

No.: 1532/EVN-KD  
Re: Implementation guidelines for rooftop solar  
photovoltaic projects

*Hanoi, March 27, 2019*

Attention to:

- EVN Power Corporations
- EVN Telecom and Information Technology Companies

Pursuant to the Prime Minister's Decision No.11/2017/QĐ-TTg dated April 11, 2017 on support mechanisms for development of solar photovoltaic (PV) projects in Vietnam, the Prime Minister's Decision No.02/2019/QĐ-TTg dated January 08, 2018 on Amendment and Supplement to some Articles of the Decision No.11/2017/QĐ-TTg;

Pursuant to the Circular No.16/2017/TT-BCT dated September 12, 2017 by the Ministry of Industry and Trade (MOIT) on the project development and Standardized Power Purchase Agreement for solar PV projects (hereinafter referred to as the Circular No. 16/2017/TT-BCT), Circular 05/2019/TT-BCT dated 11/03/2019 on amendments, supplements Circular No.16/2017/TT-BCT (hereinafter referred to as the Circular No. 05/2019/TT-BCT),

Vietnam Electricity Corporation (EVN) requests electricity buyers and sellers from rooftop solar PV projects to implementing the following requirements:

## **I. FOR EVN POWER CORPORATIONS**

### **1. Definition of rooftop solar PV projects**

- Rooftop solar PV projects are solar power projects that use solar panels installed on the rooftops or attached to the construction works invested by the organizations or individuals (hereinafter referred to as the project owners) and that are connected to and sells electricity to EVN's grids.

- Solar PV projects that use solar panels installed on the ground, water surface, etc., not attached to the rooftops or the construction works are not within the scope of this Guideline.

### **2. Mechanism for purchasing and selling electricity and Feed-in Tariffs (FiT) for rooftop solar PV projects**

- Rooftop solar PV projects adopt net meters (two-way meters) that are capable of measuring electricity delivery and receipt for its electricity purchasing and selling mechanism.

- FiT:

- Before January 01, 2018, the FiT (excluding VAT) is 2,086 VND/kWh (equivalent to 9.35 US cent/kWh, given the exchange rate of 22,316 VND/USD announced by the State Bank of Vietnam on April 10, 2017).
- From January 01, 2018 to December 31, 2018, the FiT (excluding VAT) is 2,096 VND/kWh (equivalent to 9.35 US cent/kWh, given the exchange rate of 22,425 VND/USD announced by the State Bank of Vietnam on December 31, 2017).
- From January 01, 2019 to 31 December 31, 2019, the FiT (excluding VAT) is 2,134 VND/kWh (equivalent to 9.35 US cent/kWh, given the exchange rate of 22,825 VND/USD announced by the State Bank of Vietnam on December 31, 2018).

- From 2020 onwards, the FiT each year (excluding VAT) is determined on a yearly basis and calculated in Vietnamese Dong (VND) equivalent to 9.35 US cent/kWh multiplied by the VND/USD exchange rate, announced by the State Bank on the last day of the previous year.

### **3. Decentralization of signing and execution of rooftop solar Power Purchase Agreements (PPAs)**

- EVN Power Corporations (PCs) shall authorize their subsidiary power companies/units to sign and execute PPAs for rooftop solar PV projects connected to the grid parts under the latter's respective control in accordance with the Decision No.67/QD-EVN dated February 28, 2018 by EVN Board of Members.

- Power Corporations/power companies shall closely monitor and control the installed capacities of these grid-connected rooftop solar PV projects to avoid overload of distribution grids and transformers.

- Power Corporations/power companies shall advise the project owners on choosing and installing PV panels, inverters with manufacturer's certificate of origin and certificate of quality (CO, CQ) and with high efficiency, durability and a long warranty period to ensure investment efficiency. The project owners shall be encouraged to install hybrid inverters and power storage systems (if needed) as a backup solution during power outages or load shedding.

### **4. Sequence and procedures for grid connection of and electricity purchase from rooftop solar PV projects.**

Sequence and procedures for grid connection of and electricity purchase from rooftop solar PV projects are presented in the flowcharts in Appendix 1, with the following details:

#### **a. Rooftop solar PV installation requests submitted by investors**

Power Corporations/power companies shall communicate and encourage project owners to submit requests of rooftop solar PV installation for approval before project commencement so that grid connection feasibility surveys can be organized, and project investment effectiveness is ensured.

- In their requests, project owners should provide such basic information including rooftop solar PV project sites, planned installed capacities, and EVN customer codes (if applicable) for follow-up communication and grid connection surveys.

- Requests shall be sent to customer service centers of Power Corporations/power companies via phone, email, zalo, chat box, etc.

#### **b. Grid connection surveys and agreements:**

- The principles for grid connection agreement: total installed capacities of rooftop solar PV projects connected into medium- and low-voltage grids shall not be higher than the benchmarked capacities of medium- and low-voltage lines and transformers.

- In case total installed capacities of grid-connected rooftop solar PV projects (including those under survey phase) are lower than the benchmarked capacities of low-voltage lines and transformers, power companies/units shall work with the project owners to reach an agreement on the following grid connection options:

For a rooftop solar PV project with installed capacity < 03 kWp: connect to the low voltage grid using single-phase or 3-phase depending on the actual conditions.

For a rooftop solar PV project with installed capacity  $\geq$  03 kWp: connect to the low voltage grid using 3-phase . If the project owner is a customer whose electricity system is connected into single-phase low voltage grid, then single-phase grid connection is allowed for this rooftop solar PV project, provided that the grid can still operate in a stable and safe condition.

- In case total installed capacities of grid-connected rooftop solar PV projects (including those under survey phase) are higher than the rated capacities of low-voltage lines and transformers:

- Power companies/units shall notify the project owners by documents about the overload possibility of low-voltage lines and transformers and advise them to lower rooftop solar PV project installed capacities or install medium-voltage lines and transformers to be connected into the nearest medium-voltage grids.
- The sequence and procedures for rooftop solar PV project grid connection into medium-voltage grids shall comply with provisions in Articles 43-51 of the Circular 39/2015/TT-BCT dated November 18, 2015 by the MOIT on regulating electricity distribution system (hereinafter referred to as the Circular 39/2015/TT-BCT).
- In case the existing grid cannot afford the grid-connected capacity of a rooftop solar PV project, power companies/units shall notify the project owner in writing.

c. A proposal dossier for electricity sale from rooftop solar PV projects

03 days prior to the tentative installation completion date, the project owner shall submit a dossier of proposal for electricity sale to power companies/units, including:

- An official request letter for electricity sale (see attached form BM.01)
- A technical dossier (if any): specifications, COs, CQs of solar panels and inverters and minutes of parameter testing in line with the applicable regulations carried out by a competent unit.

- For a rooftop solar PV project with capacity  $\geq$  01 MWp: the project owner shall additionally prepare a solar PV development plan and obtain an electricity operation license as stipulated in the Circular No. 16/2017/TT-BCT, the Circular No. 12/2017/TT-BCT dated July 31, 2017 by the MOIT and any amendment, supplement and replacement documents (if any).

d. Parameter testing and installation of 2-way meters for rooftop solar PV projects

- Within 3 days from the receipt of a proposal for electricity sale from a Rooftop solar PV project by a project owner, the power company/unit in charge shall complete parameter testing and sign a PPA with such project owner.

- Project owners should employ a competent unit to carry out such parameter testing themselves and then provide the power company/unit in charge with the testing results which demonstrate compliance with technical requirements regulated in Appendix 2. Otherwise, based on manufacturer's specifications, the power company/unit shall work with the project owner to conduct such testing, make an inspection report and record the results as follows:

- Agree to purchase electricity generated from the rooftop solar PV project if all technical requirements are satisfied.
- Do not agree to purchase electricity generated from the rooftop solar PV project if all technical requirements are not satisfied. Remedial actions need to be taken by the project owner if the investor insists on selling electricity to EVN.

- Installation of 2-way meters for rooftop solar PV projects
  - For project owners with existing PPAs for project sites: after the testing and approval of electricity sale, power companies/units shall replace 1-way meters with 2-way meters and sign an agreement to purchase electricity generated from rooftop solar PV projects with project owners. In case of upgrade from single-phase to 3-phase low-voltage grid connection, the upgrade of lines from project sites to the meters and the upgrade of lines from meters to connection points and of meters shall be the responsibility of project owners and power companies/units respectively.
  - For project owners without PPAs for project sites (new customers): after the testing and approval of electricity sale, power companies/units shall replace 1-way meters with 2-way meters and sign an agreement with project owners to purchase electricity generated from rooftop solar PV projects and an agreement to sell electricity to project owners for use at project sites.

- During the operation of rooftop solar PV projects, power companies/units shall be responsible for inspecting and monitoring such operation and handling violations as stipulated in Article 52 of the Circular No.39/2015/TT-BCT and its related amendments, supplement and replacements (if any).

e. Signing of electricity purchase and sales agreement with rooftop solar PV project owners

- Purchase agreements for electricity generated from rooftop solar PV projects: the template stipulated in the Circular No. 05/2019/TT-BCT is adopted, together with the following specific terms:

- COD date: the date when the two parties sign the minutes of meter reading confirmation. For projects which have been put into operation prior to the issuance date of this document, COD date shall be the date when the two parties sign the minutes of meter readings in accordance with Document No.1337/EVN-KD dated March 21, 2018.
- Meter readings: once a month, at the same time as meter readings of electricity purchased from the grid by project owners. For project owners who are also EVN customers with multiple meter readings in quarter/month, the meter readings for electricity sold to the grid will be performed at the same time as the records of the last meter readings in the month.

- Agreements for electricity sales from the grid to project owners without PPAs for project sites (new customers): sign new PPAs in accordance with the template regulated in EVN's electricity sales procedures based on project owners' electricity use purposes. For project owners with PPAs for project sites, use such PPAs.

## **5. Electricity bill payments**

- Payments shall be made in Vietnam Dong (VND) at an exact amount (no round-up)

- Payment mode shall be bank transfer. Transfer fees shall be borne by project owners.

- Payment amount:

- For project owners are enterprises who can issue invoices: every month, power companies/units shall receive and check bills and make payments accordingly as regulated.

- For household/individual project owners who cannot issue invoices: every month, business departments of power companies/units shall prepare payment lists on CMIS system, submit them to the units' leadership for approval and forward them to accounting and finance departments for payments to project owners. Payments are VAT excluded. After the end of each year or after the end of the purchase agreement of electricity generated from rooftop solar PV projects, based on "Confirmation report on meter reading, electricity output delivered and received as well as bill payment" (see attached from BM.02), the two parties shall finalize VAT payment as stipulated (if any)
- VAT calculation method for project owners shall comply with Document No. 1534/BTC-CGT dated January 31, 2019 of the Ministry of Finance (see the attached document).

## **6. Record of electricity purchase volume and accounting of electricity purchase expenses:**

- Electricity purchase volume from rooftop solar PV projects are recorded into electricity purchase volume at EVN Power Corporations (see BM03).
- Electricity purchase expenses from rooftop solar PV projects are recorded into electricity purchase expenses at EVN Power Corporations.
- Every year, EVN shall calculate EVN Power Corporations' planned electricity purchase expenses from rooftop solar PV projects based on planned electricity purchase volume and applicable FiT in order to come up with electricity wholesale prices.
- Such planned electricity purchase expenses from RRSPs included into the calculation of planned annual wholesale prices shall be reviewed and reconciled to the actual expenses for difference set-off (if any) in calculation of annual wholesale prices.

## **II. EVN TELECOM AND INFORMATION TECHNOLOGY COMPANIES**

- By March 31, 2019, complete the development of Rooftop Solar PV Project Management module on CMIS 3.0 and guide EVN Power Corporations on how to use this module for monitoring, information exploration and payments to Rooftop solar PV project owners which sell electricity to EVN.

- By March 31, 2019, add this function to EVN's Business and Customer Service Portal for management and monitoring of electricity purchases and sales from rooftop solar PV projects.

EVN would like to request relevant units to urgently implement the Guidelines and report to EVN for any arising issues (if any). This document replaces Document No.1337/EVN-KD dated March 21, 2018 and Document No.5113/EVN-KD dated October 09, 2018 by EVN.

### ***Received by:***

- As above;
- BOM (to report);
- General Director
- Deputy General Director Nguyen Xuan Nam;
- EVN EPTC;
- Board: TTD, KTSX;
- For filing: Clerical section, Business, Finance and Accounting

**PP. GENERAL DIRECTOR  
DEPUTY GENERAL DIRECTOR**

(signed and sealed)

**Vo Quang Lam**

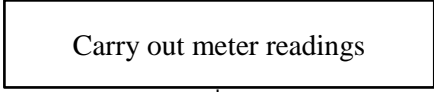
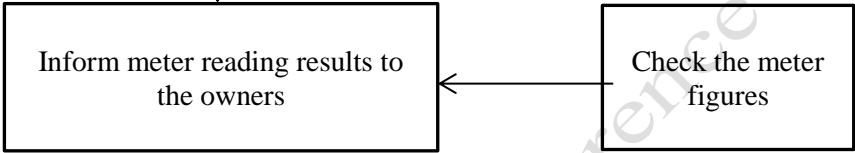
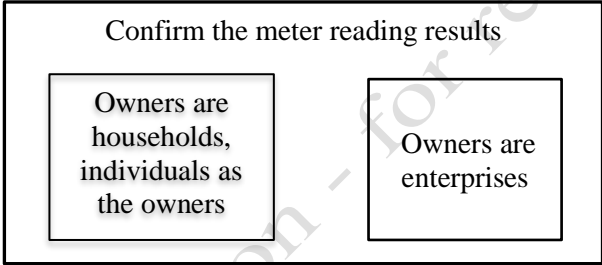
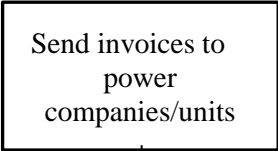
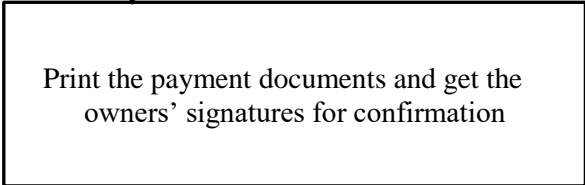
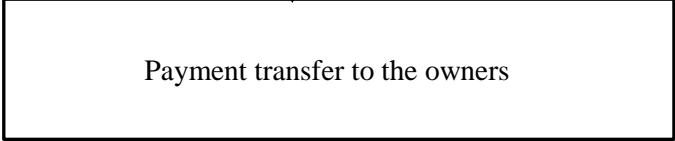
## Appendix 1

### Flowcharts of grid connection as well as electricity sale and purchase from rooftop solar PV projects

#### 1. Receipt and handling of electricity sales requests from the project owners' rooftop solar PV projects

Responsible parties	Processing time	Flowcharts
The project owners	03 days prior to the tentative installation completion date	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Register their needs to install the RSPP</div>
Subsidiary power companies/units	01 working day	
The project owners		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Invest in the projects</div>
The project owners		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Submit the dossiers to request power sales from the RSPPs</div>
Subsidiary power companies/units	01 working day	
Subsidiary power companies/units	02 working days	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Install two-way meters and sign the PPAs with the owners</div>

## 2. Payment for Rooftop Solar Projects

Responsible parties	Processing time	Flowcharts
Subsidiary power companies/units (business division)		 <pre> graph TD     A[Carry out meter readings] --&gt; B[Inform meter reading results to the owners]             </pre>
Subsidiary power companies/units (business division)	01 working day from the date of meter reading	 <pre> graph TD     C[Check the meter figures] --&gt; B[Inform meter reading results to the owners]             </pre>
The project owners	01 working day from the date of receiving the information	 <pre> graph TD     subgraph Confirm [Confirm the meter reading results]         D[Owners are households, individuals as the owners]         E[Owners are enterprises]     end     D -- Agree --&gt; B     E -- Agree --&gt; B             </pre>
The project owners		 <pre> graph TD     B --&gt; F[Send invoices to power companies/units]             </pre>
Subsidiary power companies/units (business division)	07 working days from the date of the owners' confirmation of the meter reading	 <pre> graph TD     B --&gt; G[Print the payment documents and get the owners' signatures for confirmation]             </pre>
Subsidiary power companies/units (Finance-Accounting department)		 <pre> graph TD     G --&gt; H[Payment transfer to the owners]             </pre>

## Appendix 2

### Items for initial testing at the time of grid connection and during the operation of rooftop solar PV project

No	Teasting items	Specification descriptions (according to Circular 39/2015/TT-BCT and 16/2017/TT-BCT)	Connected to single phase low voltage grid		Connected to three-phase low voltage grid	
			At the time of connection	During operations	At the time of connection	During operations
1	Frequency	The PV system is capable of maintaining continuous power-generating operations in the frequency range of 49-51 Hz. When the system's frequency is out of range, the solar PV system must be capable of maintaining power-generating operations in at least 0.2 second.		Satisfied		Satisfied
2	Voltage	The solar PV system is capable of maintaining continuous power-generating operations when the voltage at the connection point is within the range of 85%-110%. When the system's voltage is out of range, the solar PV system must be capable of maintaining power-generating operations in at least 0.2 second.		Satisfied		Satisfied
3	Phase balance	The opposite phase sequence component as compared to the nominal voltage must be $\leq 5\%$				Satisfied
4	DC Current Injection	The injection of the direct current connected to the distribution grid as compared to that of		Satisfied		Satisfied



		the rated current at the connection point must be $\leq 0.5\%$				
5	Voltage harmonic	Total voltage harmonic distortion at the connection point must be $\leq 6.5\%$		Satisfied		Satisfied
		Total current harmonic distortion at the connection point must be $\leq 20\%$ load current with its capacity of less than 50kW and $\leq 12\%$ load current with its capacity of 50kW or more		Satisfied		Satisfied
6	Earthing	Direct earthing is used in the solar PV system connected to the low voltage network.		Satisfied		Satisfied
7	Protection	The solar PV system must be automatically disconnected in case of a power outage in the distribution grid.	Satisfied	Satisfied	Satisfied	Satisfied
		The solar PV system must be automatically disconnected from the distribution grid in case of its internal incidents.		Satisfied		Satisfied

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BM.01

**OFFICAL REQUEST LETTER FOR ELECTRICITY SALE**  
(From the rooftop solar PV project)

**Attention to:** .....

Name of the organizations/individuals: .....  
Tax number: .....  
Account number: ..... At the bank: .....  
Represented by Mr. (Ms.): ..... Title: .....  
ID card number: .....  
Issued by: ..... dd/mm/yy .....  
Based on the Authorization Letter ..... dd/mm/yy ..... of  
Email/contact telephone: .....

Register to sell electricity from the rooftop solar PV project:

1. The project information:
  - Project site: .....
  - Project capacity: .....kWp.
  - Solar panel type: .....kW/ made by the manufacturer.....
  - Inverter type: .....kW/set made by the manufacturer.....
  - Voltage connection level:.....
2. Information regarding PPA from the grid (if any):
  - Electricity customer code:.....
  - Current location of electricity use:.....

....., dd.....mm.....yy.....  
Proposer

(full name, signed and stamped)

Unofficial GIZ translation - for reference only

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**CONFIRMATION REPORT**

**ON METER READING, ELECTRICITY OUTPUT DELIVERED AND RECEIVED AND BILL PAYMENT**

from.....to.....

The Seller (Party A): .....

Address: .....

The Buyer (Party B): .....

Address: .....

hereafter together confirm the meter reading results, electricity output delivered and received as well as bill payment, as follows:

Month	Meter reading			Output (kWh)	Unit price (VND/kWh)	Total amount (Tax excluded) (VND)	VAT (VND)	Total
	Beginning	End	Multiplier					
1								
...								
12								
Total			.....		.....	.....		.....

*In words:* .....

.....

**The Seller**

**The Buyer**

Unofficial GIZ translation for reference only



	EPTC by EVN (>30 MW)																
2	Based on contracts authorized to PC by EVN (≤ 30 MW)																
3	Rooftop solar PV																
<b>E</b>	<b>Self-production</b>																
	- including rooftop solar PV is generated at the headquarters of companies																
	<b>Total (A+B+C+D+E)</b>																
	- including rooftop solar PV																
	<b>ELECTRICITY PURCHASED FROM EVN (A+B+C+D)</b>																

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