

Project Name: Copt Oak

04/12/2025

Your PV system

Address of Installation

Copt Oak
Whitwick Road
Markfield
Leicestershire
LE67 9QB



Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Markfield, GBR (2005 - 2020)
Values source	PVGIS-SARAH2/ERA5
PV Generator Output	20.02 kWp
PV Generator Surface	87.9 m ²
Number of PV Modules	44
Number of Inverters	1

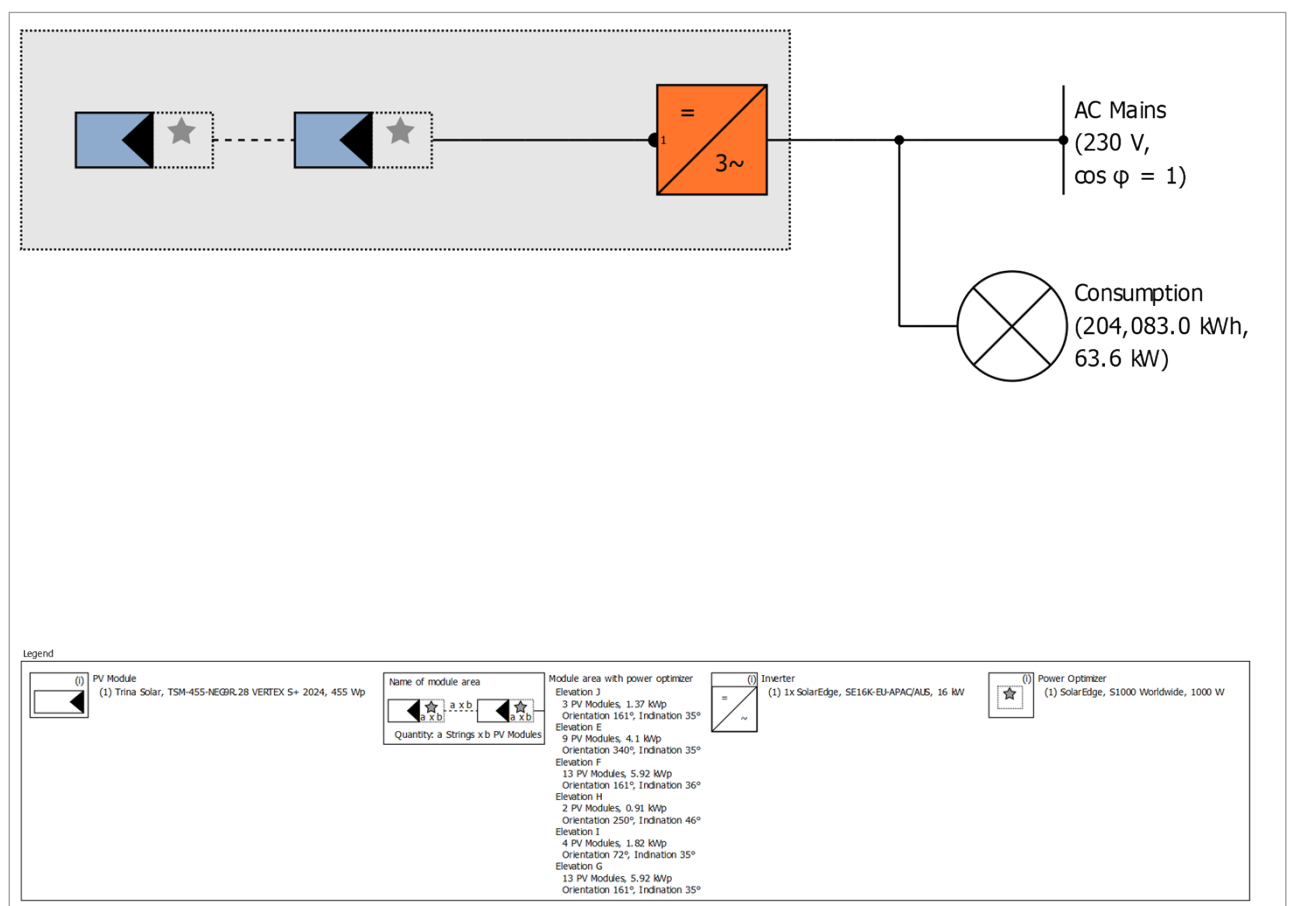


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	20.02 kWp
Spec. Annual Yield	797.06 kWh/kWp
Performance Ratio (PR)	83.22 %
Yield Reduction due to Shading	8.2 %
PV Generator Energy (AC grid)	15,968 kWh/Year
Own Consumption	15,950 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	18 kWh/Year
Own Power Consumption	99.9 %
CO ₂ Emissions avoided	2,824 kg / year
Level of Self-sufficiency	7.8 %

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
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Climate Data

Location	Markfield, GBR (2005 - 2020)
Values source	PVGIS-SARAH2/ERA5
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Perez

Consumption

Total Consumption	204083 kWh
PVSol HHD Input - Copt Oak	204083 kWh
Load Peak	63.6 kW

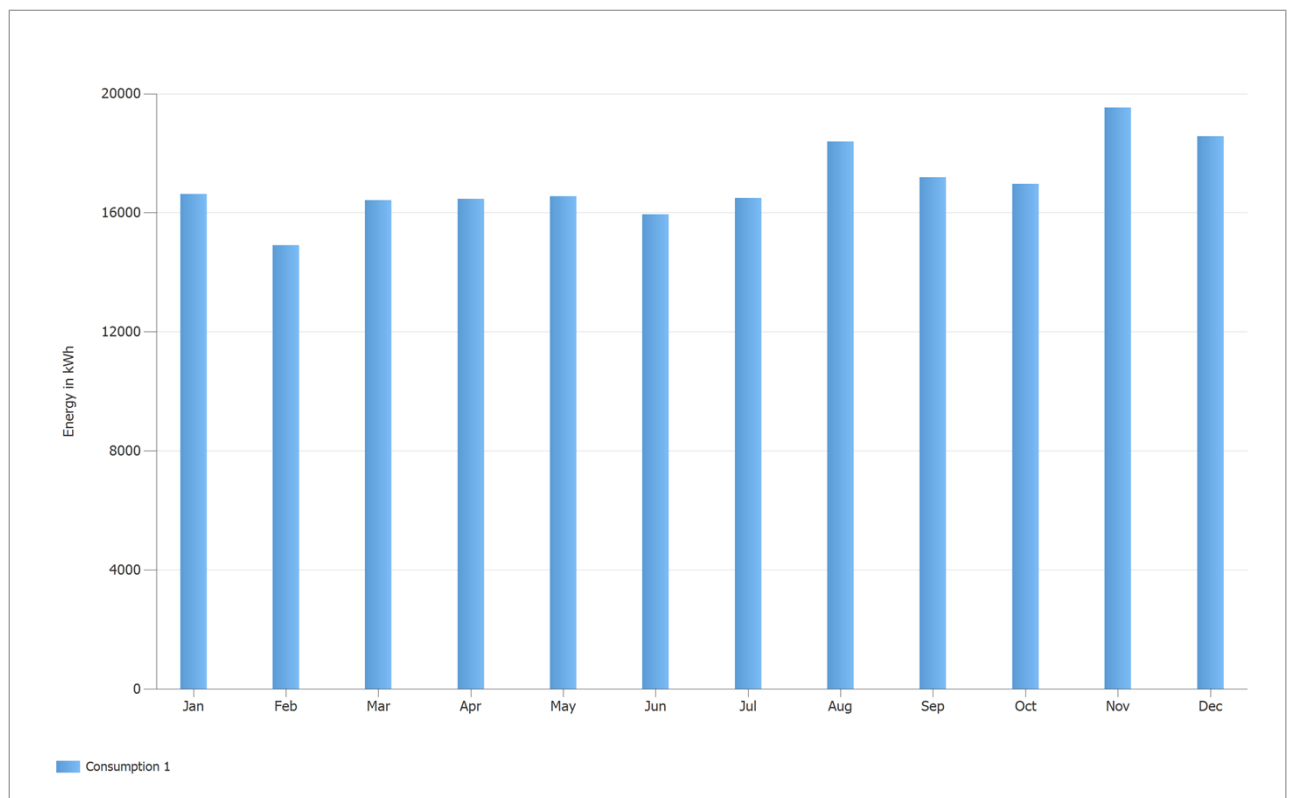


Figure: Consumption

Module Areas

1. Module Area - Elevation J

PV Generator, 1. Module Area - Elevation J

Name	Elevation J	
PV Modules	3 x TSM-455-NEG9R.28 VERTEX S+ 2024 (v1)	
Manufacturer	Trina Solar	
Inclination	35 °	
Orientation	South 161 °	
Installation Type	Roof parallel	
PV Generator Surface	6.0 m ²	

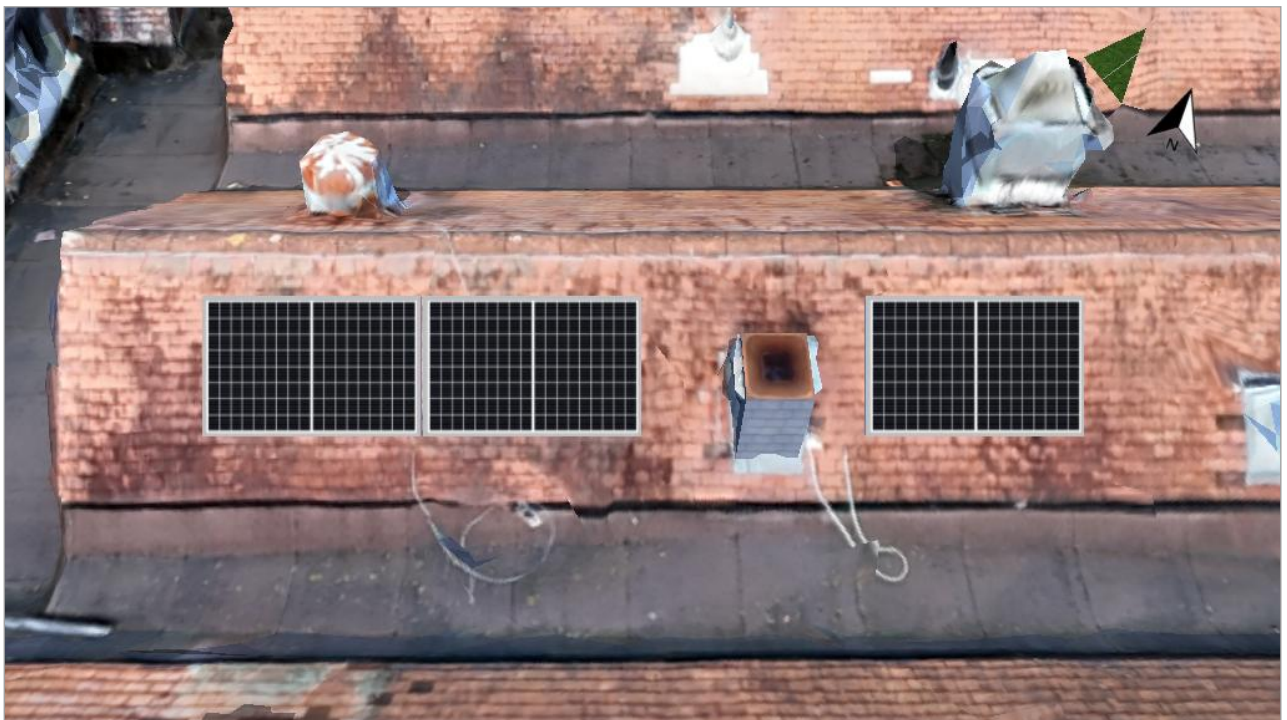


Figure: 1. Module Area - Elevation J

2. Module Area - Elevation E

PV Generator, 2. Module Area - Elevation E

Name	Elevation E	
PV Modules	9 x TSM-455-NEG9R.28 VERTEX S+ 2024 (v1)	
Manufacturer	Trina Solar	
Inclination	35 °	
Orientation	North 340 °	
Installation Type	Roof parallel	
PV Generator Surface	18.0 m ²	



Figure: 2. Module Area - Elevation E

3. Module Area - Elevation F

PV Generator, 3. Module Area - Elevation F

Name	Elevation F	
PV Modules	13 x TSM-455-NEG9R.28 VERTEX S+	2024 (v1)
Manufacturer	Trina Solar	
Inclination	36 °	
Orientation	South 161 °	
Installation Type	Roof parallel	
PV Generator Surface	26.0 m²	



Figure: 3. Module Area - Elevation F

4. Module Area - Elevation H

PV Generator, 4. Module Area - Elevation H

Name	Elevation H	
PV Modules	2 x TSM-455-NEG9R.28 VERTEX S+ 2024 (v1)	
Manufacturer	Trina Solar	
Inclination	46 °	
Orientation	West 250 °	
Installation Type	Roof parallel	
PV Generator Surface	4.0 m ²	

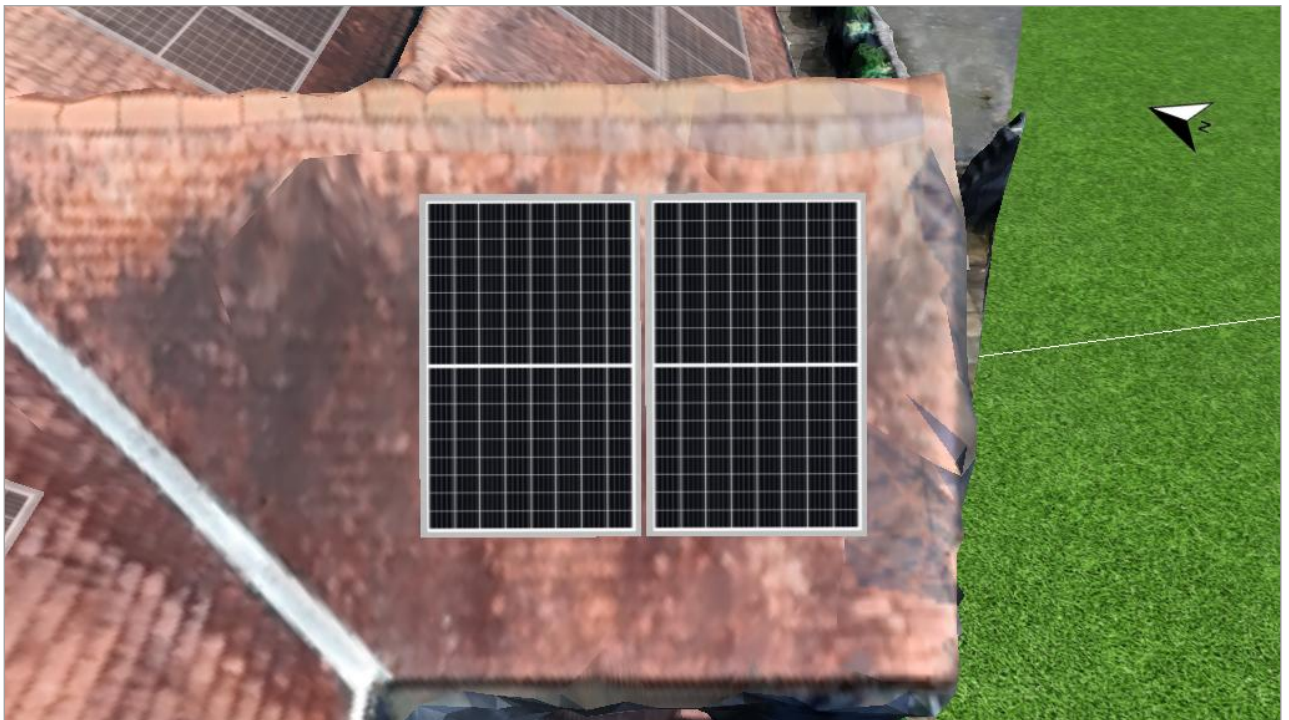


Figure: 4. Module Area - Elevation H

5. Module Area - Elevation I

PV Generator, 5. Module Area - Elevation I

Name	Elevation I	
PV Modules	4 x TSM-455-NEG9R.28 VERTEX S+	2024 (v1)
Manufacturer	Trina Solar	
Inclination	35 °	
Orientation	East 72 °	
Installation Type	Roof parallel	
PV Generator Surface	8.0 m²	



Figure: 5. Module Area - Elevation I

6. Module Area - Elevation G

PV Generator, 6. Module Area - Elevation G

Name	Elevation G	
PV Modules	13 x TSM-455-NEG9R.28 VERTEX S+ 2024 (v1)	
Manufacturer	Trina Solar	
Inclination	35 °	
Orientation	South 161 °	
Installation Type	Roof parallel	
PV Generator Surface	26.0 m²	



Figure: 6. Module Area - Elevation G

Horizon Line, 3D Design

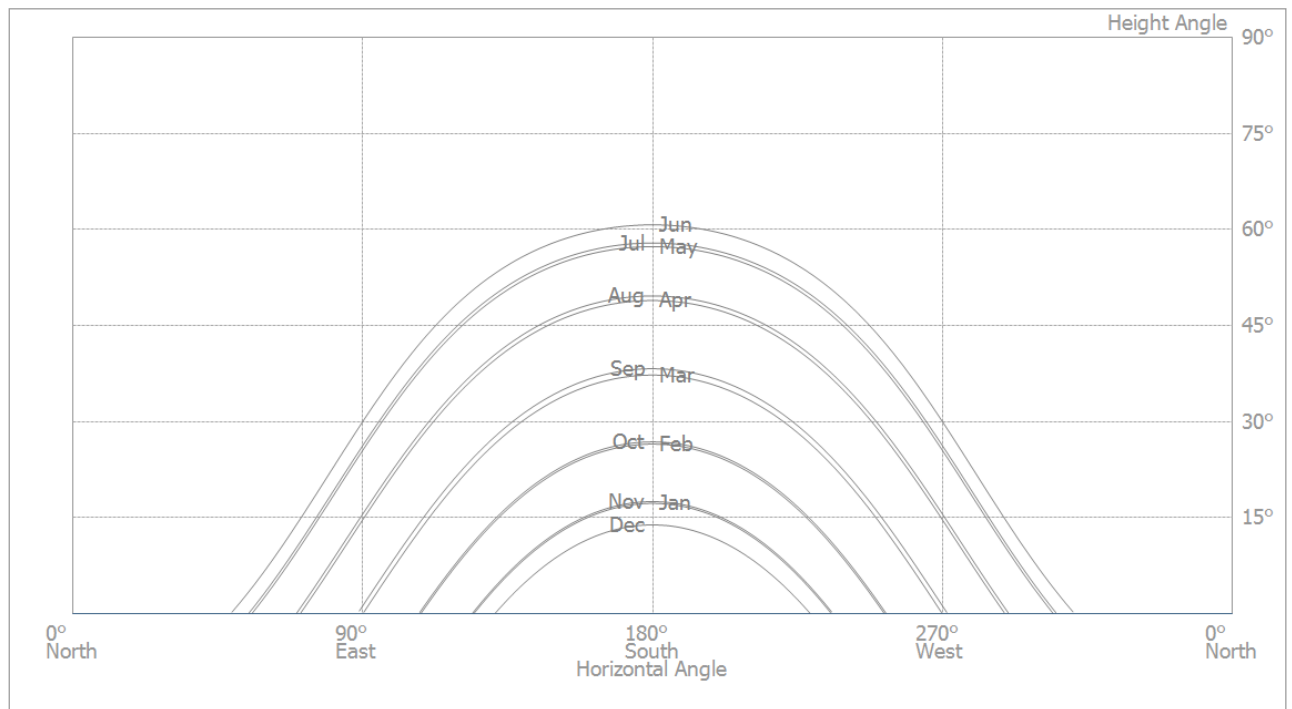


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Elevation J + Elevation E + Elevation F + Elevation H + Elevation I + Elevation G
Inverter 1	
Model	SE16K-EU-APAC/AUS (v2)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	125.1 %
Configuration	MPP 1: 1 x 3 ☆ [1 x 1] + 1 x 9 ☆ [1 x 1] + 1 x 3 ☆ [1 x 1] + 1 x 2 ☆ [1 x 1] 1 x 2 ☆ [1 x 2] + 1 x 5 ☆ [1 x 2] + 1 x 6 ☆ [1 x 2] + 1 x 1 ☆ [1 x 1]
Power Optimizer	31x SolarEdge, S1000 Worldwide (v2)

AC Mains

AC Mains

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

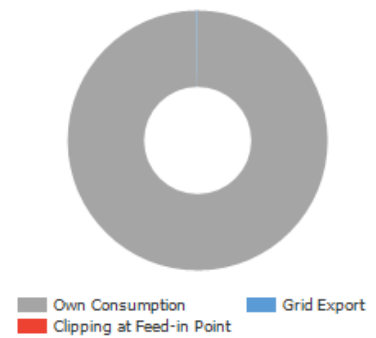
Simulation Results

Results Total System

PV System

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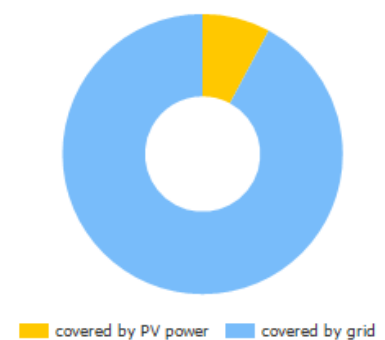
PV Generator Energy (AC grid)



Appliances

Appliances	204,083 kWh/Year
Standby Consumption (Inverter)	11 kWh/Year
Total Consumption	204,094 kWh/Year
covered by PV power	15,950 kWh/Year
covered by grid	188,144 kWh/Year
Solar Fraction	7.8 %

Total Consumption

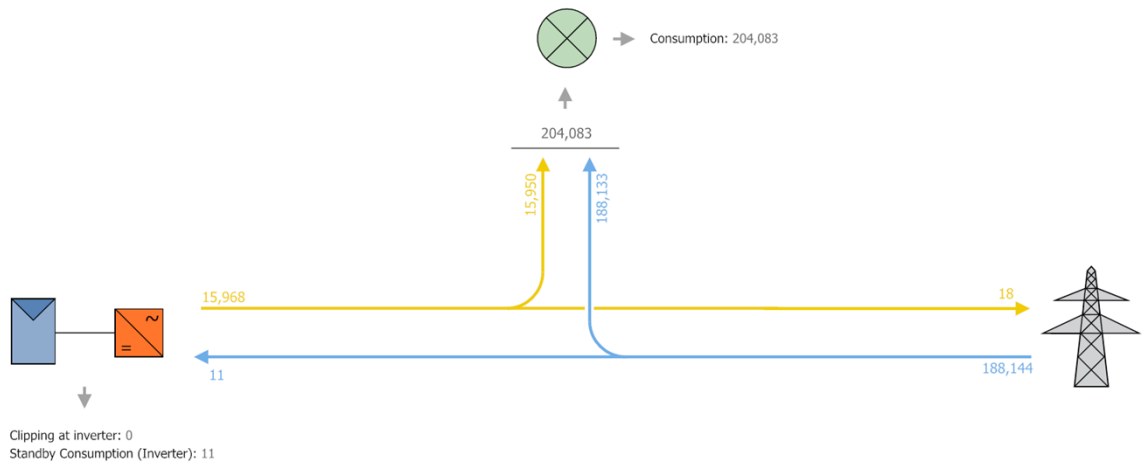


Level of Self-sufficiency

Total Consumption	204,094 kWh/Year
covered by grid	188,144 kWh/Year
Level of Self-sufficiency	7.8 %

Energy Flow Graph

Project: Copt Oak



All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL

Figure: Energy flow

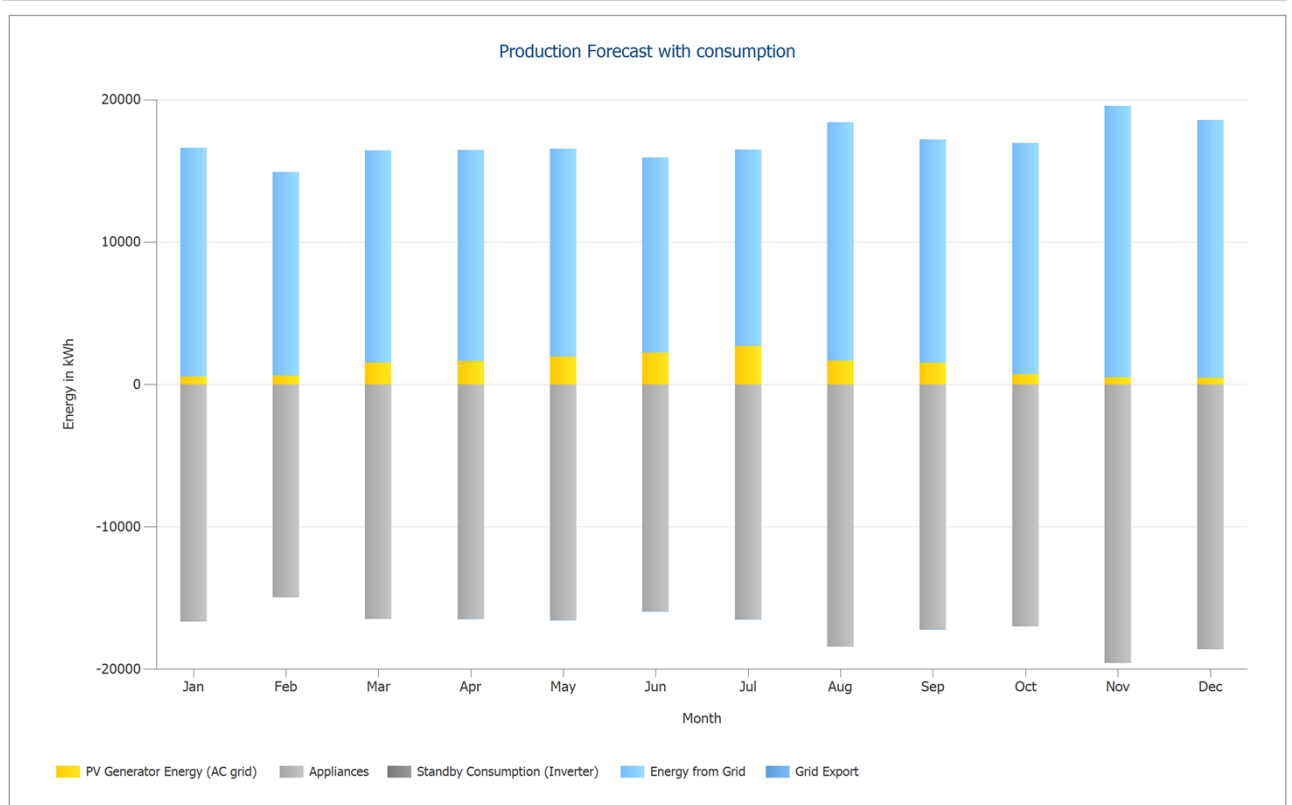


Figure: Production Forecast with consumption

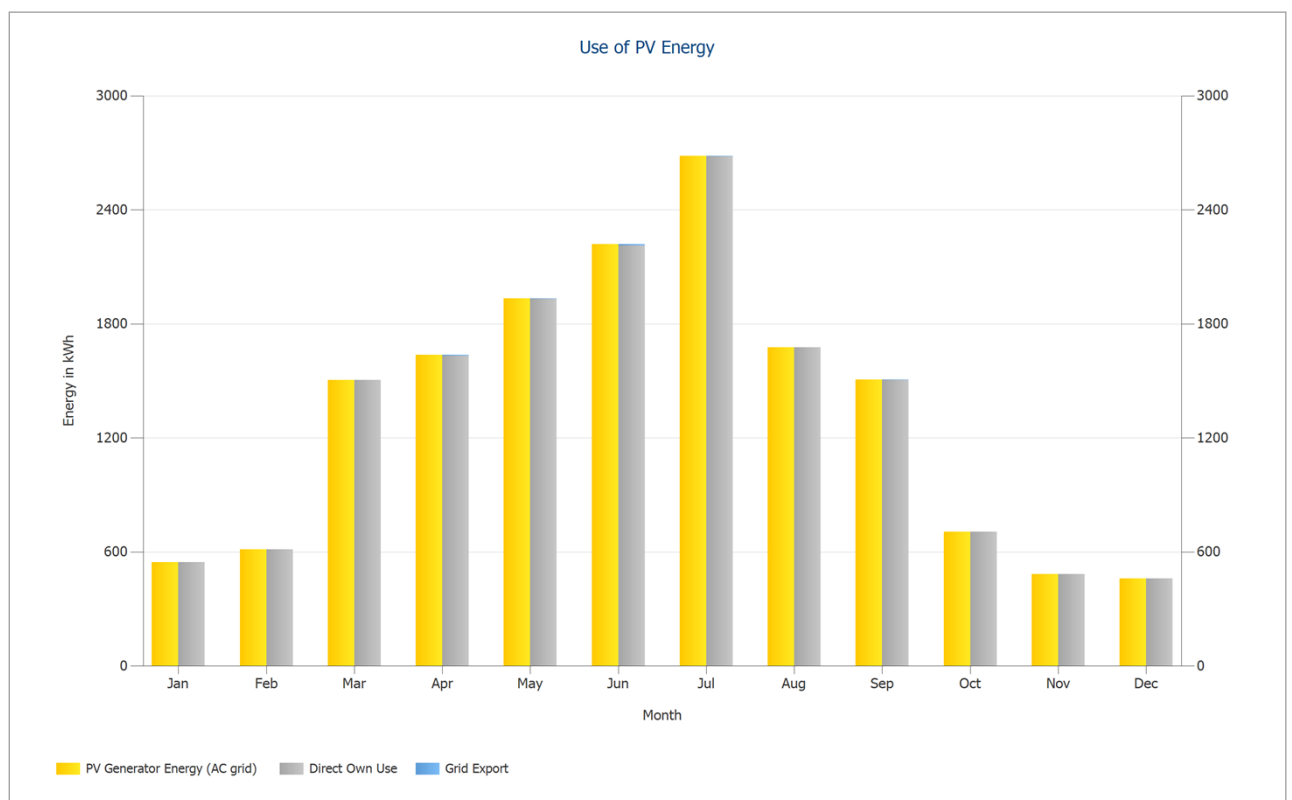


Figure: Use of PV Energy

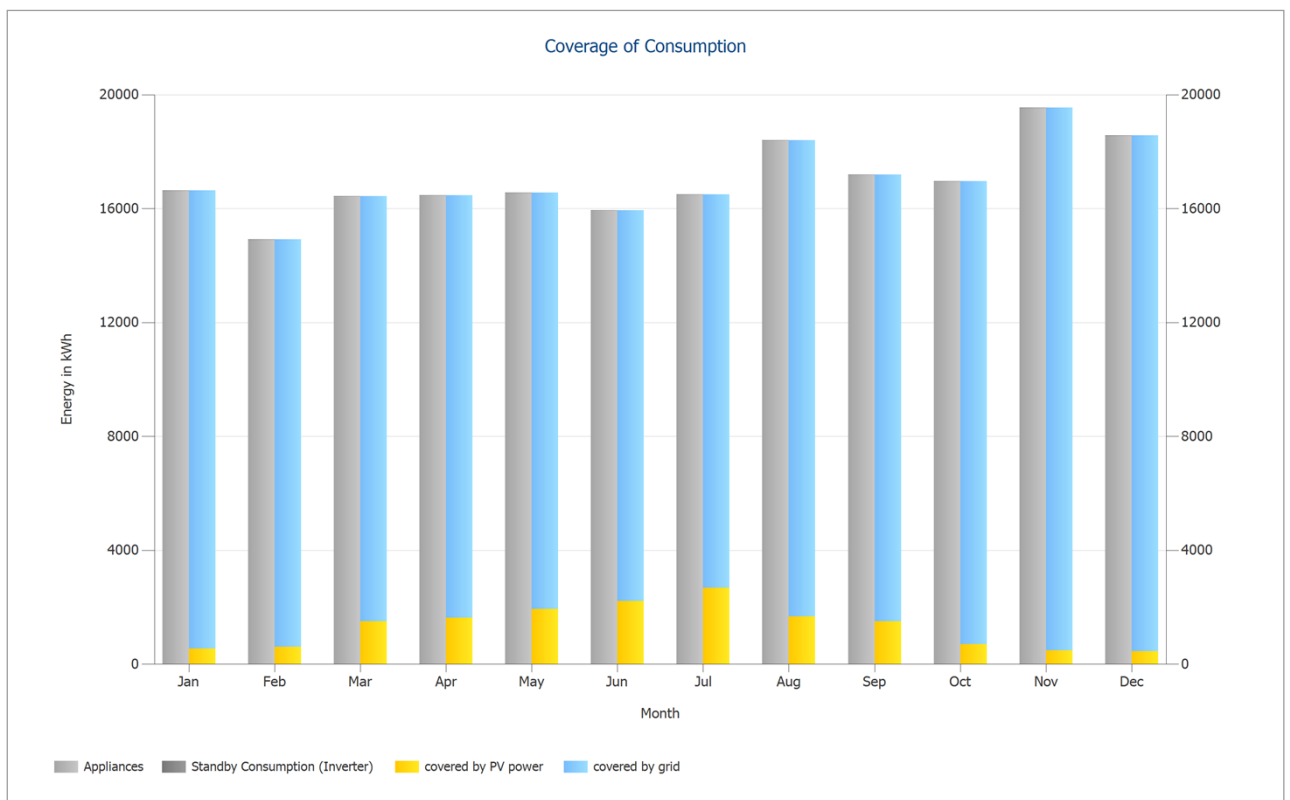


Figure: Coverage of Consumption

PV System Energy Balance

PV System Energy Balance

Global radiation - horizontal	974.36 kWh/m²	
Deviation from standard spectrum	-9.74 kWh/m ²	-1.00 %
Ground Reflection (Albedo)	18.28 kWh/m ²	1.90 %
Orientation and inclination of the module surface	-5.08 kWh/m ²	-0.52 %
Module-independent shading	-19.97 kWh/m ²	-2.04 %
Reflection on the Module Surface	0.00 kWh/m ²	0.00 %
Global Radiation at the Module	957.85 kWh/m²	
	957.85 kWh/m ²	
	x 87.917 m ²	
	= 84,210.67 kWh	
Global PV Radiation	84,210.67 kWh	
Soiling	-2,947.20 kWh	-3.50 %
STC Conversion (Rated Efficiency of Module 22.77 %)	-62,760.56 kWh	-77.23 %
Rated PV Energy	18,502.91 kWh	
Module-specific Partial Shading	-784.06 kWh	-4.24 %
Low-light performance	-267.13 kWh	-1.51 %
Deviation from the nominal module temperature	-18.68 kWh	-0.11 %
Diodes	-22.74 kWh	-0.13 %
Mismatch (Manufacturer Information)	0.00 kWh	0.00 %
Mismatch (Configuration/Shading)	-145.55 kWh	-0.84 %
Power optimizer (DC conversion/clipping)	-86.92 kWh	-0.50 %
PV Energy (DC) without inverter clipping	17,177.82 kWh	
Failing to reach the DC start output	0.00 kWh	0.00 %
Clipping on account of the MPP Voltage Range	-222.24 kWh	-1.29 %
Clipping on account of the max. DC Current	-45.55 kWh	-0.27 %
Clipping on account of the max. DC Power	0.00 kWh	0.00 %
Clipping on account of the max. AC Power/cos phi	0.00 kWh	0.00 %
MPP Matching	0.00 kWh	0.00 %
PV energy (DC)	16,910.03 kWh	
Energy at the Inverter Input	16,910.03 kWh	
Input voltage deviates from rated voltage	0.00 kWh	0.00 %
DC/AC Conversion	-447.96 kWh	-2.65 %
Standby Consumption (Inverter)	-11.00 kWh	-0.07 %
Total Cable Losses	-493.86 kWh	-3.00 %
PV energy (AC) minus standby use	15,957.21 kWh	
PV Generator Energy (AC grid)	15,968.21 kWh	

Plans and parts list

Circuit Diagram

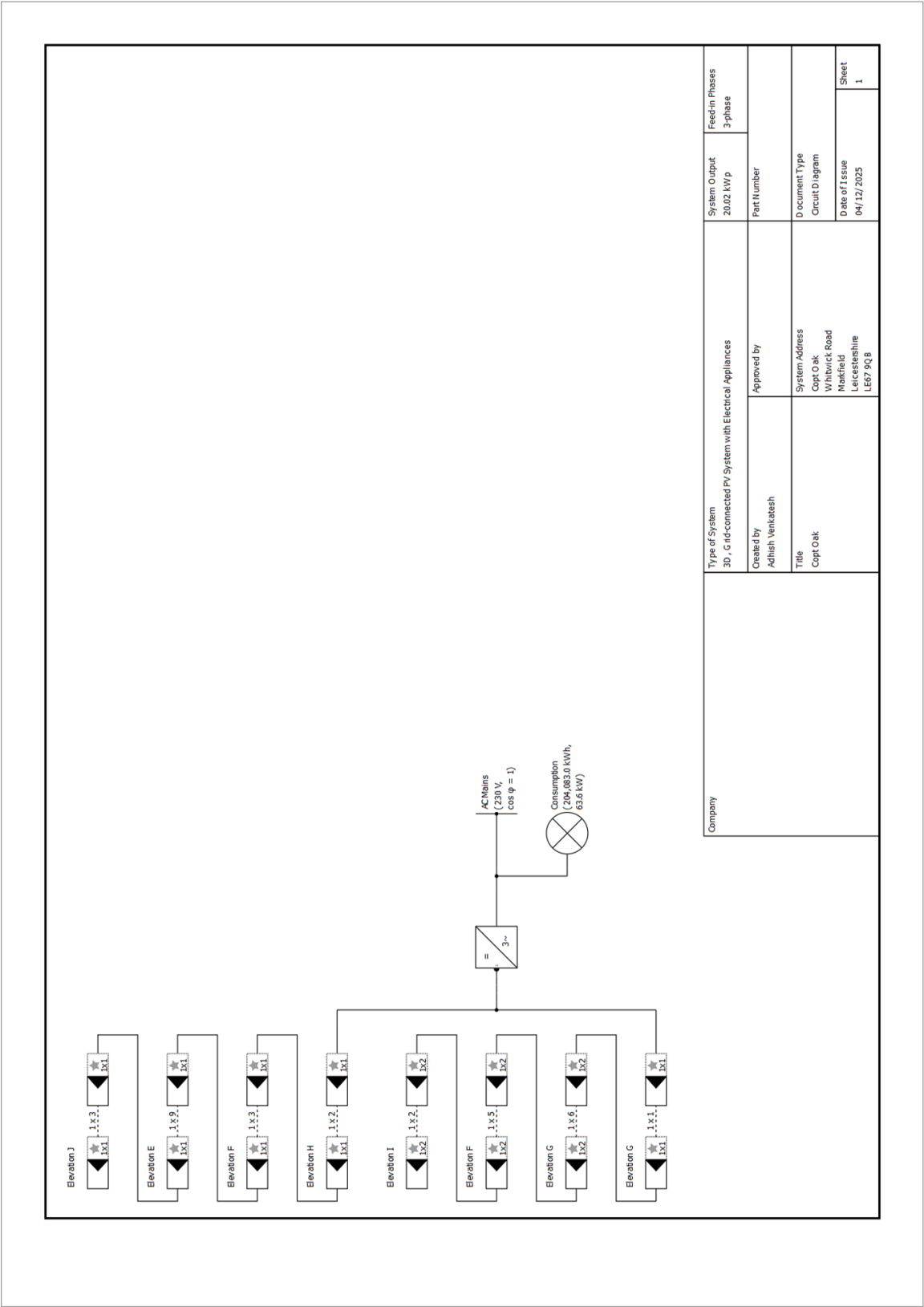


Figure: Circuit Diagram

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	TSM-455-NEG9R.28 VERTEX S+ 2024	44	Piece
2	Inverter		SolarEdge	SE16K-EU-APAC/AUS	1	Piece
3	Power Optimizer		SolarEdge	S1000 Worldwide	31	Piece