

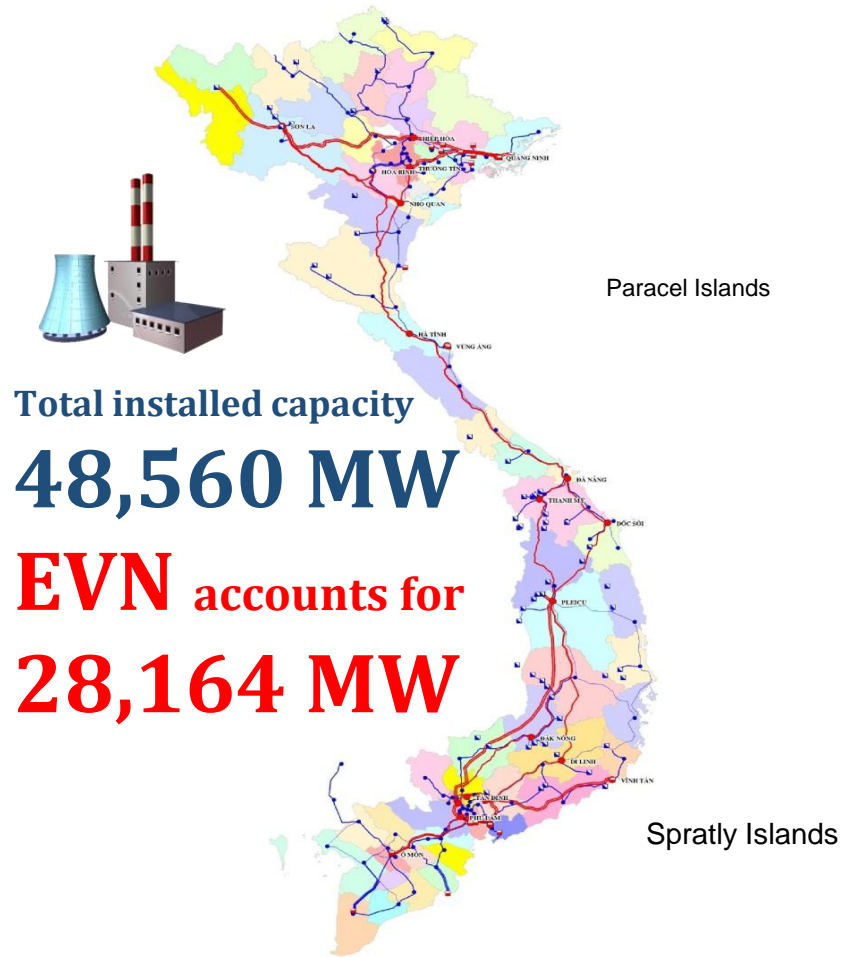


EVN

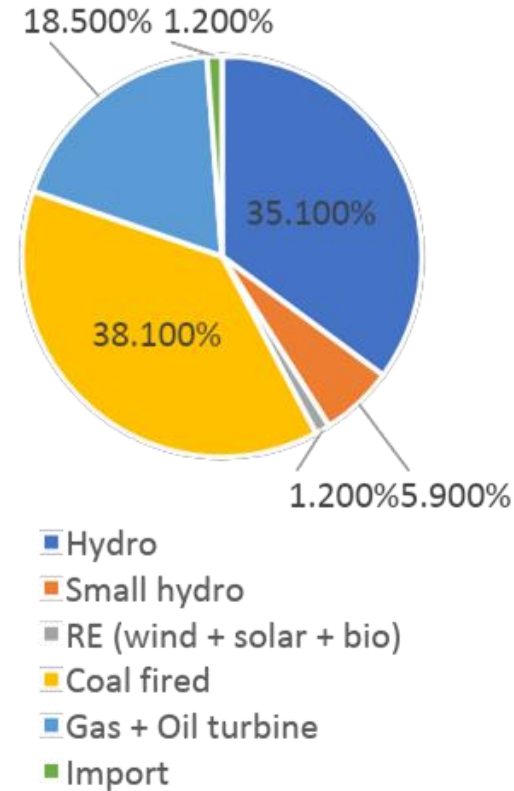
VIET NAM ELECTRICITY

RENEWABLE ENERGY AND CHALLENGES

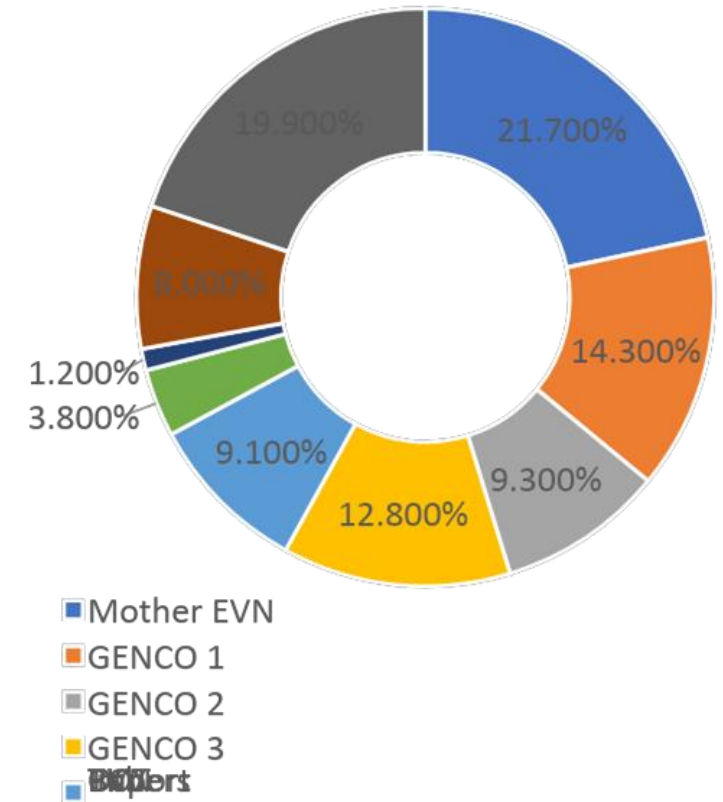
Presented by: Trinh Quang Ninh – Corporate Planning Department
Ha Noi, June 2019



Installed capacity by fuel type



Installed capacity by ownership

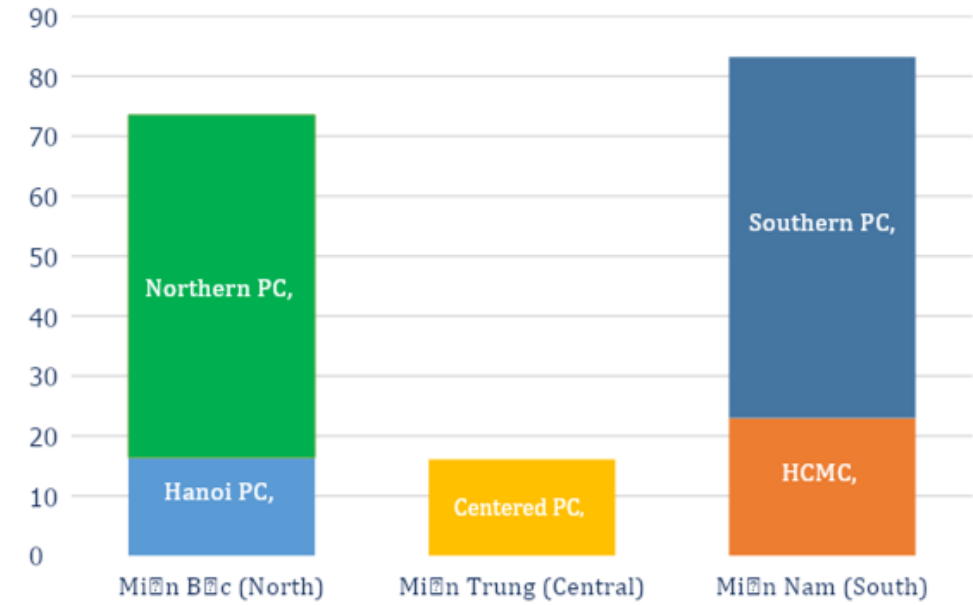
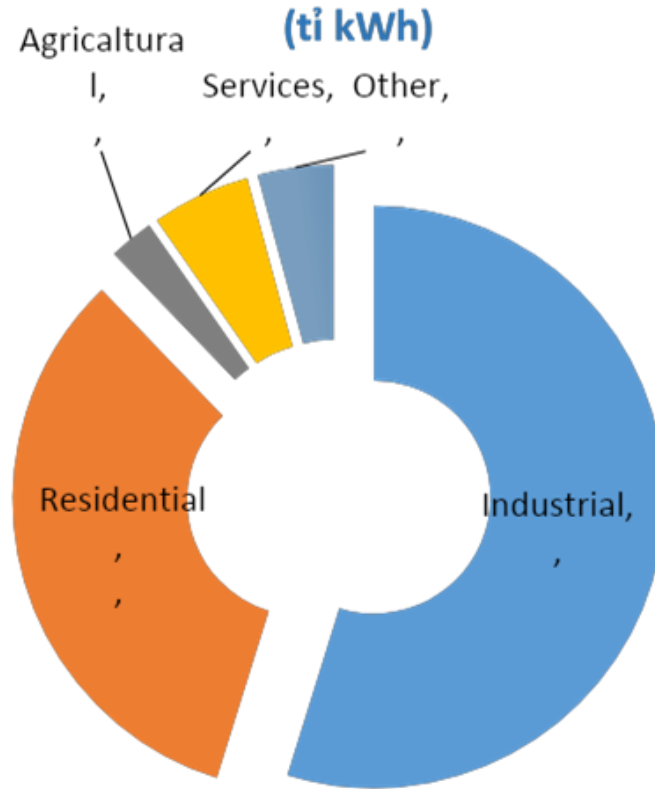


VIETNAM ELECTRIC POWER INDUSTRY

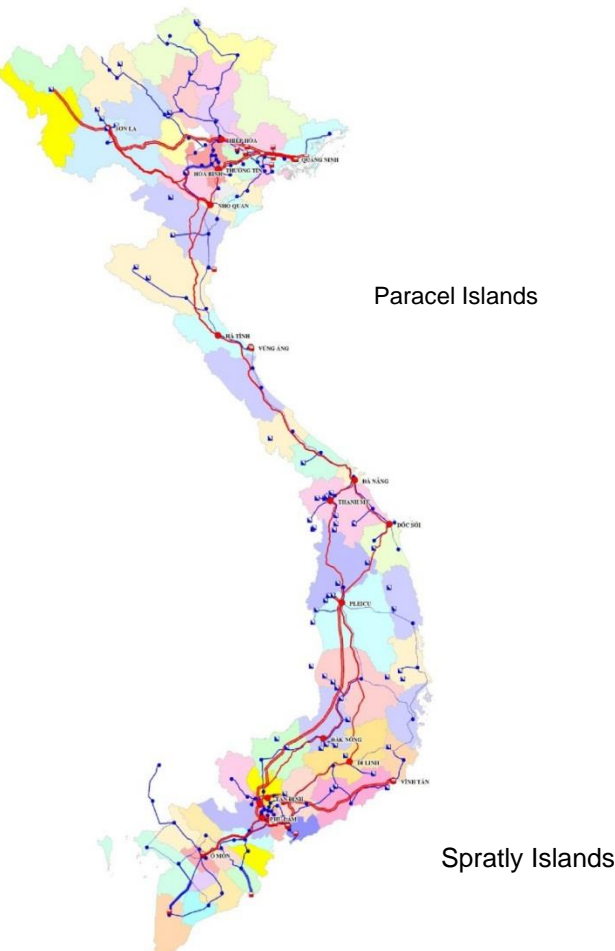
Demand load of 2018



National demand load structure (billion kWh)



Demand load by region (billion kWh)



~26,300 MWp (~22,300MW)

332 solar power projects registered in Power Master Plans


~11,000 MWp (~9,200MW)

121 approved solar power projects with a total capacity of ~6,000 MW,
commercial operation date before 2020

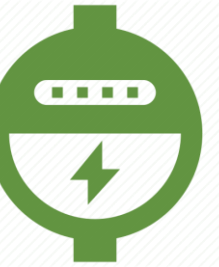
~2,000 MW

Approved wind power projects with ~4,000MW registered

Feed-in-Tariff (FiT) of solar power projects

- 
- Supporting regime for the development of solar power projects is applied with the FiT of **9.35 UScent/kWh** for projects in operation before June 30, 2019 (Decision 11/2017/QĐ-TTg)
 - Government's Resolution 115/NQ-CP dated August 31, 2018 envisioned Ninh Thuan as the RE center of Vietnam and extended the application of FiT for RE projects until the end of 2020.

Roof-top solar power projects (*Circular 16/2017/TT-BCT and Decision 02/2019/QĐ-TTg dated January 8, 2019*)

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- Approved a two-way measuring mechanism and payment with prices regulated by Decision 11/2017/QĐ-TTg
 - Roof-top solar power projects are subject to all taxes and fees similar to those of households running electricity business.

Supports to energize and operate renewable energy plants

- In compliance to the Government's consistent policy, EVN has always supported and created the most favorable conditions to support the energization and grid connection of wind and solar power projects.
- In the early months of 2019, EVN has supported to energize 47 solar power projects with total capacity of 2,300 MW.
- In June 2019, EVN is expected to continue the energization and grid connection of around 49 power plants.
- A huge amount of work and great pressure on the entire system of electrical operation and management.



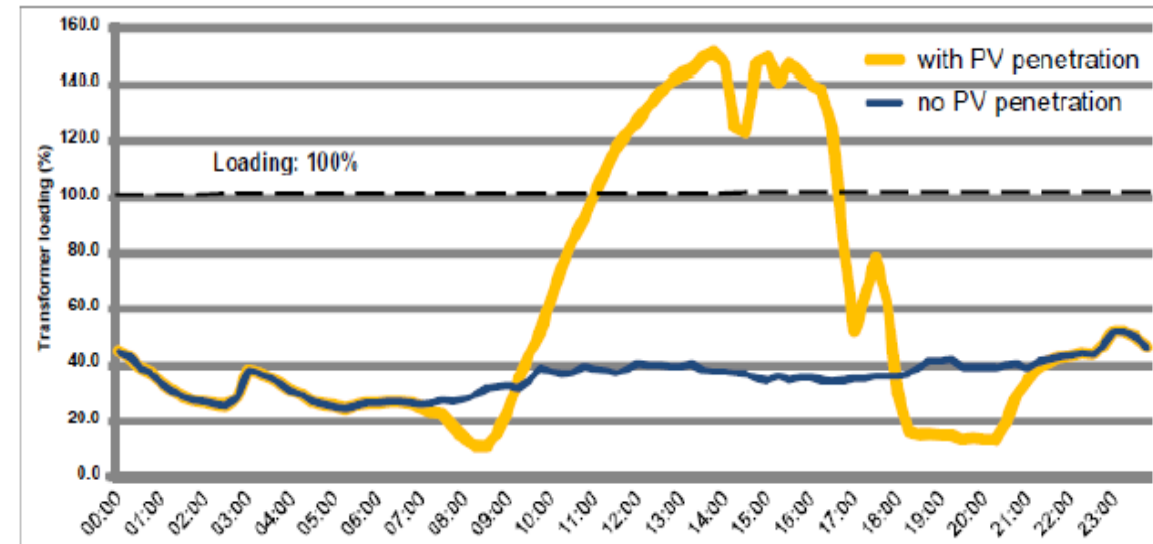
Integrated RE – current situation

- Usually located in areas of low load demand
- In need of upgraded grid infrastructure

Location	June 2019			December 2020		
	Approved (MWAC)	Transmission network capacity (MWAC)	Deduction (MWAC)	Approved (MWAC)	Transmission network capacity (MWAC)	Deduction (MWAC)
Khanh Hoa	306	214	92 (30%)	306	306	0
Phu Yen	400	125	275 (69%)	442	245	197 (45%)
Gia Lai	82	72	10 (12%)	82	72	10 (12%)
Binh Thuan	1120	600	520 (46%)	1941	750	1191 (61%)
Ninh Thuan	1826	650	1176 (64%)	2021	650	1371 (68%)
An Giang	217	177	40 (18%)	252	252	0
Total	3951	1838	2113 (53%)	5044	2275	2869 (55%)

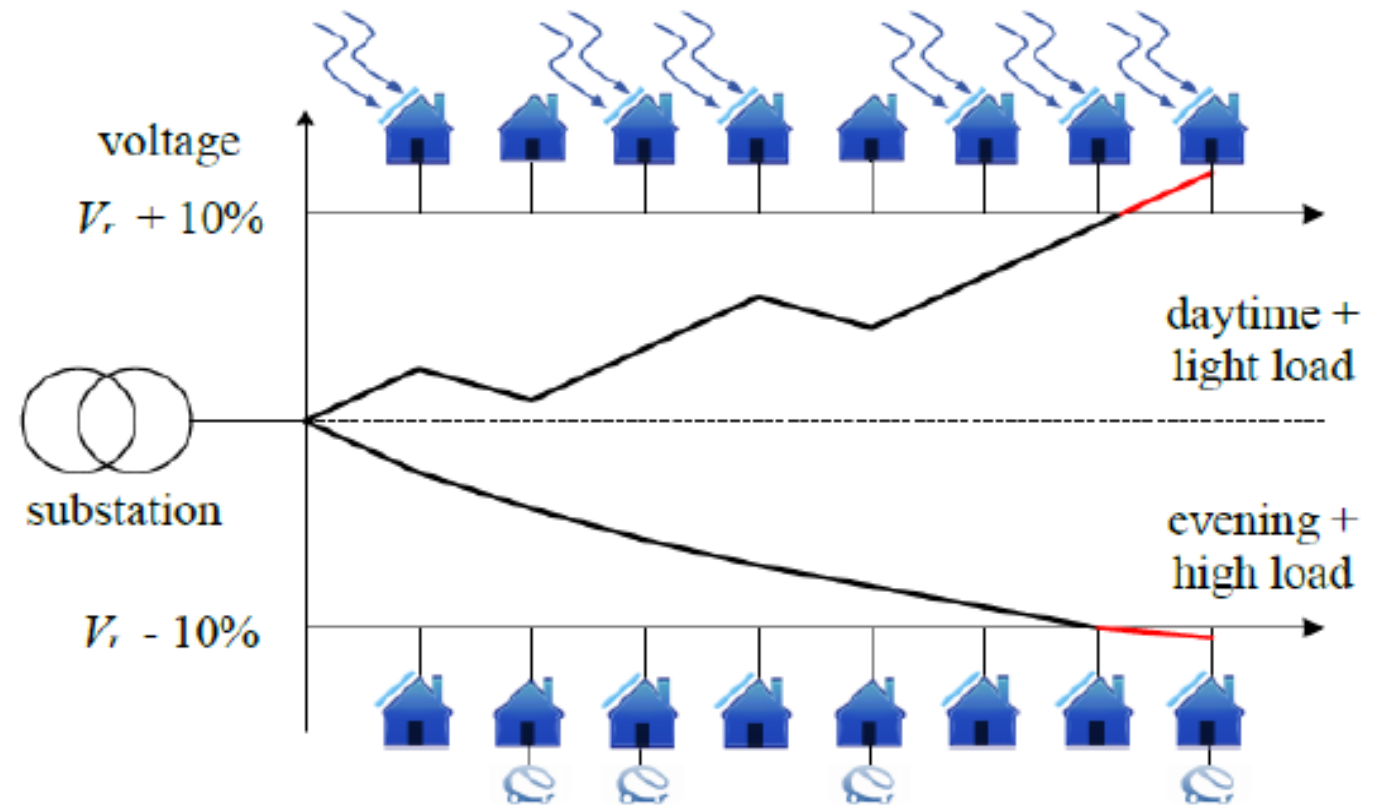
Overload network

- **Full/overload transformers:**
 - 500kV Di Linh; 500kV Vinh Tan; 500kV Dak Nong
 - 220kV Thap Cham 2, Dai Ninh.
- **Full/overload 220kV, 110kV transmission lines:**
 - 220kV Da Nhim – Duc Trong, Duc Trong – Di Linh
 - 220kV Thap Cham – Vinh Tan,....
 - 110kV Song Cau – Long My - Quy Nhon
 - 110kV Da Nhim – Don Duong,



Other disadvantages

- Voltage deviation
- Voltage control
- Harmonics
- Flickering
- Reliability of power supply



THANK YOU!

VIETNAM ELECTRICITY

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