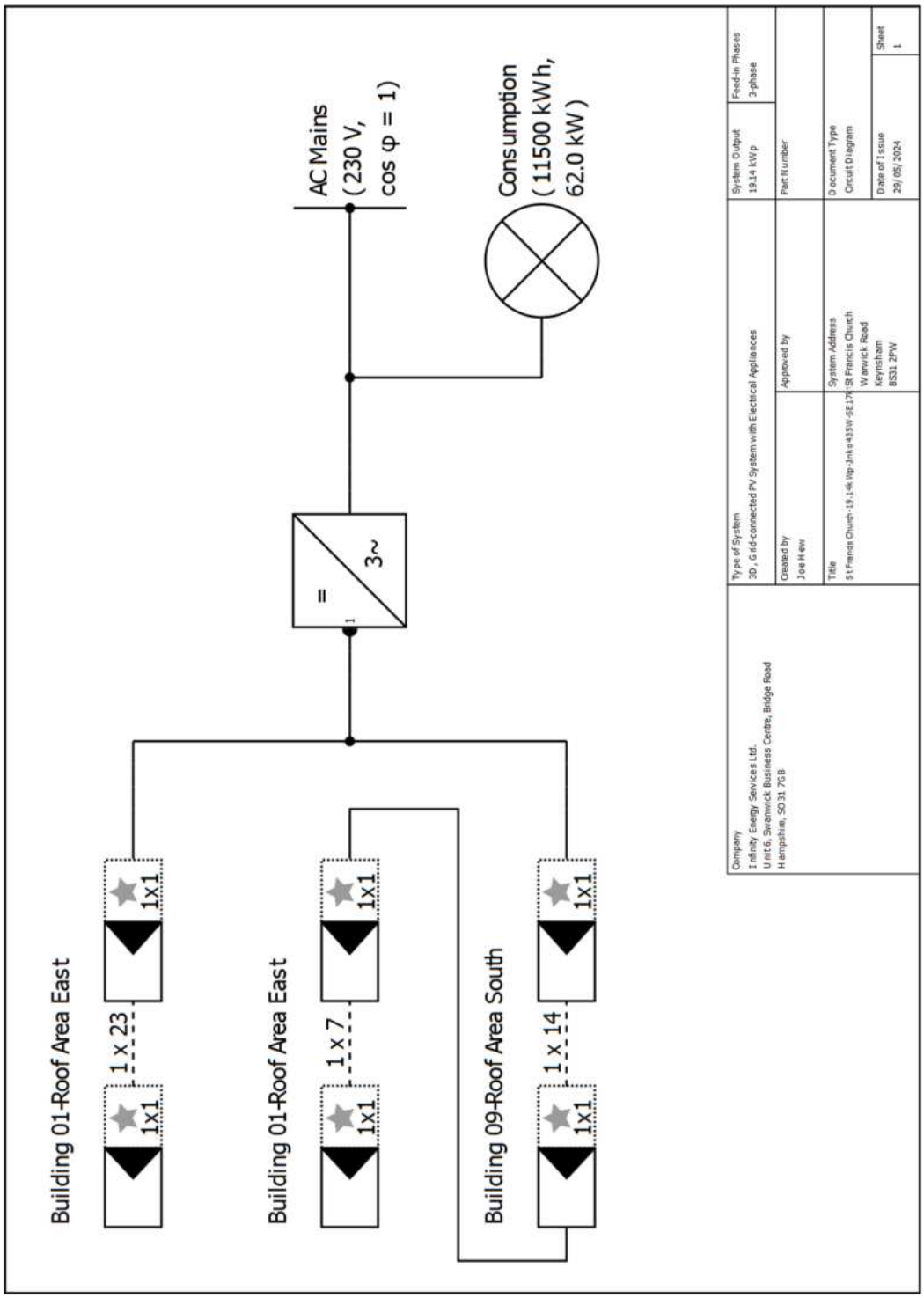


Figure: Circuit Diagram

Overview plan

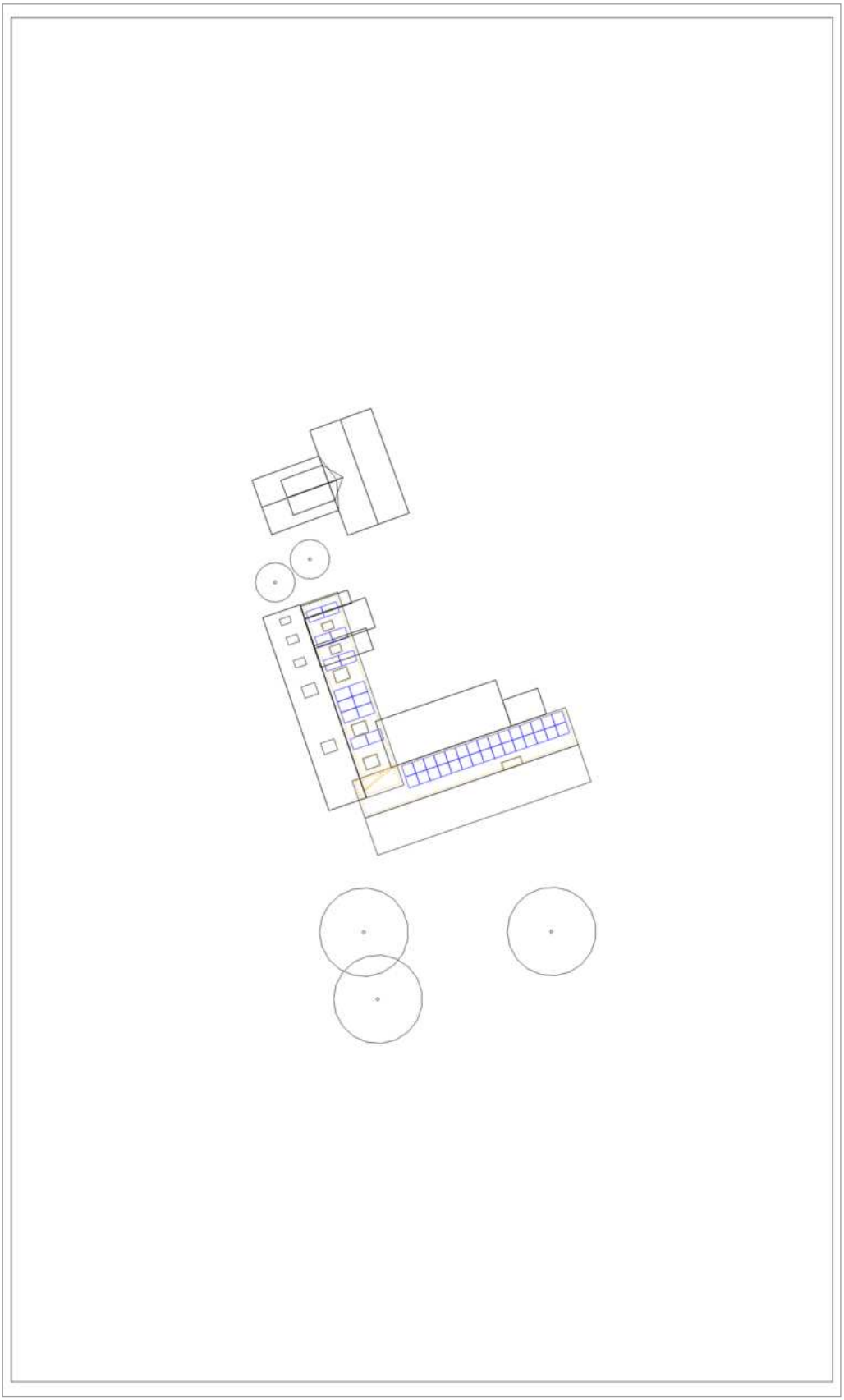


Figure: Overview plan

Dimensioning Plan

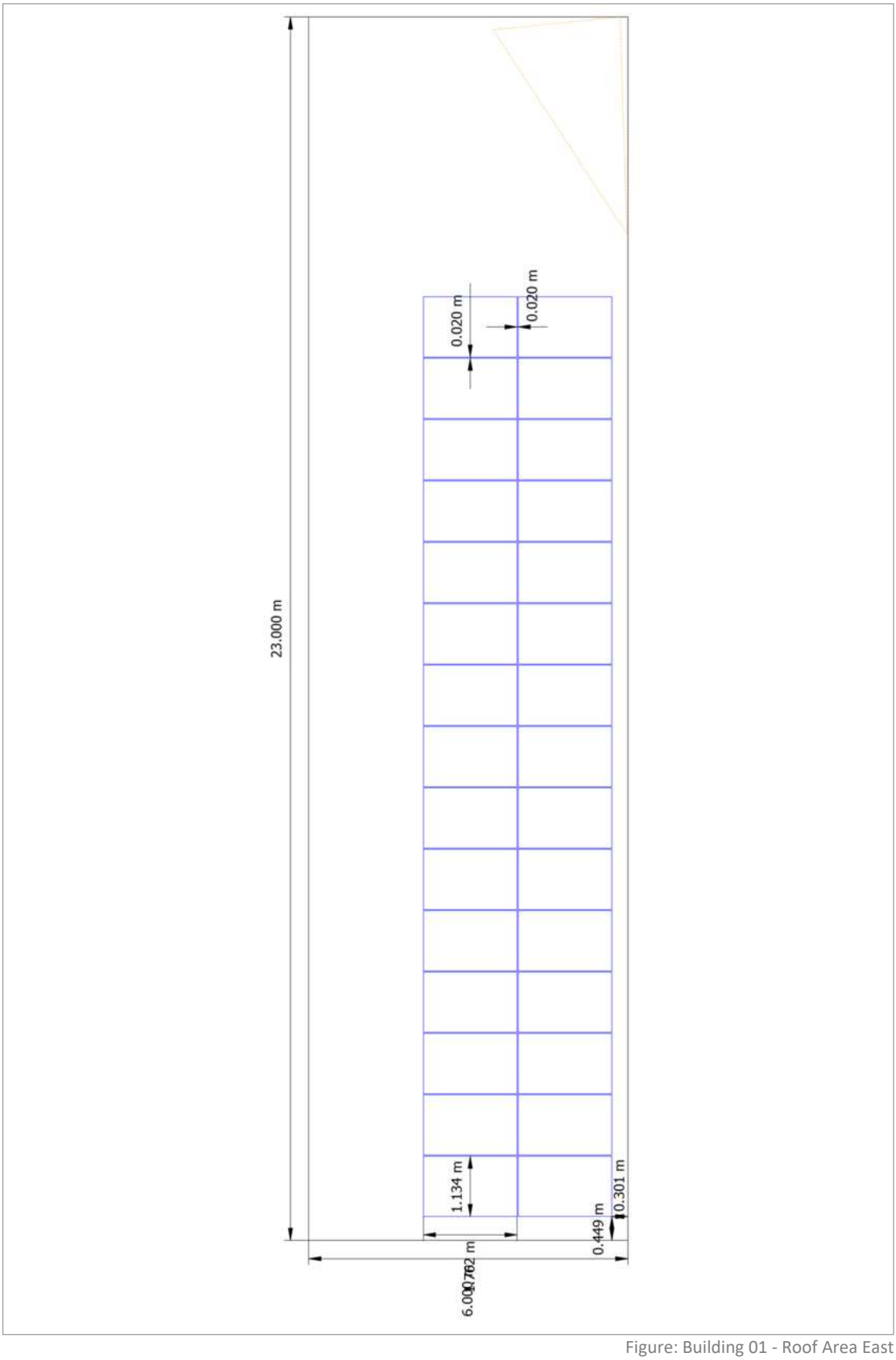


Figure: Building 01 - Roof Area East

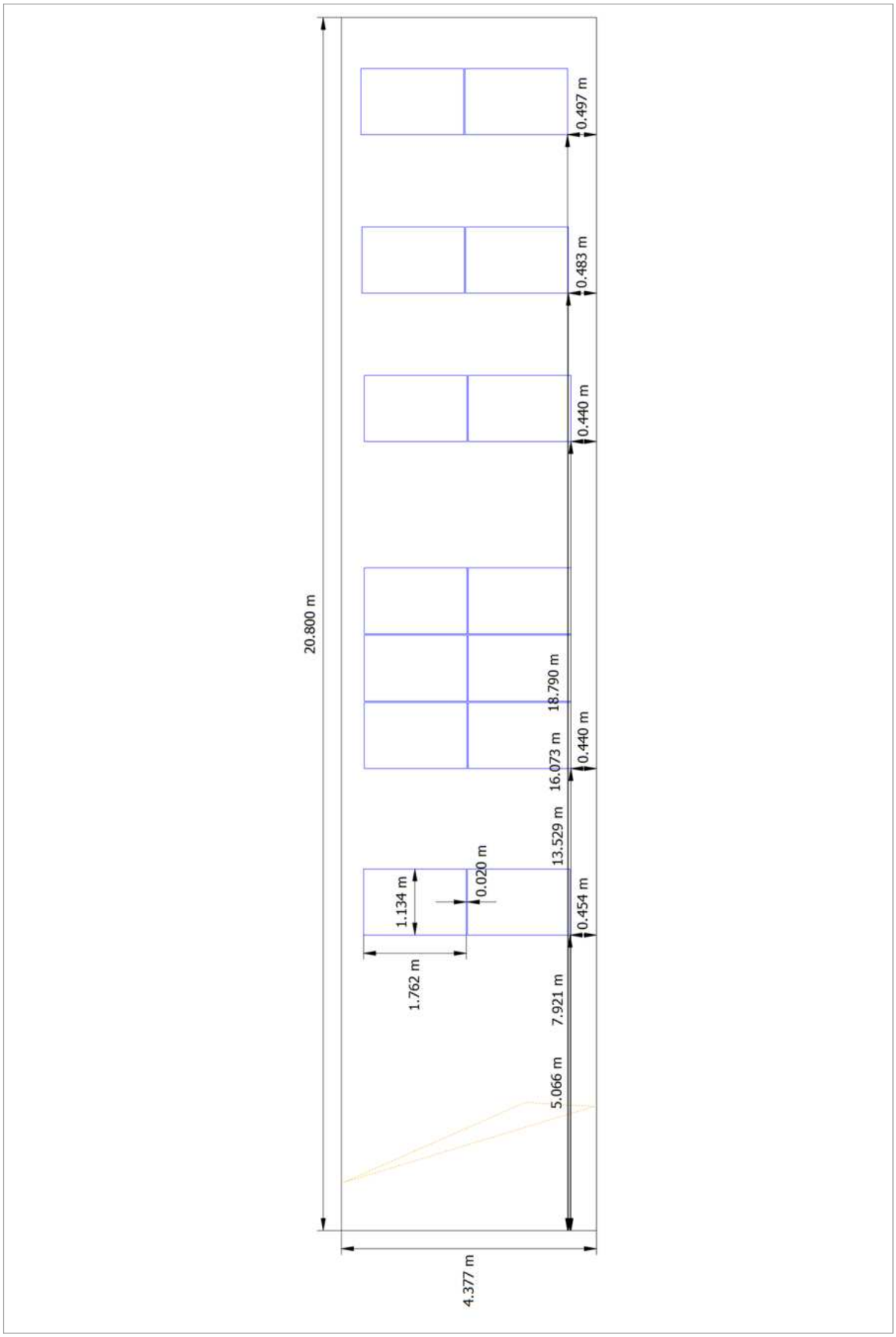


Figure: Building 09 - Roof Area South

String Plan

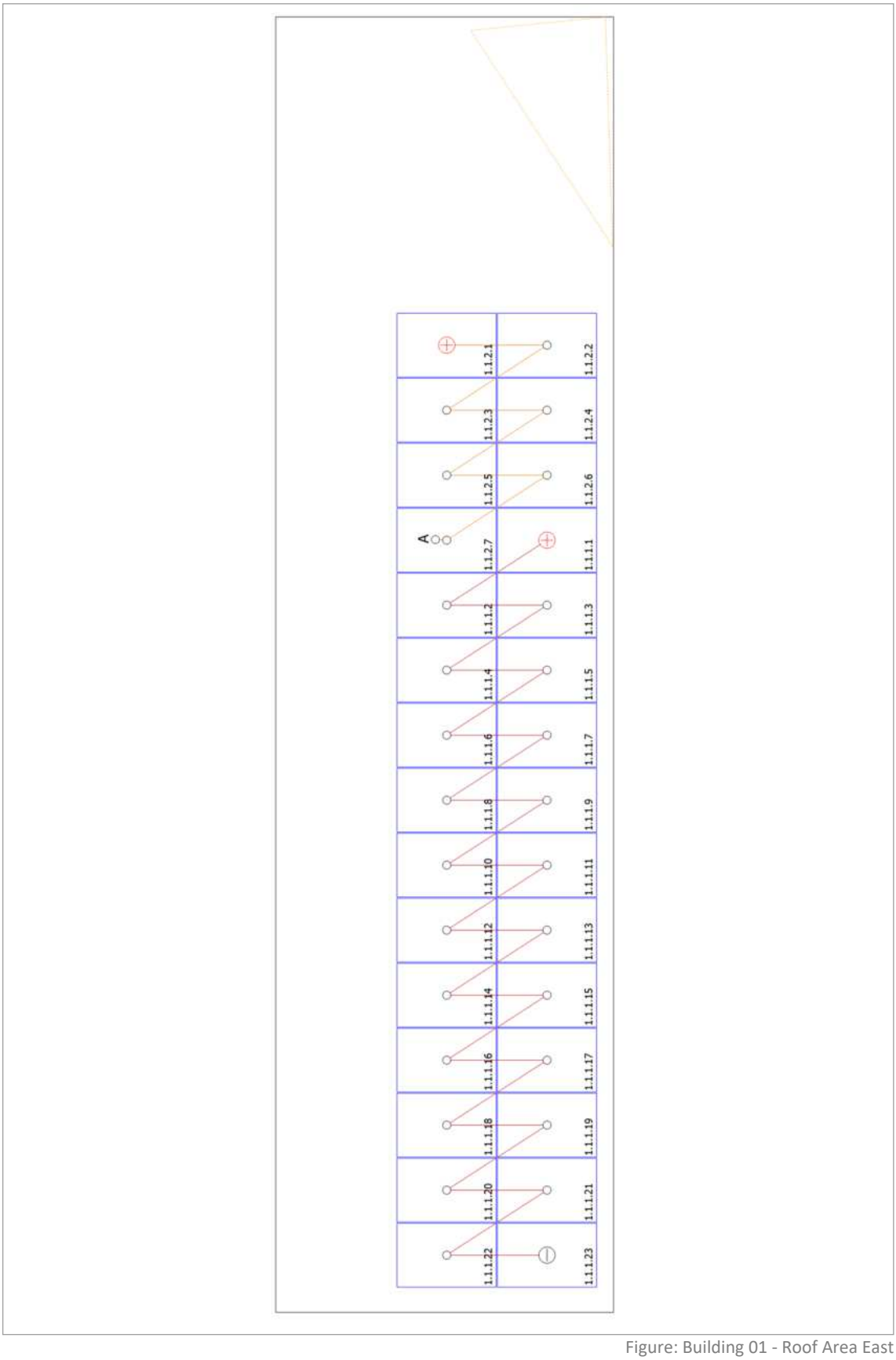


Figure: Building 01 - Roof Area East

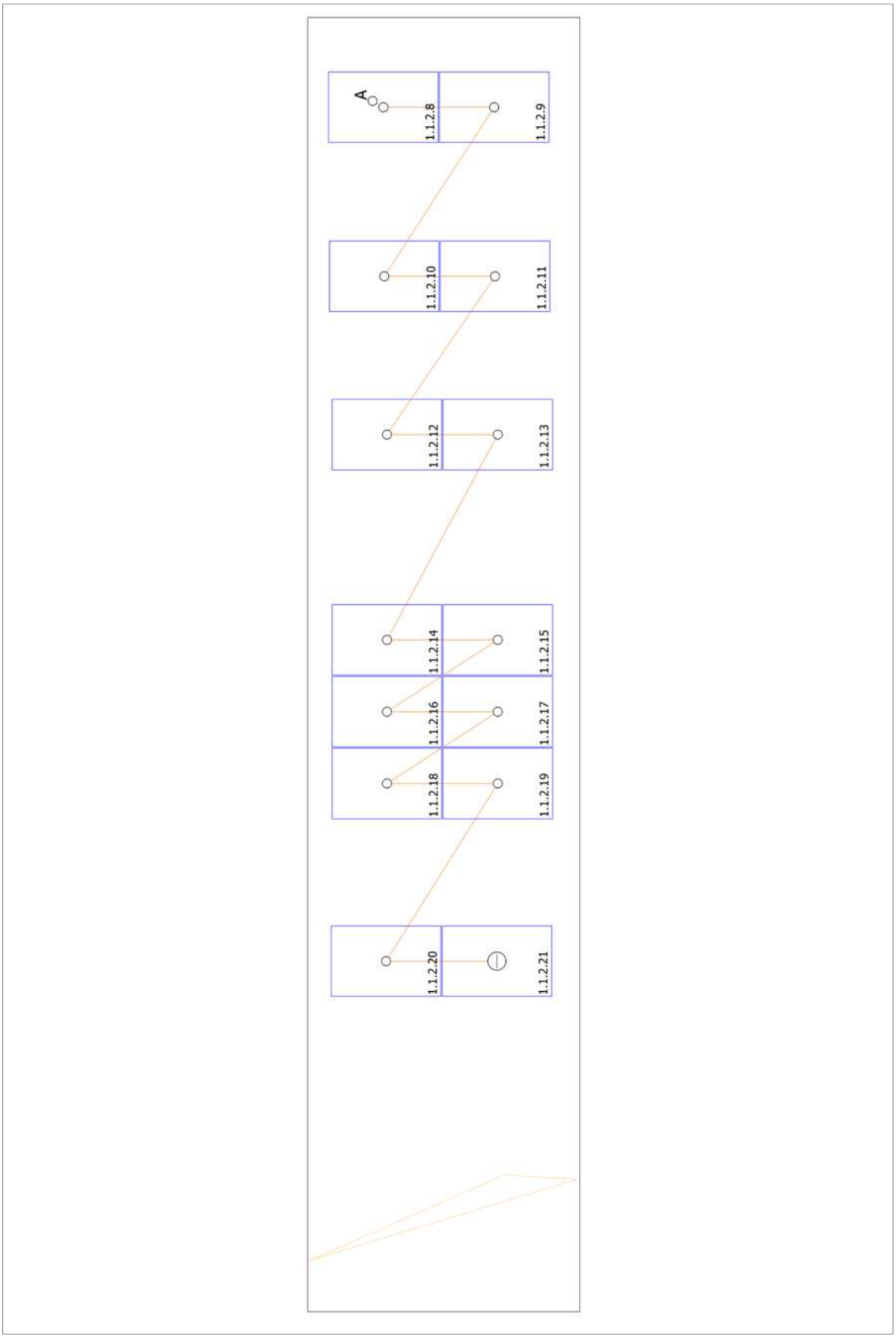


Figure: Building 09 - Roof Area South

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Jinko Solar	Tiger Neo JKM435N-54HL4R-B	44	Piece
2	Inverter		SolarEdge	SE17K-EU-APAC/AUS	1	Piece
3	Power Optimizer		SolarEdge	S500B WorldWide	44	Piece

Screenshots, 3D Design

Environment

Figure: Screenshot07

Figure: Screenshot08

Module Areas

Figure: Screenshot03

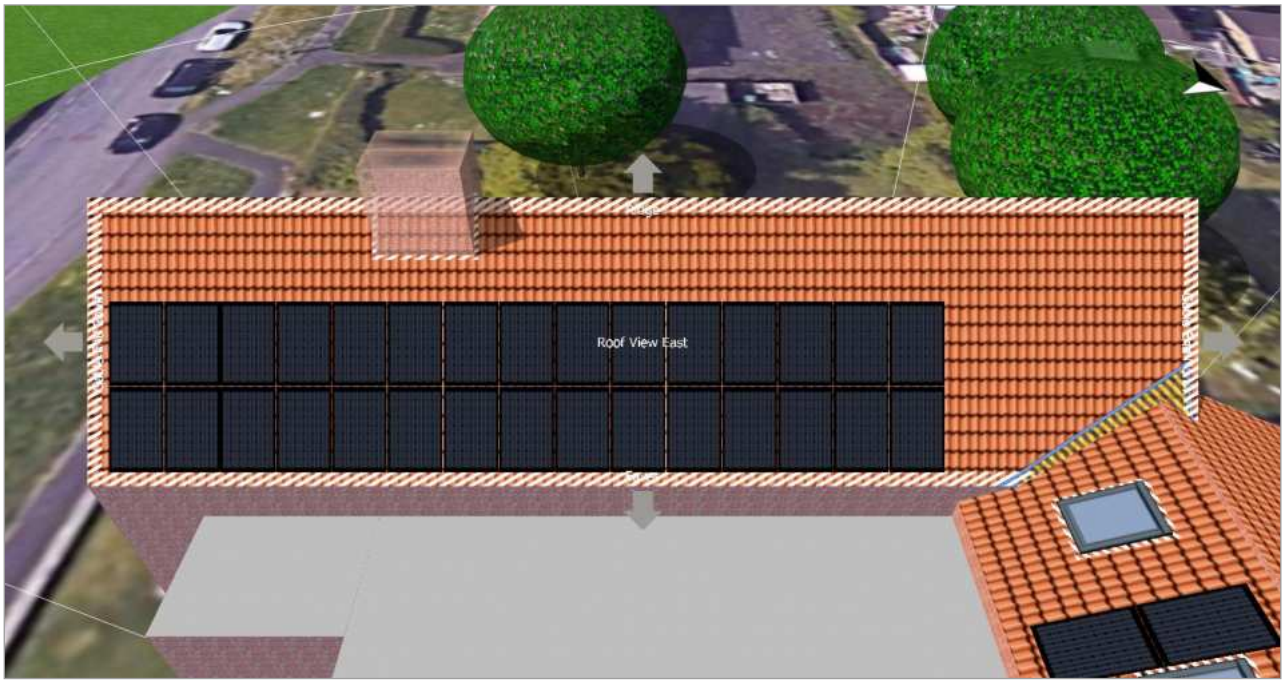


Figure: Screenshot04

Configuration

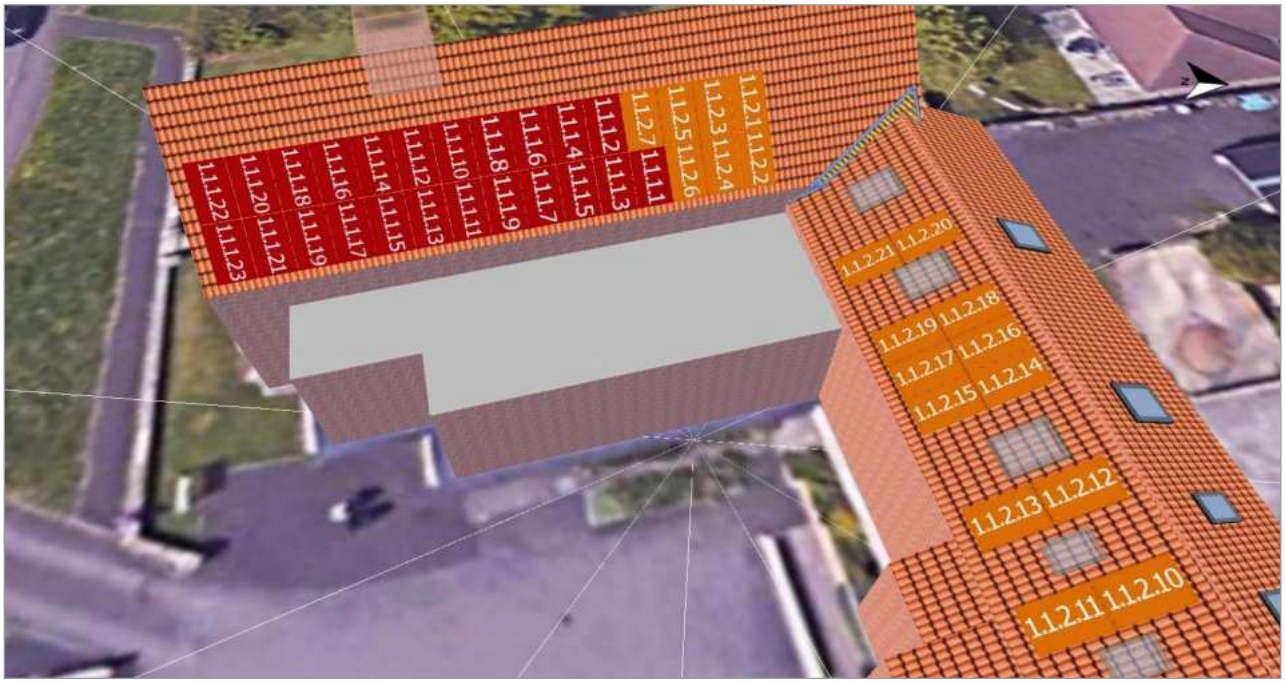


Figure: Screenshot06

Shading

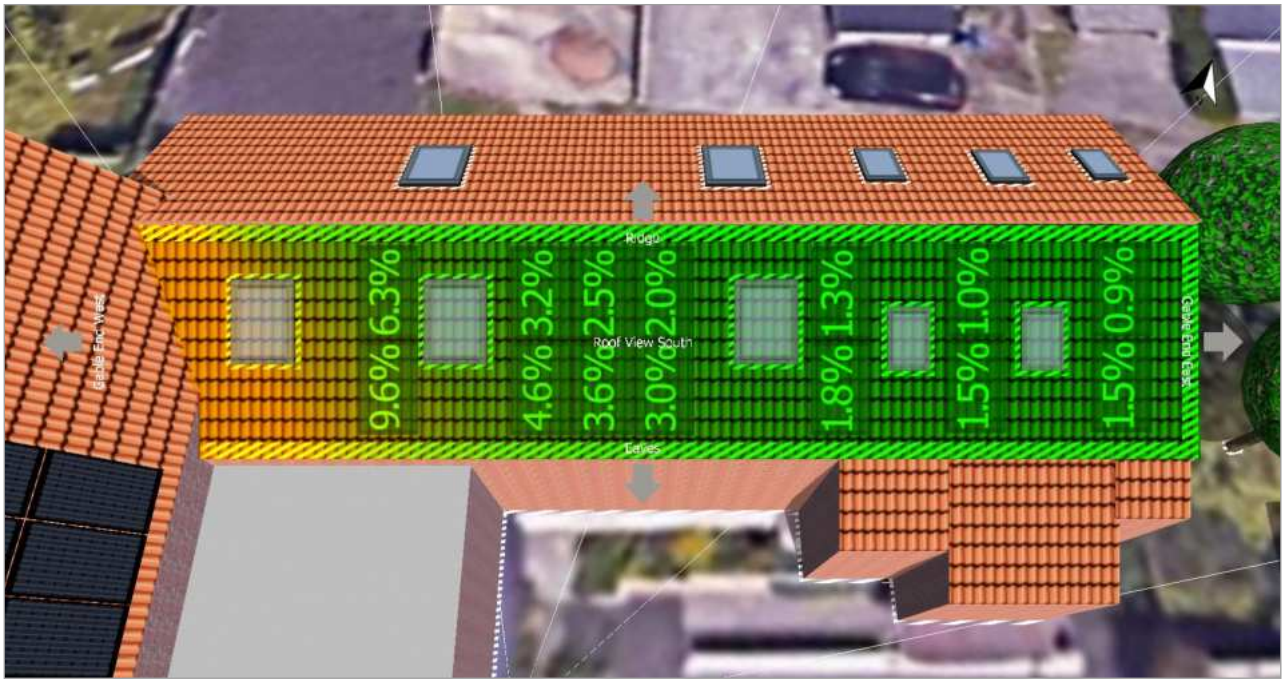


Figure: Screenshot02

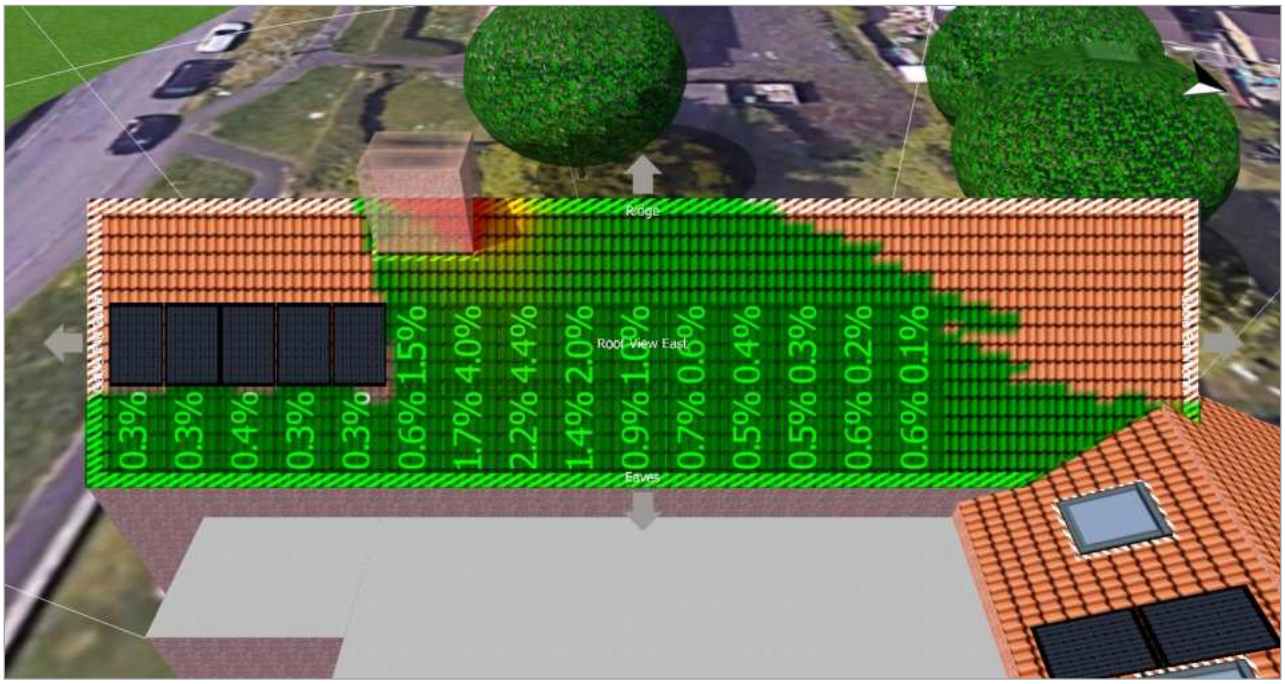


Figure: Screenshot05

www.jinkosolar.com

Building Your Trust in Solar

Tiger Neo N-type 54HL4R-B 420-440 Watt

ALL-BLACK MODULE

N-Type

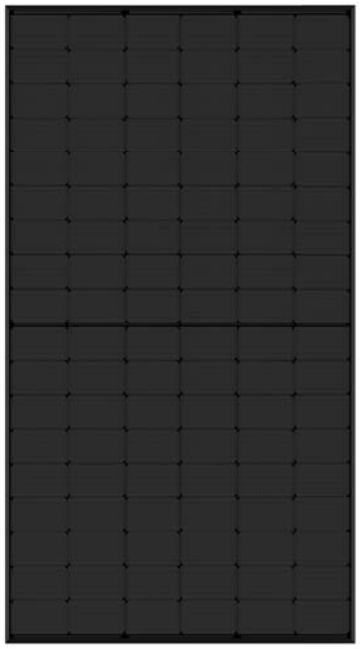
Positive power tolerance of 0~+3%

IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018
Occupational health and safety management systems



Key Features

SMBB Technology

Better light trapping and current collection to improve module power output and reliability.

Hot 2.0 Technology

The N-type module with Hot 2.0 technology has better reliability and lower LID/LETID.

PID Resistance

Excellent Anti-PID performance guarantee via optimized mass-production process and materials control.

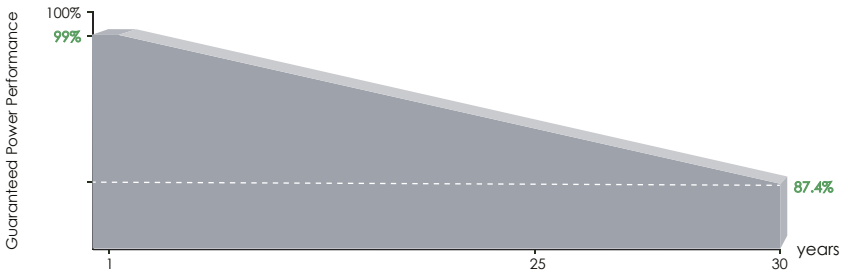
Enhanced Mechanical Load

Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).

Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance.

LINEAR PERFORMANCE WARRANTY

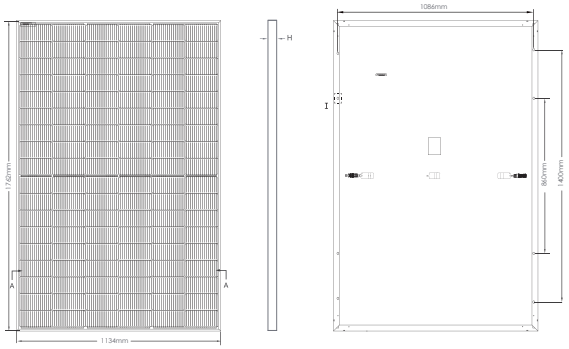


25 Year Product Warranty

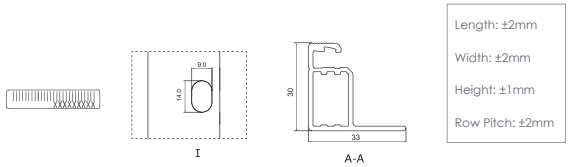
30 Year Linear Power Warranty

0.40% Annual Degradation Over 30 years

Engineering Drawings



Front Side Back



Length: ±2mm
Width: ±2mm
Height: ±1mm
Row Pitch: ±2mm

*This tolerance range applies only to the four-angle distance of the module as indicated above.

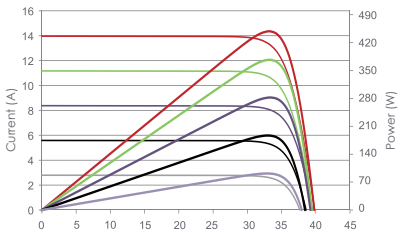
Packaging Configuration

(Two pallets = One stack)

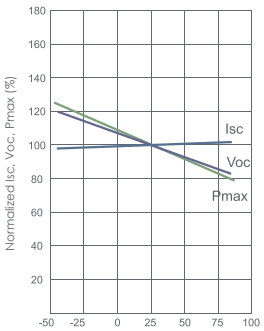
36pcs/pallets, 72pcs/stack, 936pcs/ 40'HQ Container

Electrical Performance & Temperature Dependence

Current-Voltage & Power-Voltage Curves (430W)



Temperature Dependence of Isc, Voc, Pmax



Cell Temperature (C)

Mechanical Characteristics

Cell Type	N type Mono-crystalline
No. of cells	108 (6×18)
Dimensions	1762×1134×30mm (69.36×44.65×1.18 inch)
Weight	22 kg (48.50 lbs)
Front Glass	3.2mm,Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1×4.0mm² (+): 400mm , (-): 200mm or Customized Length

SPECIFICATIONS

Module Type	JKM420N-54HL4R-B		JKM425N-54HL4R-B		JKM430N-54HL4R-B		JKM435N-54HL4R-B		JKM440N-54HL4R-B	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	420Wp	316Wp	425Wp	320Wp	430Wp	323Wp	435Wp	327Wp	440Wp	331Wp
Maximum Power Voltage (Vmp)	32.16V	29.95V	32.37V	30.19V	32.58V	30.30V	32.78V	30.50V	32.99V	30.73V
Maximum Power Current (Imp)	13.06A	10.55A	13.13A	10.60A	13.20A	10.66A	13.27V	10.72A	13.34A	10.77A
Open-circuit Voltage (Voc)	38.74V	36.80V	38.95V	37.00V	39.16V	37.20V	39.36V	37.39V	39.57V	37.59V
Short-circuit Current (Isc)	13.51A	10.91A	13.58A	10.96A	13.65A	11.02A	13.72A	11.08A	13.80A	11.14A
Module Efficiency STC (%)	21.02%		21.27%		21.52%		21.77%		22.02%	
Operating Temperature(℃)	-40℃~+85℃									
Maximum system voltage	1000VDC (IEC)									
Maximum series fuse rating	25A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.29%/℃									
Temperature coefficients of Voc	-0.25%/℃									
Temperature coefficients of Isc	0.045%/℃									
Nominal operating cell temperature (NOCT)	45±2℃									

*STC: Irradiance 1000W/m² Cell Temperature 25℃ AM=1.5

NOCT: Irradiance 800W/m² Ambient Temperature 20℃ AM=1.5 Wind Speed 1m/s

Three Phase Inverter

For Europe

SE12.5K - SE17K

INVERTERS

Specifically designed to work with power optimizers

- Superior efficiency (98%)
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Small, lightest in its class, and easy to install
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- IP65 – Outdoor and indoor installation
- Fixed voltage inverter for longer strings
- Smart Energy Management control
- Advanced safety features - integrated arc fault protection
- Optional RS485 surge protection

/ Three Phase Inverter

For Europe

SE12.5K - SE17K

Applicable to inverters with part number	SEXXK-XXXXXBXX4			
	SE12.5K	SE16K	SE17K	
OUTPUT				
Rated AC Active Output Power	12500	16000	17000	W
Maximum AC Apparent Output Power	12500	16000	17000	VA
AC Output Voltage - Line to Line / Line to Neutral (Nominal)	400 / 230			Vac
AC Output Voltage - Line to Neutral (Range)	184 - 264.5			Vac
AC Frequency	50/60 ± 5			Hz
AC Output Line Connections	20	25.5	26	Aac
Grids Supported - Three Phase	3 / N / PE (WYE with Neutral)			
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes			
THD	≤ 3			%
INPUT				
Maximum DC Power (Module STC)	16850	21600	22950	W
Transformer-less, Ungrounded	Yes			
Maximum Input Voltage DC+ to DC-	1000			Vdc
Nominal Input Voltage DC+ to DC-	750			Vdc
Maximum Input Current	21	23	23	Adc
Reverse-Polarity Protection	Yes			
Ground-Fault Isolation Detection	700kΩ Sensitivity			
Maximum Inverter Efficiency	98			%
European Weighted Efficiency	97.7			%
Nighttime Power Consumption	< 2.5			W
ADDITIONAL FEATURES				
Supported Communication Interfaces(1)	RS485, Ethernet, Wi-Fi (optional)(2) Cellular (optional)			
Inverter Comissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection			
Smart Energy Management	Export Limitation			
Arc Fault Protection	Integrated, User Configurable (According to UL1699B)			
RS485 Surge Protection	Optional(3)			
STANDARD COMPLIANCE				
Safety	IEC-62103 (EN50178), IEC-62109, AS3100			
Grid Connection Standards(4)	VDE-AR-N-4105, G99, AS-4777, EN50438, EN50549-1, CEI-021, VDE 0126-1-1, CEI-016, EN50549-1			
Electromagnetic Compatibility (EMC)	EN/IEC 61000-6-1, EN/IEC 61000-6-2, EN/IEC 61000-6-3, EN/IEC 61000-6-4,EN 55011, FCC Part 15, EN/IEC 61000-3-2, EN/IEC 61000-3-3, EN/IEC 61000-3-11, EN/IEC 61000-3-12			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
AC Output Gland Diameter / Wire Cross Section	15-21mm / Solid wire 2.5-16 mm^2			
DC Input	2 MC4 pairs			
Dimensions (H x W x D)	549 x 317 x 264			mm
Weight	30.7			kg
Operating Temperature Range	-40 to +60(5)			˚C
Cooling	Fan (user replaceable)			
Noise	< 50			dBA
Protection Rating	IP65 - outdoor and indoor			
Mounting	Brackets provided			

(1) Refer to Datasheets -> Communications category in Downloads page for specifications of optional communication options: http://www.solaredge.com/groups/support/downloads
(2) Wi-Fi connectivity requires connection of an additional Wi-Fi component, ordered separately. For more details ask your SolarEdge sales person or refer to: https://www.solaredge.com/products/communication
(3) An RS485 SPD plug-in can be purchased. Refer to: https://www.solaredge.com/sites/default/files/se_spd_plug_in_for_rs485_for_3ph_with_setapp_ds.pdf
(4) For all standards refer to Certifications category in Downloads page: http://www.solaredge.com/groups/support/downloads
(5) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf

CE RoHS

The UK's favourite PV accessory!

Solar iBoost+ is our latest automatic water heating device for pv system owners. Its increased efficiency and extra functions deliver even more savings and when coupled with iBoost Buddy you can conveniently monitor and control ***Solar iBoost+*** within the home.
With over 45,000 ***Solar iBoost*** products successfully working in UK homes installers recommend it!

Solar iBoost+ is brought to you by Marlec, manufacturers in wind and solar renewables since 1979.

Visit www.solariboost.co.uk for latest customer feedback and detailed specifications

Contact your local electrical installer for fitting at:

marlec
renewable power

Marlec Eng Co Ltd
Rutland House, Trevithick Road, Corby, NN17 5XY
Tel:+44 (0)1536 201588 sales@marlec.co.uk
www.solariboost.co.uk

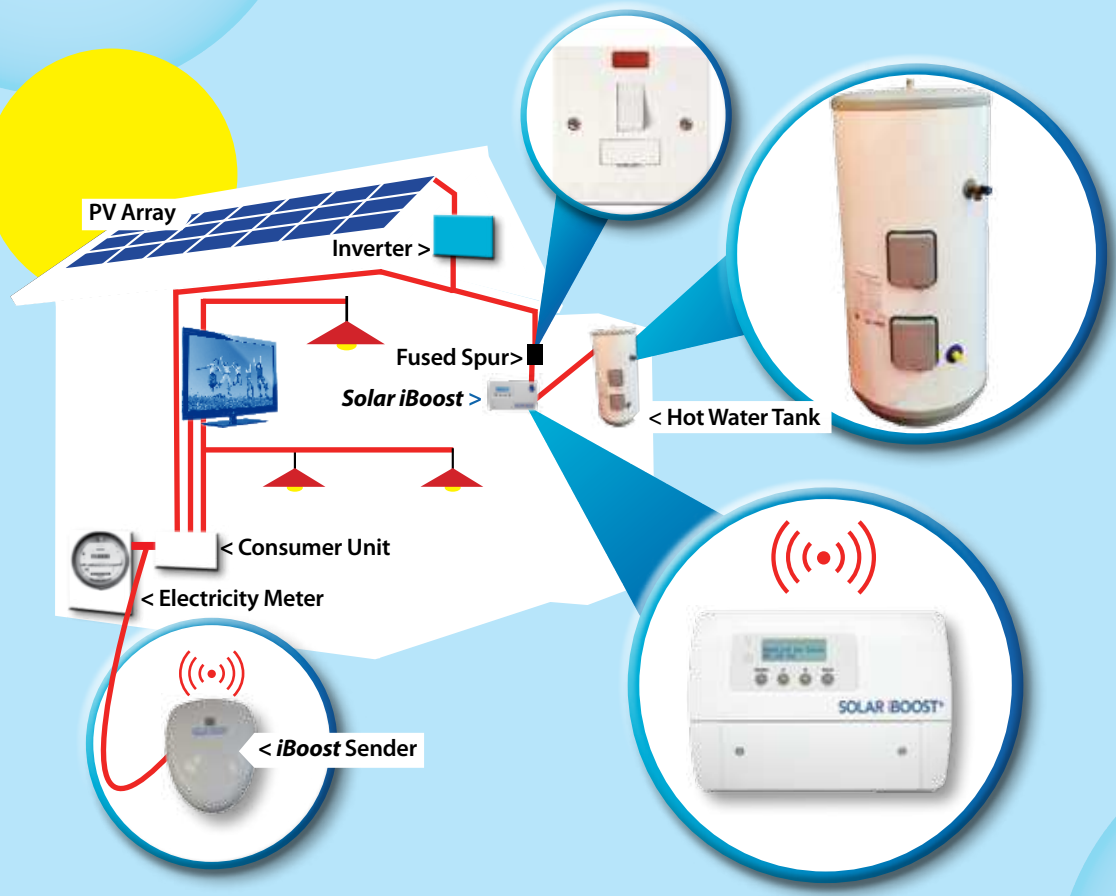
SOLAR iBOOST+

Gives you free hot water from your PV array!

Automatically consume the surplus PV generated energy at your home

Install a *Solar iBoost+* and watch your heating bills fall!

The *Solar iBoost*+ concept is to divert the surplus solar photovoltaic energy generated at your home to heat the water in the household tank and save you money.



With *Solar iBoost*+ fitted you will

- Cut the cost of water heating in your home.
- Reduce the use of your boiler.
- Maximise the use of the free solar energy generated at your property.

***Solar iBoost*+ uses only the energy that would otherwise be exported**

How does it affect my Feed in Tariff Payments?

This depends on the type of scheme operated in your country but many tariffs are reducing as energy costs are rising, favouring "self consumption" of PV and wind powered home generation. Generation based FiT's are not normally affected as the ***Solar iBoost*** only measures what is exported. In the UK, the additional export tariff is typically unmetered and therefore self consumption is most advantageous.

Benefits on net metering systems depend on the tariff paid but it may be more cost effective to consume the electricity.

How it Works

1 Using just a single clamp installed at the household meter the Sender transmits vital export energy information to the ***Solar iBoost***+ wirelessly.

2 ***Solar iBoost***+ is activated when excess energy is available. It intelligently controls and adjusts the flow of energy to the immersion in proportion with the fluctuating export levels.

3 Water is heated during the day using excess energy only up to the immersion thermostat's setting. You can top up if required from usual heating methods or using the ***Solar iBoost***'s grid power functions.

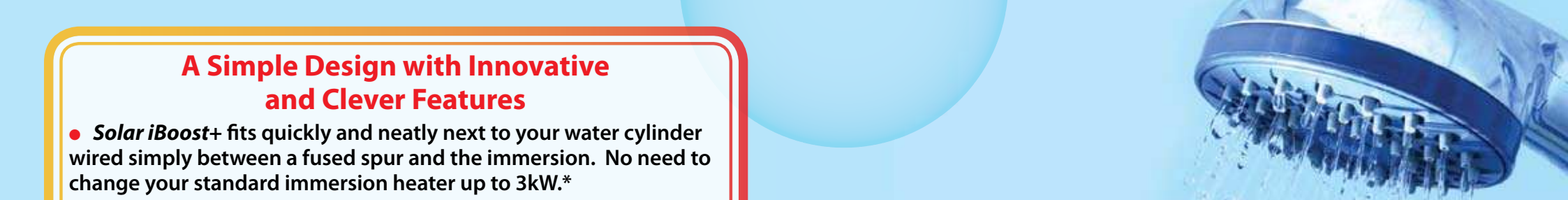
Typical example of Solar iBoost+ captured energy:

Generation	2700 W
Energy Consumed	1400 W
Potential Export	1300 W
Energy Diverted	1200 W
Energy Exported	100 W

A Simple Design with Innovative and Clever Features

- ***Solar iBoost+*** **fits quickly and neatly next to your water cylinder wired simply between a fused spur and the immersion. No need to change your standard immersion heater up to 3kW.***
- **It responds rapidly to the varying home consumption and changing weather ensuring that only excess power is used.**
- ***Solar iBoost+*** **features connections for 2 immersions, switching between them automatically to maximise electric water heating systems.**
- **Wireless Sender eliminates unsightly and costly wiring.**
- ***Solar iBoost+*** **displays real time information "Heating by Solar 1.6kW" and historical energy saving figures are seen at the push of a button. View this and more data using the optional *iBoost+ Buddy* home display.**
- **LED's also give an instant visual indication of the system in operation.**
- **Simple programmable timer enables *Solar iBoost+* to work in harmony with your existing water heating system on a 5/2 day basis. Even separate winter and summer settings can be programmed and switched between at the push of a button.**
- **Selectable languages; French, German, Italian, Portuguese & Spanish.**
- **Built-in Boost override switch keeps you in control so you can top up your hot water in 15 minute increments up to 2 hours.**
- ***Solar iBoost+*** **is ready to connect wirelessly to the *Buddy* if added at installation or a later date.**
- **CE compliance to all product and safety standards conducted by independent test laboratories.**
- **2 year warranty. Dimensions: 288x255x100mm 1.95kg**

Consult your PV installer or qualified electrician for installation in your home. The wireless communication, no essential programming and connection into existing circuits means that installation is straightforward for a professional.
Add ***iBoost+ Buddy*** to conveniently monitor home energy and *Heating by Solar* savings.



iBOOST+ Buddy

Monitor home energy usage with ***iBoost Buddy***. The eco-gauge lets you know when unused energy is available so you can switch on appliances.

View the ***Solar iBoost+*** display and remotely activate the Boost function.

Keep the ***Buddy*** handy so you can check the intuitive "traffic light" energy indicator.

Dims: 133x113x56mm 150g

The ***iBoost+ Buddy*** comes with a mains adaptor and connects wirelessly to the ***Solar iBoost+***. Your installer can pair it into the system at the same time or you can add it at a later date.

Call us on

0800 909 8882

Visit us online

www.infinity-energy.co.uk

Infinity
ENERGY SERVICES