

Activ8 | HSE Feasibility Study

Midlands Regional Hospital

Site Address: Block Rd, Kilminchy, Portlaoise, Co. Laois

Survey Date: 23/04/2024

Surveyor: Kevin McGeough

Drone Deploy: N/A

Coordinates: 53°02'16.8"N 7°16'32.3"W



Activ8 Solar Energies

About Activ8

Activ8 Solar Energies was established in 2007 having been previously known as Ciaran Marron Electrical from 2004. Since this distinct move, we are proud to have become Ireland's number one installer of solar energy systems.

In the solar industry for over 16 years the directors of Activ8 Solar Energies have gained their unrivalled knowledge and experience through the installation of over 15,000 systems supplied and installed across Ireland and the UK.

Your PV system from Activ8 Energies

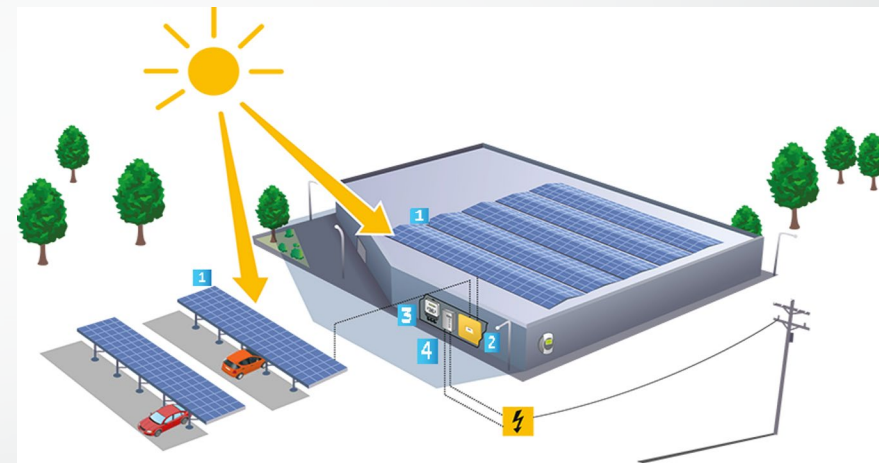
Block Rd, Kilminchy, Portlaoise, Co. Laois

53°02'16.8"N 7°16'32.3"W

53.03787826568918, -7.2759245855107695



How Solar PV Works



- Solar Panels:** The panels installed on your rooftop absorb the sunlight and convert it to direct current (DC electricity), which is then sent to the solar inverter.
- Inverter:** The inverter converts the direct current electricity to alternating current electricity. DC power is produced from the solar panels and AC power is the power used in the building.
- Distribution Board:** The electricity from the inverter goes to the electric distribution board and is then used throughout the building just like electricity from the grid. The PV system is equipped with energy monitoring system, which controls the energy consumption and export management.
- Smart logger:** For self consumption, the PV energy produced will be consumed directly by the loads on site, limiting the energy exportation to the grid.

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Configuration & Payback



System Size (DC)	276.64 kWp
No of panels	608 modules
Inverters (AC)	213 kW AC
Solar Panel Model	Tier 1 Canadian HiKu6 Mono PERC CS6L-455MS
Inverter Models	Huawei SUN2000-8KTL,10KTL,15KTL,20K MB0, 25K MB0,30KTL,40KTL
PV Generation	242,730.52 kWh/Year**
Investment	€ 665,507
Electricity Rate	€0.25
Payback	9.8 years *

**Including degradation

- Table Includes Carport + rooftop

Payback:

Payback:				Export Rate (inf.0%) (€/kWh)		€0.0000
Energy Inflation		3%		Electricity Rate (€/kWh)		€0.2500
PV Cost		€665,507		Power per Panel (Wp)		455
NDMG Grant		€54,096		System Power (kWp)		276.64
ACA**		€76,426		PV Generation (kWh/Year)		247,684
Final Price		€665,507		Payback (Years)		9.8
Year	PV degradation [kWh]	Electricity Rate (Net)	Savings Yearly	Savings Accumulative	Cumulative Cash flow	
1	242,730.52	€ 0.249	€ 60,453	€ 60,452.75	-€ 605,054.25	
2	241,516.86	€ 0.258	€ 62,191	€ 122,643.34	-€ 542,863.66	
3	240,309.28	€ 0.265	€ 63,736	€ 186,379.37	-€ 479,127.63	
4	239,107.73	€ 0.273	€ 65,320	€ 251,699.24	-€ 413,807.76	
5	237,912.19	€ 0.281	€ 66,943	€ 318,642.30	-€ 346,864.70	
6	236,722.63	€ 0.290	€ 68,607	€ 387,248.91	-€ 278,258.09	
7	235,539.02	€ 0.299	€ 70,311	€ 457,560.38	-€ 207,946.62	
8	234,361.32	€ 0.307	€ 72,059	€ 529,619.10	-€ 135,887.90	
9	233,189.52	€ 0.317	€ 73,849	€ 603,468.48	-€ 62,038.52	
10	232,023.57	€ 0.326	€ 75,685	€ 679,153.01	€ 13,646.01	
11	230,863.45	€ 0.336	€ 77,565	€ 756,718.30	€ 91,211.30	
12	229,709.14	€ 0.346	€ 79,493	€ 836,211.09	€ 170,704.09	
13	228,560.59	€ 0.356	€ 81,468	€ 917,679.28	€ 252,172.28	
14	227,417.79	€ 0.367	€ 83,493	€ 1,001,171.95	€ 335,664.95	
15	226,280.70	€ 0.378	€ 85,567	€ 1,086,739.42	€ 421,232.42	
16	225,149.29	€ 0.389	€ 87,694	€ 1,174,433.23	€ 508,926.23	
17	224,023.55	€ 0.401	€ 89,873	€ 1,264,306.24	€ 598,799.24	
18	222,903.43	€ 0.413	€ 92,106	€ 1,356,412.59	€ 690,905.59	
19	221,788.91	€ 0.426	€ 94,395	€ 1,450,807.79	€ 785,300.79	
20	220,679.97	€ 0.438	€ 96,741	€ 1,547,548.70	€ 882,041.70	
Totals	4.630.789.47				€1.547.548.70	

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Configuration & Payback



A8-HSE Midlands Portlaoise_240516:	
M.P.R.N.:	10000070470 (Meter Point Reference Number)
M.I.C.:	650 kVA (Maximum Import Capacity)
PV Power S.T.C.:	98.28 kWp (Standard Test Conditions of the PV Modules)
PV Modules S.T.C.:	216 × Canadian HiKu6 Mono PERC CS6L-455MS
AC Power Nominal:	80 kW (Rated Output Power of the PV inverters)
Grid Protection:	G10 Relay 80 kW (AC) (MV VTs & CTs included)
Inverter:	2 × Huawei SUN2000 40KTL-M3 40 kW (5 Years warranty)
DC Protection:	2 × DC Automatic Switch-Disconnecter for 10 Strings
PV Generation*:	92,498 kWh/year (using the database described in the simulation report)
Payback*:	12.7 years (net metering daytime electricity rate: 0.2500 €/kWh)
Total cost:	330,050 €
Cost per Wp S.T.C.:	3.358 €/Wp

Payback:

Energy Inflation			3%	Electricity Rate (€/kWh)	€0.2500
PV Cost			€330,572	Power per Panel (Wp)	455
NDMG Grant			€22,256	System Power (kWp)	98.28
ACA**			€38,540	PV Generation (kWh/Year)	92,498
Final Price			€330,572	Payback (Years)	12.7
Year	PV degradation [kWh]	Electricity Rate (Net)	Savings Yearly	Savings Accumulative	Cumulative Cash flow
1	90,647.94	€ 0.250	€ 22,658	€ 22,658.48	-€ 307,913.52
2	90,194.70	€ 0.258	€ 23,225	€ 45,883.62	-€ 284,688.38
3	89,743.73	€ 0.265	€ 23,802	€ 69,685.90	-€ 260,886.10
4	89,295.01	€ 0.273	€ 24,394	€ 94,079.67	-€ 236,492.33
5	88,848.54	€ 0.281	€ 25,000	€ 119,079.62	-€ 211,492.38
6	88,404.29	€ 0.290	€ 25,621	€ 144,700.82	-€ 185,871.18
7	87,962.27	€ 0.299	€ 26,258	€ 170,958.71	-€ 159,613.29
8	87,522.46	€ 0.307	€ 26,910	€ 197,869.10	-€ 132,702.90
9	87,084.85	€ 0.317	€ 27,579	€ 225,448.22	-€ 105,123.78
10	86,649.42	€ 0.326	€ 28,264	€ 253,712.68	-€ 76,859.32
11	86,216.18	€ 0.336	€ 28,967	€ 282,679.52	-€ 47,892.48
12	85,785.10	€ 0.346	€ 29,687	€ 312,366.18	-€ 18,205.82
13	85,356.17	€ 0.356	€ 30,424	€ 342,790.55	€ 12,218.55
14	84,929.39	€ 0.367	€ 31,180	€ 373,970.96	€ 43,398.96
15	84,504.74	€ 0.378	€ 31,955	€ 405,926.22	€ 75,354.22
16	84,082.22	€ 0.389	€ 32,749	€ 438,675.55	€ 108,103.55
17	83,661.81	€ 0.401	€ 33,563	€ 472,238.71	€ 141,666.71
18	83,243.50	€ 0.413	€ 34,397	€ 506,635.92	€ 176,063.92
19	82,827.28	€ 0.426	€ 35,252	€ 541,887.89	€ 211,315.89
20	82,413.14	€ 0.438	€ 36,128	€ 578,015.88	€ 247,443.88
Totals	1.729.372.73				€ 578,015.88

**Including degradation

• Table Includes Carport + rooftop

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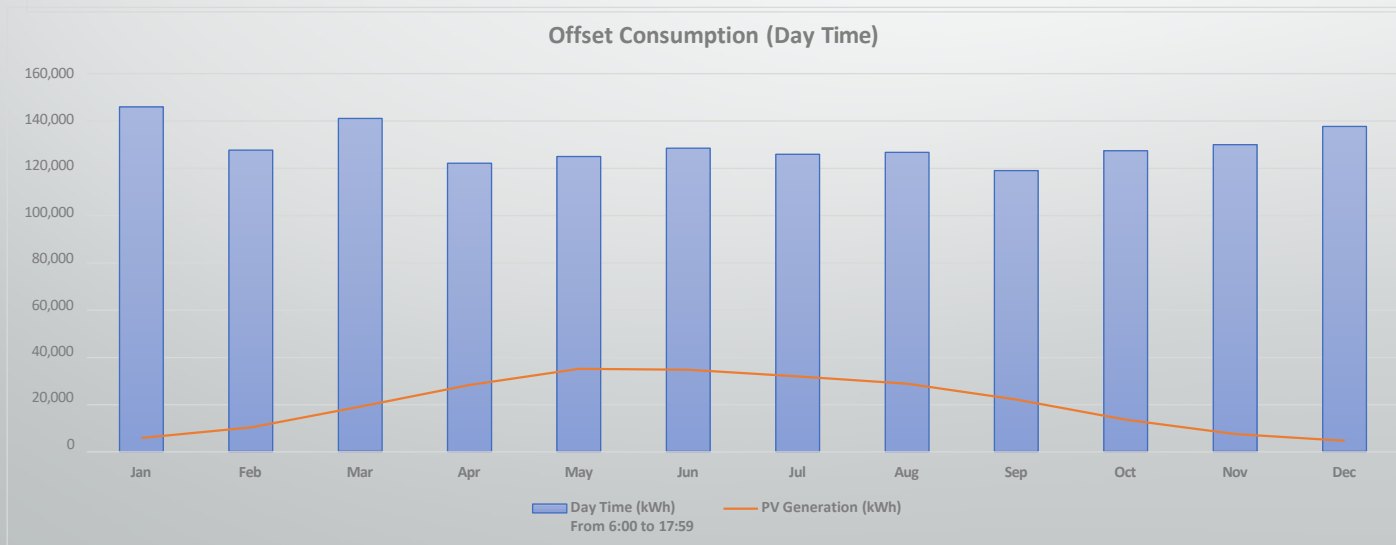
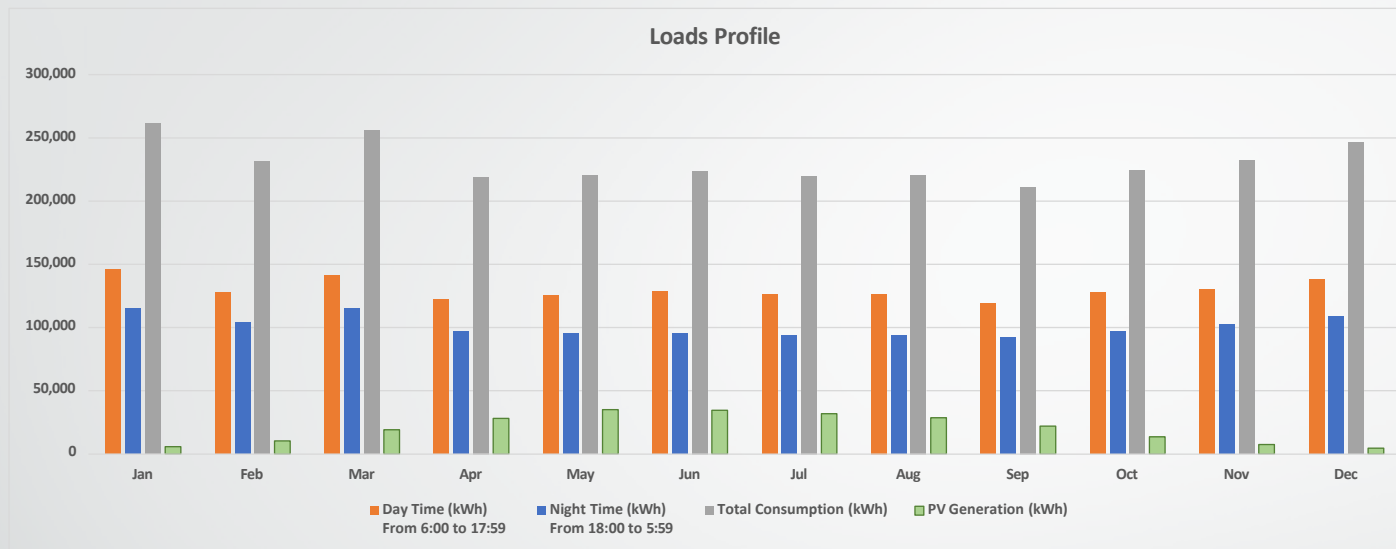
QH Data Analysis



 In Partnership with 					PROJECT NAME:	A8- HSE MID Portlaoise		M.P.R.N.:	10000070470	
					RESPONSIBLE:	Faris A.	Faris.Abbas@activ8energies.com			
					Total PV Power:	276.64	kWp STC	M.I.C. [kVA]	650	
					Panels:	608	x CS6L HiKu6 Mono PERC			455 Wp STC
					Inverters:	213 kW AC	_xHuawei SUN2000 ##KTL-M# + ##KTL-M#			
Title:		QH Data Analysis			Start Date:	End Date:	Page:	Version:		
					Feb-23	Jan-24	1	v4.03		
Time interval [values]		48	Days analysed	365	Day start [hh]	6	Day ends [hh]	18		
Month	Day Time (kWh) From 6:00 to 17:59	Day Time (MWh) From 6:00 to 17:59	Night Time (kWh) From 18:00 to 5:59	Night Time (MWh) From 18:00 to 5:59	Total Consumption (kWh)	Total Consumption (MWh)	PV Generation (kWh)	Offset Consumption Day Time (%)		
Jan	145,900	145.90	115,119	115.12	261,019	261.02	5,928	4%		
Feb	127,644	127.64	103,667	103.67	231,311	231.31	10,419	8%		
Mar	141,056	141.06	114,862	114.86	255,918	255.92	19,227	14%		
Apr	122,200	122.20	96,786	96.79	218,986	218.99	28,311	23%		
May	125,035	125.03	95,366	95.37	220,401	220.40	35,168	28%		
Jun	128,500	128.50	95,307	95.31	223,807	223.81	34,752	27%		
Jul	125,915	125.91	93,995	94.00	219,910	219.91	31,957	25%		
Aug	126,701	126.70	94,042	94.04	220,744	220.74	28,875	23%		
Sep	119,024	119.02	92,208	92.21	211,232	211.23	22,166	19%		
Oct	127,405	127.41	97,062	97.06	224,467	224.47	13,650	11%		
Nov	129,937	129.94	102,176	102.18	232,113	232.11	7,546	6%		
Dec	137,779	137.78	108,983	108.98	246,762	246.76	4,733	3%		
Total	1,557,096	1,557.10	1,209,575	1,209.58	2,766,671	2,766.67	242,730.52	16%		

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QH Data Analysis



Simulation Results

Results Rooftop System

PV Generator Output	178.36 kWp
Spec. Annual Yield	869.14 kWh/kWp
Performance Ratio (PR)	88.88 %
Yield Reduction due to Shading	3.9 %

PV Generator Energy (AC grid)	155,186 kWh/Year*
Own Consumption	154,606 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	581 kWh/Year

Own Power Consumption	99.6 %
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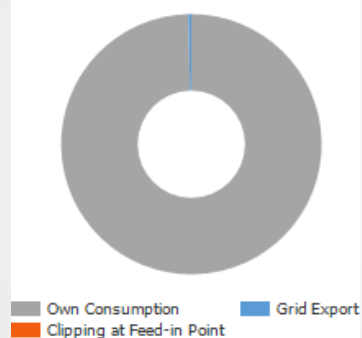
CO ₂ Emissions avoided	38,135 kg / year
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Appliances

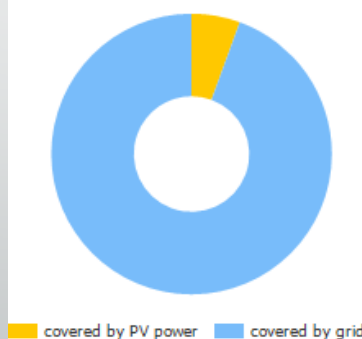
Appliances	2,766,671 kWh/Year
Standby Consumption (Inverter)	166 kWh/Year
Total Consumption	2,766,837 kWh/Year
covered by PV power	154,606 kWh/Year
covered by grid	2,612,231 kWh/Year

Solar Fraction	5.6 %
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PV Generator Energy (AC grid)



Total Consumption



*Excluding degradation

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PVSOL Simulation Results



Name	Arbitrary 3D Object 02-Module Area Northeast	Name	Arbitrary 3D Object 02-Module Area Southwest
PV Modules	22 x CS6L-455MS (v1)	PV Modules	22 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.	Manufacturer	Canadian Solar Inc.
Inclination	10 °	Inclination	10 °
Orientation	Northeast 67 °	Orientation	Southwest 247 °
Installation Type	Mounted - Roof	Installation Type	Mounted - Roof
PV Generator Surface	47.5 m ²	PV Generator Surface	47.5 m ²

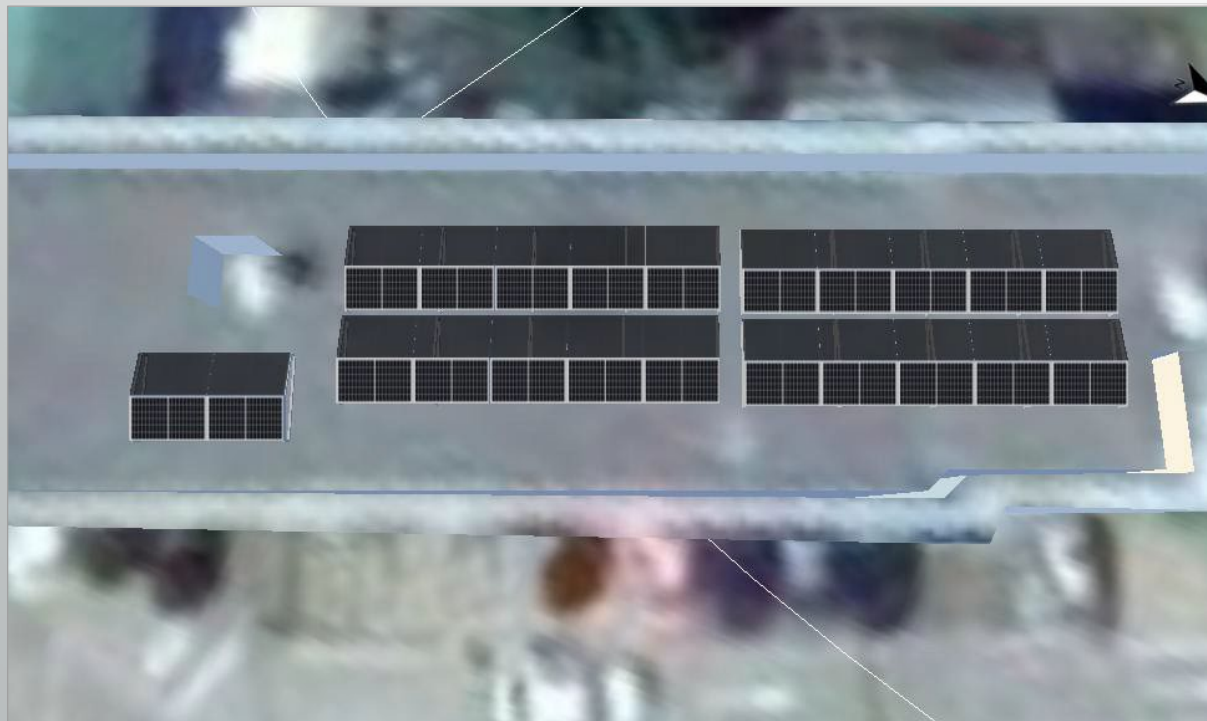


Figure: 1. Module Area - Arbitrary 3D Object 02-Module Area Northeast

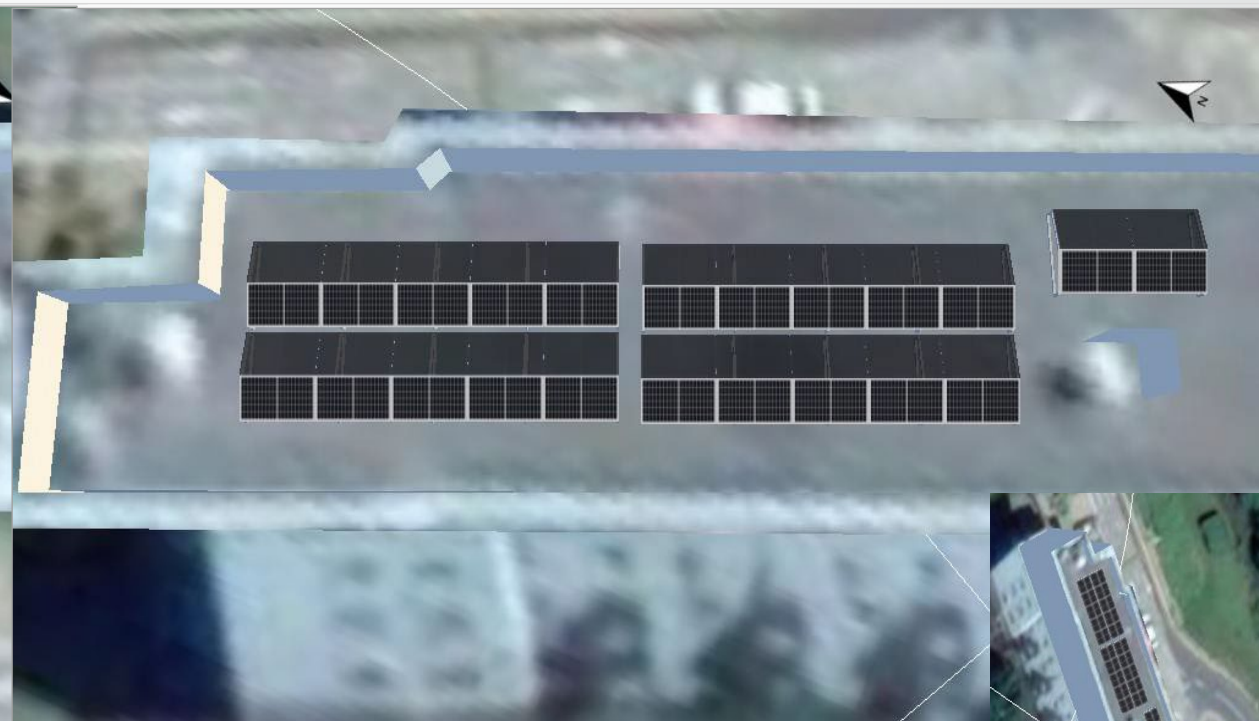


Figure: 2. Module Area - Arbitrary 3D Object 02-Module Area Southwest

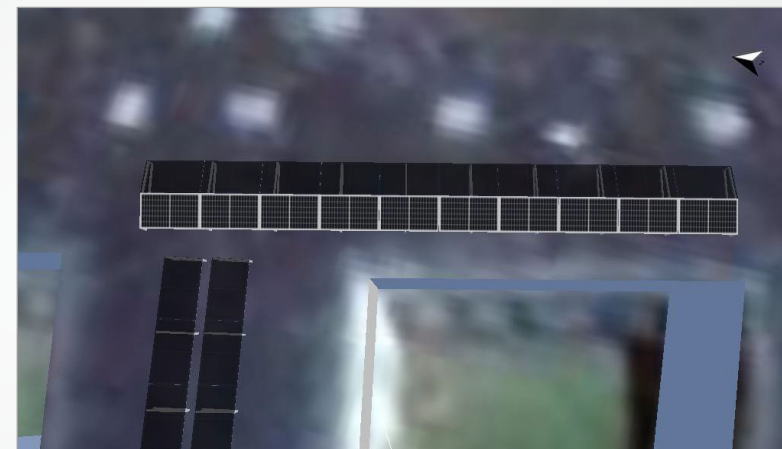


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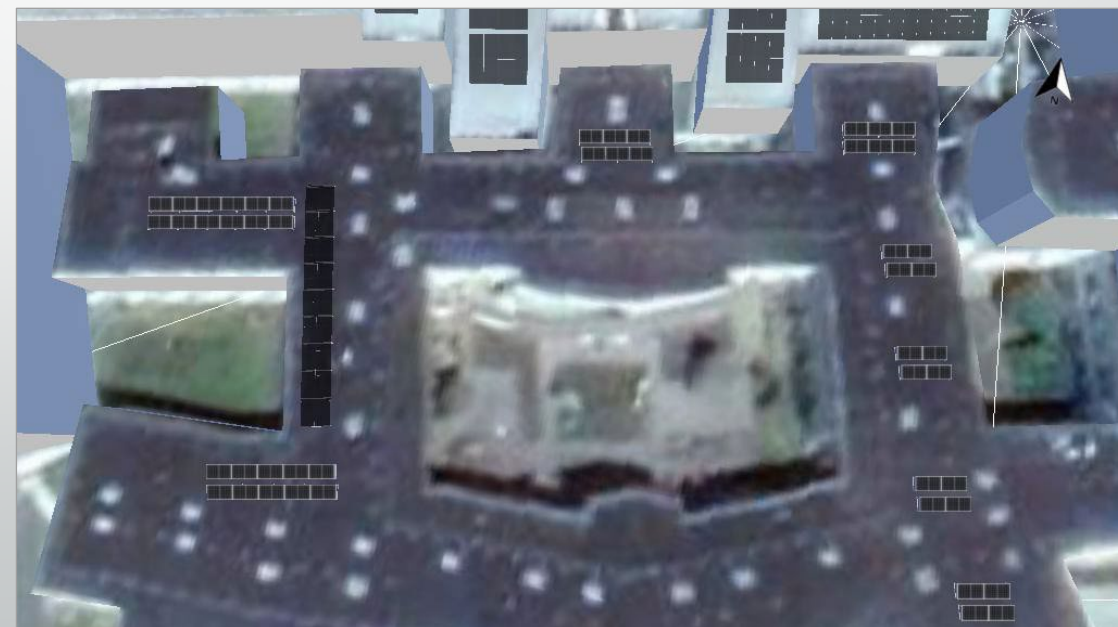
PVSOL Simulation Results



Name	Arbitrary 3D Object 03-Module Area
	East
PV Modules	10 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	10 °
Orientation	East 79 °
Installation Type	Mounted - Roof
PV Generator Surface	21.6 m ²



Name	Arbitrary 3D Object 03-Mounting Surface South
	Surface South
PV Modules	50 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	10 °
Orientation	South 170 °
Installation Type	Mounted - Roof
PV Generator Surface	107.9 m ²



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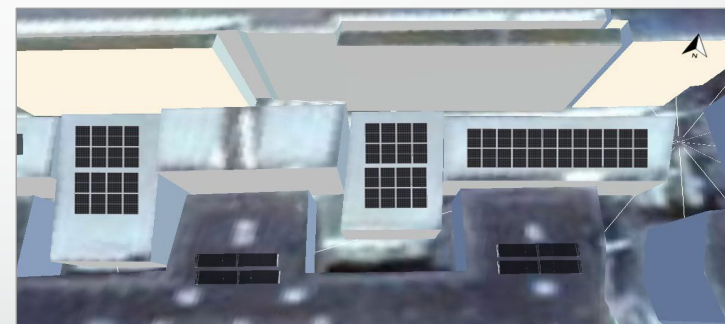
PVSOL Simulation Results



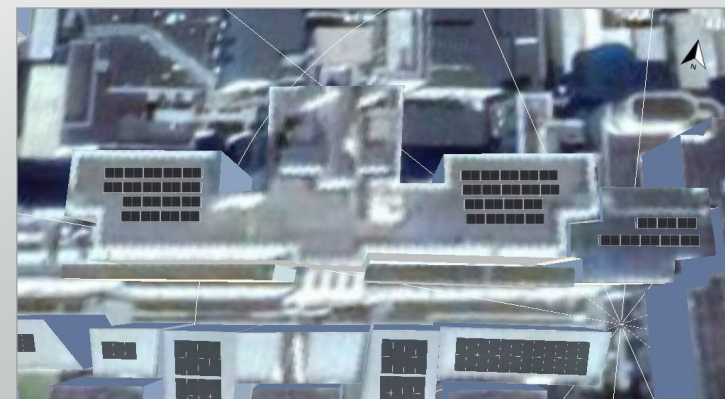
Name	Arbitrary 3D Object 05-Mounting Surface South
PV Modules	22 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	20 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	47.5 m ²



Name	Arbitrary 3D Object 10-Mounting Surface South
PV Modules	56 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	20 °
Orientation	South 171 °
Installation Type	Roof parallel
PV Generator Surface	120.8 m ²



Name	Arbitrary 3D Object 11-Mounting Surface South
PV Modules	44 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	10 °
Orientation	South 169 °
Installation Type	Mounted - Roof
PV Generator Surface	95.0 m ²

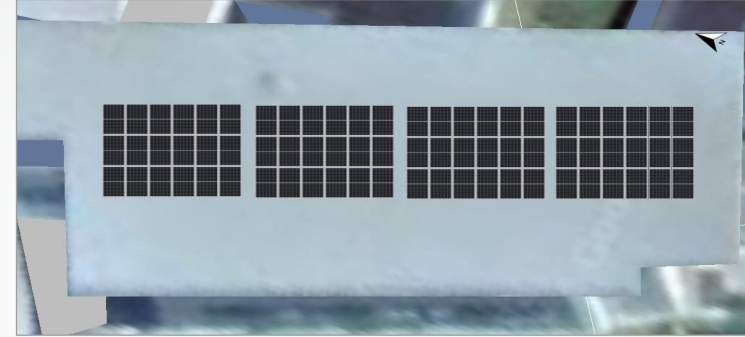


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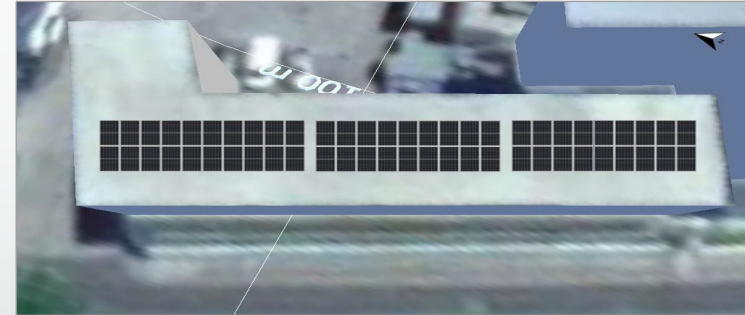
PVSOL Simulation Results



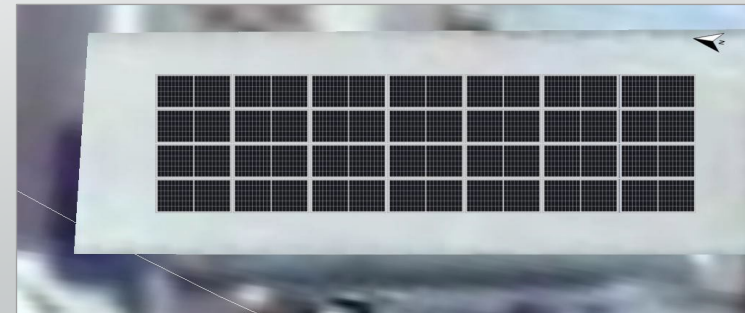
Name	Arbitrary 3D Object 04-Mounting Surface West
PV Modules	72 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	10 °
Orientation	Southwest 247 °
Installation Type	Roof parallel
PV Generator Surface	155.4 m ²



Name	Arbitrary 3D Object 04-Mounting Surface West
PV Modules	72 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	10 °
Orientation	Southwest 247 °
Installation Type	Roof parallel
PV Generator Surface	155.4 m ²



Name	Arbitrary 3D Object 13-Mounting Surface West
PV Modules	56 x CS6L-455MS (v1)
Manufacturer	Canadian Solar Inc.
Inclination	15 °
Orientation	West 249 °
Installation Type	Roof parallel
PV Generator Surface	120.8 m ²



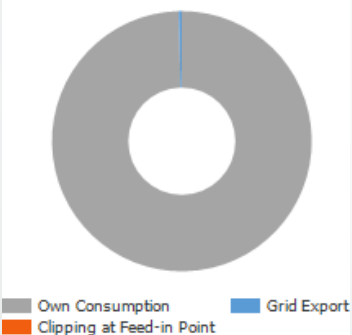
Simulation Results

Results Total System

PV System

PV Generator Output	98.28 kWp
Spec. Annual Yield	940.67 kWh/kWp
Performance Ratio (PR)	91.83 %
Yield Reduction due to Shading	0.0 %
PV Generator Energy (AC grid)	92,498 kWh/Year*
Own Consumption	92,140 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	358 kWh/Year
Own Power Consumption	99.6 %
CO ₂ Emissions avoided	22,742 kg / year

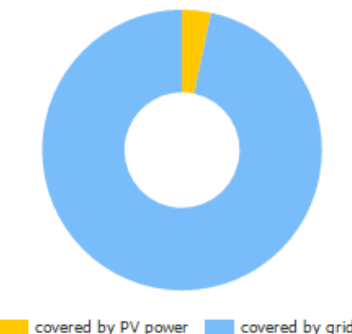
PV Generator Energy (AC grid)



Appliances

Appliances	2,766,671 kWh/Year
Standby Consumption (Inverter)	49 kWh/Year
Total Consumption	2,766,720 kWh/Year
covered by PV power	92,140 kWh/Year
covered by grid	2,674,580 kWh/Year
Solar Fraction	3.3 %

Total Consumption



*Excluding degradation

Carport

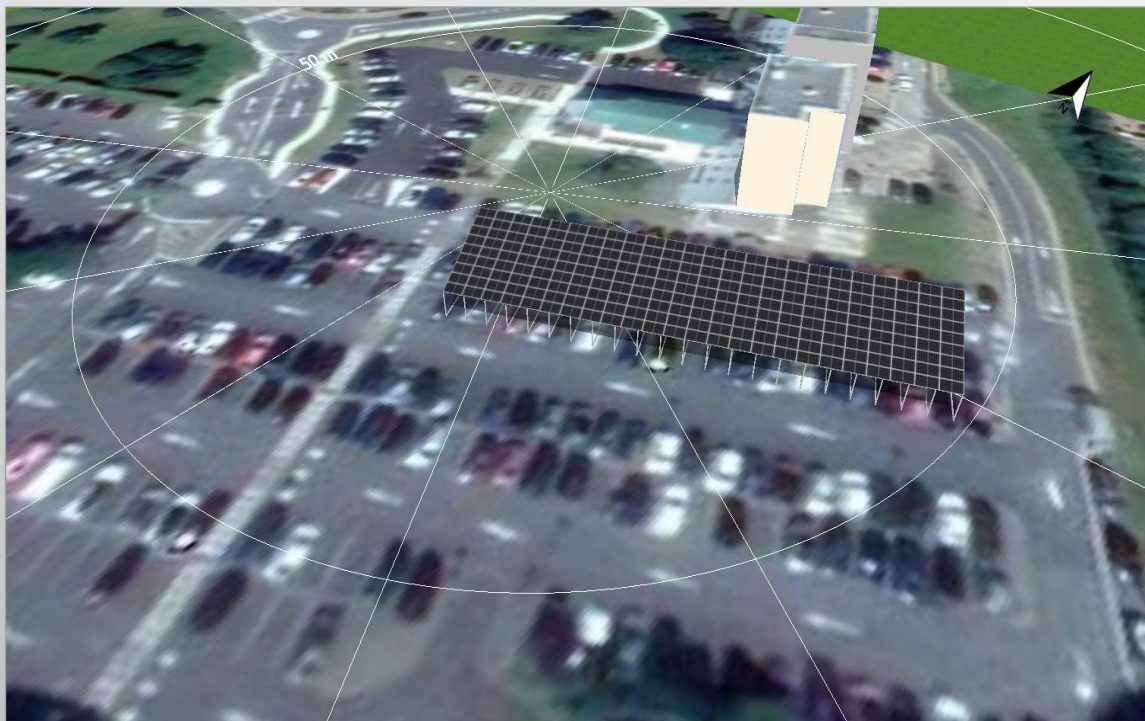


Figure: Carport Overview , 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Portlaoise, IRL (2001 - 2020)
Values source	Meteonorm 8.2(i)
PV Generator Output	98.28 kWp
PV Generator Surface	466.1 m ²
Number of PV Modules	216
Number of Inverters	2



Parts list

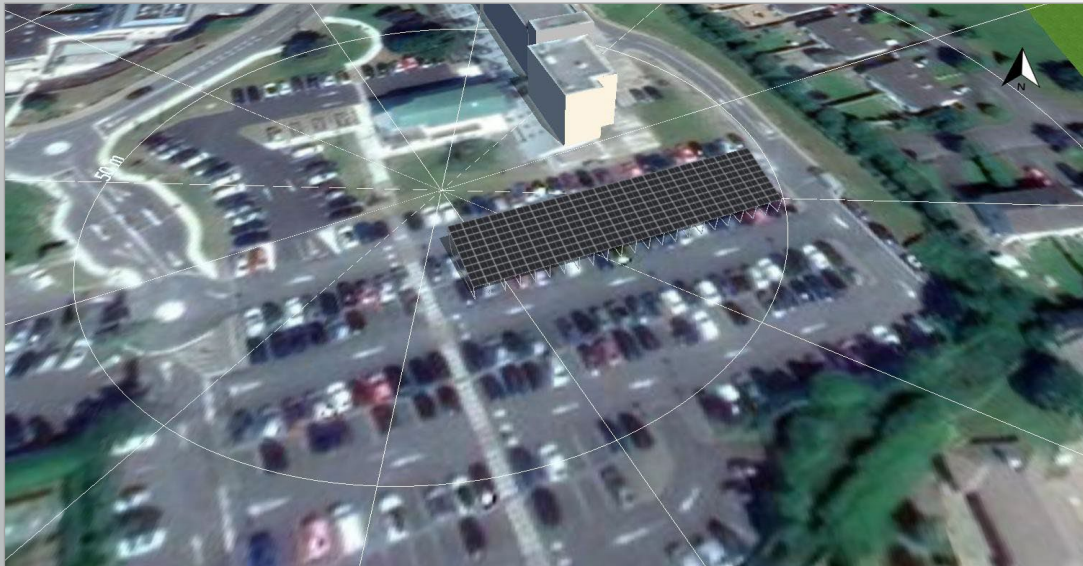
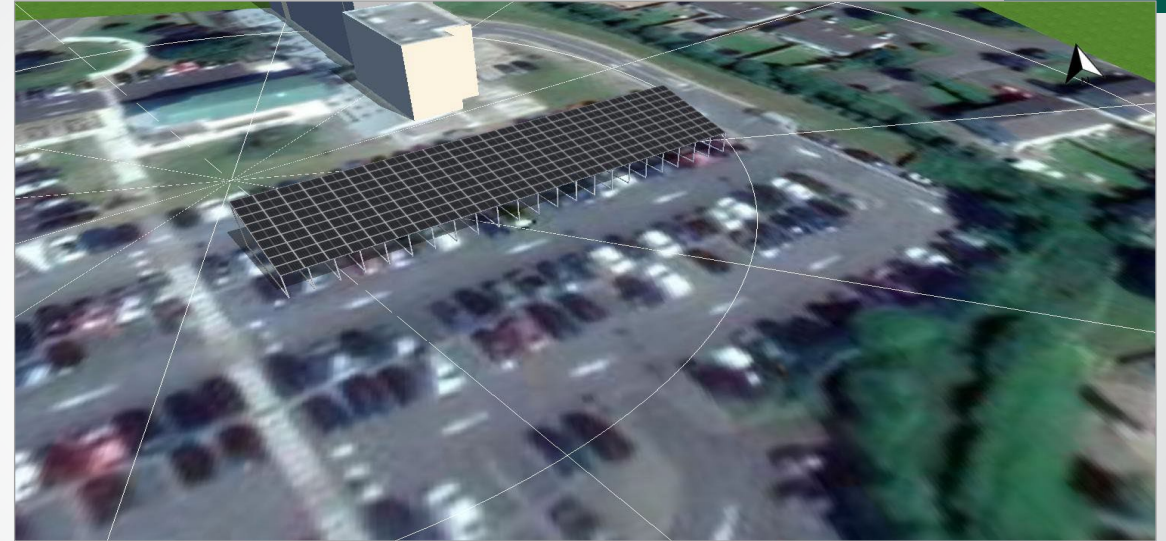
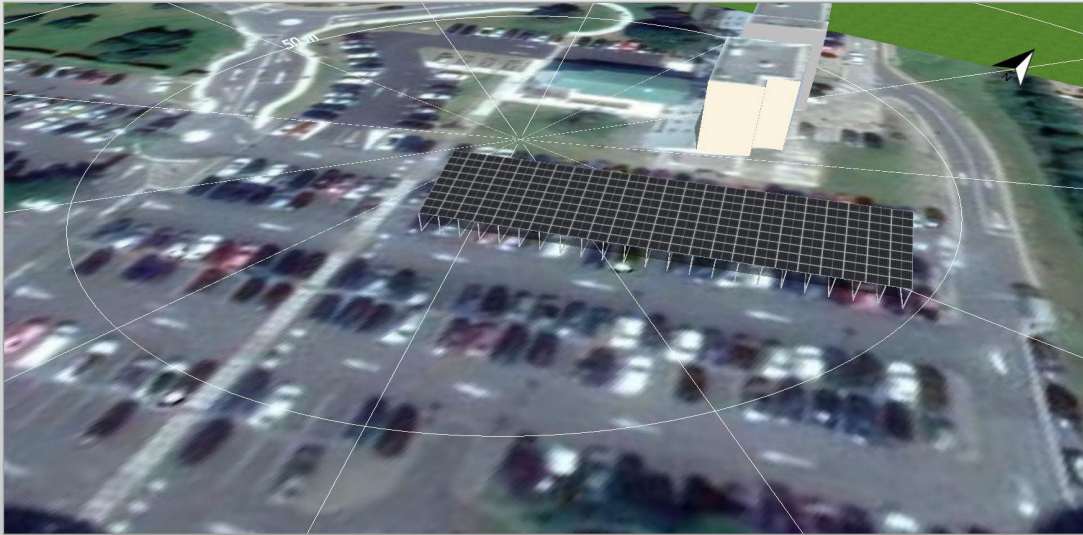
#	Type	Manufacturer	Name	Quantity	Unit
1	PV Module	Canadian Solar Inc.	CS6L-455MS	216	Piece
2	Inverter	Huawei Technologies	SUN2000-40KTL-M3 (400Vac)	1	Piece
3	Inverter	Huawei Technologies	SUN2000-30KTL-M3 (400Vac)	1	Piece
4	Components		Circuit Breaker 125A	1	Piece

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Portlaoise, IRL (2001 - 2020)
Values source	Meteonorm 8.2(i)
PV Generator Output	98.28 kWp
PV Generator Surface	466.1 m ²
Number of PV Modules	216
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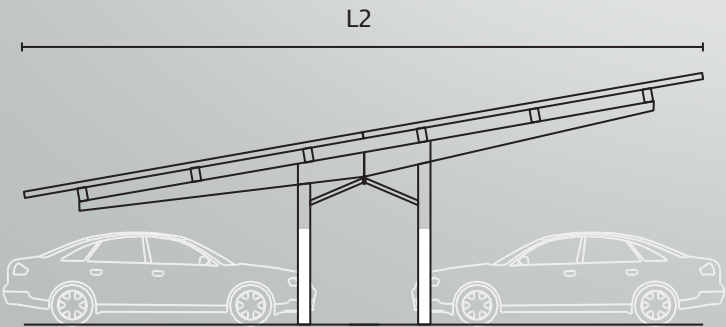
Carport Images



BION - Type 2

Orientation: South

Solar Carport System



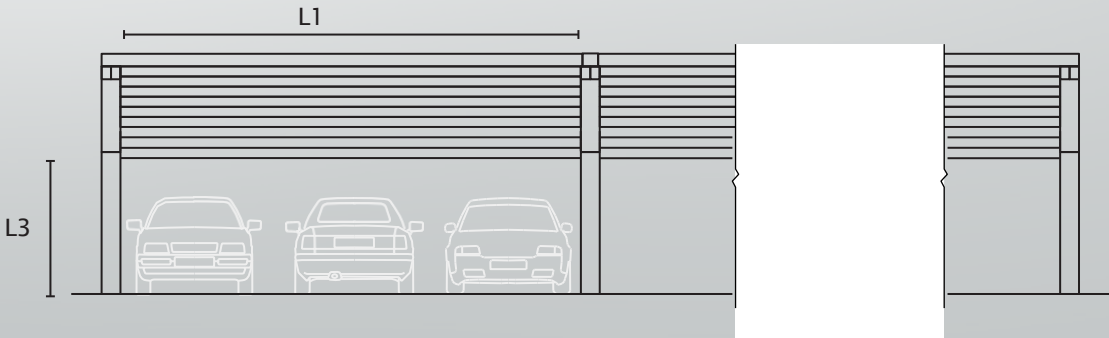

SUITABLE FOR SCREW PILES

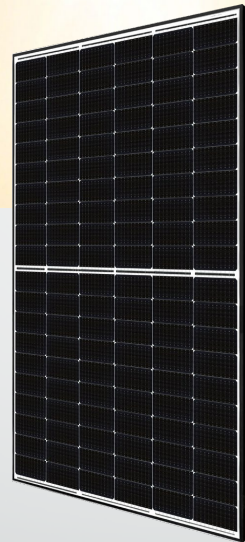

LOW WEIGHT = ECONOMICAL


HIDDEN CABLES & DRAINAGE

Materials:	Hot Galvanized according to EN - 1461 Zinc-magnesium in accordance to DIN 55928-8
Roof tilt angle:	10°
Span between posts (L1*):	4,6 - 8,1 m
Width (L2*):	10,2-12 m
Clearance height (L3*):	2,3 m
Available roof types:	BlueRoof - With Subroof - Without Subroof
Optional additions:	Drainage - Inverter plate - Full flashing Clearance height >2,3 m - Painting - LED lights

**Distance can be adjusted according to the requirements.*





HiKu6 Mono PERC

445 W ~ 465 W

CS6L-445|450|455|460|465MS

**25
Years**

Industry Leading Product Warranty on Materials and Workmanship*

MORE POWER

465 W

Module power up to 465 W
 Module efficiency up to 21.5 %

\$

Lower LCOE & system cost

↑

Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation

☁

Better shading tolerance

ELECTRICAL DATA | STC*

CS6L	445MS	450MS	455MS	460MS	465MS
Nominal Max. Power (Pmax)	445 W	450 W	455 W	460 W	465 W
Opt. Operating Voltage (Vmp)	34.2 V	34.4 V	34.6 V	34.8 V	35.0 V
Opt. Operating Current (Imp)	13.03 A	13.10 A	13.17 A	13.24 A	13.30 A
Open Circuit Voltage (Voc)	40.8 V	41.0 V	41.2 V	41.4 V	41.6 V
Short Circuit Current (Isc)	13.86 A	13.9 A	13.95 A	14.00 A	14.09 A
Module Efficiency	20.6%	20.9%	21.1%	21.3%	21.5%
Operating Temperature	-40°C ~ +85°C				
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)				
Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)				
Max. Series Fuse Rating	25 A				
Application Classification	Class A				
Power Tolerance	0 ~ + 10 W				

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS6L	445MS	450MS	455MS	460MS	465MS
Nominal Max. Power (Pmax)	334 W	338 W	341 W	345 W	349 W
Opt. Operating Voltage (Vmp)	32.1 V	32.2 V	32.4 V	32.6 V	32.8 V
Opt. Operating Current (Imp)	10.41 A	10.47 A	10.52 A	10.58 A	10.63 A
Open Circuit Voltage (Voc)	38.6 V	38.8 V	38.9 V	39.1 V	39.3 V
Short Circuit Current (Isc)	11.18 A	11.21 A	11.25 A	11.29 A	11.36 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

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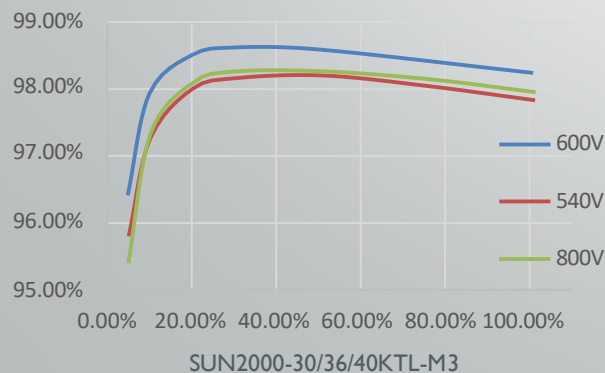
Data Sheet – Inverter (1)



SUN2000-30/36/40KTL-M3
Smart PV Controller



Efficiency Curve



Technical Specification

SUN2000-30KTL-M3

SUN2000-36KTL-M3

SUN2000-40KTL-M3

Efficiency

Max. Efficiency	98.7%
European Efficiency	98.4%

Input

Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	26 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1000 V
Rated Input Voltage	600 V
Number of Inputs	8
Number of MPP Trackers	4

Output

Rated AC Active Power	30,000 W	36,000 W	40,000 W
Max. AC Apparent Power	33,000 VA ³	40,000 VA	44,000 VA
Rated Output Voltage	230 Vac / 400 Vac / 480 Vac, 3W/N+PE		
Rated AC Grid Frequency	50 Hz / 60 Hz		
Rated Output Current	43.3 A	52.0 A	57.8 A
Max. Output Current	47.9 A	58.0 A	63.8 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD		
Max. Total Harmonic Distortion	< 3%		

¹ The maximum input voltage is the upper limit of the DC voltage. Any higher input DC voltage would probably damage inverter.

² Any DC input voltage beyond the operating voltage range may result in inverter improper operating.

³ For Austria, German, Belgium & Ukraine the Max. AC Apparent Power will not exceed 30,000 VA (with regard to grid code: VDE-AR-N-4105, C10/11 & Austria)

⁴ SUN2000-30~40KTL-M3 raises potential between PV- and ground to above zero through integrated PID recovery function to recover module degradation from PID. Supported module types include: P-type (mono, poly), N-type (nPERT, HIT)

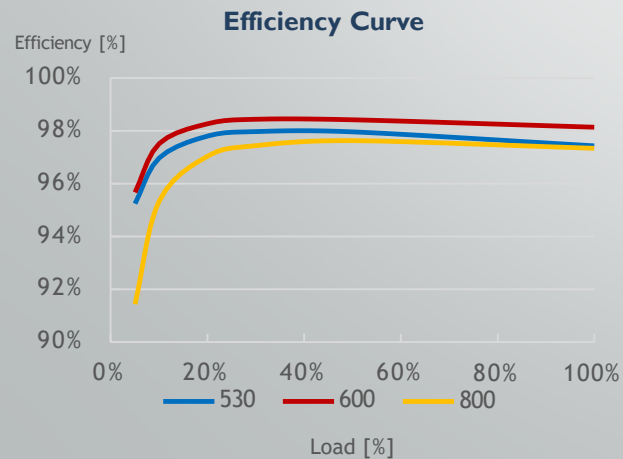
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Data Sheet – Inverter (2)



SUN2000-12/15/17/20/25K-MB0

Technical Specification



Technical Specification ¹	SUN2000-12K-MB0	SUN2000-15K-MB0	SUN2000-17K-MB0	SUN2000-20K-MB0	SUN2000-25K-MB0
	Efficiency				
Max. efficiency	98.4 %	98.4 %	98.4 %	98.4 %	98.4 %
European weighted efficiency	97.9 %	98.0 %	98.1 %	98.1 %	98.2 %
	DC Input				
Recommended max. PV power	18,000 Wp	22,500 Wp	25,500 Wp	30,000 Wp	37,500 Wp
Max. input voltage ²	1,100 V				
Max. input current per MPPT	30 A (two strings) / 20 A (single string)				
Max. short-circuit current	40 A				
Start-up voltage	200 V				
MPPT operating voltage range ³	200 V ~ 1,000 V				
Full-load MPPT voltage range	370 V ~ 800 V	410 V ~ 800 V	440 V ~ 800 V	480 V ~ 800 V	530 V ~ 800 V
Rated input voltage	600 V				
Max. number of inputs	4				
Number of MPP trackers	2				
	Output				
Rated output power	12,000 W	15,000 W	17,000 W	20,000 W	25,000 W
Max. apparent power	13,200 VA	16,500 VA	18,700 VA	22,000 VA	27,500 VA
Max. active power (cosφ = 1)	13,200 W	16,500 W	18,700 W	22,000 W	27,500 W
Rated output voltage	220 Vac / 380 Vac, 230 Vac / 400 Vac, 240 Vac / 415 Vac; 3 W / N + PE				
Rated output current	18.2 A / 380 Vac	22.8 A / 380 Vac	25.8 A / 380 Vac	30.4 A / 380 Vac	38.0 A / 380 Vac
	17.3 A / 400 Vac	21.7 A / 400 Vac	24.5 A / 400 Vac	28.9 A / 400 Vac	36.1 A / 400 Vac
	16.7 A / 415 Vac	20.9 A / 415 Vac	23.7 A / 415 Vac	27.8 A / 415 Vac	34.8 A / 415 Vac
	20.2 A / 380 Vac	25.2 A / 380 Vac	28.6 A / 380 Vac	33.6 A / 380 Vac	42.0 A / 380 Vac
Max. output current	19.1 A / 400 Vac	23.9 A / 400 Vac	27.1 A / 400 Vac	31.9 A / 400 Vac	39.9 A / 400 Vac
	18.5 A / 415 Vac	23.1 A / 415 Vac	26.1 A / 415 Vac	30.8 A / 415 Vac	38.5 A / 415 Vac
Rated AC grid frequency	50 Hz / 60 Hz				

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Data Sheet – DC Shunts



High Craftsmanship AND High Standards



Max 1500V
Max 50A



Arc Fault protection
(Optional)



PID recovery
(Optional)



Flame retardant
UL94-V0



Easy Installation



Physical isolation

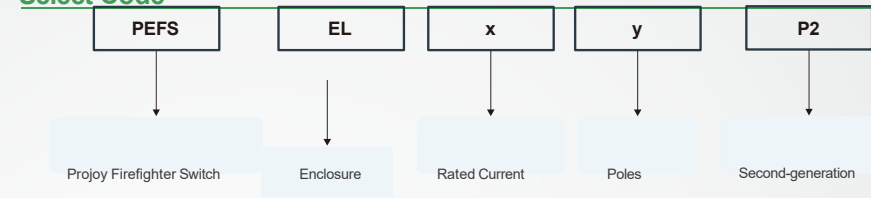


Outdoor installation
IP65



Over temperature
protection > 70°C

Select Code



Models: PEFS-ELx-y. Rated current: x=16/25/32/40/55/40H/50H, y= 12/16/20

When the current is greater than
40A, please select cable
glands.

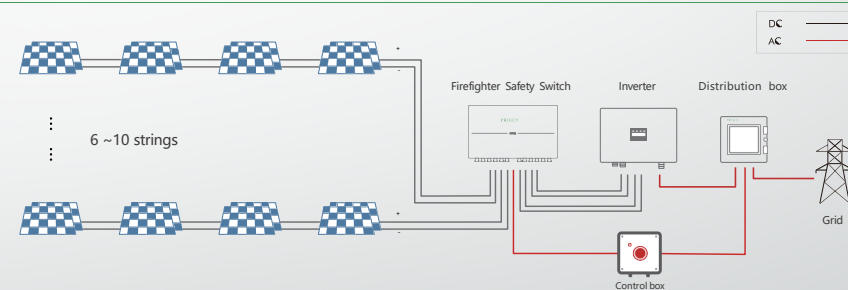


Unit with cable glands, M12



Unit with
QC4connectors (Other brand
connectors Optional)

Diagram

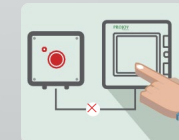


Tripping ways

By temperature



By AC Power cut-off



By Manual



Technical data

Technical Parameter	
Main Parameters	PEFS-ELx-y-P2
System voltage (Vdc)	300~1500
Max current (A)	50
Number of strings	6/8/10
Poles	12/16/20
Operating voltage	100Vac - 270Vac
Nominal voltage	230Vac
Nominal current	60mA
Operating temperature	-40°C - +70°C
Automatically switch off by temperature	+70°C
Storage temperature	-40°C - +85°C
Ingress protection level	IP65
Protection level	Class II
Certification	CE
Regulations compliance	EN 60947-1&3
Mechanical life	10000
Electrical life	>1500
PID recovery function	optional
Arc fault protection	optional

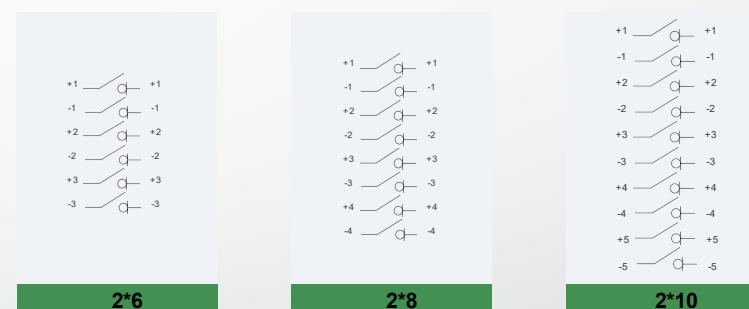
PID Recovery Module Spec (optional)

AC Input	Static Power	<0.5W
	Operating Power	3.75W
	Max. Power	8.75W
DC Output	Rated Output Voltage To Ground	600V
	Rated Output Current	3.3mA
	Max. Short Circuit Current	6.7mA
PV Modules And Inverter Requirements	Max. System Volatage	1500V
	Module Type Required	P Crystalline Silicon Type
	Minimum Insulating Impedance	200kΩ
Other Info	Operating Temperature Range	-20°C ~ +60°C
	Operating Relative Humidity	0% ~ 98%
	Max. Altitude Without Derating	4000m

Technical data

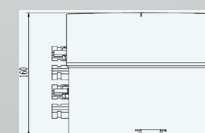
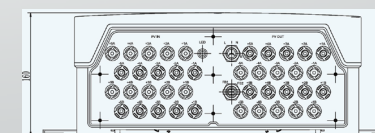
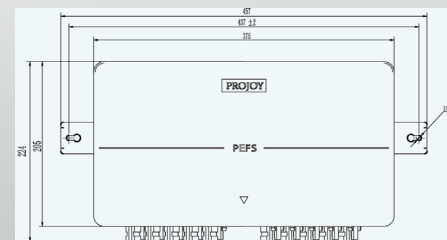
Data of PEFS refer to built-in DC isolators. Data according to IEC60947-3(ed.3.2):2015. Utilization category DC-PV1.						Poles	No. of Strings	Part Number
300V	600V	800V	1000V	1200V	1500V			
16	16	16	9	6	3	12/16/20	6/8/10	PEFS-EL16-12/16/20-P2
25	25	22	11	8	4	12/16/20	6/8/10	PEFS-EL25-12/16/20-P2
32	32	26	13	10	5	12/16/20	6/8/10	PEFS-EL32-12/16/20-P2
40	40	30	20	15	13	12/16/20	6/8/10	PEFS-EL40-12/16/20-P2
55	55	45	33	33	18	12/16/20	6/8/10	PEFS-EL55-12/16/20-P2
40	40	40	40	30	20	12/16/20	6/8/10	PEFS-EL40H-12/16/20-P2
50	50	50	50	40	30	12/16/20	6/8/10	PEFS-EL50H-12/16/20-P2

Contact Configuration



Dimensions

Unit: mm



a. Site Assessment

Conduct a thorough on-site assessment to evaluate the suitability of the campus for PV panel installation. This includes a review of the viability of the electrical infrastructure on site (e.g. boards, requirement for G10s etc.), available roof space, shading analysis, how the solar panels would be mounted to the existing roof, and any other factors influencing the feasibility of the project.

Please note due to the proximity of the adjacent prison drones cannot be used on the campus.

The site survey was conducted to assess all feasible rooftops & areas for solar PV. These were identified during the survey along with a carport structure as indicated in the Sim report. A potential ground mount has been discussed & is not part of this report.

The buildings were identified, and the roofs were selected. These included mounting the panels via ballast on the flat roofs and a railed system on the pitched roofs. The identified non-functioning thermal panels are replaced with solar PV. The main G10 panel will be connected at the ESB incomer and subsequent G10 disconnection panels at each PV point. This includes long cable runs to tie in the system.

The proposal brings the closest estimated costs to a turnkey solution. However, due to complexity of roofs & access, locations of electrical boards, the final quote is subject to final verifications of all tie in points & available ducts.

An alternative option to investigate a ground mount solution would meet greater energy demands of the site & result in a much faster payback.

b. Energy Consumption Analysis

Review historical energy consumption data of the hospital to determine the facility's energy needs. Calculate the solar potential to meet a significant portion of the facility's electricity demand.

Please see the QH data Analysis on pages 4&5 . This identifies the energy demands and the Solar's ability to cover 16% of that energy requirement.

c. Financial Analysis

Provide a detailed financial assessment of the project, including cost estimates for the installation of PV panels including any potential electrical infrastructure upgrade requirements, projected energy savings, return on investment (ROI), and payback period. Do not consider available government incentives or grants as part of the financial analysis.

Please see the revised financial assessment on page 3 . All associated grants and incentives have been excluded.

e. Technical Specifications

Provide technical specifications for the proposed PV system, including the type and capacity of panels, mounting system, inverters, and any other necessary components.

Please see datasheets and specifications of all equipment used in this proposal from pages 14 -19.

f. Risk Assessment

Identify potential risks associated with the project, including but not limited to technical, financial, and environmental risks. We are particularly interested in potential fire issues e.g. combustible materials on the roof, potential fire cert implications.

Propose mitigation strategies for each identified risk.

The major fire risk within any solar project is located on the surface of where they are placed. As standard, fire safety equipment such as the use of Fireman DC shunts are included in this proposal .

In an event of any fire alarm/fault, live DC cables will be disconnected at the fireman shunt entry and will not enter the building. Any AC connection interruption will also disconnect any DC past the fireman shunt..

To meet the expected financial payback, O&M of the solar panels will be required on a yearly or bi-yearly basis. Several factors can degrade the overall performance of the system. Appropriate O&M is recommended.

Solar panels can cause habitat loss, resource depletion, and pollution from manufacturing. To mitigate these impacts, companies can adopt recycling programs for panels and source materials sustainably. For example, Pvcycle.co.uk recycling program recovers up to 90% of materials from old panels, reducing waste and conserving resources .

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