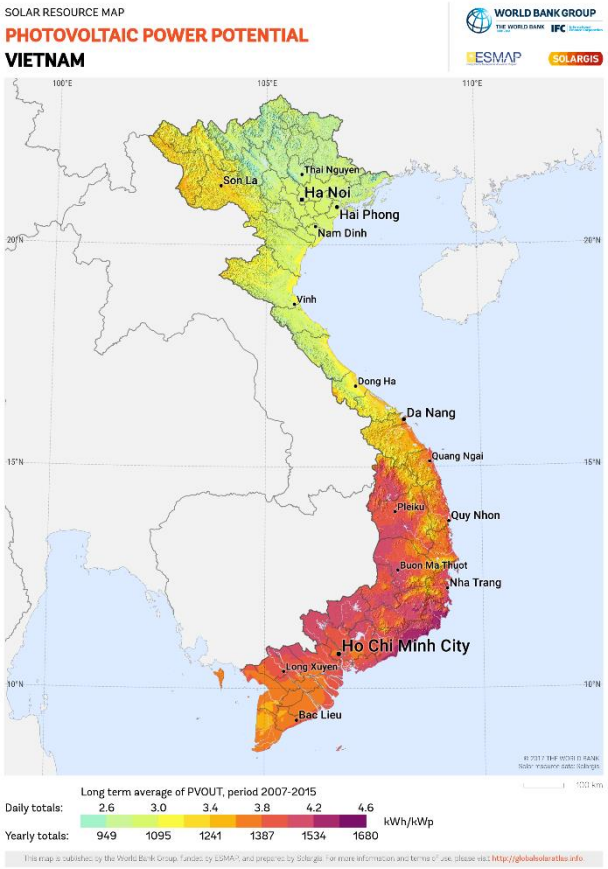


Vietnam: Solar Auction Strategy

Hanoi Off-shore Wind Workshop June 12, 2019

WORLD BANK GROUP

Vietnam Solar Targets and Compared Resource

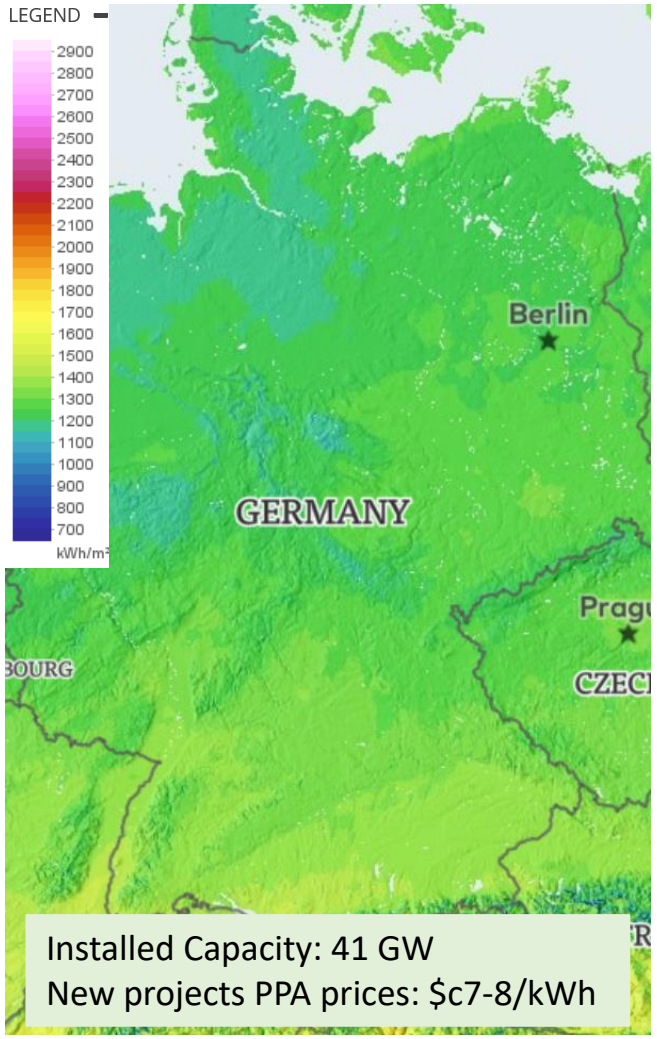
Vietnam's Solar Ambitious Targets (1)

2016 — **10 MW**

2020 — **850 MW**

2030 — **12 GW**

GERMANY

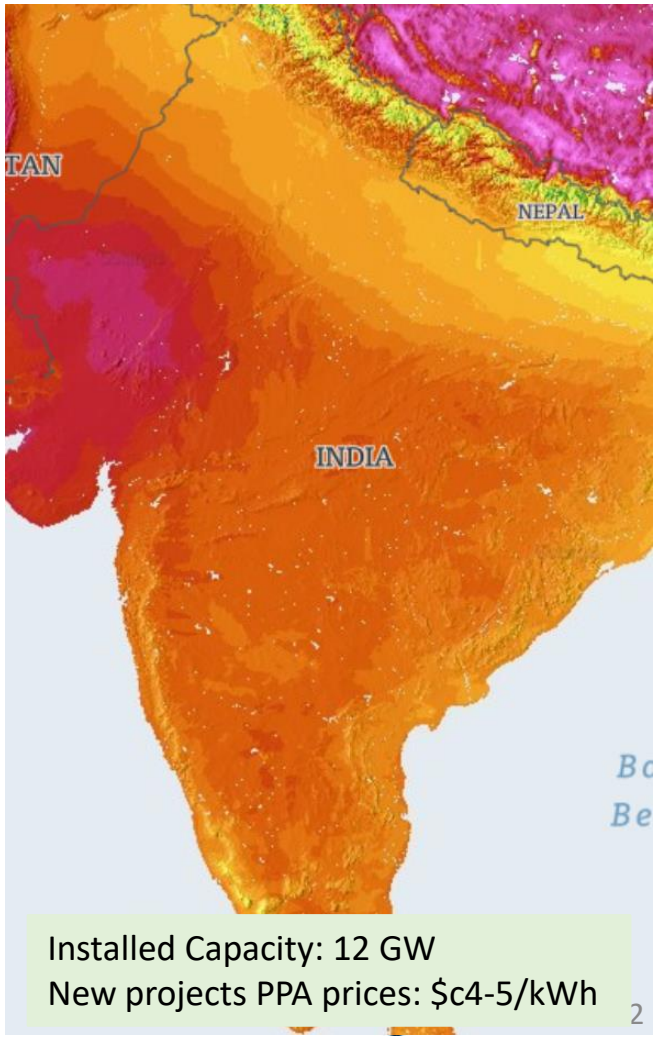


Installed Capacity: 41 GW
New projects PPA prices: $c7-8/kWh

VIETNAM

Installed Capacity: 2 GW (May 2019)
FIT: $c9.35/kWh

INDIA



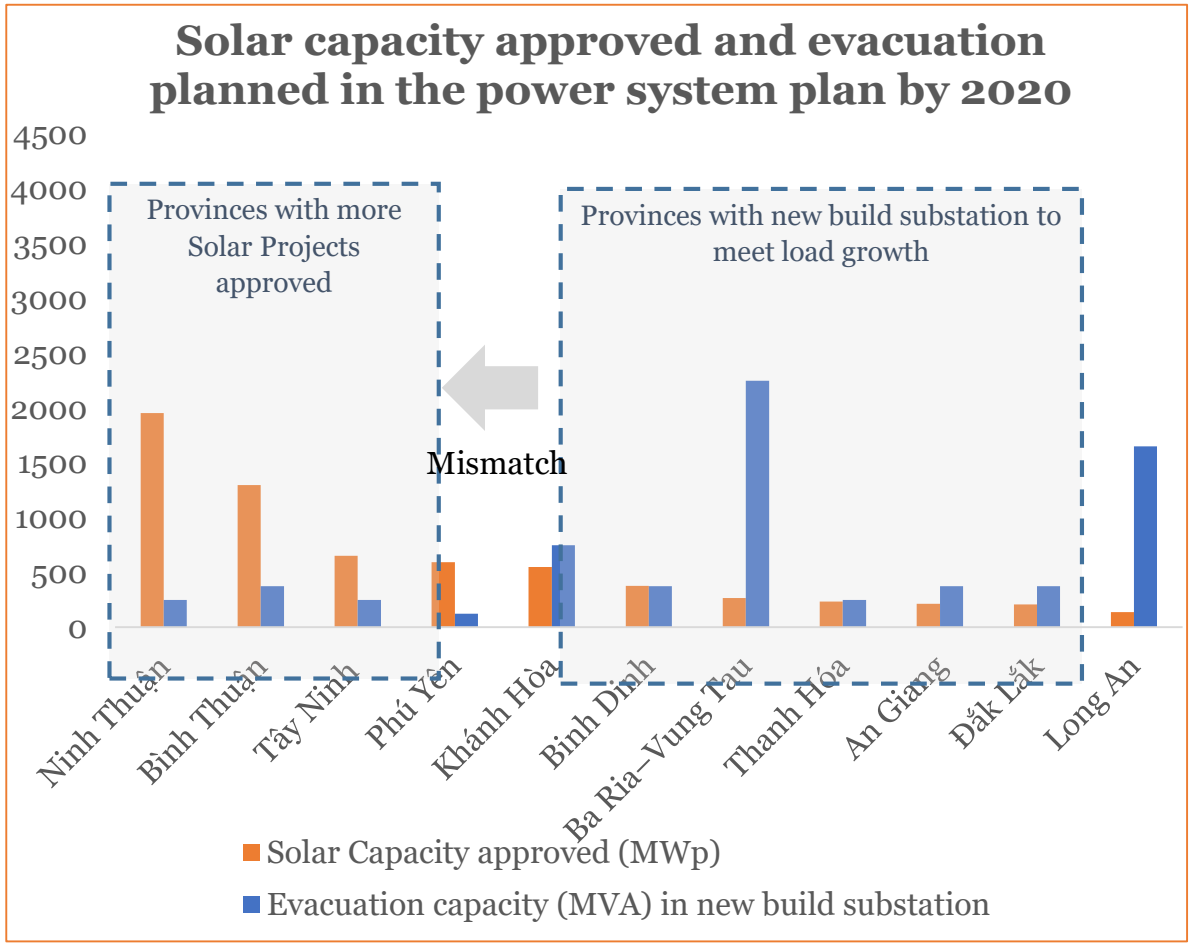
Installed Capacity: 12 GW
New projects PPA prices: $c4-5/kWh

(1) Sources: MOIT Revised PDP 7, Global Solar Atlas GTI data

Existing power system challenges to solar development

Key challenges

- Transmission capacity (current & planned up to 2020) is not sufficient to serve solar projects that are in the power system plan (PDP) in some provinces.
- In these provinces, there is need to invest in additional transmission capacity.
- Administrative processes viz., Land Use plan, Solar Master Plan and the Power System Plan are not fully aligned. This mismatch too can hold up projects.



Design of Solar Auction Program

Aim: To design a scalable Solar Auction program to achieve the government's solar energy targets at the lowest possible PPA tariff.

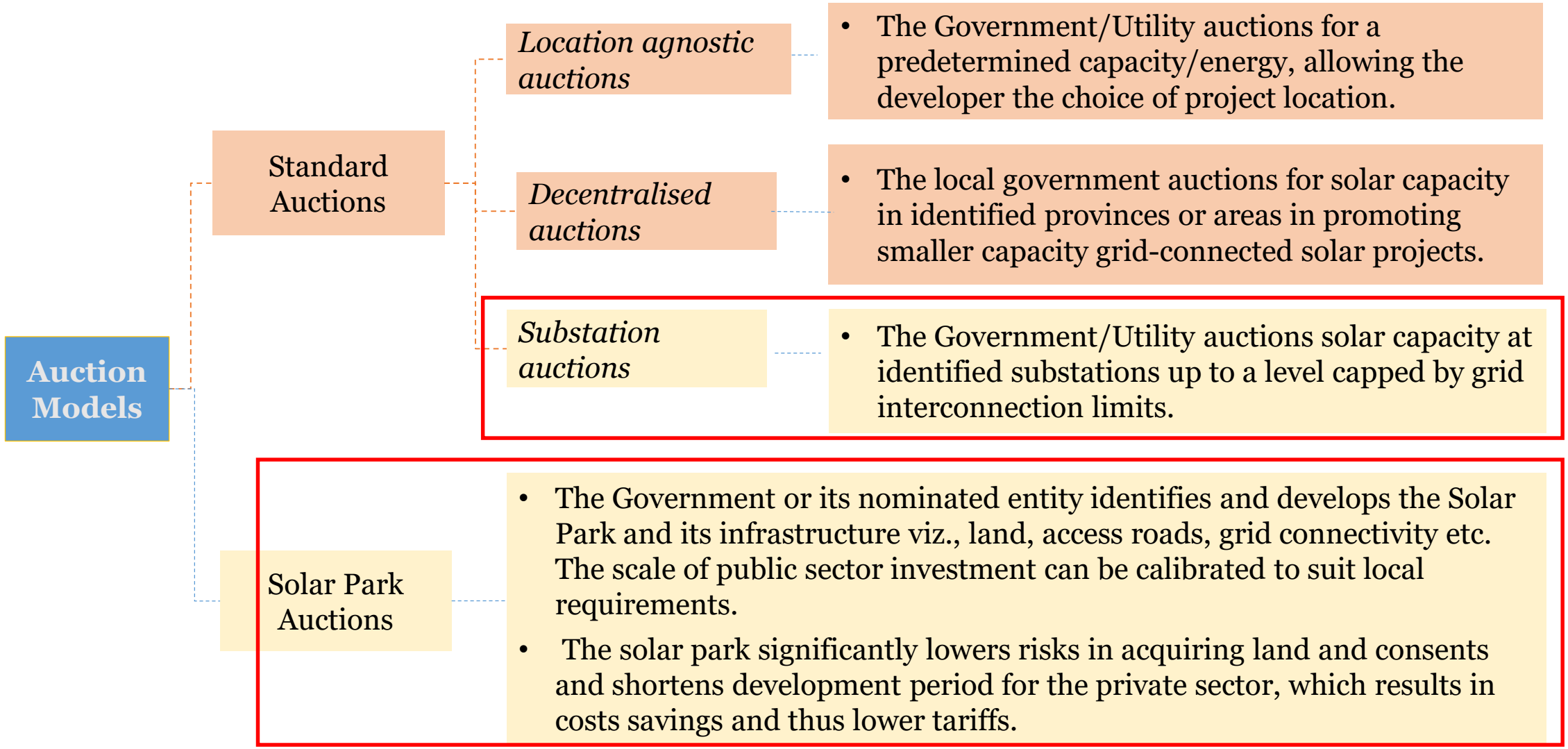
Solar Auction Strategy

- Which types of solar auctions / bidding models, presented in the previous consultation, suit us the best?
- How do we best achieve the Government's solar target at the lowest possible tariff? How do the solar auction models shall address the challenges of land, transmission capacity, financing, etc.?
- Which bidding models are suitable for us and how can it be adapted for deployment?
- What are the key features of these bidding models and what is the role of different agencies?
- Can a roadmap be proposed for implementing such solar bidding model (for the purpose of discussion)?

Solar Auction Framework

- What type of bidding process is suitable for achieving the objectives in Substation bidding and Solar Park bidding model?
- Who will be eligible to participate in the bidding process (best practices on Technical and Financing capability in qualification criteria)?
- On what basis would the winning bidders be selected?
- What are the key parameters for procurement by EVN to achieve a successful bidding with lowest possible tariff?
- What are the key terms for PPA? Risk allocation among the stakeholders to improve PPA bankability to deliver projects at lowest cost?

The solar auction models



Recommended auction models

The solutions

- The current power system planning process and PDP VIII should be aligned with the solar auction plan (including identifying new-build substation).
  - To identify substations that have available capacity after adjusting for other expected generating sources
  - To align this with the solar master plan viz., to map the capacity & location (= solar potential) vis-à-vis the available substation capacity.
- Two bidding models which address the evacuation requirement of solar projects as well as optimise the utilisation of available substation capacity, are recommended.

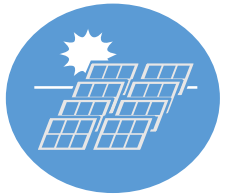
Substation based bidding

and

Solar Park based bidding

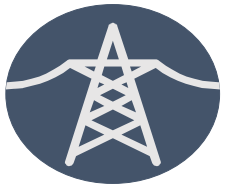
Substation bidding

Description

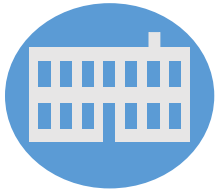


- Developer is free to choose any site location but must connect to the grid at specified substations

- Developer identifies land and secures required licence/permits as per applicable law near the identified substation(s)



- All eligible substations (and their capacity available) are identified by the bidding agency and listed for auction



- Supply power at auctioned tariff to EVN through Power Purchase Agreement (PPA)

The alternatives

- Bidding to provide available capacity in existing and planned substations. This may include solar projects registered under the master plan.
- Substation based bidding model can be designed for implementation at either voltage levels listed below (bidding on transmission voltage substations is recommended).

Transmission voltage Substations	**Distribution voltage Substations**
Bidding at 110 kV, 220 kV and 500 kV substations	*Bidding at 22 kV, 6 kV and 35 kV substations*

Substation bidding

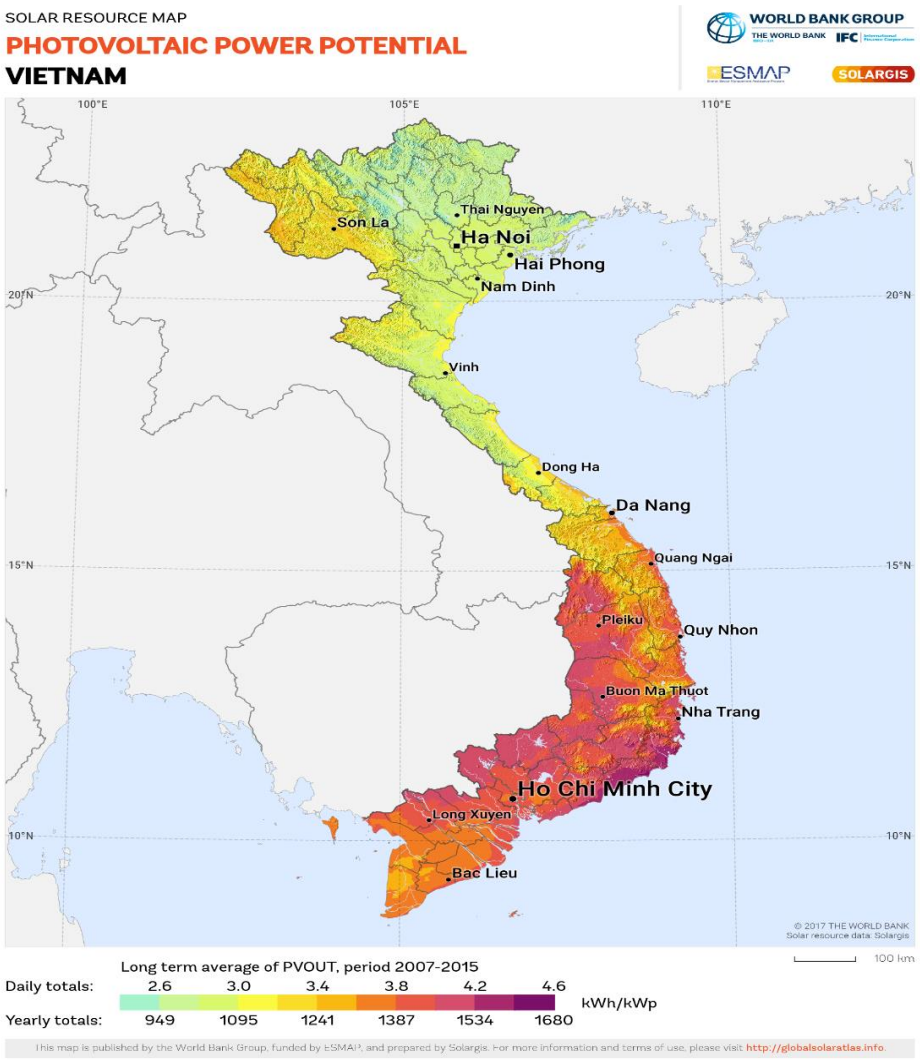
Highlights

- The Planning agency defines the capacity range for the relevant voltage level based on technical criteria.

Voltage level	Capacity range*
110 kV	50 MW - 100 MW
220 kV	100 MW - 250 MW
500 kV	500 MW and above

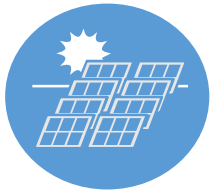
- V substations is conducted centrally across Provinces to attract greater participation and competition desirable given the scale of projects.
- A well-structured project of this scale is likely to attract experienced developers bringing cost efficiency into the bids.

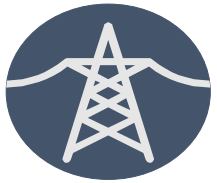
*Note: Also depends on number of transmission bays/lines i.e. single or double circuit

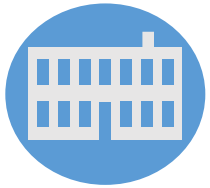


Solar Park bidding

Description







- Developer is required to develop solar project in the identified Solar Park
- Auction entity or the nominated Solar Park entity identifies land as per regulations and undertakes all permits, and develops the site infrastructure (roads, boundary, land levelling, water etc.).
- Evacuation infrastructure along with connection permits secured by auction entity/ nominated solar park entity
- Supply power at auctioned tariff to EVN through Power Purchase Agreement

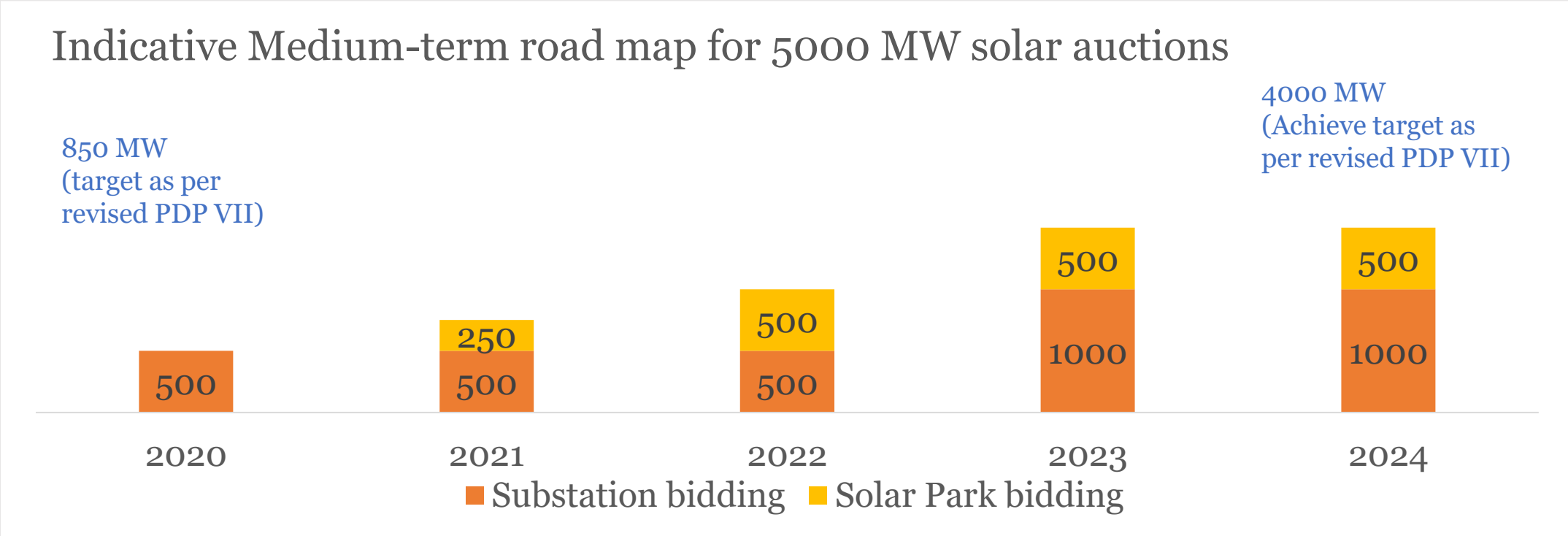
Highlights

- All the major project development risks are taken out in this transaction.
- Global investors are able to participate more readily with these uncertainties taken away.
- The combined effect of lowered risk and global participation can translate into significant tariff savings in such bidding.
- Development costs and the return on investment for the Solar Park agency can be serviced from the annual lease rental to be paid by the solar project owner.
- The Government can undertake market outreach and investment promotion activities to convey its long-term vision through such bidding.

Solar Park bidding

Implementation Options	Description	Pros	Cons
Option 1: **Solar park developed by Government**	• Province identifies land and develops it with infrastructure through a government entity (provincial or national)	• Establish benchmarks that can attract new technologies, investors and management practices	• Limited institutional capacity of implementing agency • Lacks financial budget to undertake such works (mitigation: the Province may limit the tasks it undertakes)
Option 2: **Solar park developed by Private Developer**	• Province identifies land and private developer develops the land, infrastructure (~Industrial Zones)	• Allows government to draw on the capacity and expertise of the local engineering and construction firms	• The private sector may have lower confidence in this business model in the initial years to participate • Risk of higher margins charged in solar park fees (mitigation: upfront agreement on the rental fees)

Indicative Auction Plan

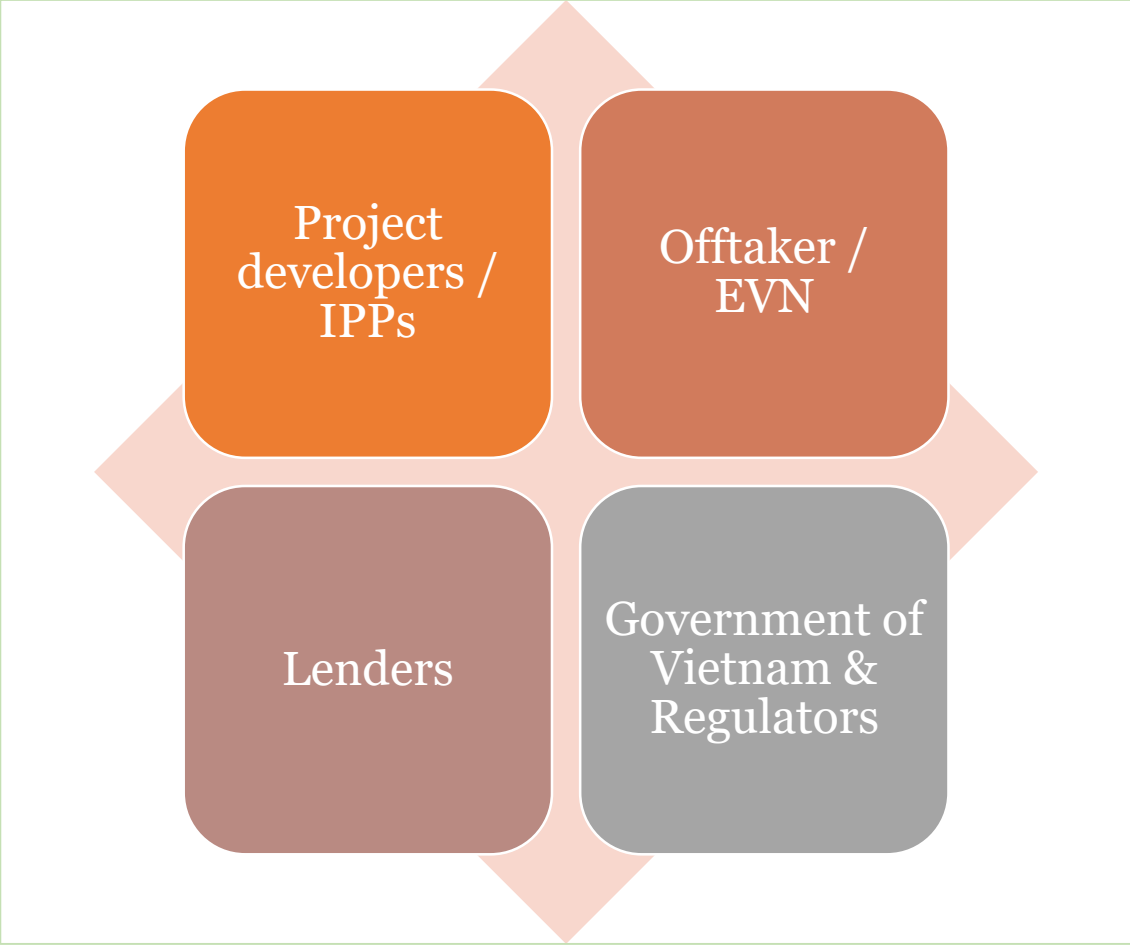


Key takeaways

- Defined road-map for auction capacity to enable investors/developers to take up preparatory actions necessary for project development leading to competitive discovery of tariff
- The program is likely to drive investments of USD 3.5 billion over 5 years, generating over 15000 jobs in the Solar PV industry
- Road map to align with the updated policy targets in upcoming power system plan (PDP VIII)

Design consideration for auction framework

Key Stakeholders

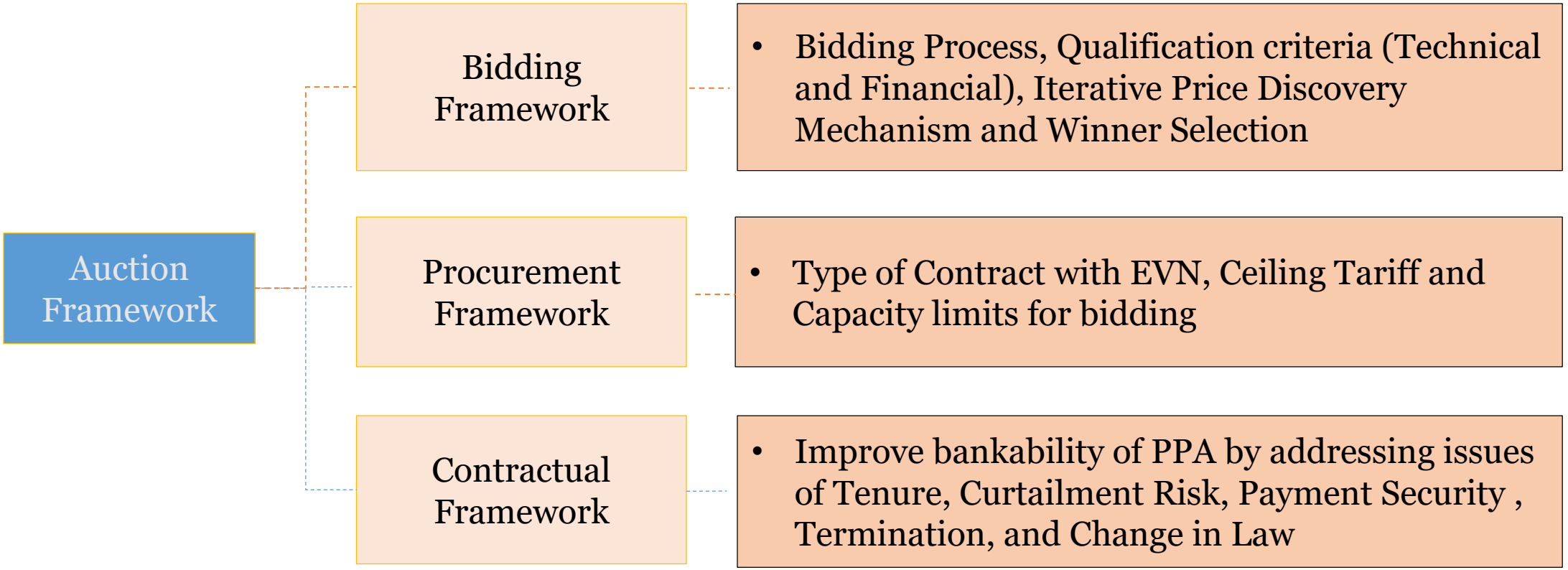


Key barriers or risks:

- Off taker/EVN – *Energy security, delays in project delivery*
- Government of Vietnam and Regulators – *Low response to auction process*
- Lenders – *Curtailment risk, Termination risk and inadequate termination compensation*
- Project Developers – *Curtailment risk, erosion of returns*

Auction Framework requires right balance of risk sharing between the stakeholders based on the maturity and implementation readiness of the local ecosystem

The elements of Auction Framework



- The elements of the auction framework have a major influence on the level of participation, quality of the bidders, and the outcomes (viz., winning tariffs, timely project delivery).
- The executing agency has to take a honest view of current conditions and provide suitable risk protection, in order to deliver value for money to power consumers.

Summary of recommendations

Parameter	Observation
Bidding Framework	
Bidding Process	One Stage Two Envelope process for pilot auctions
Winner Selection	Tariff based selection i.e. bidder with lowest quoted tariff
Procurement Framework	
Payment Mechanism	Metered energy based payments
Ceiling Tariff	FiT Tariff for pilot auction
Minimum Capacity limit	Transmission substation bidding and Solar Park bidding – 50 MW
Best Practices in Contractual Framework	
PPA Tenure	25 years
Curtailment Risks	Take or Pay compensation beyond defined number of hours of grid unavailability
Payment Security	3 layered security mechanism
Termination	Defined event of defaults and Termination compensation
Change in Law	Provision for pass through in case change in law post bid submission

Key Recommendations

- Plan a medium-term strategy which has clear procurement processes and timeline for MW being procure under a stated scheme and conduct the solar auction through a pilot of 500 MW substation bidding;
- Sequential bidding with first Transmission substation bidding followed by Solar Park bidding (Public Solar Park is preferred)
- MOIT to lead on planning and approval requirements to run the bid-process for Substation bidding;
- PPC, MOIT to lead the planning and approval requirements, with PPC and EVN being the auctioneer to runs the bid process for Solar Park bidding;
- *Legal framework changes*: Adopt suitable policies for scaling-up the development of solar projects through auction mechanism after completing the pilot auction.

Solar Auction Strategy