PVsyst V8.0.15

PVsyst - Simulation report

Grid-Connected System

Project: Dubai, AI Compute + Solar + BESS Flagship

Variant: New simulation variant

Sheds on ground

System power: 795 kWp

Location - United Arab Emirates

Author

JLMEnergy Ltd (United Kingdom)

Project summary

Geographical Site
Bab Al Shams
United Arab Emirates

Situation

Latitude	24.77 °(N)
Longitude	55.23 °(E)
Altitude	77m
Time zone	UTC+4

Project settings

Albedo	0.20

Weather data
Bab Al Shams
Meteonorm 8.2 (1994-2007), Sat=36% - Synthetic

System summary

Grid-Connected System

Sheds on ground

Orientation #1
Fixed plane
Tilt/Azimuth 25 / 0°

Near Shadings
Linear shadings : Fast (table)

User's needs
Ext. defined as file
C:\Users\user\Documents\EcoYield\Pilot Project\HH C

System information

PV Array

Nb. of modules	1500 units
Pnom total	795 kWp

Inverters

Nb. of units	3 units
Total power	1050 kWac
Pnom ratio	0.76

Battery pack
Storage strategy: Self-consumption

Nb. of units	5units
Voltage	1210 V
Capacity	8670 Ah

Results summary

Produced Energy	1508.1 MWh/year	Specific production	1897 kWh/kWp/year	Perf. Ratio PR	80.94 %
Used Energy	3504.0 MWh/year			Solar Fraction SF	43.04 %

Table of contents

General parameters

Grid-Connected System

Sheds on ground

Orientation #1

Fixed plane
Tilt/Azimuth 25 / 0°

Sheds configuration
Nb. of sheds 8 units
Set of tables
Shading limit angle
Limit profile angle °

Sizes
Sheds spacing 8.68 m
Sensitive width 2.29 m
GCR Shading 26.3 %

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

Horizon

Free Horizon

Near Shadings

Linear shadings : Fast (table)

Storage

Kind
Charging strategy Self-consumption
When excess solar power is available

Discharging strategy
As soon as power is needed

User's needs

Ext. defined as file
C:\Users\user\Documents\EcoYield\Pilot Project\HH C

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year	
297600	268800	297600	288000	297600	288000	297600	297600	288000	297600	288000	297600	3504000	kWh

PV Array Characteristics

PV module

Manufacturer JA Solar
Model JAM72-S30-530-MR
(Original PVsyst database)
Unit Nom. Power 530Wp
Number of PV modules 1500units
Nominal (STC) 795kWp
Modules 75 string x 20In series
At operating cond. (50°C)
Pmpp U mpp I mpp 730 kWp
Total PV power 749V
974A

Nominal (STC) 795 kWp
Total 1500 modules
Module area 3875 m² 3577
Cell area m²

Inverter

Manufacturer Sungrow
Model SG350-HX
(Original PVsyst database)
Unit Nom. Power 350 kWac
Number of inverters 3 units
Total power 1050 kWac
Operating voltage 500-1450 V
Pnom ratio (DC:AC) 0.76
Power sharing within this inverter

Total inverter power

Total power 1050 kWac
Number of inverters 3 units
Pnom ratio 0.76

Battery Storage

Battery
Manufacturer Huawei
Model Luna2000 - 2.0 MWh - 2H0
Battery pack
Nb. of units 5in parallel
Discharging min. SOC 20.0%
Stored energy 8389.8kWh

Battery Pack Characteristics
Voltage 1210 V
Nominal Capacity 8670Ah (C10)
Temperature Fixed 20°C

PV Array Characteristics

Battery Storage

Battery input charger

Model	Generic
Max. charg. power	700.0 kWdc
Max./Euro effic.	97.0/95.0 %

Battery to Grid inverter

Model	Generic
Max. disch. power	420.0 kWac
Max./Euro effic.	97.0/95.0 %

Array losses

Thermal Loss factor

Module temperature according to irradiance

Uc (const)	20.0W/m²K
Uv (wind)	0.0W/m²K/m/s

DC wiring losses

Global array res.	13mΩ
Loss Fraction	1.50% at STC

ModuleQuality Loss

Loss Fraction	-0.75 %

Modulemismatch losses

Loss Fraction	2.00% at MPP

StringsMismatch loss

Loss Fraction	0.05 %

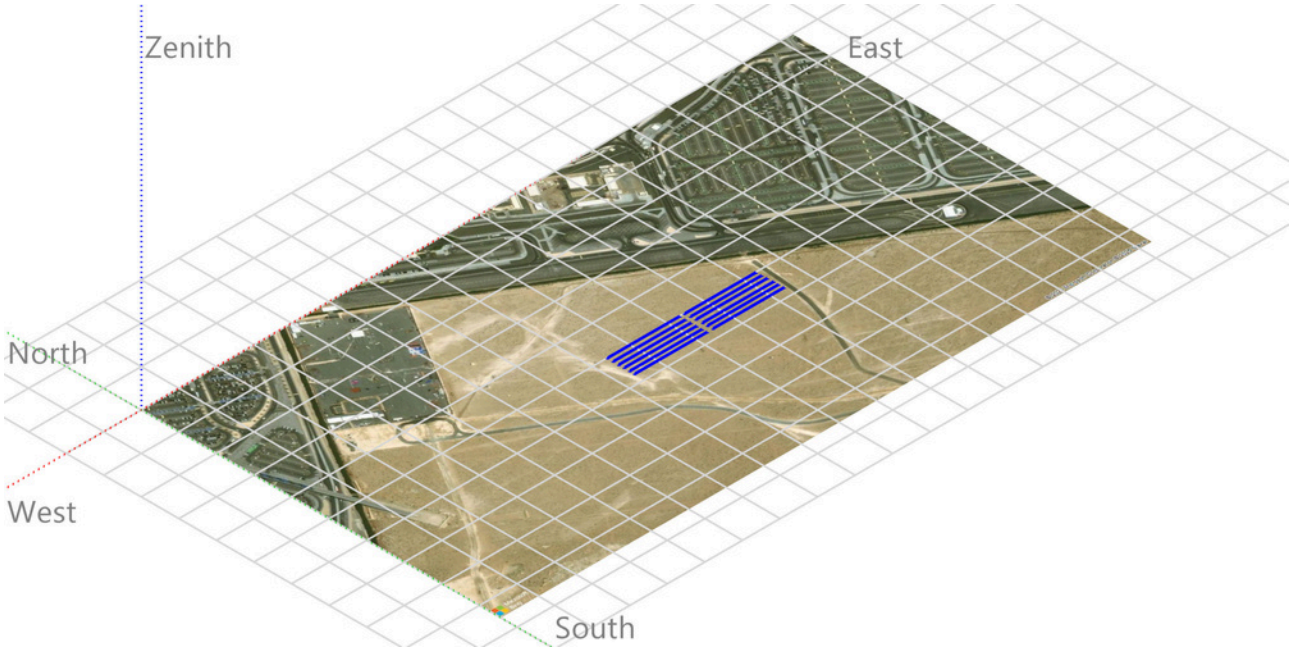
IAM loss factor

Incidence effect (IAM): User defined profile

0°	30°	50°	65°	70°	75°	80°	85°	90°
1.000	1.000	0.999	0.953	0.910	0.853	0.725	0.448	0.000

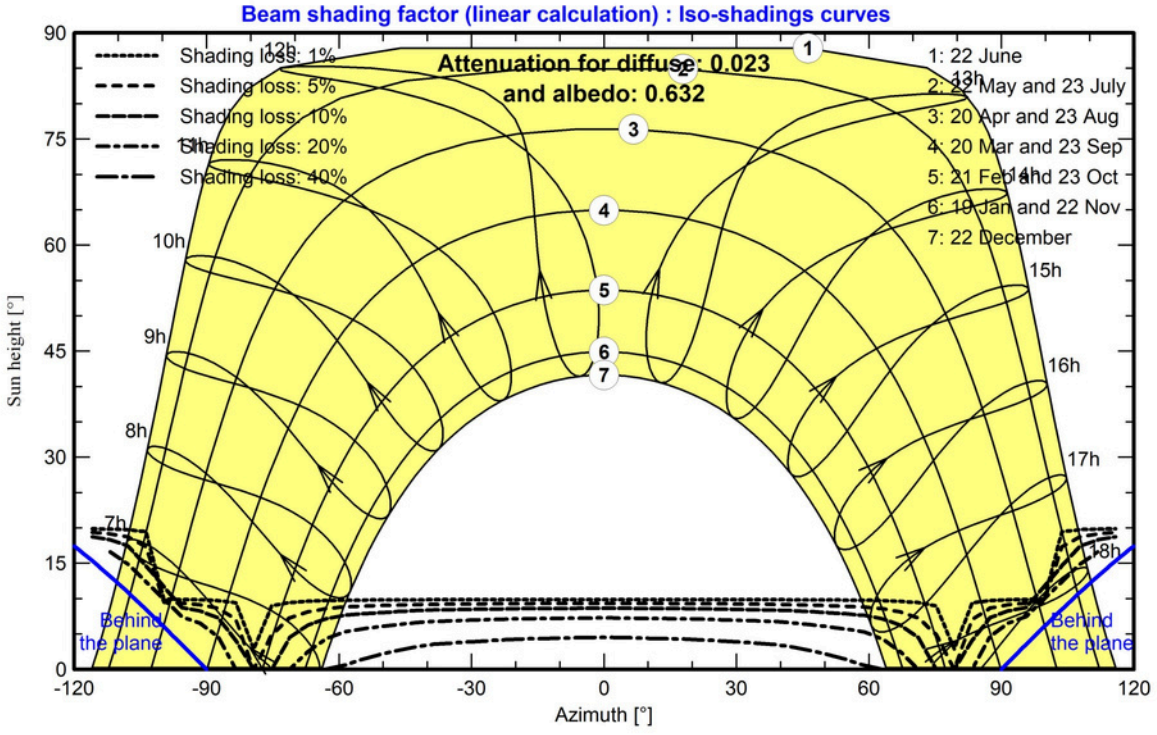
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1 - Fixed plane, Tilts/azimuths: 32.1°/ 0°



Main results

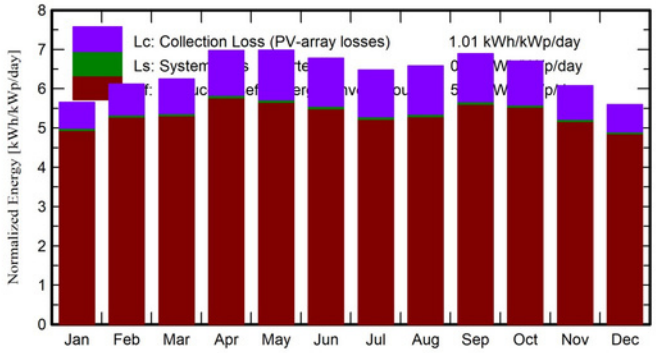
System Production

Produced Energy	1508.1 MWh/year	Specific production	1897 kWh/kWp/year
Used Energy	3504.0 MWh/year	Perf. Ratio PR	80.94 %
		Solar Fraction SF	43.04 %

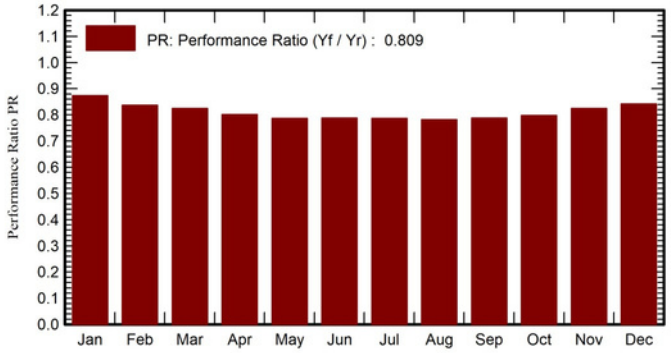
Battery ageing (State of Wear)

Cycles SOW	99.3	%
Static SOW	90.0	%
Battery lifetime	10.0 years	

Normalized productions (per installed kWp)



Performance Ratio PR



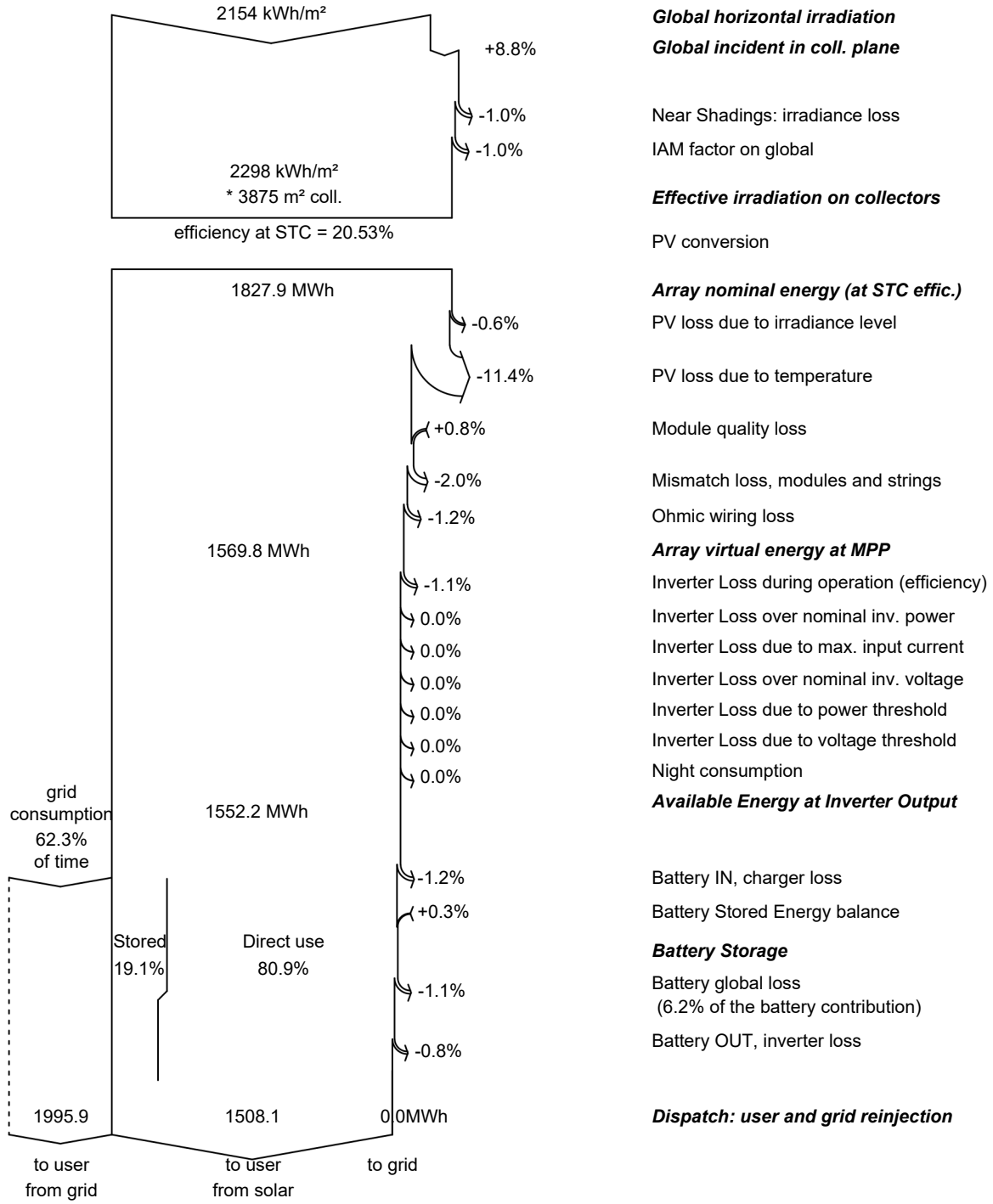
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_User MWh	E_Solar MWh	E_Grid MWh	EFrGrid MWh
January	129.4	40.7	18.46	175.1	172.8	123.3	297.6	121.7	0.00	175.9
February	138.5	50.7	20.14	171.2	168.2	119.0	268.8	113.9	0.00	154.9
March	174.9	76.5	23.89	193.7	189.8	132.5	297.6	127.1	0.00	170.5
April	206.0	77.2	28.29	209.0	204.8	139.4	288.0	133.2	0.00	154.8
May	230.9	84.3	33.17	216.3	211.1	141.2	297.6	135.3	0.00	162.3
June	224.0	100.5	34.36	203.3	198.2	132.6	288.0	127.4	0.00	160.6
July	217.4	102.9	36.63	200.8	195.9	130.4	297.6	125.6	0.00	172.0
August	207.8	103.4	36.40	204.0	199.4	132.2	297.6	126.9	0.00	170.7
September	191.6	66.4	33.25	206.8	202.9	135.4	288.0	129.6	0.00	158.4
October	172.7	50.4	30.28	207.7	204.6	138.0	297.6	131.8	0.00	165.8
November	136.6	39.9	25.01	182.2	179.4	124.7	288.0	119.5	0.00	168.5
December	124.1	38.3	20.75	173.5	170.8	121.1	297.6	116.2	0.00	181.4
Year	2153.9	831.2	28.43	2343.8	2297.9	1569.8	3504.0	1508.1	0.00	1995.9

Legends

GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_User	Energy supplied to the user
T_Amb	Ambient Temperature	E_Solar	Energy from the sun
GlobInc	Global incident in coll. plane	E_Grid	Energy injected into grid
GlobEff	Effective Global, corr. for IAM and shadings	EFrGrid	Energy from the grid

Loss diagram



Global horizontal irradiation

Global incident in coll. plane

Near Shadings: irradiance loss

IAM factor on global

Effective irradiation on collectors

PV conversion

Array nominal energy (at STC effic.)

PV loss due to irradiance level

PV loss due to temperature

Module quality loss

Mismatch loss, modules and strings

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

Battery IN, charger loss

Battery Stored Energy balance

Battery Storage

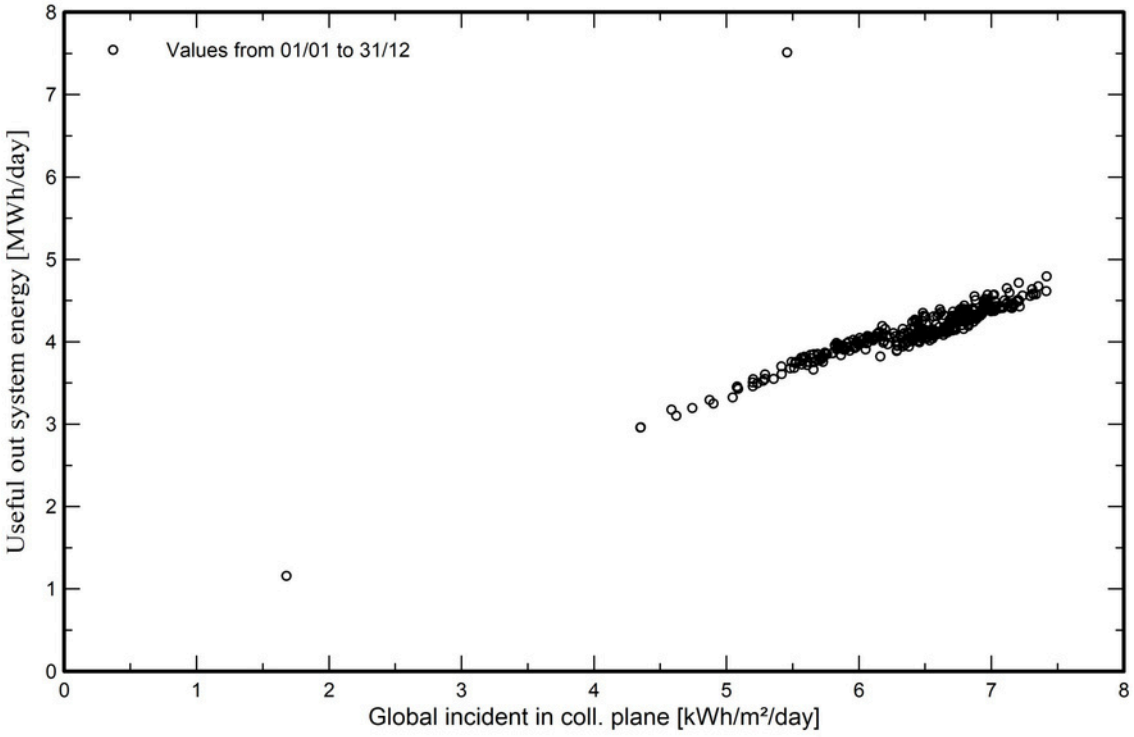
Battery global loss
(6.2% of the battery contribution)

Battery OUT, inverter loss

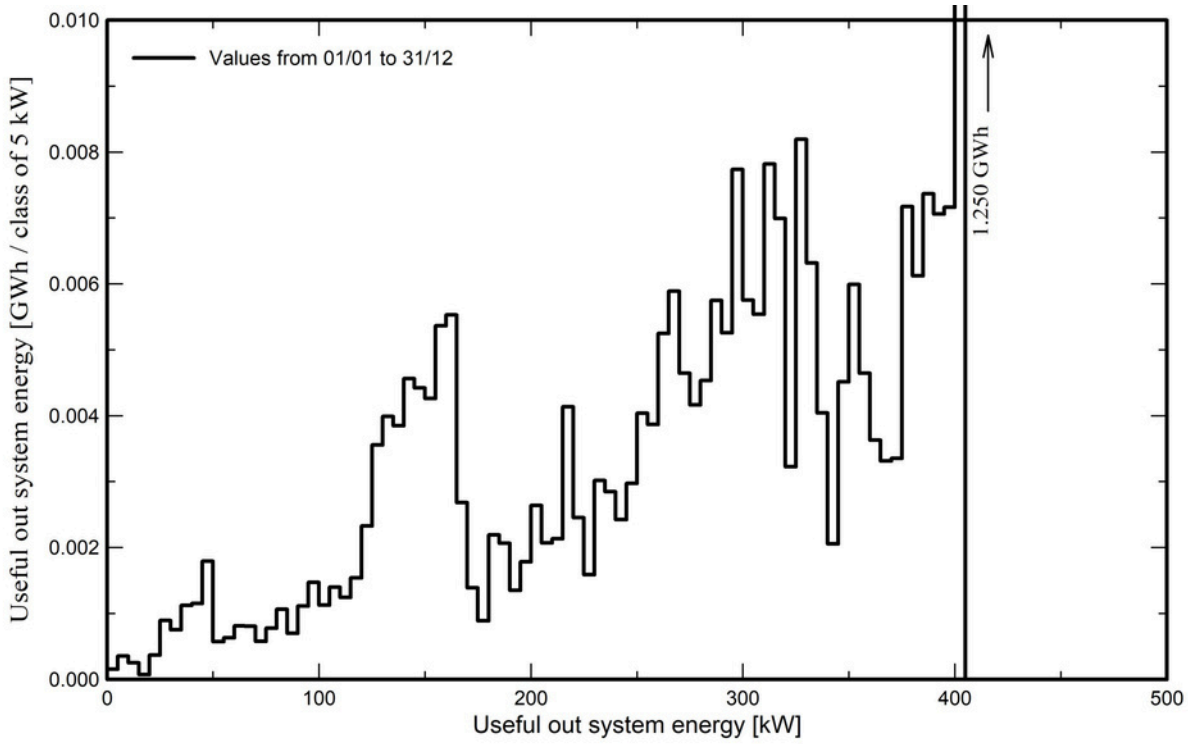
Dispatch: user and grid reinjection

Predef. graphs

Daily Input/Output diagram

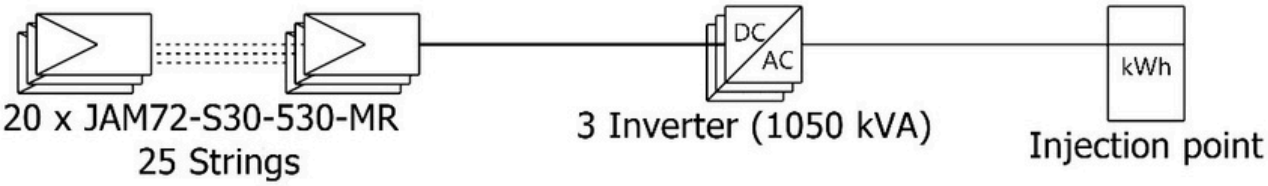


System Output Power Distribution



Single-line diagram

PVsyst V8.0.15
VC0, Simulationdate:
14/08/25 10:16
with V8.0.15



PV module	JAM72-S30-530-MR
Inverter	SG350-HX
String	20 x JAM72-S30-530-MR

EcoYield - Large Pilot Project (Dubai)	JLM Energy Ltd (United Kingd
VC0 : New simulation variant	14/08/25

Cost of the system

Installation costs

Item	Quantity units	Cost GBP	Total GBP
		Total Depreciable asset	0.00 0.00

Operating costs

Item	Total
	GBP/year
Total (OPEX)	0.00

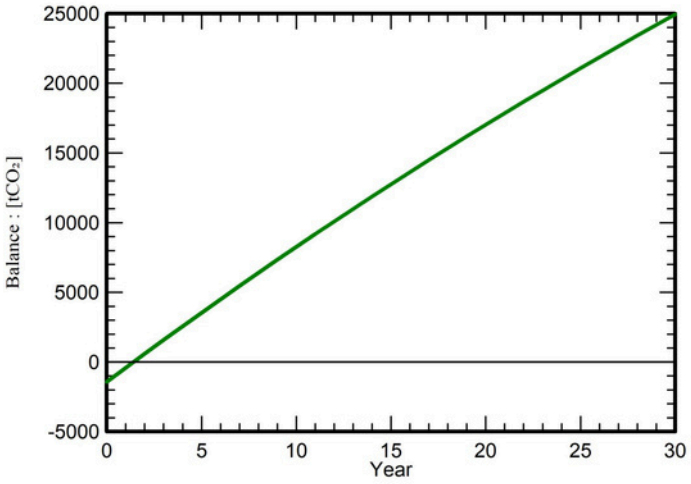
System summary

Total installation cost	0.00 GBP
Operating costs	0.00 GBP/year
Produced Energy	1508 MWh/year
Cost of produced energy (LCOE)	0.0000 GBP/kWh

CO_2Emission Balance

Total:	24955.2tCO_2
Generated emissions	
Total:	1428.24tCO_2
Source: Detailed calculation from table below	
Replaced Emissions	
Total:	30407.4tCO_2
System production:	1552.19MWh/yr
Grid Lifecycle Emissions:	653gCO_2/kWh
Source:	IEA List
Country:	United Arab Emirates
Lifetime:	30years
Annual degradation:	1.0%

Saved CO_2 Emission vs. Time



System Lifecycle Emissions Details

Item	LCE	Quantity	Subtotal
			[kgCO_2]
Modules	1713 kgCO2/kWp	795 kWp	1361612
Supports	4.36 kgCO2/kg	15000 kg	65333
Inverters	432 kgCO2/	3.00	1295