The new FIT and Net Metering Regulation in Vietnam:
Challenges for Solar PV Project Development

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Agenda

• Snapshot of the solar PV market (rooftop/utility-scale)

• Overview of the FIT and net metering support scheme (Decision 11 and Circular 16)

• The standard PPA: Key challenges of the SPPA for financing/bankability

• Summary: Key challenges for project development
Snapshot of the Solar PV Market Vietnam
About 10 MW Installed Capacity

Small of-grid applications: Solar Home Systems (SHS) or solar public lighting systems

Larger off-grid systems: local solar network stations and off-grid hybrid systems in remote areas or on islands

Solar PV Capacity Vietnam: ~10MWp (07/2017)

- On-Grid: 40%
- Off-Grid: 60%

Small (residential) and medium/large (commercial) grid-connected rooftop systems for piloting (e.g. HCMC pilot FIT), demonstration or commercial purposes.
Challenge (not specific to Vietnam):
• High **upfront investment costs** for commercial/industrial investors with different core businesses (used to procure kWh)

Limitations set by the legal framework:
• **EVN = single-buyer** of electricity
• **No legal framework** for **direct PPAs/corporate PPAs** (some preparatory work in progress)
• **No competitive power market/no wholesale market** (access for RE potentially in the medium-term post-2021/2022)

Business model solutions offered in the market:
• Leasing/ESCO models
• Equity models (long-term payment schemes, “disguised” direct PPAs, etc.)
Snapshot of the Solar PV Market Vietnam
Utility-Scale Projects in Vietnam

App. 110 projects with ~17,000 MW under development (07/2017)

Source: USAID
### Snapshot of the Solar PV Market Vietnam

#### Utility-Scale Project Examples

<table>
<thead>
<tr>
<th>Investor</th>
<th>Capacity</th>
<th>Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiên Tân</td>
<td>19.2 MW</td>
<td>Quang Ngai</td>
</tr>
<tr>
<td></td>
<td>2000 MW</td>
<td>Ninh Thuan</td>
</tr>
<tr>
<td>Sao Mai Group</td>
<td>200 MW</td>
<td>An Giang</td>
</tr>
<tr>
<td>Xuân Cầu</td>
<td>2000 MW</td>
<td>Tây Ninh</td>
</tr>
<tr>
<td>Thành Thành Công (TTC)</td>
<td>1,000 MW</td>
<td>Bình Thuan, Gia Lai, Ninh Thuan, Huế</td>
</tr>
<tr>
<td>BIM</td>
<td>200 MW</td>
<td>Ninh Thuan</td>
</tr>
<tr>
<td>Tập đoàn AES</td>
<td>500 MW</td>
<td>Dak Lak</td>
</tr>
<tr>
<td>TH True Milk</td>
<td>1000 MW</td>
<td>Dak Lak</td>
</tr>
<tr>
<td>Xuân Thiện</td>
<td>2000 MW</td>
<td>Dak Lak</td>
</tr>
<tr>
<td>EVN</td>
<td>50 MW</td>
<td>Cam Lam/Khanh Hoa</td>
</tr>
<tr>
<td></td>
<td>47 MW</td>
<td>Sesan4/Kon Tum</td>
</tr>
<tr>
<td></td>
<td>200 MW</td>
<td>Phuoc Thai/Ninh Thuan</td>
</tr>
<tr>
<td></td>
<td>200 MW</td>
<td>Song Binh/Binh Thuan</td>
</tr>
<tr>
<td></td>
<td>126 MW</td>
<td>Tri An/Dong Nai</td>
</tr>
</tbody>
</table>

*Source: USAID, Institute of Energy, EVN*
Solar PV Project Development
FIT for Grid-Connected PV Power Plants

- The electricity buyer (single-buyer EVN) has to purchase the entire solar power generated from the PV system.
- FIT = 9.35USct/kWh (2,086VND), the tariff will be adjusted regularly to changing VND-USD exchange rates.
- Sale via Standard PPA with 20yrs duration.
- Minimum requirement of >16% cell efficiency and >15% module efficiency.
- Grid connection: Seller responsible for transmission line until connecting point incl. transformer.
- Principal of nearest connection point (agreed between buyer and seller)
- The regulation has entered into force by 1st June 2017 and will be valid until 30th June 2019 (commercial operation date, COD).
General Requirements for Grid-Connected PV Projects (Art.10 Cir.16)

- **Assessment of the impact of the grid connection** plan of the project on the local power system;
- **Providing equipment** connected to the **SCADA or dispatching system** in order to provide forecast information on generated electricity by hour to the Load Dispatch Centre in charge of system dispatching;
- **Equity ownership ratio** of grid-connected solar power project can not be lower than **20%** of the total investment capital;
- **Long-term land use area** must not exceed **1.2 ha/MWp**.
Inclusion of Projects to Power Development Plans – Required Information (Art.9 Cir.16)

a) **Solar radiation potential** at the project site;

b) **Project description**: location, scale and total construction areas, construction works belonging to the project; content of sectoral planning and provincial construction planning;

c) **Necessity for project investment and construction**, advantageous and disadvantageous conditions;

d) **Preliminary implementation plan** including: technical and technological plan and capacity; technical infrastructure connection; equipment installation plan; implementation work plan and project management type; general plan on compensation and rehabilitation and technical infrastructure construction support plan (if any);

e) **Total investment capital** of the project: capital arrangement plan, capital source and disbursement plan; economic and financial analysis, social impact of the project;

f) **Basic information of the investor**: legal status document; business registration, key human resource, project implementation plan, financial and technical capabilities including list of relevant implemented projects (consisting of industrial and power projects), if any.
Solar PV Project Development
Net Metering Scheme for Rooftop Systems

- Rooftop systems shall benefit from net metering mechanism based on bi-directional metering (supplied by provincial power company).
- Remuneration for excess power is 9.35USct/kWh (same as ground-mounted) and will be adjusted annually based on VND-USD currency rate.
- Excess power can be transferred from one billing period to the following ("payment cycle"). Remuneration of consisting surplus can be annually or after termination of PPA.
- Solar rooftop projects (residential/commercial) must sign rooftop SPPA ➔ appendix to retail power purchase contract, see Annex 3 of Cir.16.
- Power company is responsible for meter readings, calculation of access energy and revenues of system owner (but system owner is also responsible to check/validate).
- For rooftop systems <50kWp: Ministry of Finance (MoF) asked to develop further (tax and fee related) incentives (Art.13.3)
General Requirements for Rooftop PV Projects (Art.11 and 13 Cir.16)

For rooftop systems <1MW:
• Registration with provincial/municipal power company (planned capacity, technical specifications of PV modules and inverters)

For rooftop systems >1MW:
• Projects must be included in Solar Power Development Plan and Power Development Plan.
• Projects must obtain Electricity Operation License (regulated in MoIT Circular 12/2017/TT-BCT as of July 31st, 2017).
## Solar PV Project Development

### Implementation of Net Metering Scheme

**Example:**

- **Appendix 3.2 to Circular 16 for commercial operations.**
- **Table** to determine the balance of delivered electricity (consumption) with the amount of surplus solar energy delivered to the grid (generation).

### Unit: kWh

<table>
<thead>
<tr>
<th>No</th>
<th>Party B’s outstanding amount of electricity from the previous period (t-1) ($\Delta SL_{k,t-1}$)</th>
<th>Party B’s electricity consumption in period t ($SL_{ET,k,t}$)</th>
<th>Party B’s amount of electricity connected to grid in period t ($SL_{MT,k,t}$)</th>
<th>Party B’s outstanding amount of electricity in period t ($\Delta SL_{k,t}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Period 1**

- Peak hour
- Normal hour
- Off-peak hour

**Period...**

- Peak hour
- Normal hour
- Off-peak hour

**Total by year end**

- Peak hour
- Normal hour
- Off-peak hour
Requirements for Capacity Connections (Art.12 Cir.16 and Art.41 Cir.39/2015TT-BCT)

- Total installed **capacity of the solar power system** into the low voltage line of the low voltage transformers **can not exceed the installed capacity of that transformer**;
- Solar power system which has a capacity **below 3 kVA** can connect to the one (01) phase or three (03) phase low voltage grid;
- Solar power system which has a capacity from equal to and **above 3 kVA** can connect to the three (03) phase low voltage grid.
Critical aspects of the SPPA for Solar PV Decision Validity

• The FIT regulation introduced with Dec. 11/2017 is only **valid until 30.06.2019** (Art.15.2 and 16.4 Cir.16).
• To be eligible for the FIT projects with **commercial operation date (COD)** before 30.06.2019:
  
  – Commercial Operation Date (COD) is the date when part or whole of the grid-connected solar PV plant is ready to sell electricity to the Buyer and fulfils the following requirements:
    (i) the power plant has completed basic experiments for part or the whole of the grid-connected solar PV plant and grid connection equipment; (ii) the solar PV plant was granted electricity operation license with regards to electricity generation; (iii) the Electricity Seller and Buyer agreed on record of meter reading to start payment (Art. 3.3 Cir.16)

⇒ This requirement creates additional time pressure on project development!
Critical aspects of the SPPA for Solar PV Off-taker Obligation/Curtailment

The Electricity Purchaser is **not obliged to purchase or receive power in the following cases**: (Art.2.7 SPPA)

- **a)** The Electricity Seller's **power plant does not operate and is not maintained in compliance with the regulations** on national grid operation as well as with the standards, technical regulations of power sector;
- **b)** During the time that the Electricity Purchaser installs equipment, repairs, replaces, inspects or examines the grid which directly connected to the Electricity Seller’s power plant;
- **c)** When the **transmission grid** and the **distribution grid** connected to the Electricity Purchaser’s grid **breaks down** or grid devices directly connected to the transmission grid, the distribution grid of the Electricity Purchaser breaks down;
- **d)** When the Electricity Purchaser’s **grid needs support to recover after the incident/break down** in accordance with the provisions on operation of the national power system and the industrial standards, technical regulations.

→ **No obligation for compensation or payments to the Seller!**
Critical aspects of the SPPA for Solar PV Dispute Resolution

Dispute resolution (according to Art.4.5 SPPA and Art.8 SPPA)
• In case the Parties are unable to reach agreement as prescribed above, the Parties have the right to submit to the Power and Renewable Energy Agency (comment: former GDE) a written request for support the Parties in handling the dispute (Art.8.1 SPPA).
• In case no agreement can be reached by negotiation: Standard procedure for dispute resolution in the electricity market according to Circular 49/2010/TT-BCTZ, 13.12.2010 (Vietnamese courts and State energy authorities).

➤ The Draft PPA does not provide for offshore arbitration.
Critical aspects of the SPPA for Solar PV

**Force Majeure** (Art.5 SPPA): *Force majeure events are any unforeseeable and objective event, which is non-remediable despite all necessary measures and available resources. Force majeure events include:*

a) Natural disasters, fires, explosions, floods, tsunamis, epidemics or earthquakes;

b) Violence, riots, war, resistance, sabotage, embargo, siege, blockade, any act of war or community hostilities whether war is declared or not;

**Consequence** (Art.5.3 SPPA)

*In case where all measures as prescribed in Clause 2 of this Article are fulfilled, the breaching Party will be exempted from liability related to the failure to perform the obligations under the Agreement caused by the force majeure event.*

➔ **No political Force Majeure and no payment protection** (first draft had included: ‘decisions of competent authorities’).
Critical aspects of the SPPA for Solar PV
Termination Clause / Compensation

The Standard PPA provides only limited compensation for the Seller in case of termination/suspension of the contract due to Purchasers default or breach of the agreement:

• If the Electricity Seller is the affected Party and selects the suspension of performance of the Agreement, the compensation value is calculated by the value of the actual power output of the Electricity Seller within the previous one (1) year period counted up to the time of suspension of the Agreement performance (Art.7.5 Cir.16).

➔ No termination payment/compensation for seller's outstanding debts or expected return on equity capital in case of purchasers default.
Critical aspects of the SPPA for Solar PV

Amendments to the agreement (Art.10.1 SPPA and Art.18.3 Cir.16):

- “It is compulsory for grid-connected and rooftop solar power projects to apply the SPPA for power purchase between the electricity purchaser and seller.” (Art. 17 Cir.16)

- “Electricity sellers and purchasers are permitted to supplement the contents of the SPPA to clarify each party’s responsibilities and rights without changing the basic contents of the SPPA issued with this Circular.” (Art.18.3 Cir.16)

→ Interpretation: probably not much room for amending the SPPA.
Critical aspects of the SPPA for Solar PV

Other Issues – What is missing?

- **No government guarantee**, assurance or support to enhance the creditworthiness of EVN as the sole off-taker/purchaser.
- **Risks of changes in law** or regulation (e.g. tax) not addressed.
Solar PV Project Development

Key Challenges

- **Bankability of SPPA** (utility-scale)?
- Limited access to **financing** (equity & loans) and **guarantee schemes** (EVN single-buyer).
- **Land availability** (land use conflicts, agriculture and fishery/seafood production).
- Complex procedures for investments
  - **Utility-scale**: licensing, Power Master Plans, >50MW Prime Minister decision
  - **Rooftop**: >1MW (licensing, Master Plan).
- Lack of framework for **beneficial PV business models** (direct PPA) or third-party off-takers/wholesale market for RE.
- **Low investment horizon** (C&I rooftop).
Thank you for your attention!

Please contact me for any questions!

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