Version 7.2.11

PVsyst - Simulation report

Stand alone system

Project: Centre d'Innovation à Gorgo

Variant: Nouvelle variante de simulation

Stand alone system with batteries

System power: 11.50 kWp

Gorgo - Burkina Faso

Author

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Project summary

Geographical Site
Gorgo
Burkina Faso

Situation

Latitude	12.07 °N
Longitude	-0.37 °W
Altitude	275 m
Time zone	UTC

Project settings

Albedo	0.20

Meteo data
Gorgo
Meteonorm 8.0 (1986-2005), Sat=100 % - Synthétique

System summary

Stand alone system

Stand alone system with batteries

PV Field Orientation

Fixed plane	
Tilt/Azimuth	15 / 0 °

User's needs

Daily household consumers	
Constant over the year	
Average	43 kWh/Day

System information

PV Array

Nb. of modules	20 units
Pnom total	11.50 kWp

Battery pack

Technology	Lithium-ion, LFP
Nb. of units	1 unit
Voltage	48 V
Capacity	350 Ah

Results summary

Available Energy	19525 kWh/year	Specific production	1698 kWh/kWp/year	Perf. Ratio PR	62.86 %
Used Energy	15155 kWh/year			Solar Fraction SF	96.03 %

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General parameters

Stand alone system — **Stand alone system with batteries**

PV Field Orientation

Orientation		Sheds configuration		Models used	
Fixed plane		No 3D scene defined		Transposition	Perez
Tilt/Azimuth	15 / 0 °			Diffuse	Perez, Meteonorm
				Circumsolar	separate

User's needs

Daily household consumers
Constant over the year
Average 43 kWh/Day

PV Array Characteristics

PV module

Manufacturer	Jinkosolar
Model	JKM575M-7RL4-V
(Original PVsyst database)	
Unit Nom. Power	575 Wp
Number of PV modules	20 units
Nominal (STC)	11.50 kWp
Modules	2 Strings x 10 In series
At operating cond. (50°C)	
Pmpp	10.49 kWp
U mpp	401 V
I mpp	26 A

Battery

Manufacturer	Felicity Solar
Model	Batterie Felicity Solar 17.5kWh
Technology	Lithium-ion, LFP
Nb. of units	1 Unit
Discharging min. SOC	10.0 %
Stored energy	15.1 kWh
Battery Pack Characteristics	
Voltage	48 V
Nominal Capacity	350 Ah (C10)
Temperature	Fixed 30 °C

Controller

Manufacturer	Generic
Model	Universal controller with MPPT converter
Technology	MPPT converter
Temp coeff.	-5.0 mV/°C/Elem.
Converter	
Maxi and EURO efficiencies	97.0 / 95.0 %

Battery Management control

Threshold commands as	SOC calculation
Charging	SOC = 0.96 / 0.80
Discharging	SOC = 0.10 / 0.35

Total PV power

Nominal (STC)	12 kWp
Total	20 modules
Module area	54.7 m²

Array losses

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. 253 mΩ
Loss Fraction 1.5 % at STC

Serie Diode Loss

Voltage drop 0.7 V
Loss Fraction 0.2 % at STC

Module Quality Loss

Loss Fraction -0.8 %

Module mismatch losses

Loss Fraction 2.0 % at MPP

Strings Mismatch loss

Loss Fraction 0.1 %

IAM loss factor

Incidence effect (IAM): Fresnel AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.962	0.892	0.816	0.681	0.440	0.000

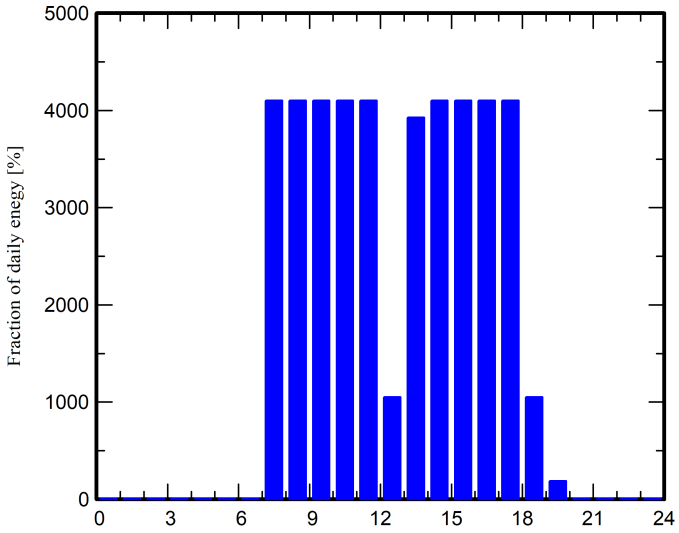
Detailed User's needs

Daily household consumers, Constant over the year, average = 43 kWh/day

Annual values

	Number	Power	Use	Energy
		W	Hour/day	Wh/day
Lampes (LED ou fluo)	1	352W/lamp	6.0	2112
TV / PC / Mobile	1	1731W/app	6.0	10386
Autres utilisations	1	3050W tot	10.0	30500
Consomm. de veille			24.0	240
Total daily energy				43238Wh/day

Hourly distribution

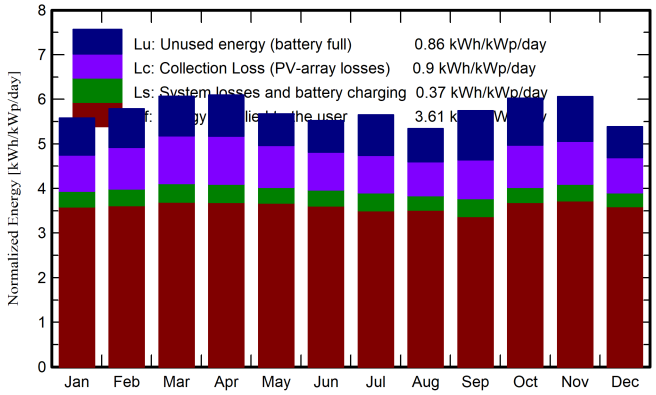


Main results

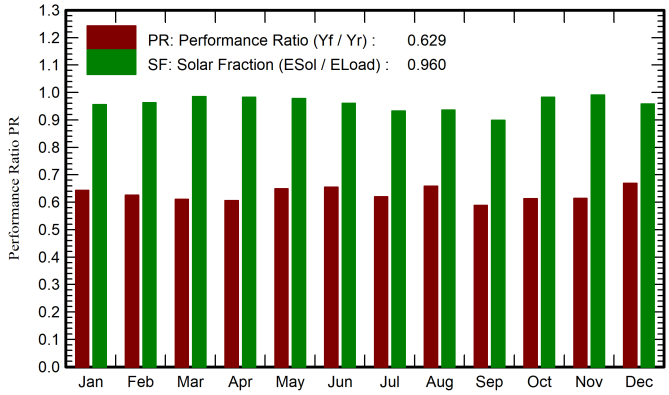
System Production

Available Energy	19525 kWh/year	Specific production	1698 kWh/kWp/year
Used Energy	15155 kWh/year	Performance Ratio PR	62.86 %
Excess (unused)	3624 kWh/year	Solar Fraction SF	96.03 %
Loss of Load		**Battery aging (State of Wear)**	
Time Fraction	5.7 %	Cycles SOW	95.8 %
Missing Energy	626 kWh/year	Static SOW	85.9 %
		Battery lifetime	7.1 years

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	GlobEff	E_Avail	EUnused	E_Miss	E_User	E_Load	SolFrac
	kWh/m²	kWh/m²	kWh	kWh	kWh	kWh	kWh	ratio
January	154.0	170.0	1642	294.0	59.3	1281	1340	0.956
February	151.1	159.2	1501	276.5	45.0	1166	1211	0.963
March	183.2	184.9	1713	314.1	20.5	1320	1340	0.985
April	186.4	179.4	1660	317.6	22.1	1275	1297	0.983
May	186.6	171.7	1615	249.9	29.4	1311	1340	0.978
June	179.6	161.4	1547	242.0	50.8	1246	1297	0.961
July	189.7	170.8	1644	322.7	90.4	1250	1340	0.933
August	172.4	161.7	1563	265.1	85.5	1255	1340	0.936
September	171.0	168.8	1613	379.0	131.3	1166	1297	0.899
October	175.4	183.4	1746	372.6	23.5	1317	1340	0.982
November	161.8	178.8	1700	345.1	11.9	1285	1297	0.991
December	147.0	164.1	1581	245.1	56.6	1284	1340	0.958
Year	2058.1	2054.3	19525	3623.7	626.4	15155	15782	0.960

Legends

GlobHor	Global horizontal irradiation
GlobEff	Effective Global, corr. for IAM and shadings
E_Avail	Available Solar Energy
EUnused	Unused energy (battery full)
E_Miss	Missing energy
E_User	Energy supplied to the user
E_Load	Energy need of the user (Load)
SolFrac	Solar fraction (EUsed / ELoad)

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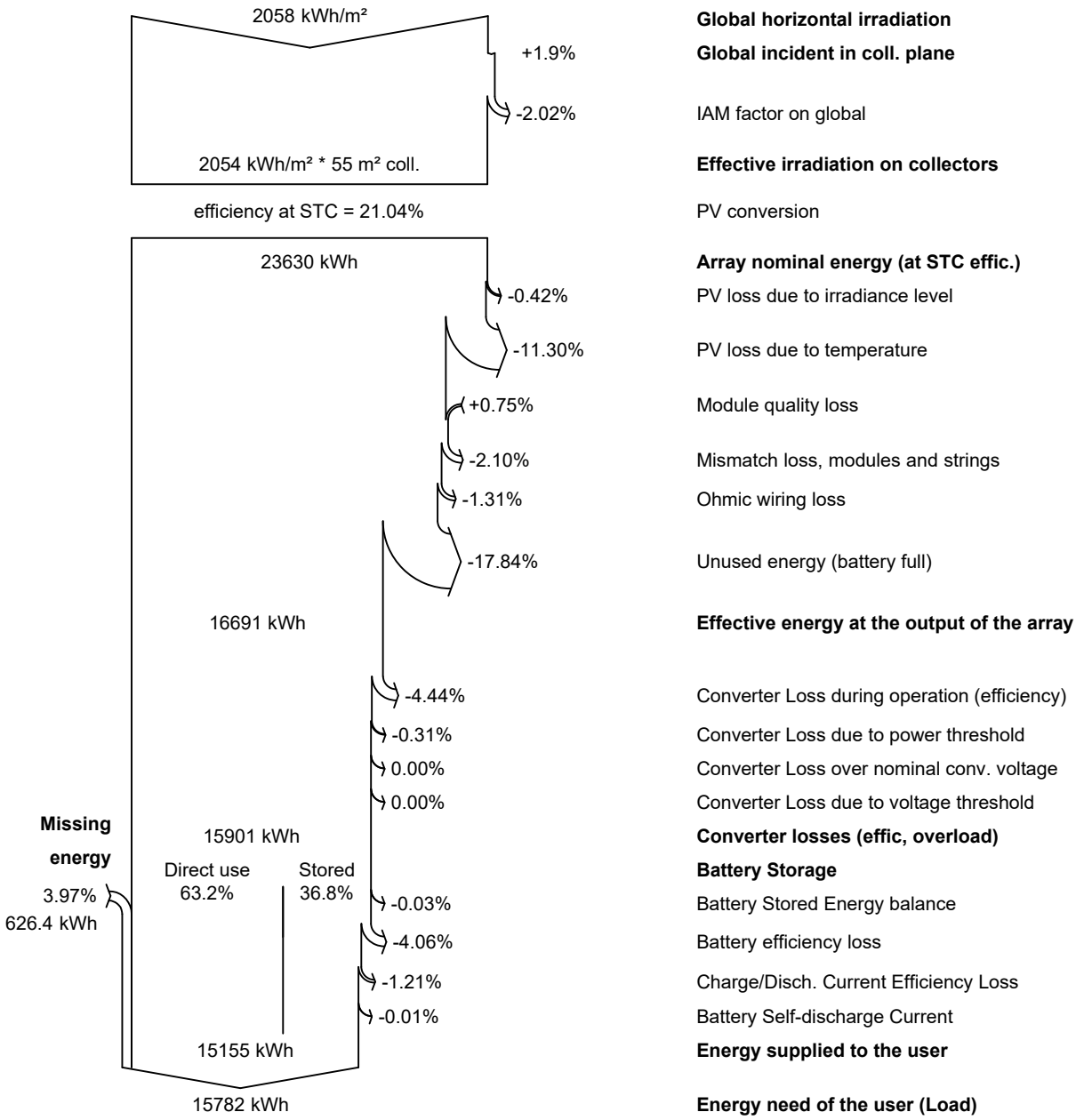
Loss diagram



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Special graphs

Diagramme d'entrée/sortie journalier