Lampiran D

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Grid-Connected System: Simulation parameters

Project : **STTPLN**

Geographical Site	**Jakarta**		Country	**Indonesia**
Situation	Latitude	6.2°S	Longitude	106.7°E
Time defined as	Legal Time	Time zone UT+7	Altitude	7 m
	Albedo	0.20		
Meteo data:	**Jakarta**	Meteonorm 7.1 (2010-2014), Sat=100% - Synthetic		

Simulation variant : **STTPLN**

Simulation date 30/07/17 01h20

Simulation parameters

Collector Plane Orientation	Tilt	15°	Azimuth	0°
Models used	Transposition	Perez	Diffuse	Perez, Meteonorm
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	CIS	Model	**SF165-S**	
Original PVsyst database		Manufacturer	Solar Frontier K. K.	
Number of PV modules		In series	7 modules	In parallel 12 strings
Total number of PV modules		Nb. modules	84	Unit Nom. Power 165 Wp
Array global power		Nominal (STC)	**13.86 kWp**	At operating cond. 12.79 kWp (50°C)
Array operating characteristics (50°C)		U mpp	558 V	I mpp 23 A
Total area		Module area	**103 m²**	

Inverter		Model	**STP17000TL**	
Custom parameters definition		Manufacturer	SMA	
Characteristics		Operating Voltage	400-800 V	Unit Nom. Power 17.0 kWac
Inverter pack		Nb. of inverters	1 units	Total Power 17.0 kWac

PV Array loss factors

Thermal Loss factor	Uc (const)	20.0 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Light soaking (with CIS/CIGS technology)			Gain Fraction	2.0 %
Wiring Ohmic Loss	Global array res.	391 mOhm	Loss Fraction	1.5 % at STC
Module Quality Loss			Loss Fraction	-0.8 %
Module Mismatch Losses			Loss Fraction	0.8 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1 - bo (1/cos i - 1)	bo Param.	0.05

User's needs : Unlimited load (grid)

PVsyst Evaluation mode

Grid-Connected System: Main results

Project : **STTPLN**

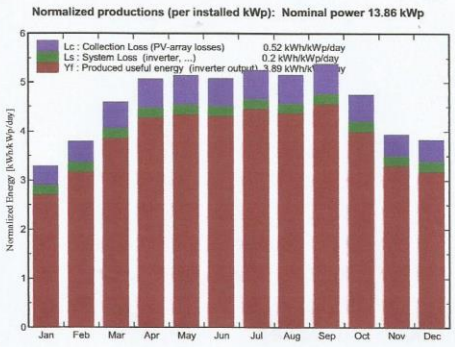
Simulation variant : **STTPLN**

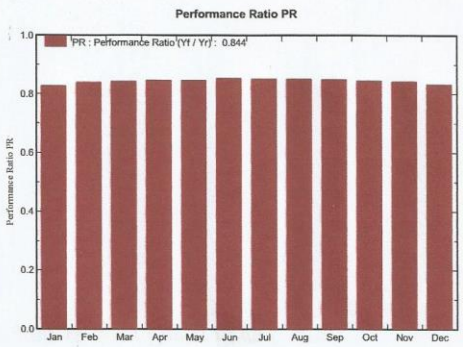
Main system parameters				
PV Field Orientation	System type	**Grid-Connected**		
	tilt	15°	azimuth	0°
PV modules	Model	SF165-S	Pnom	165 Wp
PV Array	Nb. of modules	84	Pnom total	**13.86 kWp**
Inverter	Model	STP17000TL	Pnom	17.00 kW ac
User's needs	Unlimited load (grid)			

Main simulation results

System Production

Produced Energy	**19.66 MWh/year**	Specific prod.	1418 kWh/kWp/year
Performance Ratio PR	84.4 %		





STTPLN

Balances and main results

	GlobHor kWh/m²	T Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	EffArrR %	EffSysR %
January	110.3	26.17	102.1	97.8	1.254	1.169	11.91	11.10
February	111.7	25.83	106.3	102.2	1.311	1.234	11.96	11.25
March	143.4	26.49	142.3	137.5	1.748	1.660	11.91	11.30
April	146.0	26.43	151.8	147.1	1.868	1.781	11.92	11.37
May	147.0	26.79	159.3	154.7	1.956	1.867	11.90	11.36
June	137.7	26.05	152.1	147.8	1.879	1.798	11.97	11.46
July	147.0	26.25	162.4	157.9	2.002	1.915	11.95	11.43
August	150.8	26.44	159.6	154.8	1.967	1.881	11.95	11.43
September	159.0	26.44	161.2	156.0	1.983	1.897	11.92	11.41
October	152.2	27.07	146.8	141.5	1.803	1.717	11.90	11.34
November	126.3	26.42	117.8	113.1	1.454	1.373	11.97	11.30
December	130.3	26.25	118.5	113.7	1.454	1.367	11.89	11.18
Year	1661.7	26.39	1680.2	1624.0	20.678	19.658	11.93	11.34

Legends:

GlobHor	Horizontal global irradiation	EArray	Effective energy at the output of the array
T Amb	Ambient Temperature	E_Grid	Energy injected into grid
GlobInc	Global incident in coll. plane	EffArrR	Effic. Eout array / rough area
GlobEff	Effective Global, corr. for IAM and shadings	EffSysR	Effic. Eout system / rough area

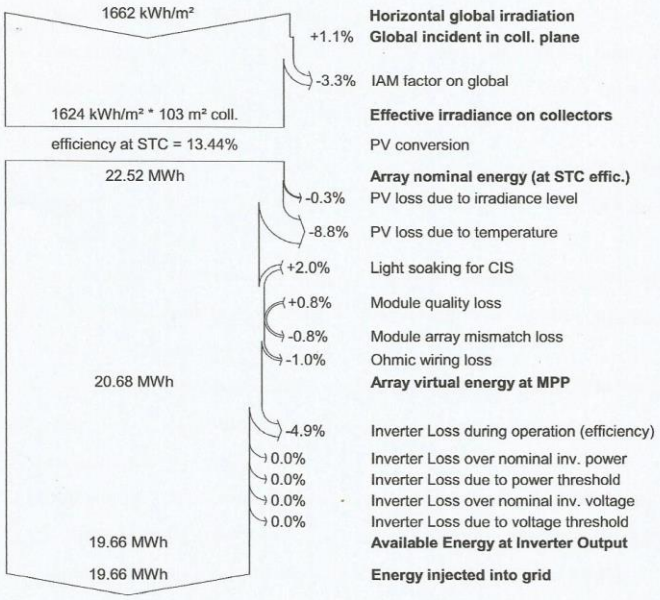
Grid-Connected System: Loss diagram

Project : **STTPLN**

Simulation variant : **STTPLN**

Main system parameters	System type	**Grid-Connected**		
PV Field Orientation	tilt	15°	azimuth	0°
PV modules	Model	SF165-S	Pnom	165 Wp
PV Array	Nb. of modules	84	Pnom total	**13.86 kWp**
Inverter	Model	STP17000TL	Pnom	17.00 kW ac
User's needs	Unlimited load (grid)			

Loss diagram over the whole year



PVsyst Evaluation mode