

EMBRACING SUSTAINABILITY IN BUSINESS OPERATIONS

Opportunities in Renewable Energy (RE) Generation for Self-Consumption under NEM 3.0 Programme



What is the NEM 3.0 Programme?

Eligible TNB consumers can install rooftop solar photovoltaic (PV) installation to generate electricity for self-consumption with excess energy being sold to TNB. 3 types of programme being offered, with a total quota allocation of up to 500MW:

<p>NEM Rakyat</p> <p>Up to 100MW is allocated for domestic consumers of TNB</p> <p>1 February 2021 - 31 December 2023</p>	<p>NEM GoMEn</p> <p>Up to 100MW is allocated for governmental agencies</p> <p>1 February 2021 - 31 December 2023</p>	<p>Net Offset Virtual Aggregation (NOVA)</p> <p>Up to 300MW is allocated for commercial, industrial, mining and agricultural sectors</p> <p>1 April 2021 - 31 December 2023</p>
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Why you should participate?

- Subscribe to sustainability for long term business growth**

 - Improve company's access to financing where lenders and investors increasingly require companies to have incorporated sustainability elements into their business operations
 - Contribute towards the country's call for sustainable low-carbon economy
- Reduce Business Costs**

 - Enjoy lower electricity tariff rates
 - Offset your electricity bill with credit from the sale of excess energy to TNB
- Ability to Monetise Environmental Attributes associated with RE generation**

 - Generate additional income from the sale of environmental attributes in the form of RE Certificates (REC). 1 REC represents every 1 MWh of electricity generated from a renewable source

Who is eligible?

*Note: This Infographic only focuses on programmes offered for businesses and government agencies

<p>NOVA Programme</p> <p>TNB Consumers from the category of commercial, industrial, mining and agriculture</p>	<p>NEM GoMEn</p> <ul style="list-style-type: none"> Ministry, department or statutory body whether at federal, state, or district level including local authorities TNB Consumers classified under the commercial tariff category
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Have not participated in the previous solar PV programme

Capacity Limit

<p>NEM GoMEn</p> <p>≤ 1,000kW</p> <p>≤ 75% of Maximum Demand of the Consumer</p>	<p>NOVA Category A (Net Offset)</p> <p>≤ 1,000kW</p> <p>≤ 75% of Maximum Demand of the consumer</p>	<p>NOVA Category B (Net Offset + Virtual Aggregation)</p> <p>≤ 5,000kW</p> <p>≤ 100% of Maximum Demand of the consumer</p>
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For low voltage⁵ Consumers

≤ 60% of fuse rating (for direct meter) OR 60% of current transformer (CT) rating

How to participate with zero upfront capital expenditure?

Engage a company that has been registered with SEDA as a **Registered Solar PV Investor (RPVI)**⁶

The RPVI will:

- manage the NEM application with SEDA including conducting the relevant assessment study,⁷ which is a pre-requisite for approval of the NEM application for installation above 72kW
- undertake the design, engineering, construction, installation, testing, commissioning, operation and maintenance of the solar PV installation
- assist in obtaining the generation license⁸

Contractual arrangements between the Consumer and RPVI⁶

The Consumer may enter into a Solar Power Purchase Agreement ("Solar PPA") or a Solar Leasing Agreement ("Solar Lease") with RPVI.

<p>SOLAR PV INSTALLATION</p> <p>RPVI will install, own, operate and maintain the solar PV installation throughout the duration of the Solar PPA or Solar Lease. Consumer would generally have an option to own the solar PV installation upon the expiration of the agreement.</p>	<p>PAYMENT</p> <p>Solar PPA - Consumer to pay RPVI an agreed tariff (RM/kWh) (which is lower than TNB's tariff) for the solar electricity generated and delivered to the Consumer for its use in the premise as measured by the PV Meter.</p> <p>Solar Lease - Consumer to pay a fixed fee every month for the lease of the solar PV installation from RPVI.</p>
<p>REC TRADING</p> <p>The Consumer or RPVI can obtain extra income from selling the environmental attributes of the solar electricity generated in the form of REC by registering the solar PV installation with an internationally recognised registry (e.g. I-REC Standard or Tradable Instrument for Global Renewables Registry) which will verify and issue REC and allow tracking and trading of the REC. The Consumer and RPVI to agree on the ownership of such environmental attributes.</p>	<p>BILLING</p> <p>The RPVI and Consumer may enter into a Supply Agreement with Renewable Energy ("SARE") with TNB to engage TNB to manage the billing and collection for the electricity supply. The Consumer's solar energy purchase under the Solar PPA will be billed on the same TNB bill. TNB Sdn. Bhd., a wholly owned subsidiary of TNB, will be the collecting agent of TNB for SARE. Currently, SARE is currently not available for Solar Lease.</p>
<p>EXCESS ENERGY</p> <p>Eligible Consumer to sell excess energy to TNB by participating in the NEM 3.0 Programme.</p>	<p>GREEN INCENTIVE</p> <p>Availability of green tax incentive⁹ helps to reduce the cost of solar PV installation.</p>

How do NOVA Programme and NEM GoMEn work?

Mechanism

- Self-consumption first**

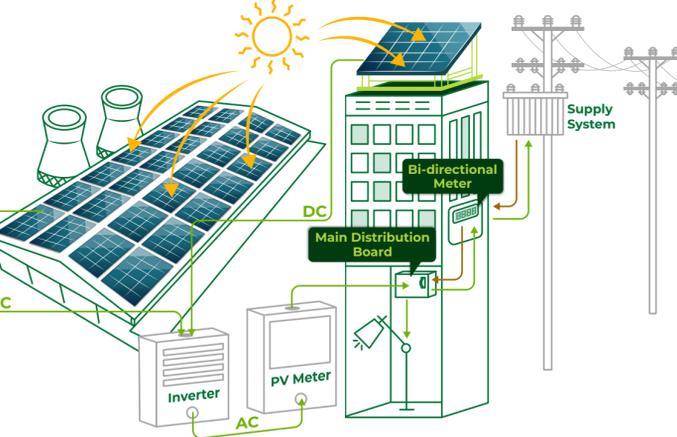
Electricity generated by the solar PV installation is to be first utilised by the premise where the solar PV installation is installed.
- Period of exportation to TNB**

Limited to a period of 10 years. After 10 years, the electricity generated by the solar PV installation is strictly for self-consumption in the premise where the solar PV installation is installed. No export to TNB is allowed.
- Excess energy to be exported to TNB**

Any excess energy can be exported to TNB via TNB's distribution or transmission system ("Supply System").
- Battery energy storage system ("BESS")**

Can be incorporated into the solar PV installation to store excess energy during peak production for use when the production is lower than demand. This could be a viable and cost effective option given that the BESS cost is gradually reducing with advancement of technology.

The connection between a solar PV installation and the Supply System



Morning to night

- when solar electricity being generated < energy usage**

powered with self-generated electricity and electricity supplied by TNB
- when solar electricity being generated > energy usage**

powered with self-generated electricity only and excess electricity will be exported to TNB via the Supply System
- when there is no solar electricity generation**

powered with electricity supplied by TNB only

Calculation of cost savings from electricity bills

Value of exported electricity for the month will be used to offset Consumer's bill payment for the immediate next billing period, to be calculated as follows:

*Note: This will not be used to offset the minimum monthly charge as stated in the tariff category of TNB.

Net electricity charge (RM)

(electricity imported from the Supply System x prevailing gazetted electricity tariff)¹ - (electricity exported to the Supply System x price for exported electricity)

<p>NOVA Programme</p> <p>Price for exported electricity</p> <p>monthly average system marginal price² ("Average SMP"), being is the market price:</p> <p>MAY 2021 16.17 sen/kWh</p> <p>JUNE 2021 16.15 sen/kWh</p> <p>JULY 2021 17.47 sen/kWh</p>	<p>NEM GoMEn</p> <p>prevailing gazetted electricity tariff, which is "one-on-one" offset basis</p>
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Electricity exported > Electricity imported

- Net credit for excess electricity exported to be forfeited.
- Net credit to be allowed to roll over for a maximum of 12 months within the Settlement Period.³

Virtual Aggregations Options under NOVA

Excess electricity in a month to be exported to TNB via Supply System

offset shall be based on priority set by Consumer

Designated Premise A, Designated Premise B, Designated Premise C

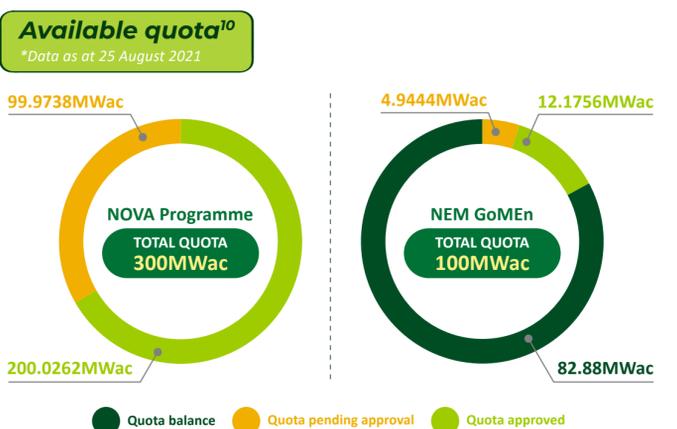
Value of exported electricity can be credited to the account of up to 3 Designated Premises of the Consumer to be used to offset the bill payment for the next billing period

A premise used or operated by the Consumer's wholly owned subsidiaries. Does not include the premise where the solar PV installation is installed.

Contractual Arrangement

Signing an additional NEM Contract

Consumer to enter into a NEM Contract with TNB. This will be in addition to the existing electricity supply contract already entered into between the Consumer and TNB for the existing supply of electricity by TNB.



Do you know?

- Solar panels can still generate electricity on a below-freezing winter day as solar panels absorb energy from the sunlight (also known as solar radiation) to produce electricity, not the sun's heat.
- This process of generating electricity directly from solar radiation is called the photovoltaic effect, or photovoltaics.
- The amount of sunlight that strikes the earth's surface in an hour and a half is enough to handle the entire world's energy consumption for a full year.¹¹

Footnotes

¹ Electricity imported is subjected to service tax, RE fund (KWTBB) and Imbalance Cost Pass-Through (ICPT), where applicable.

² SMP is for the price of the most expensive marginal generator dispatched by the Grid System Operator. Monthly Average SMP is for the daily period between 7:00 to 19:00 of the preceding month. It will be published by the Single Buyer no later than the 14th day of every month.

³ 1st January - 31st December of the same year, except for the first year which shall start on the commencement date of the NEM GoMEn and end on 31st December of the same year.

⁴ Means twice the largest number of kilowatt-hours used during any consecutive 30 minutes in the recorded. The Maximum Demand of the Consumer is based on:

(i) the average of the recorded Maximum Demands of the past 12 months; or

(ii) the declared Maximum Demand for Consumers with less than 12 months' record.

⁵ Means a voltage normally not exceeding 1,000 volts alternating current or 1,500 volts direct current between conductors, or 600 volts alternating current or 900 volts direct current between conductor and earth.

⁶ "Registered Solar PV Investor (RPVI) Directory" (SEDA) <http://www.seda.gov.my/directory/registered-solar-pv-investor-rpvi-directory/>

⁷ NOVA Programme - Connection Assessment Study (CAS) is required to check the acceptability of the installation to be connected to the Supply System. NEM GoMEn - Net Energy Metering Assessment Study (NEMAS) is required to assess the potential impact of the solar PV installation on the planning and operation of TNB's distribution system.

⁸ Generation License is not required for a solar PV installation ≤ 72kWp for three phase system and ≤ 24kWp for single phase system.

⁹ For further details, please refer to our Infographic Series 1 (Part 1), "Malaysia's Continuous Commitment to Sustainability" issued on 9 June 2021.

¹⁰ For latest data, please visit SEDA's NEM Quota Dashboard <https://services.seda.gov.my/nem/quota/dashboard>.

¹¹ "How Does Solar Work?" (Office of Energy Efficiency & Renewable Energy of the United States Department of Energy) <https://www.energy.gov/eere/solar/how-does-solar-work>.

Author



Chelsea Lim Chaw Sea
Senior Associate, Zaid Ibrahim & Co.
(a member of ZICO Law)
chaw.sea.lim@zicolaw.com
t. +603 2087 9882