 FusionSolar / SmartDesign

EU-202404-SD- Demo-PV


PV Solution

Address Av. [REDACTED] Madrid, Spain







Project Overview

System Capacity



PV System 1,049.125 kWp
 AC Power 810 kW
 Oversizing Ratio 129.52%

Devices

Device Name	Manufacturer/Model	Quantity
PV Module	 LONGi/LR5-72HBD-545	1,925
Inverter	 SUN2000-30KTL-M3	2
Optimizer	 MERC-1100W-P	968
Inverter	 SUN5000-150K-MG0	5

Economic Benefits

Accumulated Net Profits of 25 Years: **6,486,178.54** EUR

ROI Overview

991,423.12 EUR
Initial Investment Cost

991,423.12 EUR
Own Funds

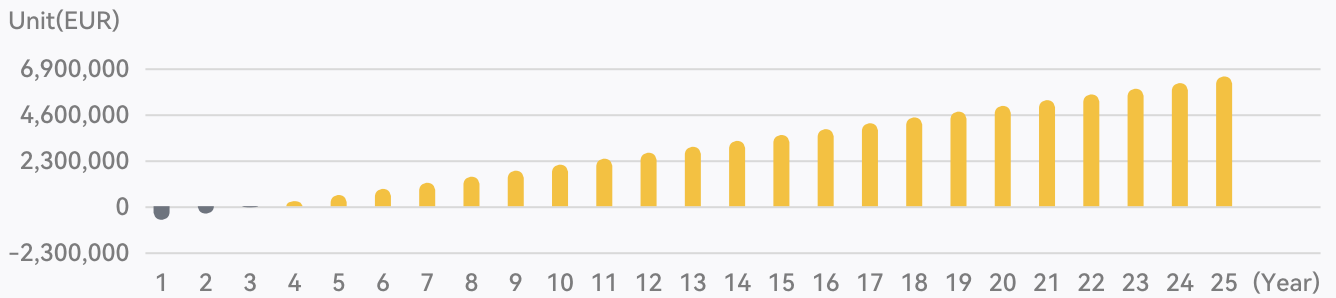
287,049 EUR
O&M Cost

2,698,757.64 EUR
NPV

24.1 %
IRR

4.03 years
Payback Period

0.05 EUR/kWh
LCOE



Economic Benefits – Details

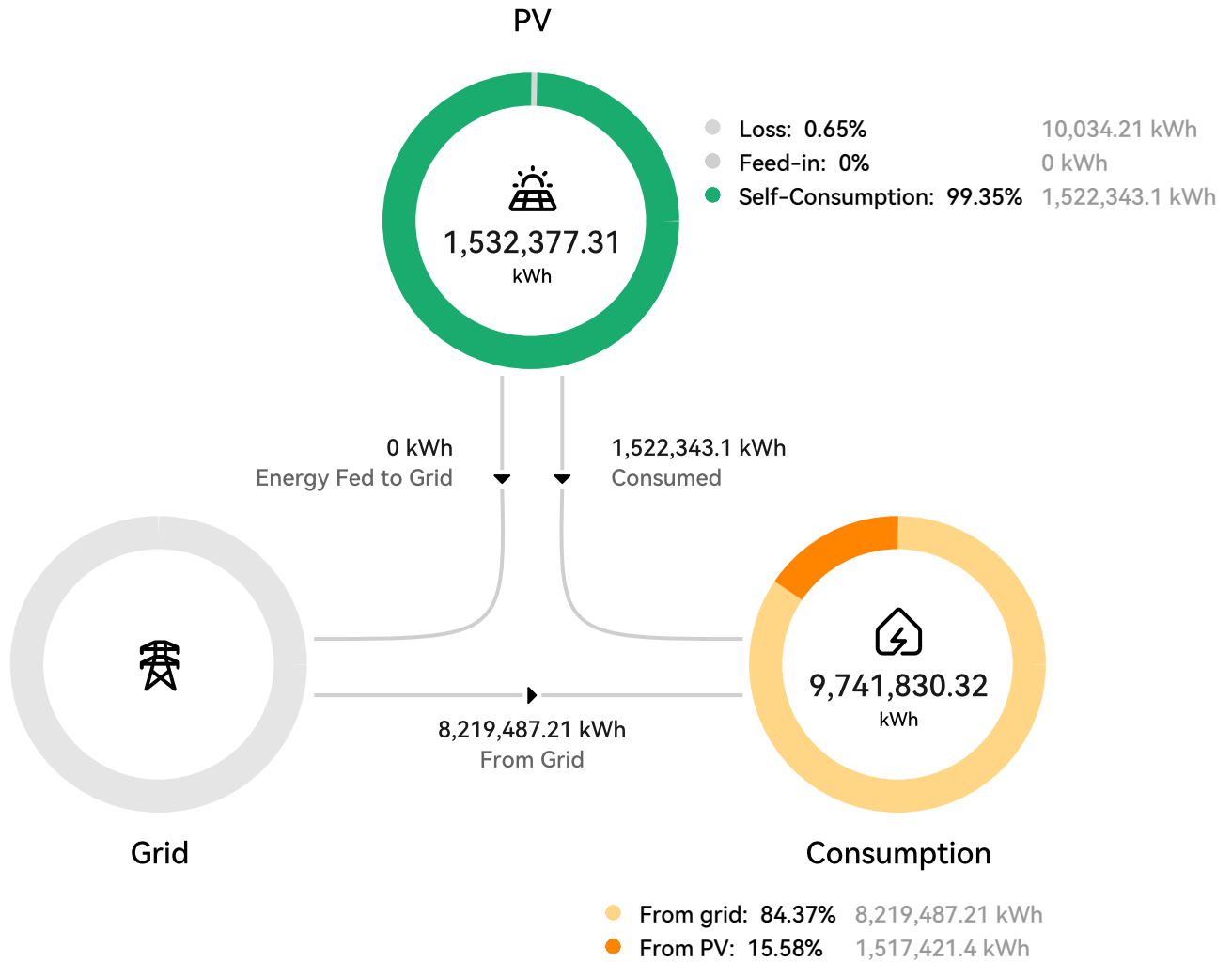
Year	Equipment Investment (EUR)	O&M Cost (EUR)	Feed-in Revenue (EUR)	Savings (EUR)	Cumulative Cash Flow (EUR)
0	-991,423.12	--	--	--	-991,423.12
1	0	-12,039.25	0	324,749.8	-678,712.57
2	0	-12,039.25	0	323,395.81	-367,356.01
3	0	-12,039.25	0	322,055.67	-57,339.59
4	0	-12,039.25	0	320,716.19	251,337.35
5	0	-12,039.25	0	319,376.63	558,674.73
6	0	-12,039.25	0	318,036.74	864,672.22
7	0	-12,039.25	0	316,696.91	1,169,329.88
8	0	-12,039.25	0	315,356.88	1,472,647.51
9	0	-12,039.25	0	314,016.42	1,774,624.68
10	0	-12,039.25	0	312,672.28	2,075,257.71
11	0	-12,039.25	0	311,327.07	2,374,545.53
12	0	-12,039.25	0	309,981.76	2,672,488.04
13	0	-12,039.25	0	308,635.73	2,969,084.52
14	0	-12,039.25	0	307,289.47	3,264,334.74
15	0	-12,039.25	0	305,943.15	3,558,238.64
16	0	-12,039.25	0	304,596.8	3,850,796.19
17	3,773.25	-10,491.25	0	302,490.39	4,146,568.58
18	0	-10,491.25	0	301,161.8	4,437,239.13
19	0	-10,491.25	0	299,832.7	4,726,580.58
20	0	-10,491.25	0	298,502.71	5,014,592.04
21	0	-10,491.25	0	297,171.74	5,301,272.53
22	0	-10,491.25	0	295,839.75	5,586,621.03
23	0	-10,491.25	0	294,507.57	5,870,637.35
24	0	-10,491.25	0	293,175.07	6,153,321.17

Economic Benefits - Details

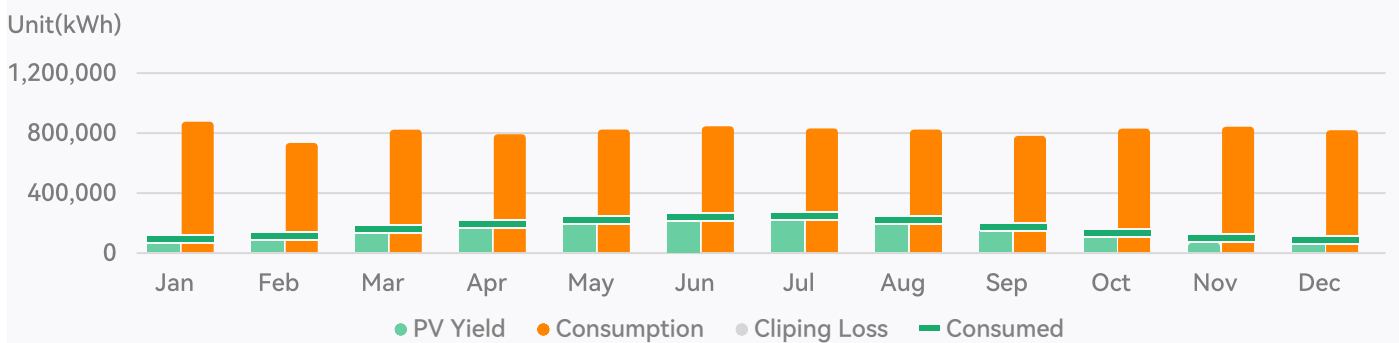
Year	Equipment Investment (EUR)	O&M Cost (EUR)	Feed-in Revenue (EUR)	Savings (EUR)	Cumulative Cash Flow (EUR)
25	51,506.16	-10,491.25	0	291,842.46	6,486,178.54

Energy Management

First-Year Data



Monthly Energy Consumption in the First Year



Energy Management

Month	PV Yield(kWh)	Consumption (kWh)	Clipping Loss(kWh)	Self-consumption (kWh)	Self-consumption Rate (%)
Jan	55,967.77	869,147.91	114.57	55,853.2	100
Feb	77,209	727,544.26	380.12	76,828.88	100
Mar	122,857.8	816,203.91	86.97	122,770.83	100
Apr	155,149.75	785,638.45	349.66	154,800.09	100
May	183,662.75	816,975.75	2,497.28	181,165.47	99
Jun	200,367.18	838,697.28	117.54	200,249.64	100
Jul	210,296.8	824,271.63	2,860.98	207,435.82	99
Aug	184,345.04	816,906.01	1,382.12	182,962.92	99
Sep	136,585.26	774,966.34	1,228.46	135,356.8	99
Oct	95,729.95	823,239.06	1,013.55	94,716.4	99
Nov	61,947.8	835,812.73	0	61,947.8	100
Dec	48,258.21	812,426.98	2.96	48,255.25	100

Power Curve

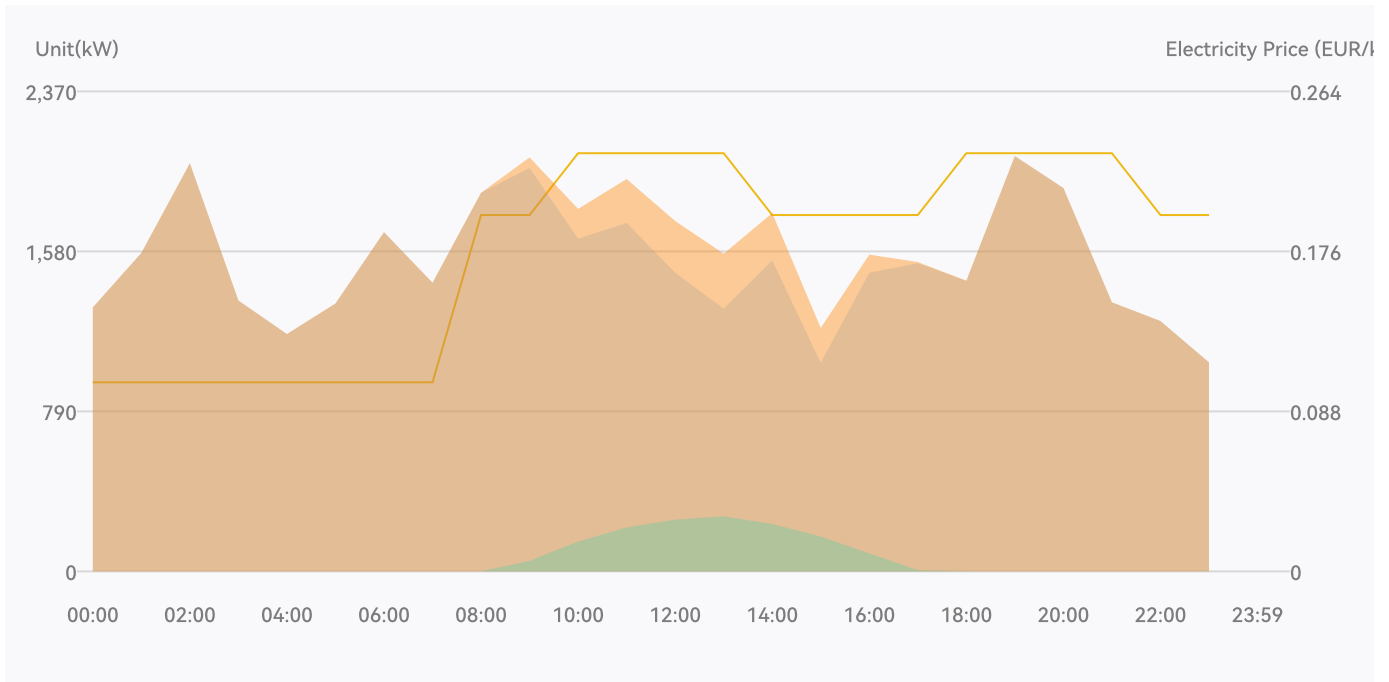
■ Load Power
 ■ +Mains Power/-Feed-in Power
 ■ PV Power



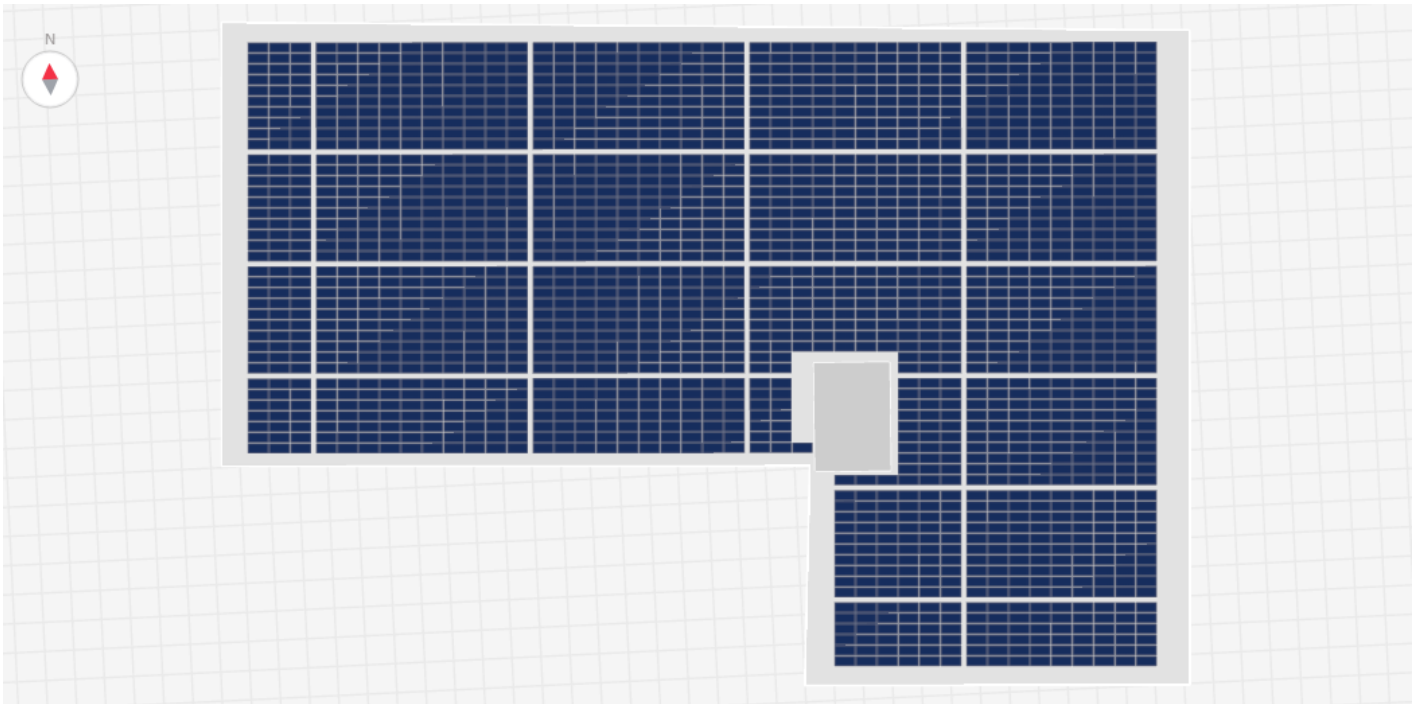
Daily Energy Consumption

12-19

■ Load Power
 ■ +Mains Power/-Feed-in Power
 ■ PV Power
 ■ Electricity Price Curve

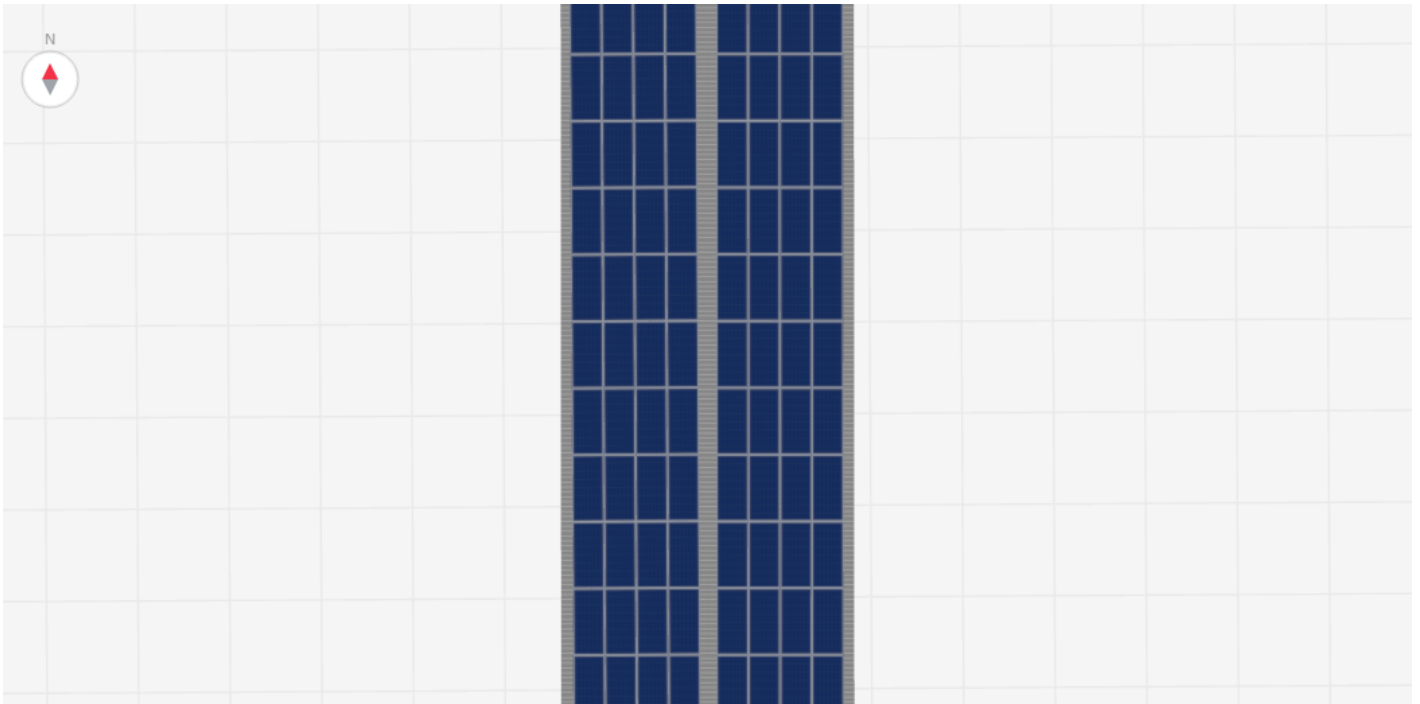


PV Module Layout Building 1



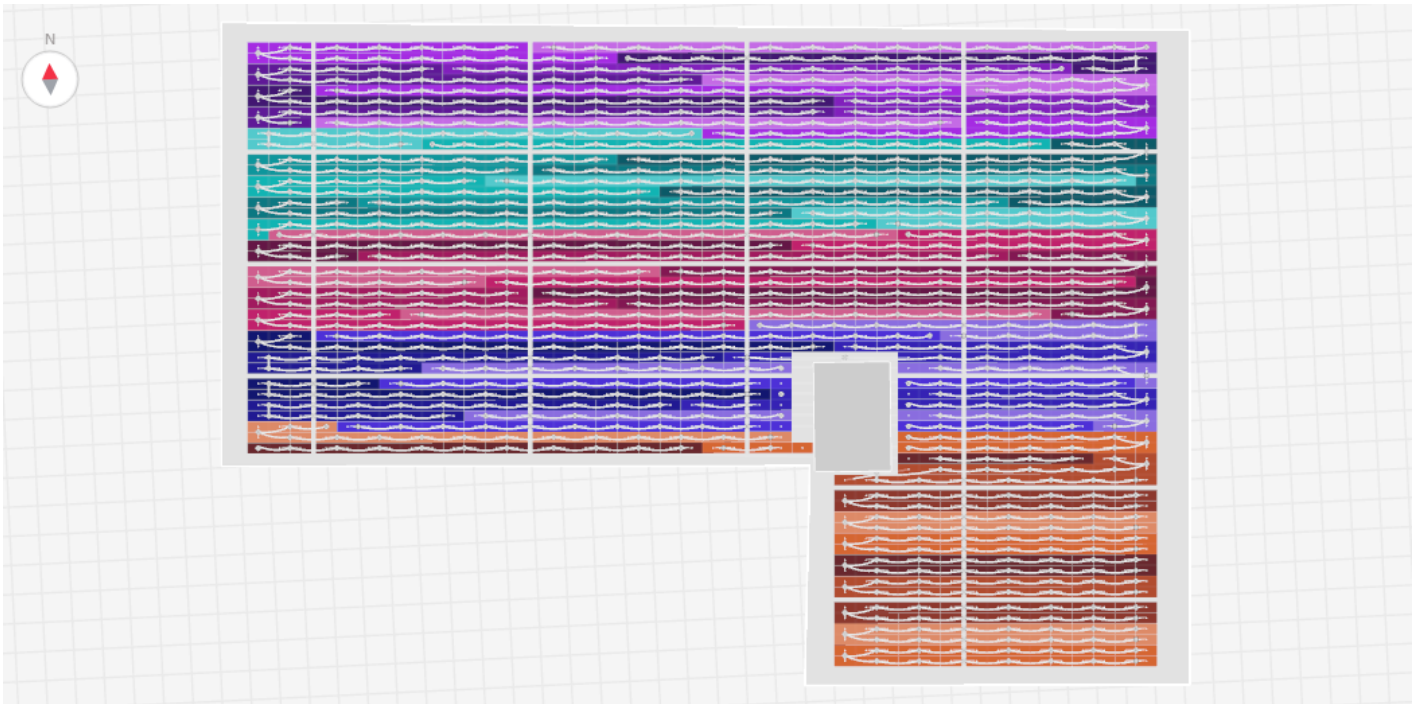
Manufacturer/Model	Quantity	Azimuth	Absolute Tilt
● LONGi/LR5-72HBD-545	1,789	-177°	1°

PV Module Layout Shed 1







Manufacturer/Model	Quantity	Azimuth	Absolute Tilt
● LONGi/LR5-72HBD-545	68	90°	20°
● LONGi/LR5-72HBD-545	68	-90°	20°





Electrical Wiring Building 1



Electrical Wiring - Details Building 1

Inverter	MPPT	String	Optimizer	PV Module
# 1  SUN5000-150K-MG0  MERC-1100W-P	MPPT1	● String1	15	30
		● String2	15	30
	MPPT2	● String3	15	30
		● String4	15	30
	MPPT3	● String5	15	30
		● String6	15	30
	MPPT4	● String7	15	30
		● String8	15	30
	MPPT5	● String9	15	30
		● String10	15	30
	MPPT6	● String11	15	29
	MPPT7	● String12	15	29
# 2  SUN5000-150K-MG0  MERC-1100W-P	MPPT1	● String1	15	30
		● String2	15	30
	MPPT2	● String3	15	30
		● String4	15	30
	MPPT3	● String5	15	30



Electrical Wiring - Details Building 1

Inverter	MPPT	String	Optimizer	PV Module	
# 2  SUN5000-150K-MG0  MERC-1100W-P	MPPT3	● String6	15	30	
	MPPT4	● String7	15	30	
		● String8	15	30	
	MPPT5	● String9	15	30	
		● String10	15	30	
	MPPT6	● String11	15	29	
	MPPT7	● String12	15	29	
	# 3  SUN5000-150K-MG0  MERC-1100W-P	MPPT1	● String1	15	30
			● String2	15	30
		MPPT2	● String3	15	30
			● String4	15	30
		MPPT3	● String5	15	30
● String6			15	30	
MPPT4		● String7	15	30	
		● String8	15	30	
MPPT5		● String9	15	30	
		● String10	15	30	
MPPT6		● String11	15	29	

Electrical Wiring - Details Building 1

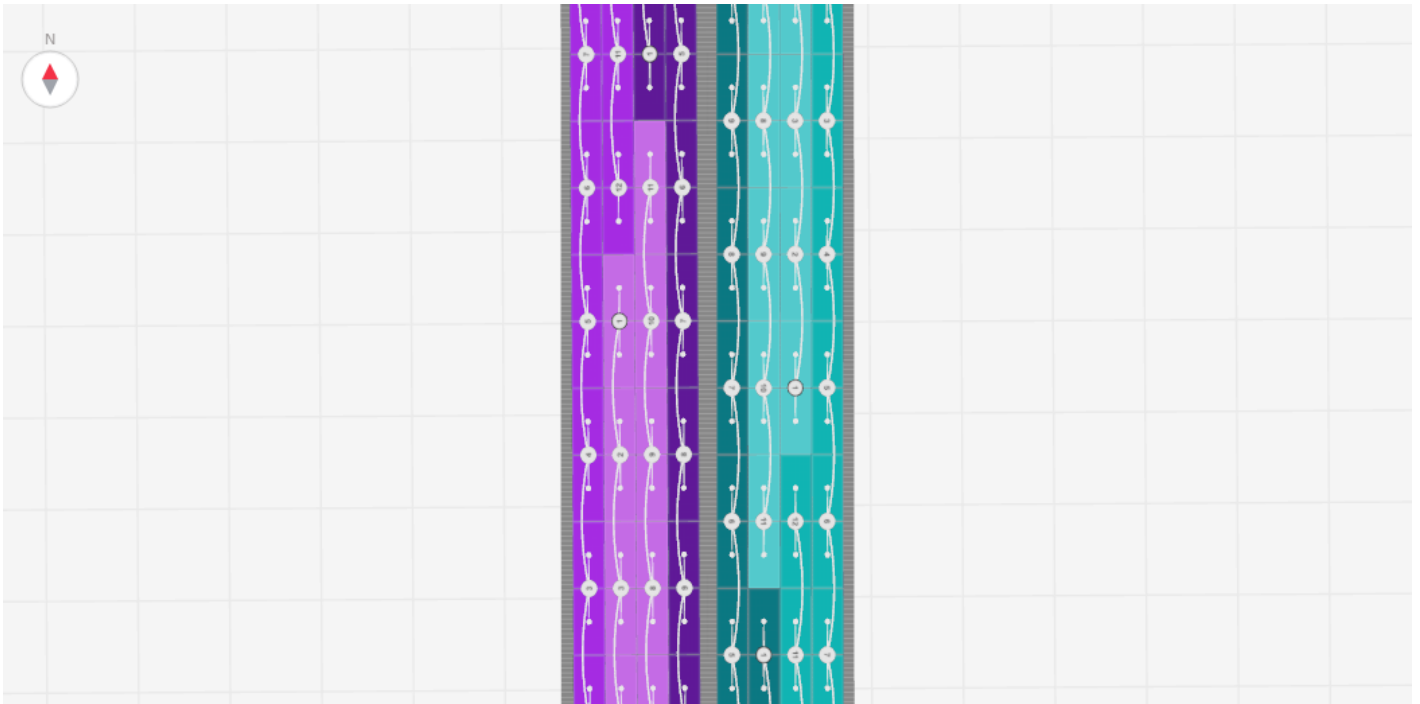
Inverter	MPPT	String	Optimizer	PV Module
# 3				
SUN5000-150K-MG0	MPPT7	● String12	15	29
MERC-1100W-P				
		● String1	15	30
	MPPT1			
		● String2	15	30
		● String3	15	30
	MPPT2			
		● String4	15	30
		● String5	15	30
	MPPT3			
		● String6	15	30
# 4				
SUN5000-150K-MG0				
MERC-1100W-P				
		● String7	15	30
	MPPT4			
		● String8	15	30
		● String9	15	30
	MPPT5			
		● String10	15	30
	MPPT6	● String11	15	29
	MPPT7	● String12	15	29
		● String1	15	30
	MPPT1			
		● String2	15	30
# 5				
SUN5000-150K-MG0				
MERC-1100W-P				
		● String3	15	30
	MPPT2			
		● String4	15	30
	MPPT3	● String5	15	30

Electrical Wiring - Details Building 1





Inverter	MPPT	String	Optimizer	PV Module
# 5  SUN5000-150K-MG0  MERC-1100W-P	MPPT3	● String6	15	30
	MPPT4	● String7	15	30
		● String8	15	30
	MPPT5	● String9	15	29
		● String10	15	29
	MPPT6	● String11	15	30
	MPPT7	● String12	15	29

Electrical Wiring

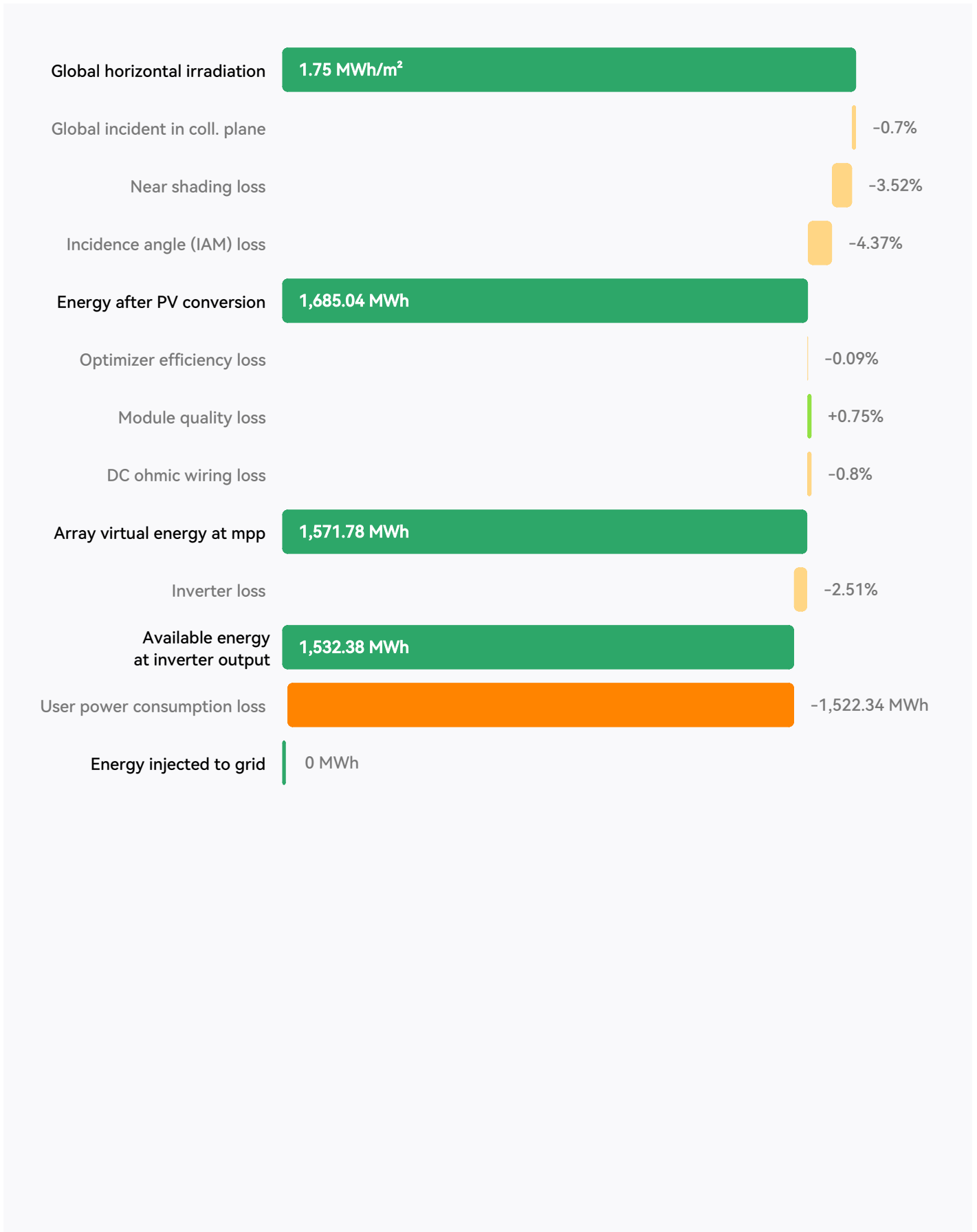
Shed 1



Electrical Wiring – Details Shed 1

Inverter	MPPT	String	Optimizer	PV Module
# 1  SUN2000-30KTL-M3  MERC-1100W-P	MPPT1	● String1	12	24
	MPPT2	● String2	11	22
	MPPT3	● String3	11	22
# 2  SUN2000-30KTL-M3  MERC-1100W-P	MPPT1	● String1	12	24
	MPPT2	● String2	11	22
	MPPT3	● String3	11	22

System Loss Diagram



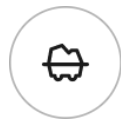
First-Year Environmental Benefits



686.5 tons
CO₂ Reduced



938
Equivalent Trees Planted



578 tons
Standard Coal Saved

Simulation Parameters

Time Zone	UTC +1:00
Weather Station	Alcorcón SP
Meteorological Data	Meteonorm
Grid Type	230 V/400 V
Plant Altitude	667 m