

PVsyst - Simulation report

Grid-Connected System

Project: Recurso solar en el puerto de Palma de Mallorca

Variant: Estructura seguimiento a 2 ejes

No 3D scene defined, no shadings

System power: 29.00 MWp

Coll d'en Rabassa - Spain

Author

Universidad Europea (Spain)



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PVsyst V8.0.17

VC1, Simulation date:
03/04/26 19:33
with V8.0.17

Universidad Europea (Spain)

Project summary

Geographical Site

Coll d'en Rabassa

España

Situation

Latitude 39.56 °(N)

Longitude 2.69 °(E)

Altitude 11 m

Time zone UTC+1

Project settings

Albedo 0.20

Weather data

Coll d'en Rabassa

Meteonorm 8.2 (2001-2020) - Sintético

System summary

Grid-Connected System

Simulation for year no 10

Orientation #1

Tracking plane, two axis

Tilt min / max. -10 / 80 °

Azimet min / max. -/+ 150 °

Diffuse shading Automatic

Tracking algorithm

Astronomic calculation

No 3D scene defined, no shadings

Near Shadings

no Shadings

User's needs

Unlimited load (grid)

System information

PV Array

Nb. of modules 46775 units

Pnom total 29.00 MWp

Inverters

Nb. of units 17 units

Total power 24446 kWac

Pnom ratio 1.19

Results summary

Produced Energy 64799 MWh/year Specific production 2234 kWh/kWp/year Perf. Ratio PR 82.49 %

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General parameters

Grid-Connected System

No 3D scene defined, no shadings

Orientation #1

Tracking plane, two axis

Tilt min / max. -10 / 80 °
Azimut min / max. -/+ 150 °
Diffuse shading Automatic

Tracking algorithm

Astronomic calculation

Horizon

Free Horizon

Near Shadings

no Shadings

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

User's needs

Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer Generic
Model AIKO-A620-MAH72Mw
(Original PVsyst database)
Unit Nom. Power 620 Wp
Number of PV modules 46775 units
Nominal (STC) 29.00 MWp
Modules 1871 string x 25 In series

At operating cond. (50°C)

Pmpp 27.12 MWp
U mpp 1047 V
I mpp 25894 A

Total PV power

Nominal (STC) 29001 kWp
Total 46775 modules
Module area 123219 m²
Cell area 111555 m²

Inverter

Manufacturer Generic
Model Ingecon Sun 1600TL U B615 IP54 H3281
(Original PVsyst database)
Unit Nom. Power 1438 kWac
Number of inverters 17 units
Total power 24446 kWac
Operating voltage 873-1300 V
Max. power (=>30°C) 1598 kWac
Pnom ratio (DC:AC) 1.19

Total inverter power

Total power 24446 kWac
Max. power 27166 kWac
Number of inverters 17 units
Pnom ratio 1.19

Array losses

Array Soiling Losses

Loss Fraction 1.0 %

Thermal Loss factor

Module temperature according to irradiance
Uc (const) 20.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res. 0.44 mΩ
Loss Fraction 1.00 % at STC

Module Quality Loss

Loss Fraction -0.75 %

Module mismatch losses

Loss Fraction 2.00 % at MPP

Strings Mismatch loss

Loss Fraction 0.15 %

Module average degradation

Year no 10
Loss factor 0.35 %/year
Imp / Vmp contributions 80% / 20%

Mismatch due to degradation

Imp RMS dispersion 0.4 %/year
Vmp RMS dispersion 0.4 %/year

IAM loss factor

Incidence effect (IAM): Fresnel smooth glass, n = 1.526

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.402	0.000



System losses

Unavailability of the system

Time fraction	1.5 %
	5.5 days,
	3 periods



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Main results

System Production

Produced Energy

64799 MWh/year

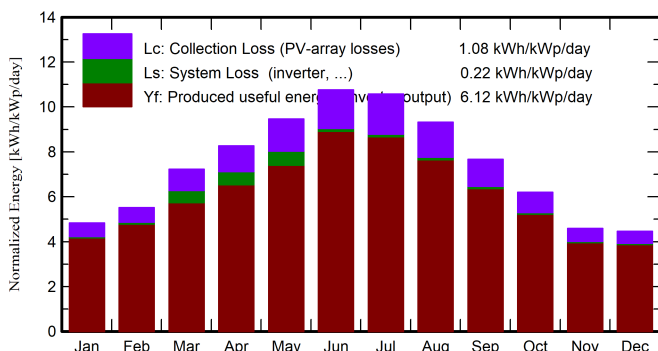
Specific production

2234 kWh/kWp/year

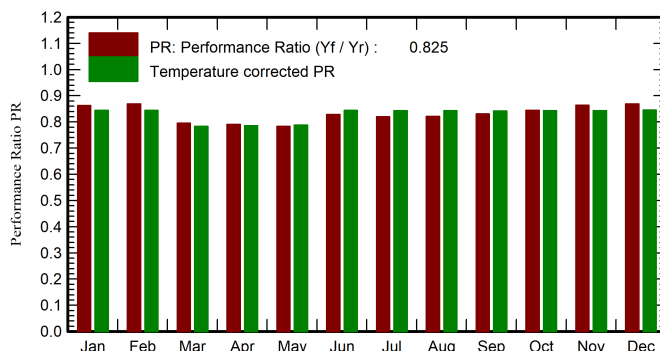
Perf. Ratio PR

82.49 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray MWh	E_Grid MWh	PR ratio
January	69.5	25.47	8.51	150.0	147.6	3814	3753	0.863
February	84.9	37.78	9.04	154.6	151.9	3958	3896	0.869
March	138.7	56.47	12.25	224.1	220.1	5658	5171	0.796
April	169.5	68.90	15.27	248.2	243.7	6200	5689	0.790
May	209.4	75.46	19.26	293.4	288.3	7233	6661	0.783
June	228.3	74.57	23.75	323.0	317.9	7874	7760	0.828
July	229.2	74.29	26.97	327.9	322.7	7914	7800	0.820
August	201.2	72.42	26.65	289.1	284.3	6988	6887	0.821
September	146.9	54.92	22.26	230.2	226.2	5628	5544	0.831
October	111.2	47.11	18.69	192.1	188.7	4773	4701	0.844
November	71.3	35.74	13.23	137.7	135.2	3503	3449	0.864
December	61.5	27.14	9.85	138.4	136.2	3544	3488	0.869
Year	1721.6	650.25	17.20	2708.7	2662.9	67085	64799	0.825

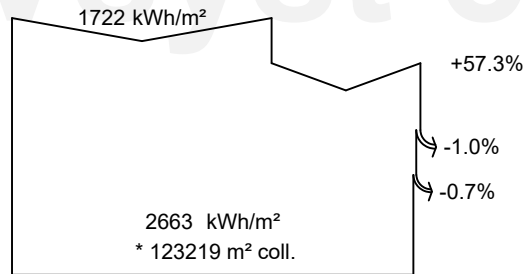
Legends

GlobHor Global horizontal irradiation
DiffHor Horizontal diffuse irradiation
T_Amb Ambient Temperature
GlobInc Global incident in coll. plane
GlobEff Effective Global, corr. for IAM and shadings

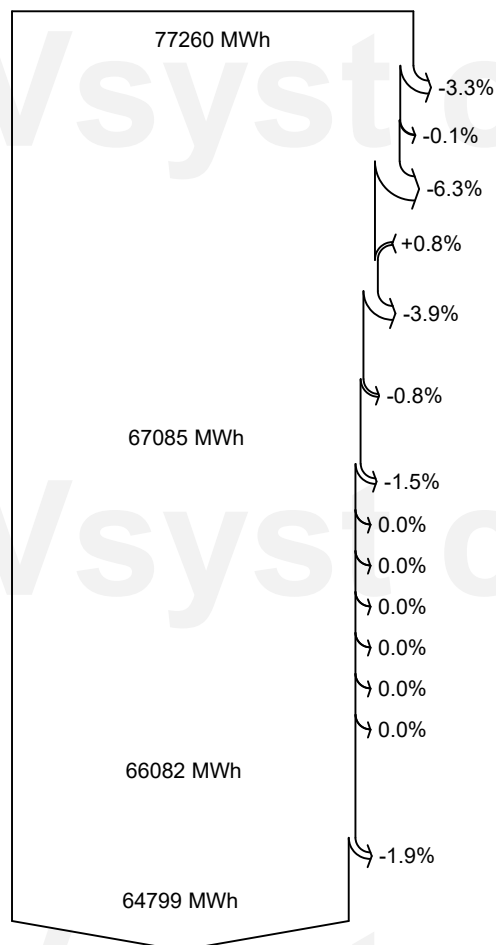
EArray Effective energy at the output of the array
E_Grid Energy injected into grid
PR Performance Ratio



Loss diagram



efficiency at STC = 23.55%



Global horizontal irradiation

Global incident in coll. plane

Soiling loss factor

IAM factor on global

Effective irradiation on collectors

PV conversion

Array nominal energy (at STC effic.)

Module Degradation Loss (for year #10)

PV loss due to irradiance level

PV loss due to temperature

Module quality loss

Mismatch loss, modules and strings
(including 1.8% for degradation dispersion)

Ohmic wiring loss

Array virtual energy at MPP

Inverter Loss during operation (efficiency)

Inverter Loss over nominal inv. power

Inverter Loss due to max. input current

Inverter Loss over nominal inv. voltage

Inverter Loss due to power threshold

Inverter Loss due to voltage threshold

Night consumption

Available Energy at Inverter Output

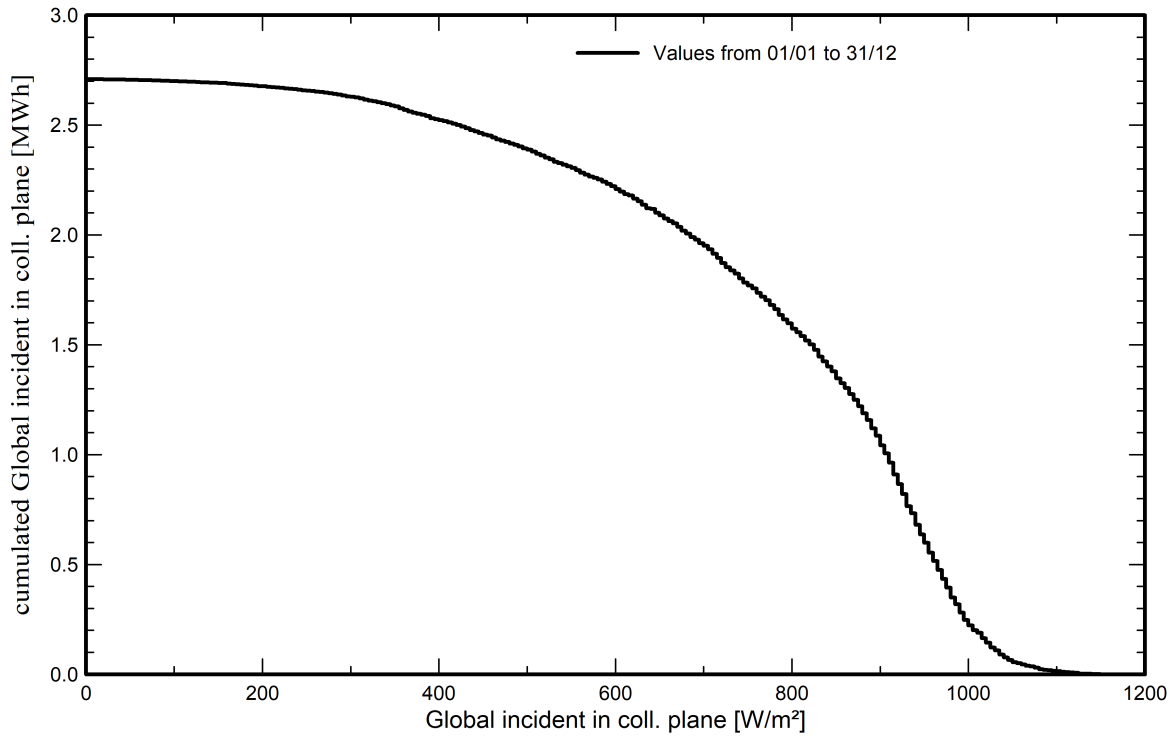
System unavailability

Energy injected into grid

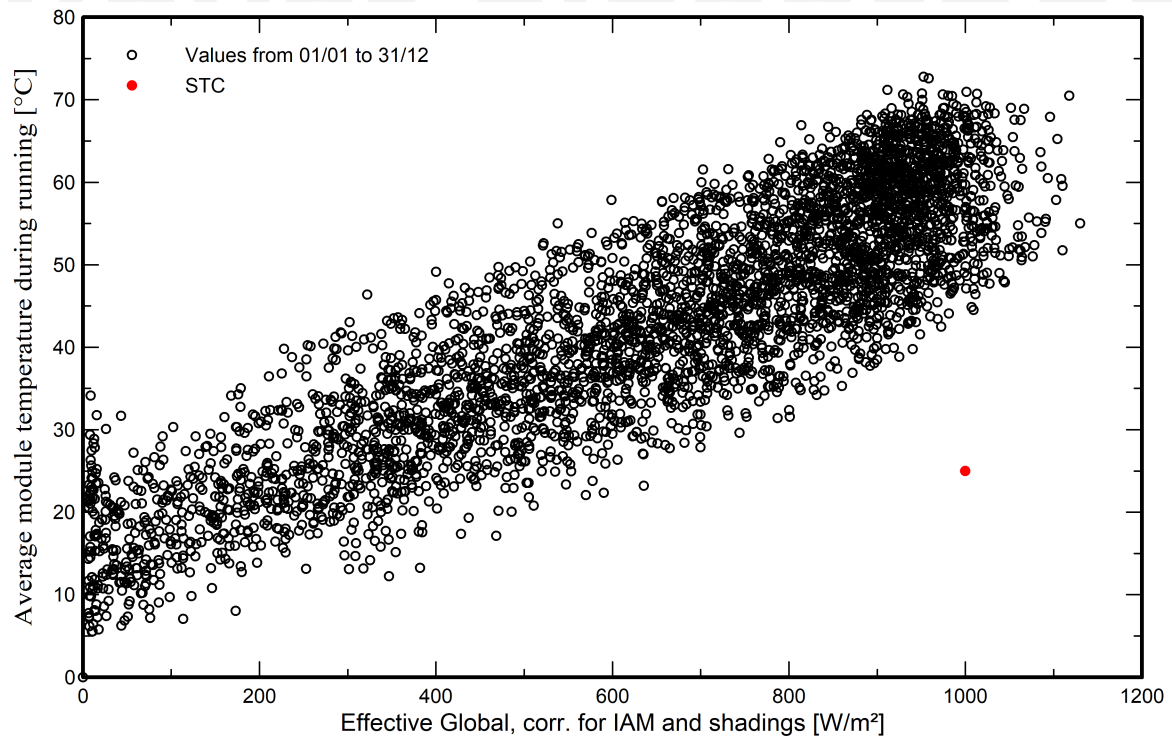


Predef. graphs

Incident Irradiation cumulative distribution



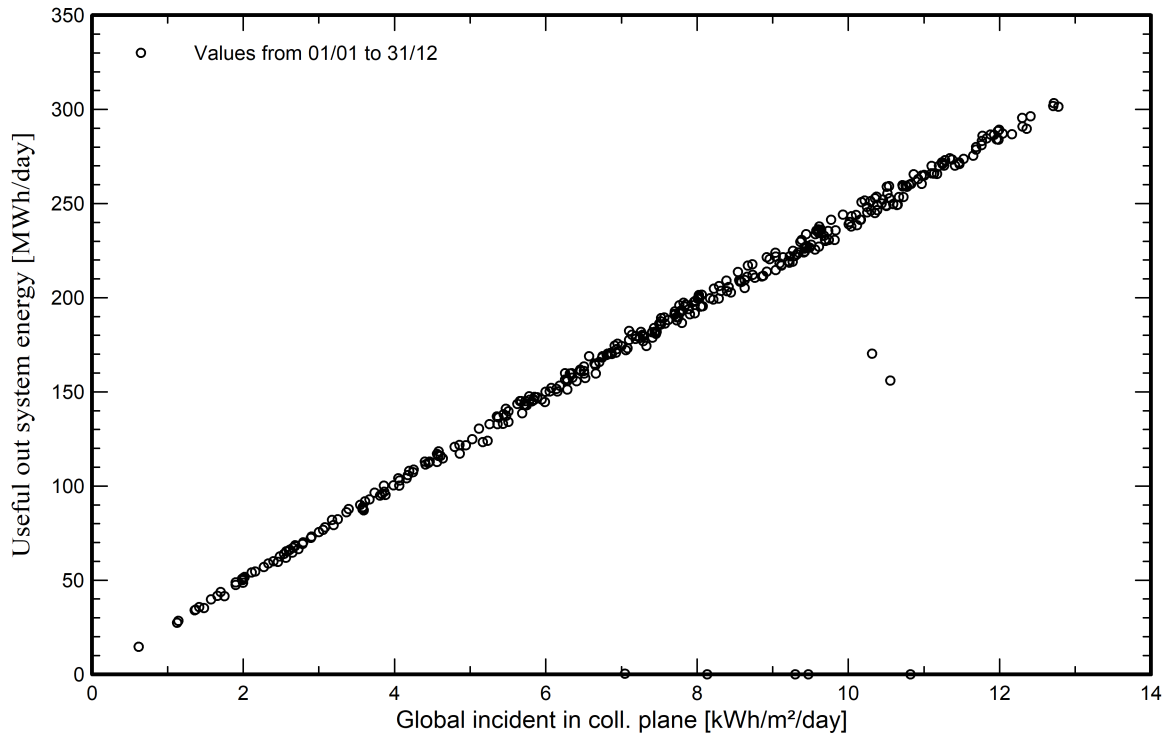
Array Temperature vs. Effective Irradiance



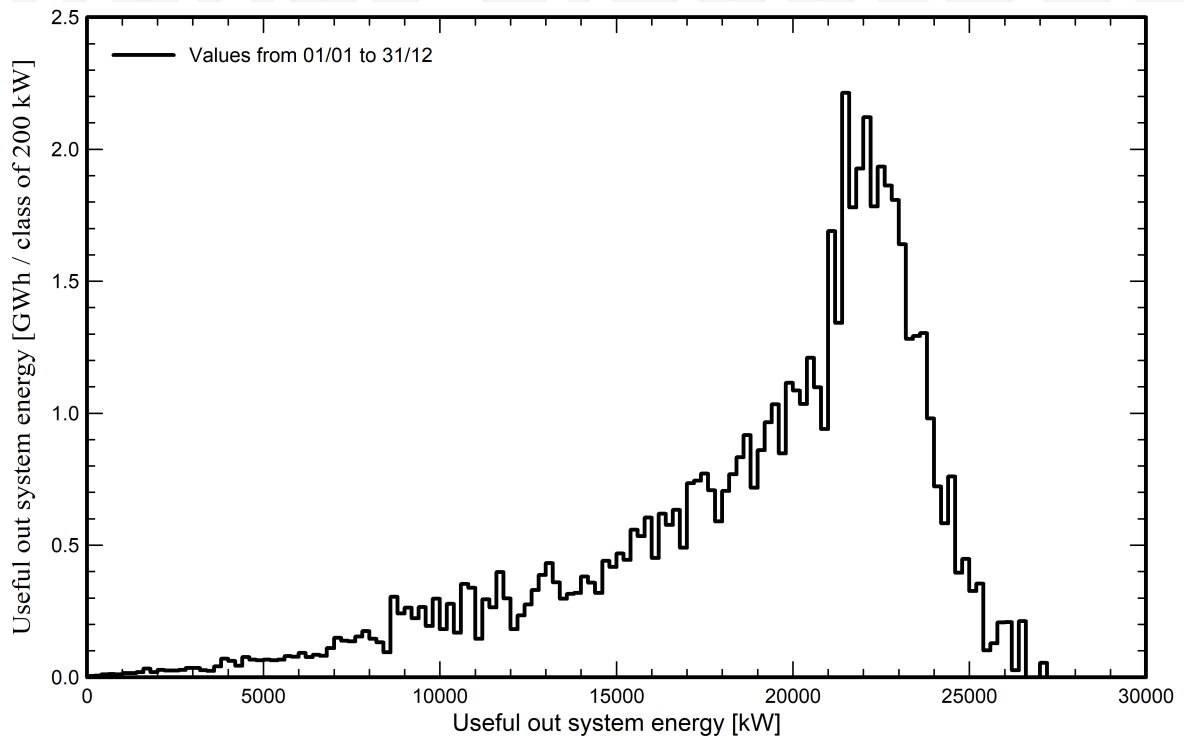


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution

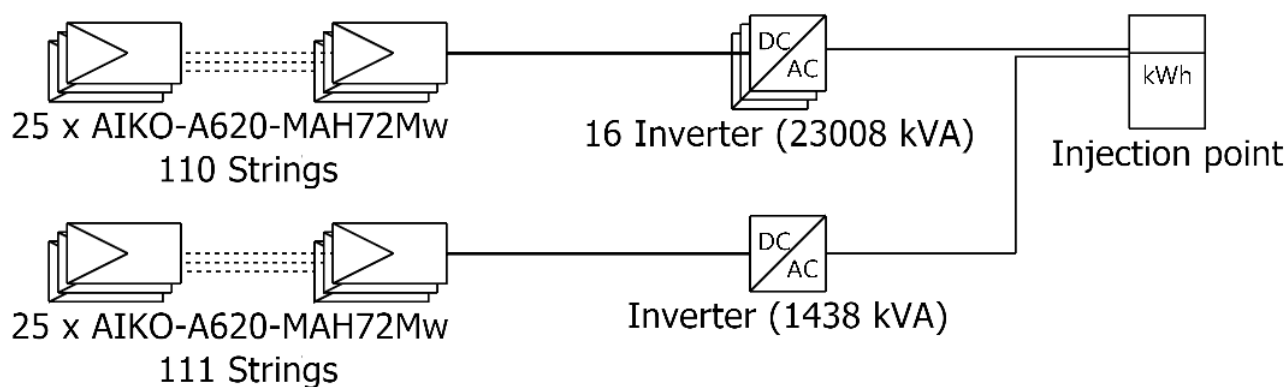




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Single-line diagram



PV module	AIKO-A620-MAH72Mw
Inverter	Ingecon Sun 1600TL U B615 IP54 H3281
String	25 x AIKO-A620-MAH72Mw

Recurso solar en el puerto de Pa
lma de Mallorca

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03/04/26



CO₂ Emission Balance

Total: 480347.3 tCO₂

Generated emissions

Total: 3743.37 tCO₂

Source: Detailed calculation from table below

Replaced Emissions

Total: 557923.2 tCO₂

System production: 64799.45 MWh/yr

Grid Lifecycle Emissions: 287 gCO₂/kWh

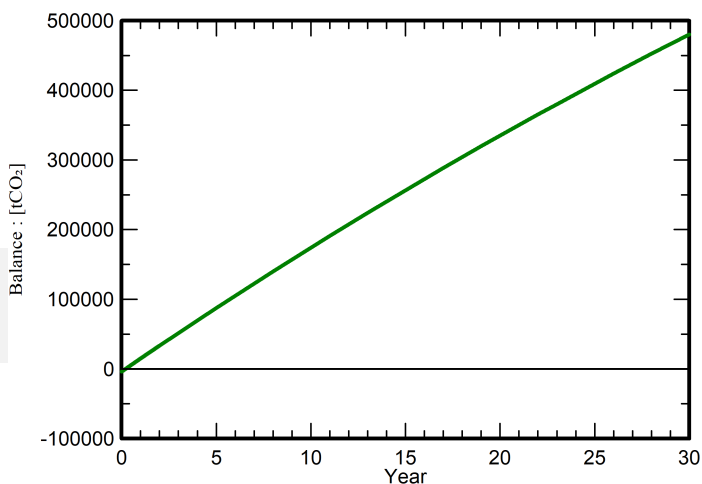
Source: IEA List

Country: Spain

Lifetime: 30 years

Annual degradation: 1.0 %

Saved CO₂ Emission vs. Time



System Lifecycle Emissions Details

Item	LCE	Quantity	Subtotal
			[kgCO ₂]
Modules	1657 kgCO ₂ /kWp	2066 kWp	3424070
Supports	1.91 kgCO ₂ /kg	166600 kg	318921
Inverters	190 kgCO ₂ /	2.00	379