



EVN

TRUNG TÂM ĐIỀU ĐỘ
HỆ THỐNG ĐIỆN QUỐC GIA

Overview of Vietnam Wholesale Energy Market

NATIONAL LOAD DISPATCH CENTER



Member of SN Registrars (Holdings) Ltd



8327



Content

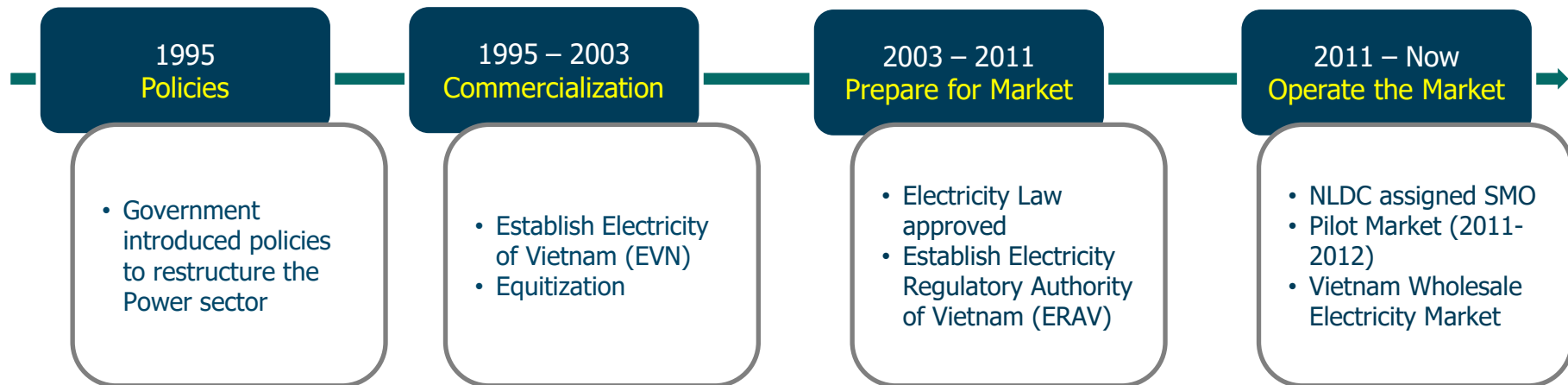
- 01.** Overview of Vietnam Wholesale Energy Market
- 02.** Future development of Vietnam Electricity Market

01

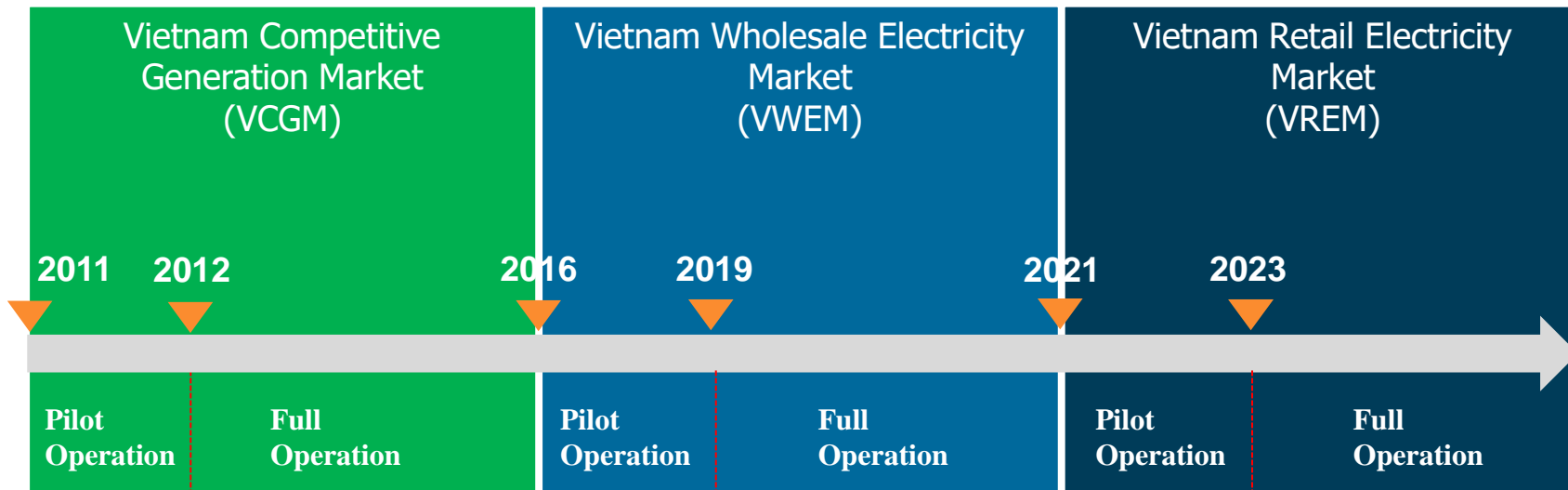
OVERVIEW OF VIETNAM WHOLESALE ENERGY MARKET



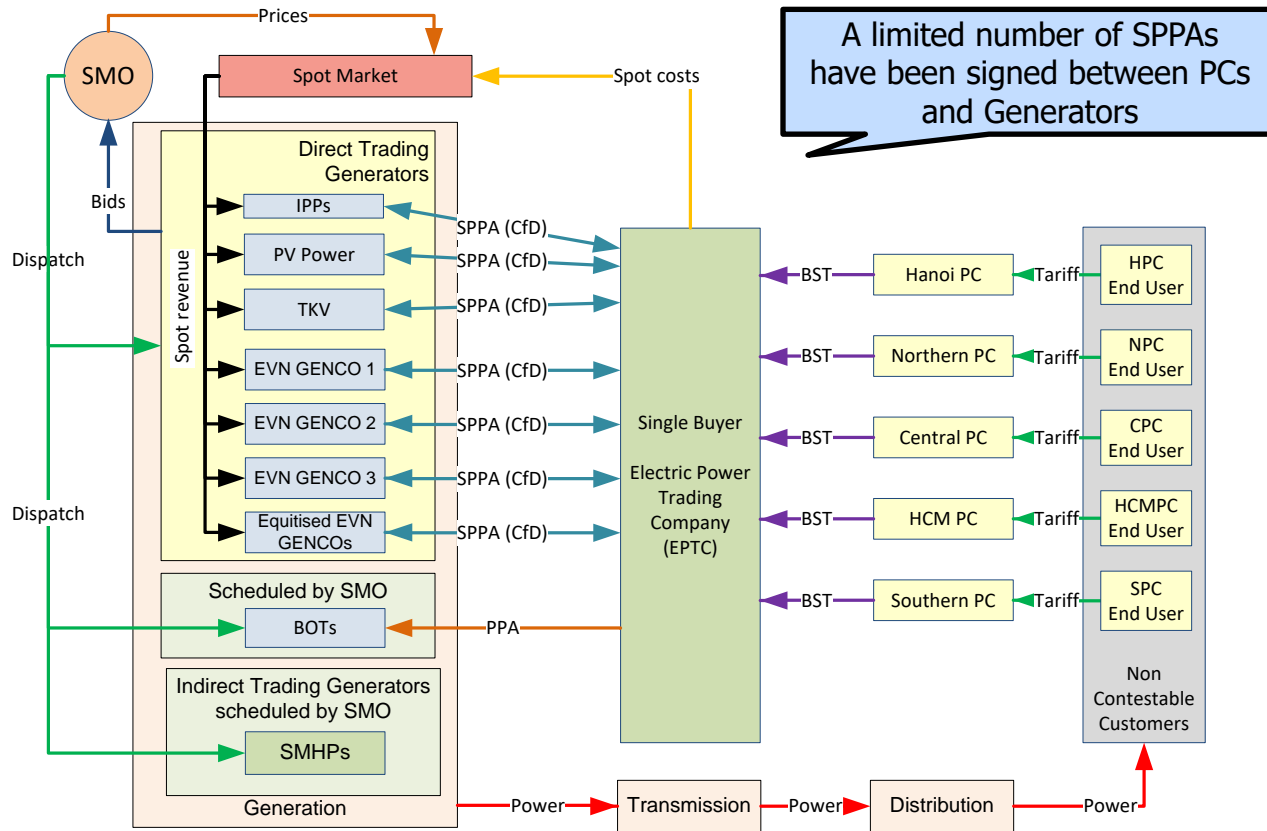
Power market roadmap



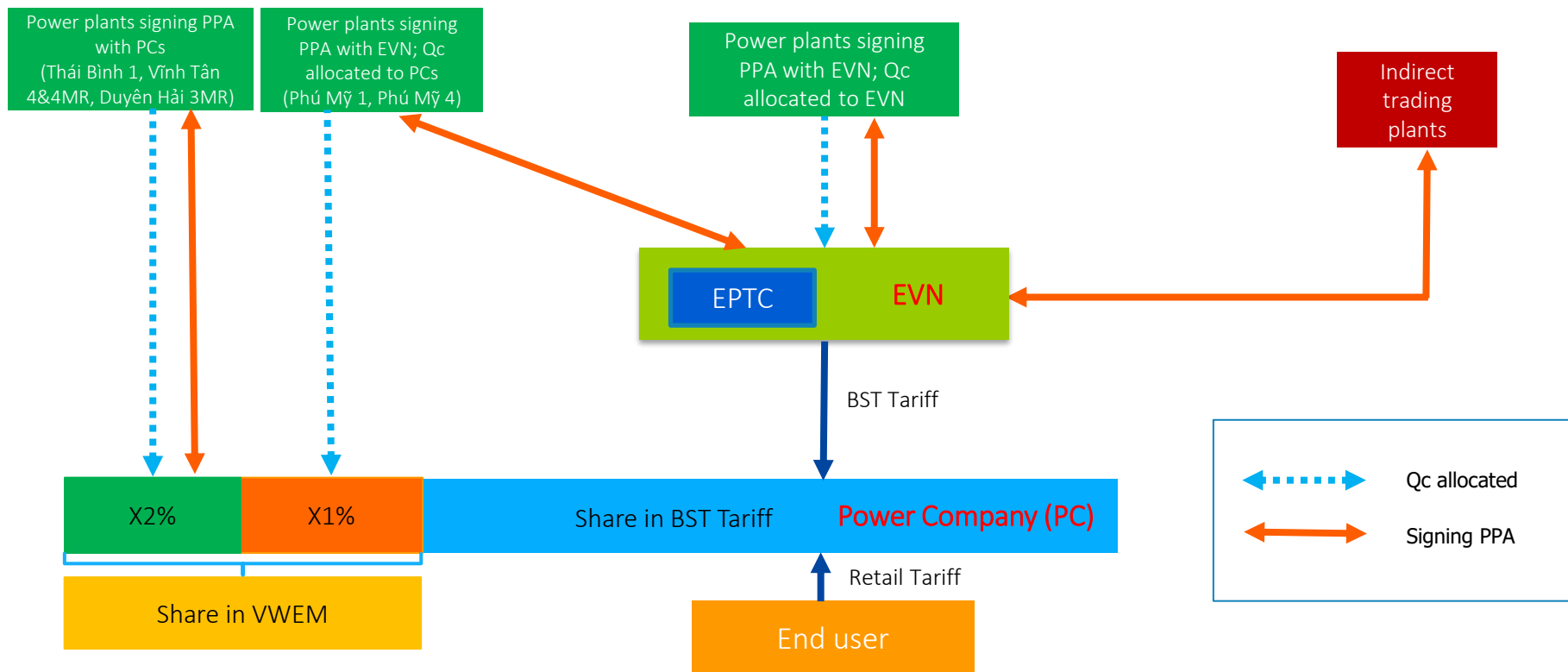
Power market roadmap



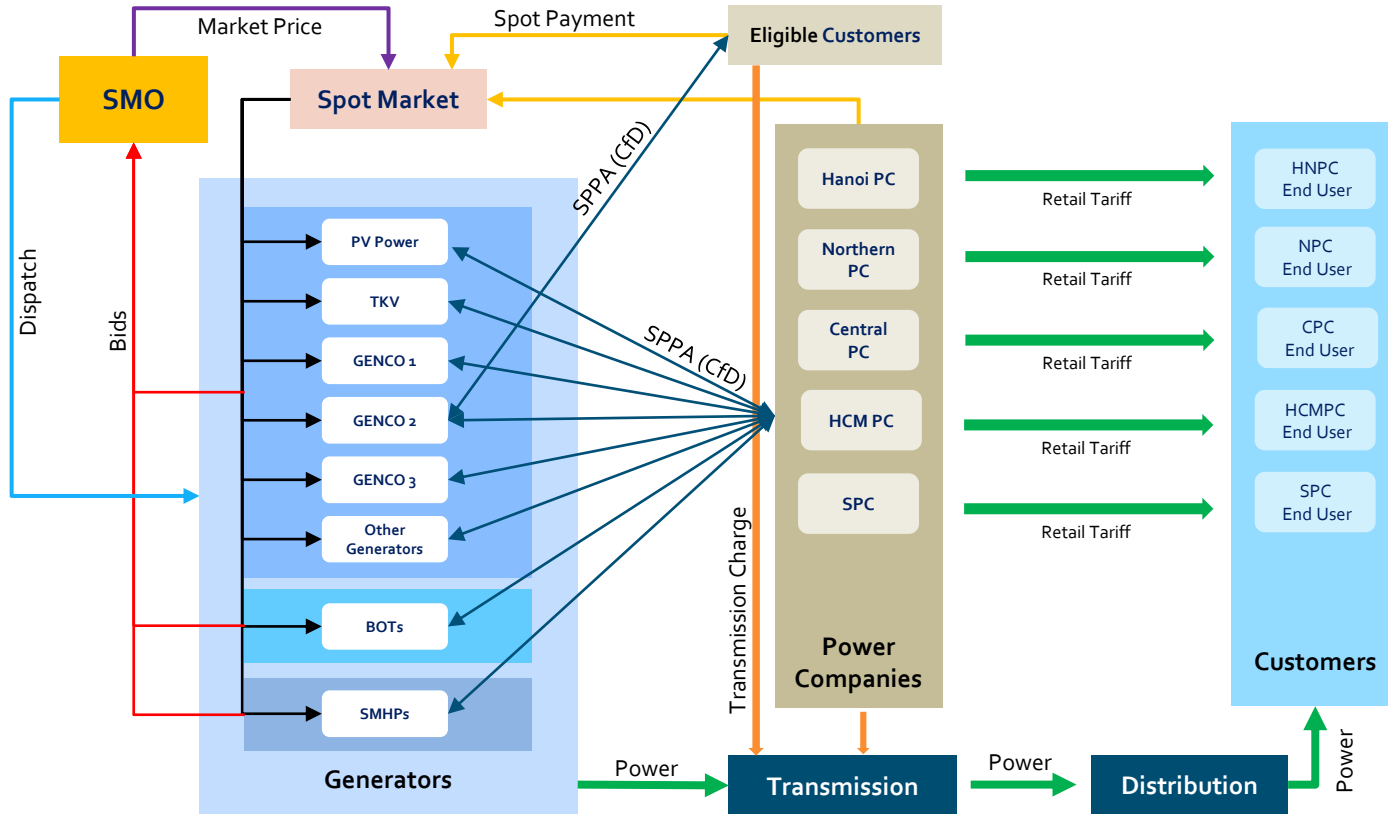
Current Vietnam Wholesale Electricity Market



Current contracting mechanism



Complete Vietnam Wholesale Electricity Market



Wholesalers

- GENCOs, IPPs...
- BOTs, SMHPs

Buyers

- **PCs:** 5 Power Companies
- **Eligible Customers**

Service Providers

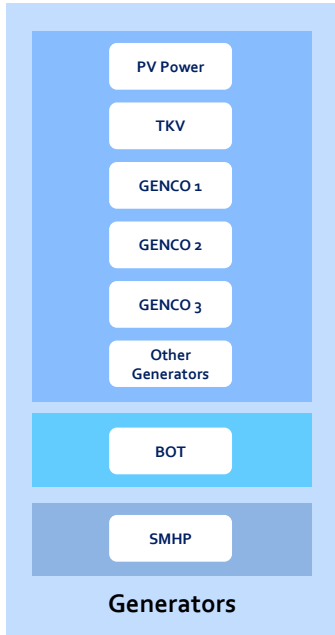
- **NLDC/SMO:** System and Market Operation
- **NPT:** Transmission service
- **Distribution Company:** Distribution service
- **MDMSP:** Metering data management

EPTC

Buy energy from non-direct trading generators and sell to PCs

Vietnam Wholesale Electricity Market

Wholesalers



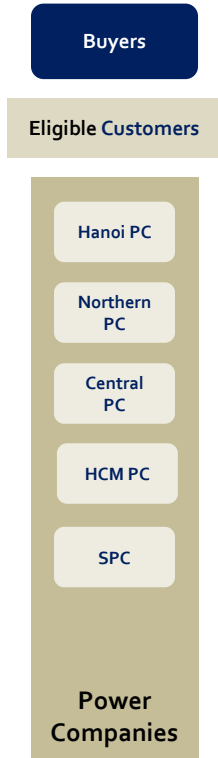
Participants

- **Direct trading**
 - All Power Plants with a capacity greater than 30 MW (must participate)
 - Power Plants with installed capacity of 30 MW or less meet the IT infrastructure requirements (may participate)
 - SMHPs and BOTs (direct or through other wholesaler)
- **In-Direct trading**
 - Import source
 - Wind turbine, Solar, Geothermal

Functional

- Trading on Spot Market
- Contracting with Buyers (bilateral contract and vesting contract)
- Settlement (Spot market and contracts)

Vietnam Wholesale Electricity Market



Participants

- **Power Companies**
 - Ring fencing of retailing and distribution functions and costs
- **Eligible Customers**
 - Initially eligible customers are large customers connected to the transmission system

Functional

- Trading on Spot Market
- Contracting with generators (bilateral contract and vesting contract)
- Settlement (Spot market and contracts)

Vietnam Wholesale Electricity Market

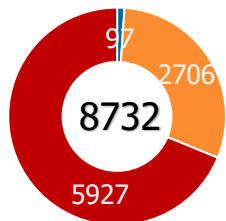
VWEM (2019)

- **Gross Pool**
- **Settlement:** Ex-post
- **Bid:** Cost based – 10 Blocks
- **Day ahead Scheduling:** Every 6 hour
- **Price:** SMP
- **Trading interval:** 30 minutes
- **Dispatch interval:** 30 minutes
- **Ancillary service:** Co-optimize for Frequency Control and Spinning Reserve, signing contract for other services.

VWEM (Longterm)

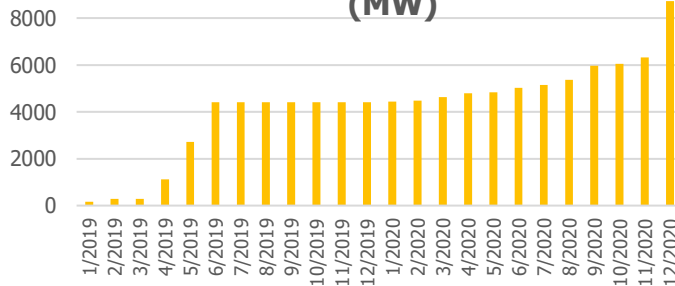
- **Gross Pool**
- **Settlement:** Ex-ante
- **Bid:** Price based – 10 Blocks
- **Day ahead Scheduling:** Every 6/N hour ($N \leq 6$)
- **Price:** ZMP and LMP
- **Trading interval:** 30 minutes
- **Dispatch interval:** 30/N minutes ($N \leq 6$)
- **Ancillary service:** Co-optimize for Frequency Control and Spinning Reserve, signing contract for other services.

DEVELOPMENT OF RENEWABLES

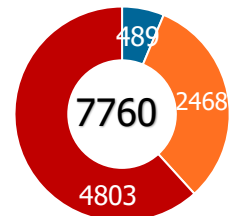
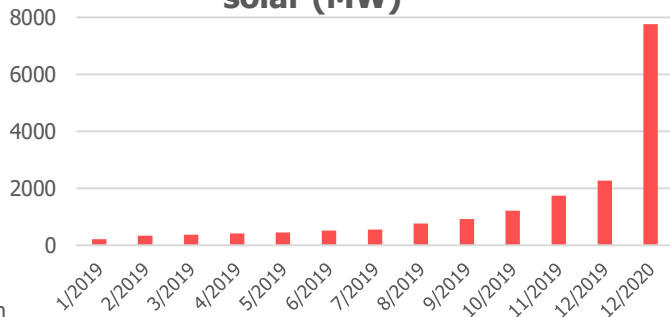


■ North ■ Central ■ South

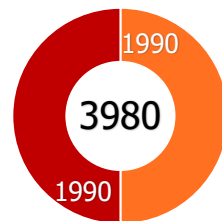
Installed capacity of Solar farm (MW)



Installed capacity of Rooftop solar (MW)

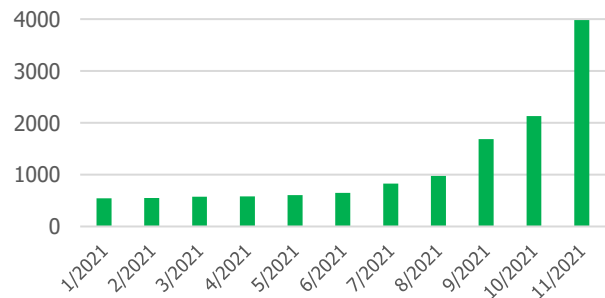


■ North ■ Central ■ South

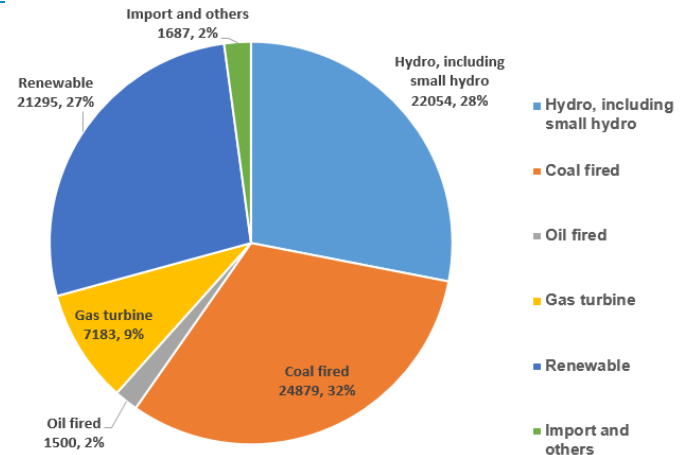


■ Central ■ South

Installed capacity of Wind (MW)



Generation Installed Capacity by fuel types, (MW,%) 78.598 MW in total



Power market operational challenges



Difficult to forecast renewable in the long-term planning



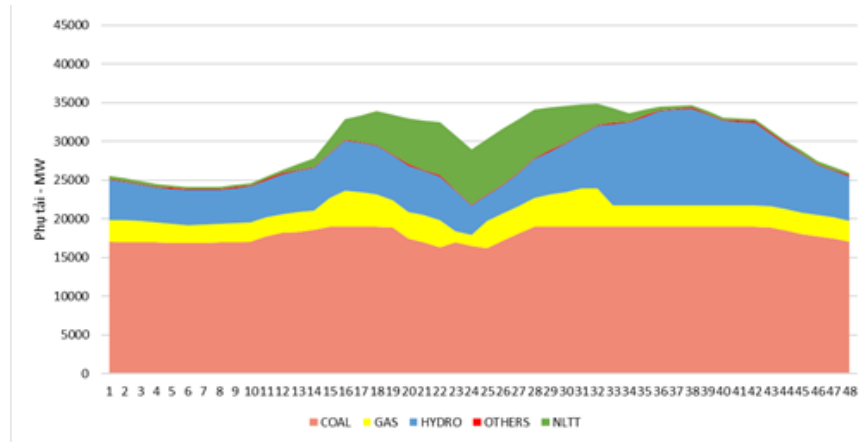
Significant impact on the output of year-ahead power market planning such as: Capacity Add-on (CAN) price, contract quality allocation



The solar power is mainly generated during daytime peak hours



Capacity Add-on (CAN) prices do not totally reflect the actual peak hours of power system



Power market operational challenges



Wind and solar power
intermittency and
fluctuation



The day-ahead and half-hour-ahead indicative market prices could be largely different from the ex-post settlement price



Increase in reserve requirement that leads to more complex optimization problems



Difficulty in renewable energy
forecast for day-ahead and
half-hour-ahead



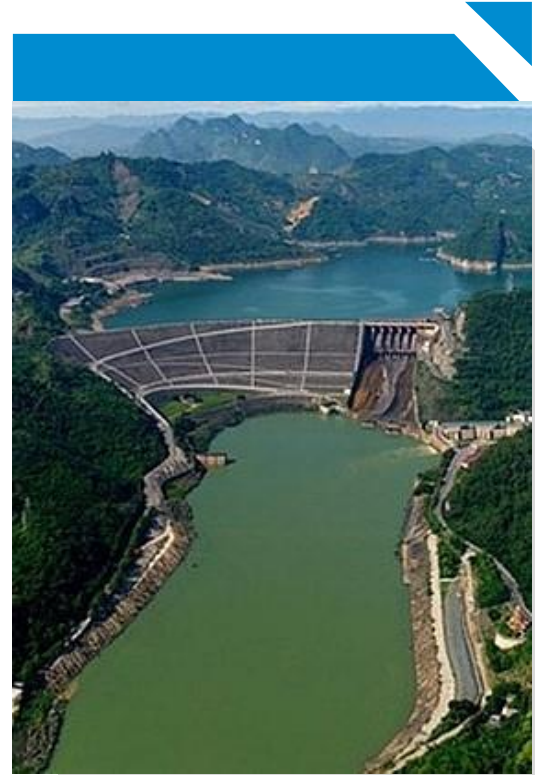
Occurrence of constrained-on payment in ex-post settlement



Increasing in the total cost of system due to scheduling and dispatching costly generators and frequent start-up/shut-down generator units

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Future development of Vietnam Electricity Market



Future development of Vietnam Electricity Market

Developing DPPA mechanism

- ❖ The DPPA mechanism allows large consumers to buy electricity directly from renewable energy power plants.
- ❖ Power transactions between parties are conducted via the spot market in accordance with the rules and regulations of VWEM.

Developing ancillary service market

- ❖ Building up co-optimization of energy and reserves mechanism.
- ❖ Building up mechanism for facilitating the participation of renewable energy power plants in Ancillary Service (frequency & voltage control).

Developing mechanisms for BESS and smart grid

- ❖ BESS can act as an integral source in order to provide reserve when occurring differences between supply and demand in power system (unit faults, sudden decrease in RE generations,...).
- ❖ BESS can directly participate in power market or in ancillary service market.
- ❖ Developing and integrating smart grid in power system (Electrical Vehicles, DERs, smart meters,...).

Developing mechanism for VRE to participate in power market

- ❖ VRE can directly participate in the power market as a price-taker by adapting new market design to high Shares of VRE.

Revising current market rules, grid codes

- ❖ Revising market rules (Circular 45/2018, 24/2019), grid codes (Circular 25/2016, 30/2019) in order to cope with the high shares of VRE.

Future development of Vietnam Electricity Market

Developing new financial mechanisms



Promoting the implementation of commercial DR programs in order to improve the response of load on market-based



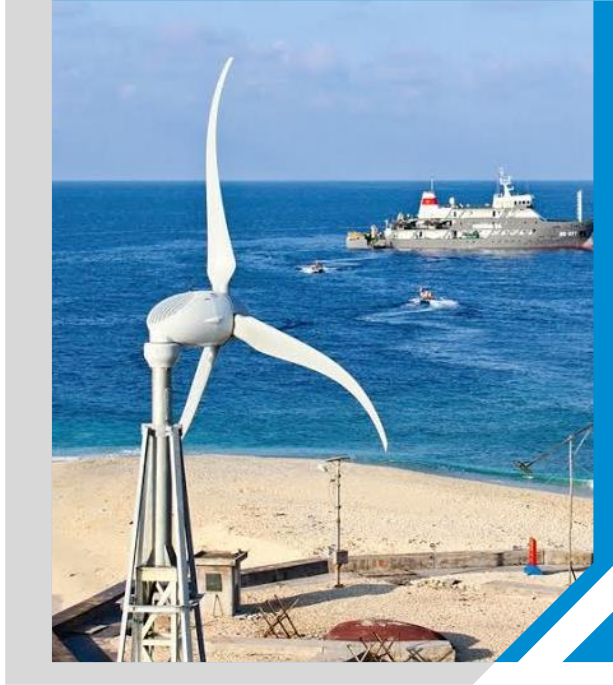
Developing Financial Transmission Right (FTR) regime in order to hedge the risk of price difference between load's node and the generator's node



Creating new forms of financial contracts such as CfD, Swap, Options for power market participant to flexibly contract with different partners



Creating new derivative financial market for electricity such as contract auctions, forward market, future markets



Thank You!