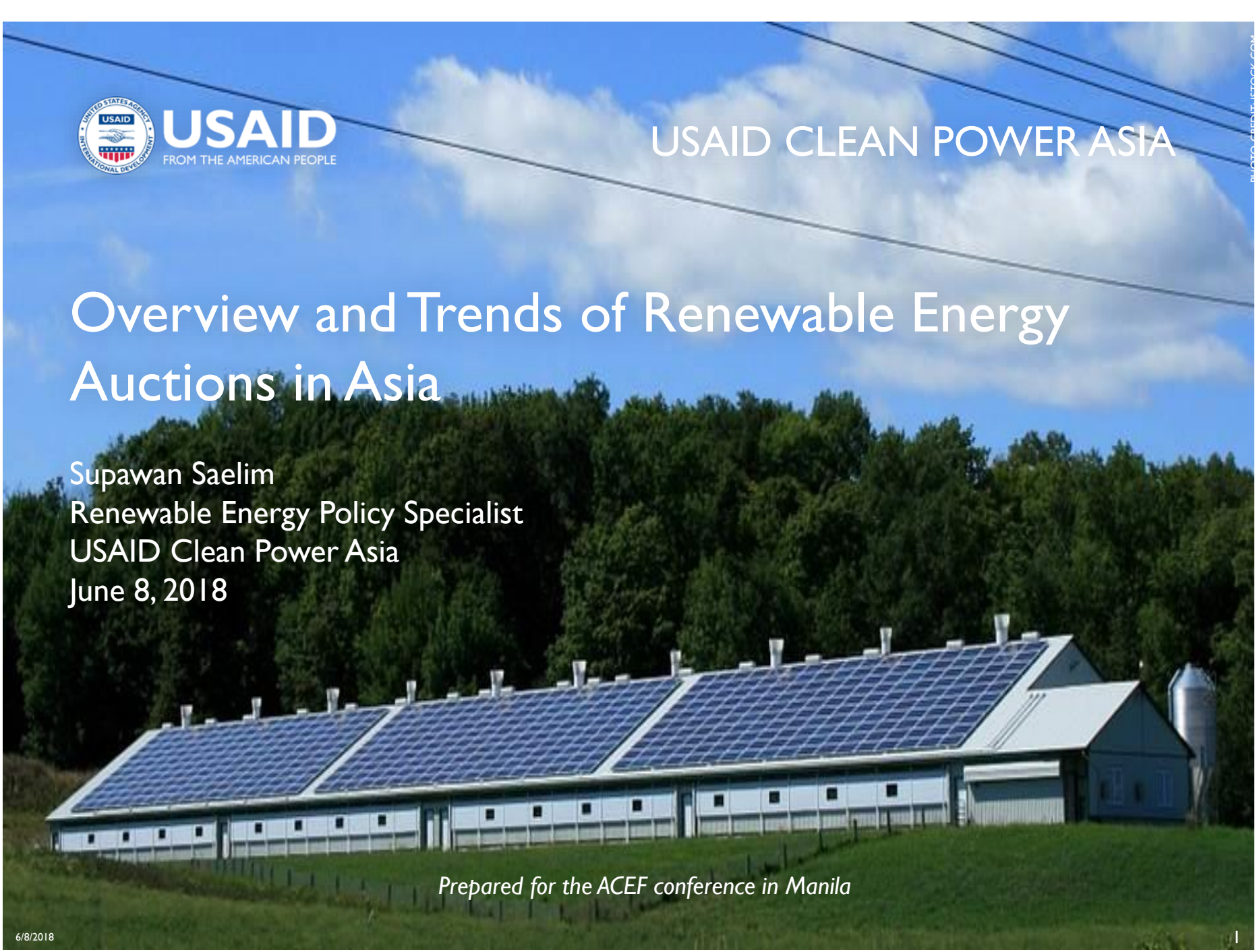
USAID
FROM THE AMERICAN PEOPLE

USAID CLEAN POWER ASIA

Overview and Trends of Renewable Energy Auctions in Asia

Supawan Saelim
Renewable Energy Policy Specialist
USAID Clean Power Asia
June 8, 2018



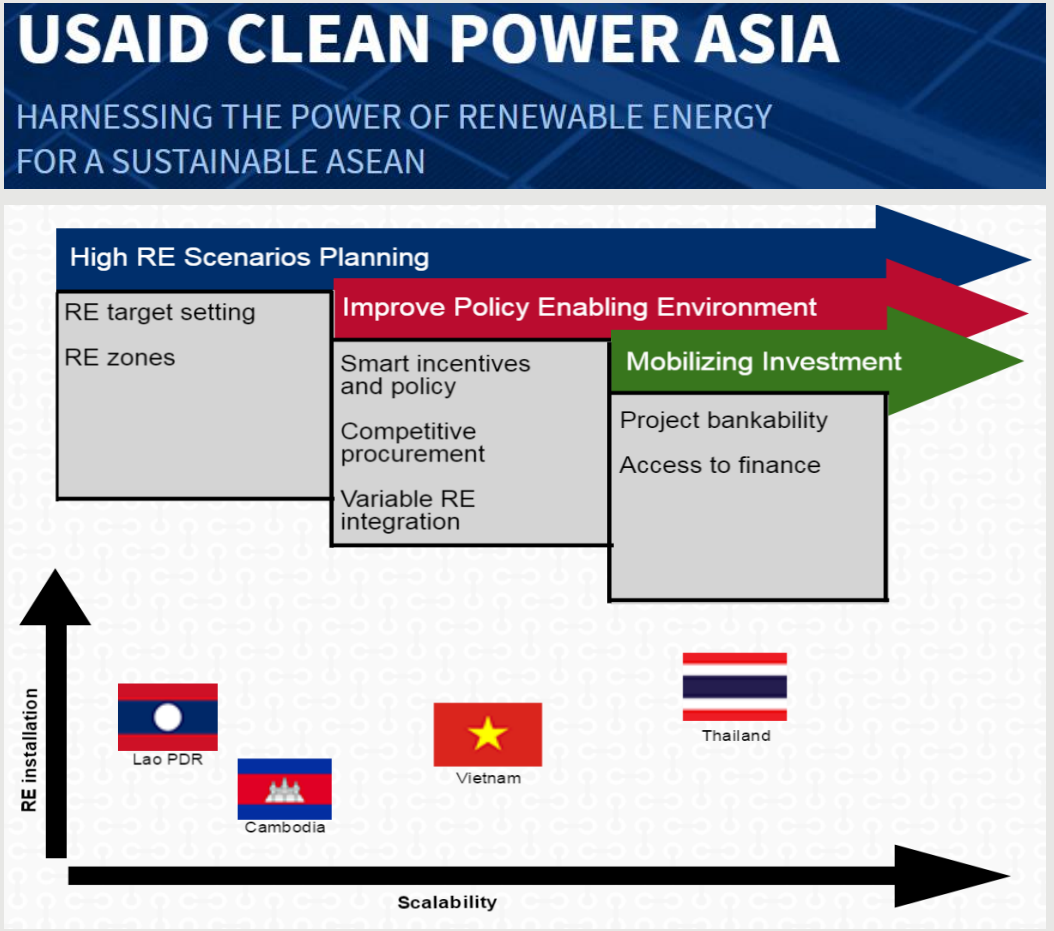
Prepared for the ACEF conference in Manila

Agenda

- Introduction:
  - USAID Clean Power Asia program
  - Highlights of recent renewable energy auctions in Asia
- Recent auction and policy for hybrid projects
  - Thailand: SPP hybrid auction
  - India: Wind-solar hybrid policy

USAID Clean Power Asia program

- 5 years: June 2016 – June 2021
- Aims to increase deployment in 'grid-connected' renewable energy in Asia
- Focus on Cambodia, Lao PDR, Thailand, and Vietnam
- Goals:
  - 15 laws/policies/regulations
  - $750 M USD investment mobilization
  - 500 MW of installed RE
  - 3.5 M tCO2e reduction
- Implemented by Abt Associates and partners
- Funded by United States Agency for International Development (USAID)



Our website link: http://www.usaidcleanpowerasia.org/

Introduction

"Electricity from renewables will soon be consistently cheaper than from fossil fuels. ***Falling renewable power costs signal a real paradigm shift*** *in the competitiveness of different power generation options."*

(IRENA, 2018)

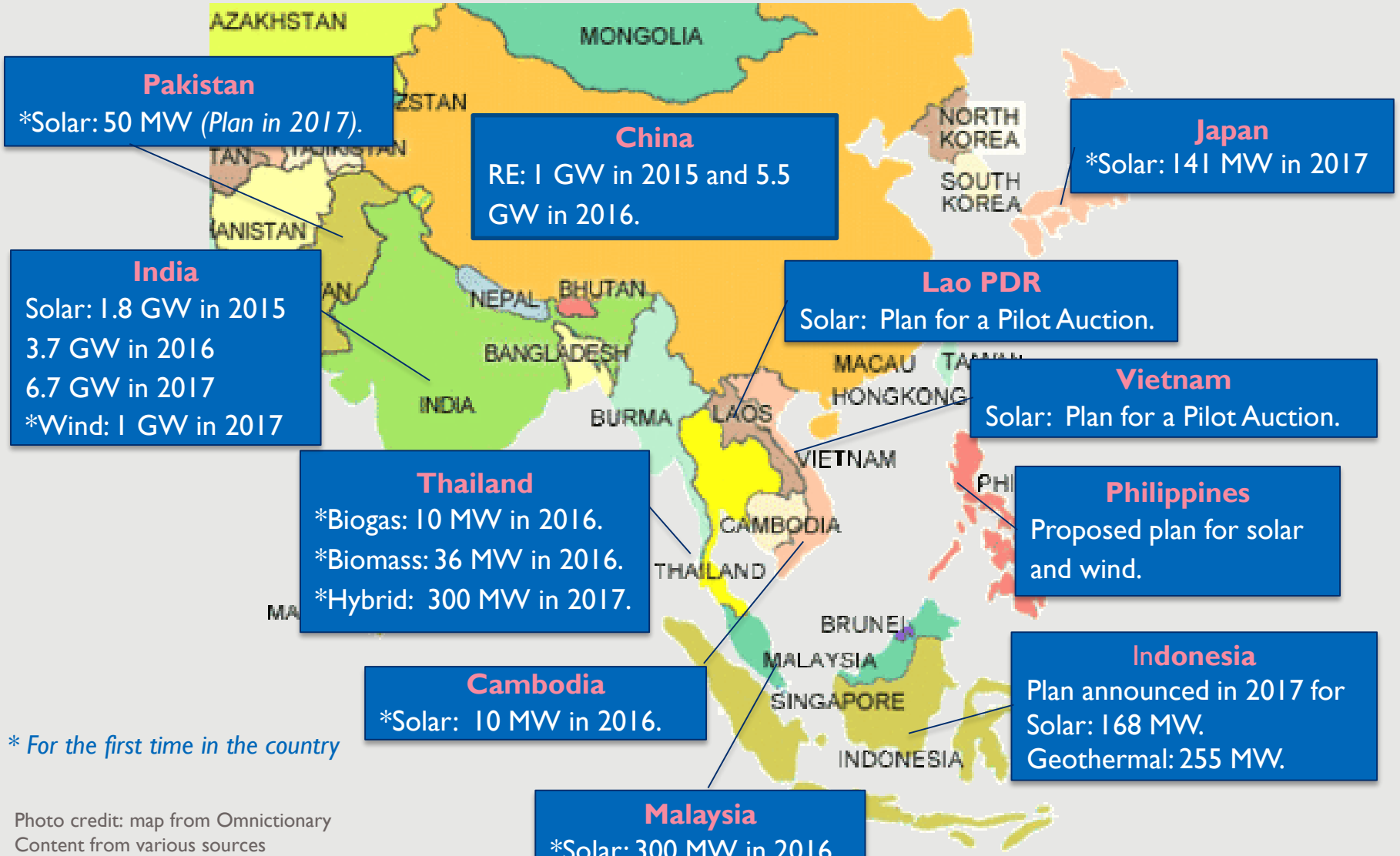
"Across Asia ***competitive bidding is making the difference****, accelerating a renewables boom sparked by already tumbling prices for solar panels and wind turbines. The* ***transition to an auction system*** *is a way for governments to put a lid on what's become a hard-to-control boom in clean-energy installations stimulated by government subsidies."*

(Bloomberg News, 2017)

"In order to solve the intermittency issue that RE has, there are different methods currently being used/developed in order ***to 'firm' the energy supply from RE*** *sources. These include large utility scale* ***battery storage, or hybrid facilities*** *(e.g., solar and gas/diesel hybrid power plants)."*

(PwC, 2018)

Recent renewable energy auctions in Asia



Pakistan
*Solar: 50 MW *(Plan in 2017).*

China
RE: 1 GW in 2015 and 5.5 GW in 2016.

Japan
*Solar: 141 MW in 2017

India
Solar: 1.8 GW in 2015
3.7 GW in 2016
6.7 GW in 2017
*Wind: 1 GW in 2017

Lao PDR
Solar: Plan for a Pilot Auction.

Vietnam
Solar: Plan for a Pilot Auction.

Thailand
*Biogas: 10 MW in 2016.
*Biomass: 36 MW in 2016.
*Hybrid: 300 MW in 2017.

Philippines
Proposed plan for solar and wind.

Cambodia
*Solar: 10 MW in 2016.

Indonesia
Plan announced in 2017 for
Solar: 168 MW.
Geothermal: 255 MW.

Malaysia
*Solar: 300 MW in 2016 and 563 MW in 2017.

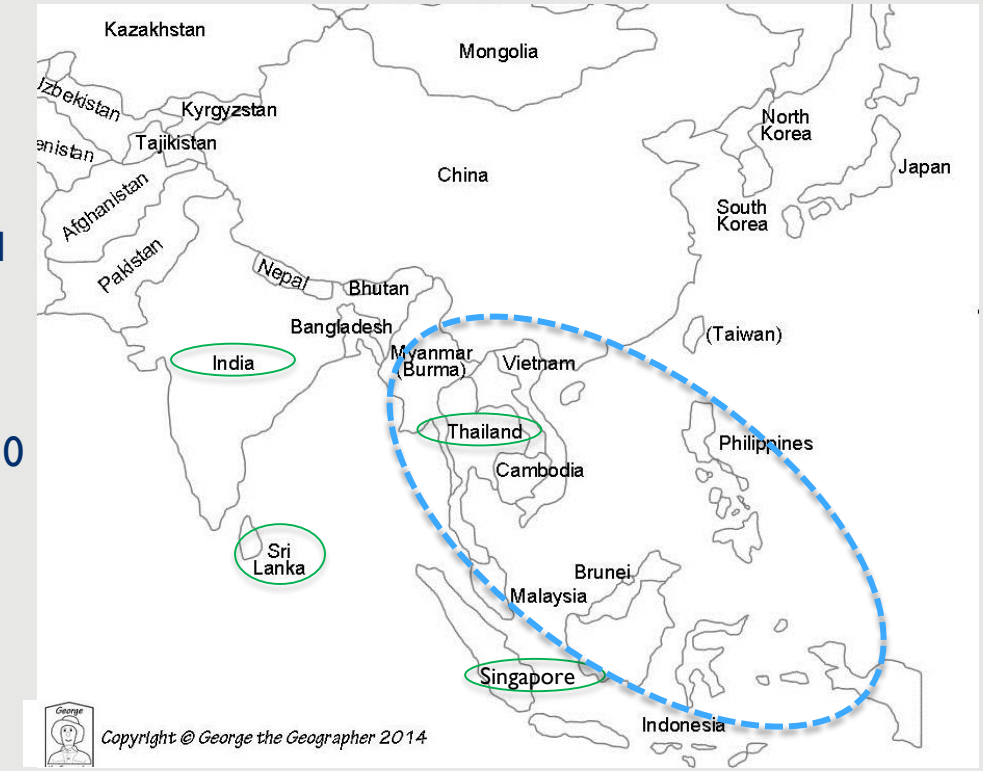
** For the first time in the country*

Photo credit: map from Omnictionary
Content from various sources

Opportunities for hybrid projects

India:

- The first National Wind-Solar Hybrid Policy in May 2018.
- Targets to build 10 GW of wind and solar hybrid projects by 2022.



Thailand:

- In recent auction,
- Allows for projects with >1 RE
- Requires firm power

Singapore:

- Plan for 56.7 MW
- Two floating solar PV plants on reservoirs
- Procured through auctions

Sri Lanka:

- Opened its first hybrid power plant (i.e., wind, solar and diesel) with a capacity of 60 MW, (support from ADB)
- plans to procure a 100 MW floating solar power project on a reservoir through competitive bidding.

South East Asia:

- Is pursuing floating solar opportunities due to the short supply of arable land to build new plants (Kenning, 2017).

Thailand: SPP hybrid firm auction

The first country in that allows for hybrid projects and requires procurement of firm power through competitive bidding

Policy objectives

- To increase the security of power system
- To reduce the variation of intermittent energy sources
- To reduce the dependency on a single RE technology

Success so far

Attracted a lot of interest and strong competition

Transparent process and clear rules, reducing transaction costs

Price reduction (99.99% discount offered)

Further consideration for achieving policy objectives

1. **To enhance power system security:**
   - A firm power requirement should not be viewed as the only solution since it does not address all the challenges that occur with increasing RE penetrations.
   - Additional measures to enhance power system security such as stronger interconnection between balancing areas, increasing existing plants' ramping capacity, etc. should also be considered and planned for

Further consideration for achieving policy objectives

2. To reduce the variation of intermittent energy sources:

Firm power requirements help reduce variability at individual points of interconnection. Is this approach cost-effective compared to other options?

- Reducing variability by combining several RE plants over a wide geographic area, taking advantage of wind-solar complementarity in Thailand
- Increasing the flexibility of other components in the power system to manage variability

Further consideration for achieving policy objectives

3. To reduce dependency on specific RE technologies

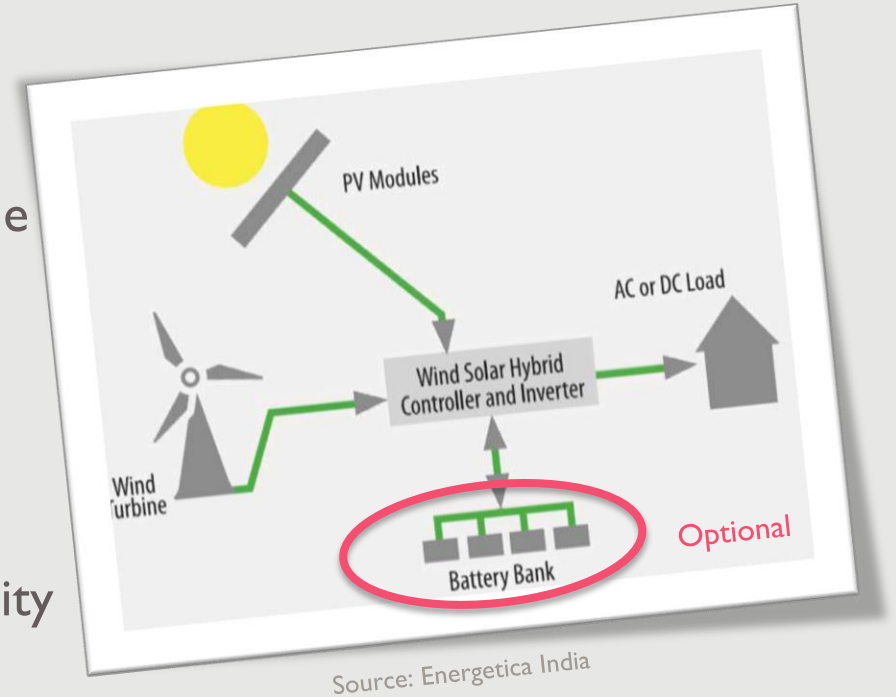
- The winning bids for firm/hybrid power were mostly from biomass plants due to lack of competitiveness of solar+storage and wind+storage or other options, compared to biomass from existing sugar mill factories.

India: Wind-solar hybrid policy

Policy was launched on May 14, 2018 to provide a framework for promotion of large grid-connected wind-solar PV systems. It aims to encourage new technologies and methods involving combined operation of wind and solar PV plants.

Policy objectives

- Reduce the intermittency of renewable power
- Optimize the utility of transmission infrastructure and land
- Reduce the variability of RE power generation, achieving better grid stability



Source: Energetica India

Battery storage may be added to hybrid projects to reduce the variability of output power from wind-solar hybrid plants i) to provide higher energy output for a given capacity at delivery points and ii) to ensure availability of firm power for a particular period

India: Wind-solar hybrid policy (cont'd)

Types of hybridization

- **New wind-solar hybrid plants**
- **Hybridization of existing wind/solar PV plants,** installation of solar PV plants or wind turbines at sites of existing wind/solar plants

Challenges

- Uncertainty of the purchase price of electricity from hybrid-projects
- There is not yet clarity on final procurement guidelines or a framework for converting existing wind or solar plants into hybrid plants.

50 MW of the first wind-solar hybrid project owned by Hero Future Energies
A 28.8 MW solar PV added to existing 50 MW wind farm to reduce the intermittency of the existing wind farm.

Summary of future considerations

1. **To increase levels of RE penetration:**
   - ➢ Avoid focusing on firm power auctions as the only solution, utilizing a range of measures in a systematic manner to ensure power system security
   - ➢ Consider cost-effectiveness and compare with other options
2. **Evolve auction design elements to take advantage of:**
   - – Value of different types of RE by time (Brazil and Chile), location, or both time and location (e.g., Mexico)
   - – Ability of RE to offer diverse products (e.g., firm capacity, energy, and clean energy certificates (CEL) in Mexico)
   - – Relatively low costs of solar and wind -> use technology-specific auctions to achieve targets (e.g., India)

   Initially, RE plants can participate in these auctions. As market dynamics evolve, RE hybrid plants will participate to take advantage of market rules.

More detail from USAID Clean Power Asia's report on "Renewable Energy Auctions: Hybrid and Firm-Power Policies and Regulations" (expected in Jun-July 2018) – from http://www.usaidcleanpowerasia.org/

Mr. Sithisakdi Apichatthanapath
USAID Regional Development Mission for Asia
Athenee Tower, 25th Floor
63 Wireless Road
Patumwan, Bangkok 10330
Tel: +66 2257 3000
Email: sapichatthanapath@usaid.gov

Ms. Dana Kenney
USAID Clean Power Asia
Abdulrahim Place, Suite 501
990 Rama IV Road
Bangrak, Bangkok 10500
Tel: +66 2026 3065
Email: Dana_Kenney@abtassoc.com

PHOTO CREDIT: ISTOCK.COM

USAID
FROM THE AMERICAN PEOPLE

USAID CLEAN POWER ASIA