



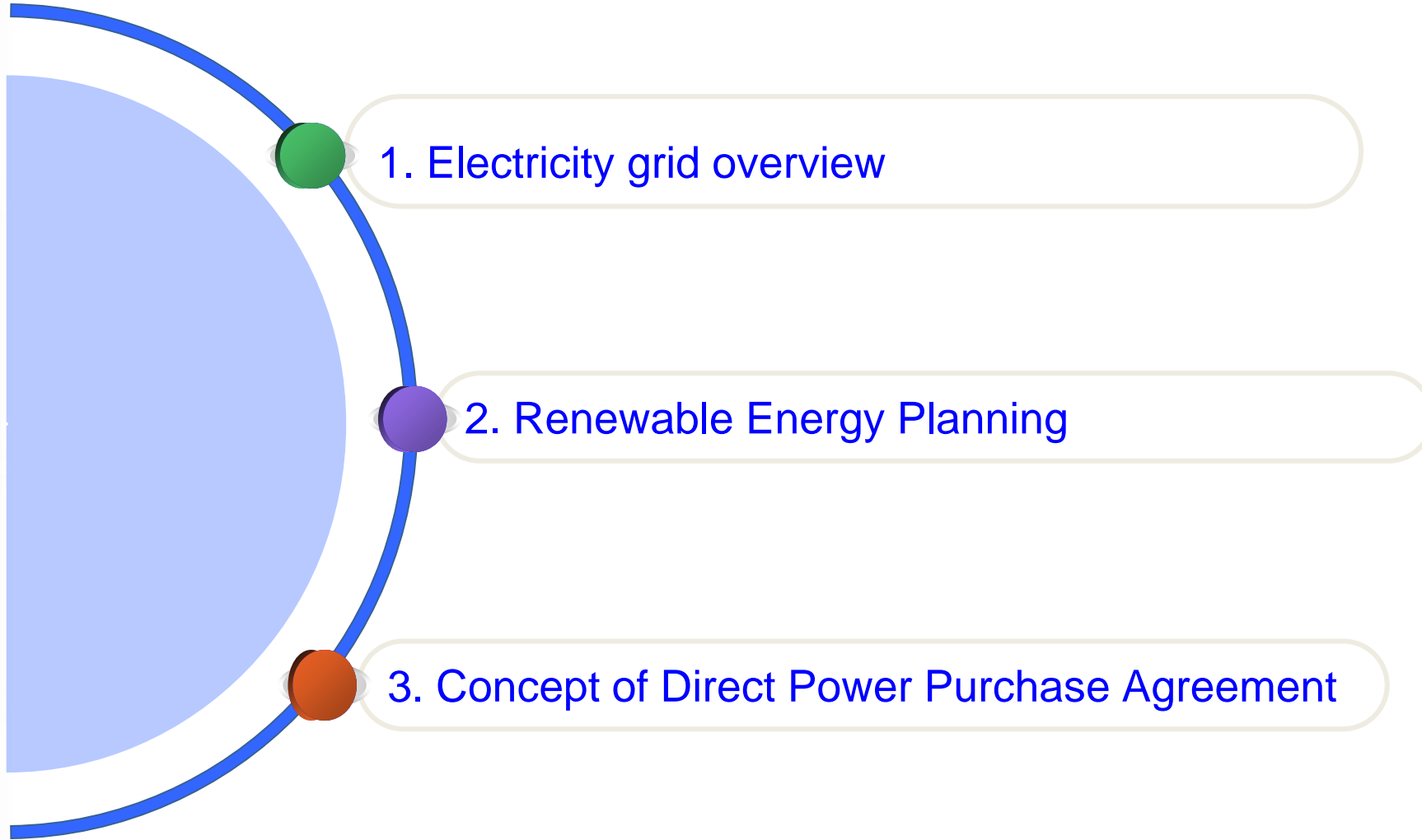
MINISTRY OF INDUSTRY AND TRADE
ELECTRICITY REGULATORY AUTHORITY OF VIETNAM

VIETNAM WIND POWER DEVELOPMENT PLAN: GRID, DPPA AND RENEWABLE ENERGY PLANNING



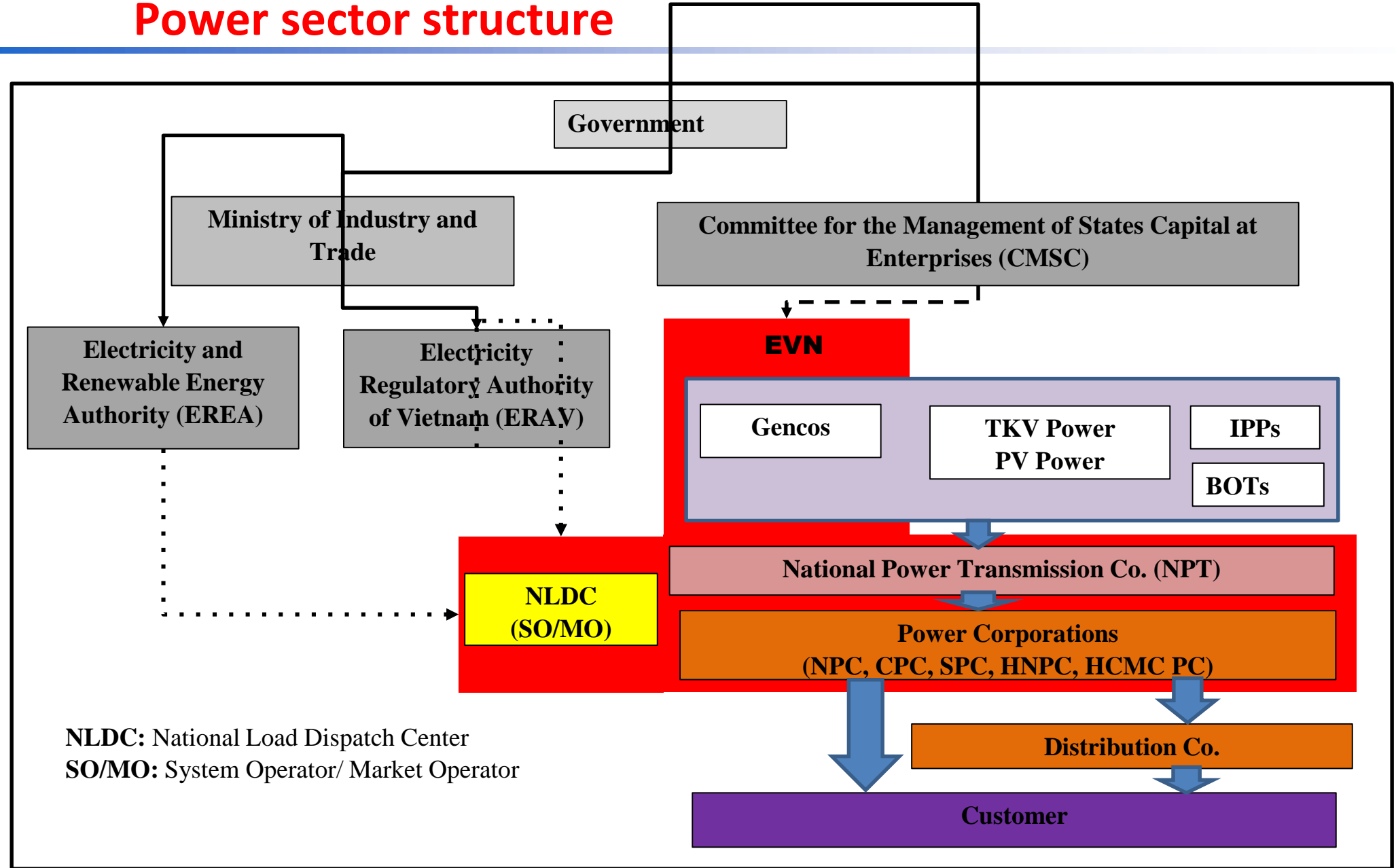
Presented by: ERAV
Ha Noi, 12 June 2019

CONTENTS

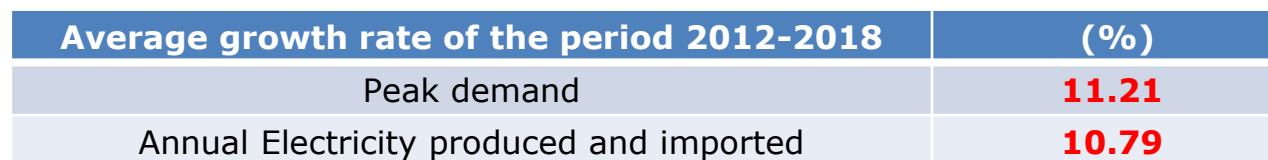


1. Electricity grid overview

Power sector structure



Load growth rate



Elasticity between Electricity – GDP growth rate

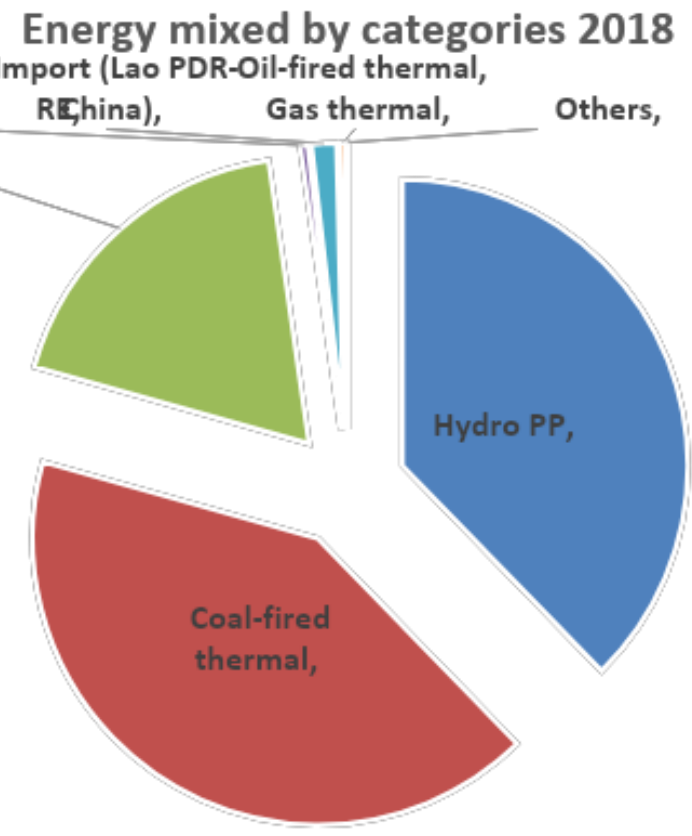
Source: General Statistics Office of Viet Nam



Energy mixed by categories 1995-2017



Installed capacity - Energy mixed by categories 2018



7

1. Electricity grid overview

Transmission grid



Transmission grid (12/2017)

- Connect 3 regions
- Voltage level: 500-220kV
- 500 kV: 27 substations – 29400 MVA;
- OHL 500 kV: 7445 km

	Unit	Quantity
500kV substation	MVA	29400
500kV lines	km	7445
220kV substation	MVA	48053
220kV Lines	km	17010

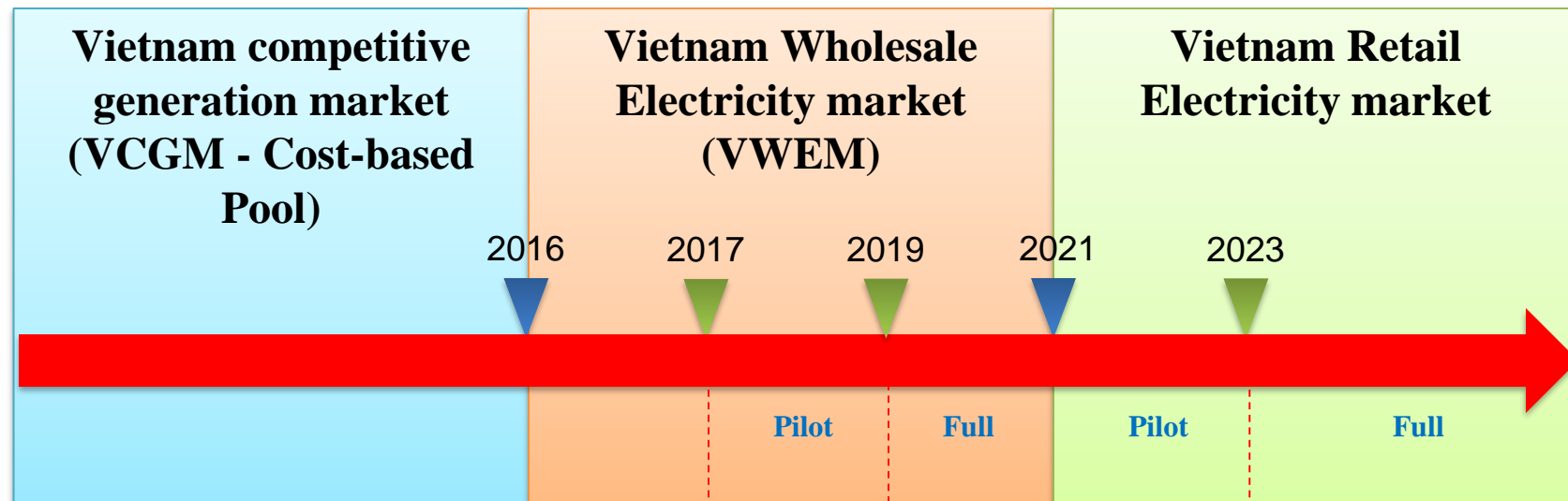
Transmission limit (MW)

Year	North – Center	Center – South
2015	1800	3500
2016	2200	4000
2017-2020	2400	4000

1. Electricity grid overview

Power market development roadmap

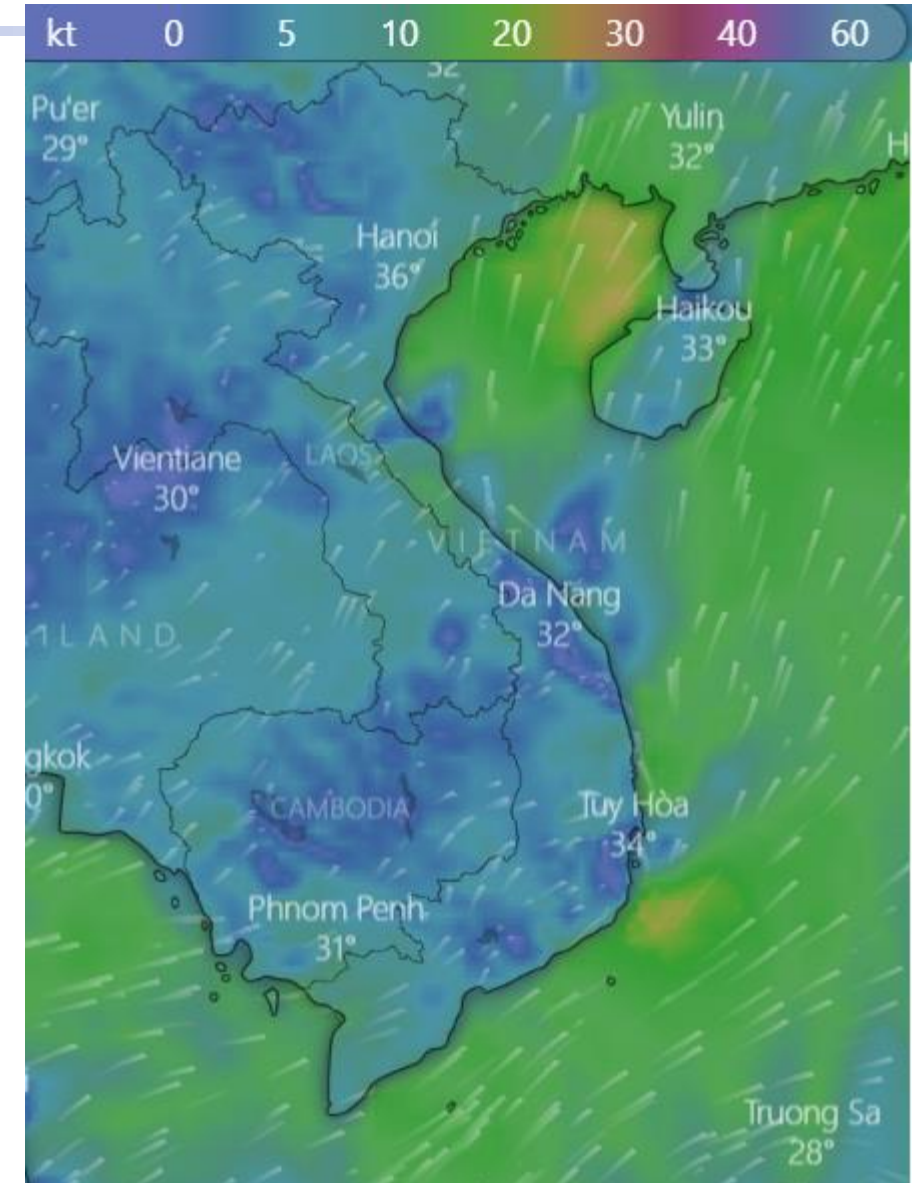
- Power market development market in Vietnam: Decision number 63/2013/QĐ-TTg of Prime Minister



2. Renewable Energy Planning

Wind power potential

- Existing Wind projects:
 - Huong Linh
 - Tay Nguyen
 - Phu Quy
 - Phu Lac, Tuy Phong, Trung Nam, Dam Nai
 - Bac Lieu
- High potential of wind:
 - Center: Quang Binh – Quang Tri
 - Highland: Dak Lak – Dak Nong
 - Coast line: Ninh Thuan – Binh Thuan, Bac Lieu – Ca Mau



Source: www.windy.com

Power Development Master Plan No. 7- revised



Power Development Master Plan 7 revised – Renewable Energy

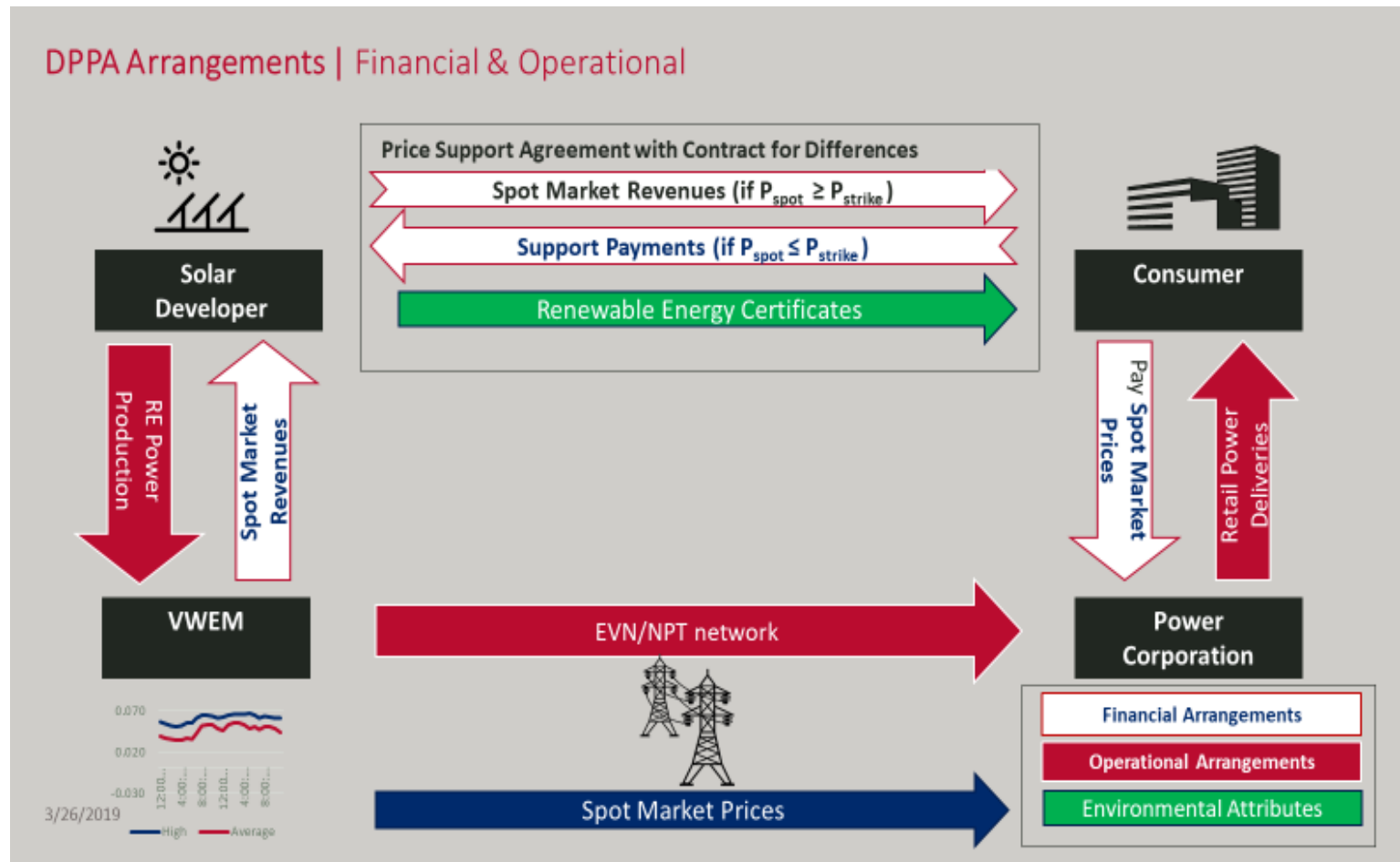
- | | 2015 | 2020 | | 2025 | | 2030 | |
|-------|---------------|---------------|-------------------------------------|---------------|-------------------------------------|---------------|-------------------------------------|
| | Capacity (MW) | Capacity (MW) | Percentage of Energy production (%) | Capacity (MW) | Percentage of Energy production (%) | Capacity (MW) | Percentage of Energy production (%) |
| Wind | 105 | 800 | 0.8 | 2000 | 1 | 6000 | 2.1 |
| Solar | 3.5 | 850 | 0.5 | 4000 | 1.6 | 12000 | 3.3 |

- 12

3. Direct Power Purchase Agreement (DPPA)

DPPA – Definition and Model

DPPAs are long-term contracts under which an off-taker, typically a commercial or industrial consumer, purchases electricity directly from a power generation company (GENCO)



Seller: RE GENCOs

Buyer: Customer (off-taker)

Spot price: VWEM's hourly spot market price (become half-hourly in the future)

Strike price: RE GENCOs long-term production costs

DPPA: a synthetic Contract for Difference PPA between Seller and Buyer though which Buyer pays the difference between strike price and spot price for a scheduled quantity of Seller production.

3. Direct Power Purchase Agreement (DPPA)

DPPA – Definition and Model

- DPPA tenure: 10-20 years, with the mutually agreeable option to extend
- Buyer (Consumer):
 - Access to wholesale market for up to 100% of power consumption and pays at spot market prices
 - DPPA fee: an additional charge for network cost and other extra cost of power sector agencies.
 - Pays (or be paid) to the Seller a difference between strike price and spot price for a scheduled quantity of Seller's production.
 - Receive Renewable Energy Certificate from RE GENCO.
- Seller (RE GENCO):
 - Sells 100% of generation into the wholesale market, receiving the spot market price
 - Receives an hourly price support payment (equal to strike price minus spot market price) for scheduled quantities of generation as specified in the DPPA between Buyer and Seller



3. Direct Power Purchase Agreement (DPPA)

DPPA – Pilot Program

- **Pilot DPPA program:**
 - Target: 150 – 300 MW
 - Min/Max Project size: Projects accepted into the DPPA Pilot Program shall have an installed capacity of no less than 5MWp and no more than 50 MWp (for solar)
 - Pilot program location: Buyers shall be located in Southern Power Corp service area. Sellers shall be allowed to site projects at any location which best fits the projects criteria, while making best efforts to avoid areas currently considered “congested”. Projects accepted into the Pilot Program must be located in low congestion regions as determined by EVN.
 - Proposed Timelines:

Pilot Program Release	Nov/Dec 2019
GVN Review/Approval of Project	Jan-Mar 2020
Projects Finalize Pilot Agreements	Apr- June 2020
Projects Financial Close	Oct 2020
Project COD	Mar 2021
Monitoring and Evaluation	Mar 2021 – Dec 2023
Pilot Program Completion	Dec 2023



MINISTRY OF INDUSTRY AND TRADE
Electricity Regulatory Authority of Vietnam

**Thank you for
your attention!**

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