Sureserve Energy Services
Enterprise Point, Altrincham Rd, Manchester
M22 9AF
United Kingdom

Project Name: Choices Cafe & Restaurant

16/06/2025

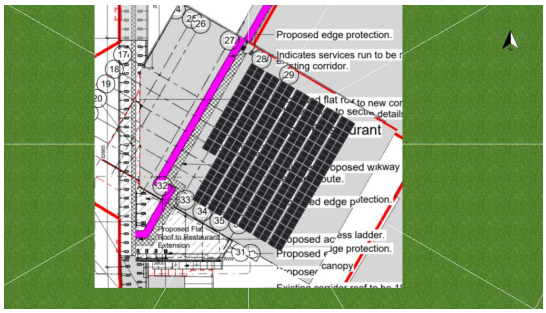
Documentation

Customer Details

Company	Hillingdon Hospital
Customer Number	
Contact person	
Address	
Phone	
Fax	
E-Mail	

Project Data

Project Name	Choices Cafe & Restaurant
Offer no.	
Project Designer	JB
Address	Choices Cafe & Restaurant, Hillingdon Hospital, Pield Heath Rd, Uxbridge UB8 3NN



Project Description:
Rooftop PV

Project Designer: JB **Client:** Hillingdon Hospital

Project Overview

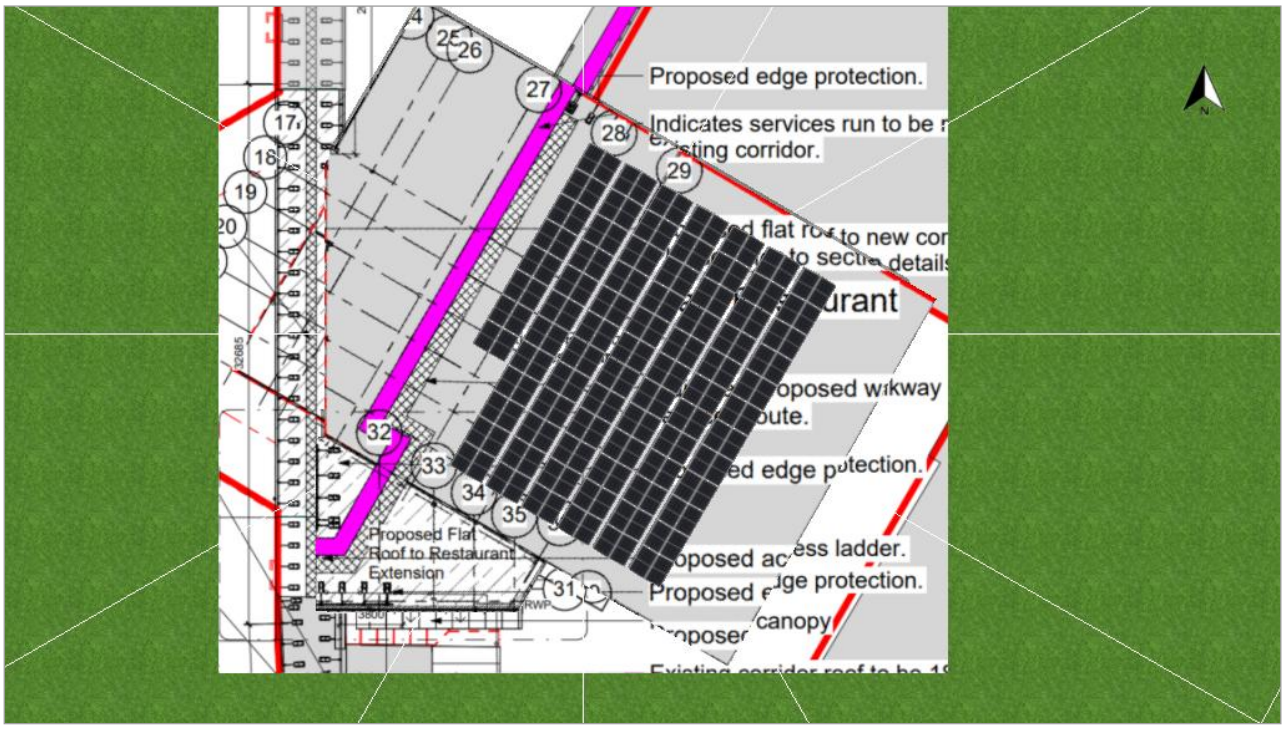


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Uxbridge, GBR (2001 - 2020)	
Values source	Meteonorm 8.2(i)	
PV Generator Output	75.2	kWp
PV Generator Surface	318.8	m²
Number of PV Modules	160	
Number of Inverters	2	

Project Designer: JB **Client:** Hillingdon Hospital

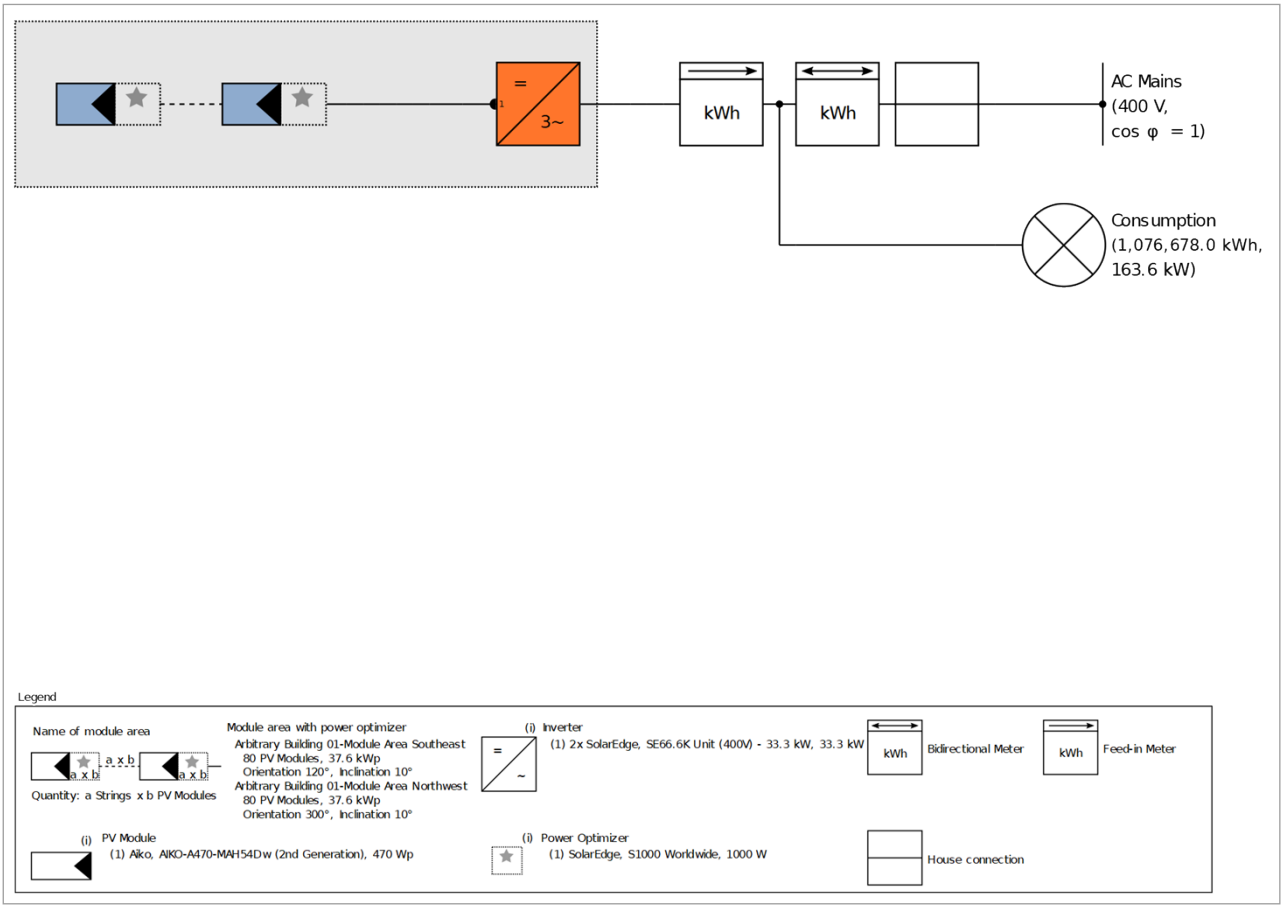


Figure: Schematic diagram

Production Forecast

Production Forecast		
PV Generator Output	75.20	kWp
Spec. Annual Yield	917.96	kWh/kWp
Performance Ratio (PR)	90.76	%
Yield Reduction due to Shading	0.8	%
PV Generator Energy (AC grid)	69,083	kWh/Year
Own Consumption	69,083	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	0	kWh/Year
Own Power Consumption	100.0	%
CO_2 Emissions avoided	15,531	kg / year
Level of Self-sufficiency	6.4	%

Financial Analysis

Your Gain

Total investment costs	71,049.27	£
Internal Rate of Return (IRR)	27.69	%
Amortization Period	3.9	Years
Electricity Production Costs	0.0412	£/kWh
Energy Balance/Feed-in Concept	Surplus Feed-in	

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
Start of Operation	01/01/2025

Climate Data

Location	Uxbridge, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Reindl reduced
- Irradiance onto tilted surface	Perez

Consumption

Total Consumption	1076678 kWh
HH Restaurant 051123 to 041124	1076678 kWh
Load Peak	163.6 kW

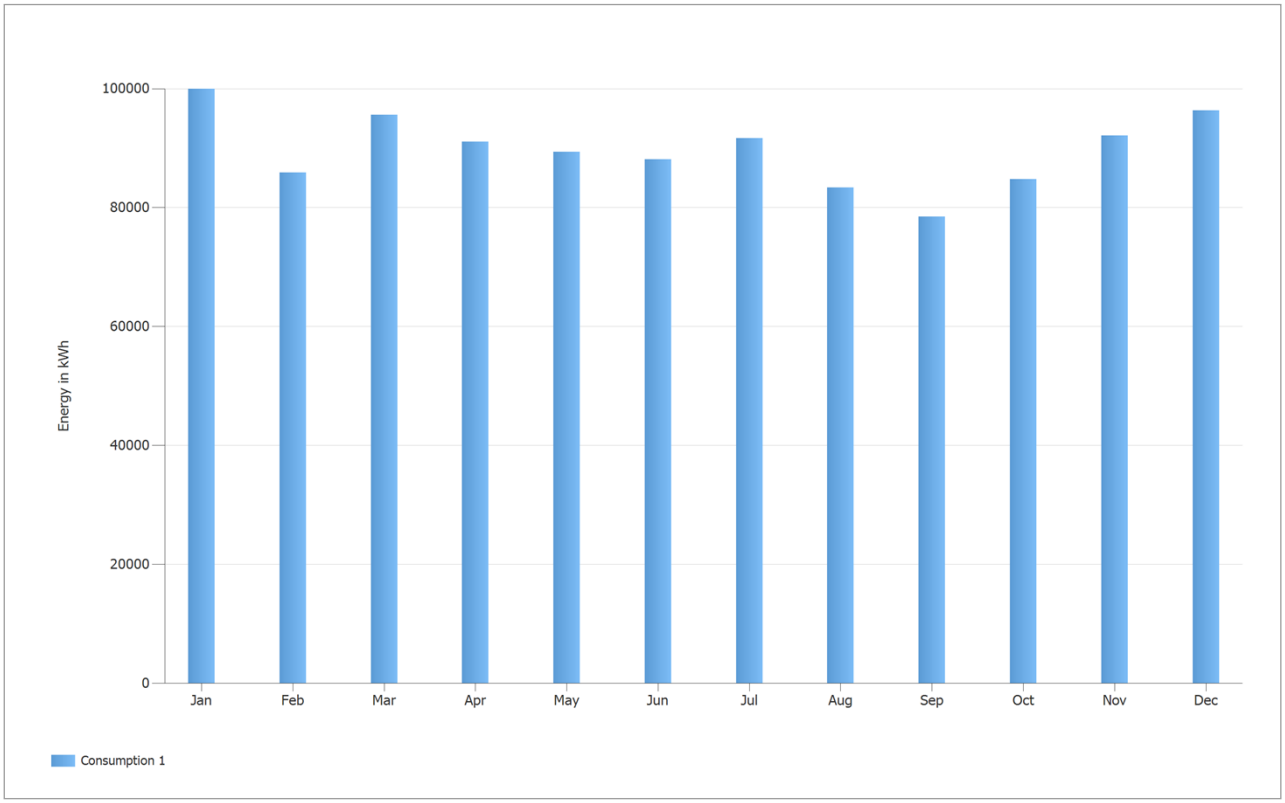


Figure: Consumption

Module Areas

1. Module Area - Arbitrary Building 01-Module Area Southeast

PV Generator, 1. Module Area - Arbitrary Building 01-Module Area Southeast

Name	Arbitrary Building 01-Module Area Southeast	
PV Modules	80 x AIKO-A470-MAH54Dw (2nd Generation) (v1)	
Manufacturer	Aiko	
Inclination	10	°
Orientation	Southeast 120	°
Installation Type	Mounted - Roof	
PV Generator Surface	159.4	m²

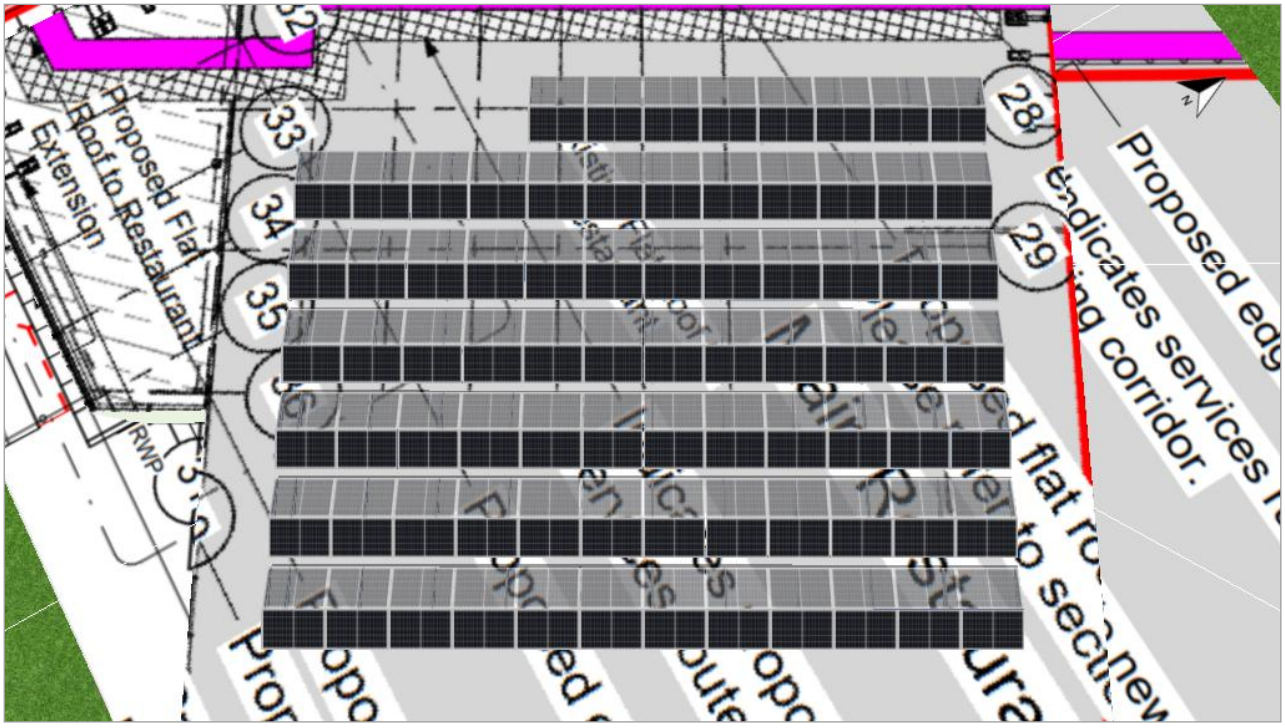


Figure: 1. Module Area - Arbitrary Building 01-Module Area Southeast

Degradation of Module, 1. Module Area - Arbitrary Building 01-Module Area Southeast

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

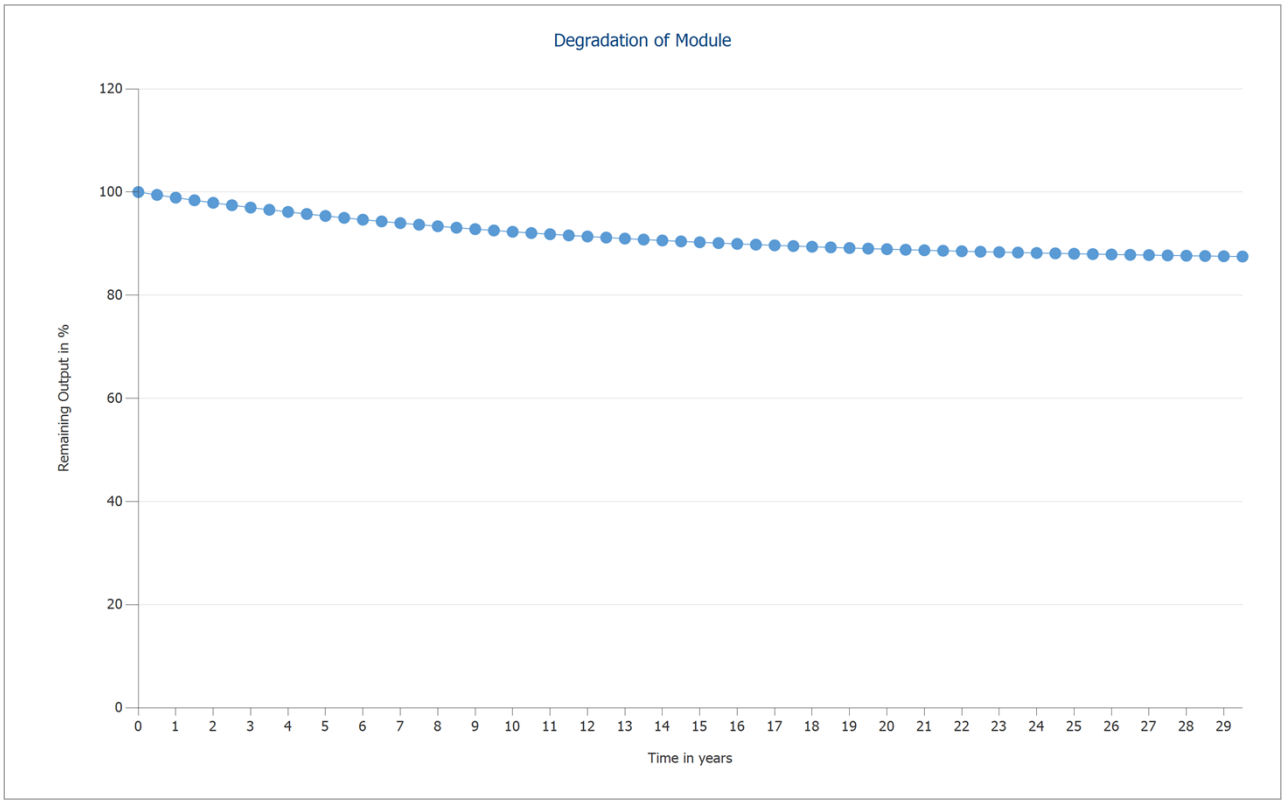


Figure: Degradation of Module, 1. Module Area - Arbitrary Building 01-Module Area Southeast

2. Module Area - Arbitrary Building 01-Module Area Northwest

PV Generator, 2. Module Area - Arbitrary Building 01-Module Area Northwest

Name	Arbitrary Building 01-Module Area Northwest	
PV Modules	80 x AIKO-A470-MAH54Dw (2nd Generation) (v1)	
Manufacturer	Aiko	
Inclination	10	°
Orientation	Northwest 300	°
Installation Type	Mounted - Roof	
PV Generator Surface	159.4	m²

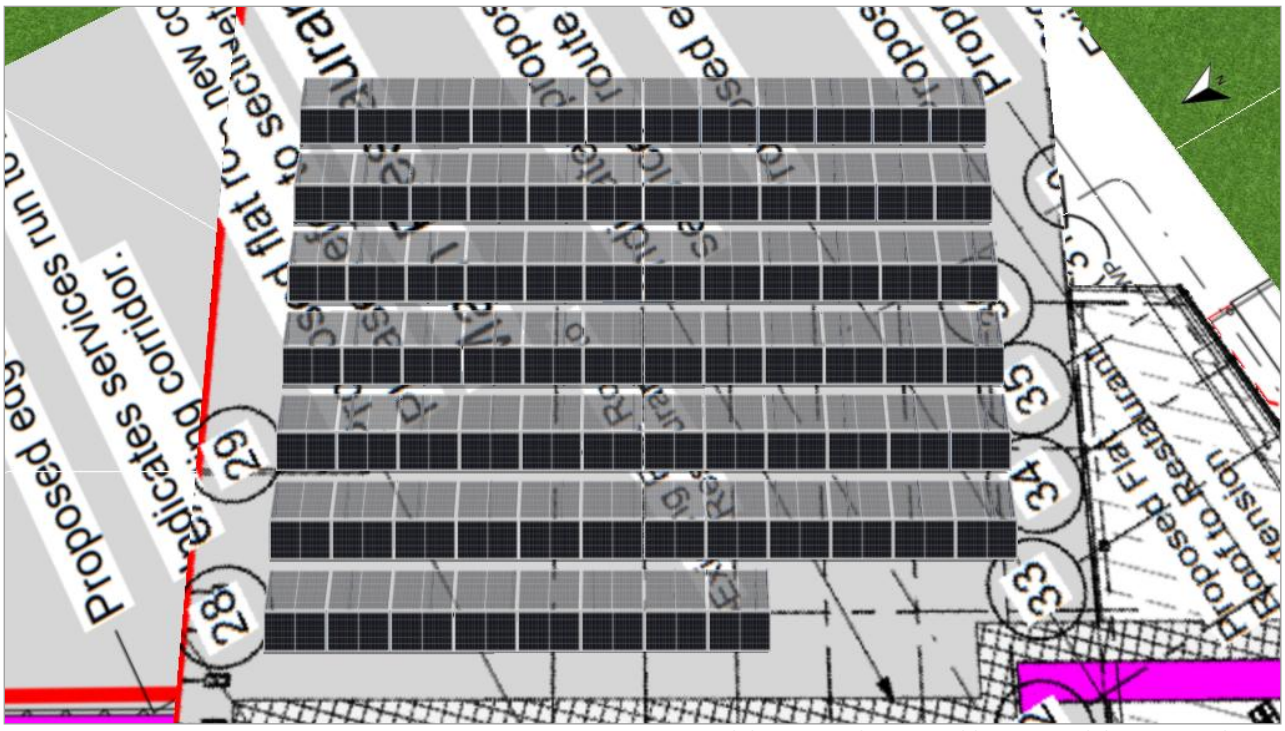


Figure: 2. Module Area - Arbitrary Building 01-Module Area Northwest

Degradation of Module, 2. Module Area - Arbitrary Building 01-Module Area Northwest

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

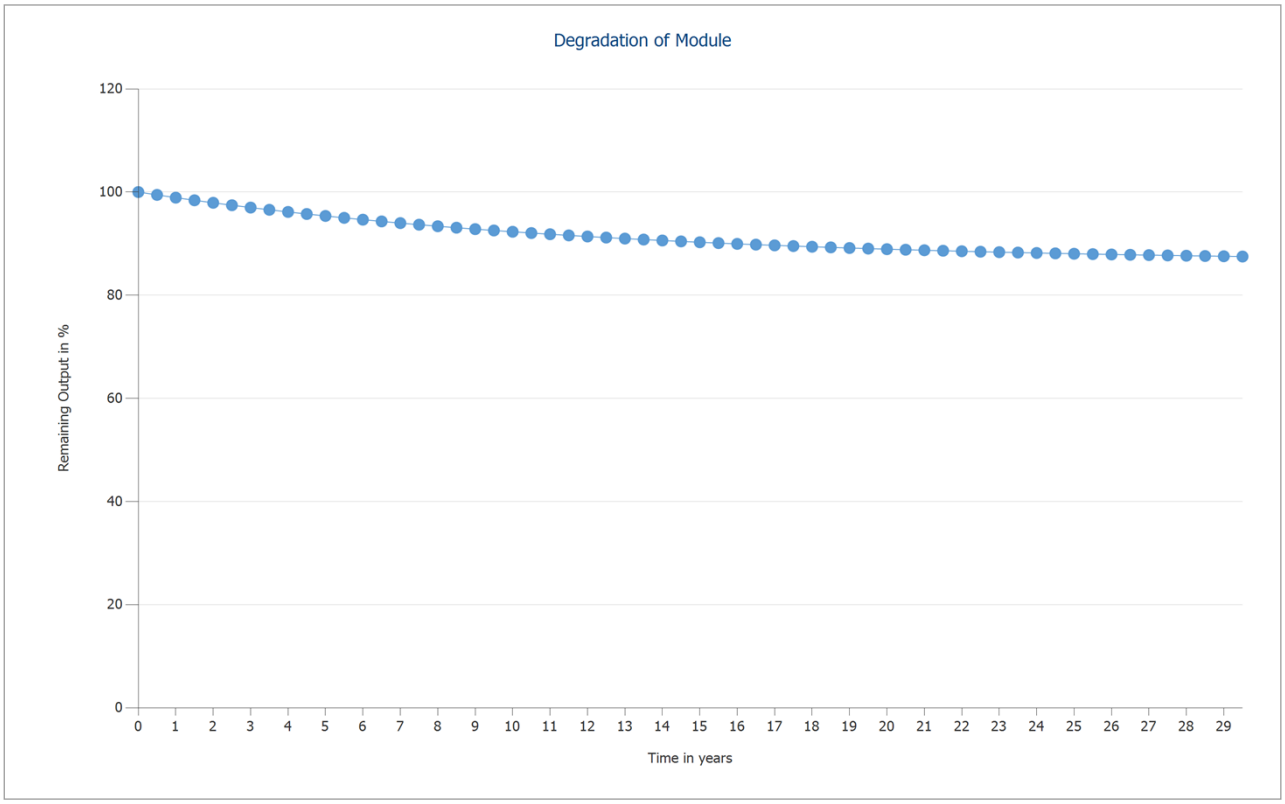


Figure: Degradation of Module, 2. Module Area - Arbitrary Building 01-Module Area Northwest

Horizon Line, 3D Design

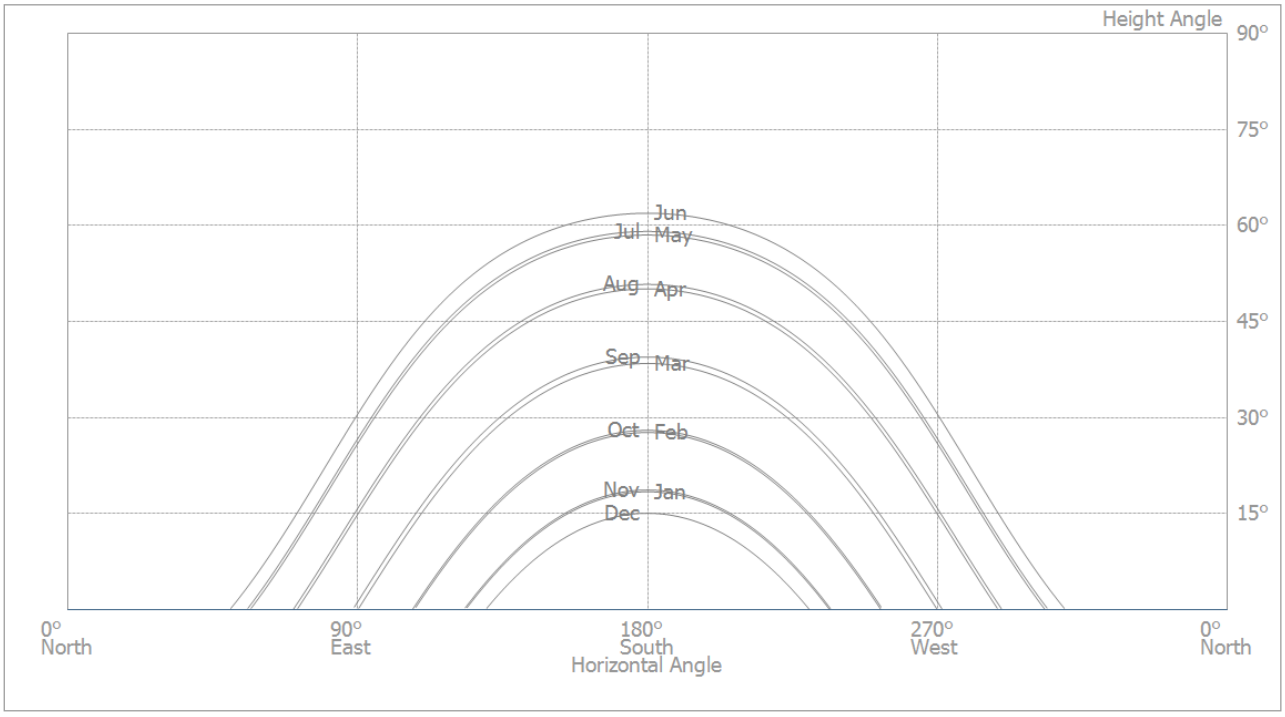


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Arbitrary Building 01-Module Area Southeast + Arbitrary Building 01-Module Area Northwest
Inverter 1	
Model	SE66.6K Unit (400V) - 33.3 kW (v1)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	101.6 %
Configuration	MPP 1:
	2 x 18☆ [1 x 2]
Power Optimizer	36x SolarEdge, S1000 Worldwide (v2)
Inverter 2	
Model	SE66.6K Unit (400V) - 33.3 kW (v1)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	124.2 %
Configuration	MPP 1:
	1 x 15☆ [1 x 2] | |
	1 x 14☆ [1 x 2] | |
	1 x 4☆ [1 x 2] | |
	1 x 11☆ [1 x 2]
Power Optimizer	44x SolarEdge, S1000 Worldwide (v2)

AC Mains

AC Mains

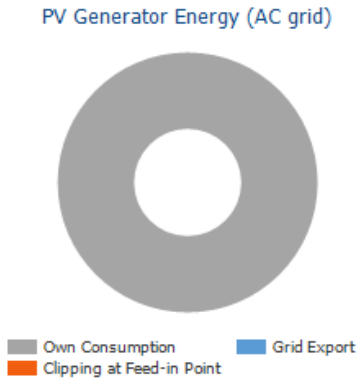
Number of Phases	3
Mains voltage between phase and neutral	400 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

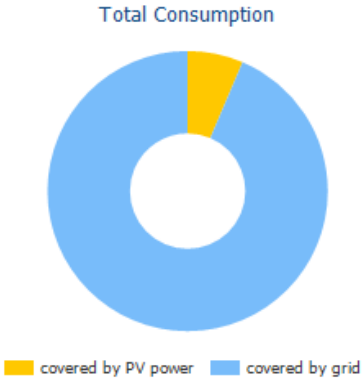
PV System

PV Generator Output	75.20	kWp
Spec. Annual Yield	917.96	kWh/kWp
Performance Ratio (PR)	90.76	%
Yield Reduction due to Shading	0.8	%
PV Generator Energy (AC grid)	69,083	kWh/Year
Own Consumption	69,083	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	0	kWh/Year
Own Power Consumption	100.0	%
CO_2 Emissions avoided	15,531	kg / year



Appliances

Appliances	1,076,678	kWh/Year
Standby Consumption (Inverter)	52	kWh/Year
Total Consumption	1,076,730	kWh/Year
covered by PV power	69,083	kWh/Year
covered by grid	1,007,648	kWh/Year
Solar Fraction	6.4	%



Level of Self-sufficiency

Total Consumption	1,076,730	kWh/Year
covered by grid	1,007,648	kWh/Year
Level of Self-sufficiency	6.4	%

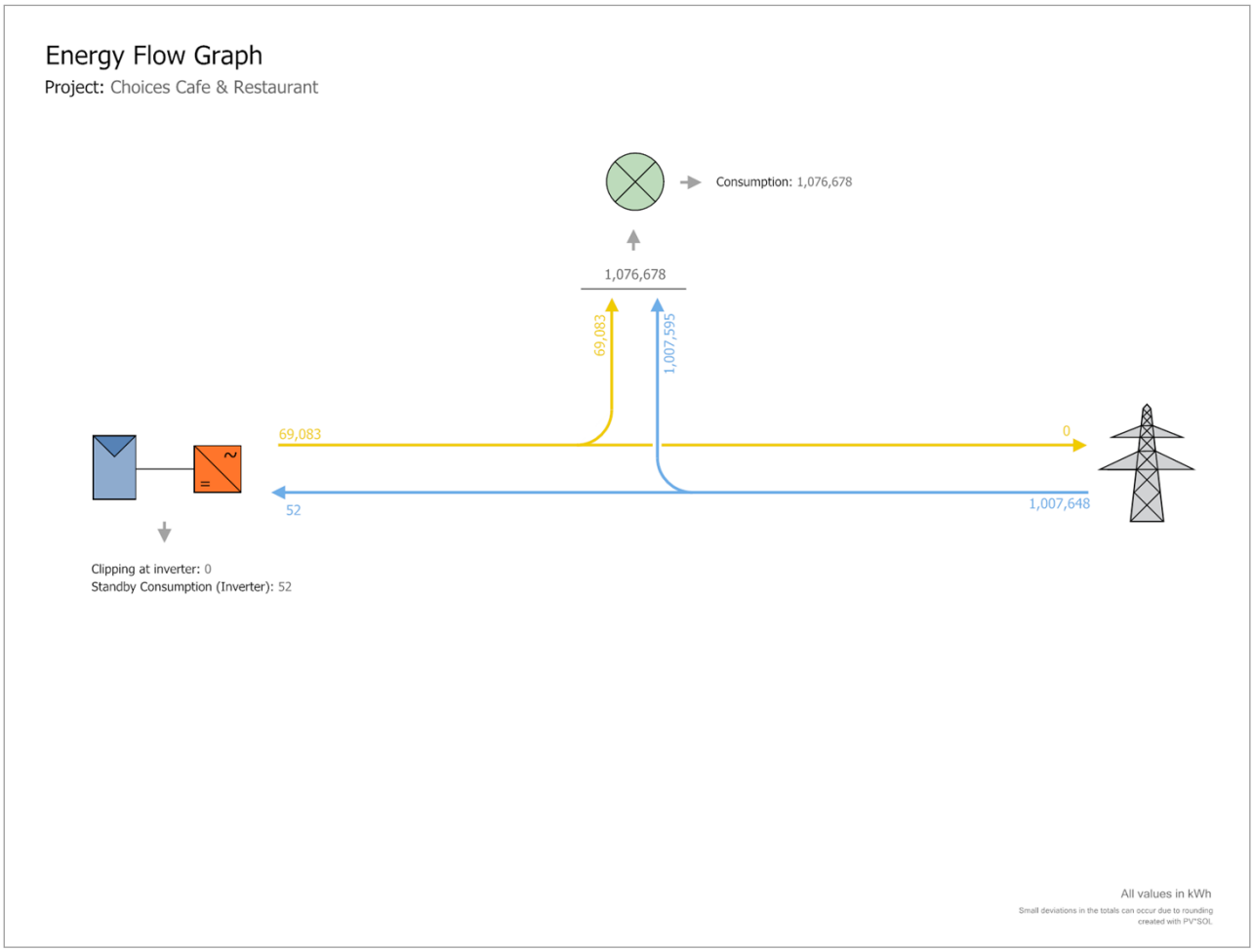


Figure: Energy flow

Project Designer: JB **Client:** Hillingdon Hospital

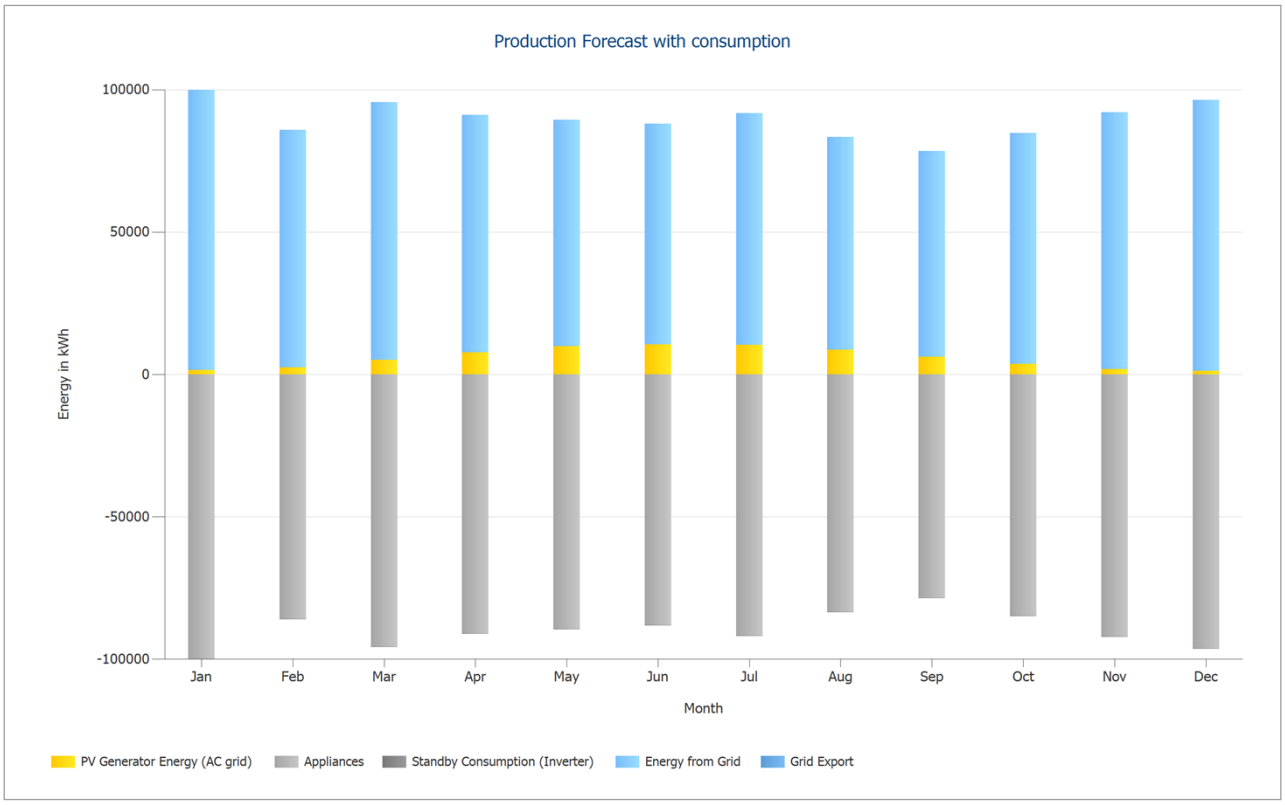


Figure: Production Forecast with consumption

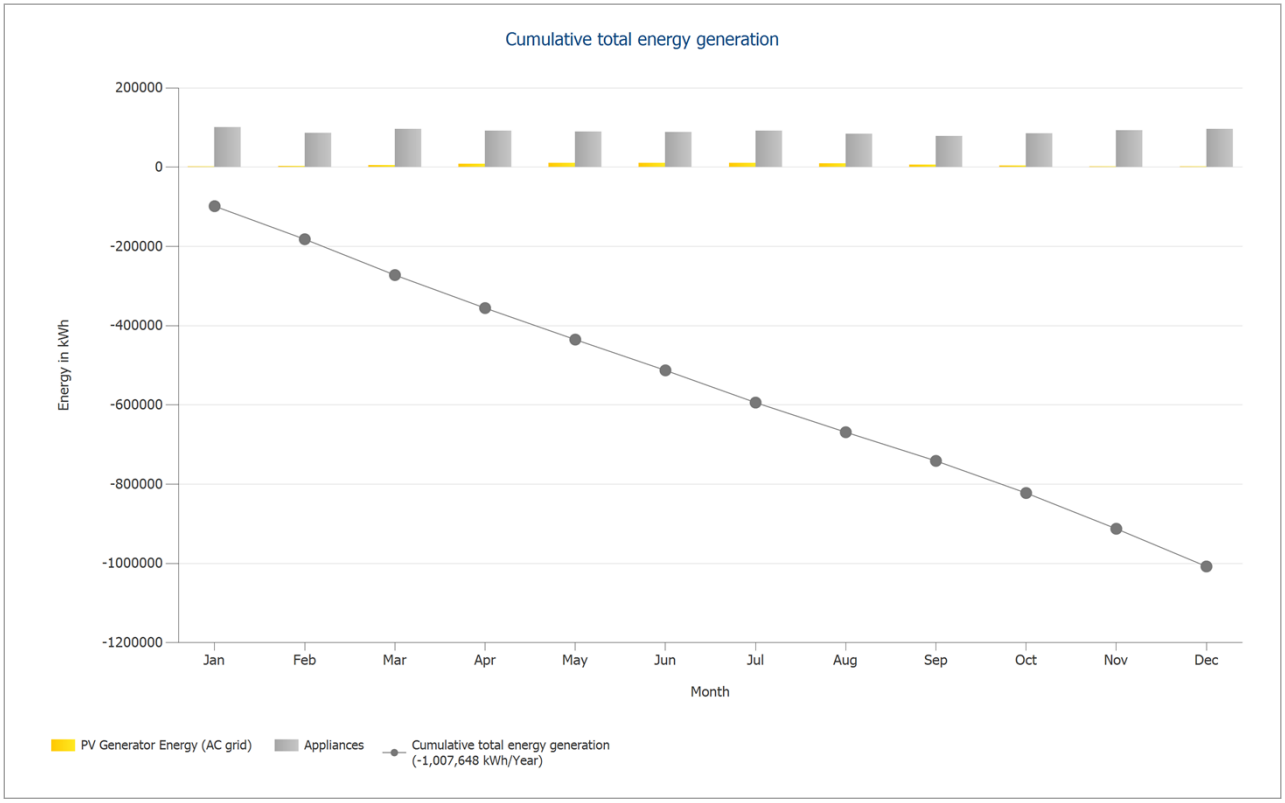


Figure: Cumulative total energy generation

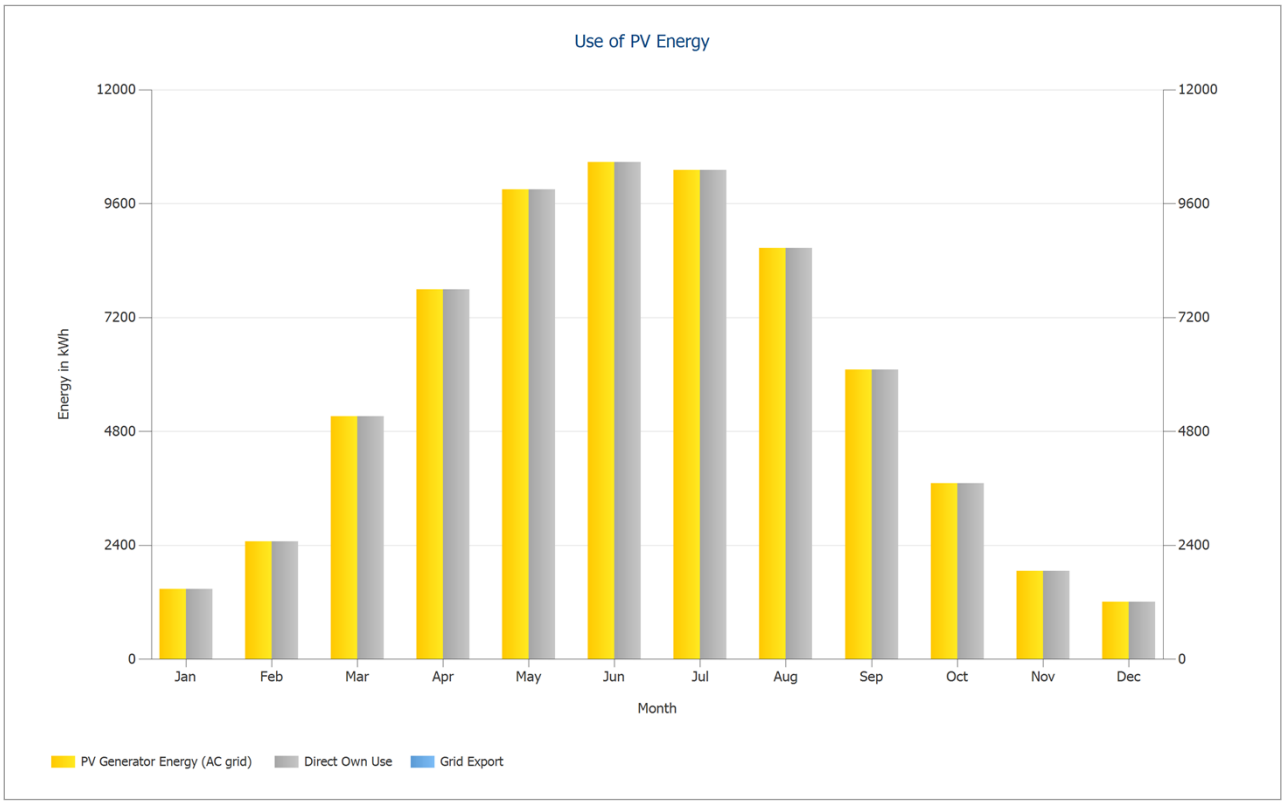


Figure: Use of PV Energy

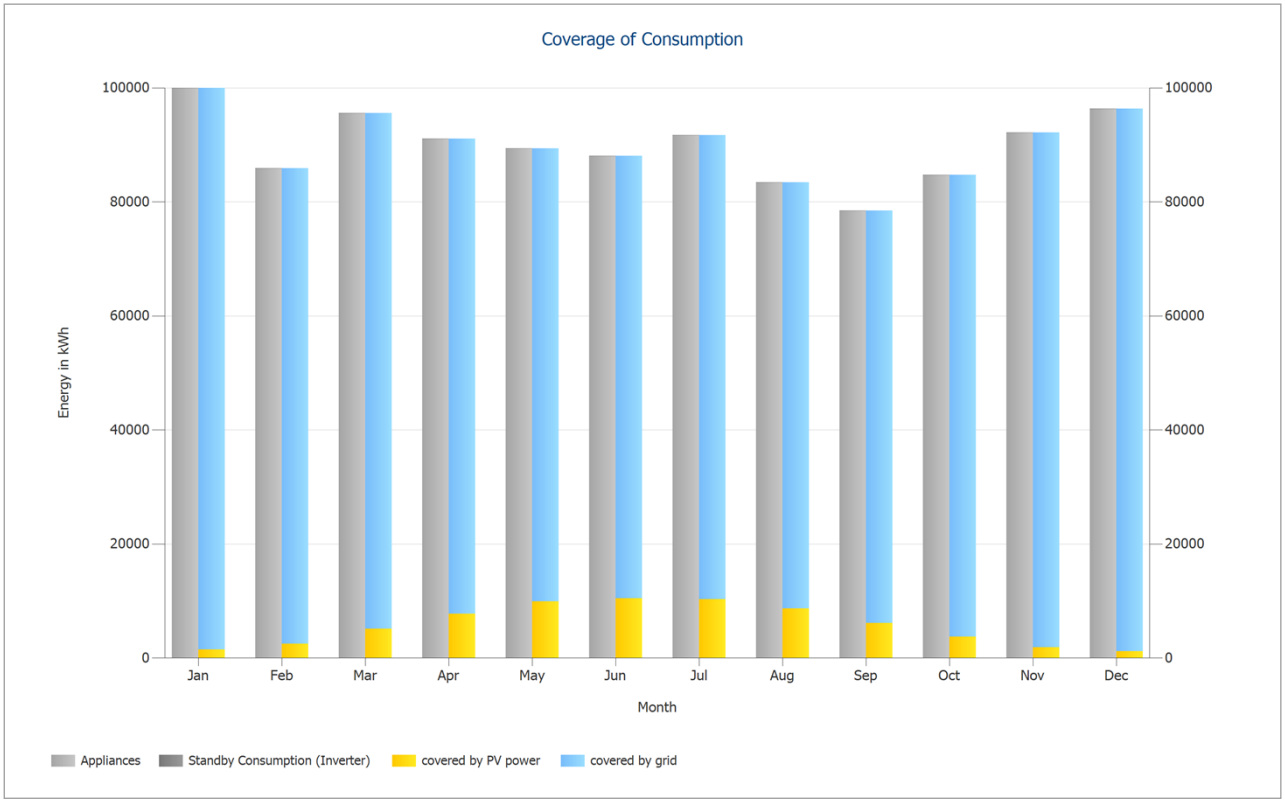


Figure: Coverage of Consumption

Energy balance Sankey-Diagram

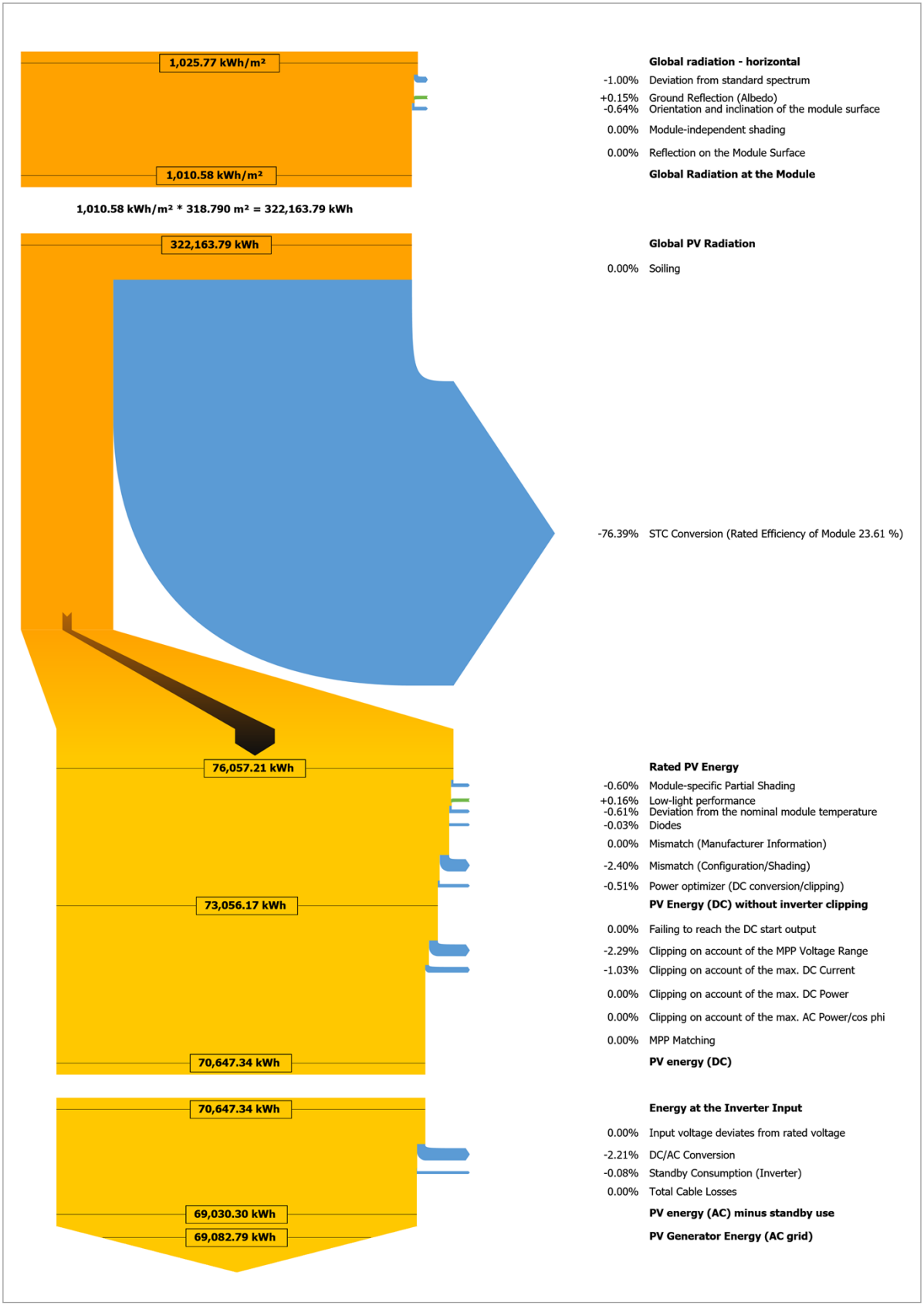


Figure: Energy balance Sankey-Diagram

Financial Analysis

Overview

System Data

Grid Export in the first year (incl. module degradation)	0	kWh/Year
PV Generator Output	75.2	kWp
Start of Operation of the System	01/01/2025	
Assessment Period	25	Years
Interest on Capital	0	%

Economic Parameters

Internal Rate of Return (IRR)	27.69	%
Accrued Cash Flow (Cash Balance)	600,991.91	£
Amortization Period	3.9	Years
Electricity Production Costs	0.0412	£/kWh

Payment Overview

Specific Investment Costs	944.80	£/kWp
Investment Costs	71,049.27	£
One-off Payments	0.00	£
Incoming Subsidies	0.00	£
Annual Costs	0.00	£/Year
Other Revenue or Savings	0.00	£/Year

Remuneration and Savings

Total Payment from Utility in First Year	0.00	£/Year
First year savings	17,590.19	£/Year

Hillingdon Hospital (Example)		
Energy Price	0.2563	£/kWh
Inflation Rate for Energy Price	4	%/Year

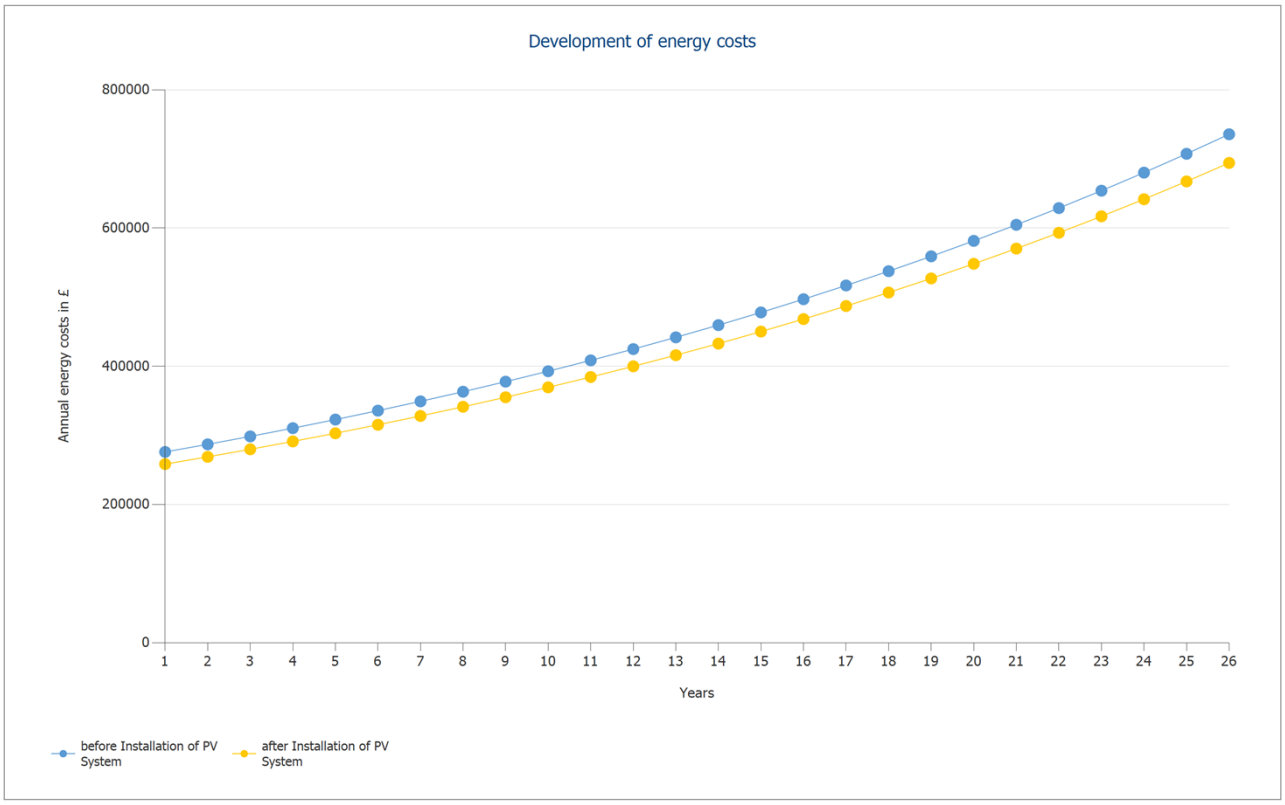


Figure: Development of energy costs

Cash flow

Cash flow

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-£71,049.27	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£17,590.19	£18,102.17	£18,642.79	£19,212.83	£19,813.16
Annual Cash Flow	**-£53,459.08**	**£18,102.17**	**£18,642.79**	**£19,212.83**	**£19,813.16**
Accrued Cash Flow (Cash Balance)	-£53,459.08	-£35,356.91	-£16,714.12	£2,498.72	£22,311.88

Cash flow

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£20,444.64	£21,108.24	£21,804.94	£22,535.78	£23,301.88
Annual Cash Flow	**£20,444.64**	**£21,108.24**	**£21,804.94**	**£22,535.78**	**£23,301.88**
Accrued Cash Flow (Cash Balance)	£42,756.52	£63,864.75	£85,669.69	£108,205.48	£131,507.36

Cash flow

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£24,104.37	£24,944.48	£25,823.47	£26,742.68	£27,703.48
Annual Cash Flow	**£24,104.37**	**£24,944.48**	**£25,823.47**	**£26,742.68**	**£27,703.48**
Accrued Cash Flow (Cash Balance)	£155,611.73	£180,556.21	£206,379.68	£233,122.36	£260,825.84

Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£28,707.37	£29,755.82	£30,850.47	£31,992.98	£33,185.07
Annual Cash Flow	**£28,707.37**	**£29,755.82**	**£30,850.47**	**£31,992.98**	**£33,185.07**
Accrued Cash Flow (Cash Balance)	£289,533.21	£319,289.03	£350,139.49	£382,132.48	£415,317.54

Cash flow

	Year 21	Year 22	Year 23	Year 24	Year 25
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£34,428.57	£35,725.39	£37,077.50	£38,486.97	£39,955.93
Annual Cash Flow	**£34,428.57**	**£35,725.39**	**£37,077.50**	**£38,486.97**	**£39,955.93**
Accrued Cash Flow (Cash Balance)	£449,746.12	£485,471.51	£522,549.01	£561,035.98	£600,991.91

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

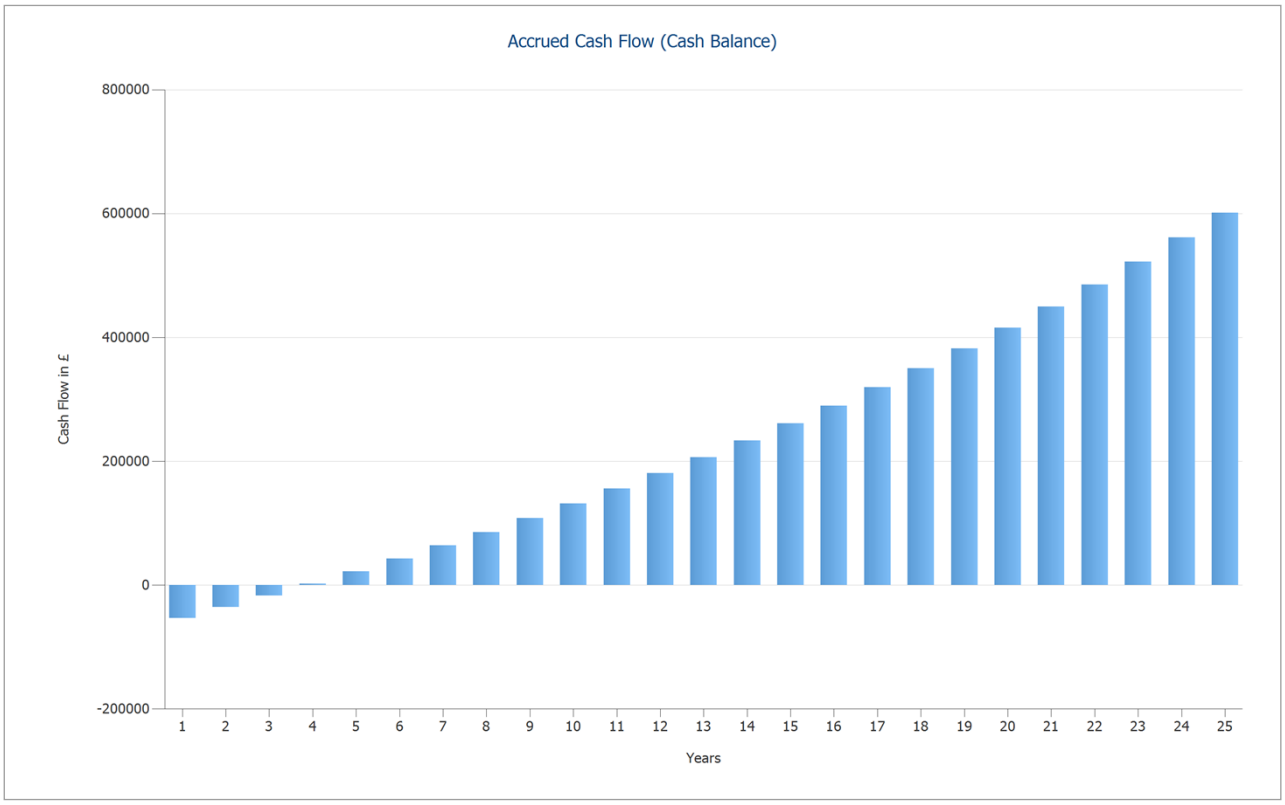


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram

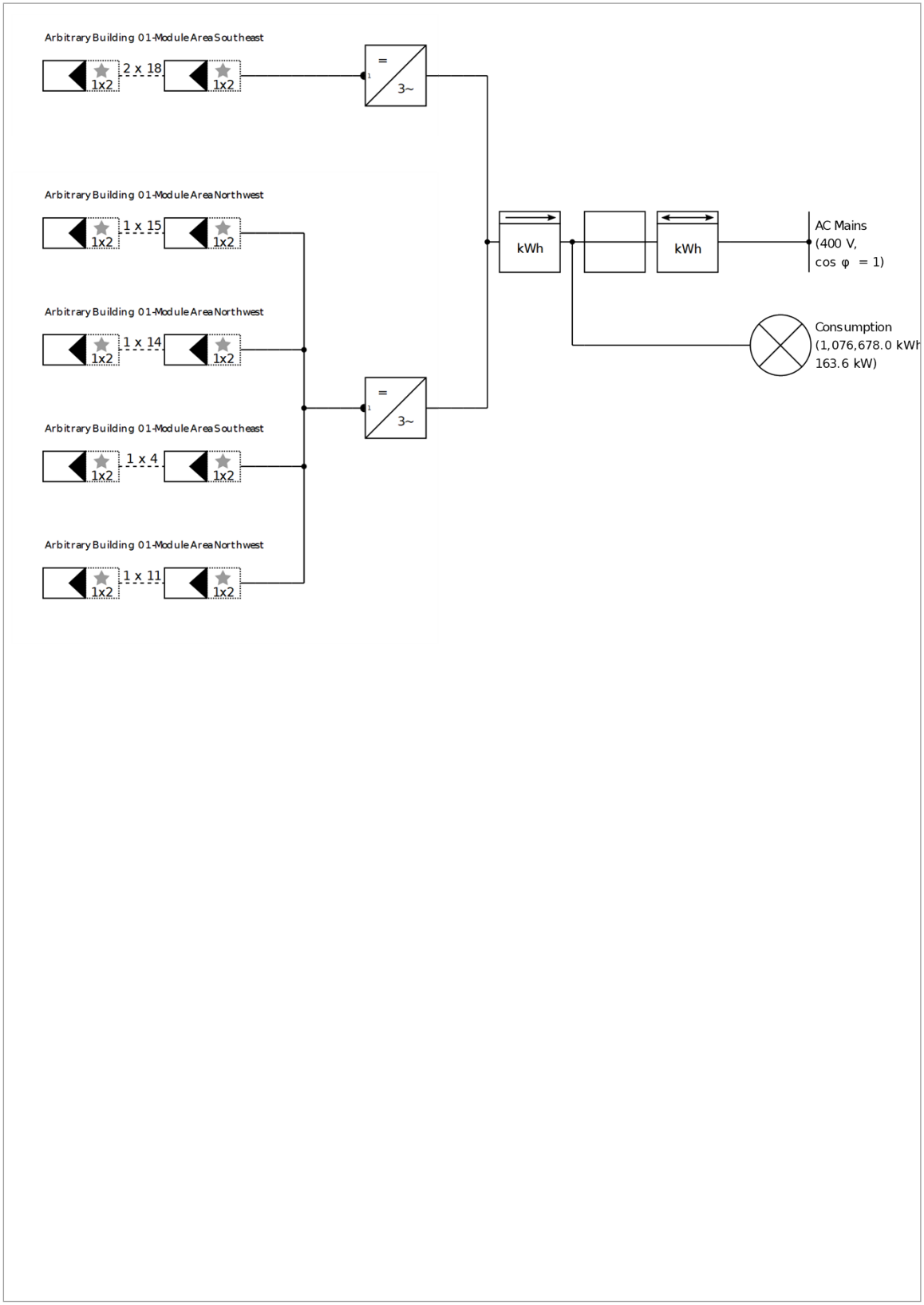


Figure: Circuit Diagram

Overview plan

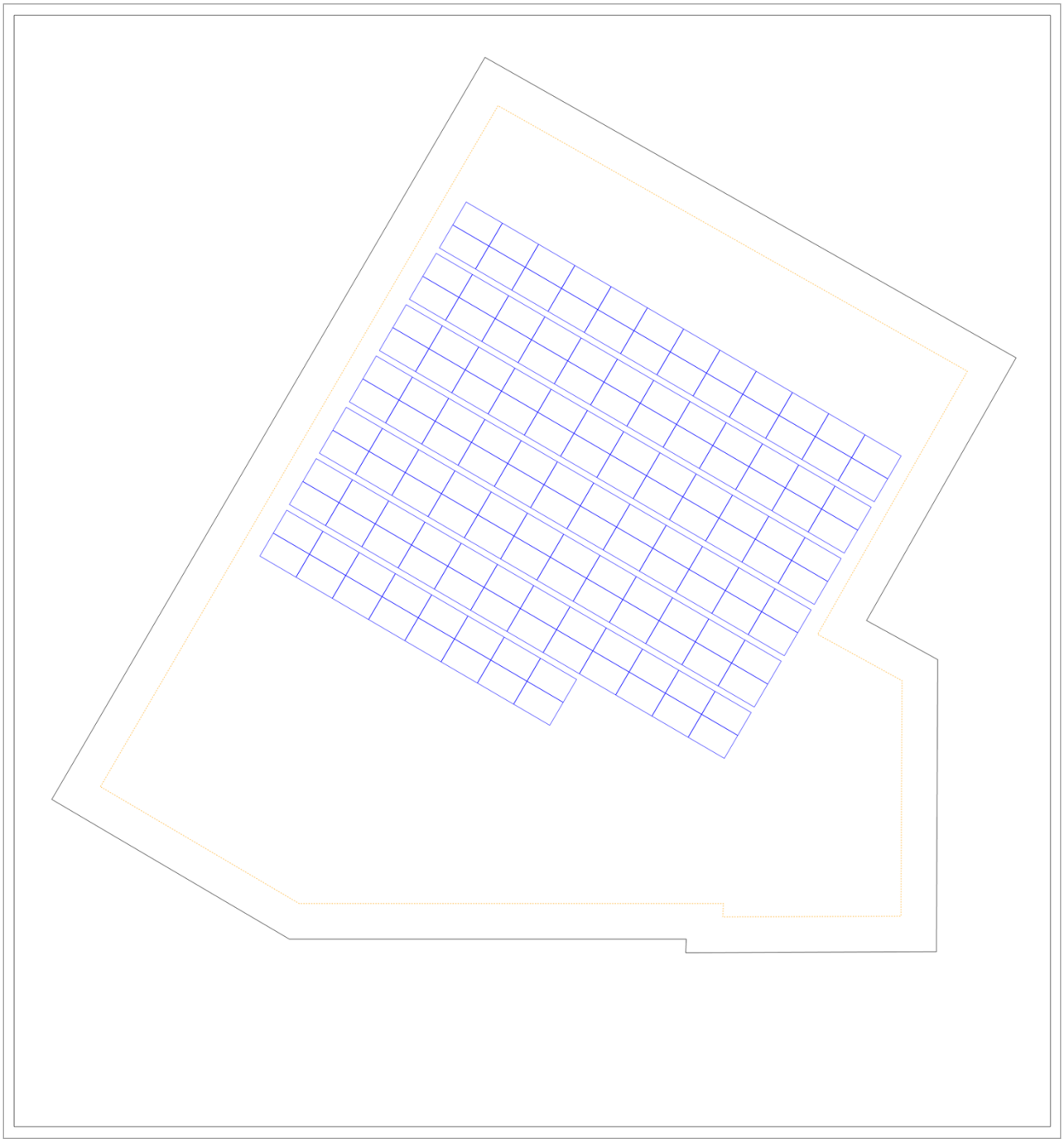


Figure: Overview plan

Dimensioning Plan

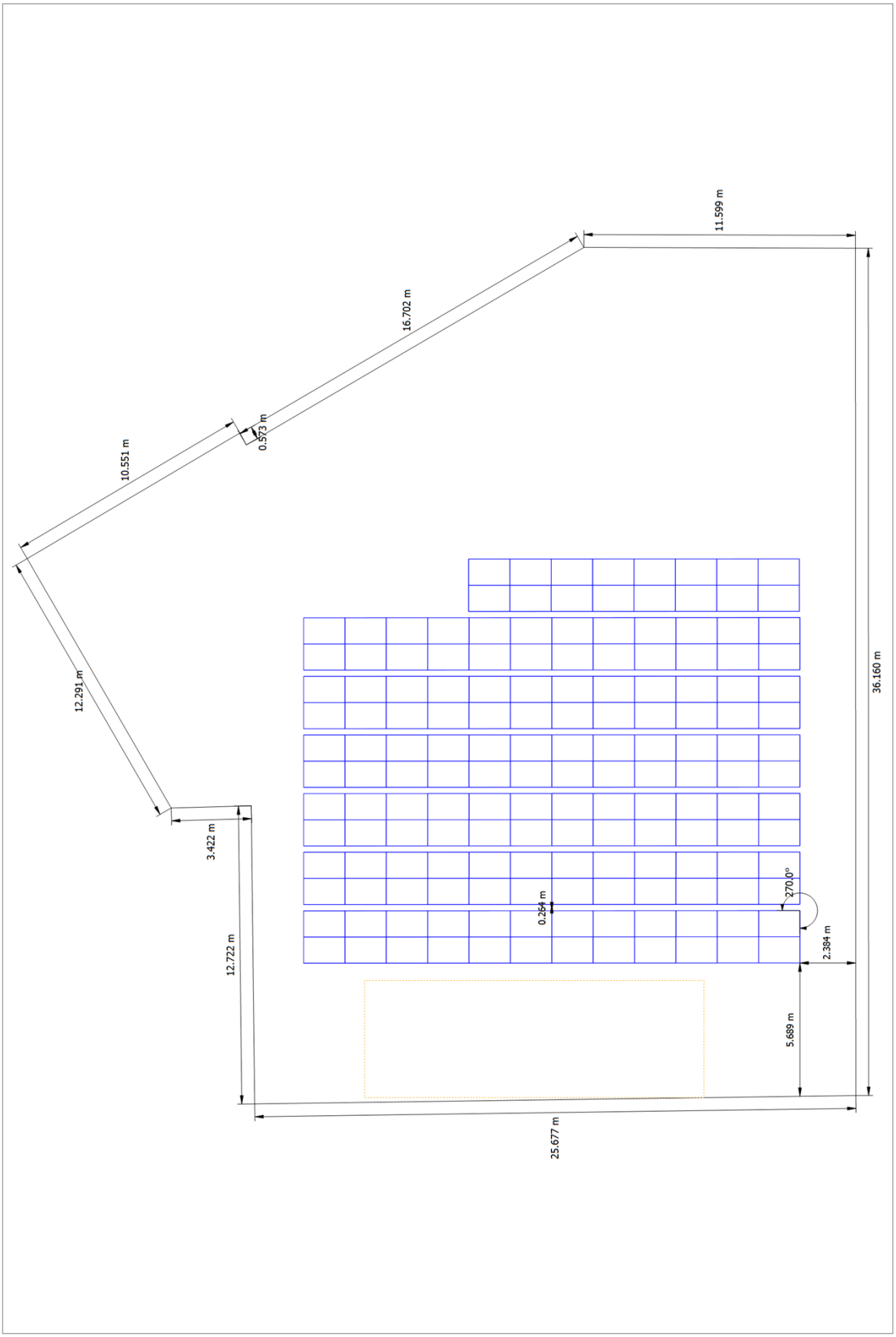


Figure: Arbitrary Building 01 - Mounting Surface Northeast

String Plan

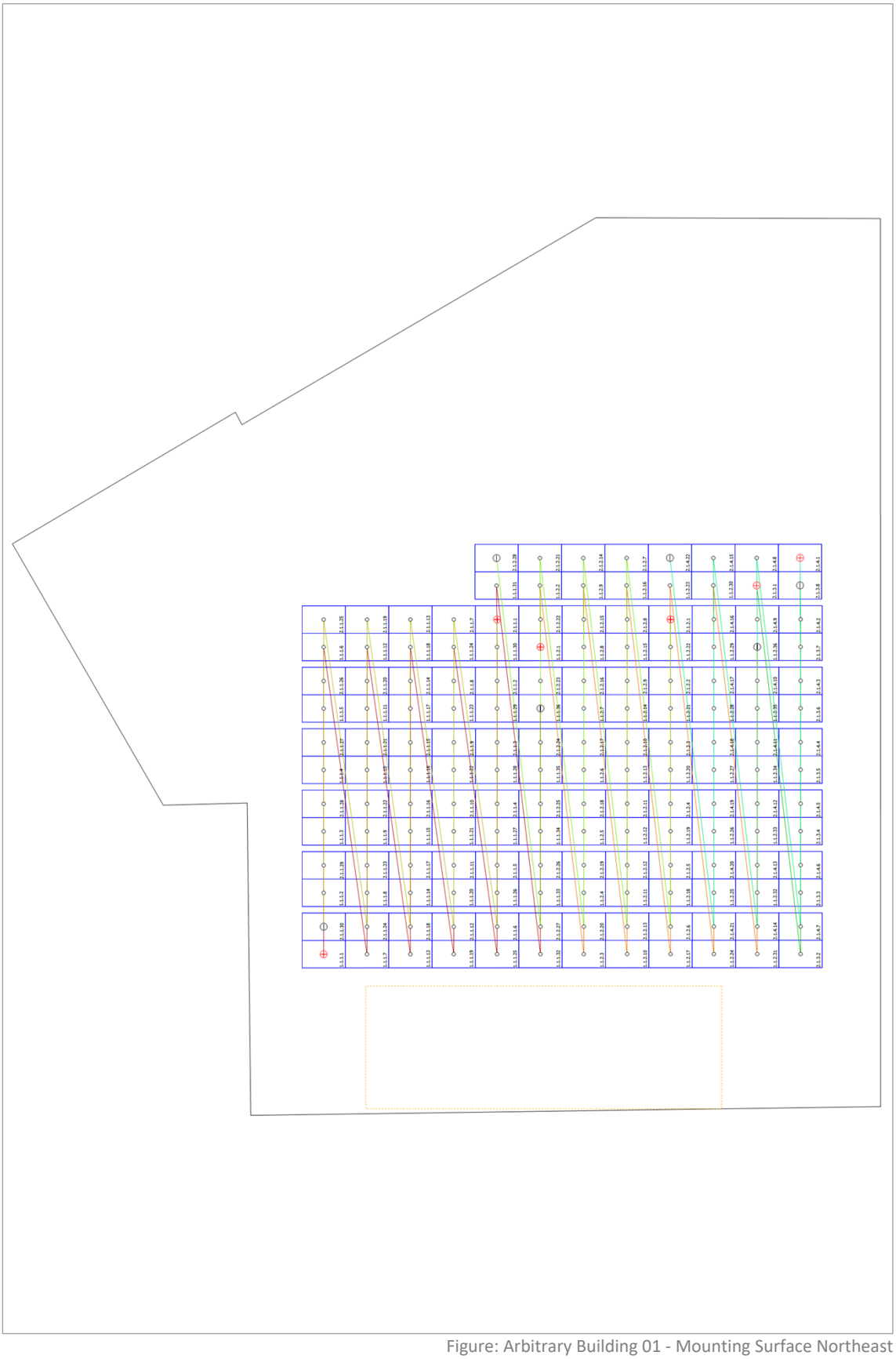


Figure: Arbitrary Building 01 - Mounting Surface Northeast

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Aiko	AIKO-A470-MAH54Dw (2nd Generation)	160	Piece
2	Inverter		SolarEdge	SE66.6K Unit (400V) - 33.3 kW	2	Piece
3	Power Optimizer		SolarEdge	S1000 Worldwide	80	Piece
4	Components			Feed-in Meter	1	Piece
5	Components			House connection	1	Piece
6	Components			Bidirectional Meter	1	Piece