



CASE
for Southeast Asia



Power system and recent trends in wind energy development in Vietnam

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Content

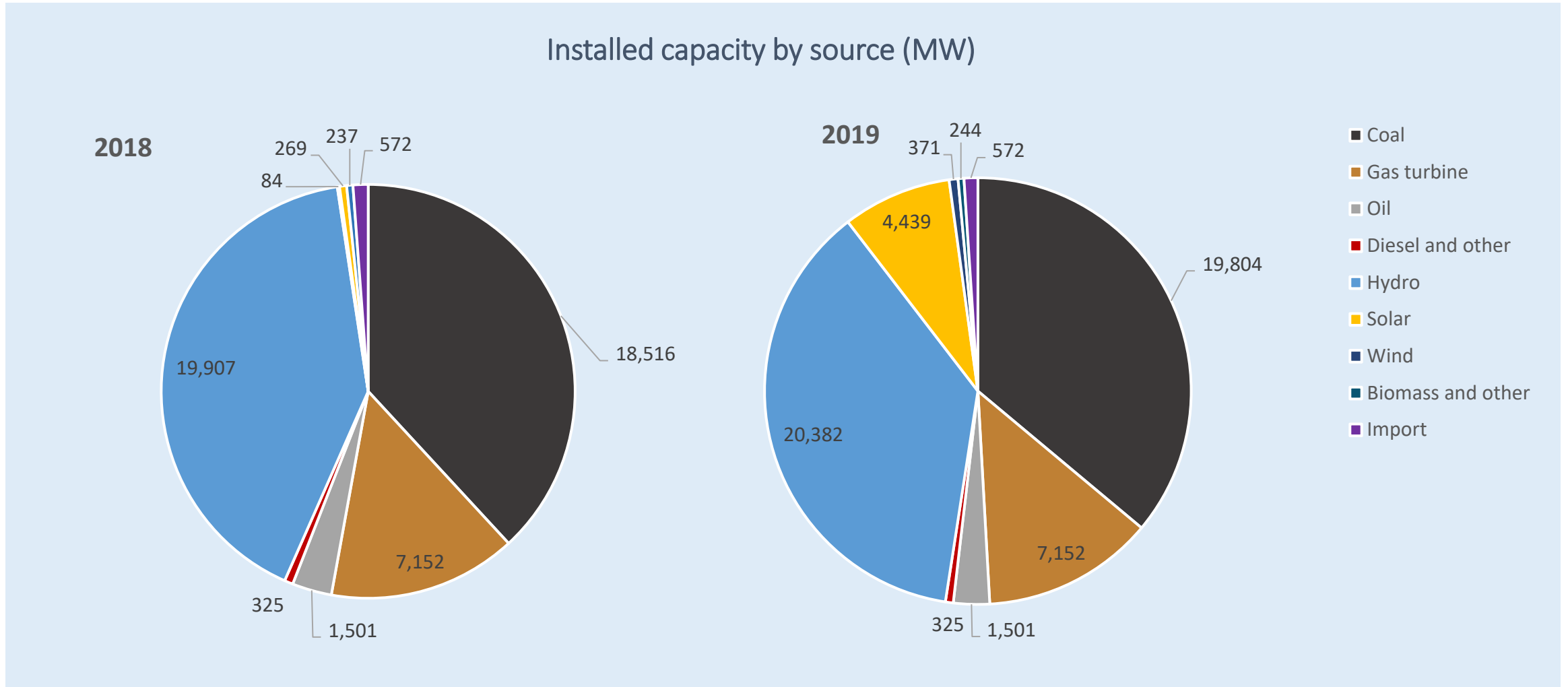


OVERVIEW OF VIETNAM'S
POWER SECTOR



PROSPECT OF OFFSHORE
WIND POWER

Vietnam's Power mix – a transition underway

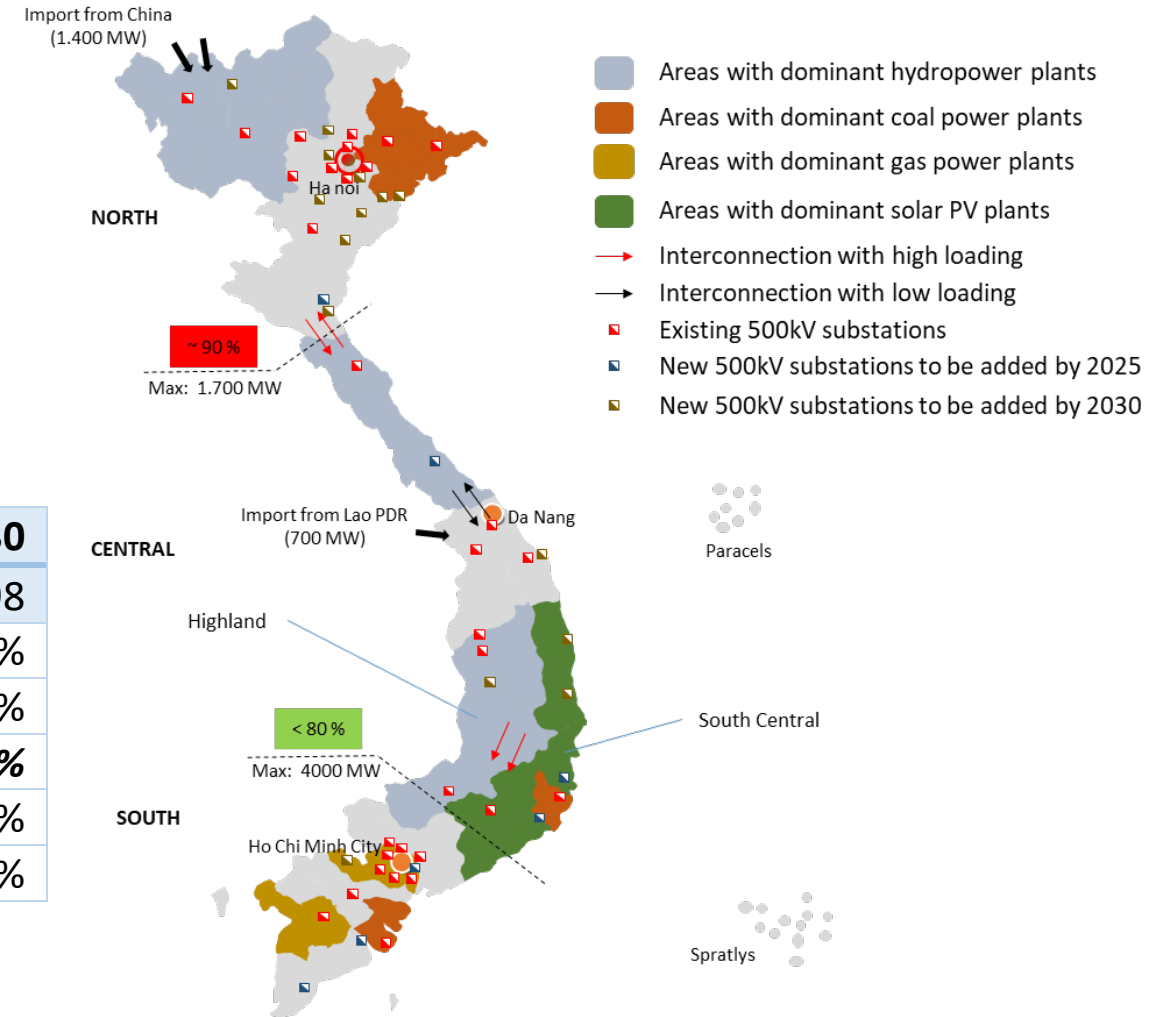


Source: NLCD report, Sep. 2020

System overview

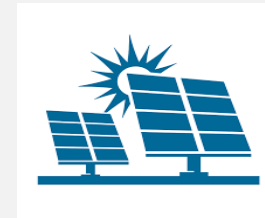
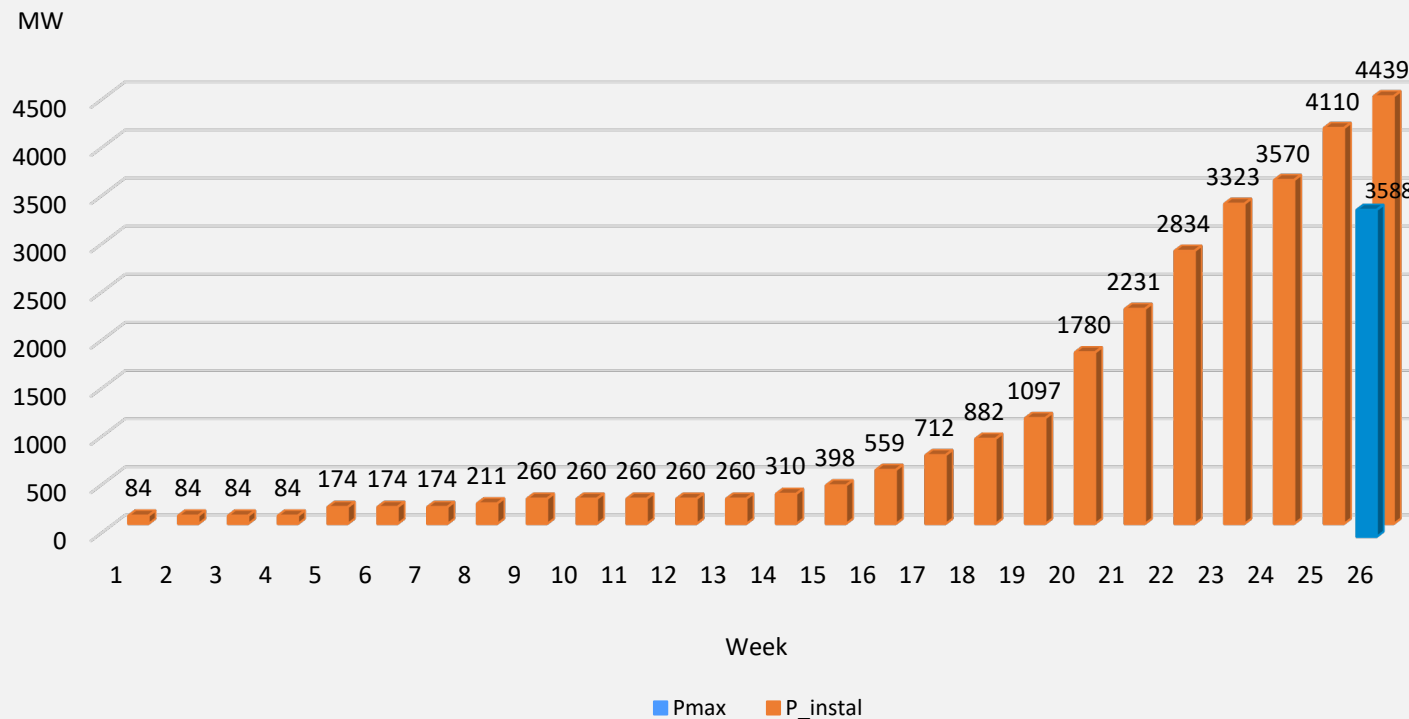
	2020	2025	2030
Total load demand [MW]	44.244	68.367	100.215
Load demand from the North	17.698	27.347	40.086
Load demand from the Central	4.424	6.837	10.022
Load demand from the South	22.122	34.184	50.108

	2020	2025	2030
Total installed capacity [MW]	60.090	116.699	169.498
Share of coal and (LNG) CCGT	47,2%	46,0%	51,3%
Share of hydropower and pump storages	29,6%	18,4%	14,5%
Share of wind	1,7%	10,0%	10,8%
Share of solar PV	12,8%	17,4%	14,9%
Others	8,8%	8,2%	8,5%



Renewable energy development is getting momentum

Cumulative of solar installed capacity in the first half of 2019



- **99 Solar** plants ~ **5053 MW**
- **56,139** Rooftop Solar System ~ **1,543 MW**

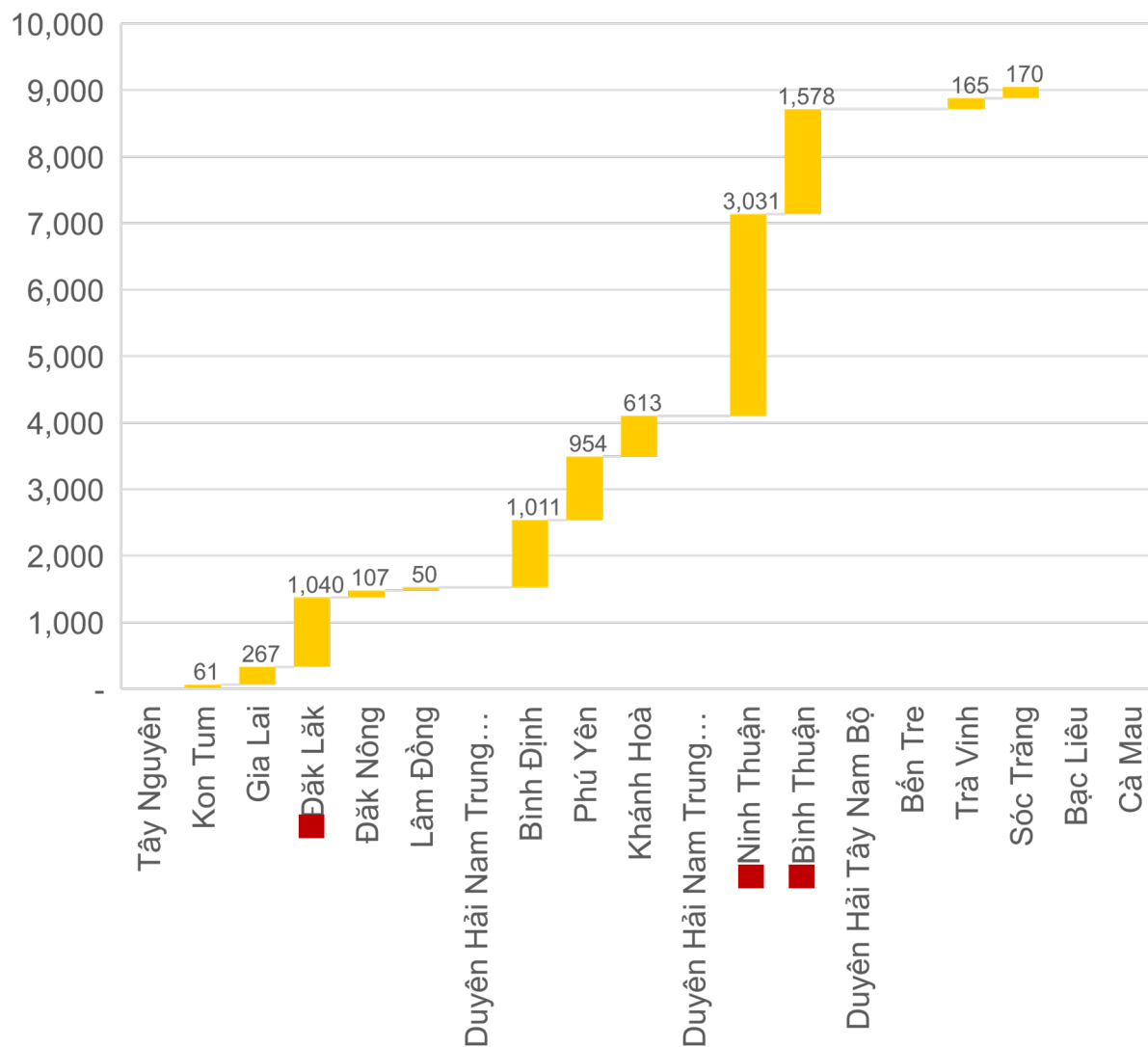


- 11** plants – **429 MW**
- Before 30/6: 9 NM – 371 MW
- After 30/6: 2 NM – 58 MW added

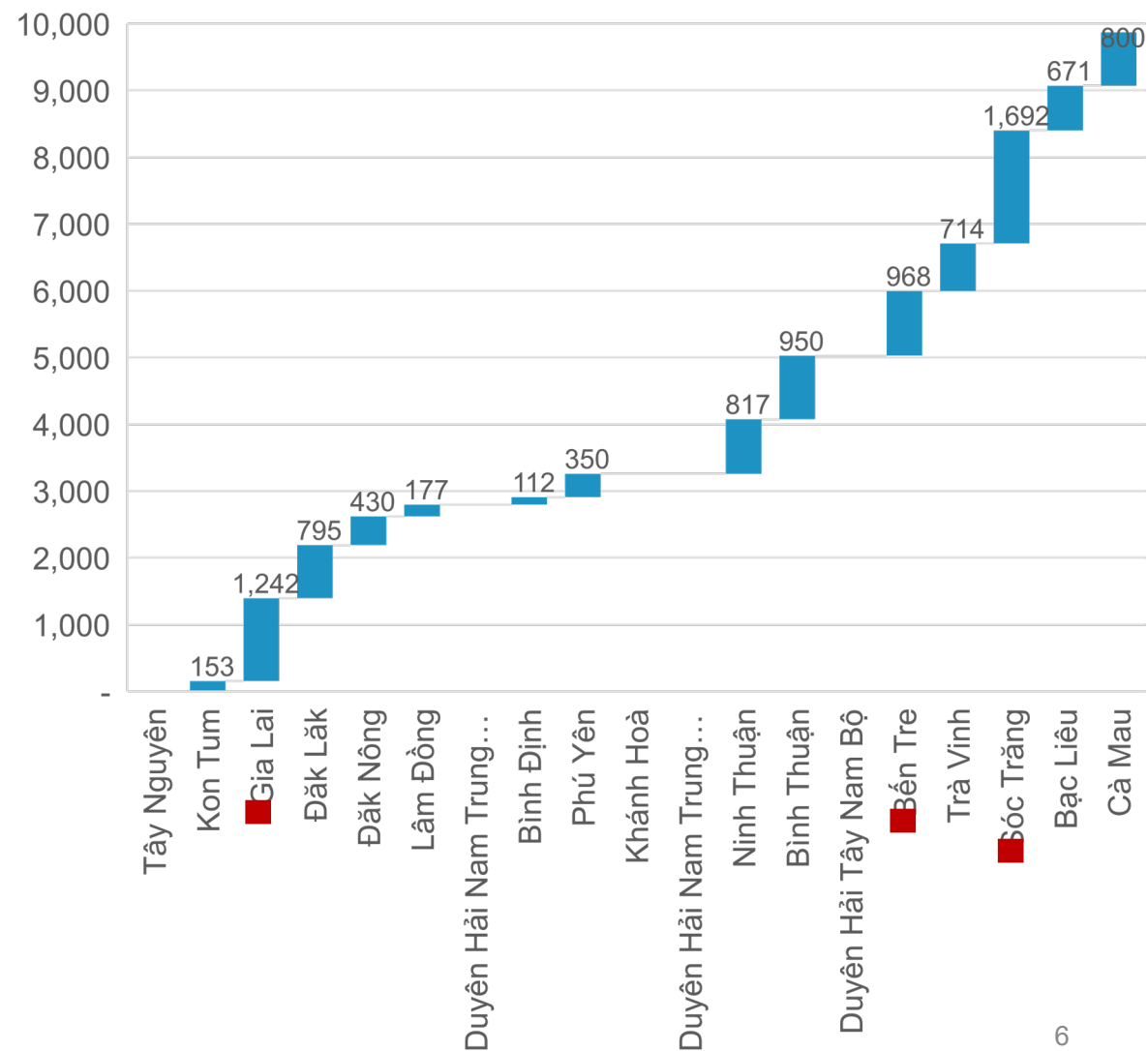
Source: NLCD report, Sep. 2020

Solar and wind power capacity planned for 2022

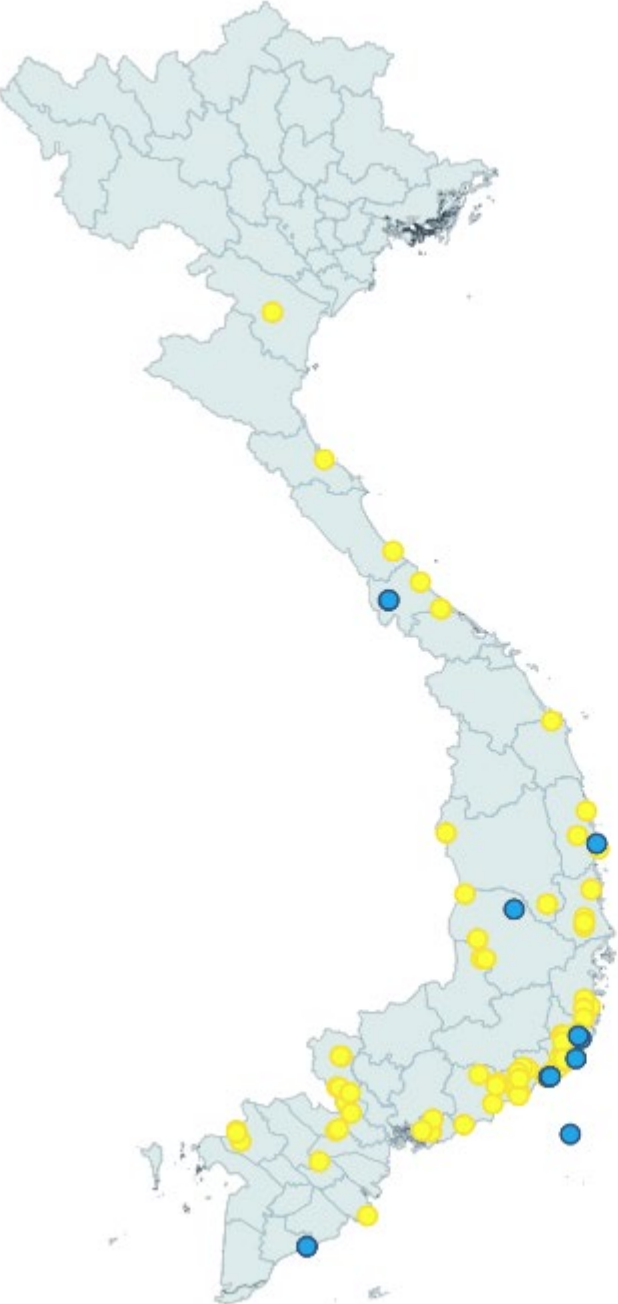
Solar (MWp)



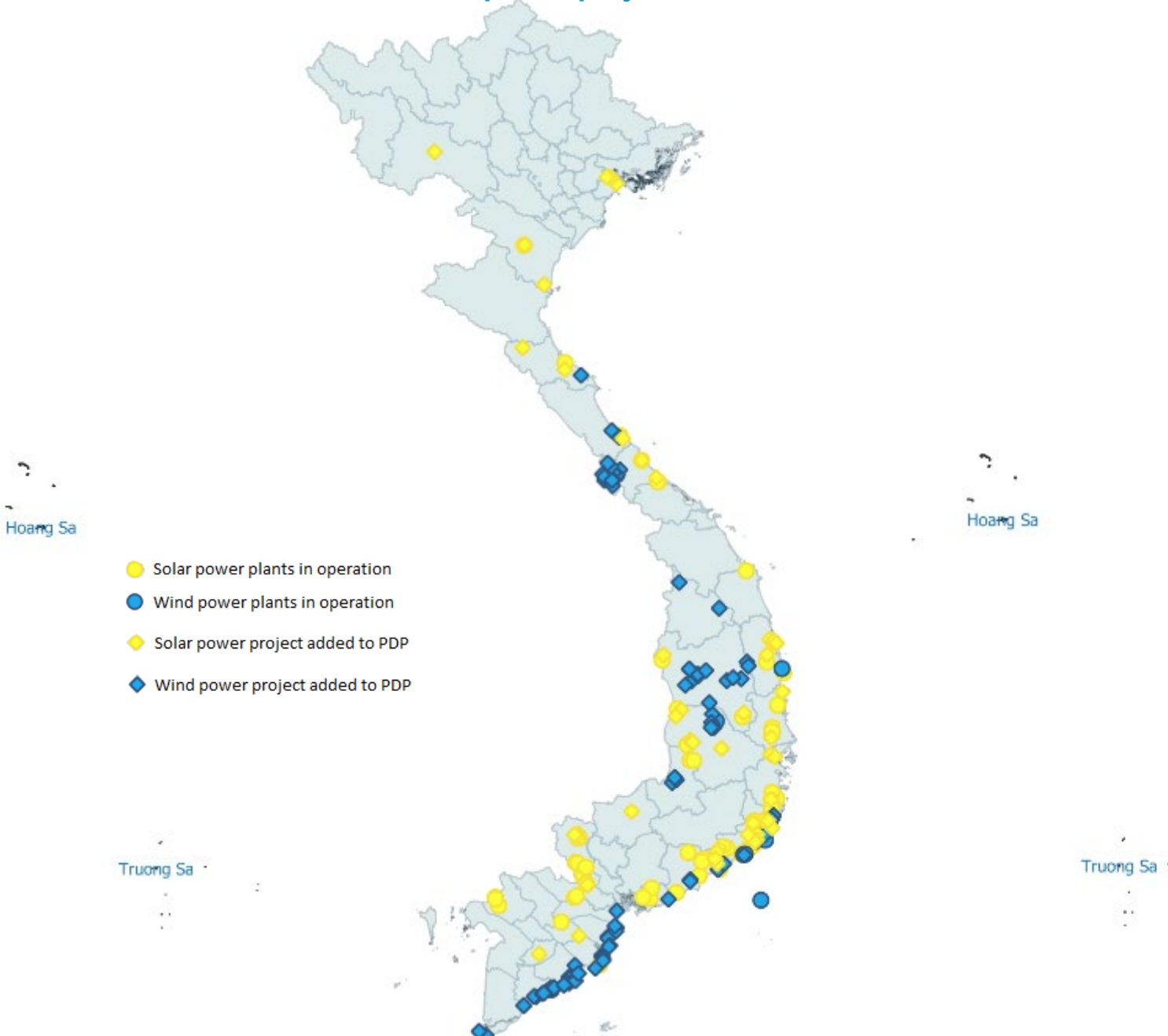
Wind (MW)



Wind and solar power projects in operation



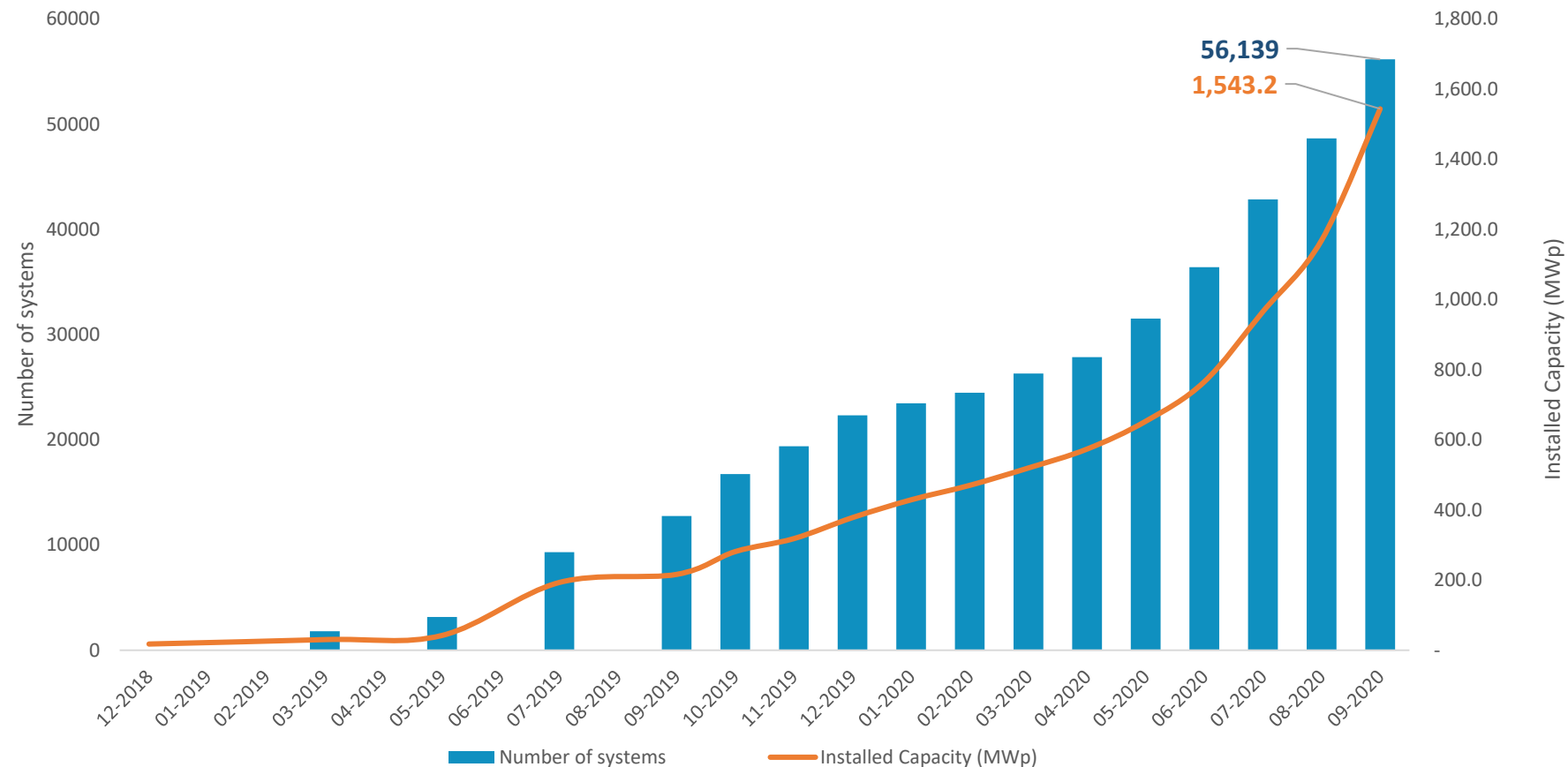
Wind and solar power project included in the PDP



Source: VIET 2020

Rooftop solar (RTS) market development 2019-2020

Development of the Rooftop Solar Systems and Installed Capacity in Viet Nam

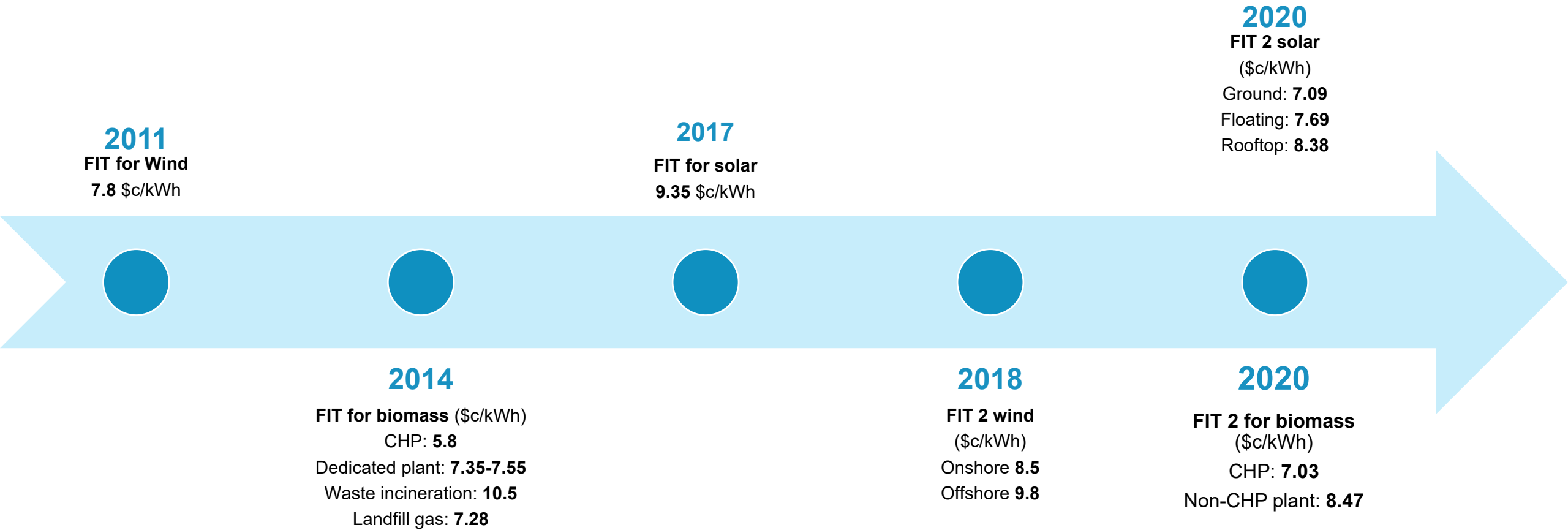


September 2020:

- 1,543 MW
- 56.139 systems

Source: VEPG Factsheet on Rooftop Solar Development September 2020, data: EVN

Supporting policies for RE development





Upcoming policy

2019 2020 2021 2022 2023 2024 2025



Renewable Energy Law

Revise Electricity Law

Power Development Plan 8 to 2030, vision 2045

National Energy Plan to 2030, vision 2050

Sea Ports Development Plan to 2030, vision 2050

Development of Competitive Power Market

◆ Wholesale market officially operated

Retail market to be operated ◆

EIA Offshore wind

New FIT wind

Auctioning scheme for Solar energy

DPPA Pilot

New grid I&O mechanism

Development of Vietnam Energy Information System

RPS, Emission Trading System?

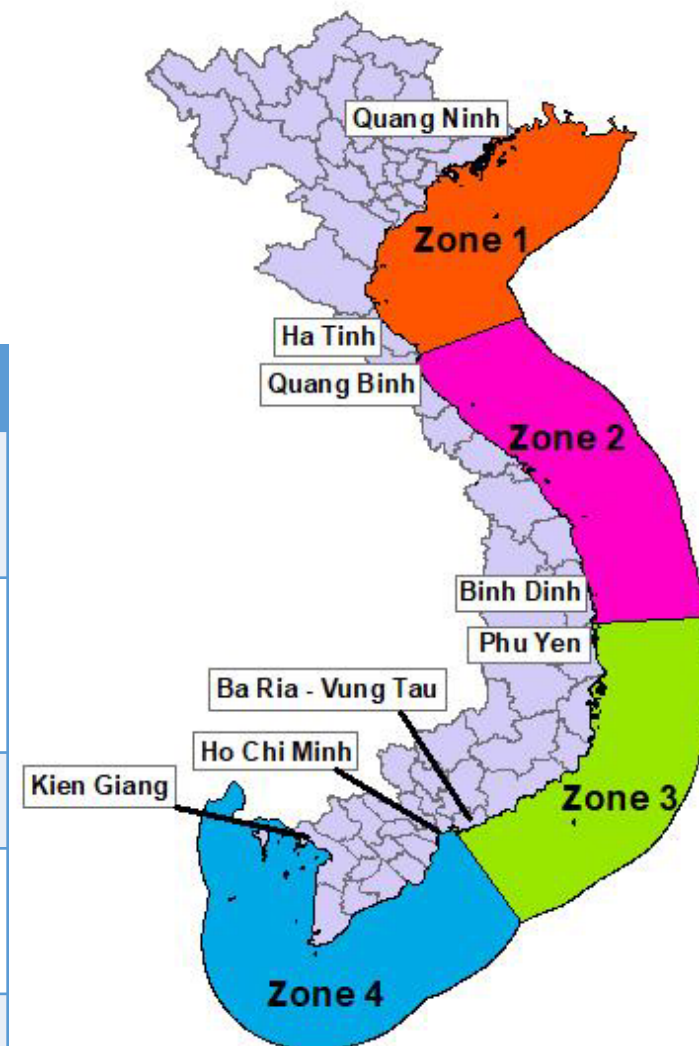
Prospect of Offshore Wind Power



Offshore Wind Potential

- Potential ^[1]
 - 261 GW fixed
 - 214 GW floating
- Possible zoning^[2] – Table 3

	Current		2025		20230	
	Onshore existing 500kV substations	Avg. max loading [%]	New onshore 500kV substations	Residual cap. [MW]	New onshore 500kV substations	Residual cap. [MW]
Zone 1	Quang Ninh, Pho Noi, Dong Anh, Hiep Hoa, Thuong Tin	78	Bac Giang, Bac Ninh, Hai Phong	4,032	Gia Loc, Long Bien	5,382
Zone 2	Da Nang, Doc Soi, Thach My	33		3,003	Binh Dinh	3,228
Zone 3	Song May, Tan Uyen, Chon Thanh	51	Long Thanh	3,335	Dong Nai 2, Binh Duong 1	5,135
Zone 4	Cau Bong, Phu Lam, Nha Be	62	Duc Hoa, Long An	3,743	Thot Not, Cu Chi	5,318



[1] ESMAP - Energy Sector Management Assistance Program, "Going Global - Expanding Offshore Wind to Emerging Markets," 2019.

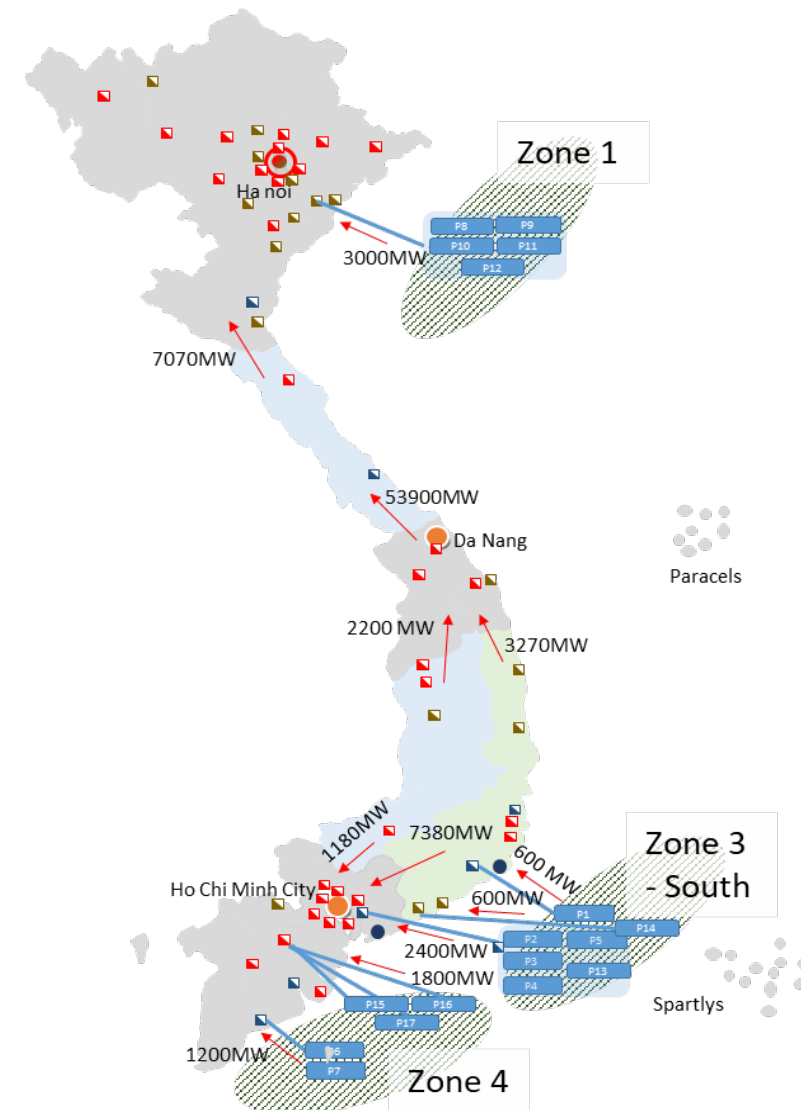
[2] V. Q. Doan et al., "Usability and challenges of offshore wind energy in Vietnam revealed by the regional climate model simulation," Sci. Online Lett. Atmos., 2019.

Roadmap to reach 10GW of Offshore wind

Unit: MW

Zone	Trans. Tech.	2023	2024	2025	2026	2027	2028	2029	2030	Total
1	VSC-HVDC				600	600	600	600	600	3,000
3	Point-to-point HVAC VSC-HVDC	600	1200	1200		600		600		4,200
4	VSC-HVDC		600	600	600		600		600	3,000
Total		600	1,800	1,800	1,200	1,200	1,200	1,200	1,200	10,200

Source: Integrating Offshore Wind in Vietnam Power System – A technical-economic assessment. VIET 2020



Constraints for OSW development

Environmental

- Protected area/ essential habitats **(R)**
- Vulnerable marine species (value of biodiversity) **(A)**
- Birds and bats **(A)**

Social

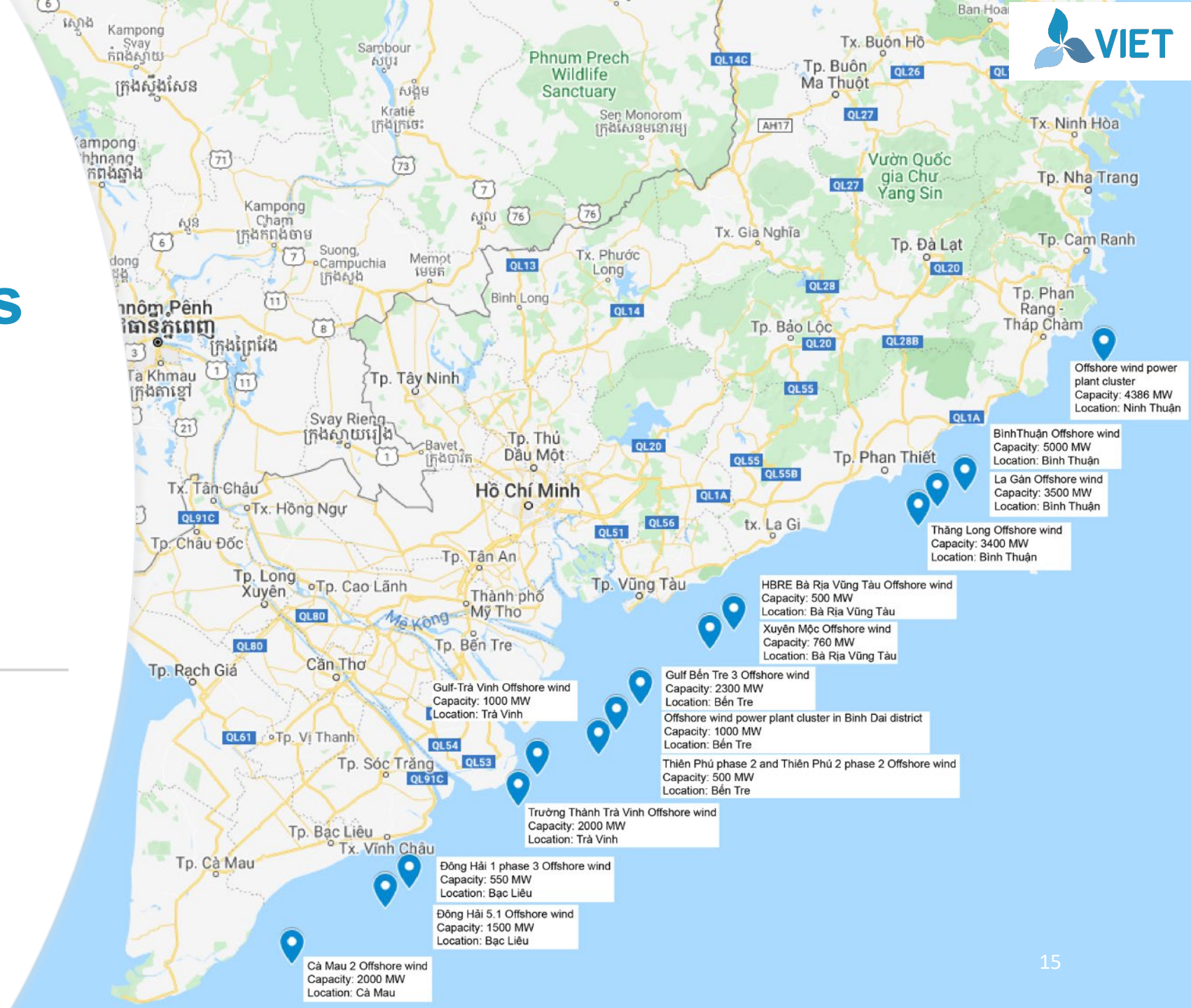
- Oil-related activities **(R)**
- Energy and communication infrastructures **(A)**
- Aquaculture **(A)**
- Commercial fishing grounds **(R)**
- Sea landscape and tourisms **(A)**
- Historical and cultural heritages **(R)**

Technical

- Marine traffic **(R)**
- Air traffic **(A)**
- Military exercise area **(R)**

14 OSW projects
has been
proposed

~ 28 GW



Conclusion

- In the next 10 years, renewable energy will continue to explode in Vietnam, mainly from offshore wind energy;
- However, there are some issues to keep in mind:
 - RE development needs to be **develop synchronously** between **supply** and **transmission** system,
 - major challenges in balancing systems and increasing transmission infrastructure cost cause by concentrating RE projects in some areas
 - Investing in upgrading the transmission grid should be carefully consideration
 - It is recommended to **optimize the regional supply-demand balance**, minimize inter-regional transmission
 - The purchase price of RE electricity can be close to the international market by apply **auction mechanism**.
 - should define specific roadmap to accelerate the development of the RE market
 - The Government of Vietnam should proactively announce the **national renewable energy development target** for the next 10 years
 - Market need specific signals, form a domestic supply supporting industries → create job opportunities →
 - **create real value from the process of energy transition for Vietnam.**

Thank you for your attention!



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