Kementerian Utiliti
SARAWAK

ENGINEERING CIRCULAR: EC/ESD/01/2021

GUIDELINES FOR SOLAR PHOTOVOLTAIC INSTALLATION ON NET ENERGY METERING SCHEME

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Kementerian Utiliti
SARAWAK

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1. SCOPE

This Engineering Circular provides requirements and guidelines for solar photovoltaic installation under the Net Energy Metering (NEM) scheme. NEM is a mechanism for non-licensed solar photovoltaic (PV) prosumer to install PV system at their premises and connect to the Grid. The prosumer can offset the electricity consumed with the electricity exported to the grid during the applicable billing period.

2. INTERPRETATION

In these Guidelines, the following are applicable terms used for the NEM scheme.

Billing Cycle or Billing Period	means the period for which electricity bill is prepared and issued to the prosumers by licensee.
Common Connection Point (CCP)	means the point of connection between utility system and prosumer.
Direct Connection	means a renewable energy installation is connected directly to the Grid distribution supply line. The renewable energy system is separate from the internal prosumer network.
Director	means the Director of Electricity Supply, and includes any person who is acting or temporarily discharging the duties of that office.
Distribution Licensee	means Syarikat SESCO Berhad (SESCO), who is the holder of a license to generate, transmit, distribute and supply electricity in Sarawak issued under the Electricity Ordinance (Cap. 50) and any subsequent amendments thereof. The Distribution Licensee will be the implementing agency for the NEM scheme.
Energy	means electrical energy or electricity measured in kWh.

kWp	means kilowatt peak. Rated kWp in relation to a PV installation means the maximum direct current power such installation can produce under standard test conditions of 1000 watts per square meter of solar irradiation at 25 degrees Celsius ambient temperature.
NEM Assessment Study or NEMAS	means a technical analysis carried out by the Distribution Licensee /qualified consultants to assess the potential impact of the distributed generation on the planning and operation of the Distribution Licensee's distribution system.
NEM Contract	means an agreement entered into between the prosumer and the Distribution Licensee for connecting the rooftop solar PV system on the premises of the prosumer to the Grid distribution system.
NEM Prosumer	means an eligible electricity consumer who install solar PV power generation system under NEM scheme at their premises.
Net Energy Metering or NEM	means a mechanism where an eligible prosumer installs a solar PV system primarily for his own use and the excess energy to be exported to the grid for which credit to be received that may be used to offset part of energy provided by the Distribution Licensee to the electricity prosumer during the applicable billing period.
Net Excess Electricity/Energy	means all electricity produced by a NEM Prosumer measured in kilowatt hour (kWh) over a 24-month period that exceeds the amount of electricity consumed by that NEM Prosumer and exported to the Distribution Licensee.
Net Export Capacity	means the maximum level of electrical power which a solar PV system can deliver to the Grid distribution system at the common Connection Point.

2.1 These Guidelines shall apply to:

(i) any grid-connected electricity consumer seeking approval for installing solar PV generating facility to the distribution network in Sarawak through NEM scheme;

(ii) any grid-connected electricity prosumer who have installed a solar PV system in his premises before the NEM scheme is introduced; and

(iii) the Distribution Licensee, whose distribution network is to be connected with the NEM Prosumer.

3. NEM Scheme Mechanism

3.1 Under the NEM, energy generated from solar PV can be exported back to the grid on a "one-on-one" offset basis. This means that every 1kWh exported to the grid will be offset against 1kWh consumed from the grid.

3.2 The amount of energy generated is credited to the NEM Prosumer account in their monthly electricity bill for sixteen (16) years period on commencement of the NEM Contract. Within the period, the NEM Prosumer is allowed to roll-over any excess Energy generated for every twenty-four (24) months. Any available or unutilized credits for after every twenty-four (24) months will be forfeited and no compensation in any form either from the Government or the Distribution Licensee. After the sixteen (16) years period, the solar PV Installation shall be strictly for self-consumption in the premises where the solar PV Installation is installed, and no offset and roll-over allowed for any excess Energy.

3.3 Upon the commencement of the NEM Contract, any changes made to the system installed at the premises such as increasing the kWp capacity, such changes will not affect the period as mentioned in item 3.2.

4. Eligibility Criteria

4.1 The NEM scheme is open to all Distribution Licensees' customers under the residential, commercial and industrial tariff categories where the applicants are connected to the grid.

4.2 Prosumers who have not paid their bills for more than two months and/or pending meter tampering case are not eligible to apply for NEM scheme.

4.3 The resources for producing electricity shall be from solar PV only without any form of storage such as batteries connected to the system.

5. Types of Installation Allowed

5.1 Installation of PV modules can only be done as per the following:

(i) on the rooftop of building; and

(ii) on the rooftop of garage, car park, and similar buildings.

5.2 For ground-mounted system, it may be allowed on case basis and the installation shall be within the compound of applicant's premises and approved by the Director.

6. Capacity Limit for NEM Prosumers

6.1 For NEM Prosumers, the maximum capacity of the solar PV system is limited to not more than 12kWp for single phase and 20kWp for 3 phase systems, subject to quota availability. However, NEM Prosumer is advised to install the solar PV system with the capacity that generates energy not exceeding 75% of the average consumption for the past 12 months.

6.2 The quota availability is 75% of the total maximum transformer loading in the area from 1100 hours to 1500 hours in the past 6 months. The Distribution Licensee may recommend the quota of an area to be reduced or increased subject to the approval of the Director.

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6.3 For a newly developed residential estate in which the total maximum loading in the area is unable to be determined, the consultant, developer or its representative is advised to consult with the Distribution Licensee on the capacity limit.

7. Connection

7.1 The connection to the Distribution Licensee network will be done through Direct Connection. Figure 1 shows the diagram of direct connection between the NEM Prosumer's solar PV system and the distribution system.

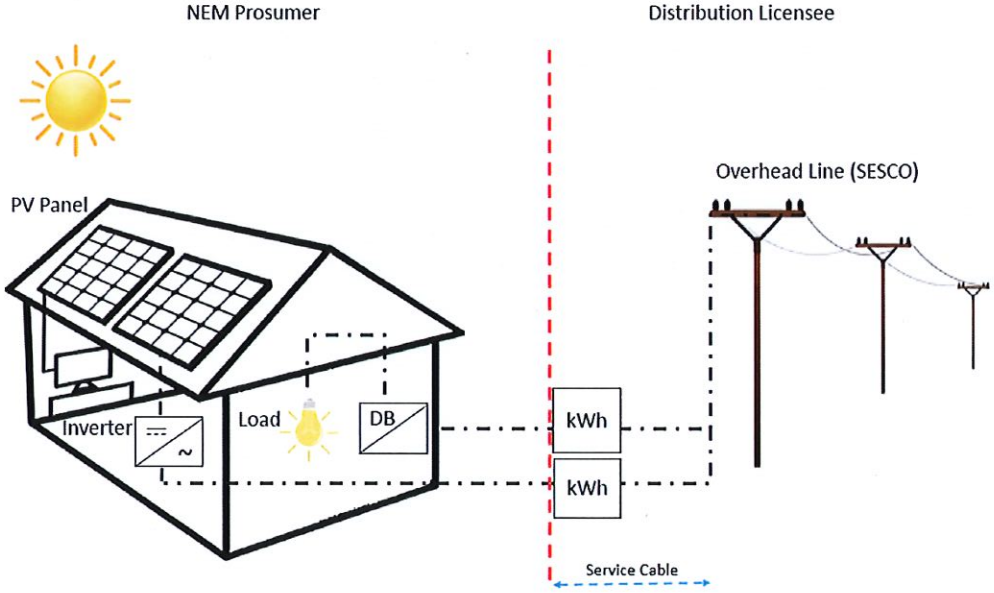

Figure 1: The Direct Feed NEM Approach
(Renewable system/solar system direct feed into Grid)

7.2 For Common Connection Point with the distribution system, the design, equipment, installation works, testing, commission and operation of the solar PV system and the CCP facility shall comply with the Ordinance and the Rules and other relevant legislations, as amended from time to time and any rules, codes, guidelines, directions or orders as may be issued by the Director.

7.3 The NEM Prosumer shall ensure there is no reverse power or back feed from the PV system generating to the Grid. The PV NEM system shall be provided with voltage-sensing automatic disconnection feature when there is no voltage on the Distribution Licensee Grid system.

7.4 The NEM Prosumer shall be responsible for safe operation and maintenance of the solar PV system in its premises up to the cut-out fuse or the termination of service cable connected to the Distribution Licensee supply line at nominal Low voltage of 240 volt or 415 volt. The supply line and equipment beyond the CCP and the metering facilities for measurement of energy supplied by and exported to the distribution system shall be responsibility of the Distribution Licensee.

7.5 Proper labelling shall be provided for the solar PV system (refer to SESCO Grid-Connected Photovoltaic Switching Coordination Operating Practices).

7.6 The Distribution Licensee shall have the right to disconnect the supply at CCP in the event of any danger or risk to the safety, reliability, security or adverse performance to the distribution system which the solar PV system may cause or breaching of any terms and conditions under the Ordinance, Rules and agreements with the Distribution Licensee.

- Provided that the solar PV system shall be reconnected to the distribution system as soon as possible if such danger or risk has ceased or has been alleviated.
- Provided further that no supply to the premises of the NEM Prosumer shall be disconnected unless under circumstances provided for under the Ordinance or any rules under the Ordinance.

7.7 Distribution Licensee undertaking maintenance activities on the distribution line where solar PV NEM system are connected, such activities is carried out as live-line works if all sources of supply from the Utility Licensee and or the NEM Prosumer PV system could not be securely isolated.

7.8 Battery storage is not allowed unless approval of such connection scheme is obtained from the Distribution Licensee.

8. Net Energy Metering Assessment Study (NEMAS)

8.1 Cumulative NEM solar PV installations undertaken simultaneously in an area but the individual unit is within the NEM capacity not requiring license, e.g. large housing estate with all solar rooftop, may require NEMAS.

8.2 The study will determine the technical impact to the Distribution Licensee's electricity distribution network and establish technical and safety requirements that may be necessary for the installation.

8.3 The study is a pre-requisite for NEM application approval and will thus be performed prior to the approval of the NEM application. At this stage the NEM applicant has not yet committed to the physical construction. The findings of the study will assist the NEM applicant to decide on the feasibility of the project.

It will also assist the Distribution Licensee to prepare the technical requirements or necessary modification to the Distribution Licensee network needed for CCP to facilitate the acceptance of energy generated by the installation.

9. Technical Requirements

9.1 NEM Prosumer shall refer to the relevant Malaysian Standard and/or Distribution Licensee Operating Practices for Connection of direct Solar PV Power Generation for Net Energy Metering for any technical requirements and specifications of design, equipment, installation works, testing, commission and operation of the solar PV system and the CCP facility.

10. Metering, Equipment and Arrangement

10.1 Smart electricity meters must be installed for NEM PV installation and used for the purpose of recording the energy consumed and exported to the distribution grid. All meters are the properties of the Distribution Licensee.

10.2 Smart meter charges for NEM are as follows:

Single-phase meter	RM 500
Three-phase meter	RM 1,000

10.3 The NEM Prosumer will bear the costs of the smart meters and system connection/modification (if applicable). The requirement for metering, equipment and its arrangement shall refer to the specifications determined by the Distribution Licensee.

10.4 For new NEM installation in the event that the existing Distribution Licensee's meter is required to be replaced or upgraded, or an additional dedicated PV meter is required to be installed to record PV generation, the cost is to be borne by the NEM Prosumer.

10.5 The subsequent smart meter replacement procedure including the chargeable cost, if any, will be based on the current standard practices of the Distribution Licensee.

11. Testing & Commissioning

11.1 The NEM Prosumer is required to follow testing and commissioning procedure by the Distribution Licensee.

12. Excess PV Energy

12.1 The calculation for the Net excess PV electricity/energy will be based on the following calculation:

Net excess energy (kWh) = Energy Exported to the Distribution Licensee (kWh) - Energy Imported from the Distribution Licensee (kWh)

12.2 The net excess energy shall be allowed to roll over for a maximum of every 24 months. Any available energy credits after every 24 months will be forfeited.

13. Energy Accounting and Settlement

13.1 The Distribution Licensee shall be responsible for billing the NEM Prosumer for each Billing Period.

14. Licensing Requirements

14.1 An installation not exceeding 5 kilowatt (kW) shall be exempted for license if that installation is contained within the premises owned or lawfully occupied by the owner of the installation.

14.2 An installation of 20kWp solar PV system is considered equivalent to 5kW generation installation. In the case of the solar PV system for NEM, the exemption for the licensing of the installation shall not exceed 20kWp and there should not be any form of energy storage for the system.

15. Application

15.1 Application for NEM shall be made to the Distribution Licensee.

15.2 The Distribution Licensee reserved the right to reject NEM application by providing reason to the applicant and the Director.

16. Change of Ownership

16.1 In the case of a NEM Prosumer who intends to sell his/her premise including its solar PV system to a new buyer, the application for change of ownership shall refer to the Distribution Licensee.

17. Relocation or Transfer of Solar PV System

17.1 NEM Prosumer shall not be entitled to transfer any credit amount (if any) to any other accounts of the NEM Prosumer or any third-party account.

17.2 All costs and expenses due to the relocation or transfer of the PV system shall be solely borne by the NEM Prosumer.

18. Arbitration on Technical Matters

18.1 All technical matters, differences, or disagreements whatsoever which may at any time hereinafter arise between the Distribution Licensee and the prosumer in respect of NEM or arising out of or in relation thereto whether as to installation or otherwise shall be referred to the Director.

19. Amendment and Variation

19.1 The Director may at any time amend, modify, vary, or revoke these Guidelines.

20. Effective Date

20.1 The effective date of this Guidelines is 30th August 2021.

Director of Electricity Supply
Ministry of Utilities
Sarawak

Date: 15 July 2021