

PART 1: INSTALLATION CHECK

DATE OF ASSESSMENT : - TIME (START) : _____ TIME (END) : _____

PART 2: OBJECTIVE

This study is prepared in accordance to Guidelines for Solar Photovoltaic Installation Under The Programme of Solar Rakyat Sabah. The study is to present the technical feasibility of Solar PV interconnection based on SESB's latest network.

PART 3: STANDARD REFERENCES

Refer to the Sabah Distribution Code by Energy Commission of Sabah (ECoS) for Steady-State Supply Voltage Variation under normal conditions in frequency 50Hz with a range of $\pm 1\%$ shall be planned to maintained as follows:

(a) **Low Voltage (LV)** : 400V and 230V within +10% and -6% of nominal voltage.

Low Voltage	ECoS Requirement	
	Min	Max
400V	376.0V	440.0V
230V	216.2V	253.0V

Frequency	ECoS Requirement	
	Min	Max
50Hz	49.5Hz	50.5Hz

In addition to industry regulatory rules, Sabah Electricity adopt the following standards which require full compliance by developer, where applicable:

- a) Sabah Distribution Code issued by Energy Commission of Sabah ('ECoS');
- b) MS 1837:2018 – Installation of Grid-Connected Photovoltaic ('PV') System;
- c) MS IEC 61727:2010 – Photovoltaic Systems: Characteristics of Utility Interface; and
- d) IEEE 1547:2018 – Standard for Interconnecting Distributed Resources with Electric Power Systems.
- e) Sabah Electricity – Technical Guideline for Indirect Solar PV Power Generation for Net-Energy-Metering @ Solar Rakyat Sabah.

PART 4: DETAILS OF PROPOSED SOLAR-PV PLANT

CUSTOMER NAME : _____

INSTALLATION ADDRESS : _____

(GPS) : _____ AREA/ STATION : _____

SESB ACCOUNT NUMBER :

CAPACITY LIMIT : ☐ Single Phase (1-Phase); **up to 5kWac**
☐ Three Phase (3-Phase); **up to 10kWac**

PART 5: INTERCONNECTION ANALYSIS – COMPLETED BY SABAH ELECTRICITY

The analysis is carried out during site visit at the premise based on without Solar PV connection.

a) Voltage performance at the premise.

PROPOSED CONNECTION – Please Tick (v)						Power Factor
	Phase	Voltage		Phase	Voltage	
1-Phase (230V) ☐	Red	(V)	3-Phase (400V) ☐	Red	(V)	
	Yellow	(V)		Yellow	(V)	
	Blue	(V)		Blue	(V)	
The voltage is: ☐ Balance ☐ Imbalance			The voltage is: ☐ Balance ☐ Imbalance			

b) Any Solar-PV Scheme available within area (limited to 1-premise on the both side and opposite).

- ☐ Yes. (Please State: _____)
- ☐ No.

PART 6: SABAH ELECTRICITY'S AUTHORISED SIGNATURE**A. Clearance Recommendation**

Based on the assessment above:

- ☐ **Approved** – Consumer is eligible for Solar Rakyat Program submission.
- ☐ **Pending** – Additional Technical documentation/clarification required.
- ☐ **Rejected** – Site Assessment does not meet eligibility criteria.

Reason for Pending/Rejection:

B. Assessed by (Estimator Staff)

Signature : _____

Name : _____

Designation : _____

Date : _____

C. Verified by (Supervisor/Manager)

Signature : _____

Name : _____

Designation : _____

Date : _____

PART 7: OPERATIONAL REQUIREMENTS, PROTECTION & CONTROL

A) Automatic Disconnection (anti-islanding)

Solar-PV Plant is to be automatically electrically disconnected from all Sabah Electricity's system following any fault on Sabah Electricity's distribution system (loss of mains). This is to ensure operational safety due to risk of back-energization and out-of-phase switching by Sabah Electricity.

As such, the Solar-PV Plant has to be equipped with appropriate protection schemes to detect loss of supply. Inverter units have to be able to isolate themselves within 2 seconds.

B) Synchronization Point and Procedure

The point of synchronization to Sabah Electricity's system shall be located on the generator side. Sabah Electricity shall not have any facility for synchronizing with the RE Plant operating in an islanded mode. Appropriate interlocking scheme is to be put in place to ensure that operation of point-of-common-couplings could be done safely.

Following a system failure, re-synchronizing by RE to Sabah Electricity's system shall only proceed once the system is restored to the normal state. Reconnection shall only be done after Sabah Electricity supply is stabilized. The inverter units are to be reconnected after 2 minutes of Sabah Electricity network restored.

C) Protection at Network Interface

Solar-PV Plant shall be disconnected upon any divergence of operating limits or developer's internal failure. Adequate protection relays are to be made available by the Solar-PV developer as required by Sabah Electricity.

The proposed protection scheme and setting from the Solar-PV Plant to Sabah Electricity substations shall be submitted for review and approval by Sabah Electricity. This is to ensure proper coordination and integrity of the overall protection system at the interface points.

D) Metering Point and Systems

The metering point is at the point of connection. Details and full scope of the metering scheme is not part of this report.

E) Operation During Contingency

The scope of this report is based on the proposed normal open point. Operation of Solar-PV source at other open point requires separate study.

Therefore, during contingency (breakdown or shutdown), the Solar-PV source is to be isolated until the normal open point is restored.

PART 8: OTHER TECHNICAL REQUIREMENTS FOR COMPLIANCE BY APPLICANT

Other general requirements to comply by the developer or ECCPV(GC) shall include as follows:

- This Site Assessment is valid only **one (1) month** to get Solar Rakyat Certificate from Energy Commission of Sabah (ECoS);
- The installation requires a license as stipulated under the "Guidelines on Licensing Under Section 8 of the Enactment";
- The Solar Rakyat installation shall comply with the prevailing standard and Energy Commission of Sabah (ECoS) Guidelines for Solar Photovoltaic Installation Under The Programme of Solar Rakyat Sabah;
- All electrical drawings are to be endorsed by Professional Engineer ('PE');
- The Solar Rakyat System shall not export to grid during 06:00pm to 06:00am not adversely impact the quality of supply;
- The developer is required to ensure that contribution to fault current is minimized;
- Sabah Electricity shall have access to the consumer meter and Net-Energy meter at any time required;
- The inverter(s) are equipped with anti-islanding function which only energizes when the grid is active;
- The proposed power plant shall be able to operate with power factor not less than 0.85 lagging and 0.95 leading;
- The proposed power plant shall install the capacitor banks if the Solar PV System affecting grid performance and/or introduce frequent harmonic distortions.
- The developer shall prove the anti-islanding capability of the plant during pre-commissioning test;
- The developer should follow the existing procedures and relevant technical requirements for the testing and commissioning of Grid Connected PV System based on type of inverter and capacity;
- The developer shall invite Sabah Electricity for the Testing & Commissioning (T&C) and the letter of invitation shall be issued at least two (2) weeks before the date of T&C;
- All Solar Rakyat registration documents and pre-commissioning test reports as Part 8 (k) shall be submitted with the letter of invitation;
- Sabah Electricity shall have access to the consumer meter and Net-Energy meter at any time required;
- All related costs associated with the Solar Rakyat installation and/ or metering shall be fully borne by the applicant;
- Should any of the above conditions are not complied, Sabah Electricity shall have the right to revoke this connection approval;
- Notwithstanding the above, Sabah Electricity shall not be liable for any damages caused by or to the installation.

SOLAR RAKYAT APPLICANT

NEW BUSINESS & MARKETING (SABAH ELECTRICITY)

NAME :
NRIC :
DATE :

NAME :
STAFF ID :
DATE :