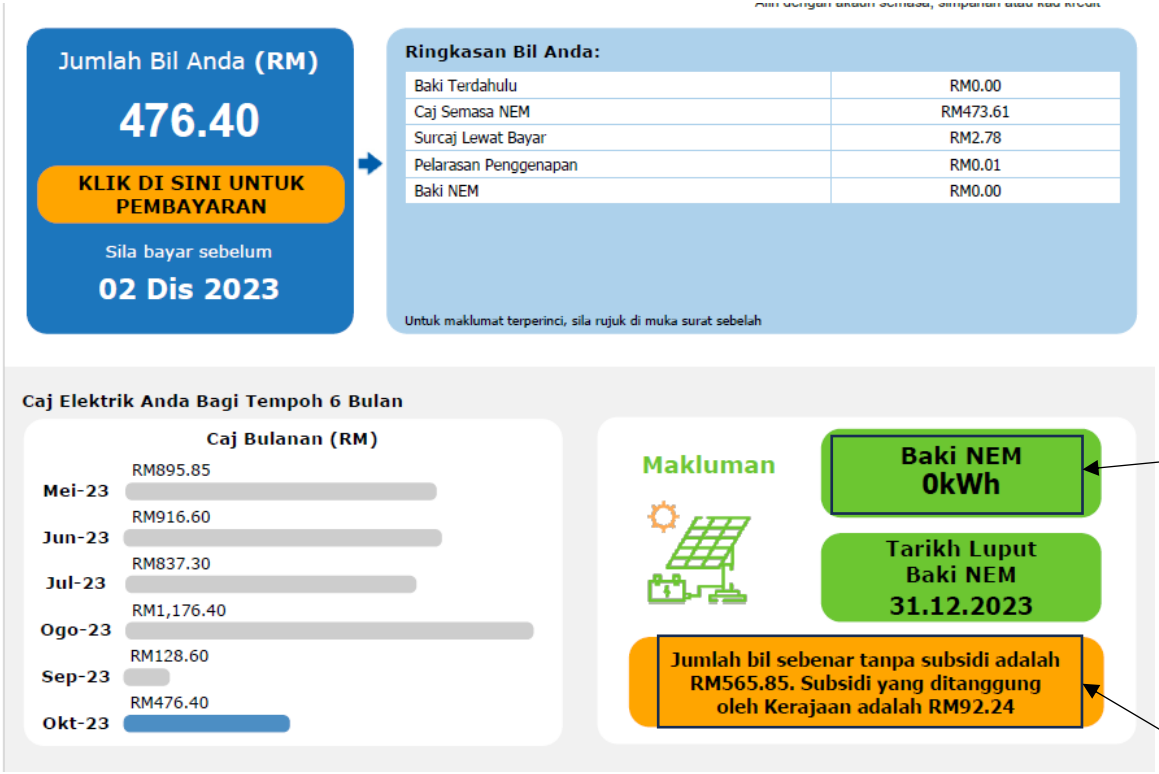
How to read NEM meter

01: Import value

51: Export unit

How to read tnb bill



The excess electricity from a month

After install the solar system, client still can entitle the subsidy from gov, but the amount is reduced due to the energy usage reduced.

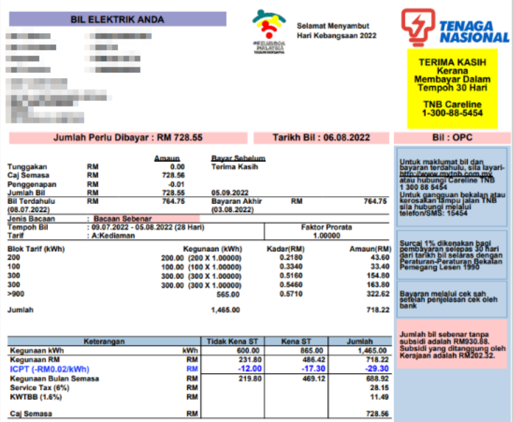
Subsidy calculation

Jumlah subsidi bahan api

= (Kadar surcaj ICPT sebenar – Kadar ICPT berdasarkan kategori pelanggan) x penggunaan bulanan dalam kWj
= [RM0.1181 – (-RM0.02)] x 1,465kWj
= RM202.32

Jumlah bil sebenar tanpa subsidi

= Caj Semasa + Jumlah Subsidi Bahan Api
= RM 728.56 + RM202.32
= RM 930.88



BIL ELEKTRIK ANDA

Selamat Menyambut Hari Kebangsaan 2022

TENAGA NASIONAL

TERIMA KASIH Kerana Membayar Dalam Tempoh 30 Hari

TNB Careline 1-300-88-5454

Jumlah Perlu Dibayar : RM 728.55 | Tarikh Bil : 06.08.2022 | Bil : OPC

		Amaun	Bayar Sebelum		
Tunggakan	RM	0.00	Terima Kasih		
Caj Semasa	RM	728.56			
Penggenapan	RM	-0.01			
Jumlah Bil	RM	728.55	05.09.2022		
Bil Terdahulu (08.07.2022)	RM	764.75	Bayaran Akhir (03.08.2022)	RM	764.75

Jenis Bacaan : Bacaan Sebenar
Tempoh Bil : 09.07.2022 - 05.08.2022 (28 Hari)
Tarif : A:Kediaman
Faktor Prorata 1.00000

Blok Tarif (kWh)	Kegunaan (kWh)	Kadar(RM)	Amaun(RM)
200	200.00 (200 X 1.00000)	0.2180	43.60
100	100.00 (100 X 1.00000)	0.3340	33.40
300	300.00 (300 X 1.00000)	0.5160	154.80
300	300.00 (300 X 1.00000)	0.5460	163.80
>900	565.00	0.5710	322.62
Jumlah	1,465.00		718.22

Keterangan		Tidak Kena ST	Kena ST	Jumlah
Kegunaan kWh	kWh	600.00	865.00	1,465.00
Kegunaan RM	RM	231.80	486.42	718.22
ICPT (-RM0.02/kWh)	RM	-12.00	-17.30	-29.30
Kegunaan Bulan Semasa	RM	219.80	469.12	688.92
Service Tax (6%)	RM			28.15
KWTBB (1.6%)	RM			11.49
Caj Semasa	RM			728.56

Untuk maklumat bil dan bayaran terdahulu, sila layari- http://www.mytnb.com.my atau hubungi Careline TNB 1 300 88 5454
Untuk gangguan bekalan atau kerosakan lampu jalan TNB sila hubungi melalui telefon/SMS: 15454

Surcaj 1% dikenakan bagi pembayaran selepas 30 hari dari tarikh bil selaras dengan Peraturan-Peraturan Bekalan Pemegang Lesen 1990

Bayaran melalui cek sah setelah penjelasan cek oleh bank

Jumlah bil sebenar tanpa subsidi adalah RM930.88. Subsidi yang ditanggung oleh Kerajaan adalah RM202.32.

Maklumat Meter

No. Meter	Bacaan Meter		Penggunaan	Unit
	Dahulu	Semasa		
M HOL1032304000814	732	1,765	1,033	kWh (E)
M HOL1032304000814	1,102	2,770	1,668	kWh (I)
M HOL1032304000814	8	15	7	kW
M HOL1032304000814	318	838	520	kVARh

kWh (E) ← Jumlah export , "51" in NEM meter

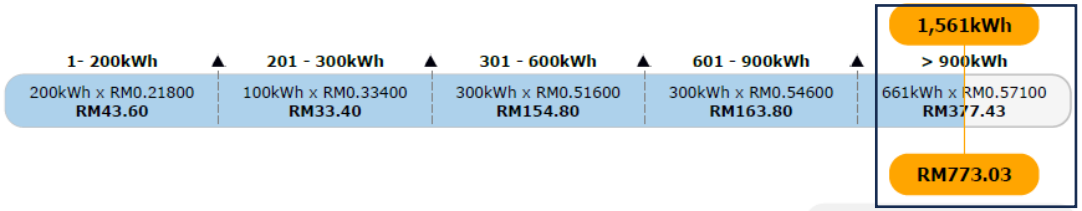
kWh (I) ← Jumlah import, "01" in NEM meter

kW ← Maximum Demand(for record purpose)

kVARh ← measure the consumption of reactive power in an electrical system(record purpose)

Dahulu ← The data from last month (eg. 31/11)

Semasa ← The data from this month (eg. 31/12)



Imported unit
- The electricity supplied by tnb

Lebihan Tenaga yang Dijana Anda

Blok (kWh)	Penjanaan (kWh)	Kadar (RM)	Jumlah (RM)
200	0	0.2180	0.00
100	0	0.3340	0.00
300	75	0.5160	38.70
300	300	0.5460	163.80
>900	661	0.5710	377.43
Jumlah	**1,036**		**579.93**

Exported unit
- Electricity from solar, but it's the excess from the daytime usage

Keterangan		Tanpa ST	Dengan ST	Jumlah
Jumlah Penggunaan Anda (1,561 kWh)	RM	231.80	541.23	773.03
ICPT (RM0.10/kWh)	RM	60.00	96.10	156.10
Caj Penggunaan Bulan Semasa	RM	291.80	637.33	929.13
Service Tax (8%)	RM			50.99
Kumpulan Wang Tenaga Boleh Baharu (1.6%)	RM			12.37
Lebihan Tenaga yang Dijana	**RM**	**-579.93**		**-579.93**
Nett Offset	RM			0.00
Caj Semasa	**RM**			412.56

Cukai Perkhidmatan 8% dikenakan kepada pelanggan kediaman (Tarif A) bagi penggunaan melebihi 600 kWh untuk tempoh bil 28 hari dan ke atas

For the service tax, only if the Jumlah import is more than 600 units, it will have 8% charges.

Calculation method:

RM 637.33 x 8% = RM 50.99

Saluran Pembayaran

- **myTNB**
- **PERBANKAN INTERNET**
- **EPAY** (Petronas, KK Mart, Caltex)
- **KIOS @ KEDAI TENAGA**
- **e-WALLET** (Boost, Touch 'n Go eWallet)

Perlu Bantuan?

- **1-300-88-5454** Pertanyaan akaun dan bil
- **15454** Gangguan bekalan elektrik di rumah dan lampu jalan
- **tnbcareline@tnb.com.my**
- **TNB CareLine**
- **Tenaga_Nasional**

Untuk maklumat lanjut, sila layari www.mytnb.com.my

KWTBB: RE Fund is a fund collected by the Government through consumer's electricity consumption. The Fund will be used to promote growth of electricity generation from renewable energy resources. It's 1.6% rate charges.

Calculation method:
RM 773.03 x 1.6% = RM 12.37

How to read solis apps

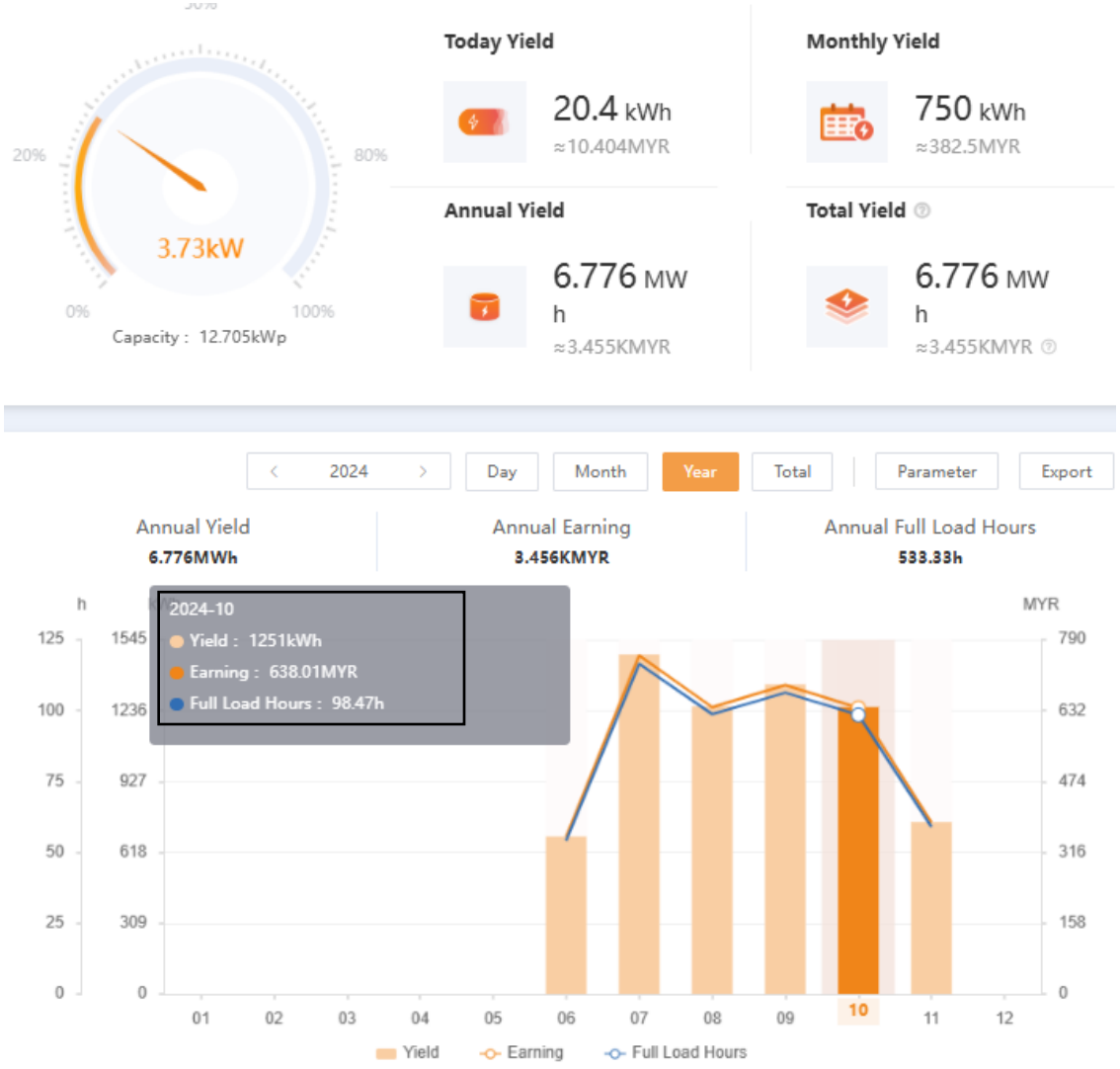
Direct consumed unit: 1251kWh – 1036kWh = 215 kWh

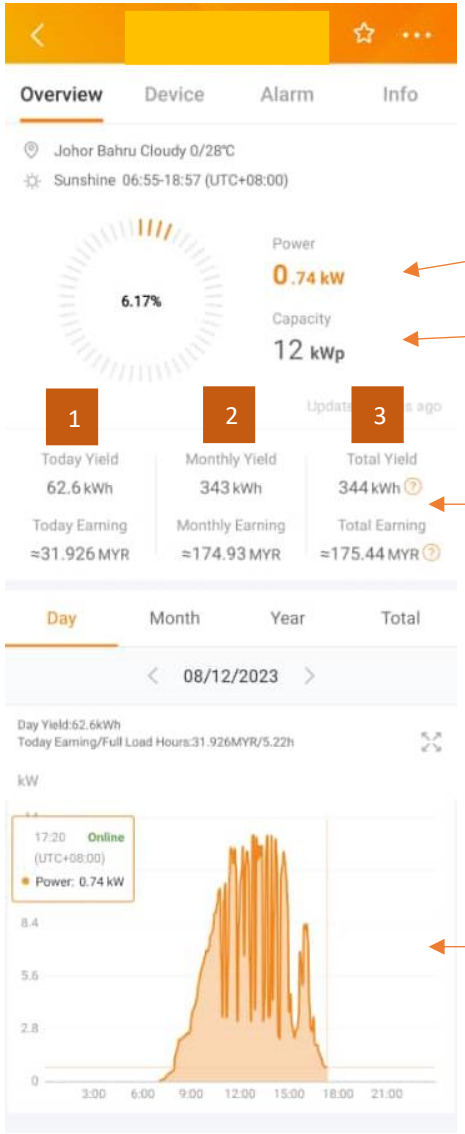
215kWh x 0.571 = RM 122.765

Explanation: Based on this month usage, if without solar, you might need to pay around RM 1,073.40

RM 122.765+RM 773.03 + RM 177.60 {(1561+215)x0.1)}=RM1073.40

Remarks: This calculation haven't include the increase of ST and KWTBB.





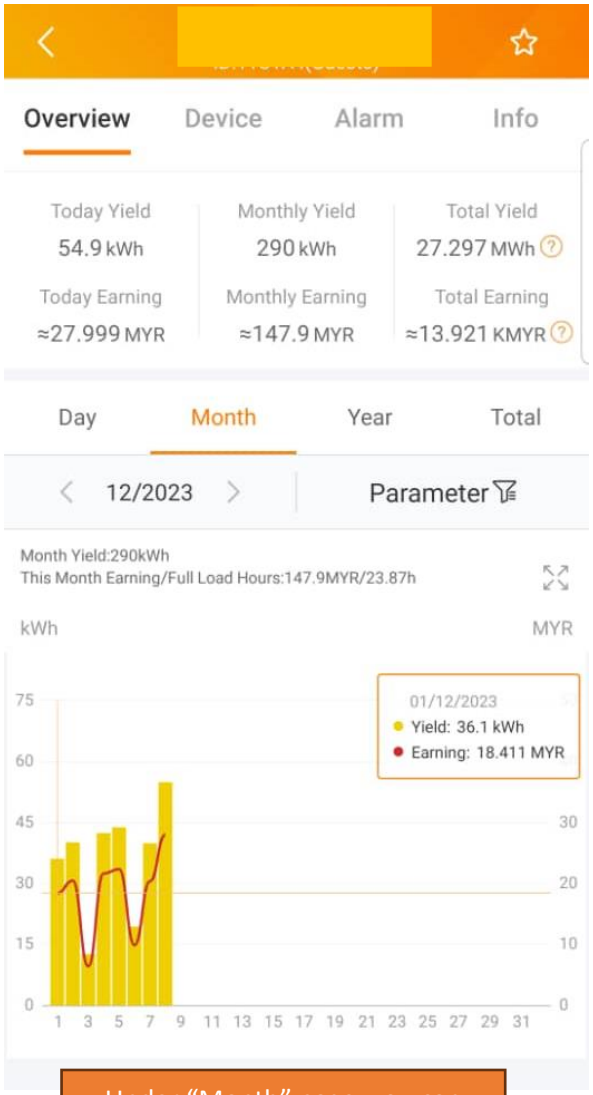
Current solar power (In the form of AC)

Installed capacity in kWp (in the form of DC)
PS: our system size in proposal is in kWDC

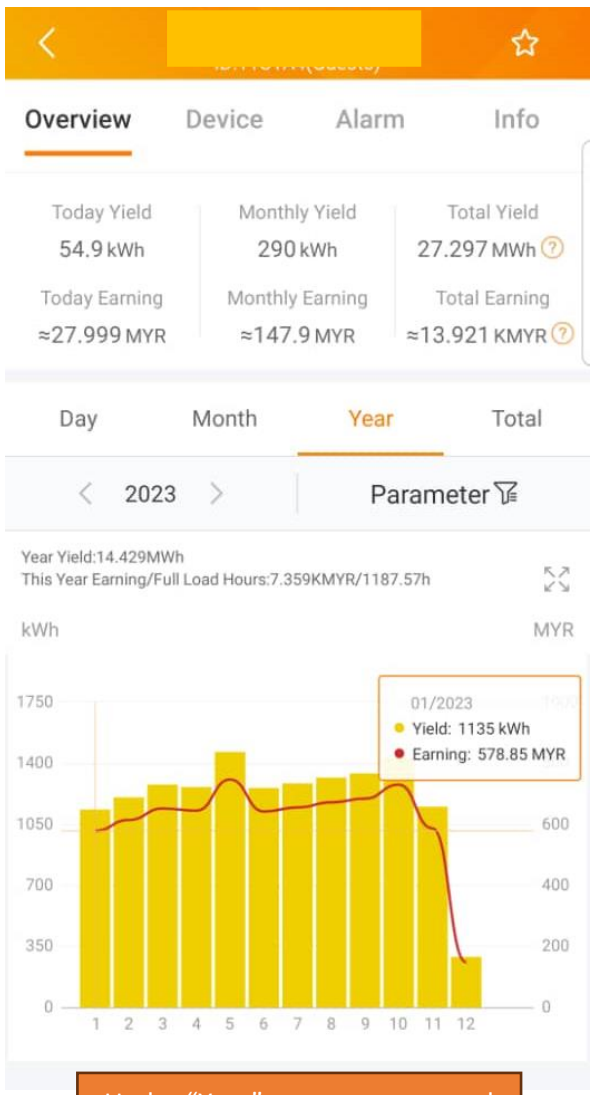
1	2	3
Today Yield: The total solar generation **on the day**	Monthly Yield: Total solar generation in a month Monthly Yield: Total solar generation **in a month**	Total Yield: Total solar generation **from the day inverter started to now.**

Earning is based on RM 0.51 / kWh (average tariff rate in tnb bill)

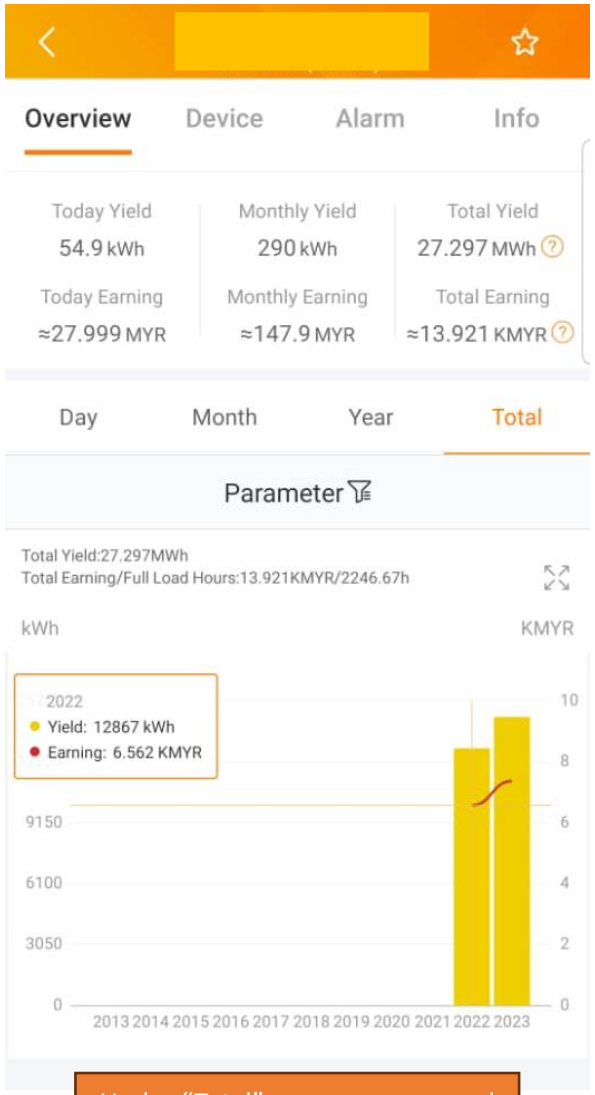
Graph of power in every 5 minutes



Under “Month” page, you can read the total yield for each of the **day (1st to 31st)**

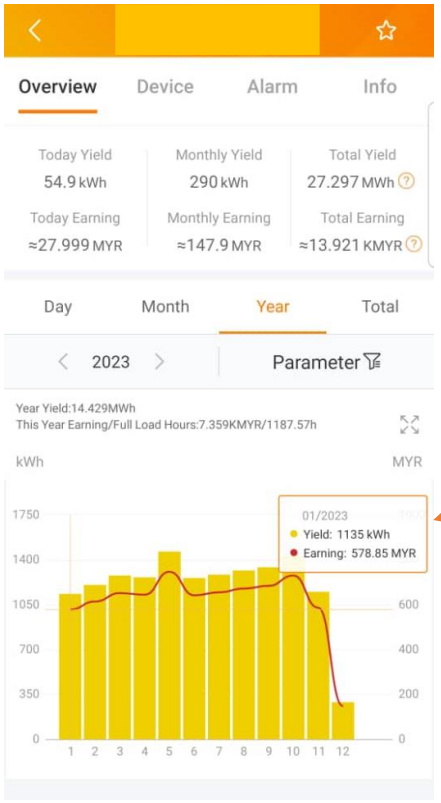


Under “Year” page, you can read the total yield for each of the **month (Jan to Dec)**



Under “Total” page, you can read the total yield for each of the **year**

How to check the system performance and compare with our calculated generation?



For example:

This client installed 12.21kWp system.

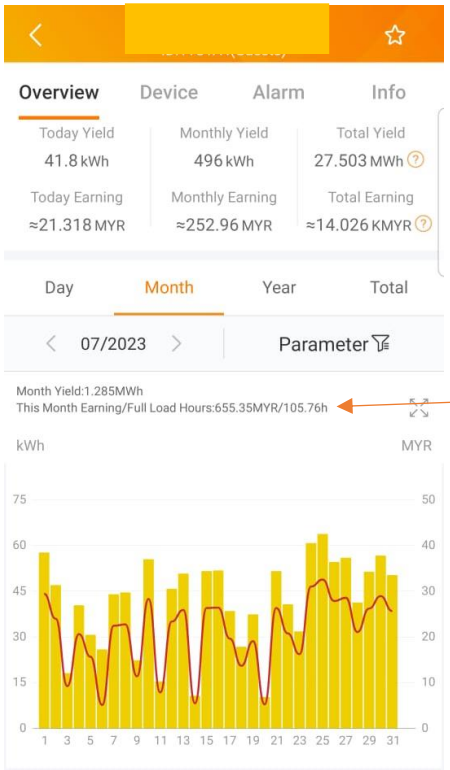
Estimated generation: 1232 kWh

Based on the January generation: 1135 kWh

% different = $\frac{Estimated\ yield - actual\ yield}{Estimated\ Yield} x100$

= $\frac{1232-1135}{1232} x100$

= 7.87%



Full load hours = peak sun hours in a month

PSH = when the sun's intensity is an average of 1,000 watts of photovoltaic power per square meter

For this case is 105.76 hours.

To check the average peak sun hour for 1 day is 105.76/ 31 = 3.41 hrs

PS: our calculation is using 3.2hrs/day

The common failure that will trigger alarm:

Alarm Message	Failure description	Solution
No power	Inverter no power on LCD	1.Check PV input connections 2.Check DC input voltage (single phase >120V, three phase >350V) 3.Check if PV+/- is reversed
LCD show initializing all the time	Can not start-up	1.Check if the connector on main board or power board are fixed. 2.Check if the DSP connector to power board are fixed.
OV-G-V01/02/03/04	Over grid voltage	1.Resistant of AC cable is too high. Change bigger size grid cable 2.Adjust the protection limit if it's allowed by electrical company.
UN-G-V01/02	Under grid voltage	
OV-G-F01/02	Over grid frequency	1.Use user define function to adjust the protection limit if it's allowed by electrical company.
UN-G-F01/02	Under grid frequency	
G-IMP	High grid impedance	
NO-GRID	No grid voltage	1.Check connections and grid switch. 2.Check the grid voltage inside inverter terminal.
OV-DC01/02/03/04	Over DC voltage	1.Reduce the module number in series
OV-BUS	Over DC bus voltage	1.Check inverter inductor connection 2.Check driver connection
UN-BUS01/02	Under DC bus voltage	
GRID-INTF01/02	Grid interference	1.Restart inverter 2.Change power board
OV-G-I	Over grid current	
IGBT-OV-I	Over IGBT current	
DC-INTF OV-DCA-I	DC input overcurrent	1.Restart inverter 2.Identify and remove the string to the fault MPPT 2.Change power board
IGFOL-F	Grid current tracking fail	1.Restart inverter or contact installer.
IG-AD	Grid current sampling fail	
OV-TEM	Over Temperature	1.Check inverter surrounding ventilation. 2.Check if there's sunshine direct on inverter in hot weather.

Over grid voltage: The voltage from the grid(tnb) is **higher** than normal operating range. It will auto recover after few minutes when the tnb electricity back to normal.

Under grid voltage: The voltage from the grid(tnb) is **lower** than normal operating range. It will auto recover after few minutes when the tnb electricity back to normal.

No-Grid:

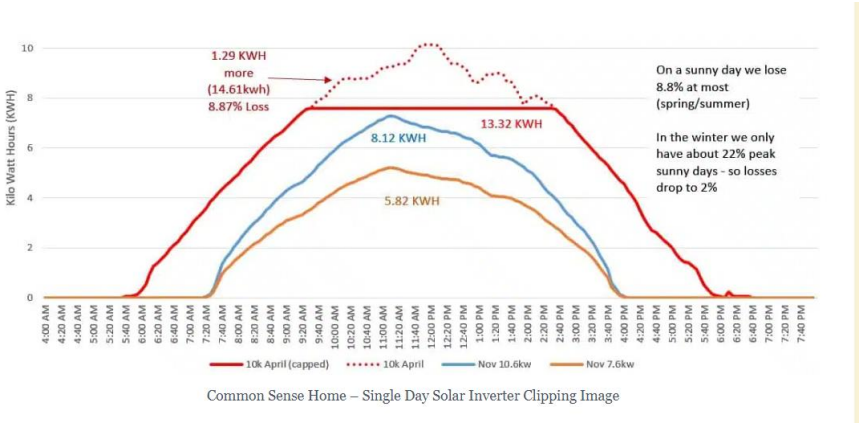
(1) The inverter is not detecting any AC (grid) voltage
(2) the inverter DC switch was turned on before the AC switch was.

Power: the rate at which work is performed, energy per unit of time

$$P = \frac{\Delta E_{sys}}{\Delta t}$$, Watt in unit (kW)

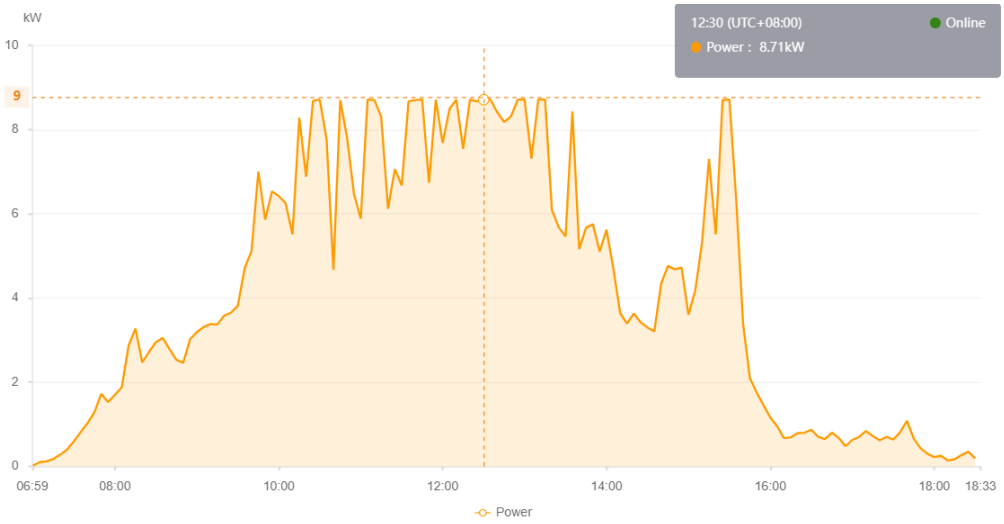
Energy: the amount of work that can be performed, kWh

Energy Clipping: Solar clipping happens when solar electric (photovoltaic) panels provide more power than an inverter can handle. Clipping is lost power production



Common Sense Home – Single Day Solar Inverter Clipping Image

Actual sample for energy clipping, for the client who install 16.65kWp system, but install 8kW inverter capacity.



The maximum capacity reached is around 8.8kW which is about 10% more than the installed capacity.

Question 1:
How to read the bill?
Ans: Blue colour one is imported unit, which means it's the electricity supplied by tnb ; green column there record the exported unit, which is the excess electricity from solar during day time.

Question 2:
Why the bill shows the electricity from solar is so low around 200 kWh only, but from apps shows 550kWh?
Ans: It's normal, as from the apps, the data shown is the total yield from the solar system , but from the tnb bill, the "Jumlah Export" is the excess electricity from solar during day time. (Help the client to recall how solar system work) As during day time, when solar system start generating electricity, our home appliance will prior choose to use the electricity from solar, if the electricity from solar is more than the current usage, then the excess will export to tnb, so that's why the exported unit is surely not equal to the total yield.

Question 3:
Why the power in the apps never reach the installed capacity ??
Ans:

16.65 kWp is peak dc power from solar panel (when sun irradiance is 1000W/m2, temperature is 25 degree Celsius)

9.8 kW is AC power (after conversion from inverter)

There is losses during conversion from dc to ac power (can go up to 20%).

Few main cause of losses:

1. temperature losses from solar panel (0.34% per degree increased for solar panel surface temperature above 25℃, during super hot day, panel surface temperature can go up to 75℃ which is 0.34*(75-25) = 17% losses)
2. inverter conversion losses - about 2%
3. cabling losses - less than 1%

So it's normal that the power cannot reach 16.65kWp (DC) , and we had taken into account when doing the calculation.

Question 4:
Why I my bill is still high?
Action to do before pass to PE:

1. check if the client get the ICPT (RM 0.1/kwh) charges, if yes, then it's normal
2. check the timeline of the first tnb bill as sometimes the meter is changed in the mid of the month so the data is not accurate
3. if it is full of the month, then ask the client whether the family member use more electricity after install solar system
4. if the client say no, check the total generation from the yield
    - if the generation is higher than estimation, then it's a good new to client and also means that the high bill is not from solar system
    - if the generation is lower within 20%, you can check the previous few months data OR check the other clients data which nearby their house. If the generation for both of them is lower, high change the reason is due to weather issue.
    - if more than 20% different from the estimation in the proposal, then pass to PE