Cor Energy Ltd
Enterprise Point, Altrincham Rd
Manchester M22 9AF

Project Name: Coleg Cambria Wrexham Site Heat Decarb. Yale Block E
Offer no.: PR250113

02/06/2025

Documentation- PR250113

Customer Details

Company	
Customer Number	
Contact person	
Address	Yale Block E, Grove Park Rd, Wrexham LL12 7AB
Phone	
Fax	
E-Mail	

Project Data

Project Name	Coleg Cambria Wrexham Site Heat Decarb. Yale Block E
Offer no.	PR250113
Project Designer	Ian Cheek
Address	Yale Block E, Grove Park Rd, Wrexham LL12 7AB



Project Description:
Roof top PV
Subject to Survey

Project Overview

PV System

Grid-connected PV System with Electrical Appliances

Climate Data	Wrexham, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
PV Generator Output	69.56 kWp
PV Generator Surface	294.9 m²
Number of PV Modules	148
Number of Inverters	1

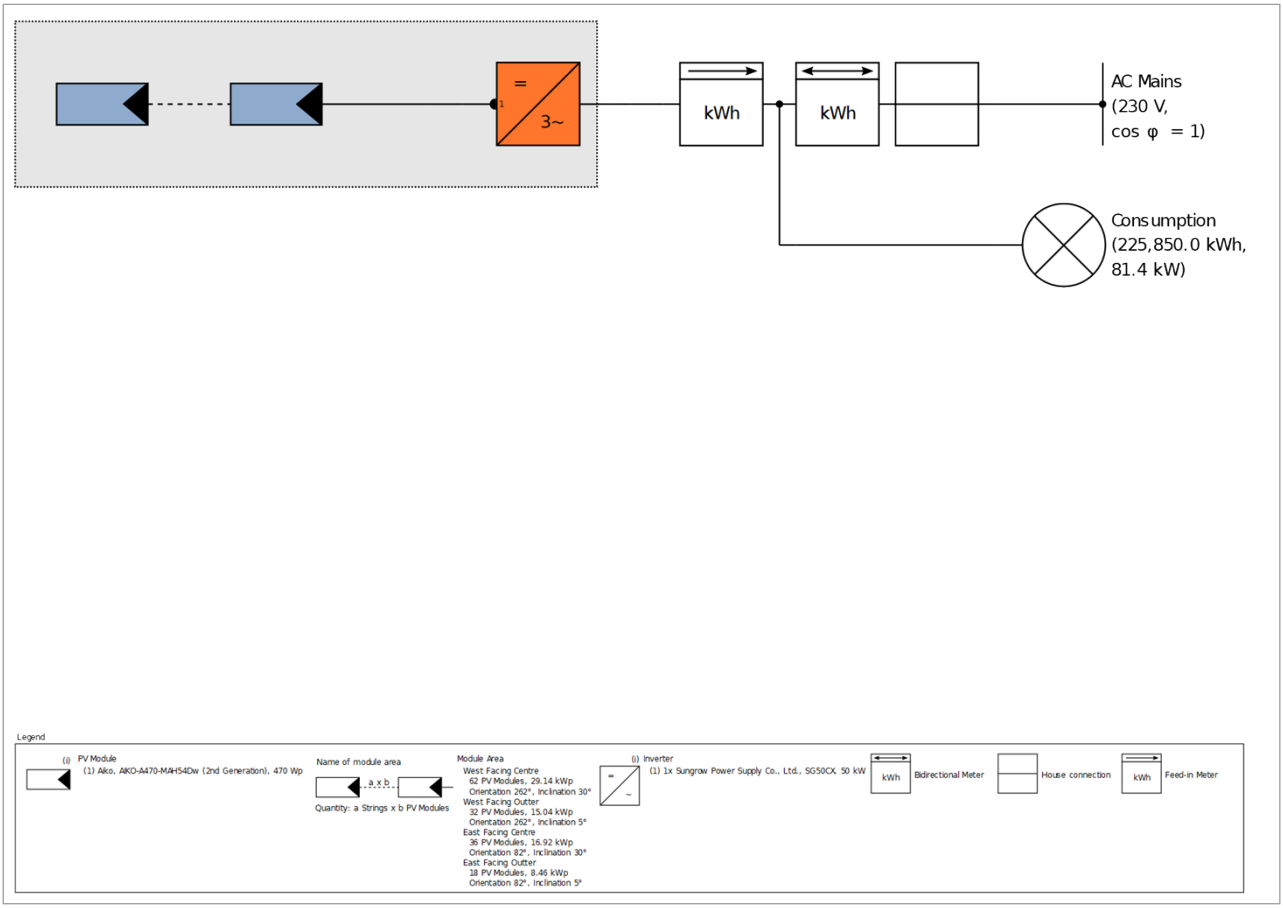


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	69.56	kWp
Spec. Annual Yield	945.02	kWh/kWp
Performance Ratio (PR)	95.57	%
PV Generator Energy (AC grid)	65,745	kWh/Year
Own Consumption	61,659	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	4,086	kWh/Year
Own Power Consumption	93.8	%
CO_2 Emissions avoided	14,791	kg / year
Level of Self-sufficiency	27.3	%

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	Grid-connected PV System with Electrical Appliances
Start of Operation	02/06/2025

Climate Data

Location	Wrexham, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	225850 kWh
School 10000 m²	225850 kWh
Load Peak	81.4 kW

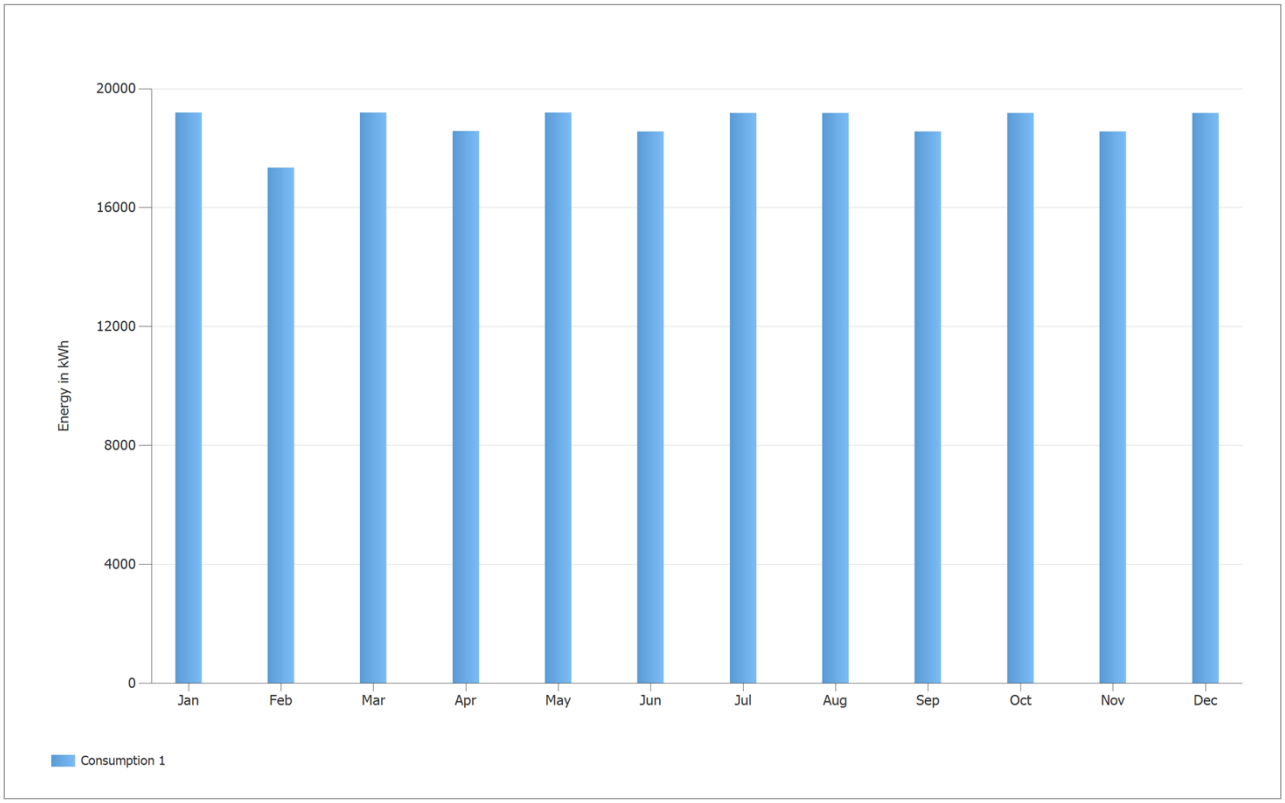


Figure: Consumption

Module Areas

1. Module Area - West Facing Centre

PV Generator, 1. Module Area - West Facing Centre

Name	West Facing Centre
PV Modules	62 x AIKO-A470-MAH54Dw (2nd Generation) (v1)
Manufacturer	Aiko
Inclination	30 °
Orientation	West 262 °
Installation Type	Roof parallel
PV Generator Surface	123.5 m²

Shading, 1. Module Area - West Facing Centre

Shading	0 %

Degradation of Module, 1. Module Area - West Facing Centre

Characteristic curve	Linear (straight line)
Remaining power (power output) after 20 years	100 %

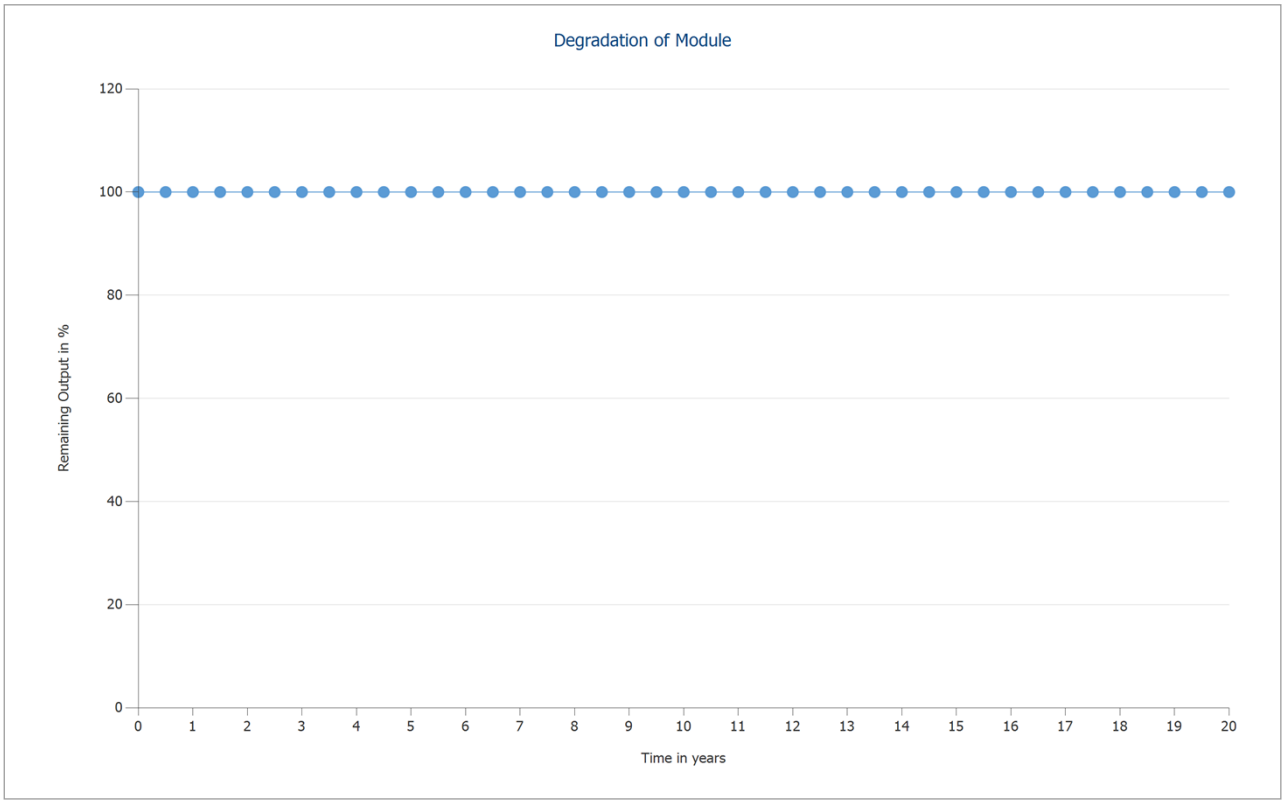


Figure: Degradation of Module, 1. Module Area - West Facing Centre

2. Module Area - West Facing Outter

PV Generator, 2. Module Area - West Facing Outter

Name	West Facing Outter	
PV Modules	32 x AIKO-A470-MAH54Dw (2nd Generation) (v1)	
Manufacturer	Aiko	
Inclination	5	°
Orientation	West 262	°
Installation Type	Roof parallel	
PV Generator Surface	63.8	m²

Shading, 2. Module Area - West Facing Outter

Shading	0	%

Degradation of Module, 2. Module Area - West Facing Outter

Characteristic curve	Linear (straight line)	
Remaining power (power output) after 20 years	100	%

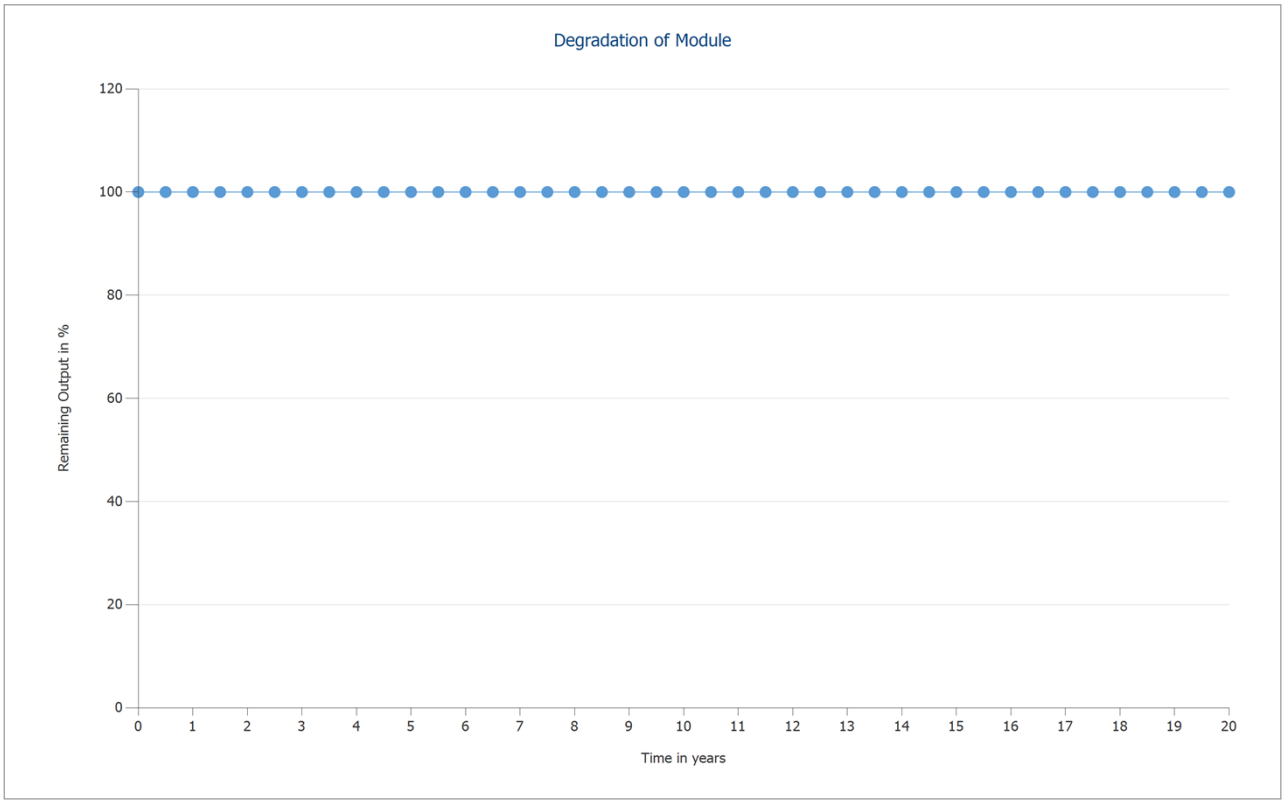


Figure: Degradation of Module, 2. Module Area - West Facing Outter

3. Module Area - East Facing Centre

PV Generator, 3. Module Area - East Facing Centre

Name	East Facing Centre	
PV Modules	36 x AIKO-A470-MAH54Dw (2nd Generation) (v1)	
Manufacturer	Aiko	
Inclination	30	°
Orientation	East 82	°
Installation Type	Roof parallel	
PV Generator Surface	71.7	m²

Shading, 3. Module Area - East Facing Centre

Shading	0	%

Degradation of Module, 3. Module Area - East Facing Centre

Characteristic curve	Linear (straight line)	
Remaining power (power output) after 20 years	100	%

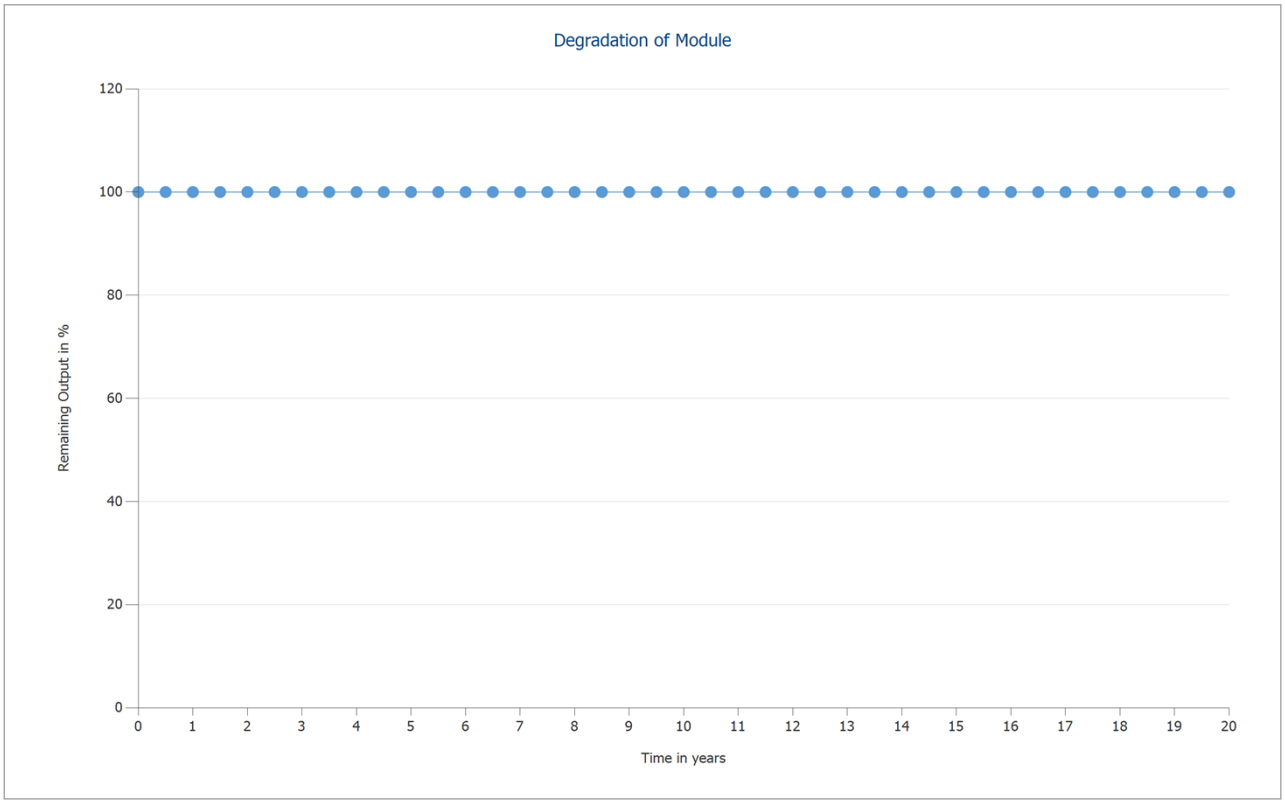


Figure: Degradation of Module, 3. Module Area - East Facing Centre

4. Module Area - East Facing Outter

PV Generator, 4. Module Area - East Facing Outter

Name	East Facing Outter	
PV Modules	18 x AIKO-A470-MAH54Dw (2nd Generation) (v1)	
Manufacturer	Aiko	
Inclination	5	°
Orientation	East 82	°
Installation Type	Roof parallel	
PV Generator Surface	35.9	m²

Shading, 4. Module Area - East Facing Outter

Shading	0	%

Degradation of Module, 4. Module Area - East Facing Outter

Characteristic curve	Linear (straight line)	
Remaining power (power output) after 20 years	100	%

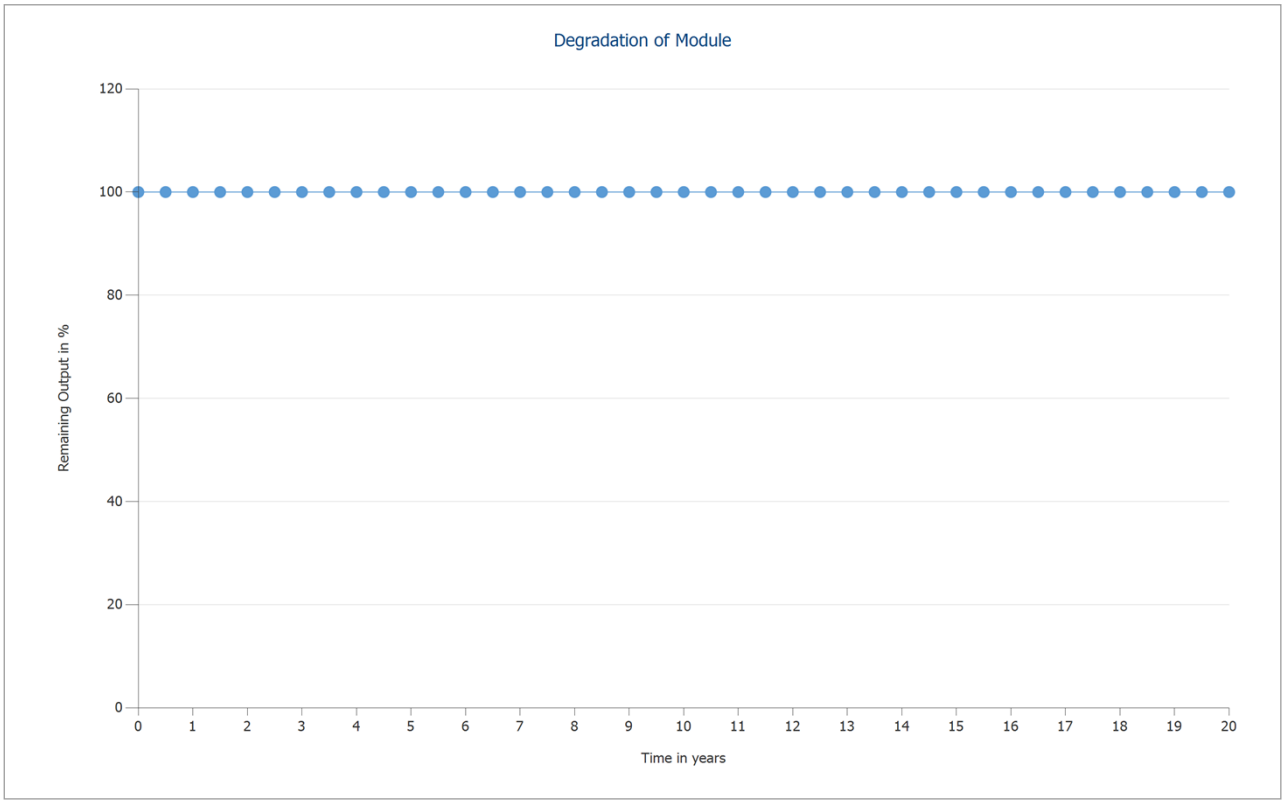


Figure: Degradation of Module, 4. Module Area - East Facing Outter

Inverter configuration

Configuration 1

Module Areas	West Facing Centre + East Facing Centre + West Facing Outter + East Facing Outter
Inverter 1	
Model	SG50CX (v9)
Manufacturer	Sungrow Power Supply Co., Ltd.
Quantity	1
Sizing Factor	139.1 %
Configuration	MPP 1: 2 x 15
	MPP 2: 2 x 16
	MPP 3: 2 x 18
	MPP 4: 2 x 16
	MPP 5: 1 x 18

AC Mains

AC Mains

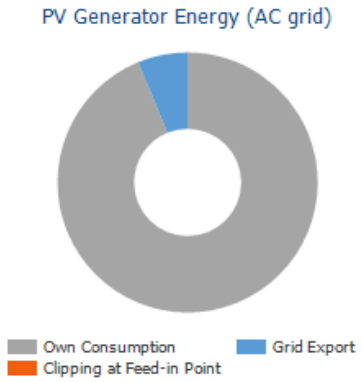
Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

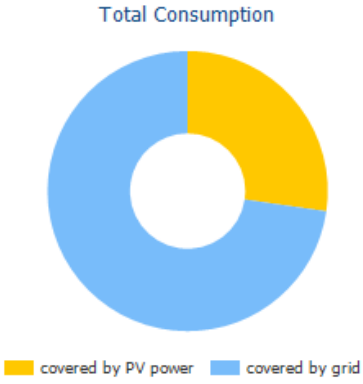
PV System

PV Generator Output	69.56	kWp
Spec. Annual Yield	945.02	kWh/kWp
Performance Ratio (PR)	95.57	%
PV Generator Energy (AC grid)	65,745	kWh/Year
Own Consumption	61,659	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	4,086	kWh/Year
Own Power Consumption	93.8	%
CO_2 Emissions avoided	14,791	kg / year



Appliances

Appliances	225,850	kWh/Year
Standby Consumption (Inverter)	9	kWh/Year
Total Consumption	225,859	kWh/Year
covered by PV power	61,659	kWh/Year
covered by grid	164,200	kWh/Year
Solar Fraction	27.3	%



Level of Self-sufficiency

Total Consumption	225,859	kWh/Year
covered by grid	164,200	kWh/Year
Level of Self-sufficiency	27.3	%

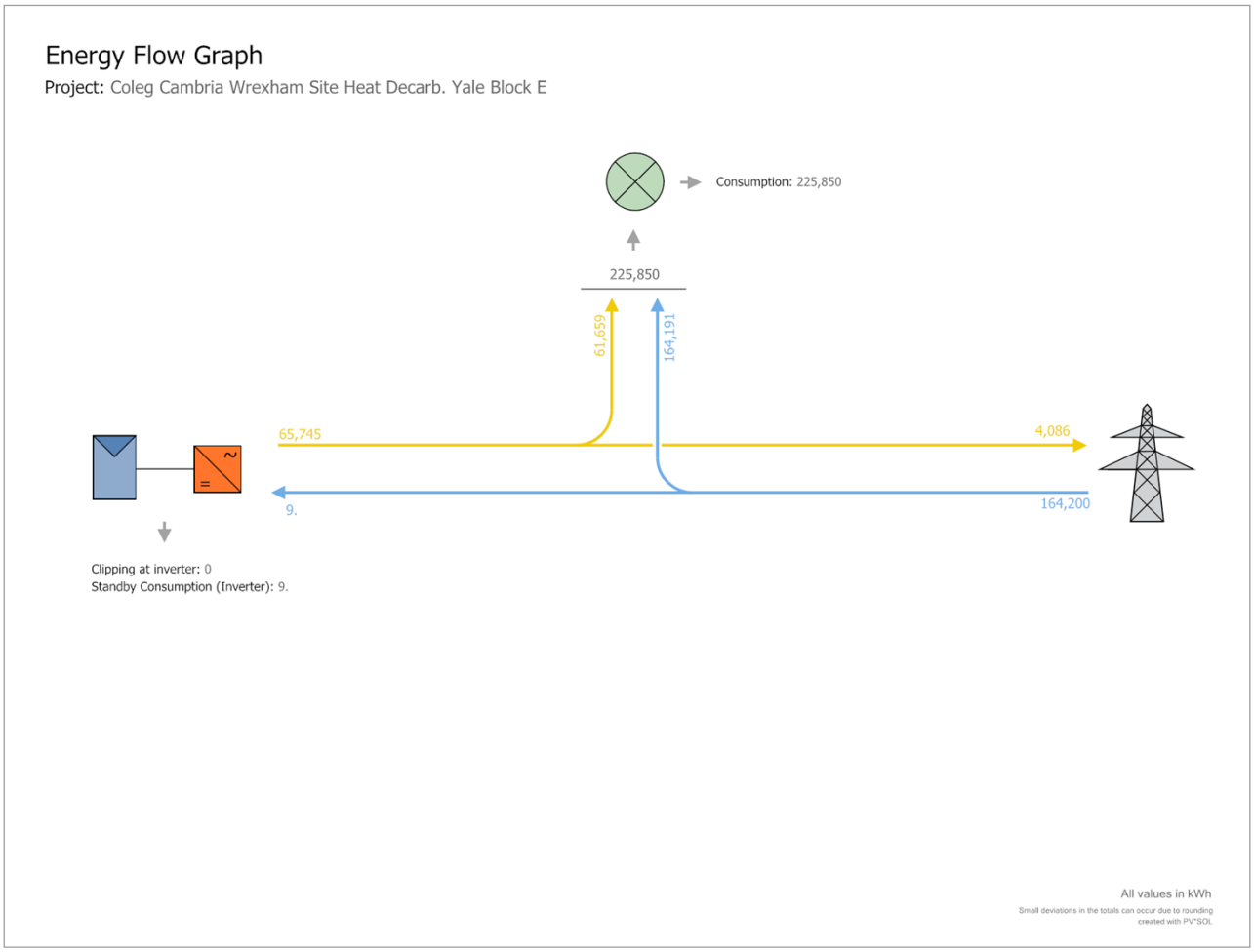


Figure: Energy flow

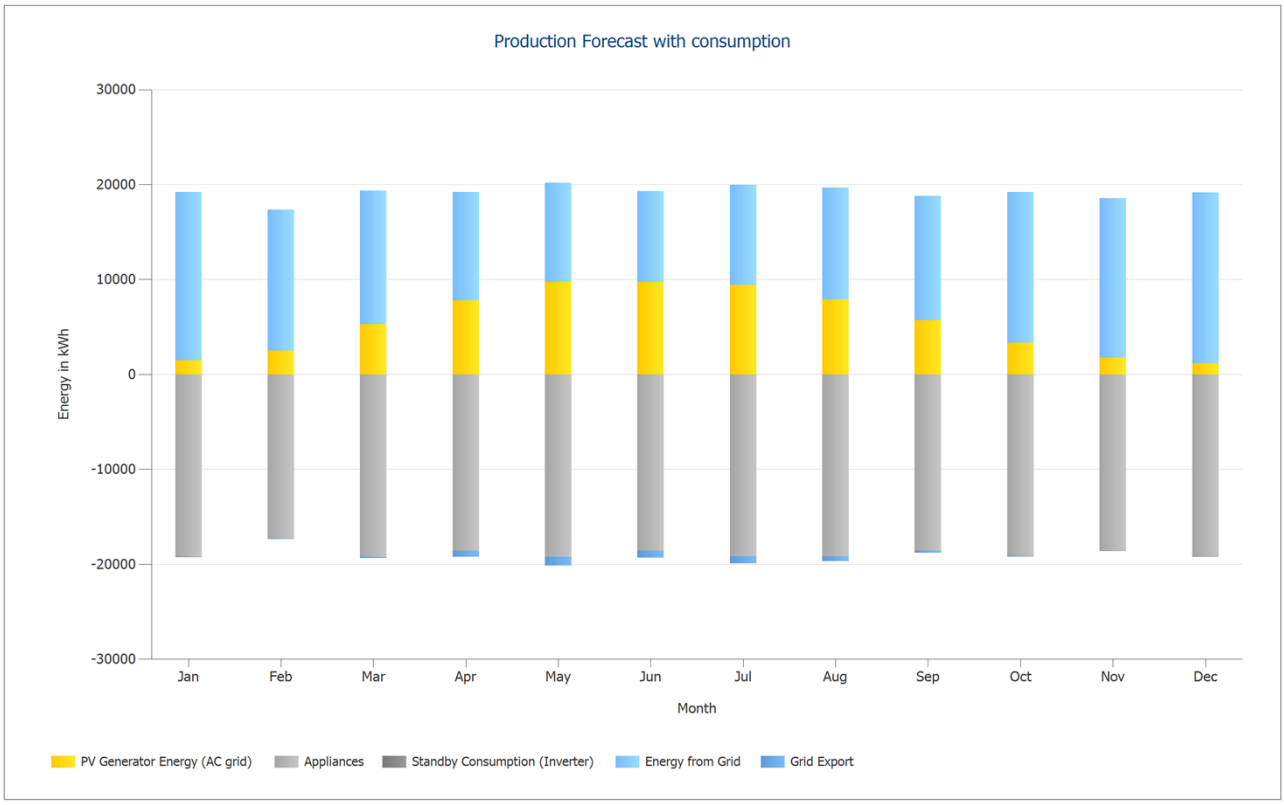


Figure: Production Forecast with consumption

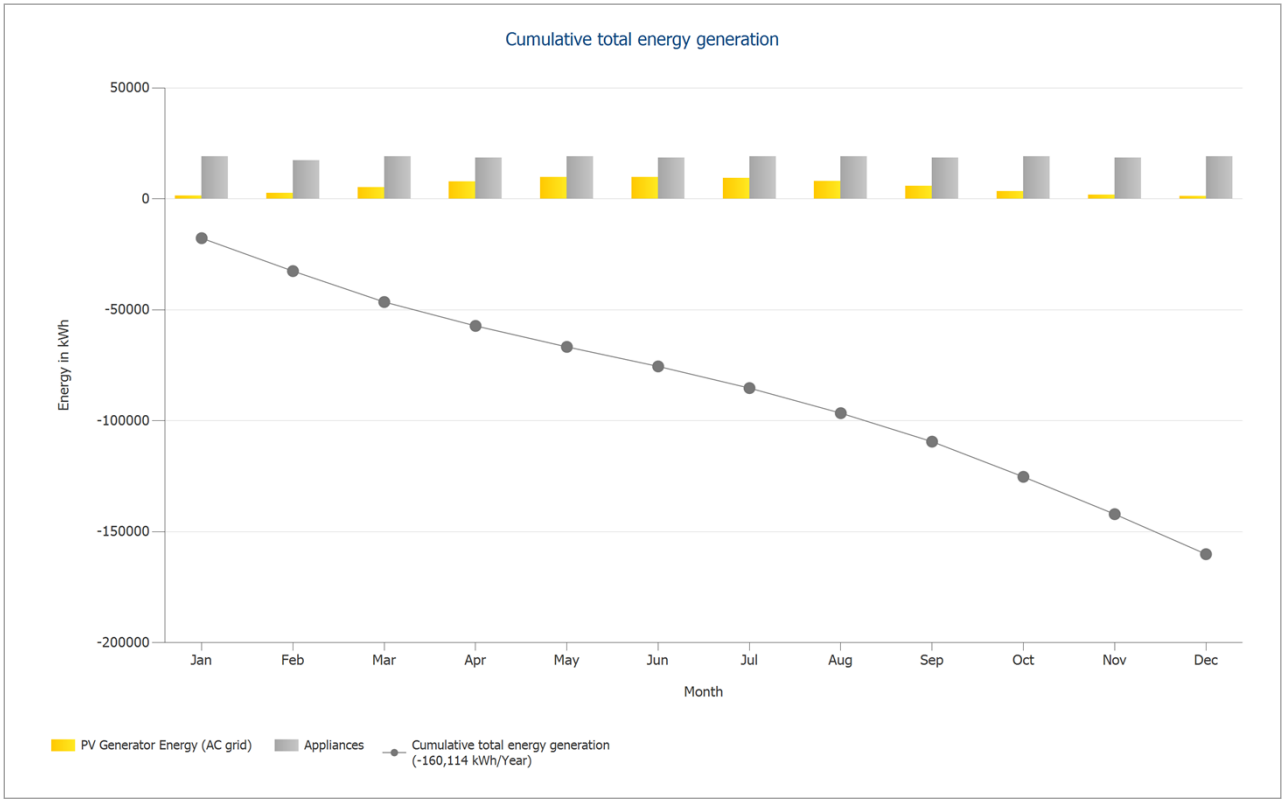


Figure: Cumulative total energy generation

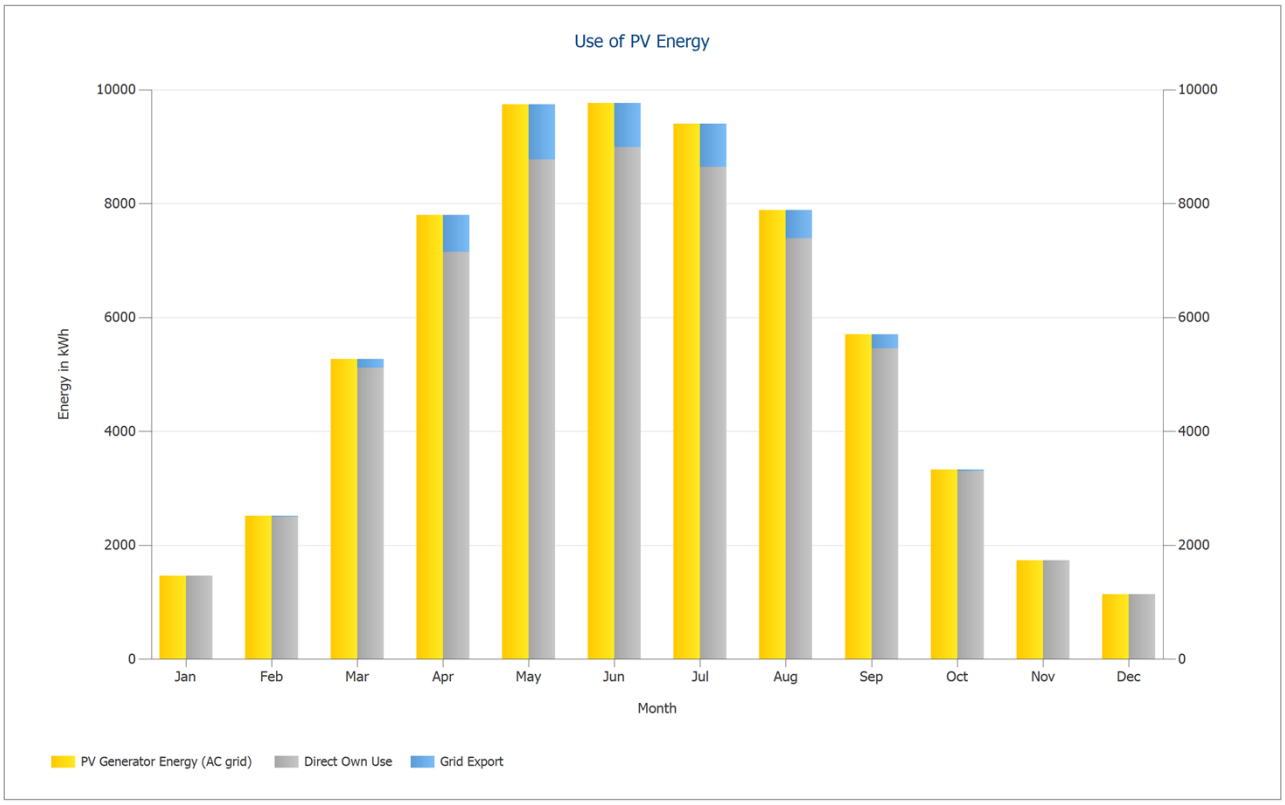


Figure: Use of PV Energy

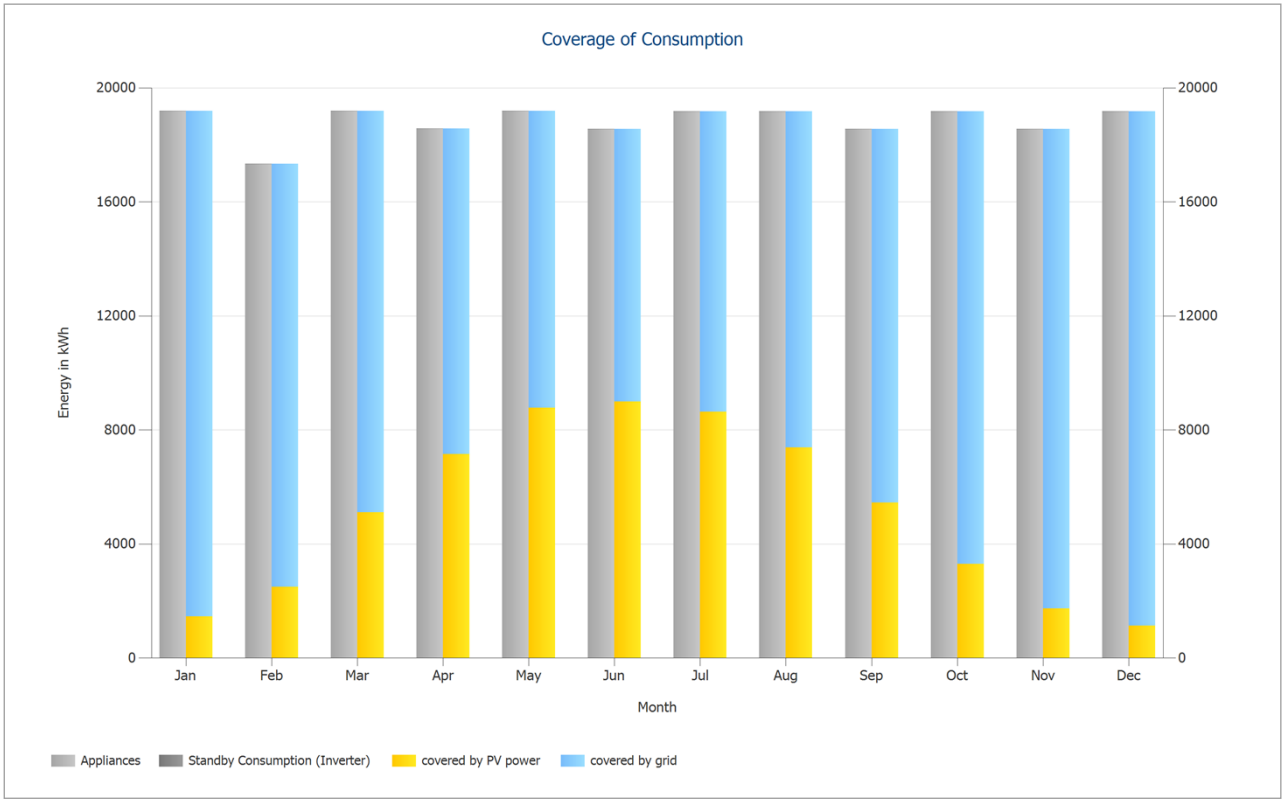


Figure: Coverage of Consumption

Results per Module Area

West Facing Centre

PV Generator Output	29.14	kWp
PV Generator Surface	123.53	m²
Global Radiation at the Module	998.57	kWh/m²
Global Radiation on Module without reflection	998.57	kWh/m²
Performance Ratio (PR)	95.40	%
PV Generator Energy (AC grid)	27783.93	kWh/Year
Spec. Annual Yield	953.46	kWh/kWp

West Facing Outter

PV Generator Output	15.04	kWp
PV Generator Surface	63.76	m²
Global Radiation at the Module	1020.73	kWh/m²
Global Radiation on Module without reflection	1020.73	kWh/m²
Performance Ratio (PR)	95.73	%
PV Generator Energy (AC grid)	14706.94	kWh/Year
Spec. Annual Yield	977.86	kWh/kWp

East Facing Centre

PV Generator Output	16.92	kWp
PV Generator Surface	71.73	m²
Global Radiation at the Module	931.51	kWh/m²
Global Radiation on Module without reflection	931.51	kWh/m²
Performance Ratio (PR)	95.68	%
PV Generator Energy (AC grid)	15092.07	kWh/Year
Spec. Annual Yield	891.97	kWh/kWp

East Facing Outter

PV Generator Output	8.46	kWp
PV Generator Surface	35.86	m²
Global Radiation at the Module	1006.63	kWh/m²
Global Radiation on Module without reflection	1006.63	kWh/m²
Performance Ratio (PR)	95.76	%
PV Generator Energy (AC grid)	8161.56	kWh/Year
Spec. Annual Yield	964.72	kWh/kWp

Energy balance Sankey-Diagram

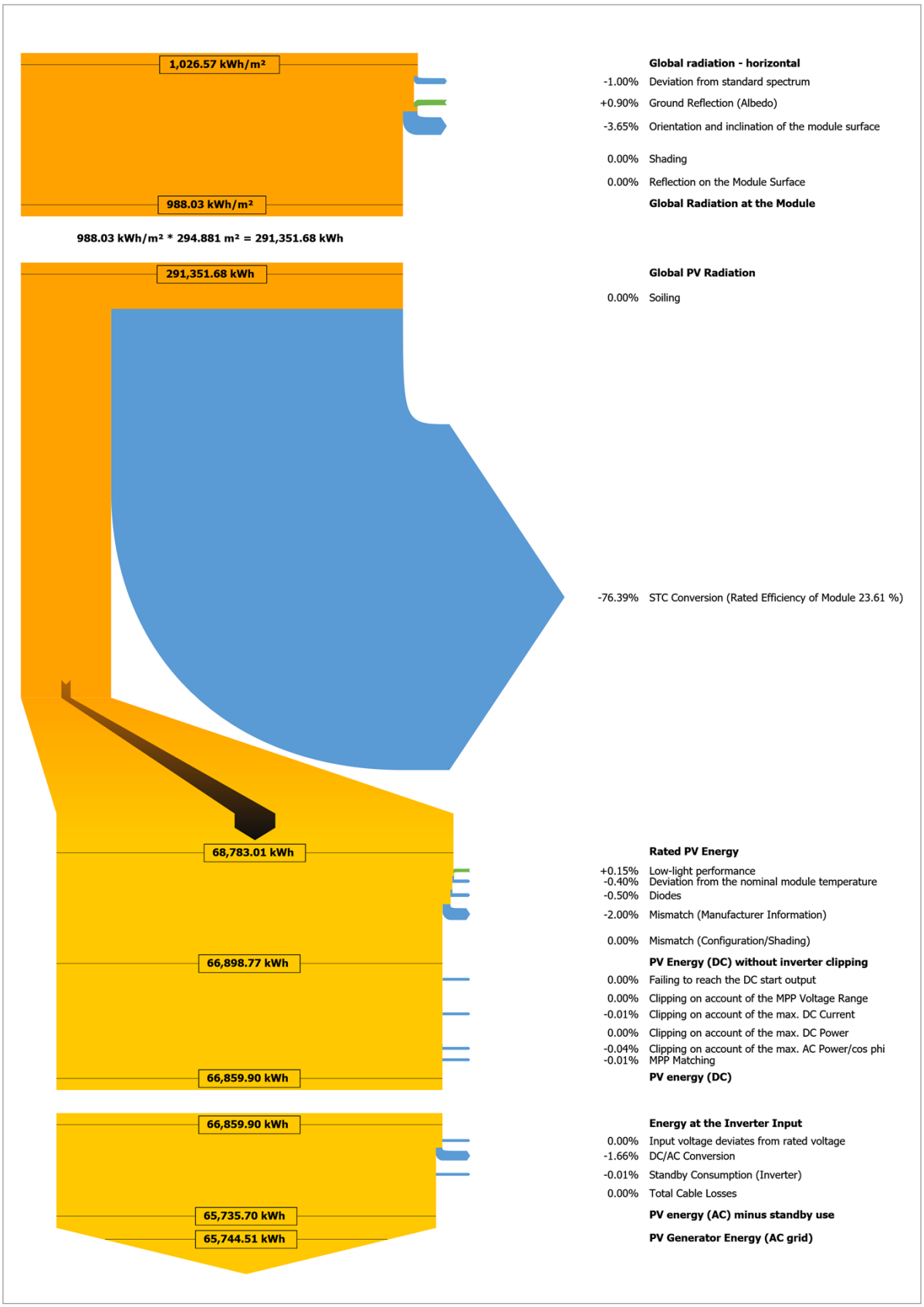


Figure: Energy balance Sankey-Diagram

Plans and parts list

Circuit Diagram

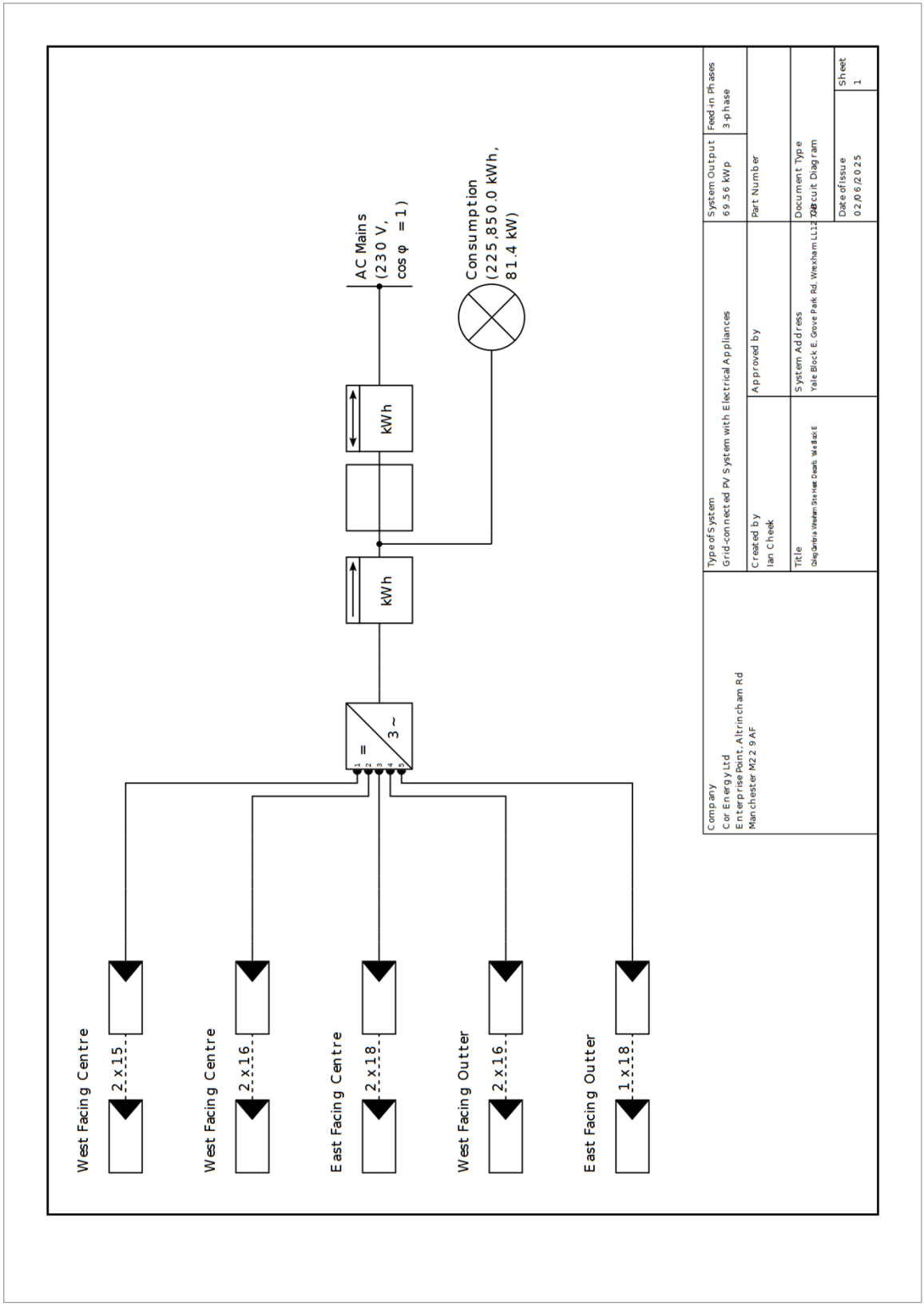


Figure: Circuit Diagram

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Aiko	AIKO-A470-MAH54Dw (2nd Generation)	148	Piece
2	Inverter		Sungrow Power Supply Co., Ltd.	SG50CX	1	Piece
3	Components			Feed-in Meter	1	Piece
4	Components			House connection	1	Piece
5	Components			Bidirectional Meter	1	Piece