ROOFTOP SOLAR STAKEHOLDER SURVEY BRIEFING

Banking and Finance for C&I Rooftop solar in Vietnam Webinar

May 28, 2020

Dang Le Ngoc
USAID V-LEEP
CONTENT

- METHODOLOGY
- STAKEHOLDER PROFILE
- KEY FINDINGS AND OUTCOME ANALYSIS

PHOTO CREDIT: SAOMAI RTS PROJECT (SAO MAI GROUP)
Survey’s population and sample

35 organizations’ response was fully recorded in a total of 54 organizations in RE buyers Vietnam working group.

The response rate is 65% (The sampling size of 35 against population size of 54) allows us to gain reliable insights and results with 95% confidence level and margin error of 10%.
DEVELOPERS

Business Profile:
- target market segments, installed capacity, plans for expansion in RTS projects

Key challenges and barriers: in Regulations, licensing, grid connection; procedures and costs

Availability of skilled professionals/staff
SURVEY’S CONTENT

BUYERS END USERS/ CUSTOMERS

- Electricity consumption profile: usage pattern, consumption and current cost of electricity
- Barriers that may hinder the adoption of RTS system;
- Product related questions: perception of stakeholders on safety of solar PV systems, quality related concerns
- Preferred financing model: CAPEX/ OPEX
- Knowledge and source of information sought.
- Motivations, awareness of rooftops solar
FINANCIERS

Perception of FIs on RTS financing models:

Perceived challenges in developing a lending product for rooftop solar PV.

Experience and plan of FIs in RTS with preferred model in lending: experiences of financing RTS projects and future plans for entering the RTS finance market segment.
Dear Participant,

United States Agency for International Development’s Vietnam Low Emission Energy Program (USAID-VLEEP) is conducting a market assessment under the Rooftop Solar (RTS) PV Promotion Program. This assessment is being used to better understand current investment options and barriers for rooftop solar. We are asking your help.

The results of this survey will be used to inform decision makers to support appropriate new and innovative support mechanisms and solutions to incentivize new investment in the RTS. Please take a few minutes to provide information in the below survey. Your support is greatly appreciated. Thank you!

USAID VIETNAM LOW EMISSION ENERGY PROGRAM (VLEEP)
Rooftop Solar Stakeholder Survey
FINANCIERS
Conducted at Renewable Energy Buyers Vietnam Working Group
December 27, 2019
Ho Chi Minh City, Vietnam

1. What is your business type?
   a. Manufacturing
   b. Commercial (service)

2. When is the electricity consumption highest in the day?
   a. 7-8:30 AM
   b. 9:00-11:00 AM
   c. 11:30 AM - 2 PM
   d. 5-6 PM
   e. 6-12 PM

3. Which of the following categories is applicable to you?
   a. Have installed solar PV (please go directly to question 5 and onwards)
   b. In the process of installing solar PV (please go directly to question 5 and onwards)
   c. Have considered solar PV but have not yet decided
   d. Have never considered to install RTS system

   i. Select factors discouraging you from investing in a solar panel system?
      a. Number of years it takes for the investment to pay back
      b. Initial cost of solar panel power system
      c. Operational costs of solar panel power system
      d. Inability of finding qualified/qualified suppliers
      e. Inability to fully realize potential return on investment
      f. Inability to receive tax benefits
      g. Anticipated cost reductions in solar installation in near future
      h. Building/structure requirements or concern
      i. Potential cost to install solar panel system (e.g., installation of rooftop solar)
      j. Uncertainty of legal regulatory framework
      k. Others: please specify

   ii. Select factors encouraging you to develop a Rooftop solar system?
      a. Reduction in electricity bills
      b. Concrete additional income
      c. Address electricity price increase in future
      d. Attractive feed-in tariffs
      e. Save the environment
      f. Back-up power (solar power may help ensure I have electricity in the event of a power cut or with a storage system)
      g. Productive use of roof
      h. Improving sustainability rating for our business

   Name of your organization:

   Year established:

   Number of employees:

   Turnover (optional):
Amongst buyers surveyed, only 23 percent have a rooftop solar PV system on their roofs, while 27 percent are currently implementing a system. Fifty percent are considering a project but have not installed the system yet.
Factors discouraging investment in a rooftop solar PV system

- Uncertainty of legal/ regulation framework: 55.6%
- Building/ infrastructure requirement concern: 44.4%
- Lack of appropriate loan options: 33.3%
- Unaware of finding quality developers: 22.2%
- Anticipation of cost reduction in RTS technology in near future: 11%

Uncertainty of legal framework including changes in the Feed-in-tariff policy or project approval procedure and requirements is the highest-weighted factor delaying RTS installation for those who have not yet installed the system.
RTS buyers/ End users

Factors encourage RTS users to develop a Rooftop solar system

- Improving sustainability rating for our business: 72.2%
- Save the environment: 72.2%
- Reduction in electricity bills: 55.6%
- Address electricity price increased in future: 38.9%
- Productive use of roof: 22.2%
- Back-up power (Solar power may help ensure I have electricity in the event of a power...): 16.7%
- Attractive feed-in tariffs: 16.7%
- Generate additional income: 11.1%
Motivation ranking in installation of RTS from electricity consumers

*Note: 1 is the strongest, 4 is the weakest*

Reduction in utility electricity bill
Economic value for unused roof space
Environmentally friendly electricity source
Electricity back up

The strongest motivation to employ rooftop solar in C&I sector is sourcing environmentally friendly electricity; improving sustainability rating of business.
Regarding respondents that have already installed RTS on their roofs, 25 percent used one hundred percent of equity for their investment, 50 percent partly financed their CAPEX from the banking system (upfront cost is financed as a combination of debt and equity).

25 percent used a third-party model (OPEX) which sourced investment based on the underlying agreements.

OPEX model is the preferred model of those who are still considering RTS installation in future. About 86 percent potential buyers are considering a third-party ownership model for their future RTS installation.
RTS buyers/ End users

Reasons to choose third-party model to develop RTS

- Savings on the cost of electricity due to discounted electricity price from RTS system: 44%
- Shortened installation process: 50%
- Reduce upfront installation cost: 50%
- Reduce system performance risk due to the lack of inhouse expertise: 78%

Respondents identified RTS system performance risk as the primary reason for focusing on third party ownership. Nearly 80 percent of respondents desired to reduce system performance risk due to the lack of in-house expertise whereas 50 percent of respondents wish to reduce upfront installation cost and shorten the installation duration. Power costs saving still remained the least important reason for selecting a third-party owner model.
Low-cost financing and Preferential tax policy are attractive incentives encouraging RTS development.
Uncertain regulatory environment and unforeseen changes in renewable energy policy (FIT, Procedure for Utility scale (>1 MWp); as well as limited and difficult access to financing solutions and off-taker risk were ranked as the most significant challenges.
Equity is still playing important source for developers. 47 percent respondents claim that they financed their projects through all equity while 53 percent respondents claim both debt and equity used for project development.
BARRIERS IN ACCESSING FINANCE

- Collateral required: 10%
- Time consumed and complicated procedure in credit appraisal: 20%
- Short-tenure loan: 25%
- High interest rate: 45%

THE MOST POLICY INCENTIVES ENCOURAGE RTS SCALING UP

- Accelerated depreciation: 14%
- Tax incentives: 29%
- Low-cost financing: 52%
Financing for RTS from banking perspective

The factors challenge the bank in financing for RTS projects
(in order 1 – the most important, 4- the least important)

1. Lack of robust and stable regulatory framework in RTS sectors (electricity price policy, FIT policy, PPA policy)
2. Low level of creditworthiness of borrowers/developers
3. Low level of creditworthiness of off-takers in PPA contract
4. Lack of inhouse expertise to implement credit appraisal and lending decision for RTS
The motivations of the bank in financing RTS (in order 1- strongest)

1. Implement the commitment of green finance business adoption
2. This is a potential business/ Good Return on investment
3. Diversify finance services to existing customers

Factors enhancing/enabling bank ability to lend RTS in future

- Stable and robust regulatory framework
- Appropriate policy from the Government in encouraging Green finance (credit guarantee, interest subsidies, co-investment by public sector; refinance/line-of-credit facility designed exclusively for RTS)
KEY FINDING

Source of RTS Information

Major sources of information on Rooftop solar market

**Source of Information**
Most developers and buyers sourced information from trade fairs, exhibition or business events. In addition, a network of friends, colleagues or peers, government website as well as “media” also contributed information to decision makers.
http://rooftopsolar.com.vn/
http://rooftopsolar.com.vn/


CLICK HERE TO START USING NREL’s PVWatts® Calculator
http://rooftopsolar.com.vn/
KEY TAKEAWAYS FOR OVERALL MARKET

- The highest motivations to employ rooftop solar include sourcing environmentally friendly electricity; improving sustainability rating of business
- Uncertainty of legal framework including changes in the Feed-in-tariff policy or project approval procedure and requirements are the highest-weighted factors delaying RTS installation
- The involvement of a third-party (i.e. developers) is the most potential and preferred model to deploy RTS
- Low-cost financing are attractive incentives encouraging RTS development in both buyers and developers, and in both CAPEX AND OPEX model
THANK YOU

USAID Vietnam Low Emission Energy Program

Dang Le Ngoc
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Introduction to

Ho Chi Minh City Development Joint Stock Commercial Bank (HDBank)
Overview of Ho Chi Minh City Development Joint Stock Commercial Bank (HDBank)

**OVERVIEW**
- Established in 1989, HDBank is now among Top 20 companies of HOSE in terms of capitalized value and in VN30 – among 30 top stocks in the market.
- HDBank is one of the banks that bring the highest value to Shareholders with the strongest profit and EPS growth over the past 5 years.
- HDBank has proven its robust M&A capability via its 2 successful deals, i.e. the acquisition of Societe Generale Viet Finance under Societe Generale (France) and DaiA Bank, becoming one of the largest FIs in Vietnam.
- HDBank owns 51% of the voting rights of HD Saison Finance, one of the 3 biggest consumer finance companies.
- As of 31/12/2019, the bank has 285 branches and transaction offices, 17,101 financial transaction points, over 14,500 staff, and about 9 million customers.
- Cooperate and partner with Sovico – one of the most prestigious and well-known private corporations in Vietnam, who is holding Vietjet Air’s shares.

**ORGANIZATIONAL STRUCTURE**

* HDBank is the founding shareholder (holding 4.95% of the total shares) and is a partner of Vietjet Air, the airline with the biggest market share in Vietnam.

**EXCELLENCE IN VALUE INCREASE FOR SHAREHOLDERS**

**STRONG PROFIT BEFORE TAX GROWTH (BILLION VND)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>788</td>
<td>1,147</td>
<td>2,416</td>
<td>4,005</td>
<td>5,018</td>
</tr>
</tbody>
</table>

2015–2019 CAGR: 59%

**STRONG BASIC EPS GROWTH (VND/SHARE)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>633</td>
<td>911</td>
<td>1,966</td>
<td>2,897</td>
<td>3,675</td>
</tr>
</tbody>
</table>

Eps 2015–2019 CAGR: 55%

Source: Audited FS, except for the figures of 2019
FINANCING FOR RTS PROJECTS

Corporate customer financing policy:

✓ Loan amount up to 70%
✓ Loan tenor up to 10 years
✓ Collateral is the RTS system with the loan amount of up to VND 10 billion
✓ The excessive power output can be sold to EVN
✓ Supported by HDBank in terms of partners who are specialized in installation, construction, maintenance/warranty.
**FINANCING FOR RTS PROJECTS**

**Solar power system**
- Installation area is 18 – 6,000 m²
- 3 – 999 kWp

**Monthly power output**
- 360 – 120,000 kWh/month

**Self-investment**
- 30%
  - Owner’s equity

**ESCO**
- 35-40%
  - Owner’s equity

**Max financing by HDBank**
- 70%
  - Max financing by HDBank

**ESCO**
- 60-65%
  - Max financing by HDBank

*Owner’s equity*
Self-investment

**Example 1:** RTS project installed by Company ABC operated in Daklak province to serve its business operation

<table>
<thead>
<tr>
<th>Design capacity</th>
<th>986kWp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation intensity</td>
<td>4.73 sunshine hours</td>
</tr>
<tr>
<td>Expected generation output</td>
<td>1,400 MWh/year</td>
</tr>
<tr>
<td>Average electricity tariff</td>
<td>1,916 VND/kWh</td>
</tr>
<tr>
<td><strong>Electricity cost savings</strong></td>
<td><strong>2,682 million VND/year</strong></td>
</tr>
<tr>
<td>Total investment</td>
<td>14,901 million (including VAT)</td>
</tr>
<tr>
<td>Equity</td>
<td>30%</td>
</tr>
<tr>
<td>Bank loan</td>
<td>70%</td>
</tr>
<tr>
<td>Payback period</td>
<td>5 years</td>
</tr>
</tbody>
</table>

The following elements are excluded:
- Preferential programs for the customer
- Electricity tariff increases in 5 years
- Government’s support for the customer
Leasing – ESCO model

- **Example 2:** RTS project installed by Company ABC operated in Daklak province for lease.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design capacity</strong></td>
<td>986kWp</td>
</tr>
<tr>
<td>Radiation intensity</td>
<td>4.73 sunshine hours</td>
</tr>
<tr>
<td>Expected generation output</td>
<td>1,400 MWh/year</td>
</tr>
<tr>
<td>Average electricity tariff</td>
<td>1,916 VND/kWh</td>
</tr>
<tr>
<td><strong>Price applied for the user</strong></td>
<td>= 85% of EVN’s tariff</td>
</tr>
<tr>
<td><strong>RTS rent turnover</strong></td>
<td>2,280 million VND/year</td>
</tr>
<tr>
<td>Roof rent turnover for the roof owner</td>
<td>20 - 60 million VND/year</td>
</tr>
<tr>
<td>Total investment</td>
<td>VND 14,901 million (including VAT)</td>
</tr>
<tr>
<td>Equity</td>
<td>37%</td>
</tr>
<tr>
<td>Bank loan</td>
<td>63%</td>
</tr>
<tr>
<td>Payback period</td>
<td>6 years</td>
</tr>
</tbody>
</table>

The following elements are excluded:
- Preferential programs for the customer
- Electricity tariff increases in 5 years
- Government’s support for the customer
KEY PROJECTS IMPLEMENTED & IN STABLE OPERATION

RTS project in the factory of Formosa Taffeta Vietnam Ltd. In Hamlet 1, Nhut Chanh Commune, Ben Luc District, Long An implemented by Tran Family Co., Ltd. And Indefol Engineering Solution Co., Ltd. HDBank financed the project:

<table>
<thead>
<tr>
<th>Design capacity</th>
<th>HDBank’s funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>999 kWp</td>
<td>VND 13 billion</td>
</tr>
</tbody>
</table>

Generation output:

<table>
<thead>
<tr>
<th>Total output From Oct 2019 to Feb 2020</th>
<th>Average monthly output</th>
<th>Expected annual output</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 530 MWh</td>
<td>~ 106 MWh</td>
<td>1,280 MWh</td>
</tr>
</tbody>
</table>

A reduction of 870 tons of CO2 from the operation date to the end of February 2020.
CONSTRAINTS, DIFFICULTIES

- RTS investors/constructors are newly established, small-sized enterprises without track record
- Multi-stakeholders in financing under ESCO model
- Risks on assets performance, warranty/maintenance as most of installation companies are newly established and small-sized
- Sole repayment source/collateral is on the RTS system
- Long term funding source as scarce resource
Thank you
Regional Perspective:
Lessons from the Philippines on C&I Rooftop Solar Market and the Role of Commercial Banks

May 28, 2020
About Greening the Banks

Our Key Stakeholders

BANKS
Supporting Banks and Financial Institutions (FIs) to increase internal capacity and build a project pipeline

REGULATORS
Connecting Regulators with private sector feedback and global best practices

DEVELOPERS
Engaging Project Developers to address financing gaps and sharpen project readiness

Our Unique Approach

Greening the Banks (GTB) fills major gaps experienced through the Allotrope team’s renewable energy work in emerging markets

Ensures high-level global and regional principles are taken up and implemented

Turns commitments into on-the-ground action

On-the-ground action contribute to transformative change

GTB brings together initiatives that would otherwise work in silos and coordinates action among partners

Key Features:
1. Localized platform
2. In-country support
3. Regional scope with emphasis on cross-country learning and collaboration
Structure of Philippine Retail Electricity Rates

**Meralco Rate Breakdown**
- 4.54 Generation
- 2.24 Distribution
- 1.52 Tax and Gov't Charges
- 0.72 Transmission
- 0.39 System Loss

- 9.40 PhP/kWh
- 0.18 USD/kWh
- 4,300 VND/kWh

**Mindanao Utility Rate Breakdown**
- 6.83 Generation
- 0.76 Distribution
- 1.63 Tax and Gov't Charges
- 0.53 Transmission
- 0.51 System Loss

- 10.25 PhP/kWh
- 0.20 USD/kWh
- 4,700 VND/kWh

**Government Charges**

**System Losses**

(Pilferage Charge)
Drivers for C&I Rooftop Solar (RTS)

1. Solar can provide immediate savings AND a hedge against rising electricity prices.

2. Improving efficiency has made it possible to price solar cheaper than today’s utility rates.

3. Green technology that reduces the carbon footprint has overwhelming positive brand image.

Survey: 93% of Filipinos believe that carbon emissions need to be significantly reduced.
Philippine RTS Market is Still Largely Untapped

Base Case Solar Rooftop Market Volume (MW)

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>426</td>
<td>485</td>
<td>547</td>
</tr>
<tr>
<td>C&amp;I</td>
<td>370</td>
<td>383</td>
<td>396</td>
</tr>
</tbody>
</table>

Challenges in Procuring Solar from the Perspective of the End Users:

- If upfront CAPEX is required, C&I customers often find it difficult to secure internal approvals for such investments, as there are other investment priorities more aligned with their core business.
- Operations and Maintenance of a solar rooftop system is outside the end-users' existing capacity and is outside their core business.
- Lack of access to affordable, no-upfront CAPEX schemes.
- Lack of technical capacity to assess the credibility of and terms offered by EPCs and Third Party Financiers (Developers).
- Ongoing policy issues related to the current Net Metering regulation and limitations for third-party financing for “non-contestable” C&I End-Users.
Challenges Observed for Developers

1. Not “homerun” returns to the Third Party Financier

2. Long term exposure to liabilities and risks to cashflows

3. Long development process given the scale and capacities involved (9 – 12 months)

4. Mismatch between consumption and generation: who takes on “excess production”?

### Sensitivities at Different Price Points

<table>
<thead>
<tr>
<th>Price Point</th>
<th>%Savings for End-User</th>
<th>IRR* for Financier (15 year contract)</th>
<th>Payback Period for the Financier</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ 6.50 PhP/kWh</td>
<td>5.2%</td>
<td>7%</td>
<td>10</td>
</tr>
<tr>
<td>@ 7.50 PhP/kWh</td>
<td>3.8%</td>
<td>10%</td>
<td>8</td>
</tr>
<tr>
<td>@ 8.50 PhP/kWh</td>
<td>2.3%</td>
<td>13%</td>
<td>7</td>
</tr>
</tbody>
</table>

Unlevered Project IRR
Role of Commercial Banks in the Ecosystem

Current General Observations:

1. Seldom involved in pure project financing, especially for greenfield projects
2. Especially for large rooftop solar (i.e. FIT or utility-scale rooftop solar), biggest appetite is for providing refinancing after project is commissioned/operational
3. Attracted to scale and size, making bite-ize rooftop solar not a big priority
4. In assessing projects under a developer’s “portfolio”, due diligence is done on a project rather than portfolio level.
5. Very open to provide corporate loans to conglomerate subsidiaries, parent-backed newcomers, and existing clients with existing credit history.
Role of Commercial Banks in the Ecosystem

For End-Users: Expand offerings for dedicated loan facilities (corporate loans for C&I customers and consumer loans for households) to accelerate self-owned turnkey projects.

For Developers: Create working capital facilities for developers to absorb early stage project risks; Could be donor or philanthropic funded.

For Developers: Explore ways to bundle Rooftop Solar with Energy Efficiency Solutions to accelerate development of portfolio and to increase project size.

For Banks (Internally)

- Contribute to collective voice that demand for policy changes that unlock massive project pipeline building.
- Continued engagement and capacity building to frontline account managers and relationship managers on revenue model and risk assessment for rooftop solar investments.
- For bigger commercial banks: explore more coordination and cohesion with leasing units especially for newer developers, smaller end-users, and smaller projects.
THANK YOU & CONTACT US:

www.allotropepartners.com

Marlon Apanada,

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• Country Lead – Philippines, Clean Energy Investment Accelerator

marlon.apanada@gmail.com