Version 7.3.1

PVsyst - Simulation report

Grid-Connected System

Project: โครงการติดตั้ง 250 kwp จ.สุราษฎร์ธานี

Variant: New simulation variant

No 3D scene defined, no shadings

System power: 264 kWp

Ban Kha Yu Kha - Thailand

Author

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VC0, Simulation date:
05/11/23 10:33
with v7.3.1

Project summary

Geographical Site
Ban Kha Yu Kha
Thailand

Situation

Latitude	6.41 °N
Longitude	101.78 °E
Altitude	7 m
Time zone	UTC+7

Project settings
Albedo 0.20

Meteo data
Ban Kha Yu Kha
Meteonorm 8.1 (1991-2009), Sat=22% - Synthetic

System summary

Grid-Connected System
Simulation for year no 12

No 3D scene defined, no shadings

PV Field Orientation
Fixed plane
Tilt/Azimuth 15 / 90 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information

PV Array		Inverters	
Nb. of modules	480 units	Nb. of units	5 units
Pnom total	264 kWp	Pnom total	250 kWac
		Pnom ratio	1.056

Results summary

Produced Energy	360847 kWh/year	Specific production	1367 kWh/kWp/year	Perf. Ratio PR	74.68 %

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General parameters

Grid-Connected System — **No 3D scene defined, no shadings**

PV Field Orientation

Orientation	Sheds configuration	Models used
Fixed plane		Transposition Perez
Tilt/Azimuth 15 / 90 °		Diffuse Perez, Meteonorm
		Circumsolar separate

Horizon
Free Horizon

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Longi Solar
Model	LR5-72HIBD-550M G2 Bifacial
(Original PVsyst database)	
Unit Nom. Power	550 Wp
Number of PV modules	480 units
Nominal (STC)	264 kWp
Modules	30 Strings x 16 In series
At operating cond. (50°C)	
Pmpp	242 kWp
U mpp	604 V
I mpp	400 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000-50KTL-ZHM3-380V
(Original PVsyst database)	
Unit Nom. Power	50.0 kWac
Number of inverters	5 units
Total power	250 kWac
Operating voltage	200-1000 V
Max. power (=>35°C)	55.0 kWac
Pnom ratio (DC:AC)	1.06
Power sharing within this inverter	

Total PV power

Nominal (STC)	264 kWp
Total	480 modules
Module area	1240 m²
Cell area	1151 m²

Total inverter power

Total power	250 kWac
Number of inverters	5 units
Pnom ratio	1.06

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. 5.5 mΩ
Loss Fraction 0.3 % at STC

LID - Light Induced Degradation
Loss Fraction 2.0 %

Module Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction 2.0 % at MPP

Strings Mismatch loss
Loss Fraction 0.1 %

Module average degradation
Year no 12
Loss factor 0.4 %/year
Mismatch due to degradation
Imp RMS dispersion 0.4 %/year
Vmp RMS dispersion 0.4 %/year

IAM loss factor
Incidence effect (IAM): User defined profile

0°	25°	45°	60°	65°	70°	75°	80°	90°
1.000	1.000	0.995	0.962	0.936	0.903	0.851	0.754	0.000

Array losses

Spectral correction

FirstSolar model

Precipitable water estimated from relative humidity

Coefficient Set	C0	C1	C2	C3	C4	C5
Monocrystalline Si	0.85914	-0.02088	-0.0058853	0.12029	0.026814	-0.001781

System losses

Unavailability of the system

Time fraction 2.0 %
7.3 days,
3 periods

Auxiliaries loss

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage 380 Vac tri
Loss Fraction 0.07 % at STC

Inverter: SUN2000-50KTL-ZHM3-380V

Wire section (5 Inv.) Copper 5 x 3 x 50 mm²
Average wires length 5 m

AC losses in transformers

MV transfo

Medium voltage 20 kV

Transformer parameters

Nominal power at STC 259 kVA
Iron Loss (24/24 Connexion) 0.25 kVA
Iron loss fraction 0.10 % at STC
Copper loss 2.68 kVA
Copper loss fraction 1.03 % at STC
Coils equivalent resistance 3 x 5.77 mΩ

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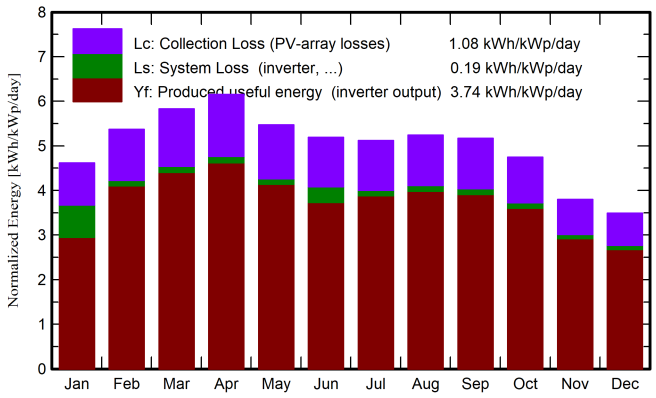
Main results

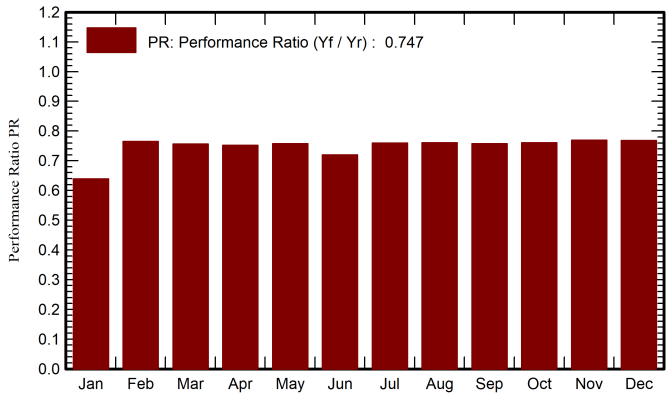
System Production

Produced Energy	360847 kWh/year	Specific production	1367 kWh/kWp/year
		Performance Ratio PR	74.68 %

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 kWh	E_Grid kWh	PR ratio
January	144.1	74.29	26.34	143.3	138.7	30087	24157	0.639
February	152.8	72.26	26.88	150.3	146.1	31294	30354	0.765
March	183.6	77.71	27.71	180.7	175.7	37208	36074	0.756
April	186.8	73.85	28.43	184.5	179.4	37794	36646	0.752
May	171.3	84.22	28.90	169.6	164.5	34945	33896	0.757
June	158.1	84.06	28.12	155.8	151.0	32360	29587	0.719
July	161.6	78.97	28.23	158.8	154.0	32813	31820	0.759
August	164.1	89.22	28.19	162.6	157.8	33663	32654	0.761
September	157.2	73.41	27.54	155.2	150.6	32005	31024	0.757
October	148.9	78.81	27.46	147.1	142.6	30485	29542	0.761
November	115.0	67.60	26.32	114.1	110.2	23909	23151	0.769
December	110.7	63.06	26.30	108.2	104.5	22684	21944	0.768
Year	1854.2	917.46	27.54	1830.3	1775.3	379247	360847	0.747

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

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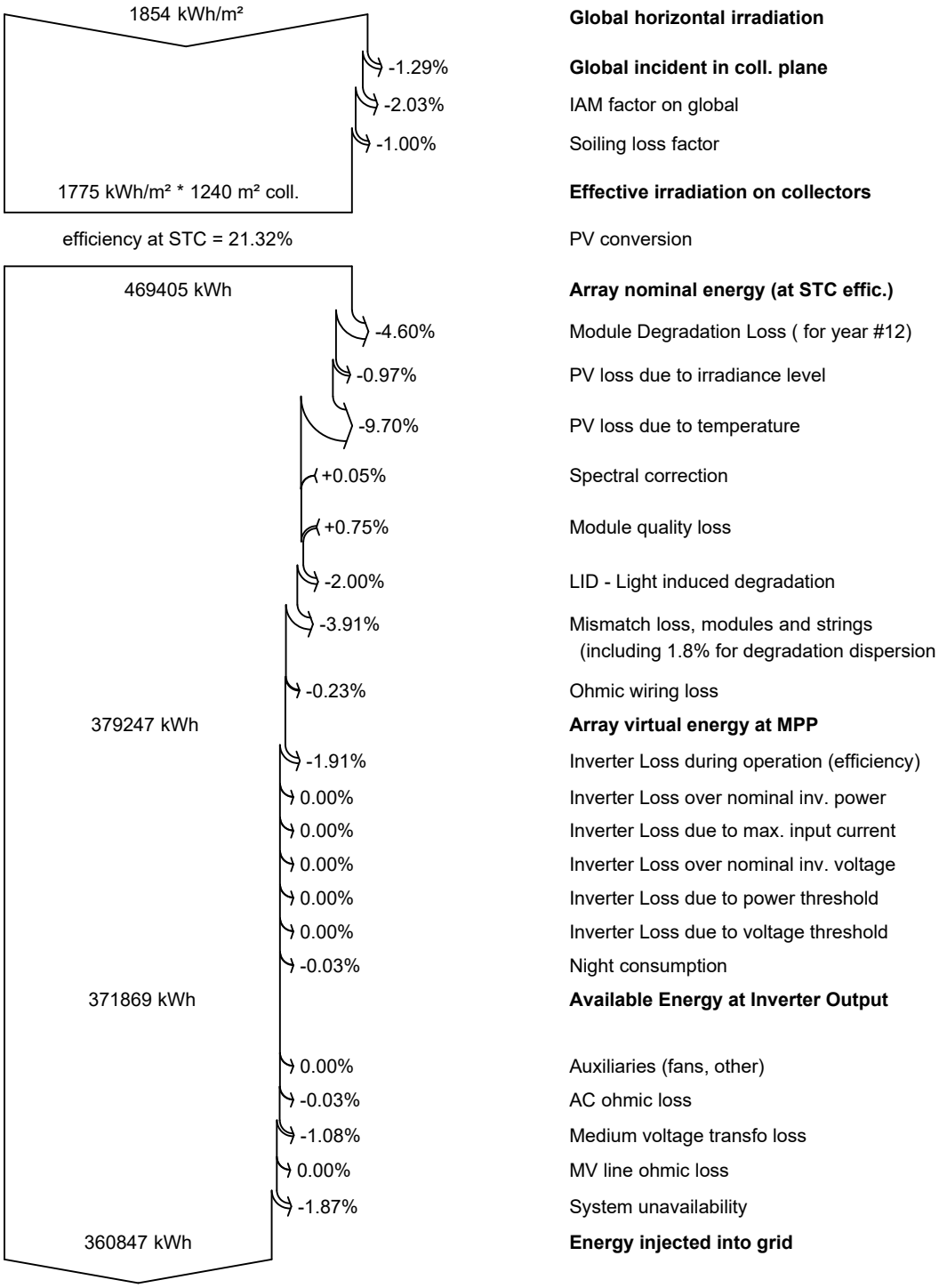
Loss diagram



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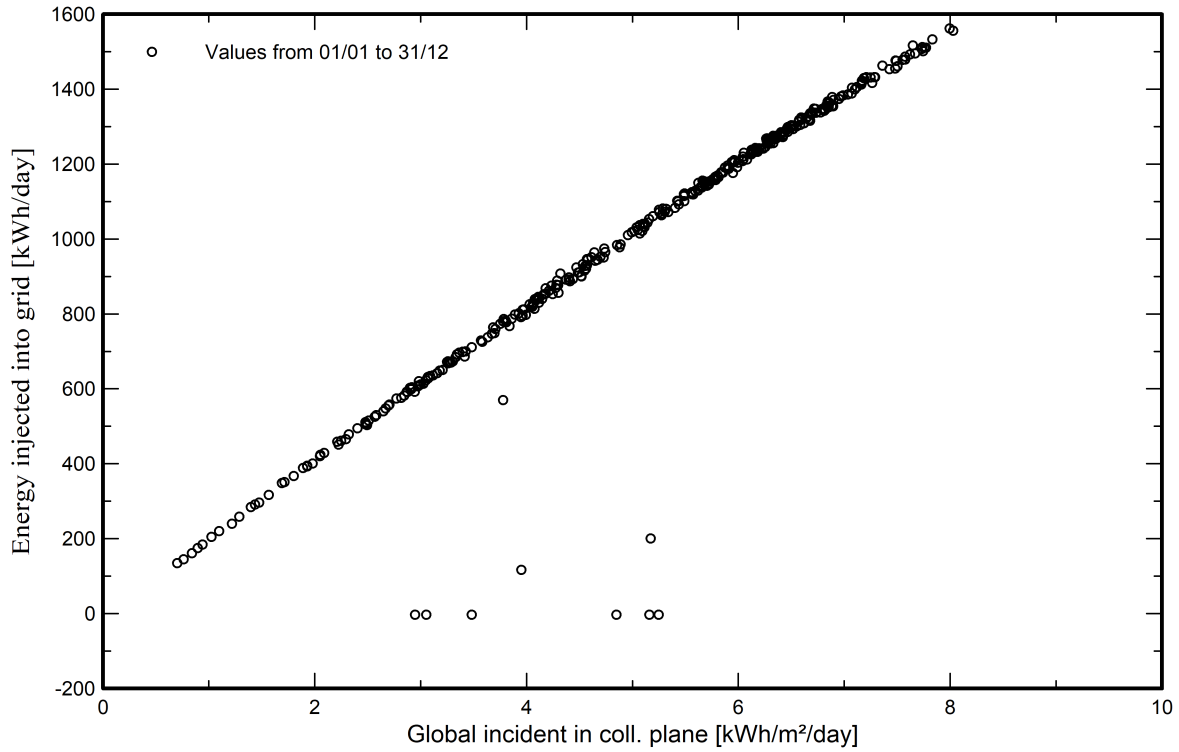
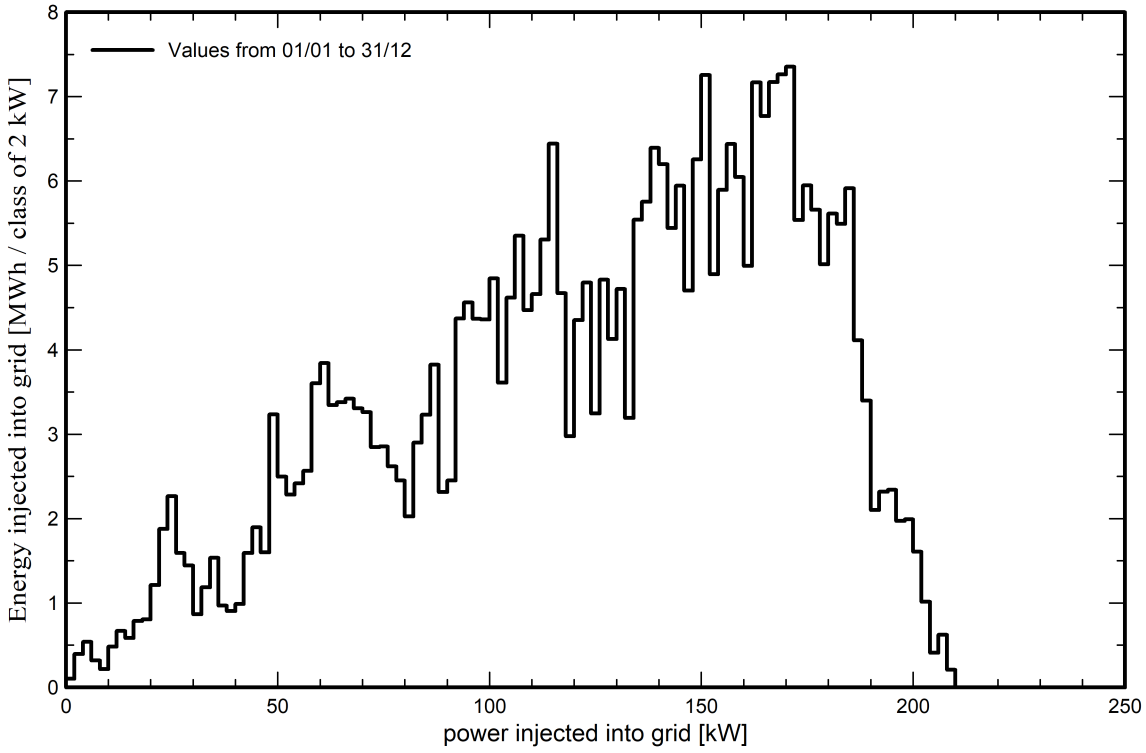
Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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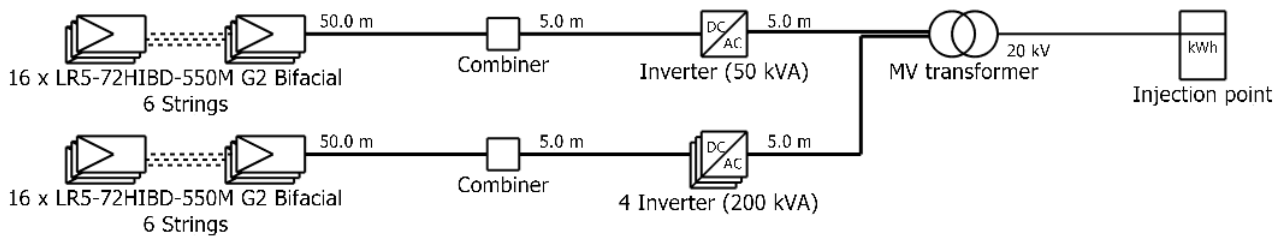

PV module	LR5-72HIBD-550M G2 Bifacial
Inverter	SUN2000-50KTL-ZHM3-380V
String	16 x LR5-72HIBD-550M G2 Bifacial

	250 kwp	
	VC0 : New simulation variant	05/11/23