My Renewable Energy
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Contact person:

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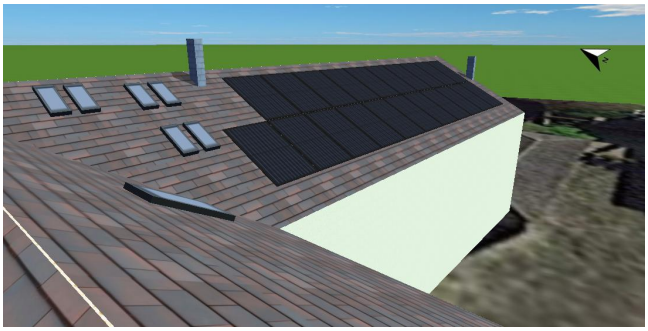
Project Name: Meadowview Barn

20/12/2022

Your PV system from My Renewable Energy

Address of Installation

Meadowview Barn,
South Yorkshire
S75 4NG



Project Description:
Solar PV + battery

Project Overview

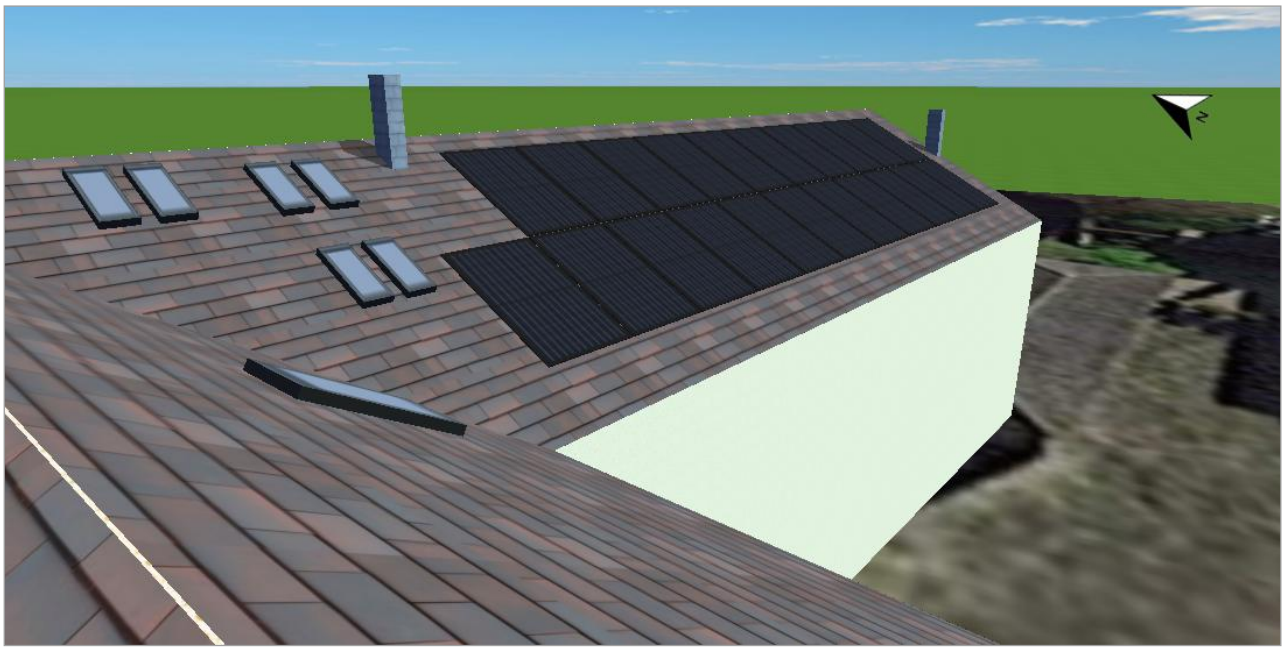


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances and Battery Systems

Climate Data	East Pennines (SAP 2012), GBR (-)	
Values source	SAP 2012	
PV Generator Output	8.51	kWp
PV Generator Surface	41.0	m²
Number of PV Modules	21	
Number of Inverters	1	
No. of battery systems	1	

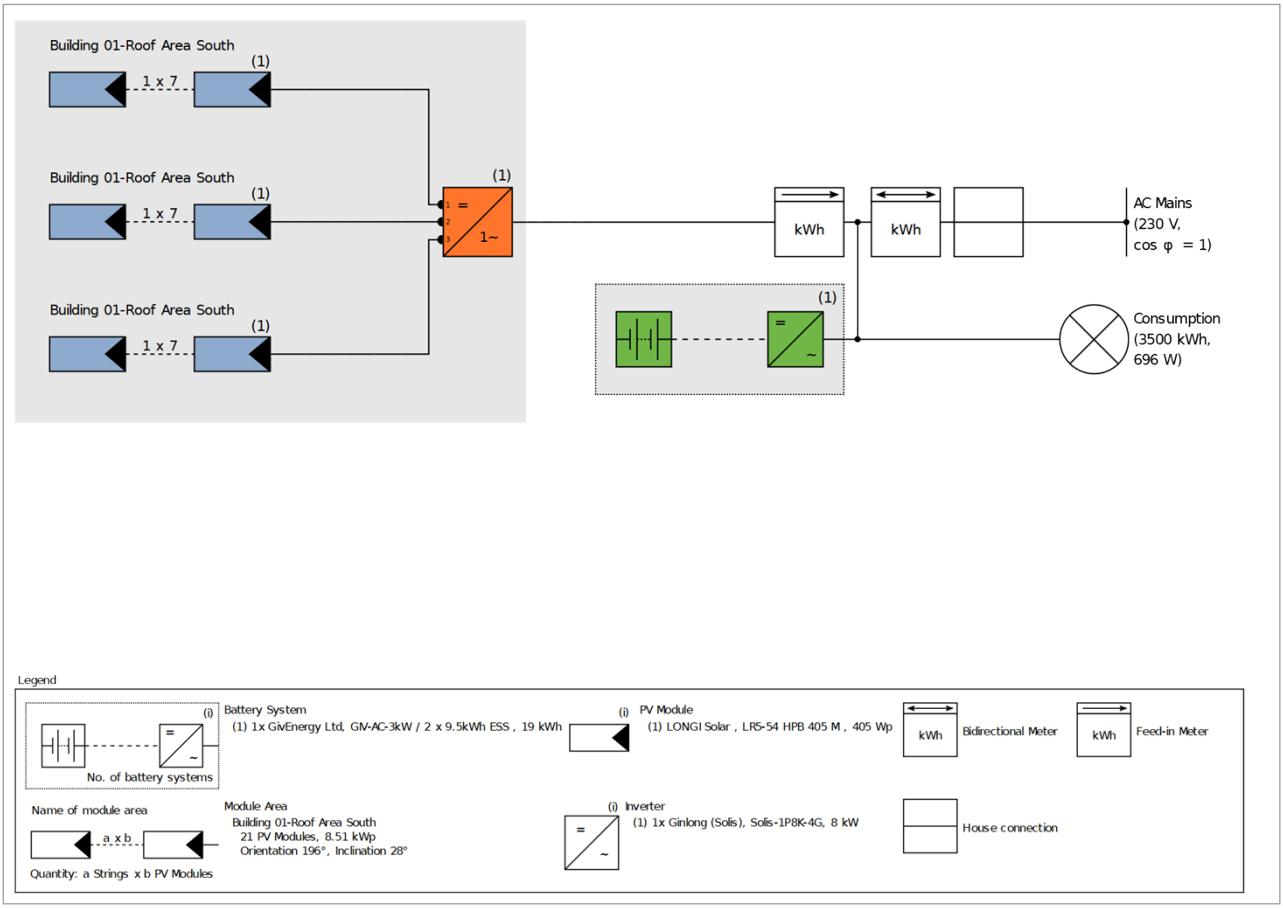


Figure: Schematic diagram

Production Forecast

Production Forecast		
PV Generator Output	8.51	kWp
Spec. Annual Yield	988.39	kWh/kWp
Performance Ratio (PR)	90.73	%
Yield Reduction due to Shading	2.9	%/Year
PV Generator Energy (AC grid)	8,422	kWh/Year
Direct Own Use	1,433	kWh/Year
Battery Charge	2,325	kWh/Year
Down-regulation at Feed-in Point	0	kWh/Year
Grid Feed-in	4,664	kWh/Year
Own Power Consumption	44.5	%
CO_2 Emissions avoided	1,847	kg / year
Level of Self-sufficiency	93.8	%

Financial Analysis

Your Gain

Total investment costs	19,995.00	£
Internal Rate of Return (IRR)	15.75	%
Amortization Period	8.4	Years
Electricity Production Costs	0.0915	£/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 and Battery Systems

Climate Data

Location	East Pennines (SAP 2012), GBR (-)
Values source	SAP 2012
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	3500 kWh
station	3500 kWh
Load Peak	0.7 kW

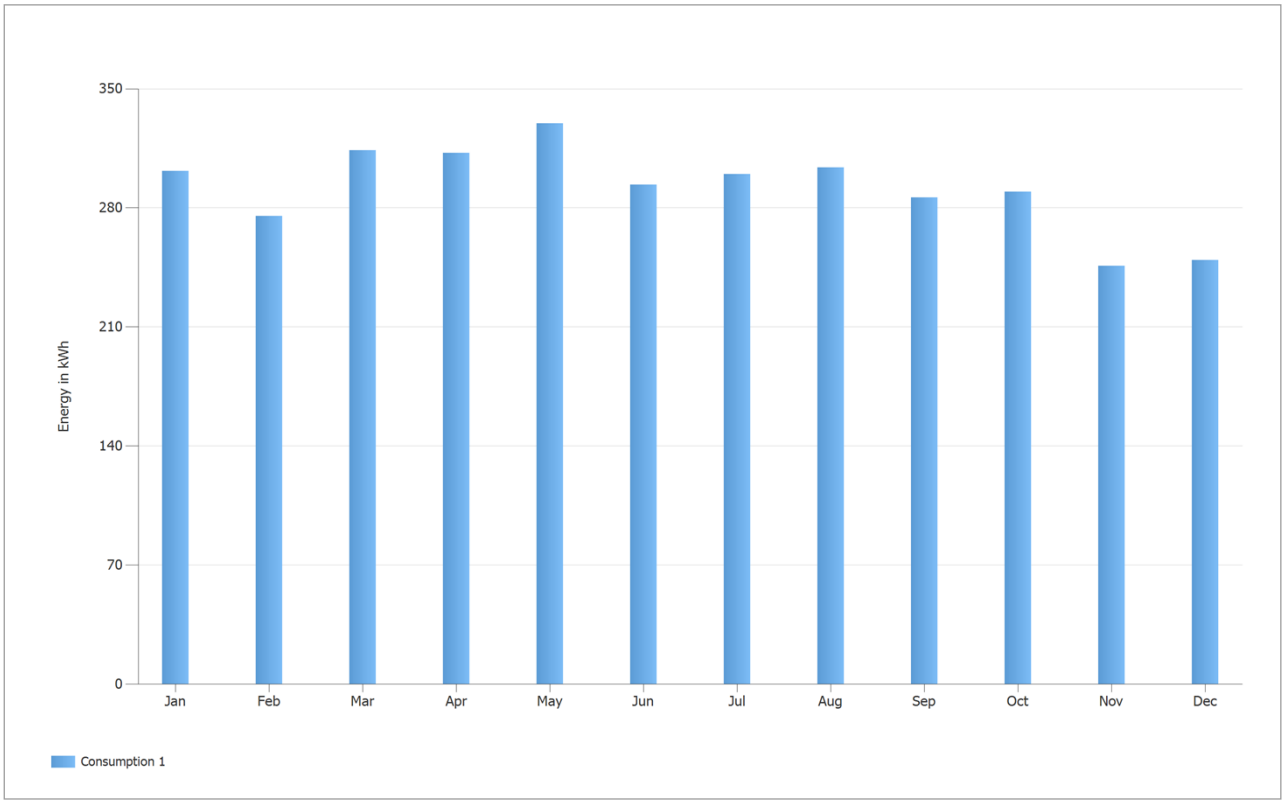


Figure: Consumption

Module Areas

1. Module Area - Building 01-Roof Area South

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

Name	Building 01-Roof Area South
PV Modules	21 x LR5-54 HPB 405 M (v1)
Manufacturer	LONGI Solar
Inclination	28 °
Orientation	South 196 °
Installation Type	Mounted - Roof
PV Generator Surface	41.0 m²

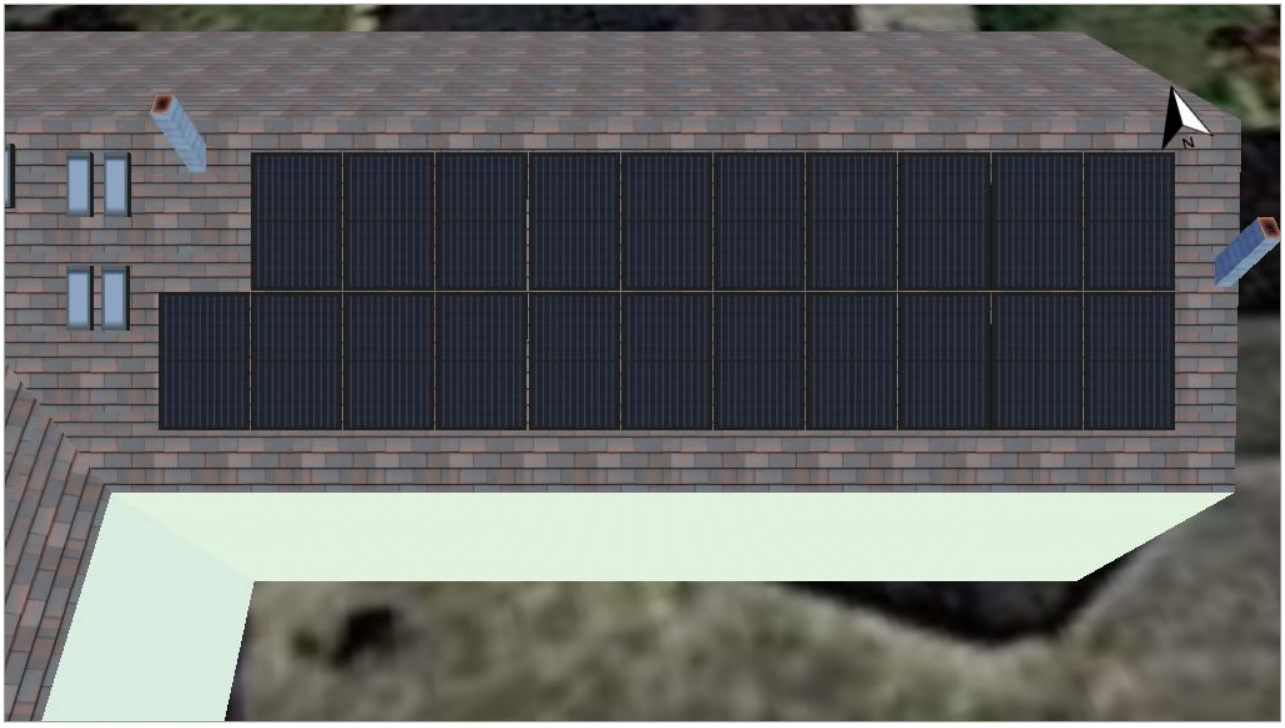


Figure: 1. Module Area - Building 01-Roof Area South

Horizon Line, 3D Design

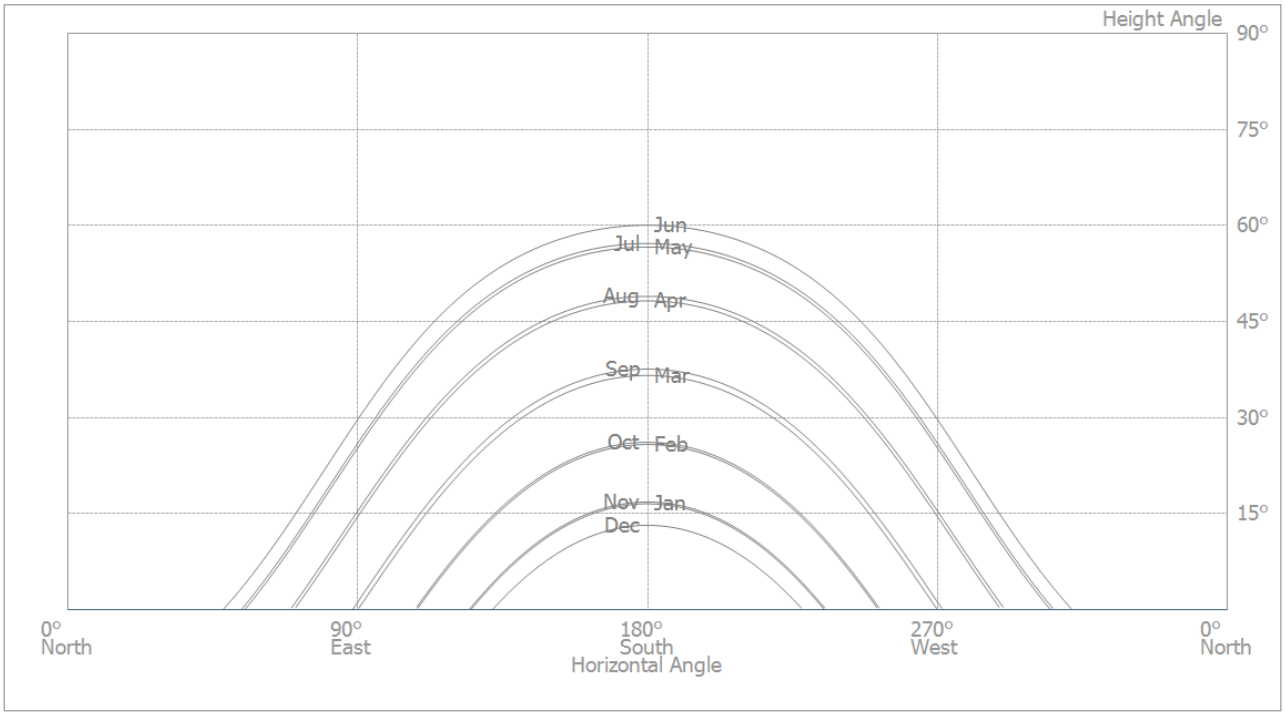


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1	
Module Area	Building 01-Roof Area South
Inverter 1	
Model	Solis-1P8K-4G (v2)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	106.3 %
Configuration	MPP 1: 1 x 7
	MPP 2: 1 x 7
	MPP 3: 1 x 7

AC Mains

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

Battery Systems

Battery System

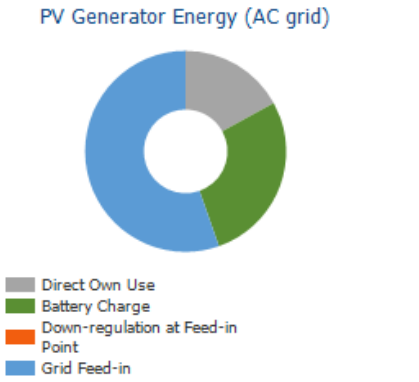
Model	GIV-AC-3kW / 2 x 9.5kWh ESS (v1)	
Manufacturer	GivEnergy Ltd	
Quantity	1	
Battery Inverter		
Type of Coupling	AC coupling	
Nominal output	3	kW
Battery		
Manufacturer	GivEnergy Ltd	
Model	GIV-BATT-9.5 (v7)	
Quantity	2	
Battery Energy	19	kWh
Battery Type	Lithium iron phosphate	

Simulation Results

Results Total System

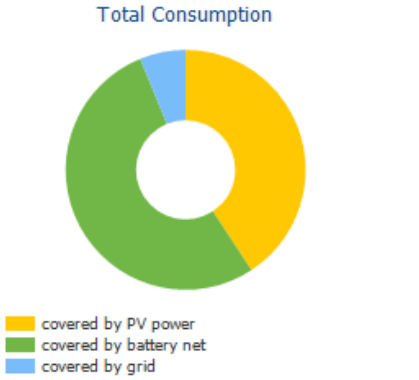
PV System

PV Generator Output	8.51	kWp
Spec. Annual Yield	988.39	kWh/kWp
Performance Ratio (PR)	90.73	%
Yield Reduction due to Shading	2.9	%/Year
PV Generator Energy (AC grid)	8,422	kWh/Year
Direct Own Use	1,433	kWh/Year
Battery Charge	2,325	kWh/Year
Down-regulation at Feed-in Point	0	kWh/Year
Grid Feed-in	4,664	kWh/Year
Own Power Consumption	44.5	%
CO_2 Emissions avoided	1,847	kg / year



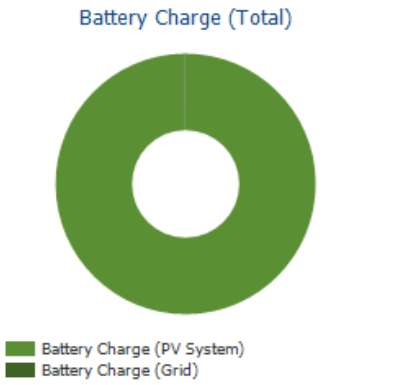
Appliances

Appliances	3,500	kWh/Year
Standby Consumption (Inverter)	16	kWh/Year
Total Consumption	3,516	kWh/Year
covered by PV power	1,433	kWh/Year
covered by battery net	1,866	kWh/Year
covered by grid	217	kWh/Year
Solar Fraction	93.8	%



Battery System

Charge at beginning	19	kWh
Battery Charge (Total)	2,328	kWh/Year
Battery Charge (PV System)	2,325	kWh/Year
Battery Charge (Grid)	3	kWh/Year
Battery Energy for the Covering of Consumption	1,869	kWh/Year
Losses due to charging/discharging	458	kWh/Year
Losses in Battery	20	kWh/Year
Cycle Load	3.2	%
Service Life	>20	Years



Level of Self-sufficiency

Total Consumption	3,516	kWh/Year
covered by grid	217	kWh/Year
Level of Self-sufficiency	93.8	%

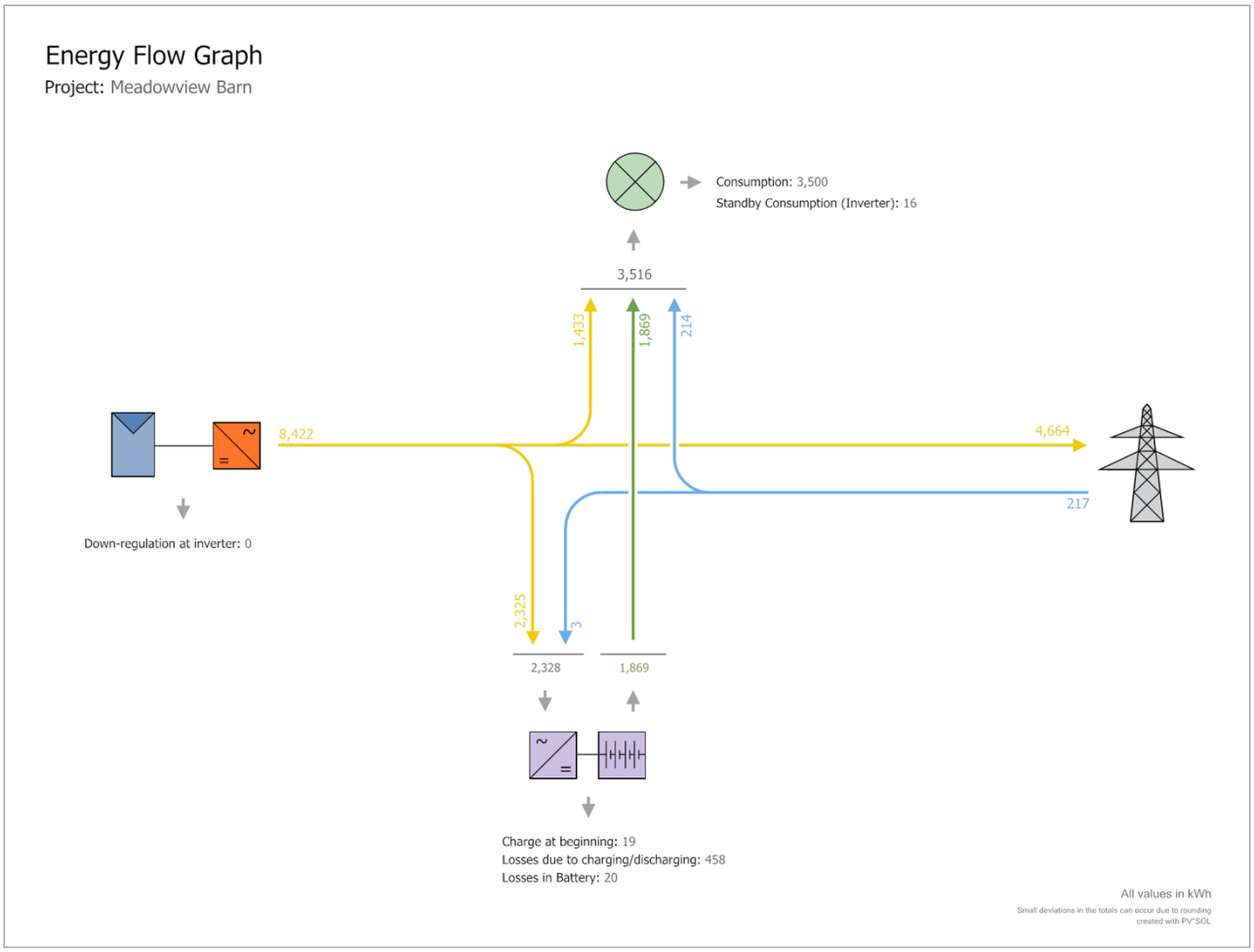


Figure: Energy flow

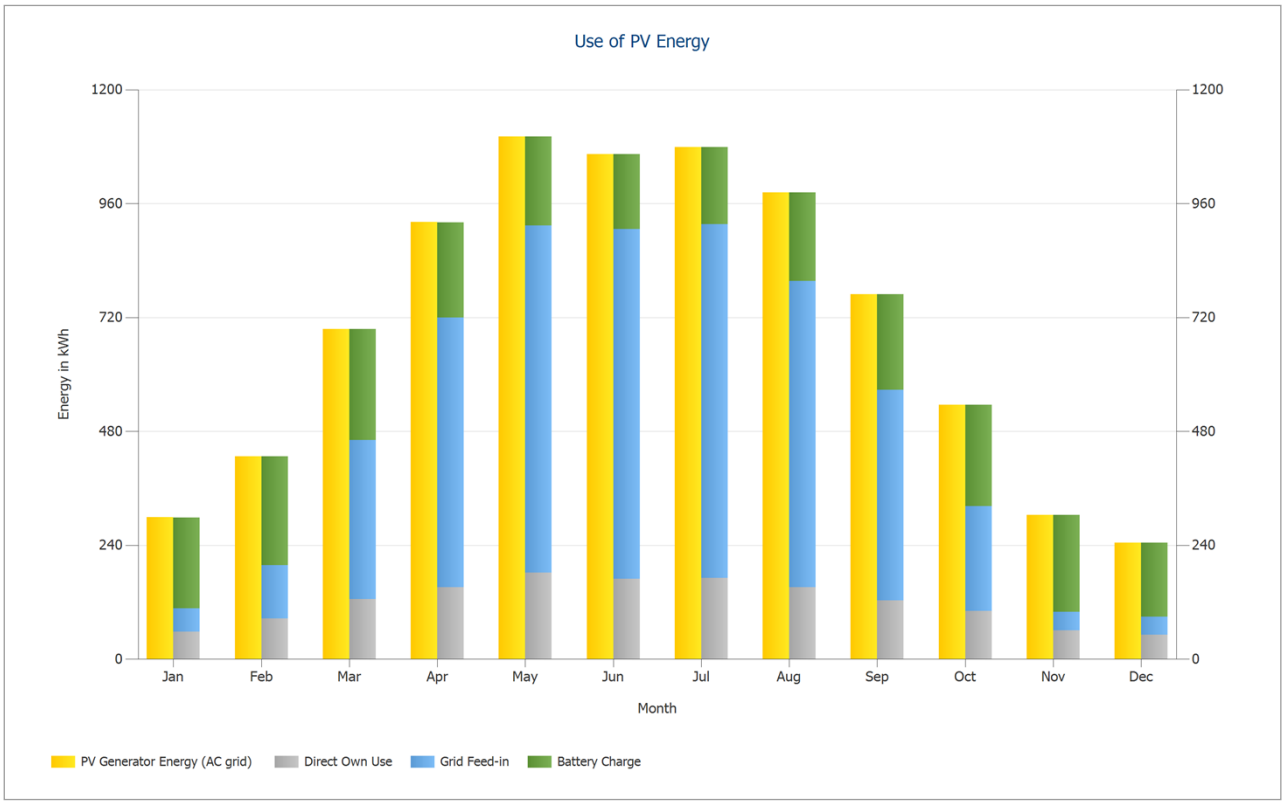


Figure: Use of PV Energy

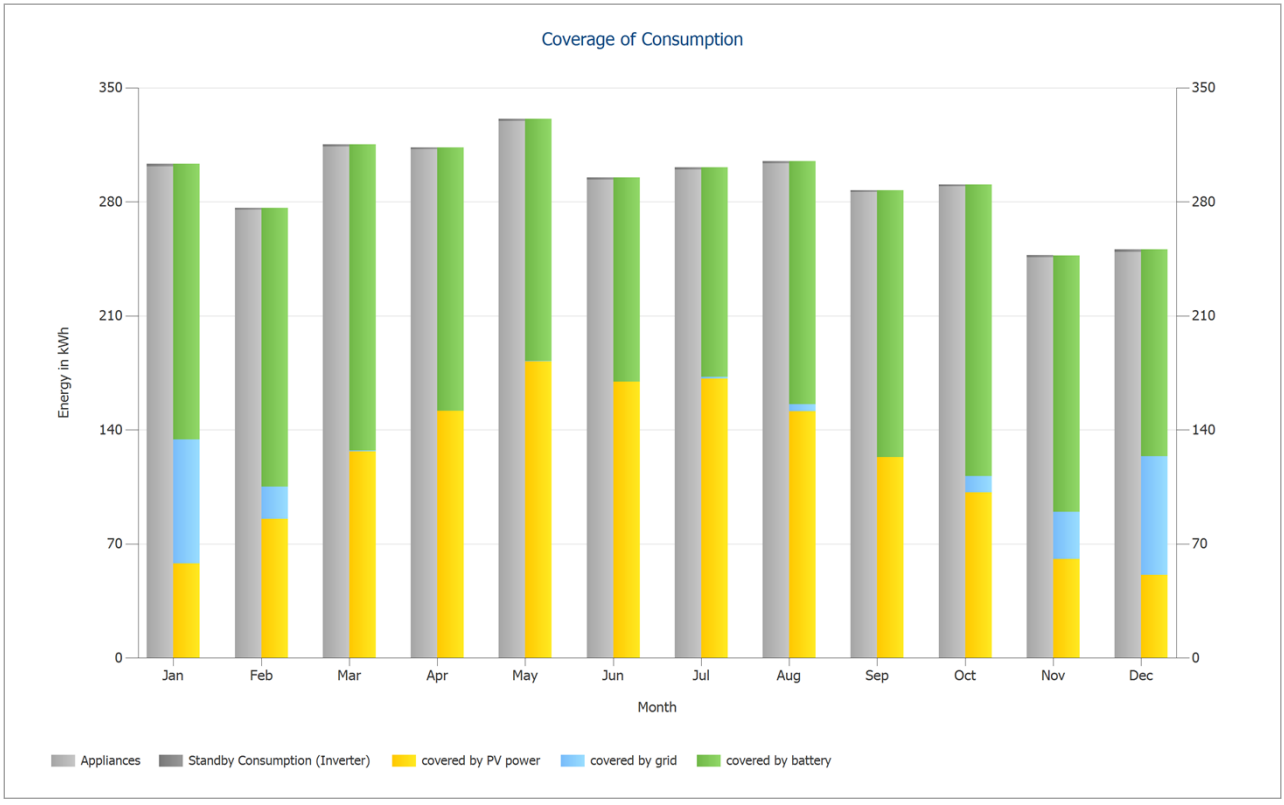


Figure: Coverage of Consumption

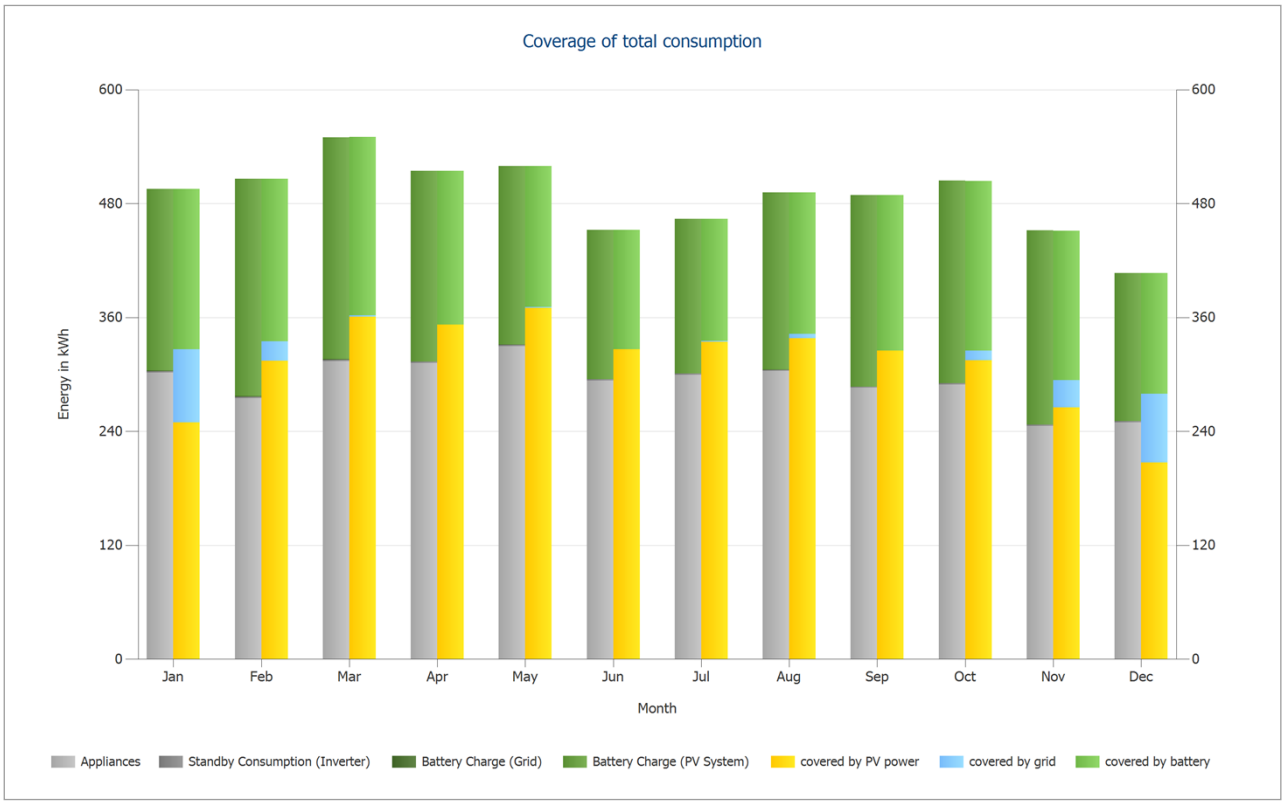


Figure: Coverage of total consumption

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	4,664	kWh/Year
PV Generator Output	8.5	kWp
Start of Operation of the System	01/08/2022	
Assessment Period	25	Years
Interest on Capital	0	%

Economic Parameters

Internal Rate of Return (IRR)	15.75	%
Accrued Cash Flow (Cash Balance)	146,413.57	£
Amortization Period	8.4	Years
Electricity Production Costs	0.0915	£/kWh

Payment Overview

Specific Investment Costs	2,350.97	£/kWp
Investment Costs	19,995.00	£
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	195.55	£/Year
First year savings	1,461.02	£/Year
SEG - Octopus (2022 -2023) - SEG eligible		
Validity	01/01/2020 -	31/12/2044
Specific feed-in / export Remuneration	0.041	£/kWh
Feed-in / Export Tariff	195.5482	£/Year
Inflation Rate for Feed-in / Export Tariff	4.00	%/Year
Meadowview (Example)		
Energy Price	0.445	£/kWh
Base Price	7	£/Month
Inflation Rate for Energy Price	10	%/Year

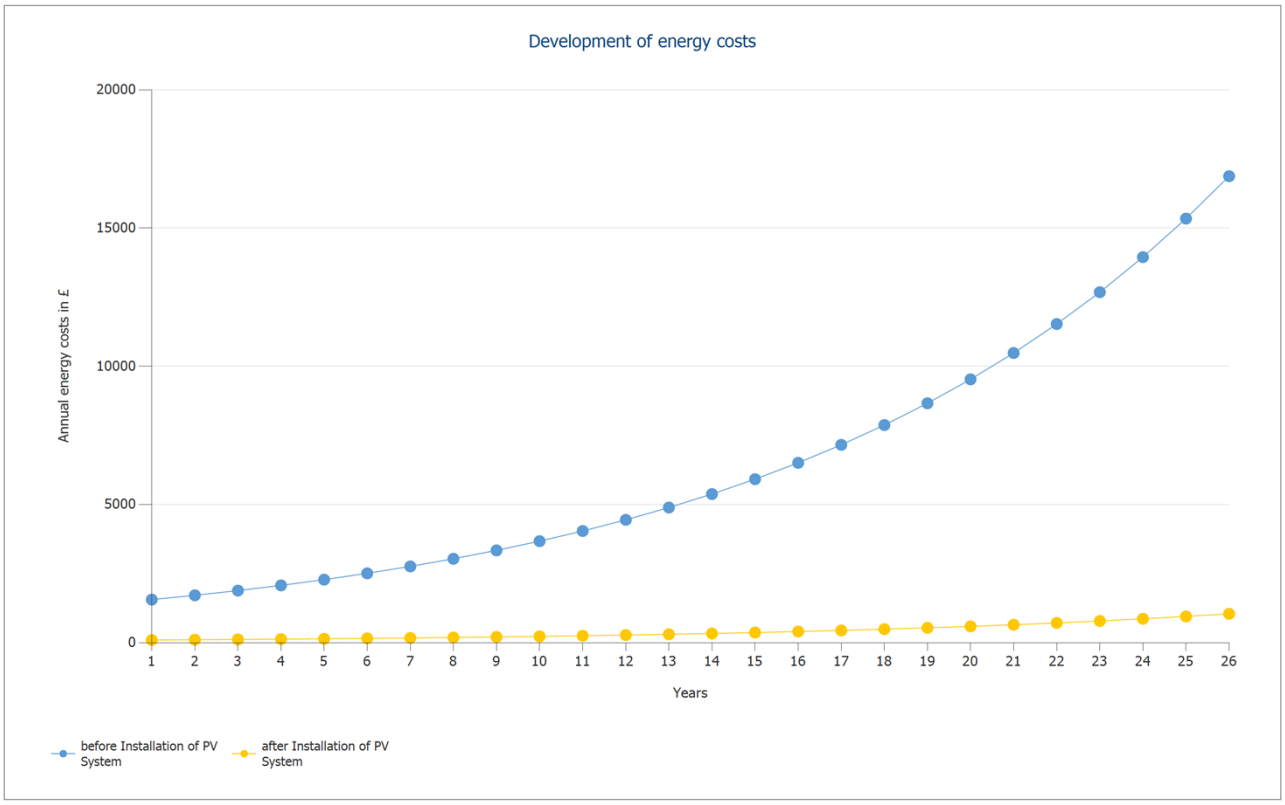


Figure: Development of energy costs

Cash flow

Cash flow

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-£19,995.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£195.55	£203.52	£211.81	£220.44	£229.42
Electricity Savings	£1,461.02	£1,607.12	£1,767.83	£1,944.61	£2,139.07
Annual Cash Flow	**-£18,338.44**	**£1,810.63**	**£1,979.64**	**£2,165.05**	**£2,368.49**
Accrued Cash Flow (Cash Balance)	-£18,338.44	-£16,527.80	-£14,548.17	-£12,383.12	-£10,014.63

Cash flow

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£238.76	£248.49	£258.62	£269.15	£280.12
Electricity Savings	£2,352.98	£2,588.28	£2,847.11	£3,131.82	£3,445.00
Annual Cash Flow	**£2,591.75**	**£2,836.77**	**£3,105.72**	**£3,400.97**	**£3,725.12**
Accrued Cash Flow (Cash Balance)	-£7,422.88	-£4,586.11	-£1,480.39	£1,920.58	£5,645.70

Cash flow

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£291.53	£303.41	£315.77	£328.63	£342.02
Electricity Savings	£3,789.50	£4,168.45	£4,585.30	£5,043.82	£5,548.21
Annual Cash Flow	**£4,081.03**	**£4,471.86**	**£4,901.06**	**£5,372.46**	**£5,890.23**
Accrued Cash Flow (Cash Balance)	£9,726.73	£14,198.59	£19,099.65	£24,472.11	£30,362.34

Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£355.96	£370.46	£385.55	£401.26	£417.61
Electricity Savings	£6,103.03	£6,713.33	£7,384.66	£8,123.13	£8,935.44
Annual Cash Flow	**£6,458.98**	**£7,083.79**	**£7,770.22**	**£8,524.39**	**£9,353.05**
Accrued Cash Flow (Cash Balance)	£36,821.33	£43,905.12	£51,675.33	£60,199.72	£69,552.77

Cash flow

	Year 21	Year 22	Year 23	Year 24	Year 25
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£434.62	£452.33	£137.20	£0.00	£0.00
Electricity Savings	£9,828.99	£10,811.89	£11,893.08	£13,082.38	£14,390.62
Annual Cash Flow	**£10,263.61**	**£11,264.22**	**£12,030.28**	**£13,082.38**	**£14,390.62**
Accrued Cash Flow (Cash Balance)	£79,816.38	£91,080.60	£103,110.88	£116,193.26	£130,583.88

Cash flow

	Year 26
Investments	£0.00
Feed-in / Export Tariff	£0.00
Electricity Savings	£15,829.68
Annual Cash Flow	**£15,829.68**
Accrued Cash Flow (Cash Balance)	£146,413.57

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

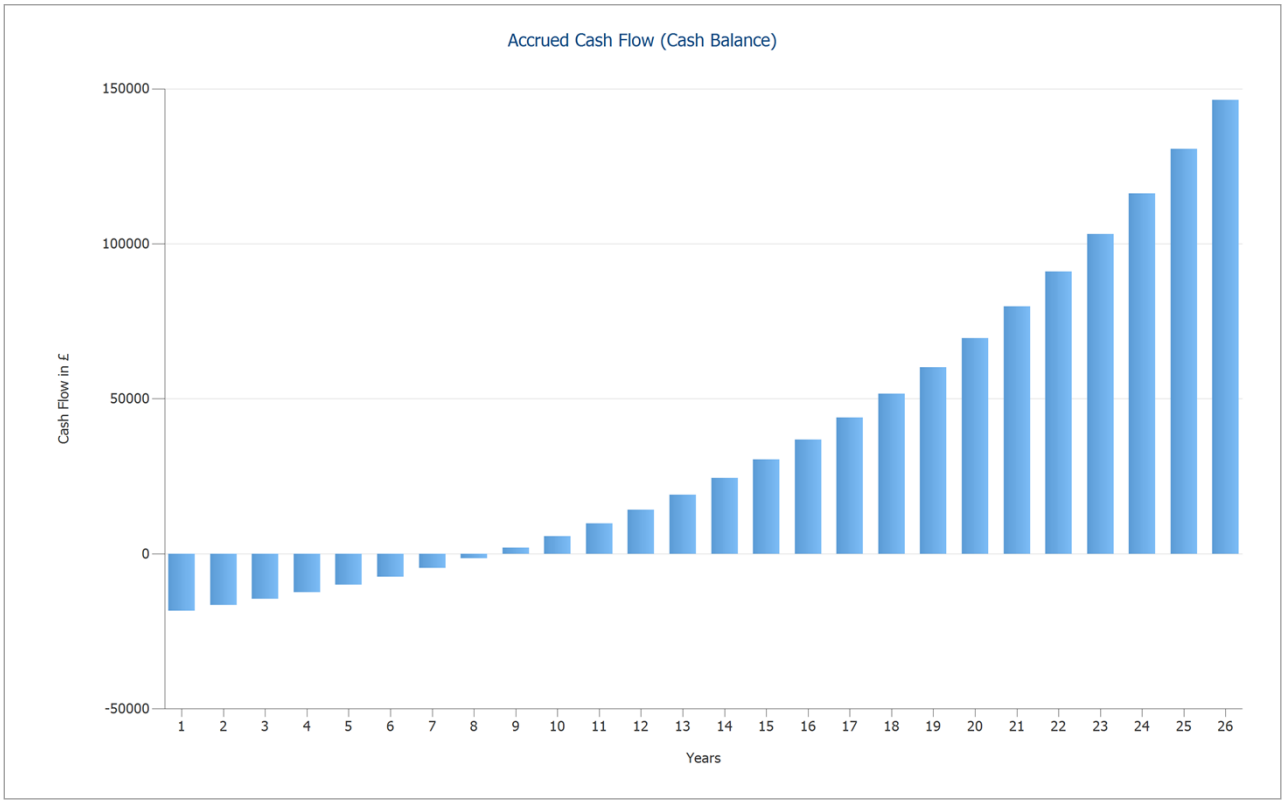


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram

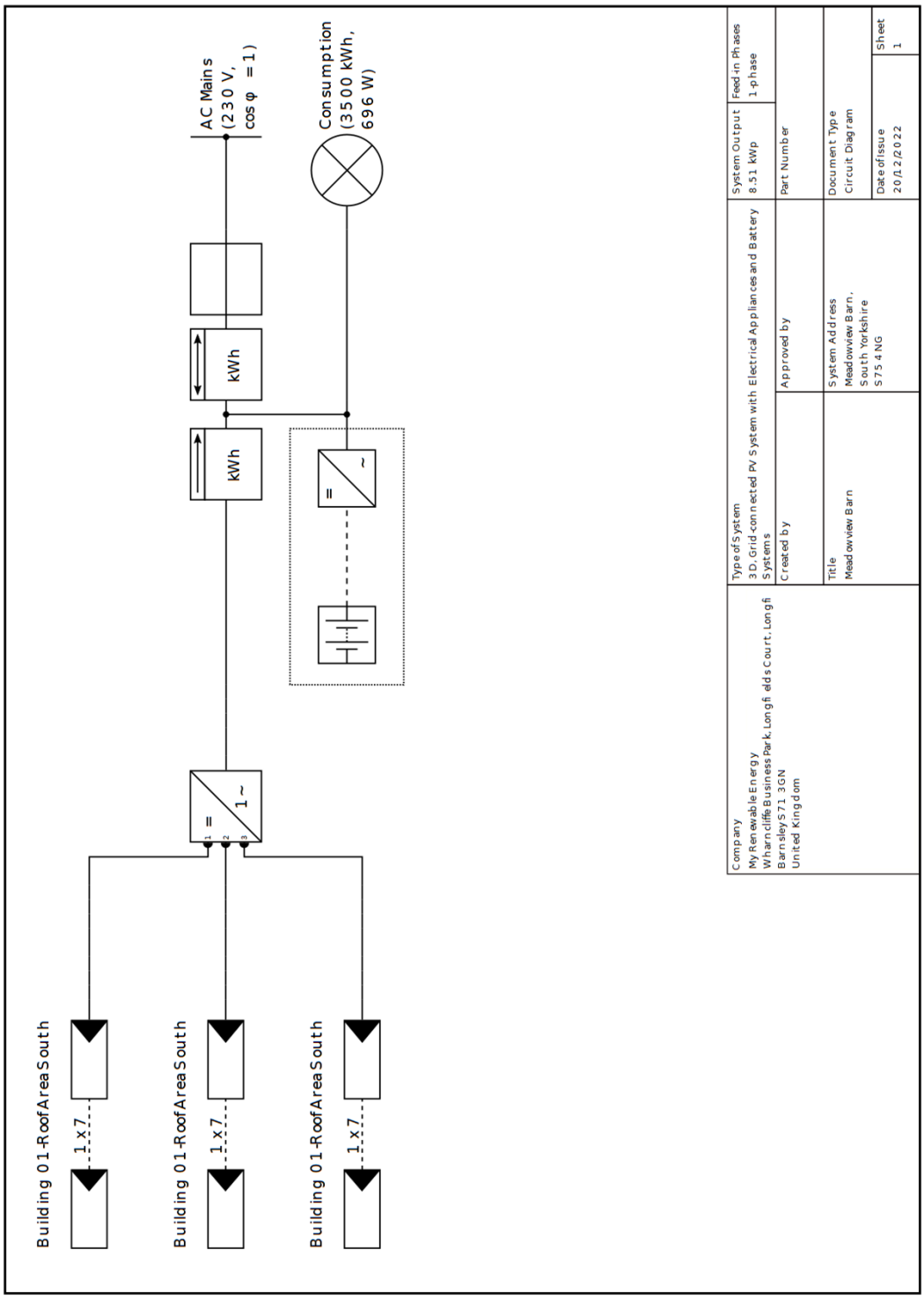


Figure: Circuit Diagram

Overview plan

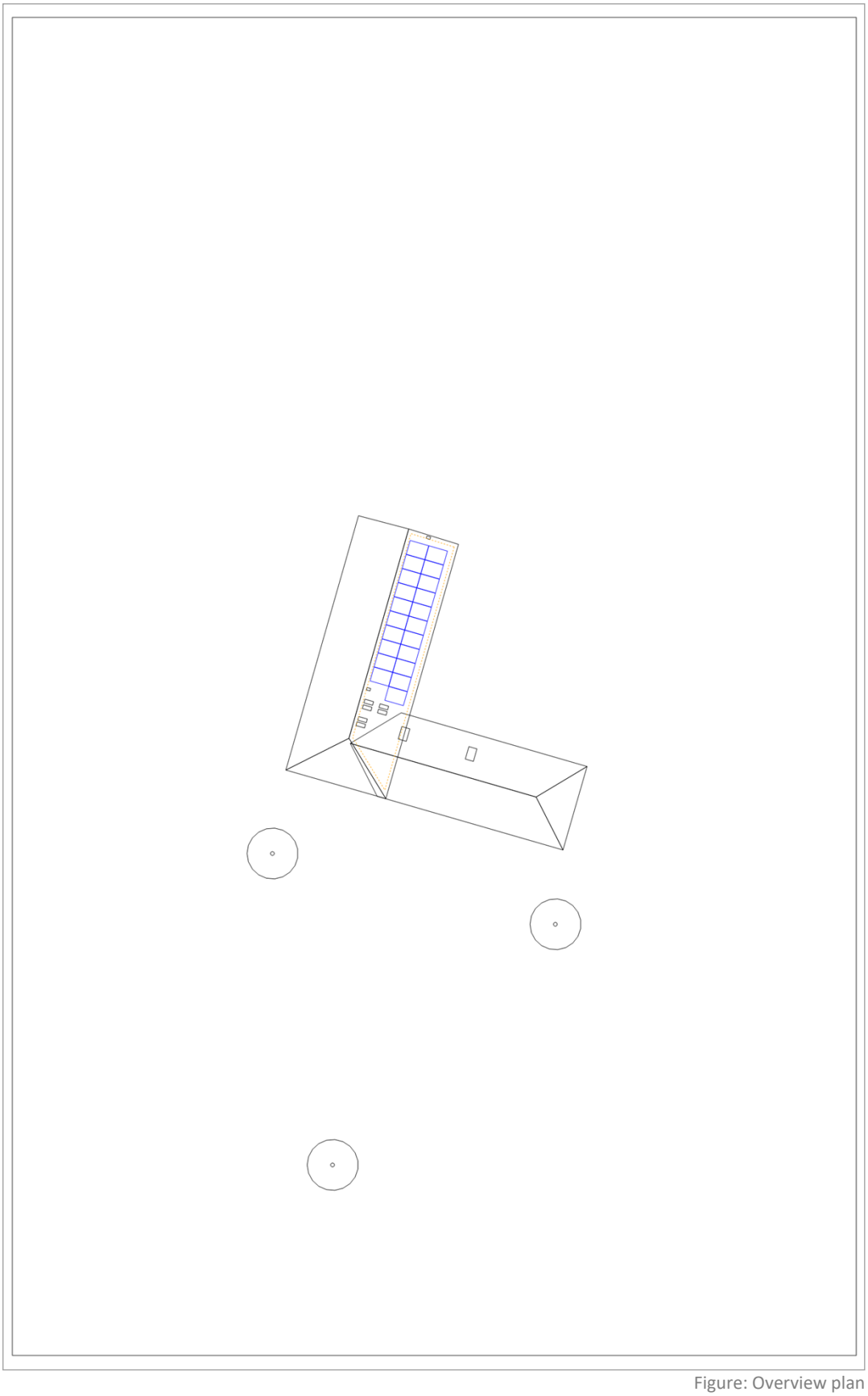


Figure: Overview plan

Dimensioning Plan

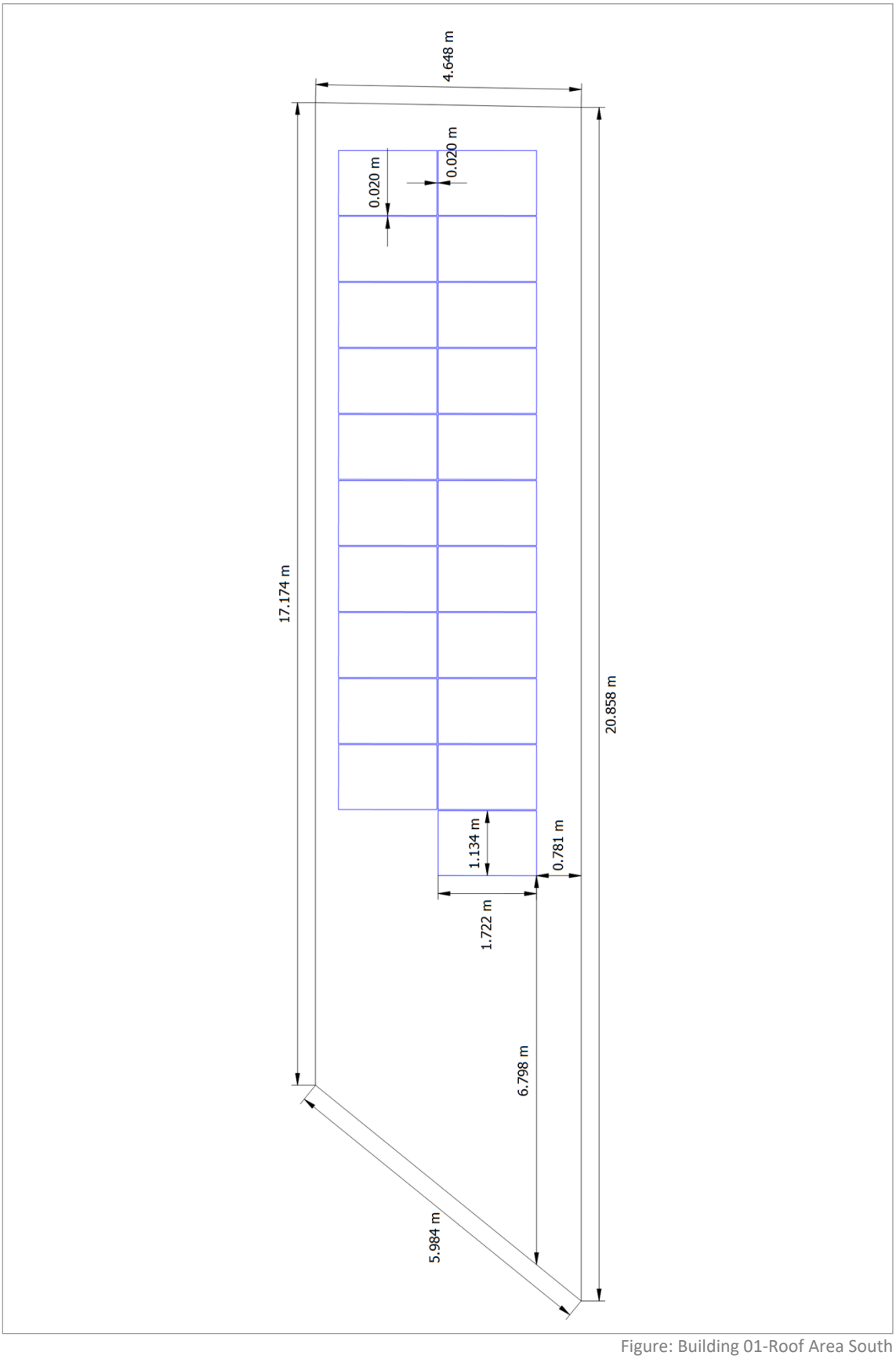


Figure: Building 01-Roof Area South

String Plan

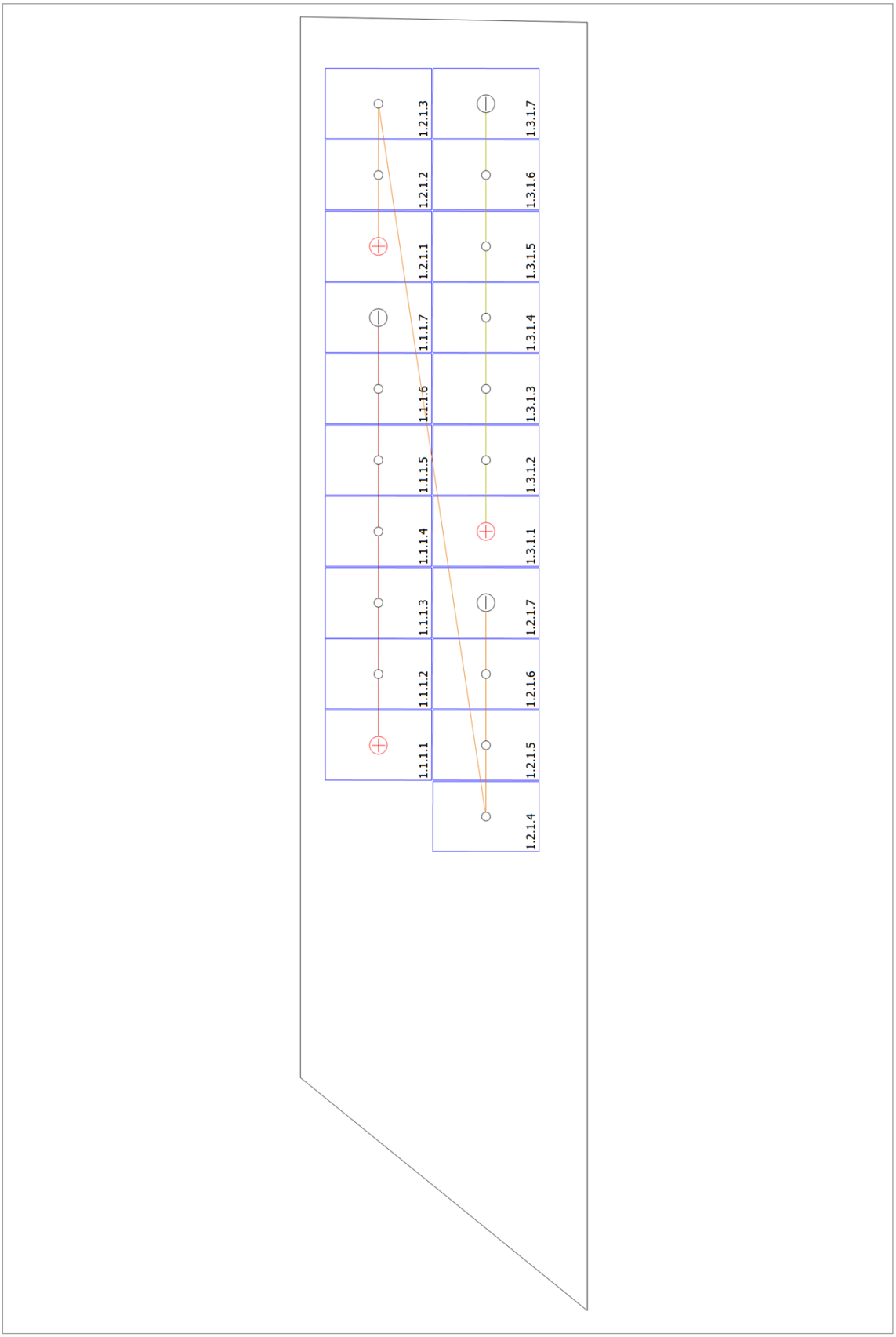


Figure: Building 01-Roof Area South

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		LONGI Solar	LR5-54 HPB 405 M	21	Piece
2	Inverter		Ginlong (Solis)	Solis-1P8K-4G	1	Piece
3	Battery System		GivEnergy Ltd	GIV-AC-3kW / 2 x 9.5kWh ESS	1	Piece
4	Components			Feed-in Meter	1	Piece
5	Components			Bidirectional Meter	1	Piece
6	Components			House connection	1	Piece

Screenshots, 3D Design

Environment

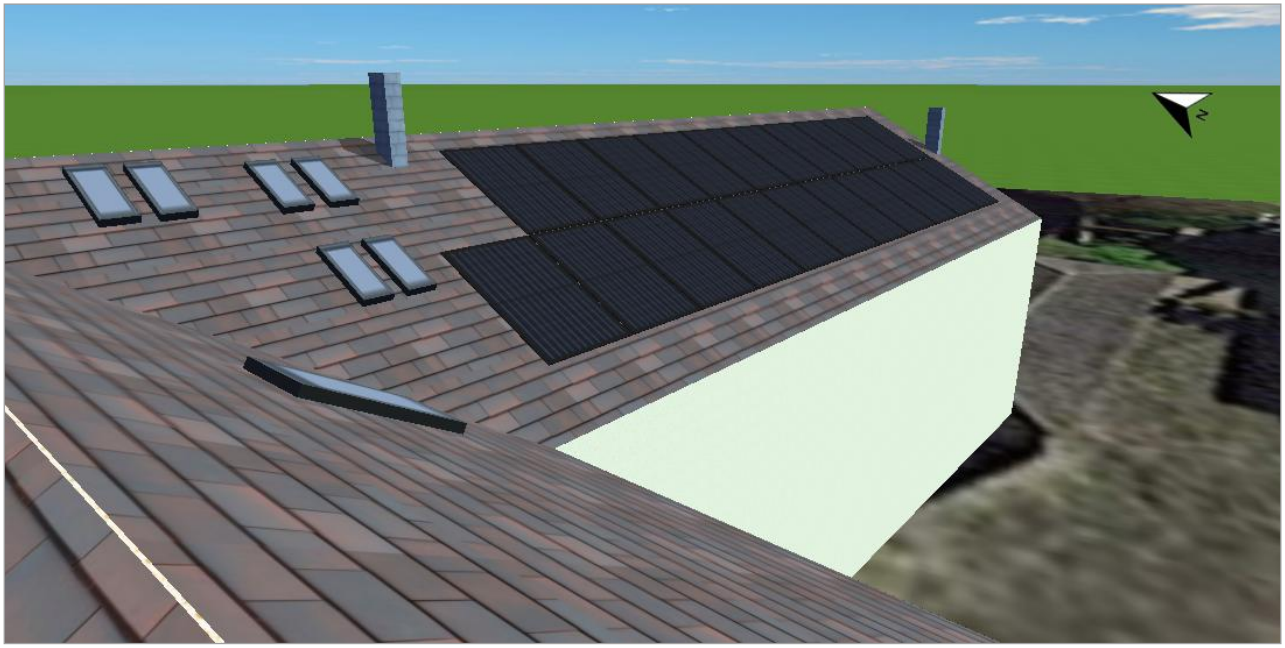


Figure: Screenshot03

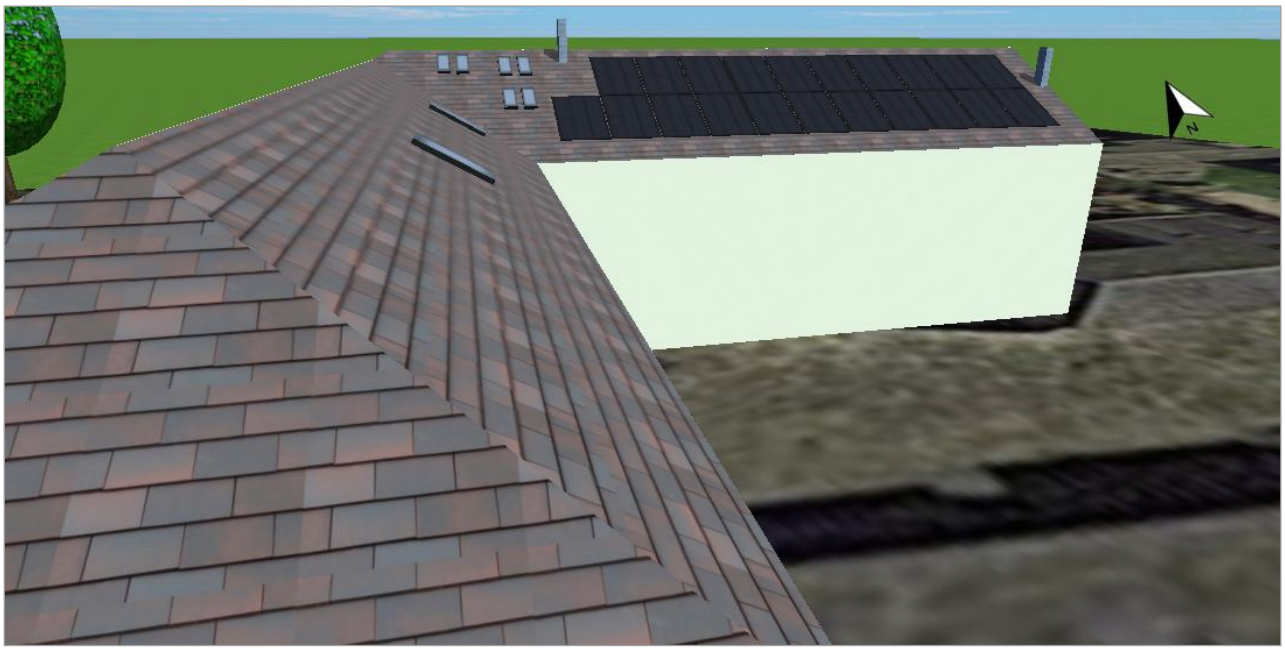


Figure: Screenshot04

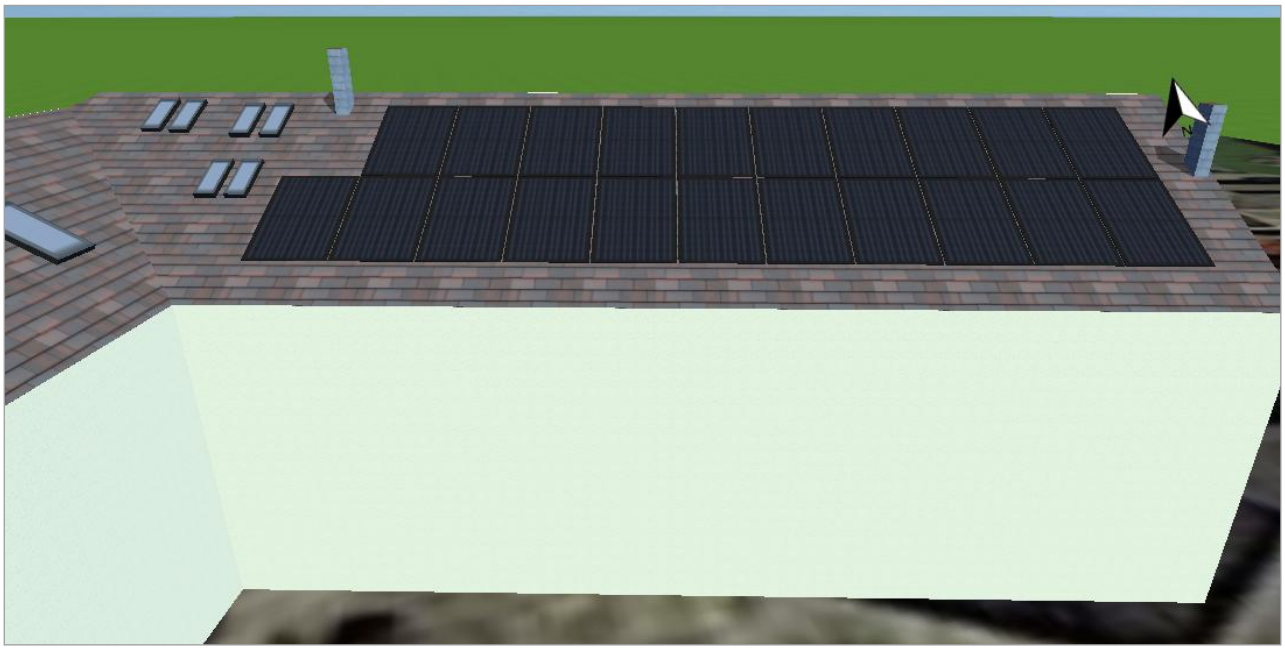


Figure: Screenshot05

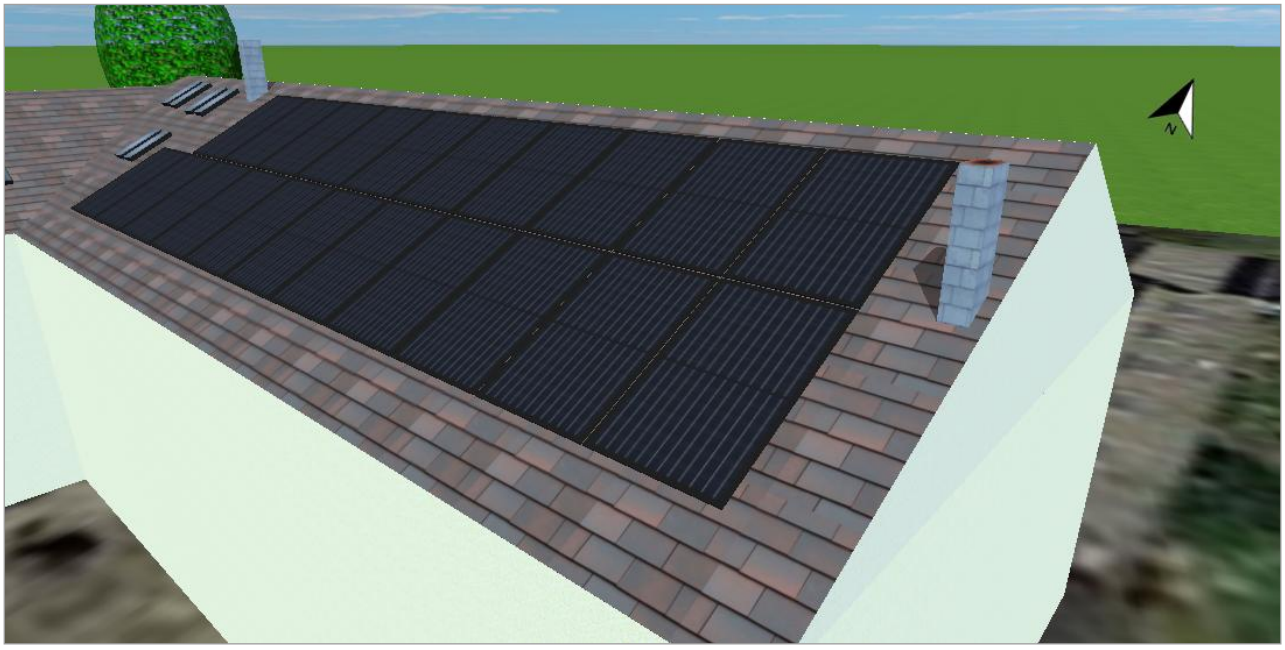


Figure: Screenshot06

Module Areas

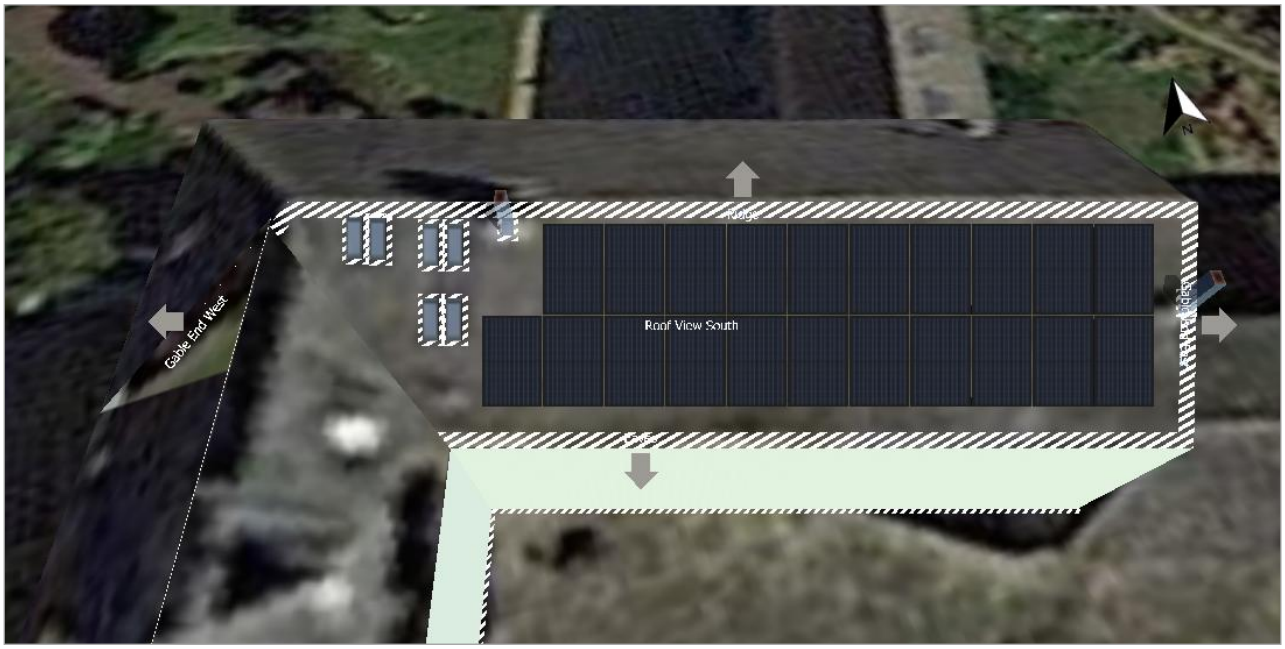


Figure: Screenshot01

Configuration

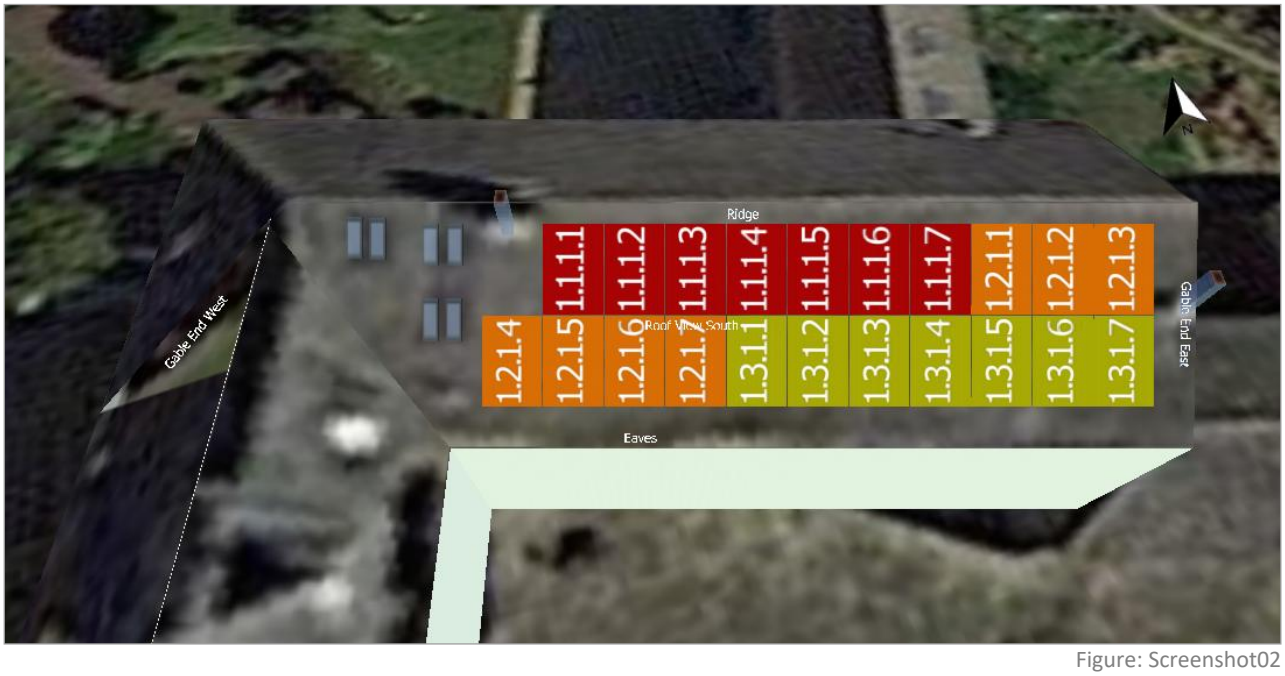


Figure: Screenshot02