



## PT SuryaTek Portfolio

This Portfolio represents a selection  
of our Projects & Services

## About SuryaTek

PT SuryaTek Indonesia is a nationwide supplier of photovoltaic equipment. From separate components to complete PV Systems. We have installed over 5 MW across the country. Grid tied, Hybrid and Off Grid as well. With our one-stop shopping philosophy and dedicated staff members we provide our customers a complete solution. From full design until installation and maintenance. Our technical staff is educated by the Dutch Delft University. PT SuryaTek is also licensed by the ESDM (Indonesian Ministry of Energy) according to D.35 & 112. We are committed to serve our customers with the best service against a fair price.

❖ Education



❖ Consultation



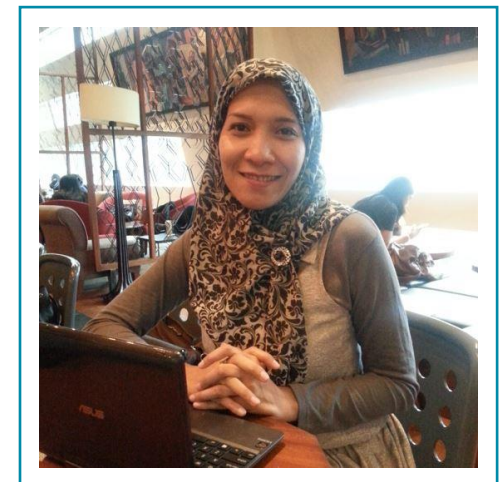
❖ Design



❖ Installation



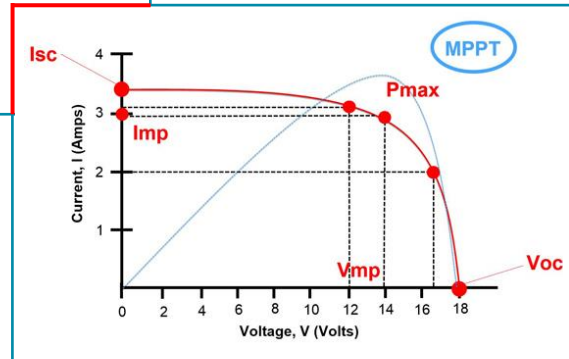
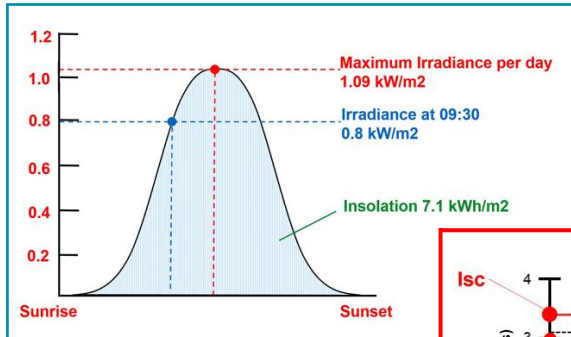
❖ Maintenance



*Lismawati van 't Wout,  
Owner Founder PT SuryaTek*



## Education: SuryaTek Academy



SuryaTek Academy offers a number of standard courses in the field of PV System design. Customization is also possible for companies and schools. The courses are mainly aimed learning by doing.



## Education: SuryaTek Academy



SuryaTek Academy also offers practical training. SMK Students install a 2000 Watt PV System. They perform everything under supervision of PT SuryaTek. Testing the system is also part of the training.

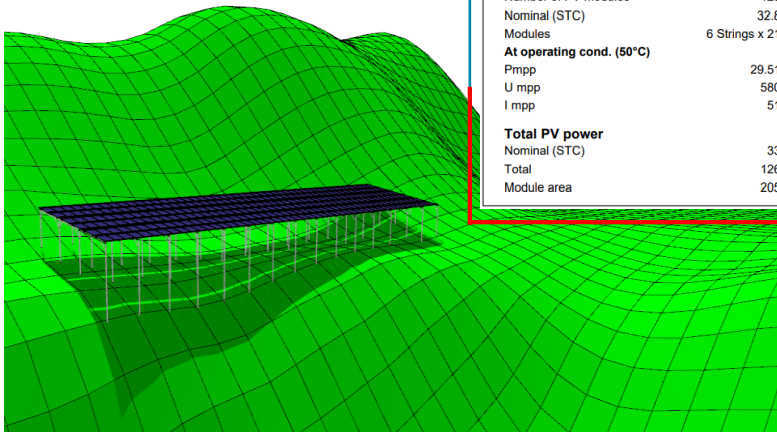


## Design 30KW Bali Hillside Installation

The design of the PV System is the basis for a properly functioning system. A good intake with the customer provides the necessary data that serve as the starting point for the design.

Array losses		
<b>Thermal Loss factor</b>	<b>DC wiring losses</b>	<b>Module Quality Loss</b>
Module temperature according to irradiance	Global array res. 192 mΩ	Loss Fraction -0.8 %
Uc (const) 20.0 W/m²K	Loss Fraction 1.5 % at STC	
Uv (wind) 0.0 W/m²K/m/s		
<b>Module mismatch losses</b>	<b>Strings Mismatch loss</b>	<b>IAM loss factor</b>
Loss Fraction 2.0 % at MPP	Loss Fraction 0.1 %	ASHRAE Param: IAM = 1 - bo(1/cool - 1)
		bo Param. 0.05

### Shadow analysis



### PV Array Characteristics

PV module		Inverter	
Manufacturer	CSUN Solar	Manufacturer	Huawei Technologies
Model	CSUN260-60P	Model	SUN2000-30KTL-US
(Original PVsyst database)		(Original PVsyst database)	
Unit Nom. Power	260 Wp	Unit Nom. Power	30.0 kWac
Number of PV modules	126 units	Number of inverters	3 * MPPT 33% 1 unit
Nominal (STC)	32.8 kWp	Total power	30.0 kWac
Modules	6 Strings x 21 In series	Operating voltage	250-950 V
<b>At operating cond. (50°C)</b>		Max. power (≈40°C)	33.0 kWac
Pmpp	29.51 kWp	Phom ratio (DC:AC)	1.09
U mpp	580 V		
I mpp	51 A		
<b>Total PV power</b>		<b>Total inverter power</b>	
Nominal (STC)	33 kWp	Total power	30 kWac
Total	126 modules	Nb. of inverters	1 Unit
Module area	205 m²	Phom ratio	1.09

### Main results

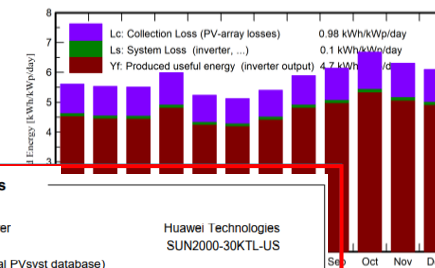
**System Production**  
Produced Energy

49.88 MWh/year

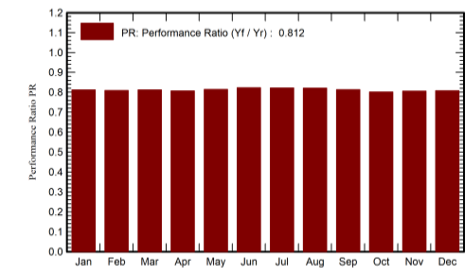
Specific production  
Performance Ratio PR

1521 kWh/kWp/year  
81.21 %

### Normalized productions (per installed kWp)

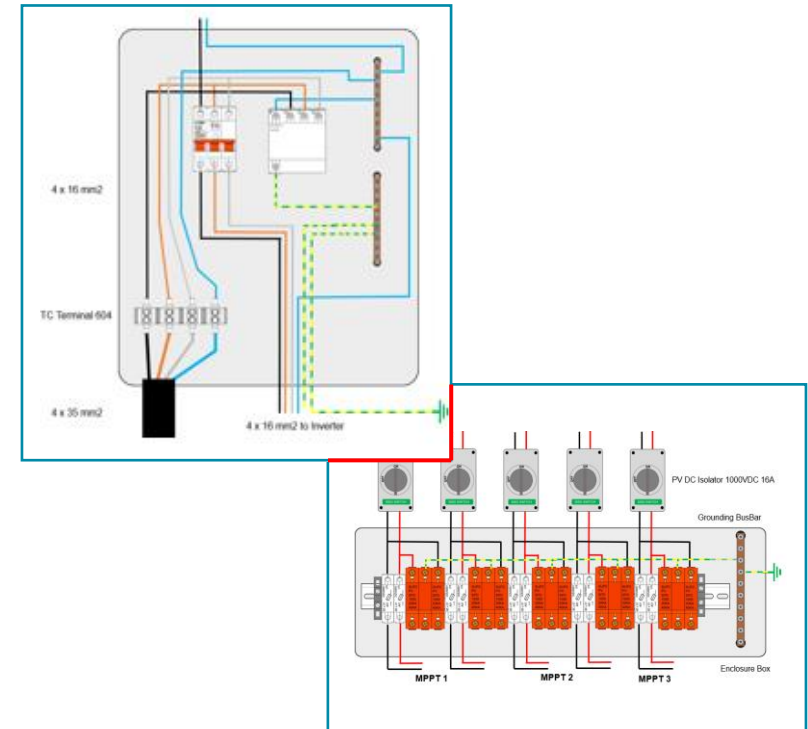
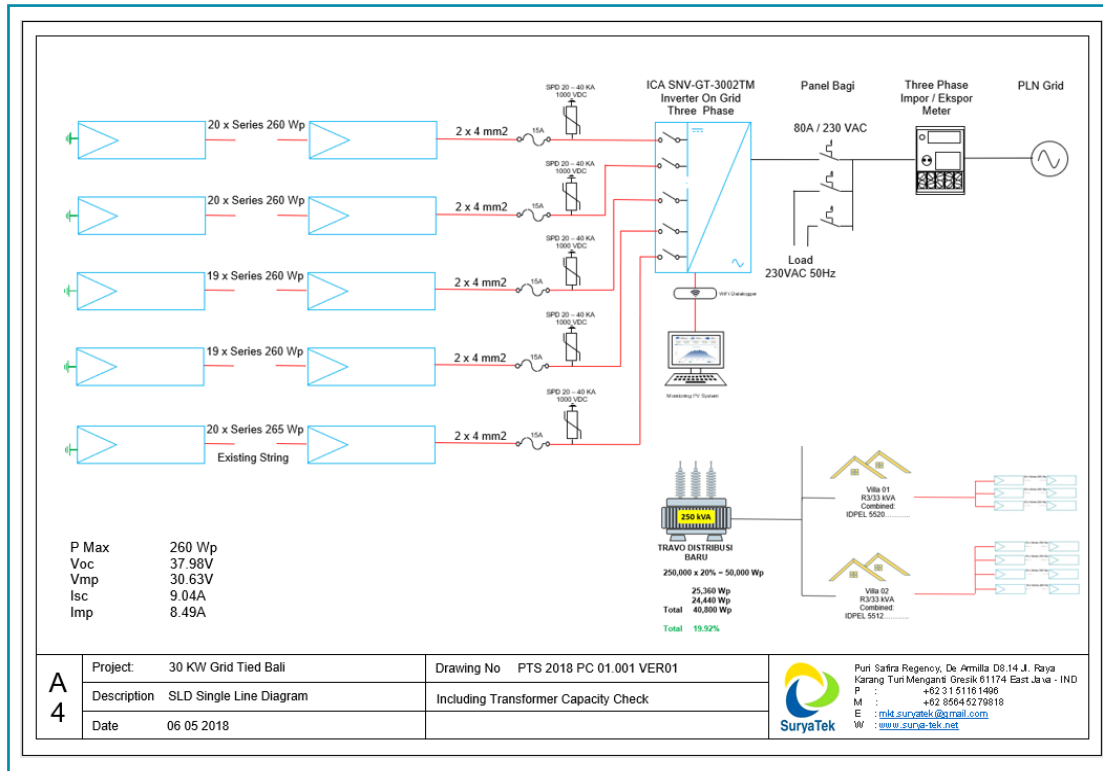


### Performance Ratio PR



PT SuryaTek has the knowledge and experience to design well-balanced PV Systems. Balanced means taking into account the requirements of the PLN, regulations of netmetering as well as the customer's consumption.

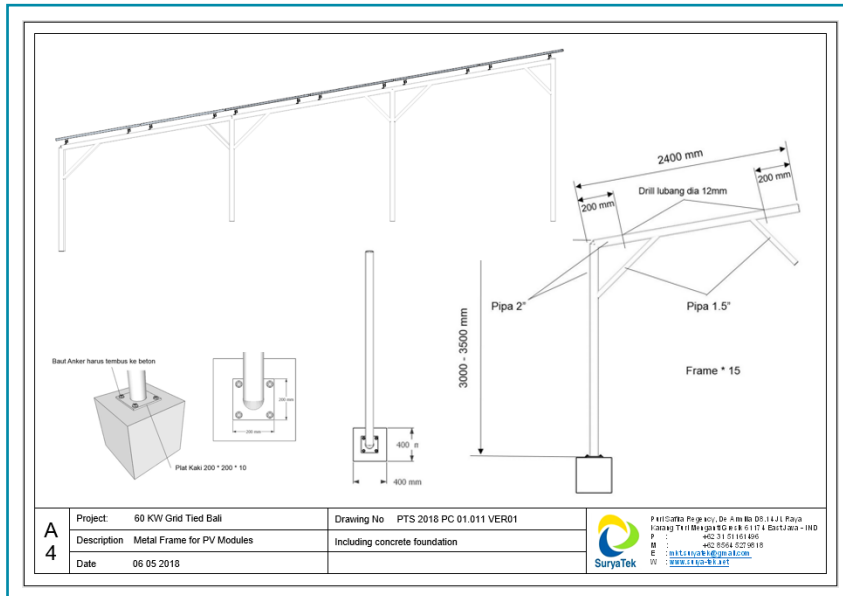
## Design 30KW Bali Hillside Installation



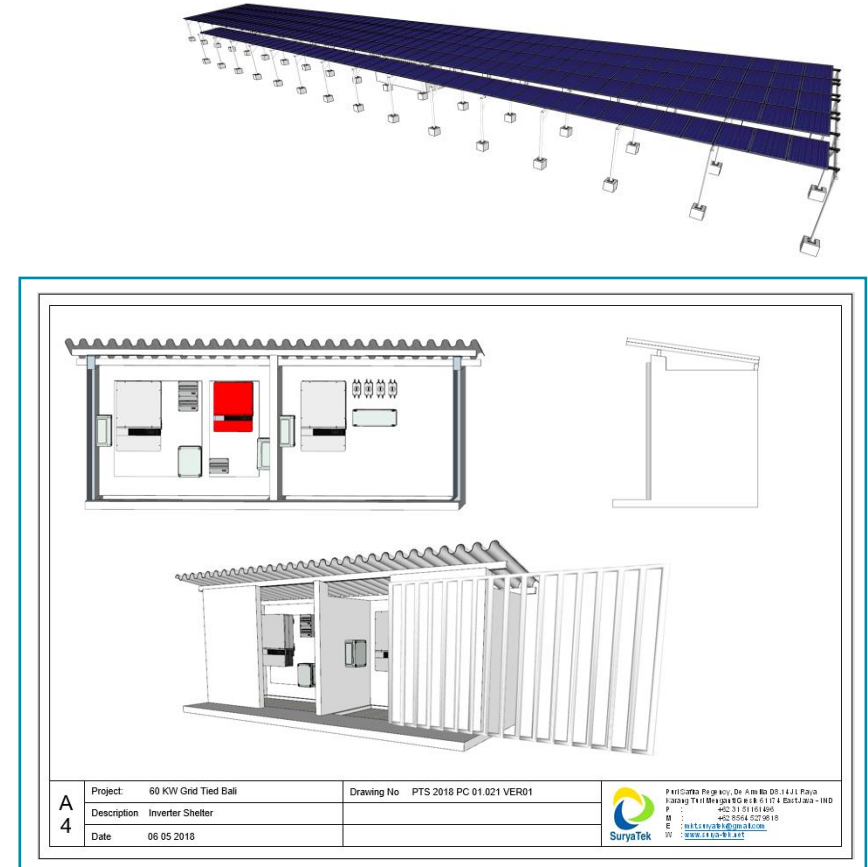
PT SuryaTek will make all necessary drawings to make sure the project will be successful. All enclosure boxes will be detailed out including wiring.



## Design 30KW Bali Hillside Installation

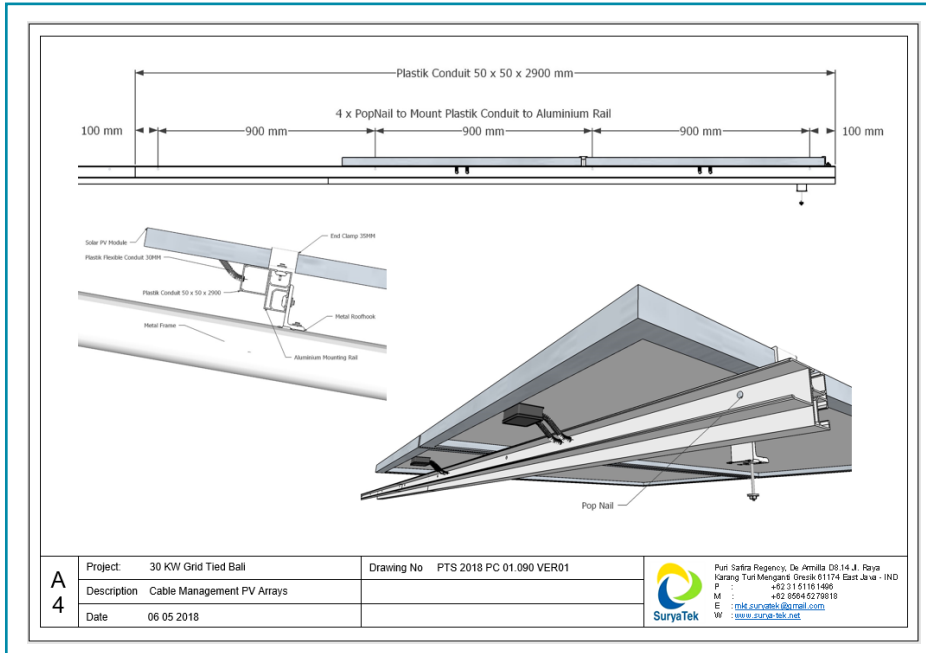


PT SuryaTek will not only design the PV System but also will take care of all mechanical design like metal frames, inverter housing etc.

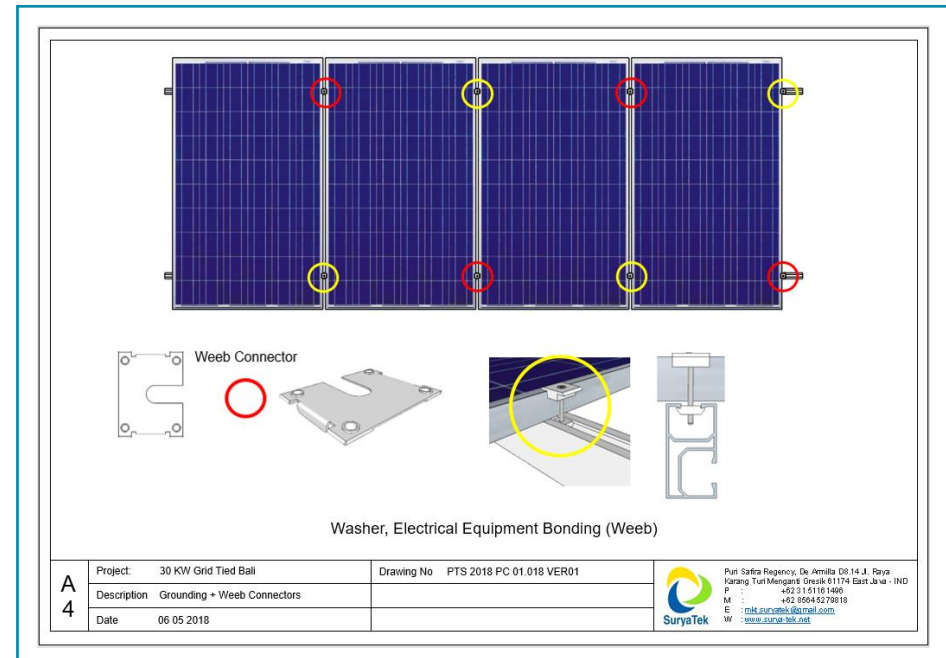


## Design 30KW Bali Hillside Installation

Grounding PV modules to eliminate shock and fire hazards is required by the SNI, Standar Nasional Indonesia. PT SuryaTek uses WEEB connectors to do this in a proper way. Sharp ridges on them penetrate through the non-conductive coatings of the aluminum module frames and mounting racks.

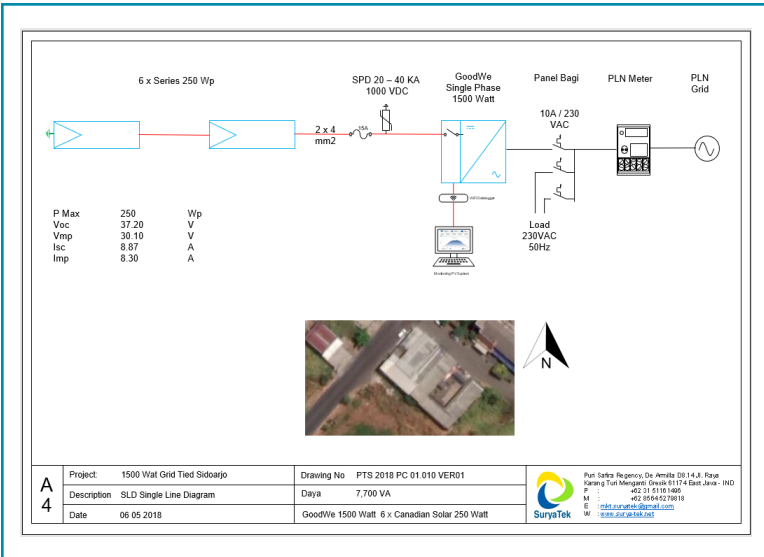


PT SuryaTek will take care of a system for cable management. All cables will be protected by conduit as much as possible. This protects your investment for the longer period.



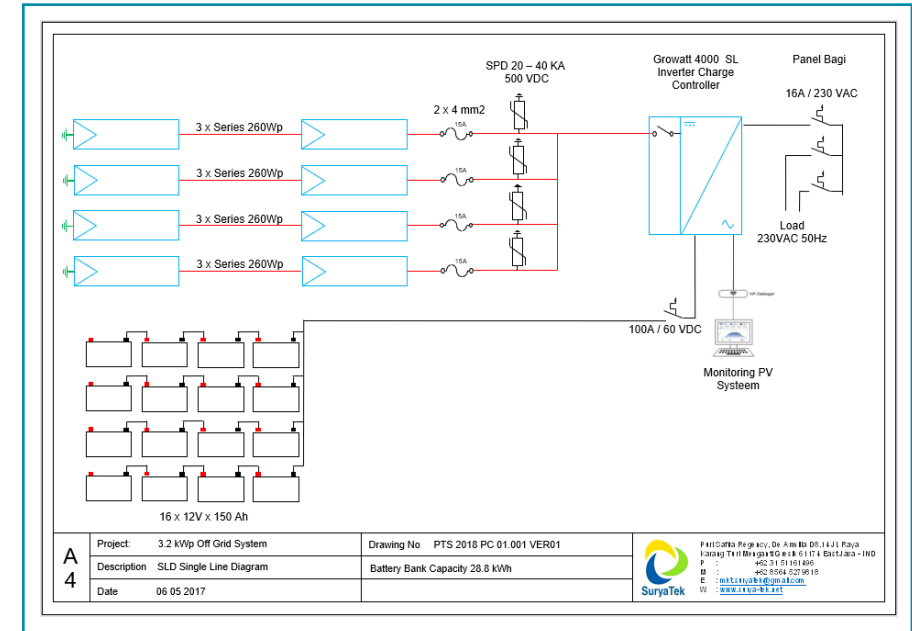
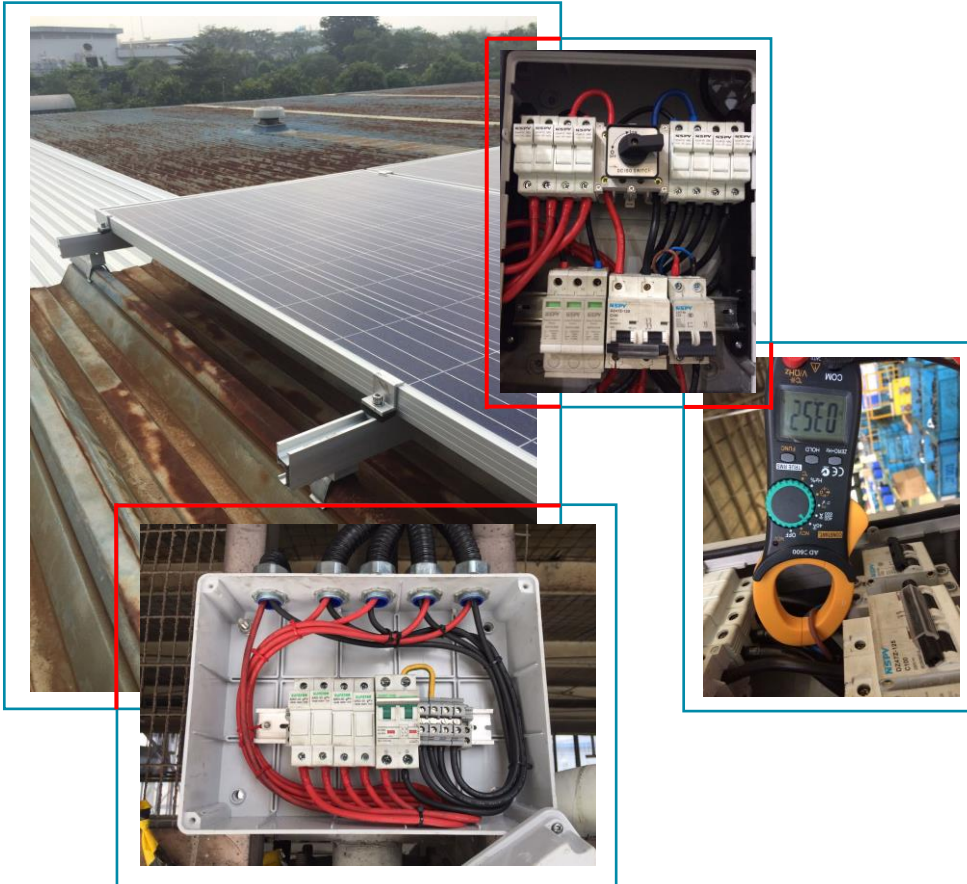


## 1500 Watt Sidoarjo Self Consumption



PT SuryaTek installed it's first system almost 10 years ago. Today it's still running fine and produces the expected yield every day. This first installation contained out of 6 PV Modules. Our latest installation consisted out of more then 10,000 PV Modules. Self Consumption means that all produced yield by the PV System will directly be consumed by all electrical appliances in the building.

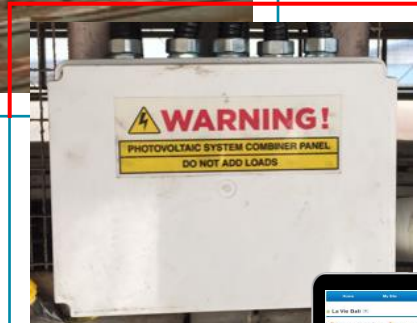
## 3.2 KW Off Grid Bekasi



PT SuryaTek installed this system for a factory in Bekasi. The factory installed it to make sure that one of their crucial equipment parts will never run out of electricity.

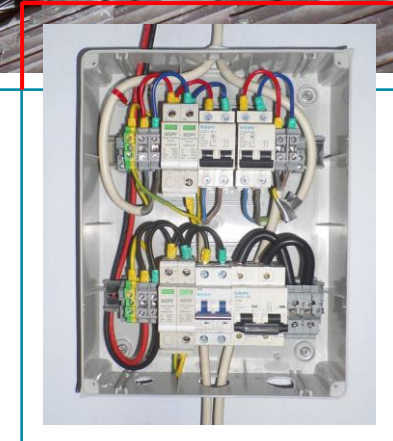
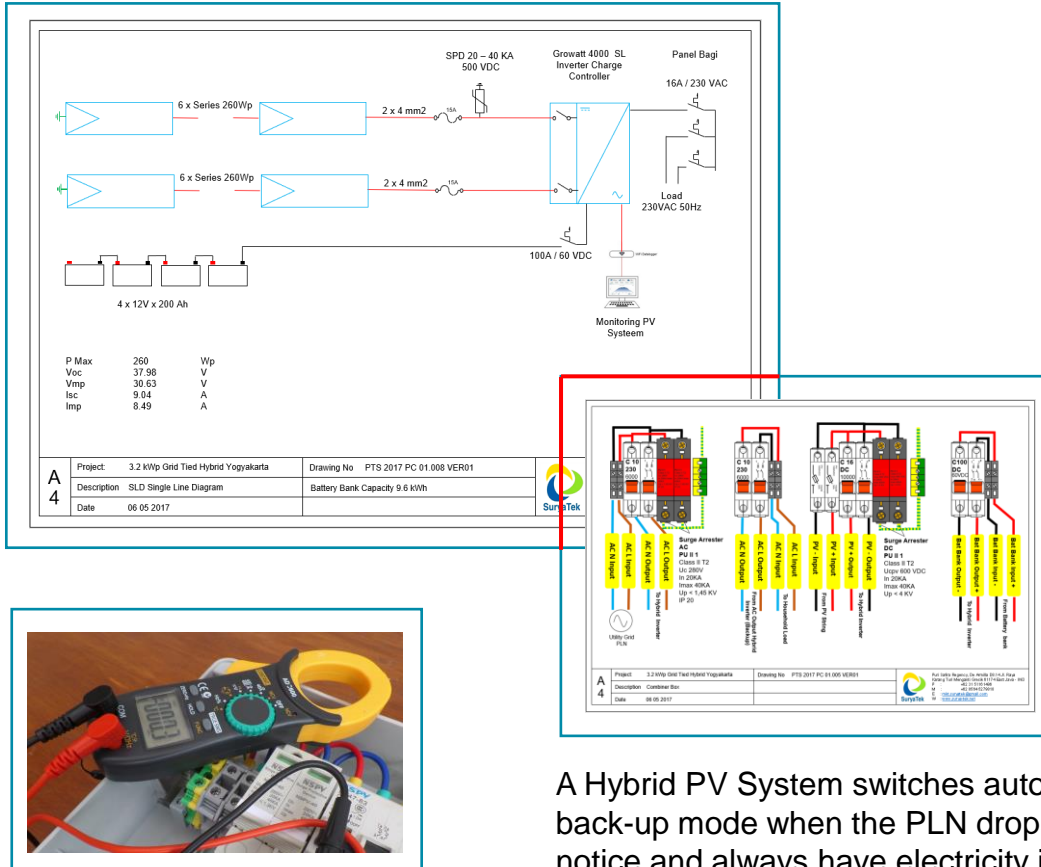


## 3.2 KW Off Grid Bekasi



Remote Monitoring.

## 3.2 kWp Grid Tied Hybrid Yogyakarta



A Hybrid PV System switches automatically to the battery back-up mode when the PLN drops out. You will hardly notice and always have electricity in the house. Even when the PLN drops out.



## 3.2 kWp Grid Tied Hybrid Yogyakarta

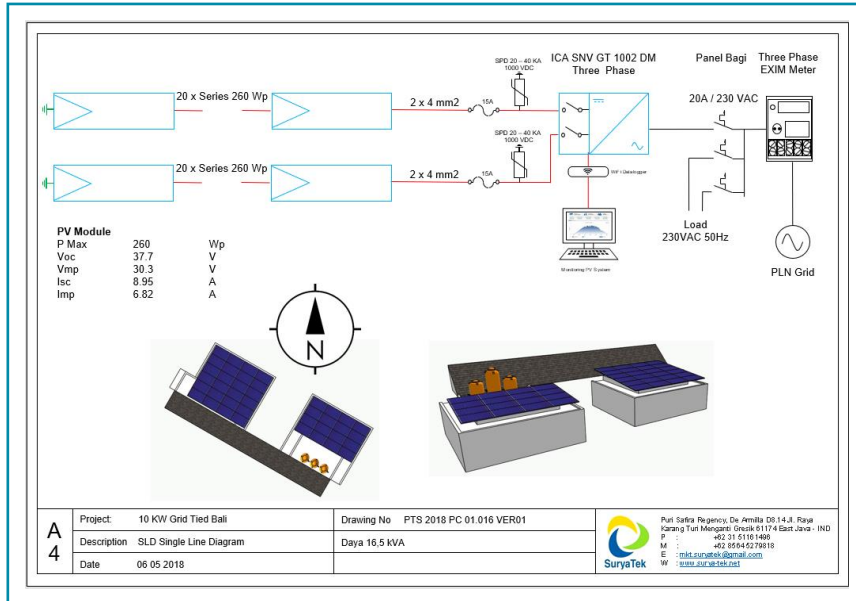


Remote Monitoring.

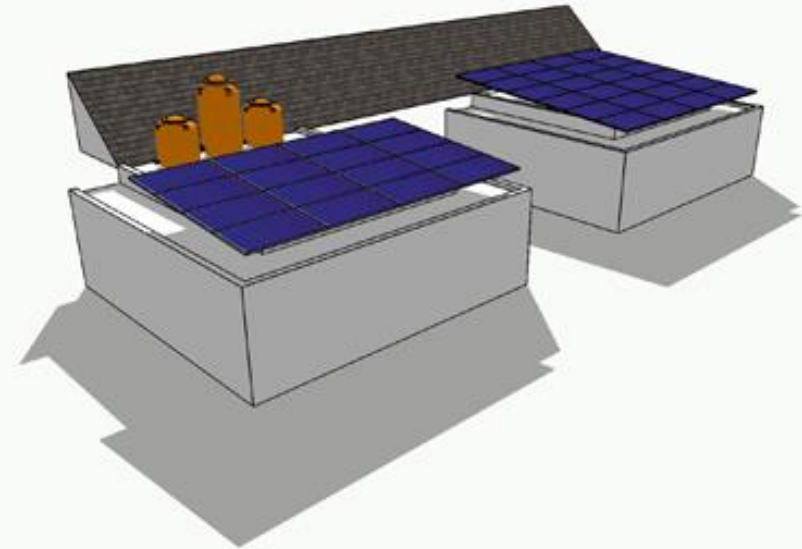


Battery Bank Capacity 9.6 kWh.

## 10 kWp Grid Tied Net Metering Bali



Shadow analysis is part of our design for a project.  
 What is the negative influence of any shadow?

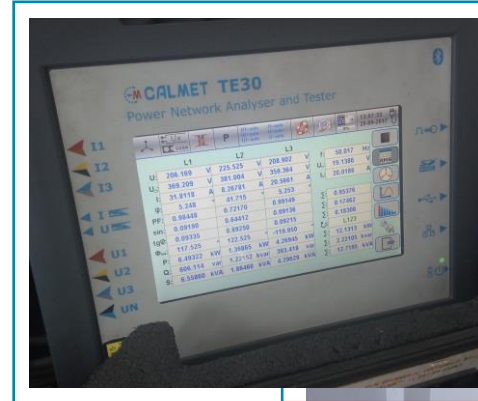


PT SuryaTek prepared all administrative and technical documents necessary to get approval and permission of the PLN to install the PV System.

## 10 kWp Grid Tied Net Metering Bali



The flat roof mounting system is custom made and designed and installed by PT SuryaTek.



PLN Testing and approval.



## 10 kWp Grid Tied Net Metering Bali



Two Array's of 20 solar panels each. Total capacity 10,000 Wp.

Finished Inverter-room. 10 KW 3 Phase Inverter. The system is connected with the internet so it can be remote monitored.



Remote Monitoring.

## 3.2 kWp Grid Tied Hybrid Yogyakarta



12 x 260 Wp Solar Panels. Total Capacity 3,120 Watt.

Remote Monitoring.



Hybrid Residential System. Battery Bank: 9.6 kWh.  
Including ATS, Automatic Transfer Switch.

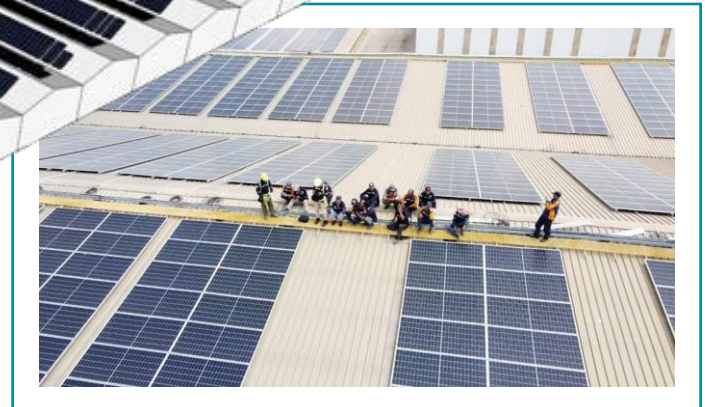
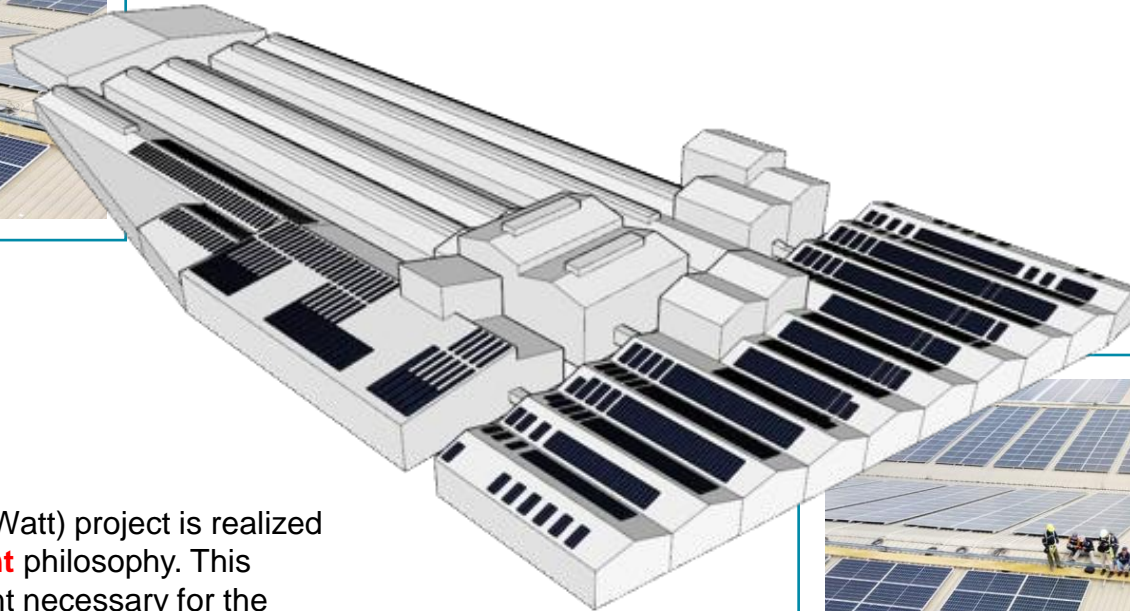


## 5.2 Mega Watt East Java



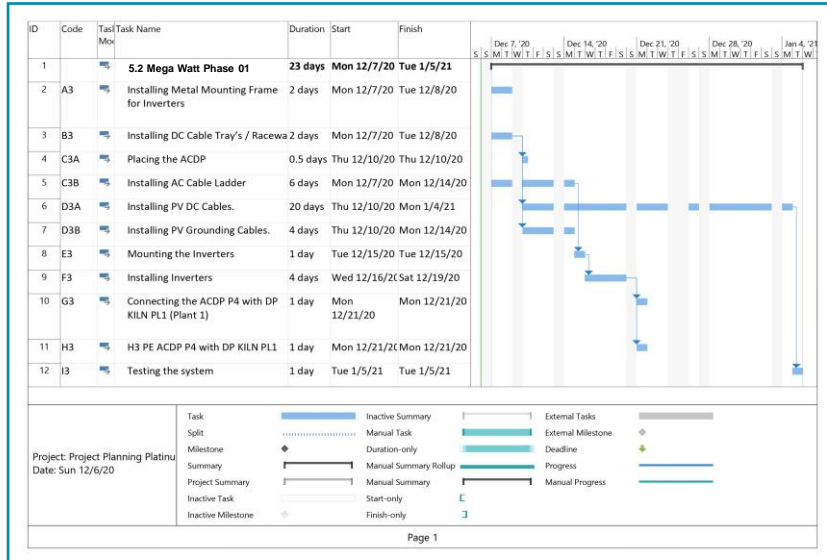


## 5.2 Mega Watt East Java



This 5.2 Mega Watt (5,200,000 Watt) project is realized completely on a **Zero Investment** philosophy. This means that there is no investment necessary for the factory owner. The factory owner will have the advantage of a significant discount on the PLN kWh price.

## 5.2 Mega Watt East Java



PT Suryatek Mulia Abadi

### 4.2 B3: Memasang DC kabel tray / Jalur Kabel

Kabel DC tray perlu dipasang dari titik masuk ke dalam gedung sampai inverter yang dipasang pada rangka logam. Kabel tray perlu memandu semua 156 Kabel String DC ke Inverter yang sesuai pada Rangka Logam. Untuk memasang Kabel DC tray ke rangka metal inverter akan dilakukan pengelasan. Kabel DC tray vertikal akan dilas ke konstruksi baja bangunan.

#	Deskripsi / Penjelasan	#
B3	Memasang DC kabel Tray / Jalur Kabel Total ± 20 Meter.	20
<b>Material</b>		
	DC Cable Tray 100mm x 200mm & 100mm x 250mm	
	Tray lurus vertikal ± 10 Meter 3 x Tray lurus 3 Meter	
	Tray lurus horizontal ± 11 Meter 10 x Tray lurus 3 Meter	
	Kedalaman Tray 90 Derajat 1 x	
	Outer/ sisi luar Tray 45 Derajat 1 x	
	Baut dan mur untuk merakit DCi Kabel tray	
<b>Tools/ Peralatan</b>		
	Measurement tool / alat ukur	
	Marker / spidol	
	Bubble level tool / waterpass	
	Iron saw / Gergaji Besi	
	Welding Equipment / Perlengkapan Las	
B3-01	Tandai tempat memasang DC Kabel tray vertikal	1
B3-02	Merakit / mengelas DC Kabel tray lurus 3 Meter untuk Kabel tray vertikal.	3
B3-03	Pasang / las tray Luar 45 Derajat di bagian atas.	1
B3-04	Pasang / las tray Dalam 45 Derajat di bagian bawah ...	1
B3-05	Pasang DC Kabel tray vertikal yang telah dirakit dari atap ke ruang BOS. Ini akan di clamp /dijepit dengan part penjepit yang disediakan.	1
B3-06	Merakit / mengelas dan Memasang DC Kabel tray horizontal pada balok melintang antara kolom pendek dan panjang. Lihat Gambar Halaman 17	1
B3-07	Pastikan kedua ujung DC Kabel tray horizontal ditutup	1
B3-08	Hubungkan DC Kabel tray vertikal dengan DC Kabel tray horizontal dengan konstruksi T.	1

#### Gambar teknik terkait

PTS 2020 PC 002.01 VER01 DC Cable Tray lihat halaman 17  
 PTS 2020 PC 002.02 VER01 Details DC Cable Tray lihat halaman 18  
 PTS 2020 PC 002.03 VER01 Details DC Cable Tray lihat halaman 19  
 ISL – 021PR5 – XDI – DWG – 02 – P3 Detail Area BOS  
 ISL – 021PR5 – XDI – DWG – 02 – P3 Tampak Depan  
 ISL – 021PR5 – XDI – DWG – 02 – P3 Tampak Depan  
 Lihat halaman 9 sampai dengan 15

Project Plan 5.2 Mega Watt East Java Phase 01 Version 01 © PT SuryaTek

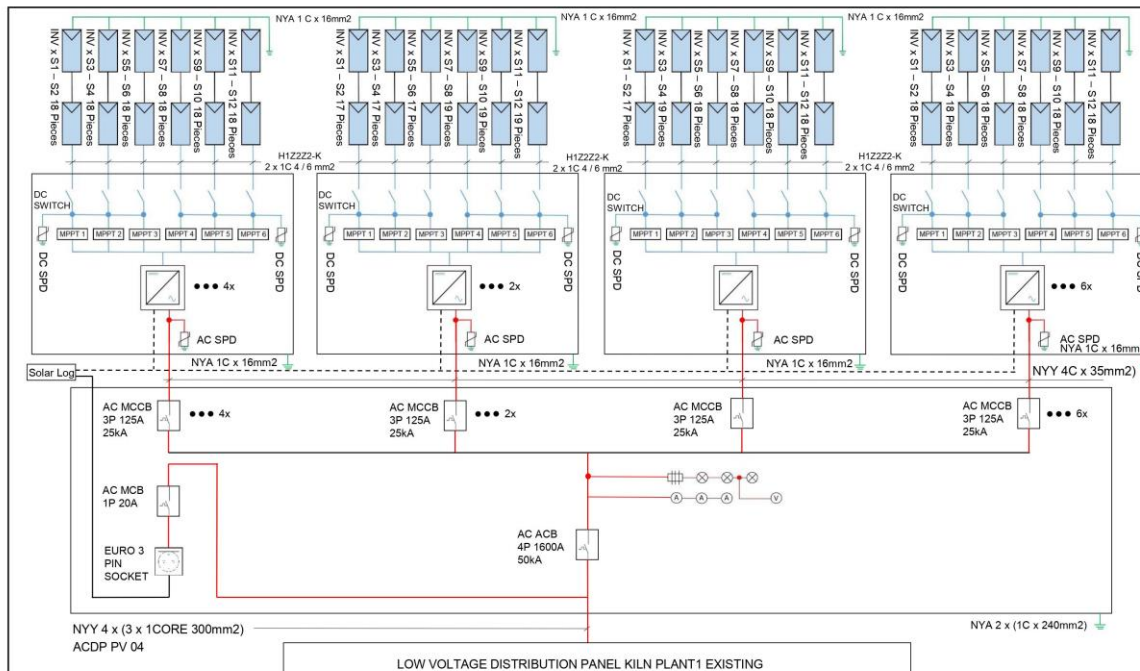
16

The preparation for the installation of this project has been carried out by PT SuryaTek.

The starting point is good planning and a project plan in which the tasks to be performed are clearly defined.

All this to avoid ambiguity during the implementation phase of the project. On the left is a schedule plan and a page from the project plan.

## 5.2 Mega Watt East Java



A  
4

Project:	5.2 MW Jawa Timur Phasa 1	Gambar No:	PTS 2020 PC 03.30 VER01
Description:	Single Line Diagram (SLD)		2,808 x Seraphim 335 Wp Poly
Date:	03 -10 - 2020		13 x Huawei SUN2000 60KTL



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E : mkt.suryatek@gmail.com  
W : www.surya-tek.net

Inverters Huawei SUN2000 60KTL.

Solar panels Seraphim 335 Wp Poly.  
Solar panels Seraphim 440 Wp Mono.

Installed 285 Km DC Cable 4/6/ and 10 mm2.  
Installed 3,2 Km AC Cable 240/300 mm2.  
Installed 450 M Grounding Cable 180/240 mm2.

Installed BOS room facilities for the inverters.

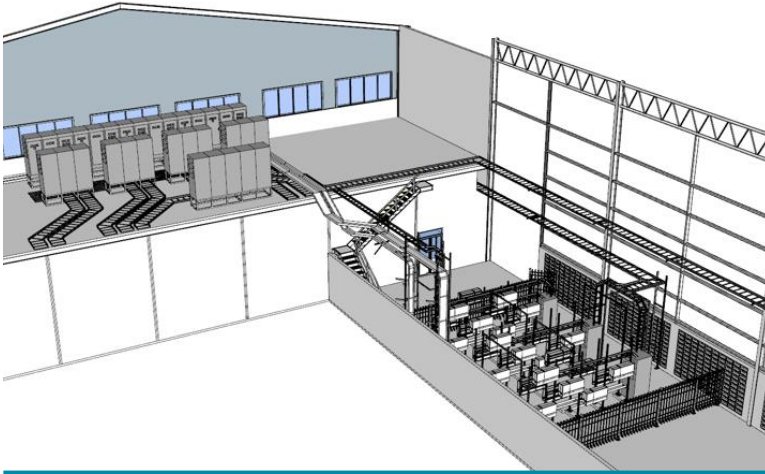
Installed AC Cable ladders.  
Installed DC Cable trays.  
Installed data cable + Solar log.

Installed Pyranometer Kip & Zn.

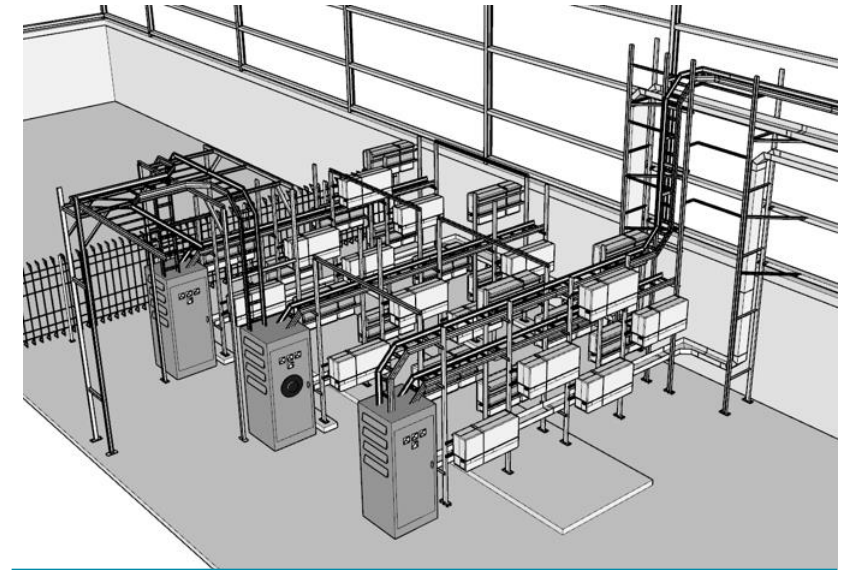
All necessary tests performed.  
Responsible for Project Management.  
Responsible for Project Planning.  
Produced all necessary drawings.



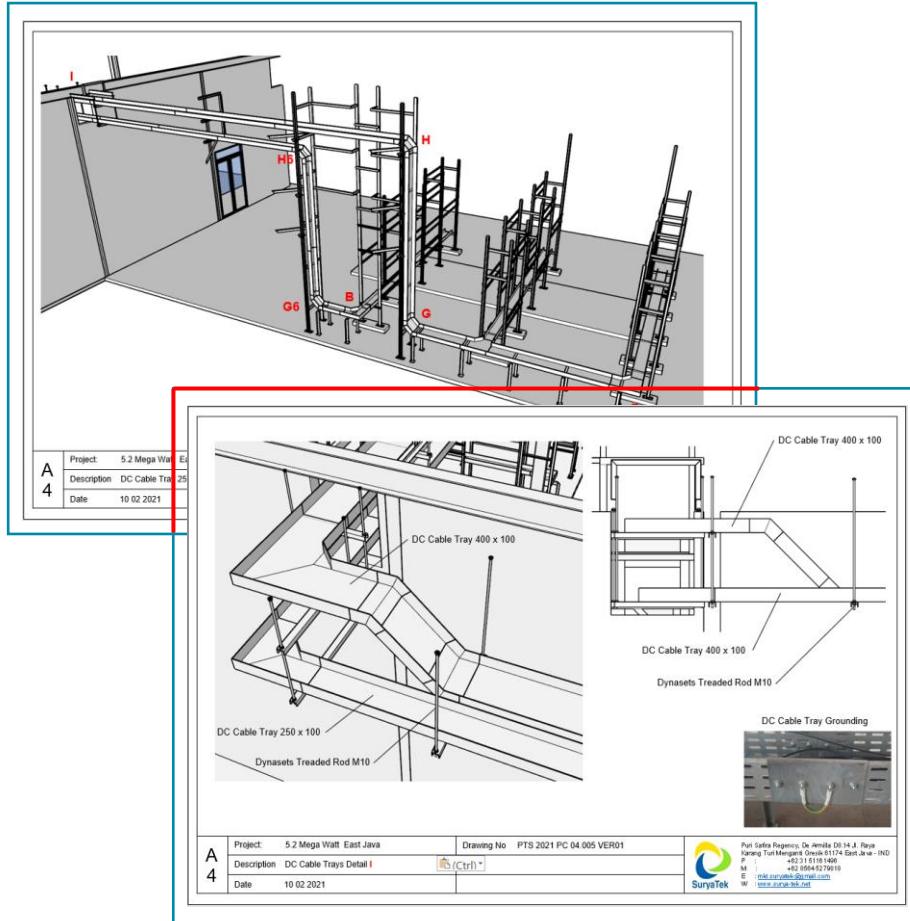
## 5.2 Mega Watt East Java



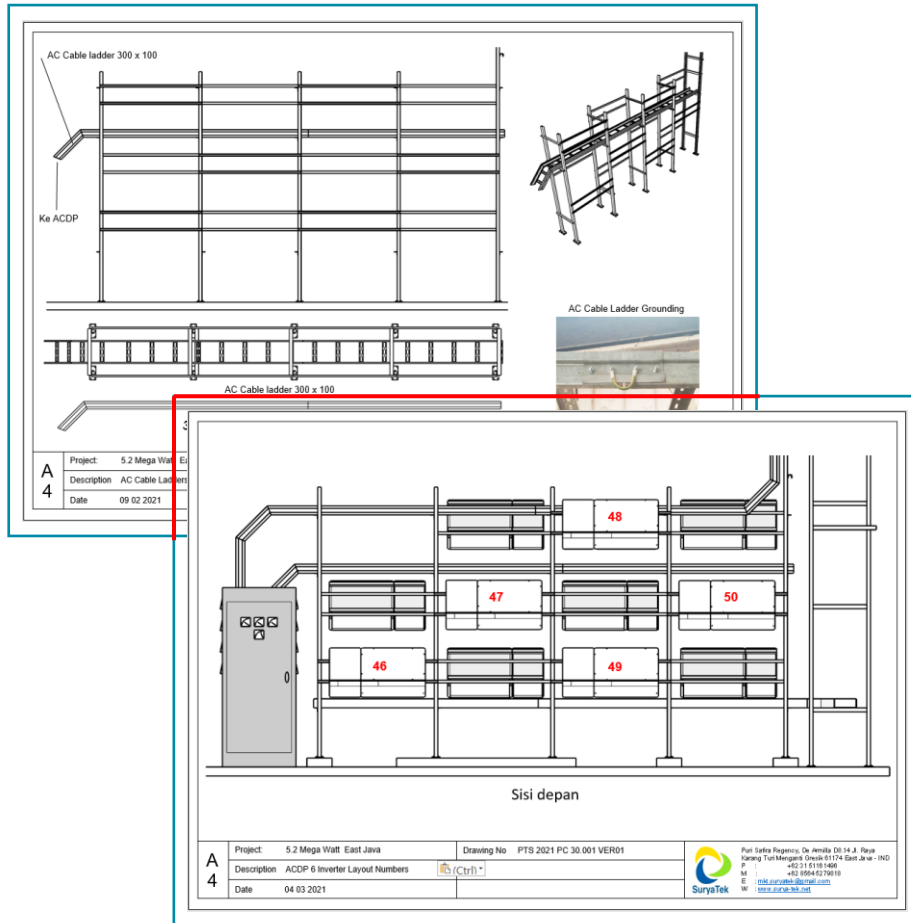
PT SuryaTek makes a 3D model of the Industrial Project. We do this to avoid ambiguity during implementation. This way we can detect problems before execution takes place. From this 3D model we generate all the necessary drawings for the project.



## 5.2 Mega Watt East Java

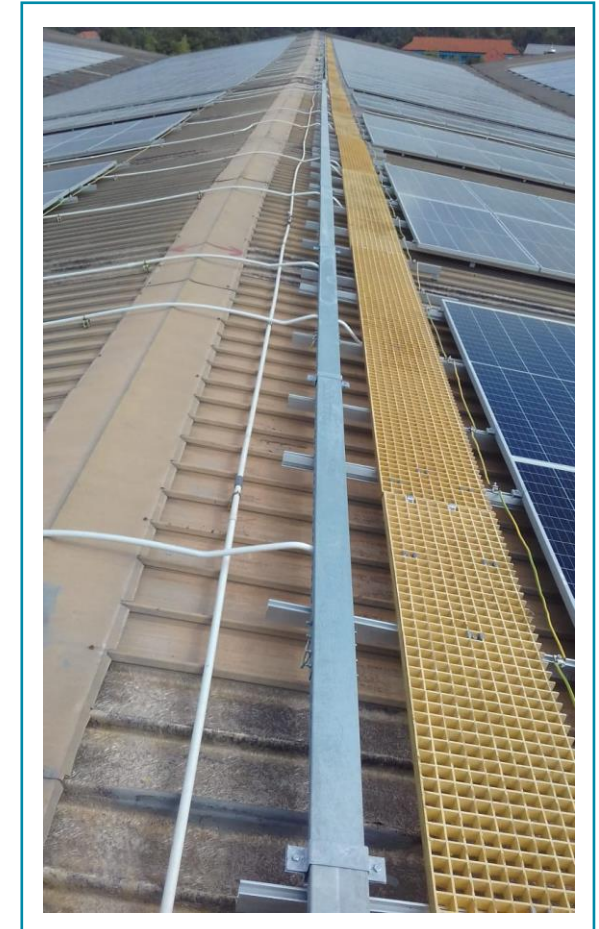
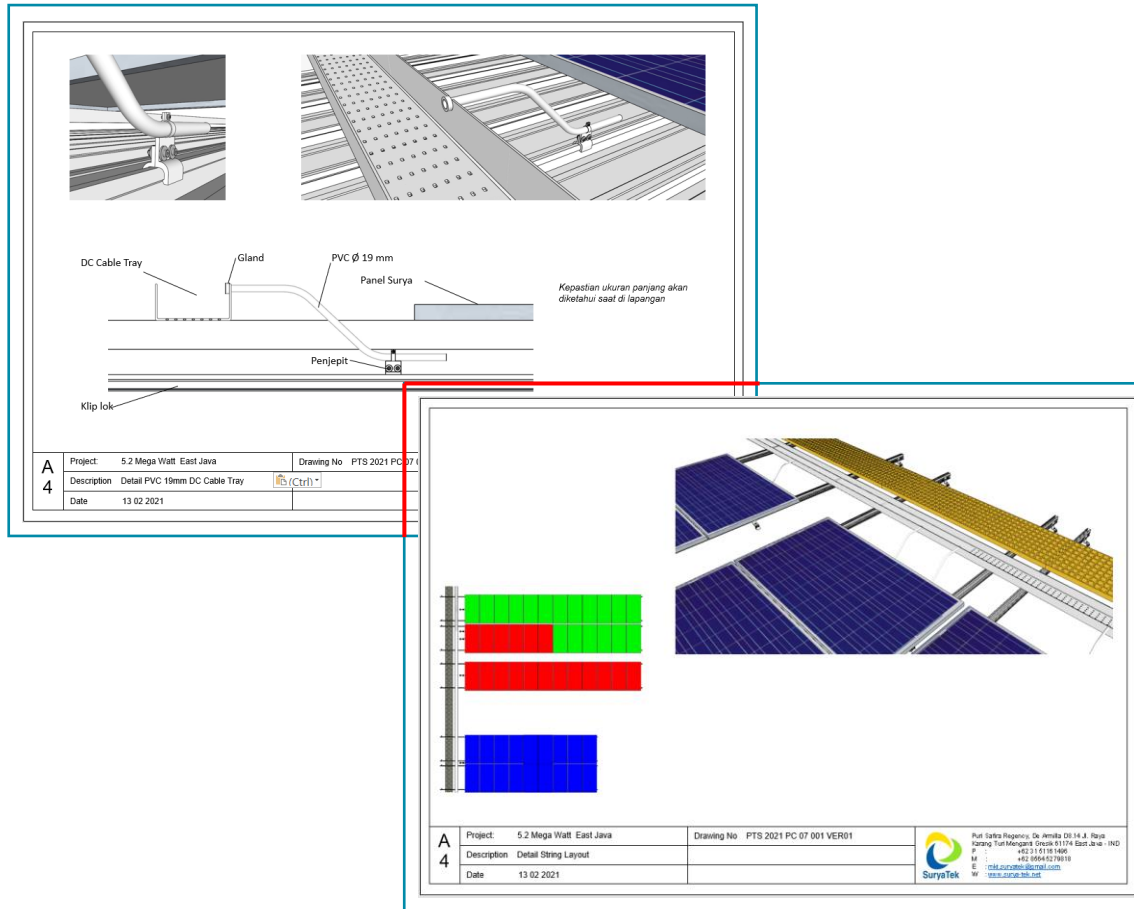


## 5.2 Mega Watt East Java





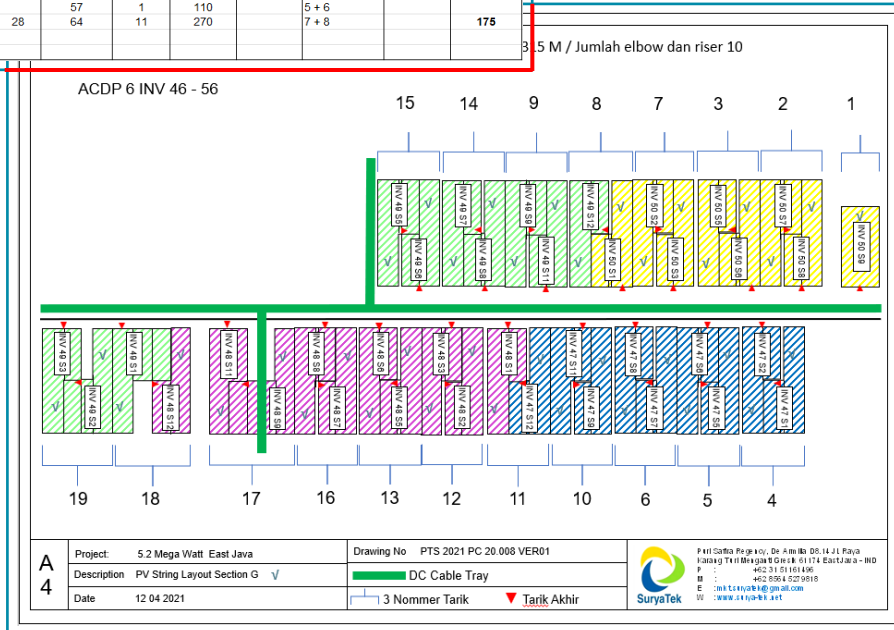
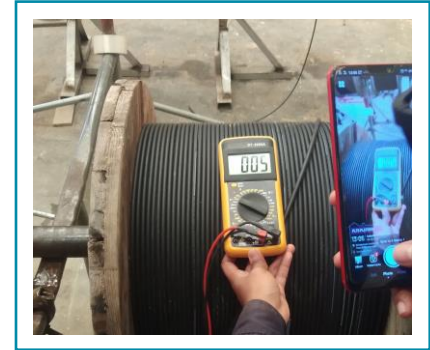
## 5.2 Mega Watt East Java



## 5.2 Mega Watt East Java

No	Section	Pull No	Inverter No	String No	Sisa Kabel Meter	Kabel Baru 1000	Kabel Drum 1/8	Total Drum 80	# String 131
DC Tray 250	45	F	5	51	2	705	1 + 2		
				51	3	705	3 + 4		
				51	5	710	5 + 6		
	44	F	3/4	51	6	710	7 + 8		167
				50	11	390	1 + 2		
DC Tray 400	43	E	2	50	12	390	3 + 4		
				51	1	395	5 + 6		
				56	12	425	7 + 8		171
	43	E	1/2	57	3	100	1 + 2		
				57	2	100	3 + 4		
	C	28		57	1	110	5 + 6		
				64	11	270	7 + 8		175

Pulling 285 km DC String cable requires careful preparation. The shortest length was 130 meters and the longest 400 meters. All string cables are made of 1 piece. PT SuryaTek made the Pull Scheme. We installed four strings per pull.



## 5.2 Mega Watt East Java

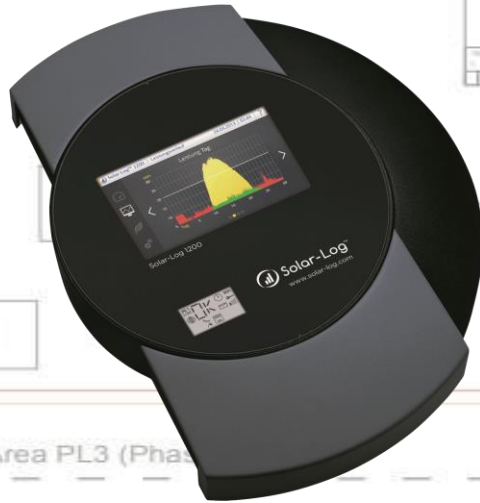




## 5.2 Mega Watt East Java



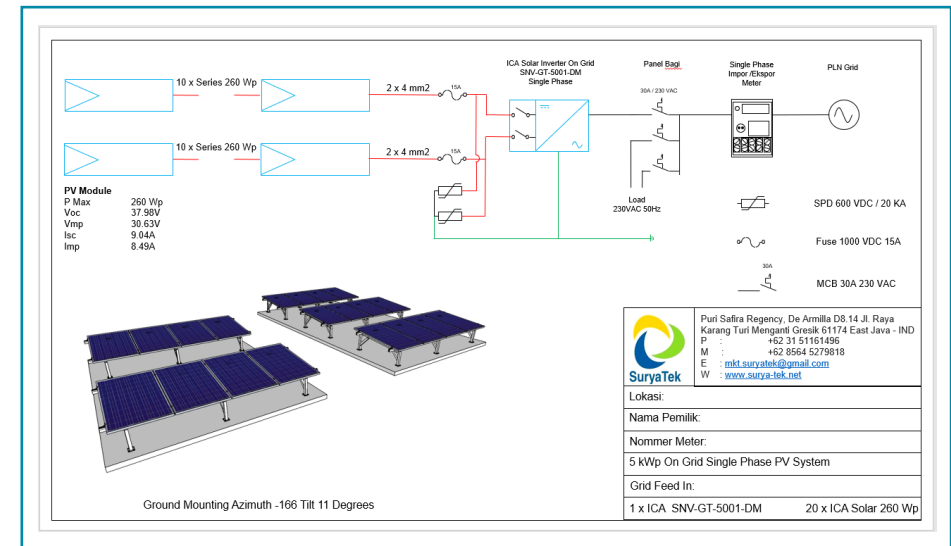
## 5.2 Mega Watt East Java



The complete system is monitored by a Solar Log 2000 System including a pyranometer of Kipp & Zonen.

## 5 kWp Grid Tied Net Metering Bali

Shadow analysis is part of our preparations for a project.  
What is the negative influence of shadow if any?



PT SuryaTek prepared all administrative and technical documents necessary to get approval and permission of the PLN to install the PV System.



## 5 kWp Grid Tied Net Metering Bali



Custom made ground mounting system designed in installed by SuryaTek.

All PV Systems are installed according to SNI Standar Nasional Indonesia and the updated PLN regulations.



## 5 kWp Grid Tied Net Metering Bali



20 x 260 Watt Solar Panels installed. Total capacity 5,200 Watt.

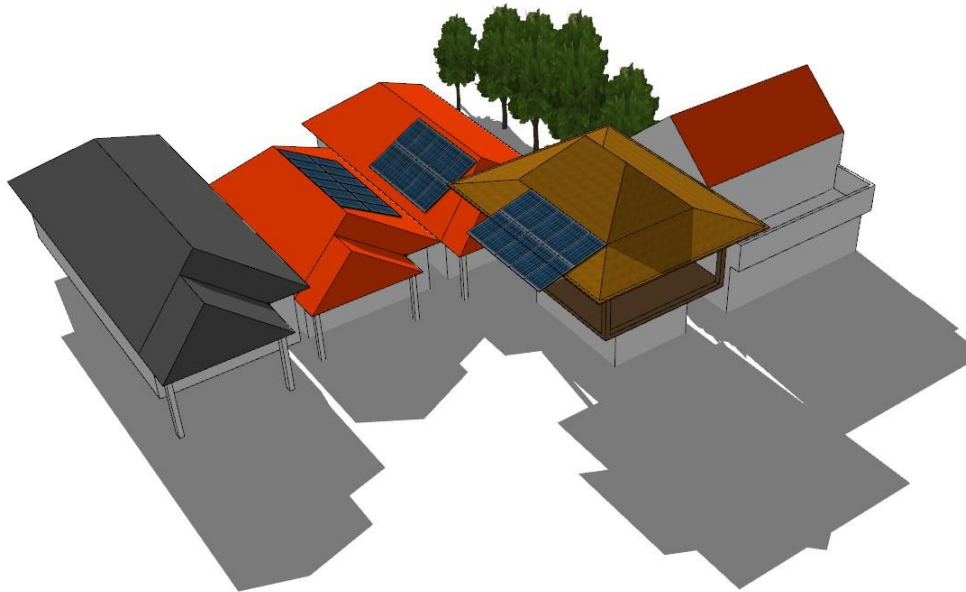


Remote monitoring.

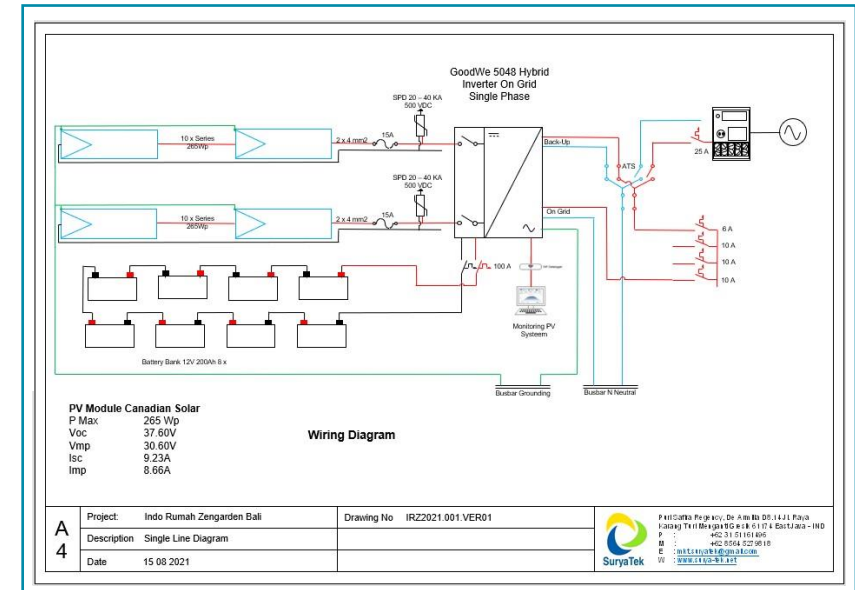
Single Phase 5 KW Inverter.



## 5.2 kWp Grid Tied Hybrid Bali



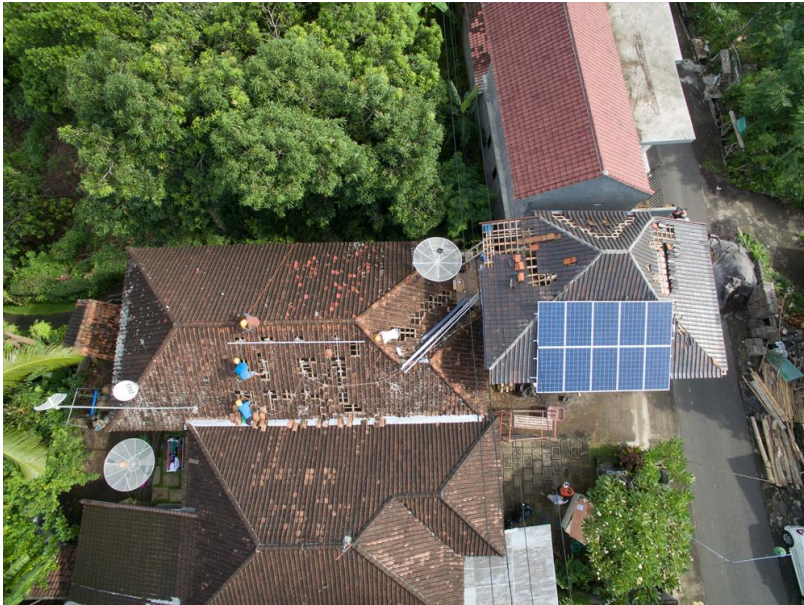
PT SuryaTek submits the application to the PLN and provides all necessary technical and administrative documents.



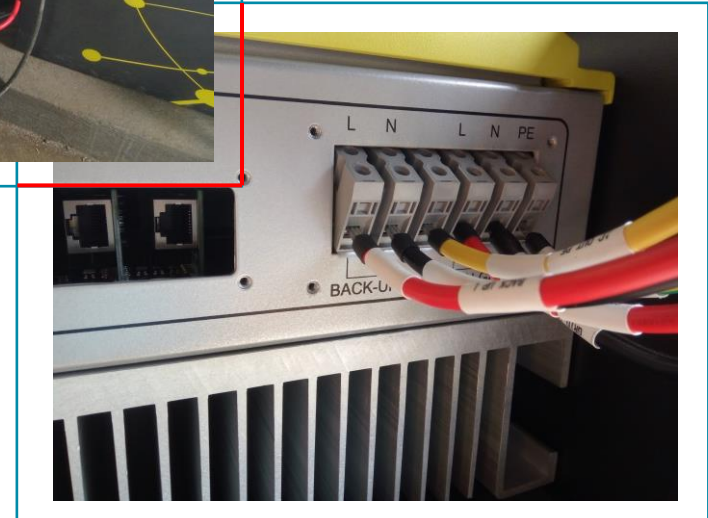
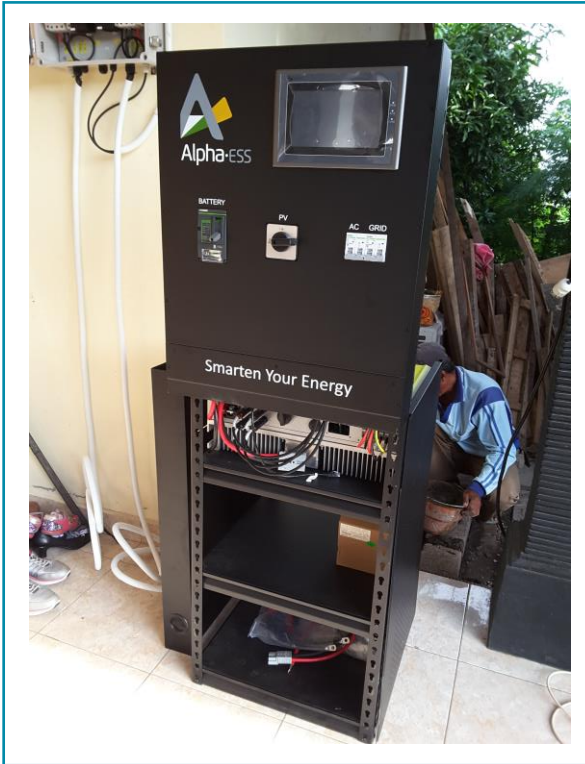
Shadow analysis is part of our preparations for a project. What is the negative influence of shadow if any?



## 5.2 kWp Grid Tied Hybrid Bali



## 5.2 kWp Grid Tied Hybrid Bali



Fully integrated system. Battery bank 19,2 kWh



## 5.2 kWp Grid Tied Hybrid Bali

20 x 265 Watt Solar Panels installed. Total capacity 5,300 Watt.



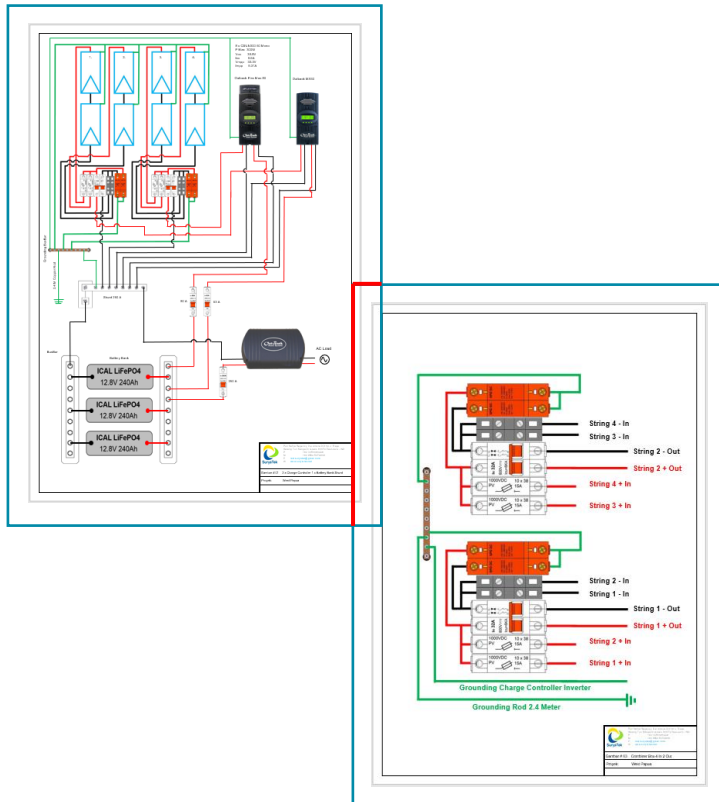
Remote monitoring.





## Plug & Play Service Installation

PT SuryaTek also has many customers in remote areas of Indonesia. Think of West Papua, Sumatra, Kalimantan, etc. These customers depend on good advice and a clear installation manual. PT SuryaTek provides this service.



- 1 Based on the intake PT SuryaTek design's The Off Grid System.
- 2 Everything will be made as much as possible Plug & Play. For example all cables for the battery bank are prepared on length and the terminals will already be attached.
- 3 Components are protected by wooden racks during shipping.
- 4 A clear and complete installation guide will be provided to the client.
- 5 During Installation PT SuryaTek is online available for guidance and questions.

## Plug & Play Service Installation

By applying the Plug & Play Service Installation concept, PT SuryaTek has already helped many remote customers with a well-functioning Off Grid PV System.



## About SuryaTek

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❖ Consultation



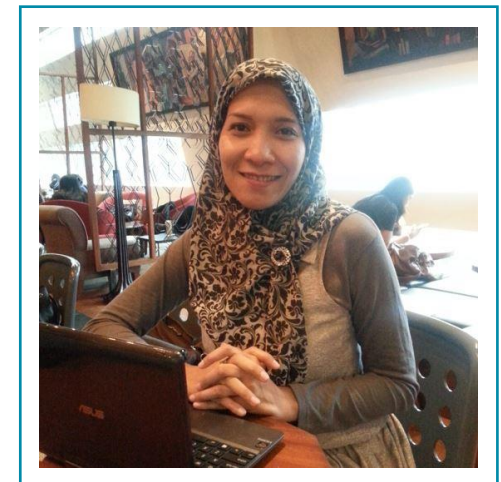
❖ Design



❖ Installation



❖ Maintenance



*Lismawati van 't Wout,  
Owner Founder PT SuryaTek*