



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

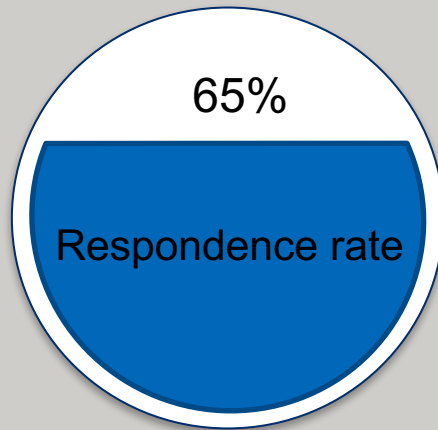


KEY FINDINGS AND OUTCOME ANALYSIS

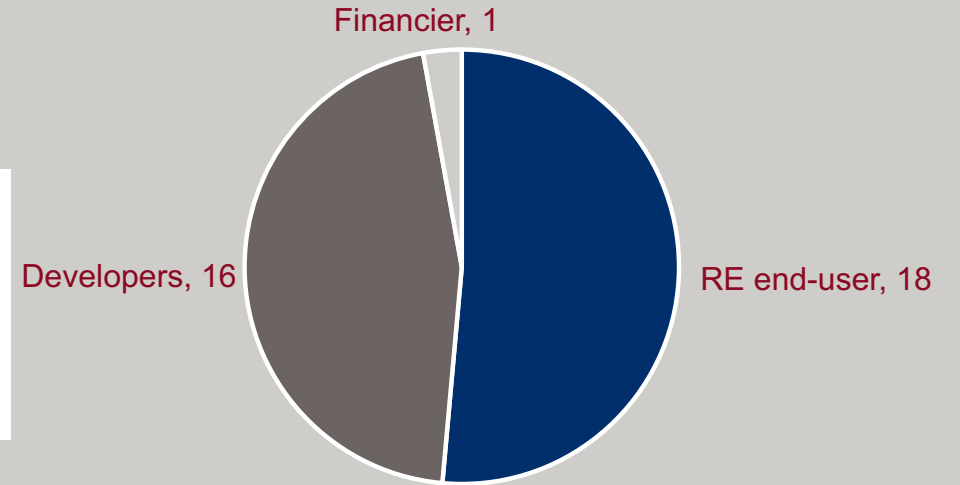


PHOTO CREDIT: SAOMAI RTS PROJECT (SAO MAI GROUP)

Survey's population and sample

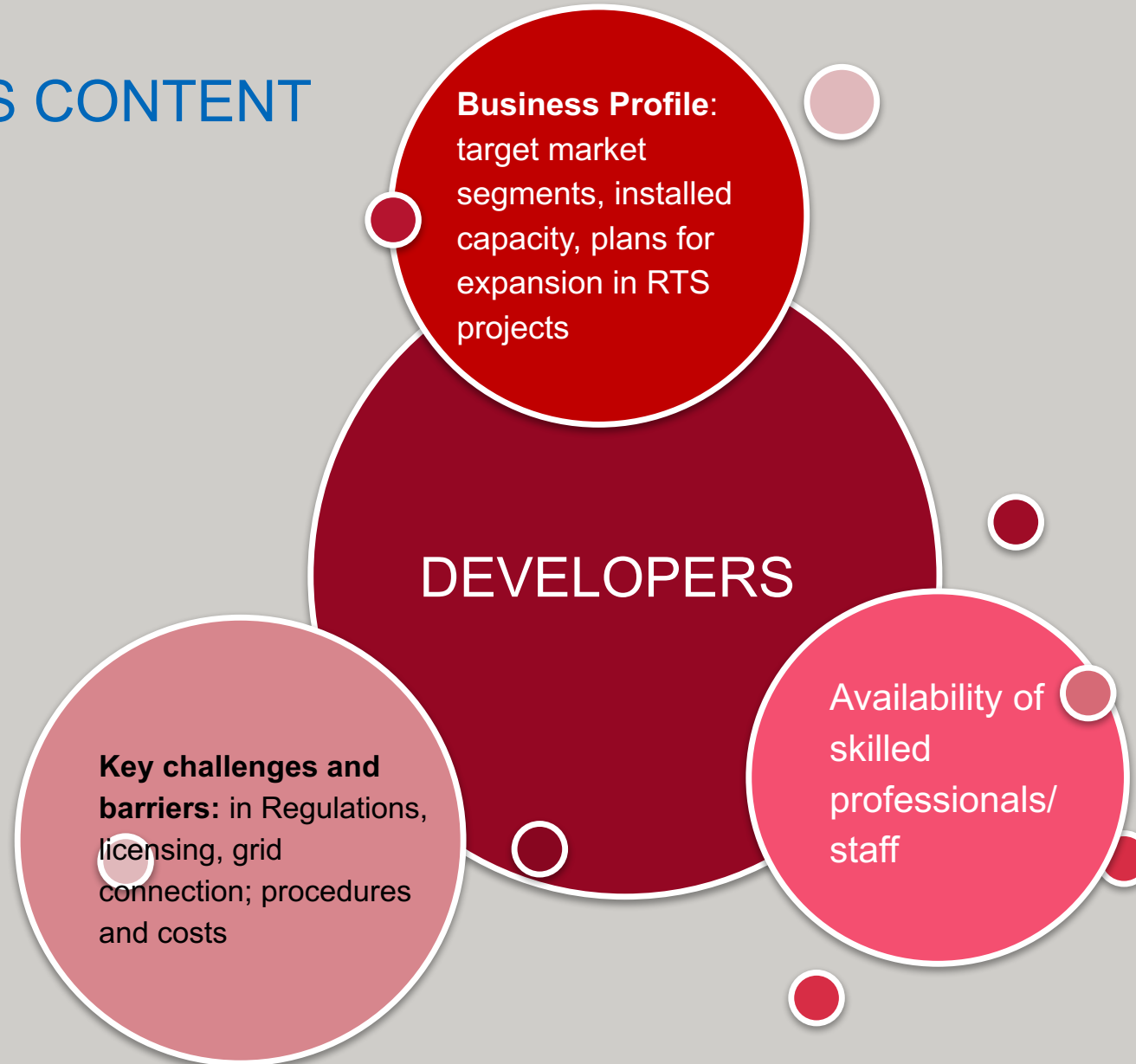


35 organizations' response was fully recorded in a total of 54 organizations in RE buyers Vietnam working group



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%

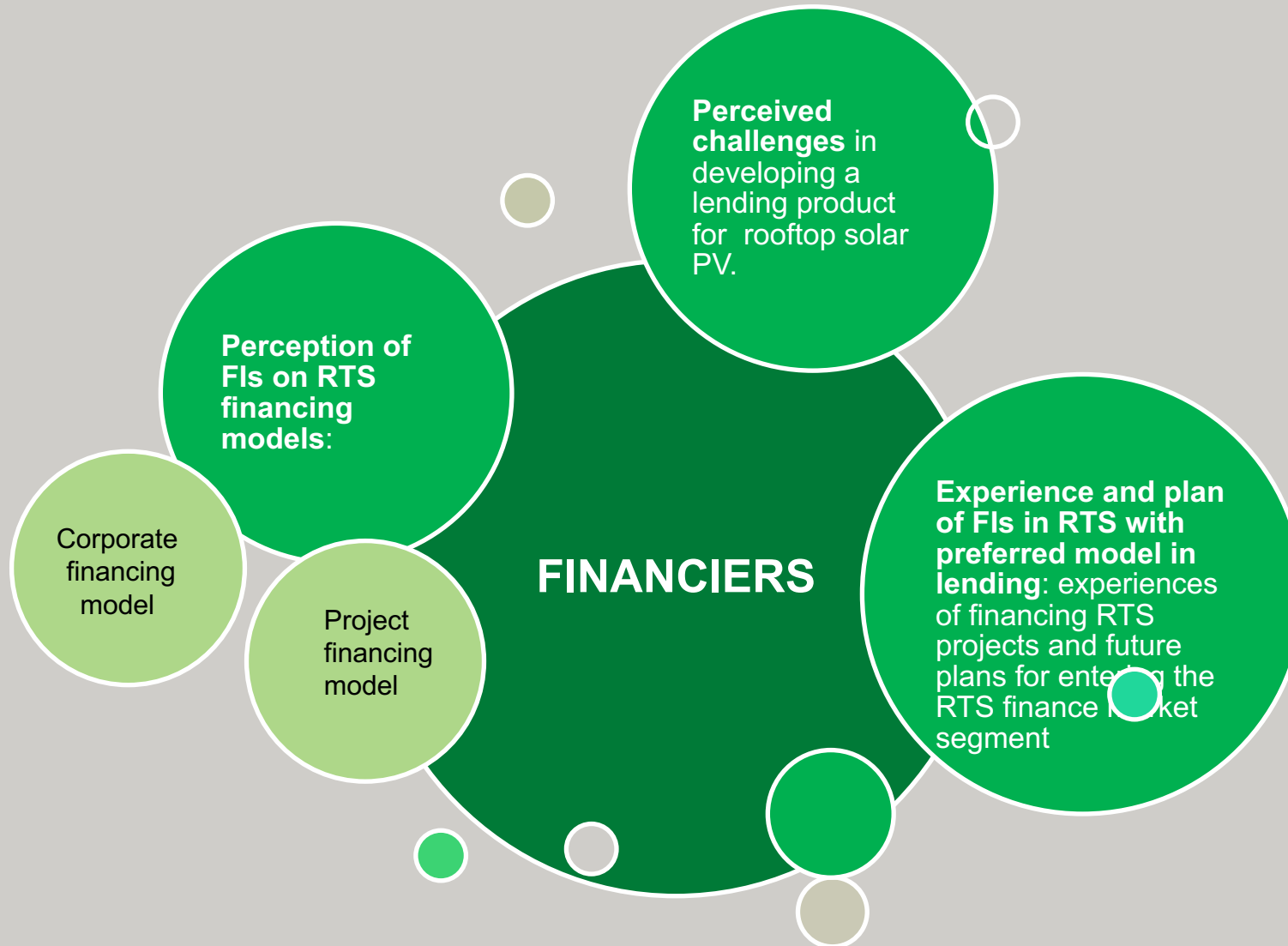
SURVEY'S CONTENT



SURVEY'S CONTENT



SURVEY'S CONTENT





USAID VIETNAM LOW EMISSION ENERGY PROGRAM (V-LEEP)

Rooftop Solar Stakeholder Survey

FINANCIERS

Conducted at: Renewable Energy Buyers Vietnam Working Group

December 3rd, 2019

Ho Chi Minh city, Vietnam

***** Please keep this file until collected!**

Dear Participant,

United States Agency for International Development's Vietnam Low Emission Energy Program (USAID V-LEEP) 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 seeking your help!

The results of this survey will be used to inform decision makers to support appropriate new and innovative support mechanism 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!

Name of your organization :
Year established :
Number of employees :
Turnover (optional) :

1. What is your business type?

- a. Manufacturing
- b. Commercial (service)

2. When is the electricity consumption highest in the day?

- a. 7-9:30 AM
- b. 9:30-11:30 AM
- c. 11:30 AM - 5 PM
- d. 5-8 PM
- e. 8-10 PM

3. Which of the following categories is applicable to you?

- a. I have installed solar PV (please go directly to question 5 and onwards)
- b. I am in the process of installing solar PV (please go directly to question 5 and onwards)
- c. I have considered solar PV but have not yet decided
- d. I have never considered to install RTS system

4. Select factors discouraging you from investing in a solar panel system?

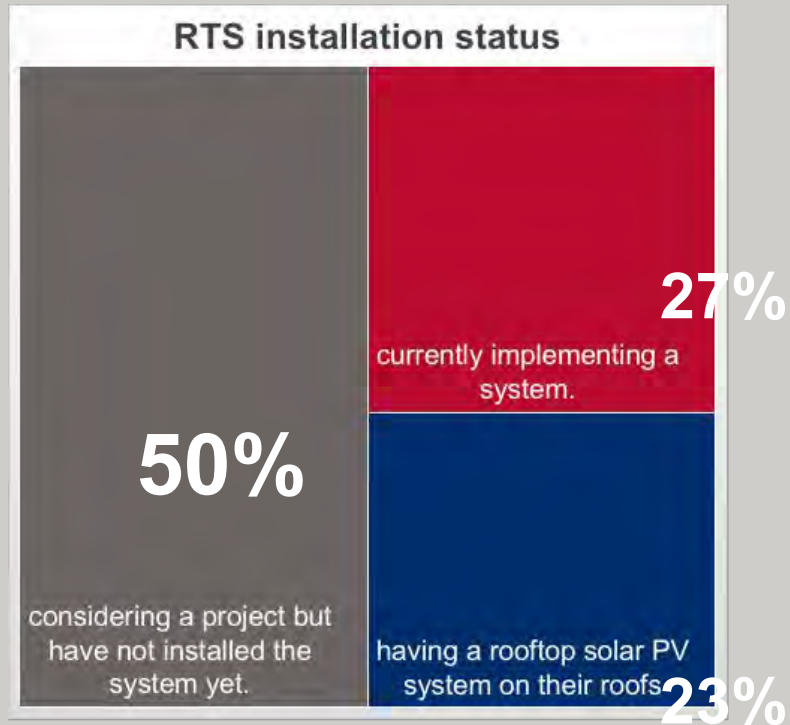
- a. Number of years it takes for the investment to pay back
- b. Lack of appropriate loan options
- c. High upfront cost of Rooftop solar power system
- d. Unaware of finding quality developers/ installers/ supplier
- e. Unaware of policy and regulation
- f. Unaware of cost-benefit aspects
- g. Anticipated cost reductions in solar installation in near future
- h. Building/infrastructure requirements concern
- i. My roof is not suitable for Rooftop solar installation (thatch/wooden shingles etc.)
- j. Uncertainty of legal/ regulatory framework
- k. Others: please specify _____

5. Select factors encouraging you to develop a Rooftop solar system?

- a. Reduction in electricity bills
- b. Generate additional income
- c. Address electricity price increased 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 cuts with a storage system)
- g. Productive use of roof
- h. Improving sustainability rating for our business

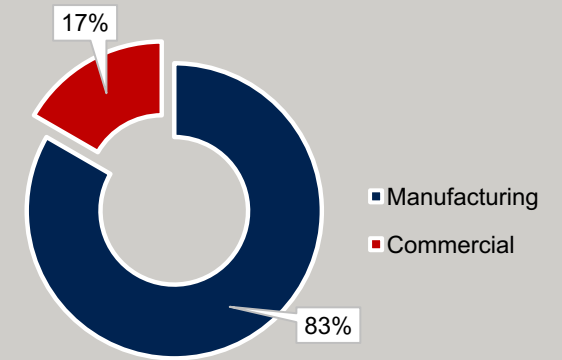
RTS end-users/ buyers

BUYERS PROFILE

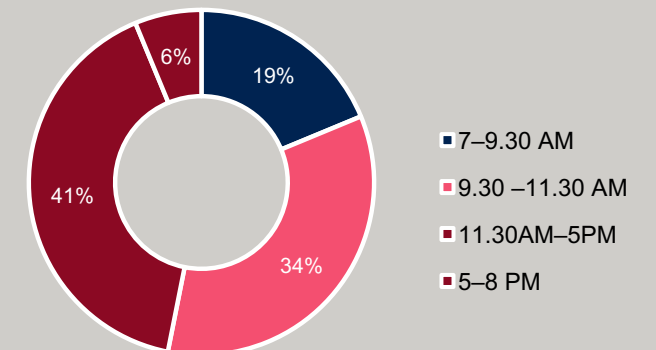


Amongst buyers surveyed, only 23 percent have a rooftop solar PV system on their roofs, while 27 percent are currently implementing a system. Fifty percent are considering a project but have not installed the system yet

RTS buyers- Business profile

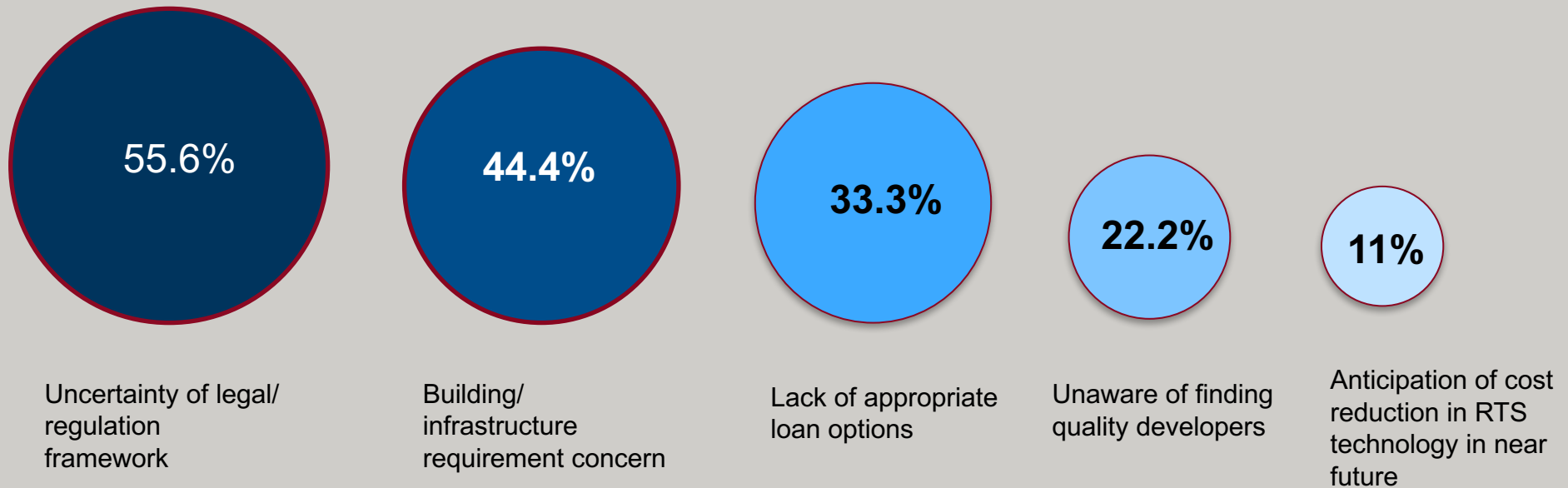


Electricity consumption Time of Use



RTS buyers/ End users

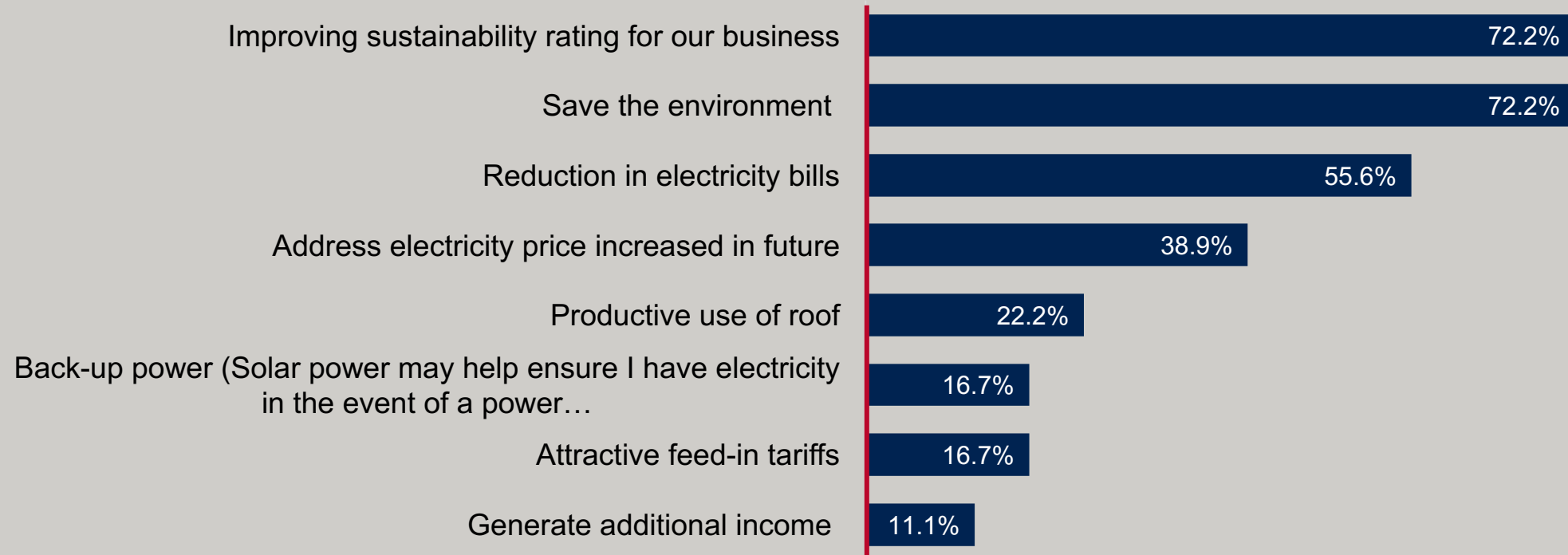
Factors discouraging investment in a rooftop solar PV system



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

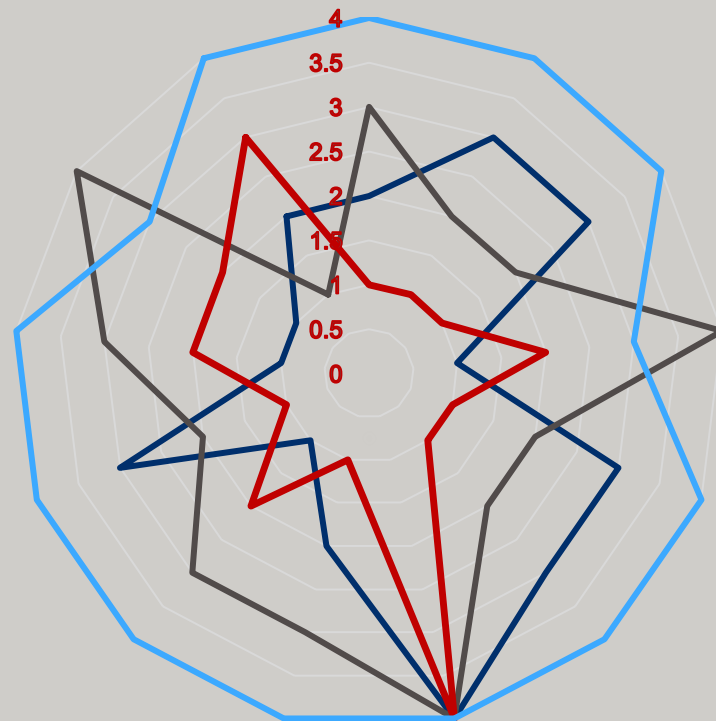


RTS buyers/ End users

Motivation ranking in installation of RTS from electricity consumers

Note: 1 is the strongest, 4 is the weakest

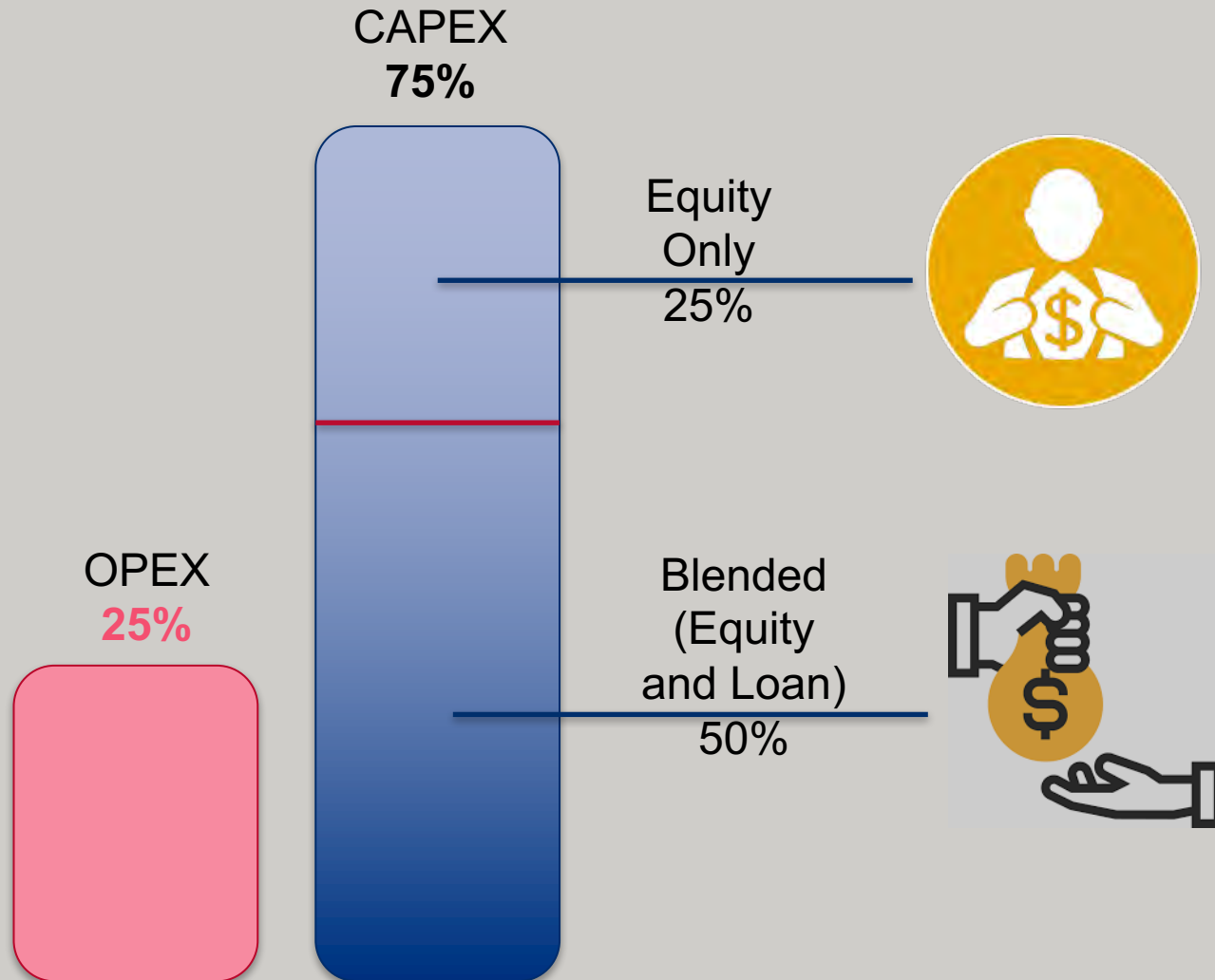
- Reduction in utility electricity bill
- Environmentally friendly electricity source
- Economic value for unused roof space
- Electricity back up



The strongest motivation to employ rooftop solar in C&I sector is sourcing environmentally friendly electricity; improving sustainability rating of business

RTS buyers/ End users

RTS Financing model and source



75 percent used CAPEX model

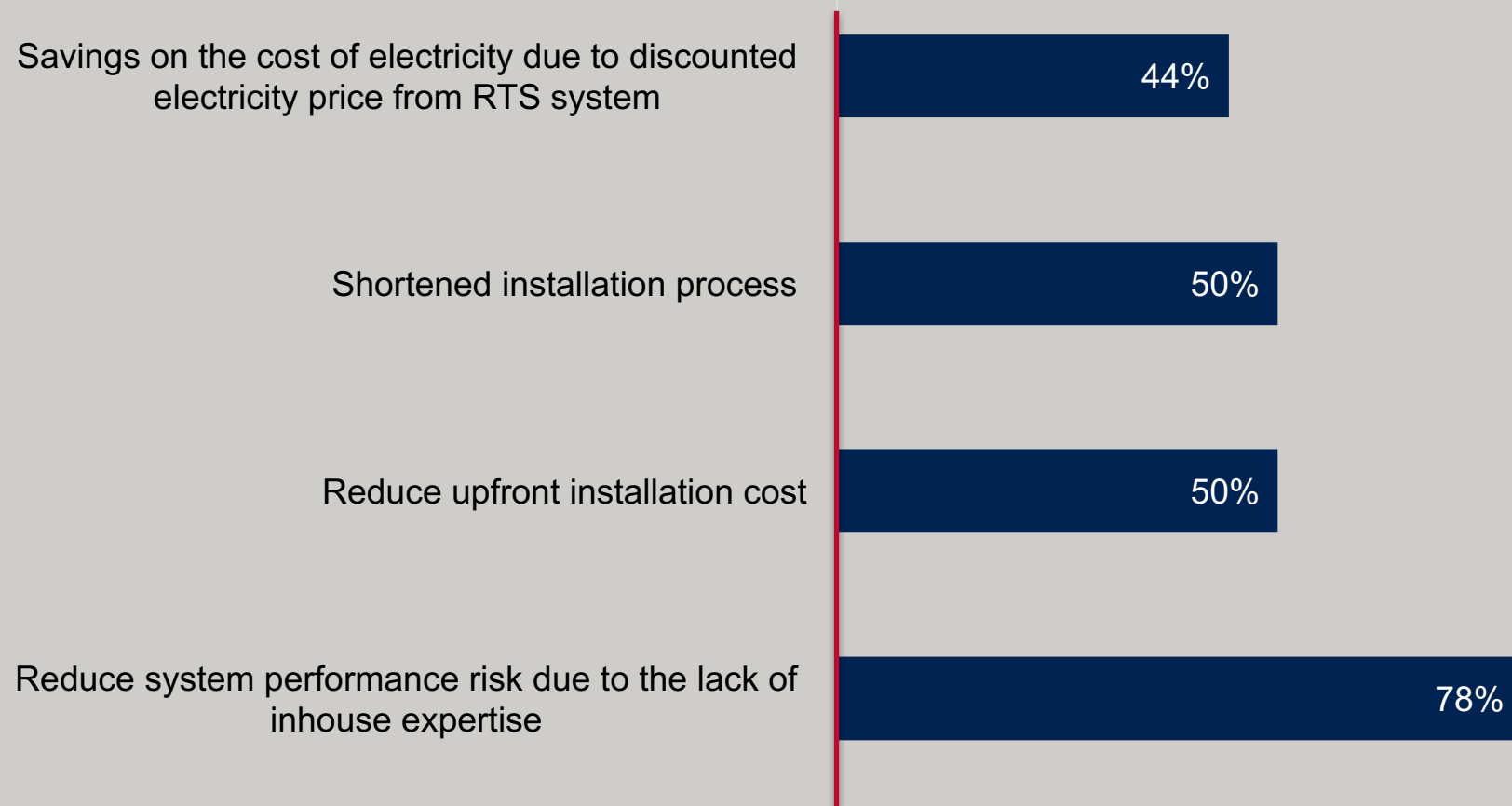
Regarding respondents that have already installed RTS on their roofs, 25 percent used one hundred percent of equity for their investment, *50 percent partly financed their CAPEX from the banking system (upfront cost is financed as a combination of debt and equity)*

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

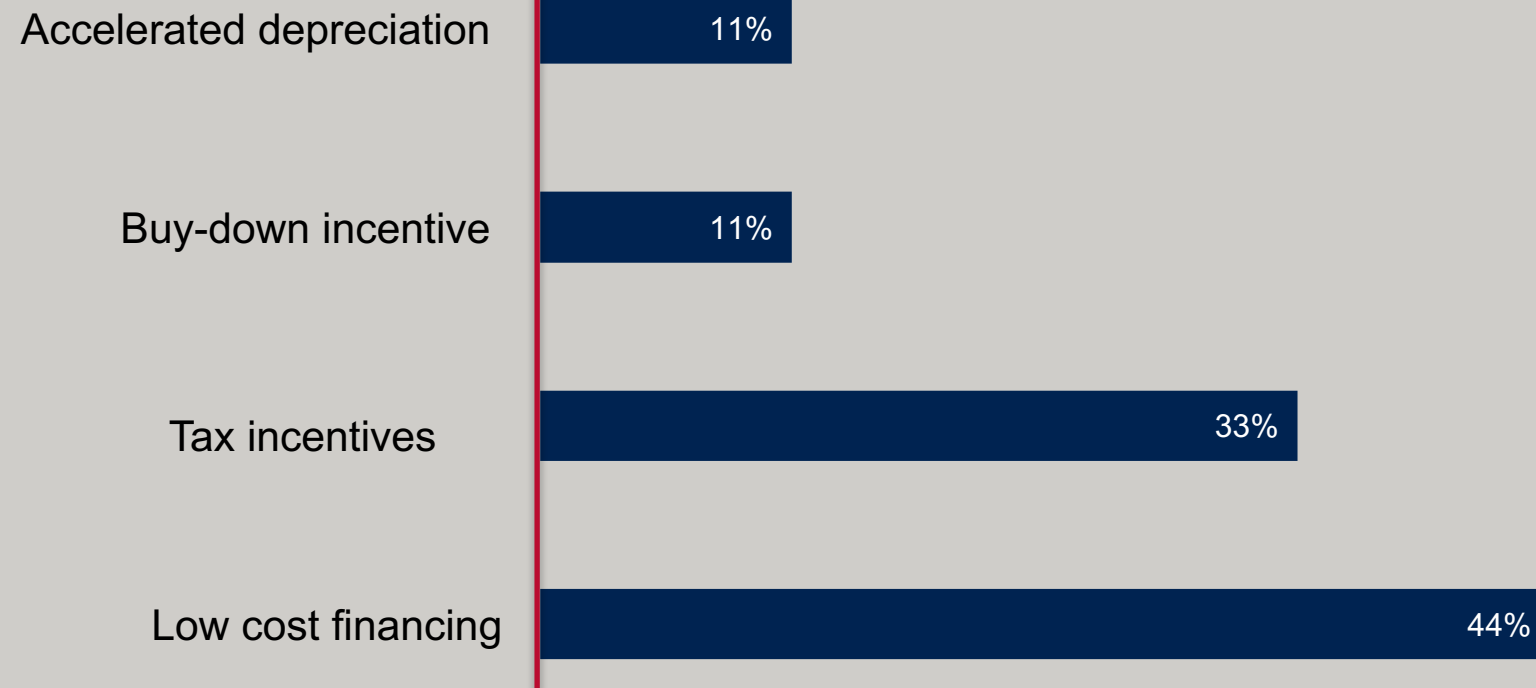
Reasons to choose third-party model to develop RTS



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

RTS buyers/ End users

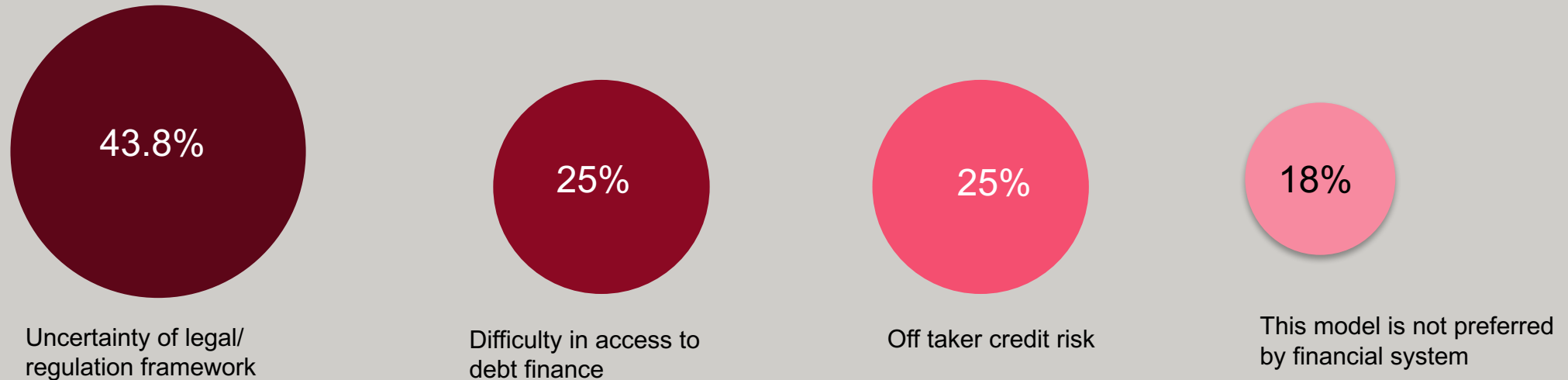
Preferred types of incentives that will attract RTS users to deploy RTS system



Low-cost financing and Preferential tax policy are attractive incentives encouraging RTS development

RTS Developers

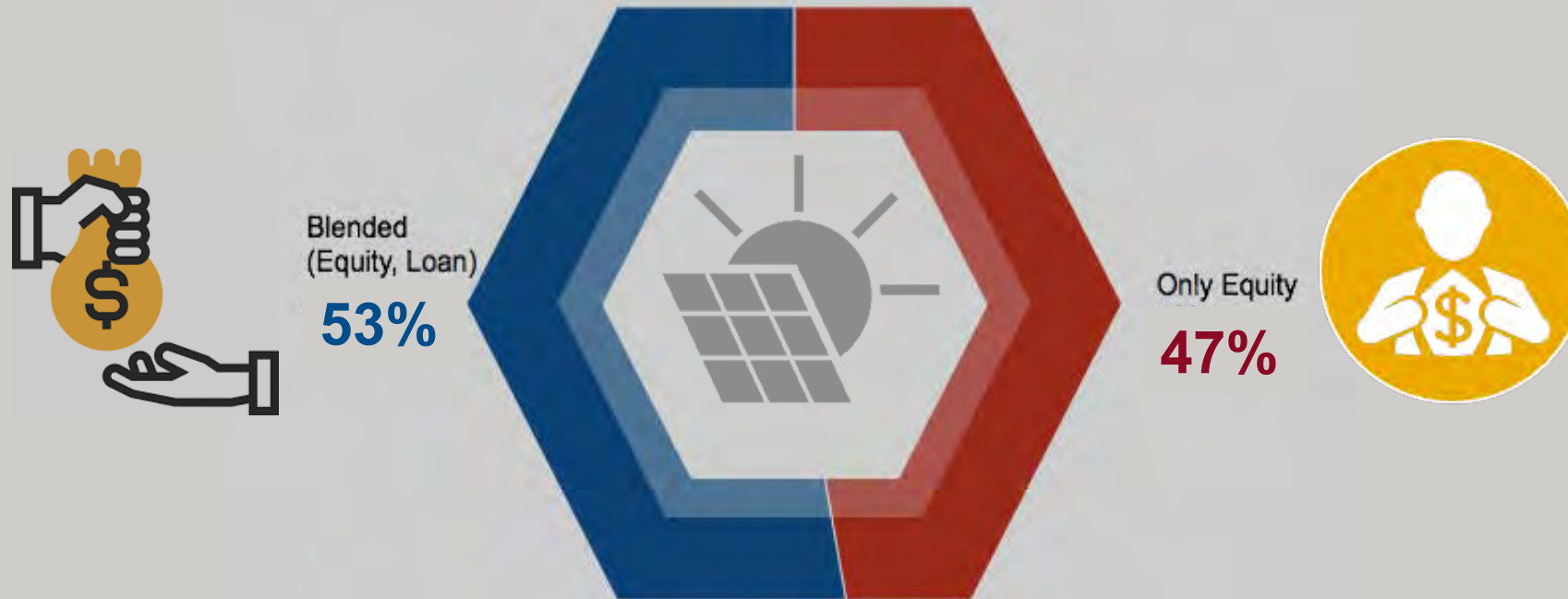
Challenges in scaling up the third party model for RTS business



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

RTS Developers

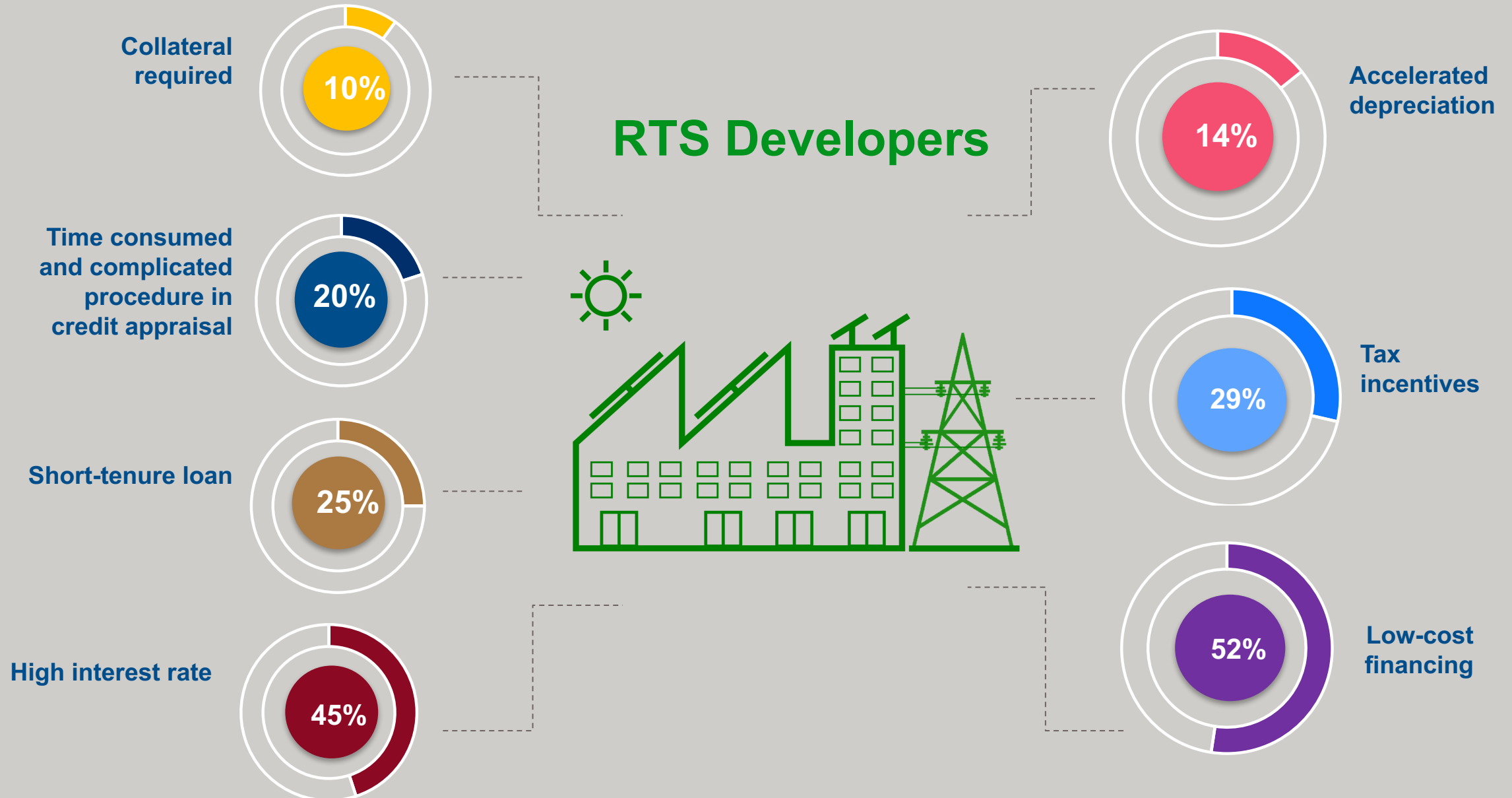
Source of finance to developers



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.

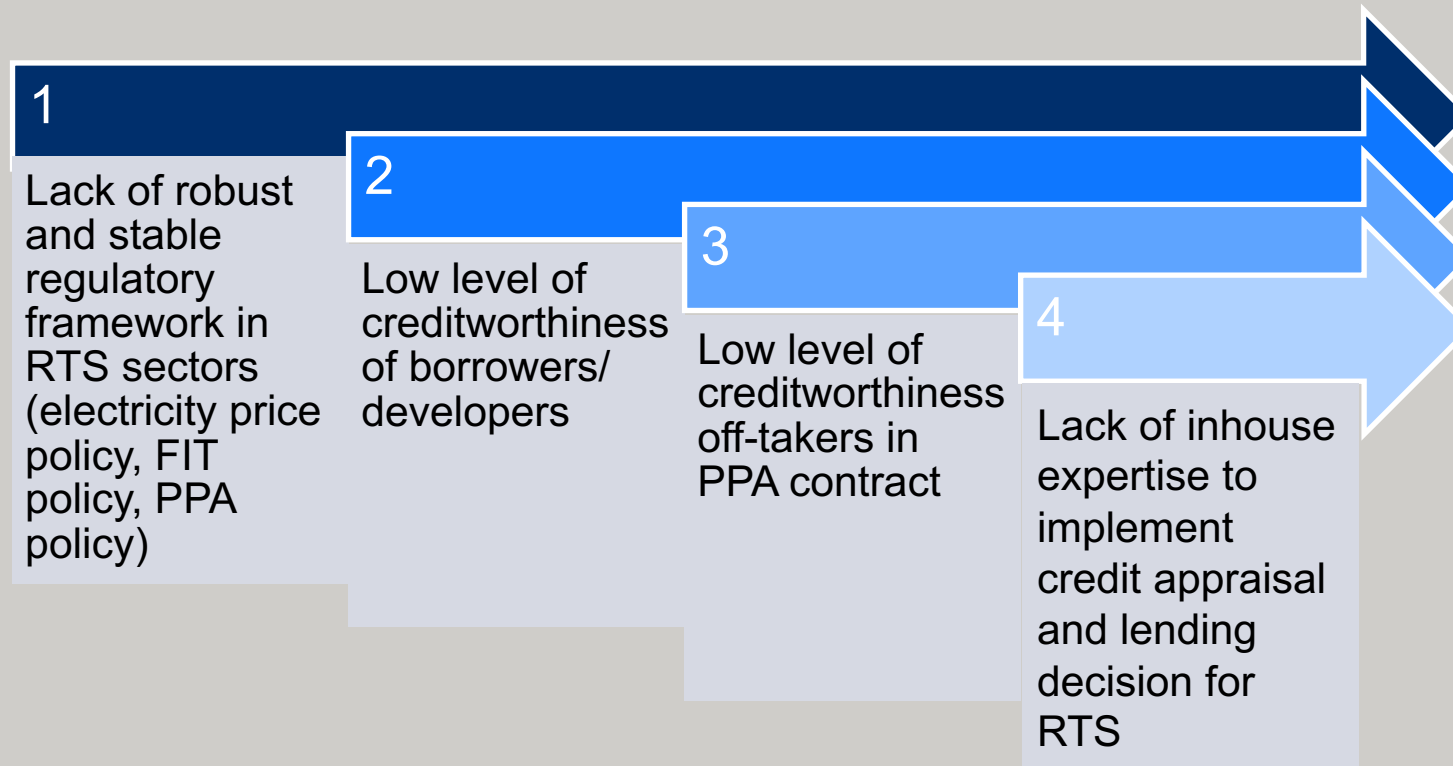
BARRIERS IN ACCESSING FINANCE

THE MOST POLICY INCENTIVES ENCOURAGE RTS SCALING UP



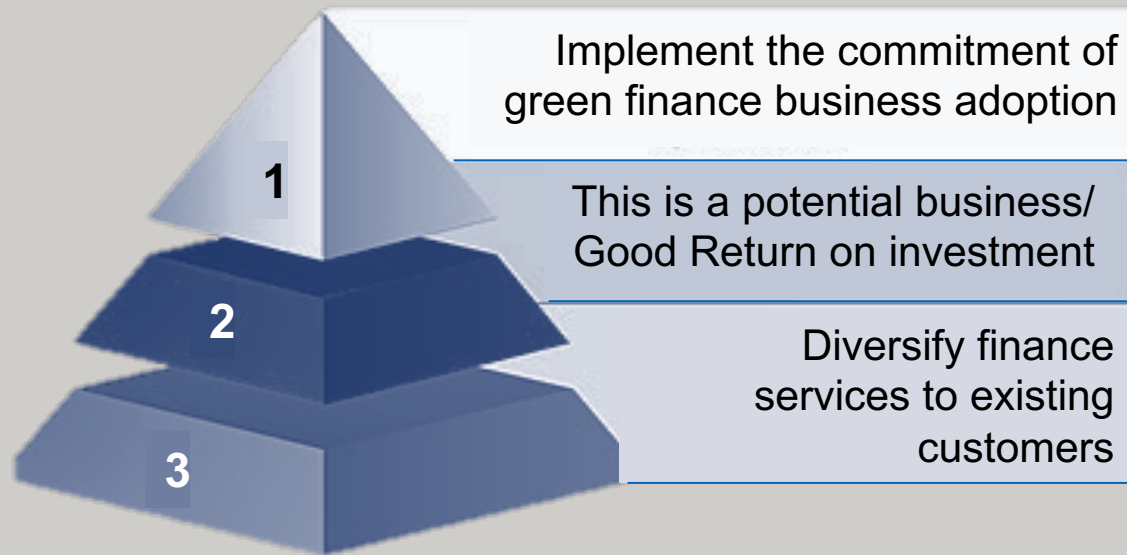
Financing for RTS from banking perspective

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



Financing for RTS from the bank perspective

The motivations of the bank in financing RTS (in order 1- strongest)



Factors enhancing/enabling bank ability to lend RTS in future

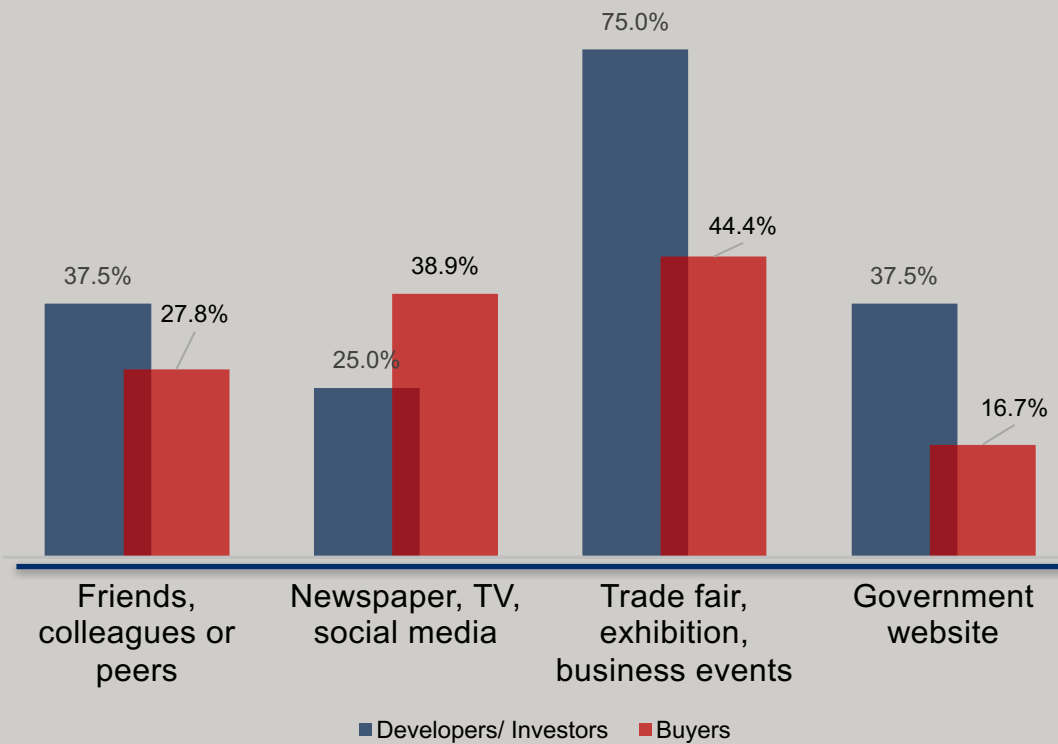
Stable and robust regulatory framework

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

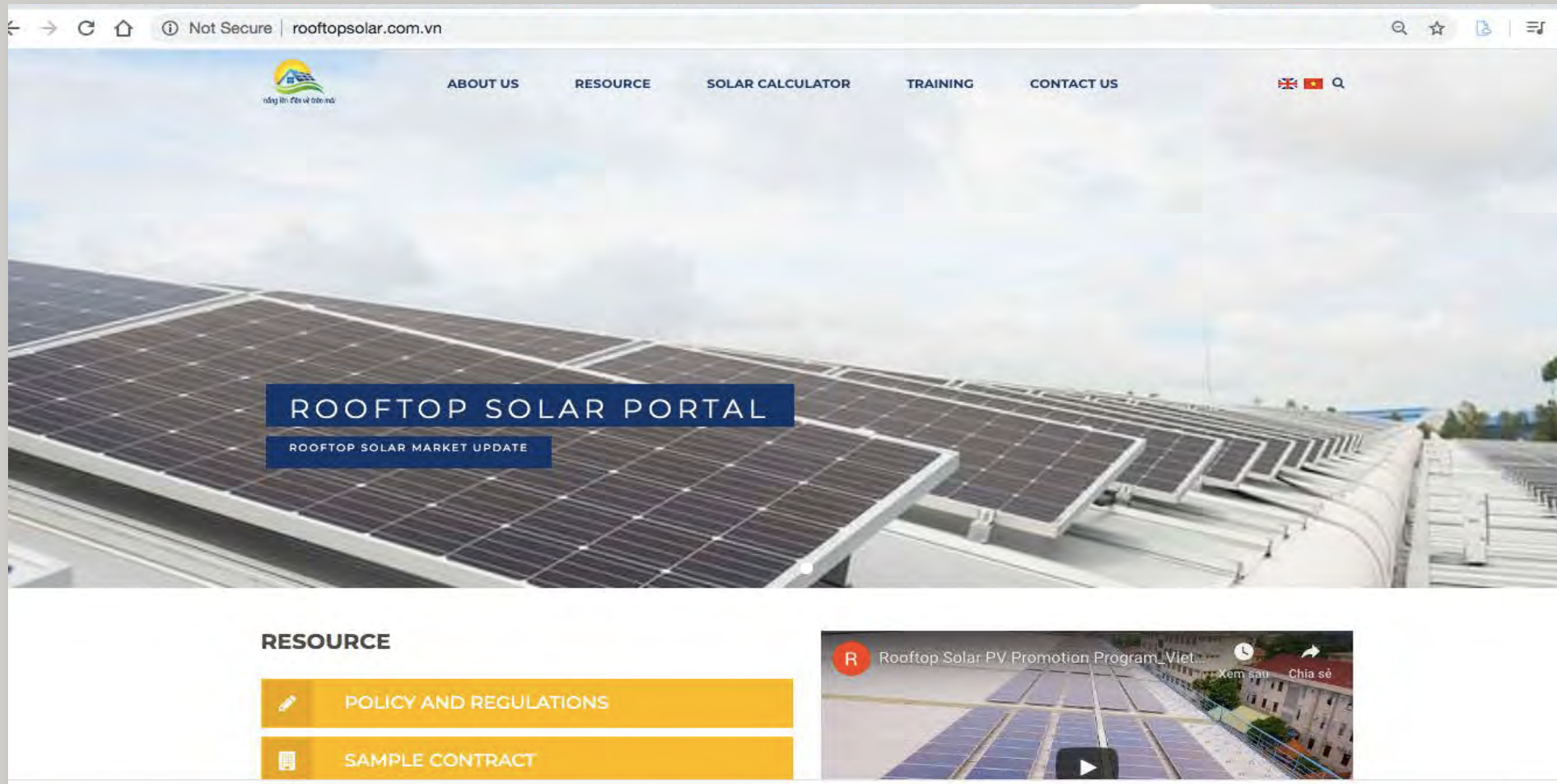


Source of Information

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.

RTS PROMOTION PROGRAM- OFFICIAL PORTAL

<http://rooftopsolar.com.vn/>



RTS PROMOTION PROGRAM- OFFICIAL PORTAL

<http://rooftopsolar.com.vn/>



DURING 2019

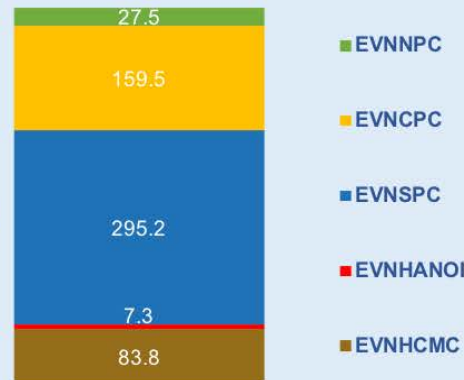
**360.5
MWp**



**30
MWp/
month**



**ROOFTOP SOLAR DEVELOPMENT BY EVNPCs
(until April 20) - MWp**



ROOFTOP SOLAR PV IN VIETNAM

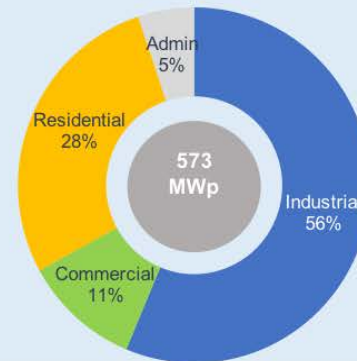
MARKET UPDATE

Data Source: Electricity of Vietnam
Data illustration: USAID V-LEEP

ROOFTOP SOLAR MARKET EVOLUTION



**CAPACITY BY CUSTOMER TYPE
(until April 2020)**



**LEADING PROVINCES/CITIES BY CUSTOMER TYPE
(Until Feb 2020)**



RTS PROMOTION PROGRAM- OFFICIAL PORTAL

<http://rooftopsolar.com.vn/>

Not Secure | rooftopsolar.com.vn/rooftop-solar-calculator1.html

 [ABOUT US](#) [RESOURCE](#) [SOLAR CALCULATOR](#) [TRAINING](#) [CONTACT US](#)  

Home | Solar calculator | **ROOFTOP SOLAR CALCULATOR**



ROOFTOP SOLAR CALCULATOR

NREL's PVWatts® Calculator estimates the energy production and cost of energy of grid-connected photovoltaic (PV) energy systems throughout the world.

This tool also allows homeowners, small building owners, installers and manufacturers to easily develop estimates of the performance of potential PV installations in different jurisdictions and locations within Vietnam.

(NEW!) Data for 19 locations in Vietnam has updated to **NREL's PVWatts® Calculator** including: Ha Noi, Da Nang, HCMC, Thanh Hoa, Ha Tinh, Khanh Hoa, Phu Yen, Dak Lak, Dak Nong, Gia Lai, Binh Dinh, Binh Thuan, Ninh Thuan, Tay Ninh, Long An, An Giang, Binh Phuoc, Ba Ria Vung Tau, Tra Vinh)

[CLICK HERE TO START USING NREL's PVWatts® Calculator](#)

RTS PROMOTION PROGRAM- OFFICIAL PORTAL

<http://rooftopsolar.com.vn/>

<http://rooftopsolar.com.vn/rooftop-solar-calculator1.html>

pvwatts.nrel.gov/pvwatts.php

PVWatts® Calculator **NREL**
NATIONAL RENEWABLE ENERGY LABORATORY

My Location **Ba Ria Vung Tau** [Change Location](#) **HELP** **FEEDBACK** **ALL NREL SOLAR TOOLS**

RESOURCE DATA **SYSTEM INFO** **RESULTS**

SOLAR RESOURCE DATA

The latitude and longitude of the solar resource data site is shown below, along with the distance between your location and the center of the site grid cell. Use this data unless you have a reason to change it.

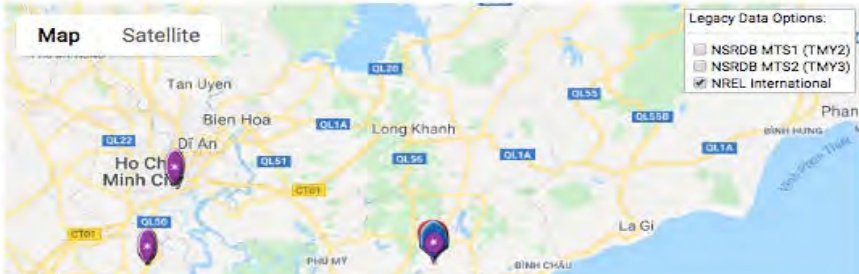
Solar resource data site: **(INTL) BA RIA VUNG TAU, VIETNAM** **0.0 mi**

Resource Data Map

The blue rectangle on the map indicates the NREL NSRDB grid cell for your location. If your location is outside the NSRDB area, the map shows a pin for the nearest available NREL international data site instead of a rectangle. If you want to use data for a different NSRDB grid cell, double-click the map to move the rectangle. *Dragging the rectangle will not move it.* Use the Legacy Data Options check boxes to show pins for legacy data sites. Click a legacy data pin to use legacy data instead of the recommended NSRDB data. See [Help](#) for details.

Map **Satellite**

Legacy Data Options:
☐ NSRDB MTS1 (TMY2)
☐ NSRDB MTS2 (TMY3)
☒ NREL International



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

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USAID
FROM THE AMERICAN PEOPLE



Introduction to Ho Chi Minh City Development Joint Stock Commercial Bank (HDBank)

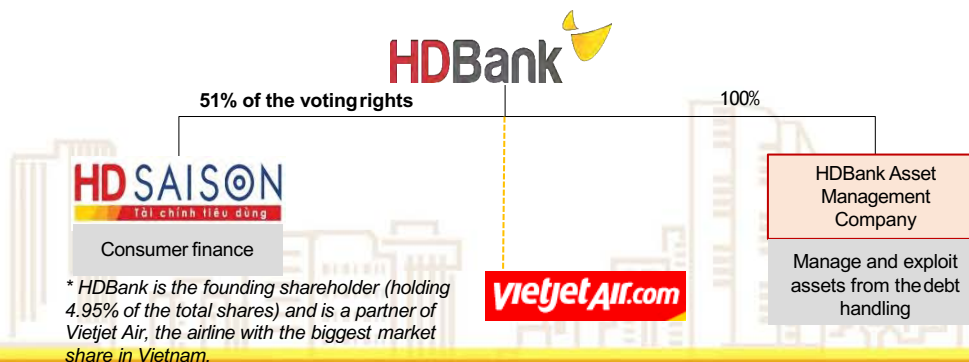


Overview of Ho Chi Minh City Development Joint Stock Commercial Bank (HDBank)

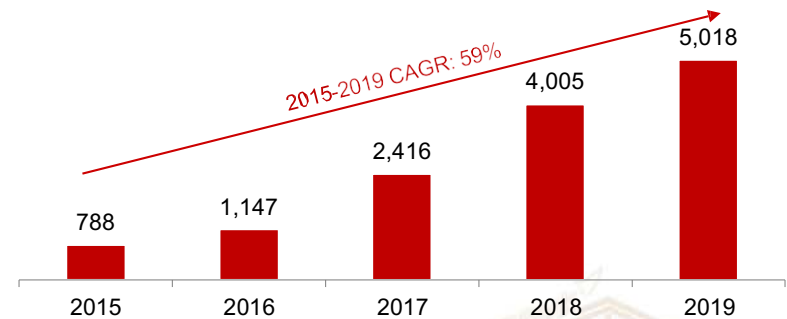
OVERVIEW

- 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



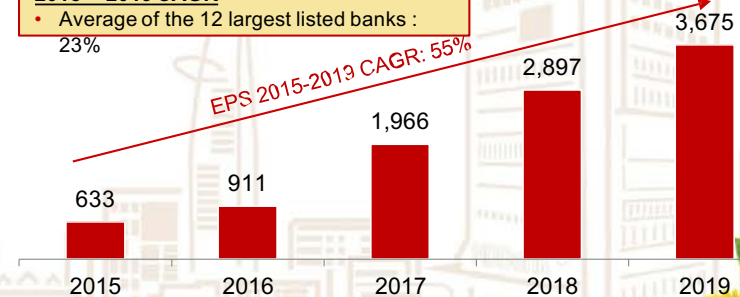
EXCELLENCE IN VALUE INCREASE FOR SHAREHOLDERS STRONG PROFIT BEFORE TAX GROWTH (BILLION VND)



STRONG BASIC EPS GROWTH (VND/SHARE)

2015 – 2019 CAGR

- Average of the 12 largest listed banks : 23%



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



Self-investment



70%

Max financing by HDBank

ESCO



60-65%

Max financing by HDBank





Self-investment

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

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

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.

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

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:

Design capacity	HDBank's funding
999 kWp	VND 13 billion

Generation output:

Total output From Oct 2019 to Feb 2020	Average monthly output	Expected annual output
~ 530 MWh	~ 106 MWh	1,280 MWh

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



GENERATION



TRANSMISSION



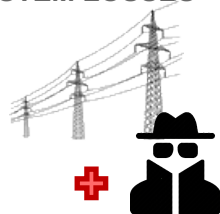
DISTRIBUTION



GOVERNMENT CHARGES

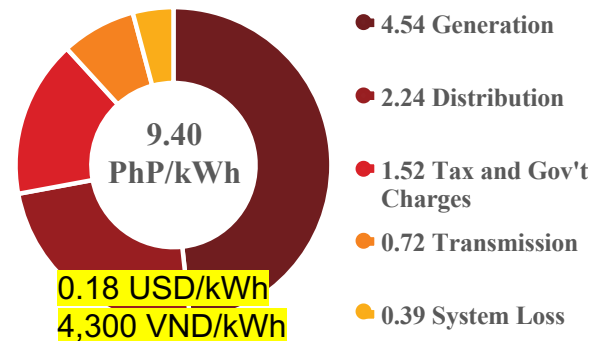


SYSTEM LOSSES

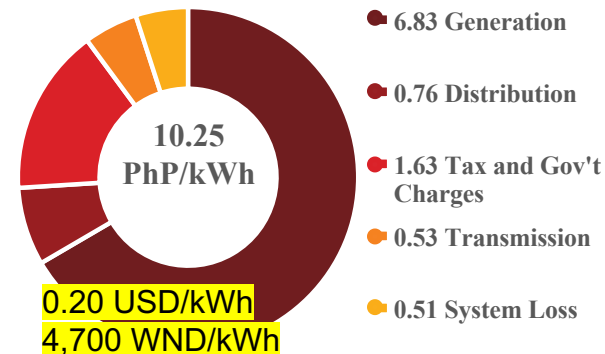


(PILFERAGE CHARGE)

Meralco Rate Breakdown



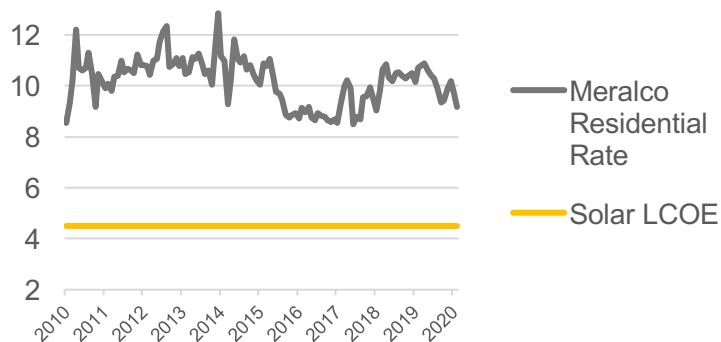
Mindanao Utility Rate Breakdown



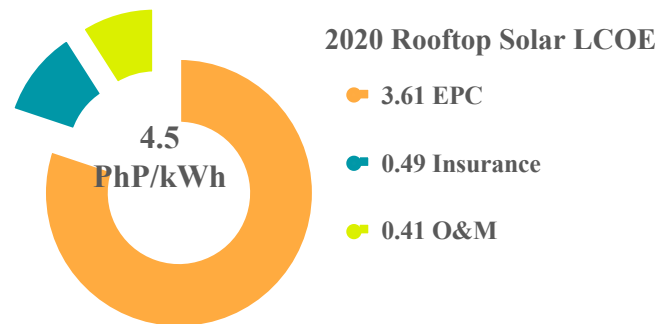
Drivers for C&I Rooftop Solar (RTS)



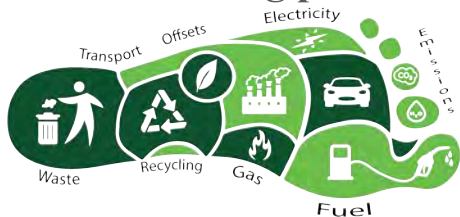
1. Solar can provide immediate savings AND a hedge against rising electricity prices.



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.



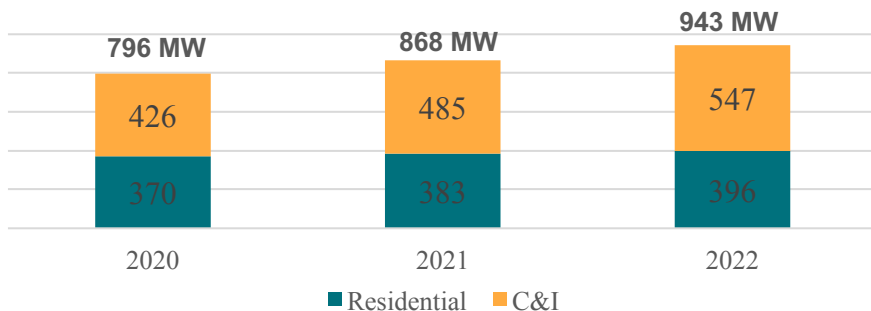
Survey: 93% of Filipinos believe that carbon emissions need to be significantly reduced.



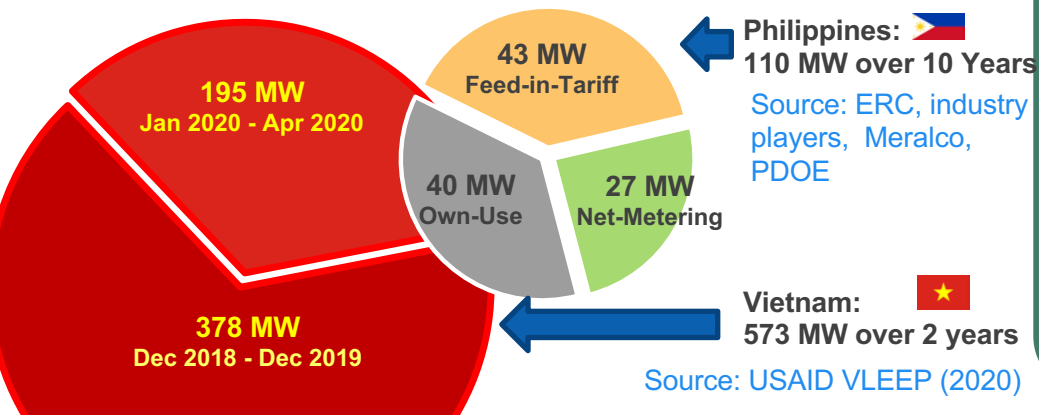
Philippine RTS Market is Still Largely Untapped



Base Case Solar Rooftop Market Volume (MW)



Commissioned RTS Solar Projects



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

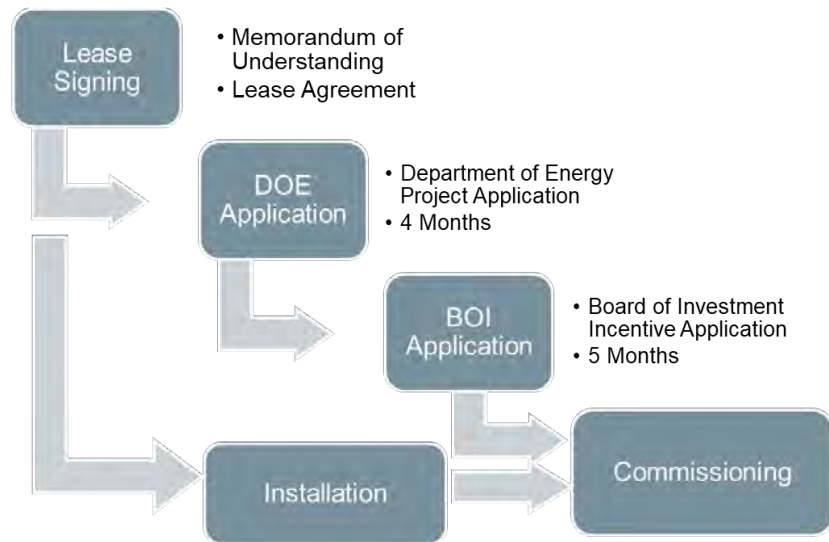


1. Not “homerun” returns to the Third Party Financier
2. Long term exposure to liabilities and risks to cashflows
3. Long development process given the scale and capacities involved (9 – 12 months)
4. Mismatch between consumption and generation: who takes on “excess production”?

Sensitivities at Different Price Points

	%Savings for End-User	IRR* for Financier (15 year contract)	Payback Period for the Financier
@ 6.50 PhP/kWh	5.2%	7%	10
@ 7.50 PhP/kWh	3.8%	10%	8
@ 8.50 PhP/kWh	2.3%	13%	7

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-size 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:



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