



Vietnam Initiative  
for Energy Transition

# Options for wind power in Vietnam by 2030

Minh Ha-Duong  
HCMC, Oct 2019

# Outline

- 1) Introduction
- 2) Wind power is taking off in Vietnam, with declining costs and excellent resource.
- 3) Wind power installed capacity in 2030 could be 12-15 GW onshore, 10-12 GW offshore.
- 4) The variability of wind energy must be compensated by various flexibility options.
- 5) Offshore wind large potential requires infrastructure planning starting soon.

# VIET is an independent think tank to provide

1. Research
2. Expertise
3. Consultancy
4. Training



**Vietnam Initiative for Energy Transition** is an independent think tank, acting as a bridge between research and policy, with a mission to accelerate the transition of Vietnamese energy system in a sustainable and reliable manner.

VIET's institutional independence is rooted in the individual independence of its scholars. As a **Social Enterprise**, any profit created from our activities will be used to reinvest in research & education.

**01 Research**  
Our research topics cover national energy policy, climate protection, economics, development, and governance.

**03 Consultancy**  
We provide consultancy, analysis and prediction related to energy and climate protection.

**02 Expertise**  
VIET brings together leading experts in government and academia who provide quality research, policy recommendations and analysis.

**04 Training**  
We receive interns and PhD students on energy and climate protection subjects.



*Climate Vulnerable Forum, Marrakech Vision (2016)*

*We strive to meet 100% domestic renewable energy production as rapidly as possible, while working to end energy poverty and protect water and food security, taking into consideration national circumstances.*

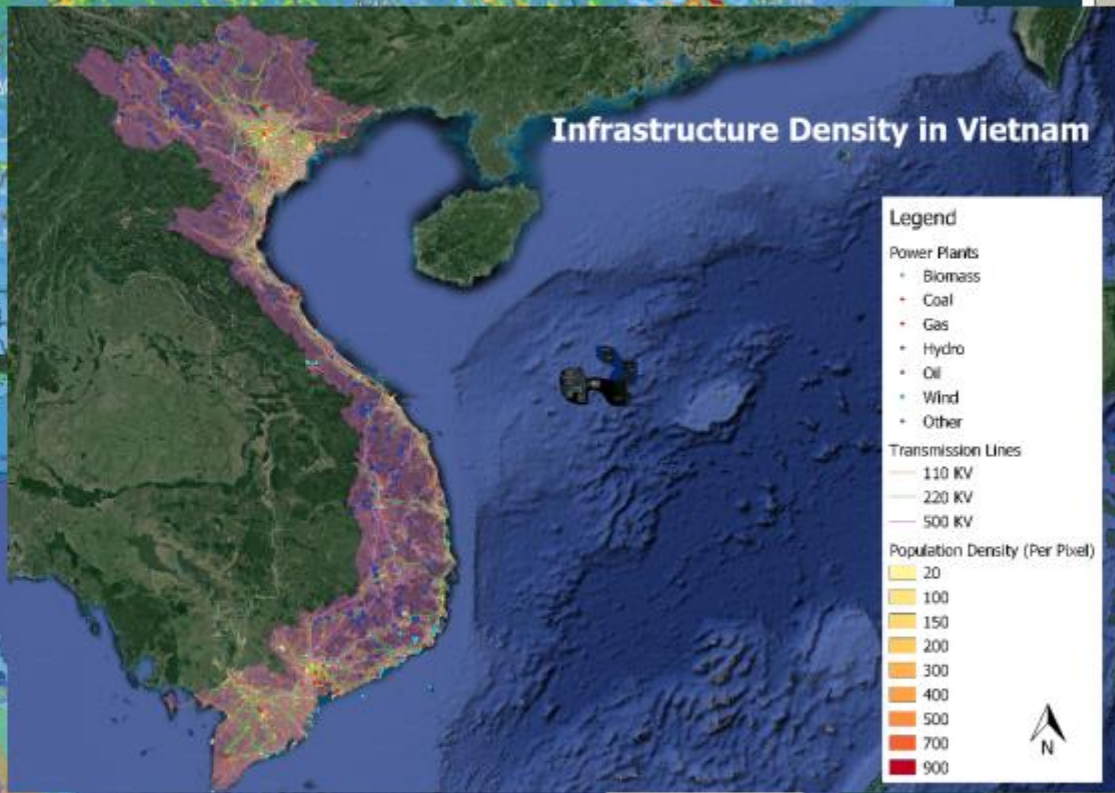
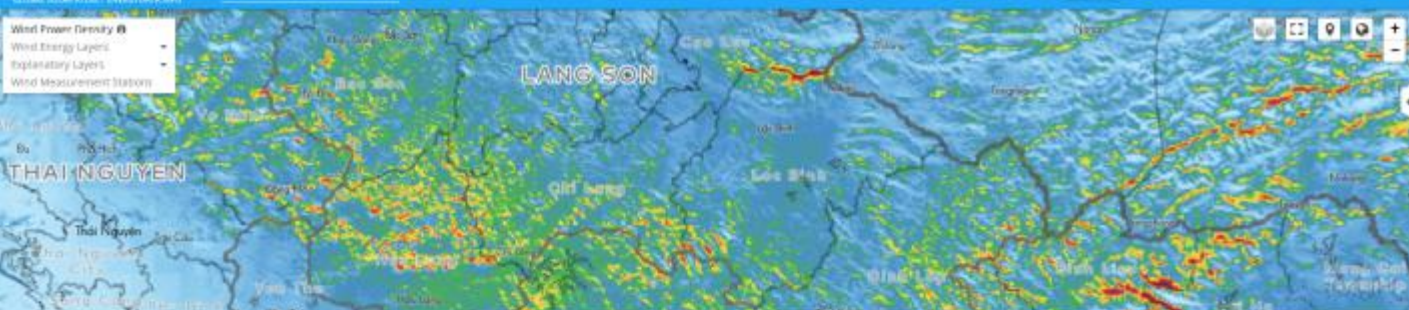
***We commit to  
a 8% GHG reduction by 2030  
(compared to 320% baseline increase,  
not including industrial processes, INDC)***

**Minister Tran Hong Ha, MONRE**



# We see that

- World impressed at Vietnam renewable energy boom
- Germans pay electricity five times higher than VN
- Solar power curtailment rates in Xinjiang, China went from 39% to 10.6% in two years
- Power Development Planning is hard



# LNG IMPORT PROJECTS



**FSRU LNG Terminal**  
- Capacity: 0.2-0.5 MMTA  
- Schedule: 2026 - 2030

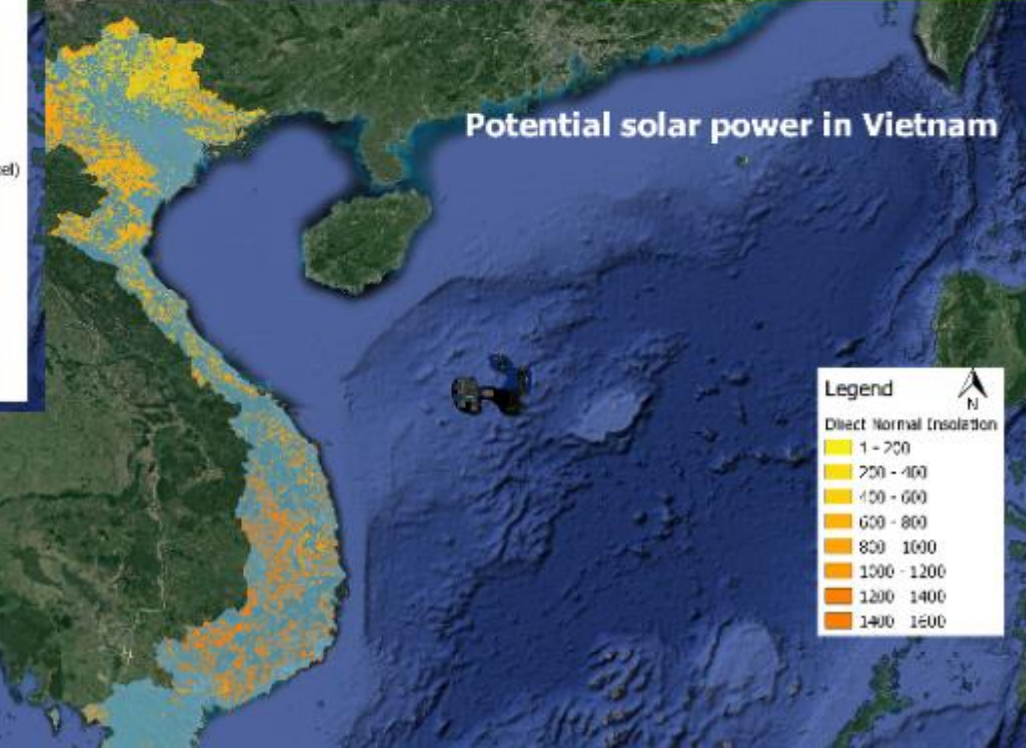
**Cat Hai – Hai Phong LNG Terminal**  
- Capacity: 1-3 MMTA  
- Schedule: 2030 - 2035

**Son My – Binh Thuan LNG Terminal**  
- Capacity: 6 MMTA  
- Schedule: 2022-2025

**My Giang – Khanh Hoa LNG Terminal**  
- Capacity: 3 MMTA  
- Schedule: 2030 - 2035

**South East LNG Terminal**  
- Capacity: 4-6 MMTA  
- Schedule: 2022 - 2025

**Thi Vai – Vung Tau LNG Terminal**  
- Capacity: 1-3 MMTA  
- Schedule: 2020 - 2022



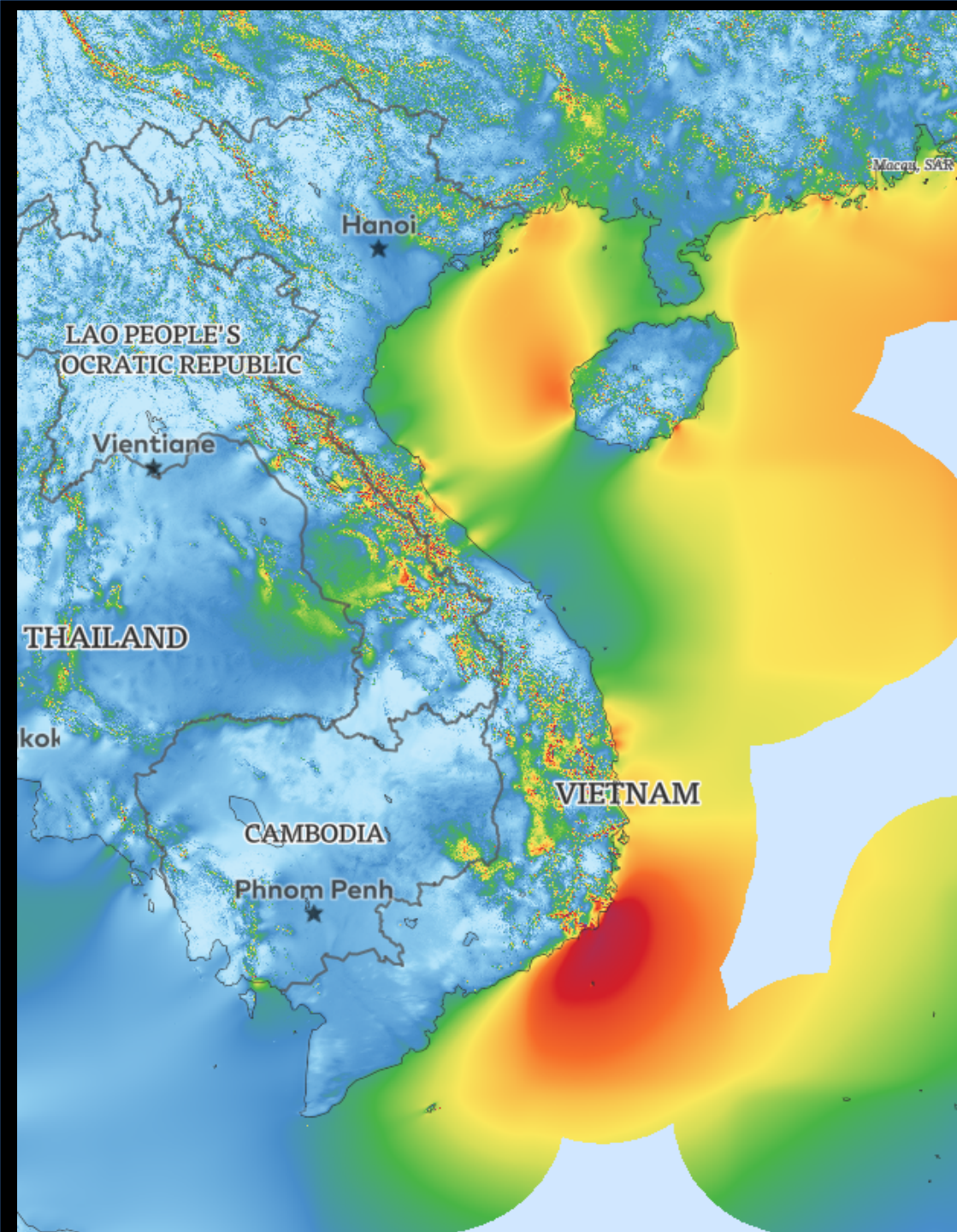
**1) Wind power is taking off in Vietnam, with declining costs and excellent resource.**



*Tác giả: Khánh Linh*

← Physical potential

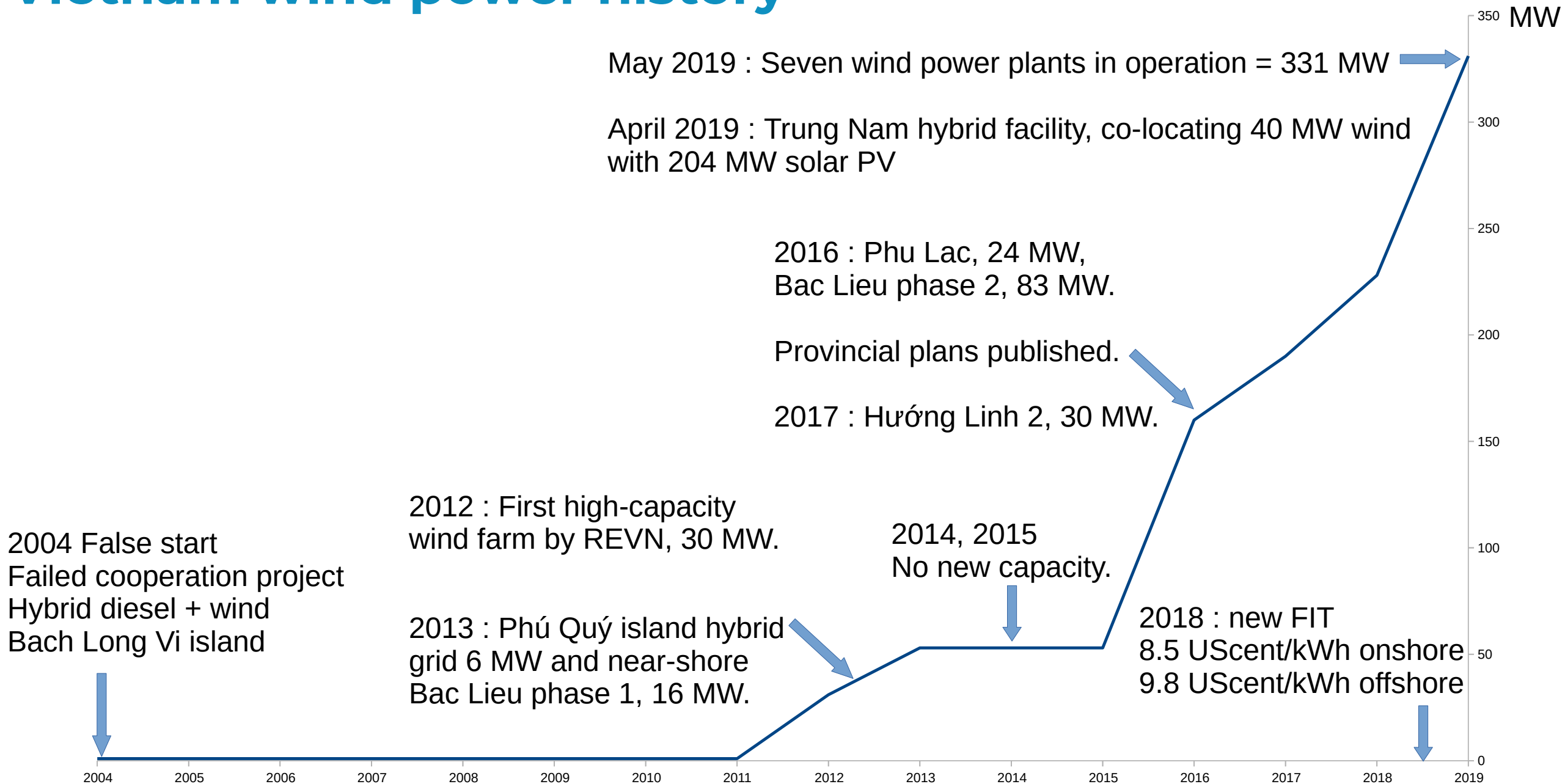
Technical potential ↓



Region	Onshore Wind GW	Offshore Wind GW
Northeast	4.6	64.5
Northwest	2.8	-
Red River Delta	1.5	66.7
North central Coast	0.3	113.0
South central Coast	16.8	78.8
Central highlands	12.5	-
Southeast	3.3	27.1
Mekong Delta	0.2	259.7
<b>Total</b>	<b>42.0</b>	<b>609.8</b>



# Vietnam wind power history

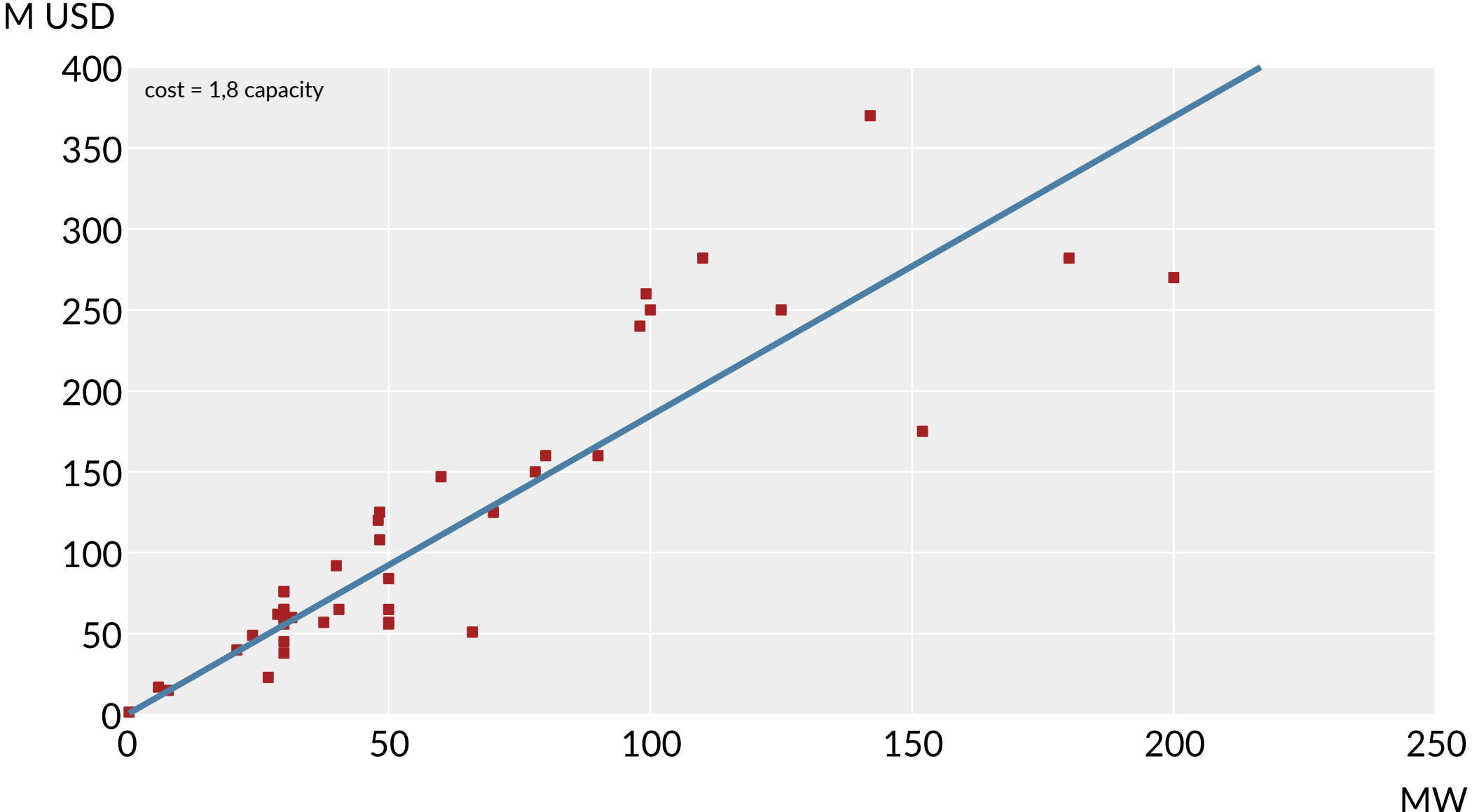


# Project pipeline

Status	Total capacity (MWp)	Number of projects	Average project size (MWp)
Canceled	792	4	198
Operating	346	11	31
Construction	990	17	58
Groundbreaking	160	3	53
Approved	3 545	49	72
Announced	3 909	23	170
Planned	1 138	22	52
<b>Total</b>	<b>10 880</b>	<b>129</b>	<b>84</b>

Summary of wind projects pipeline in Vietnam, August 2019. Source: author.

# Wind announced at 1800 USD/kW



Source :  
VIET

**2) Wind power installed capacity  
in 2030 could be 12-15 GW  
onshore, 10-12 GW offshore.**



# Lower, middle and upper scenarii

- *Old Plan* scenario : a wave of new wind farms connected to the grid in time to get the FIT, before November 2021. After that, the government does not renew the FIT, legal issues delay the first pilot auction and a global economic crisis impacts Vietnam, reducing economic growth and therefore domestic electricity demand.
- *New Normal* scenario : big initial wave of wind projects in 2021, then market pulled by government auctions and by multinational companies procuring green electricity directly from wind project developers. The government credibly commits to an auction program for 2 GW of offshore wind per year after 2025.
- *Factor Three* scenario : the national oil and gas company PVN redefines itself as a sustainable energy provider, to play on its offshore work capacities and the complementarity between gas and variable renewables. The Thang Long Wind power project starts operating its first 600 MW phase at the end of 2022. Government adopts a regional leadership strategy in the wind energy sector.

# Three scenarios

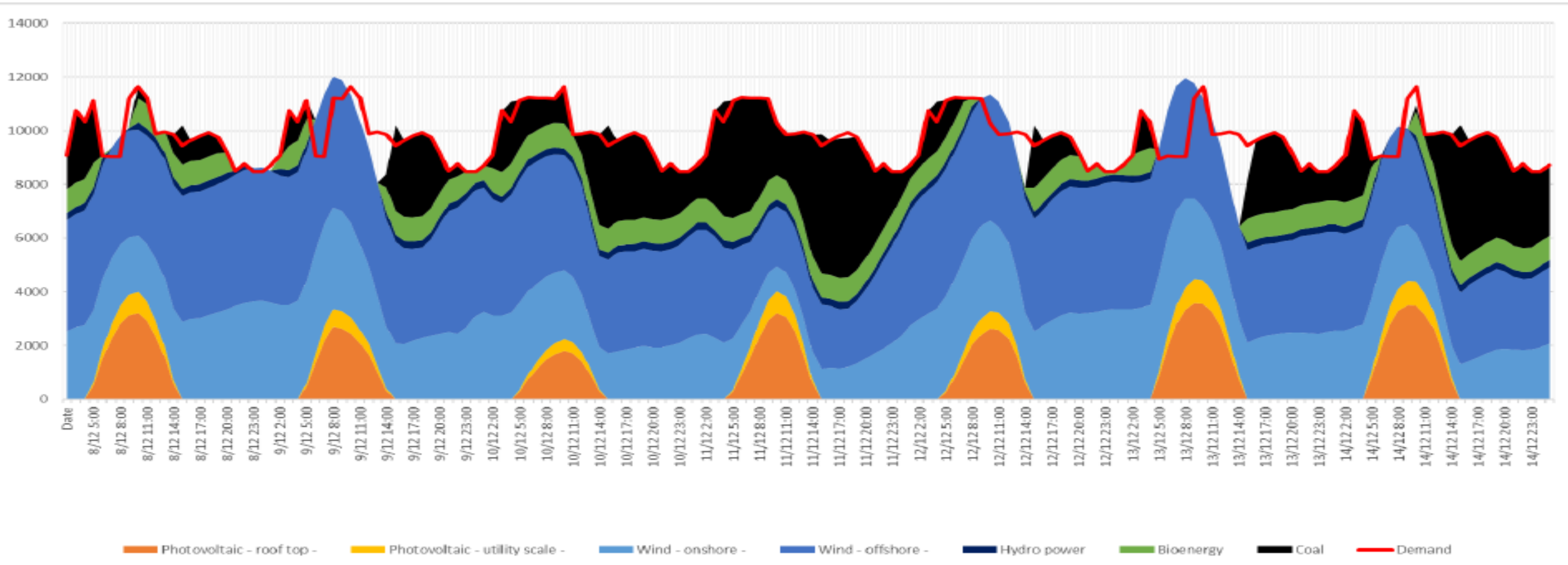
	Onshore wind			Offshore wind		
Scenario	Capacity (GW)	Annual market (MW / yr)		Capacity (GW)	Annual market (MW / yr)	
	in 2030	2020-2025	2026-2030	in 2030	2020-2025	2026-2030
Old Plan	<b>6.1</b>	300	1000	<b>0.15</b>	7	28
New Normal	<b>16.6</b>	730	3200	<b>9.5</b>	260	2100
Factor Three	<b>21.6</b>	1530	3625	<b>20.9</b>	480	4750

**3) The variability of wind energy must be compensated by various flexibility options.**



# Hourly energy mix in 2030

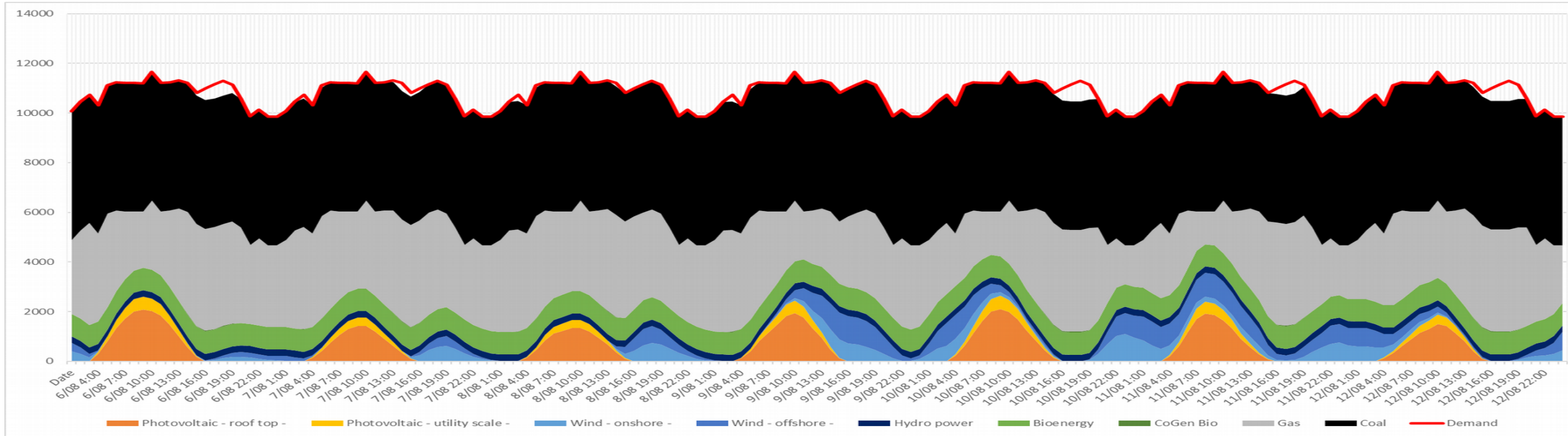
Red River Delta region, Factor three - Windy week



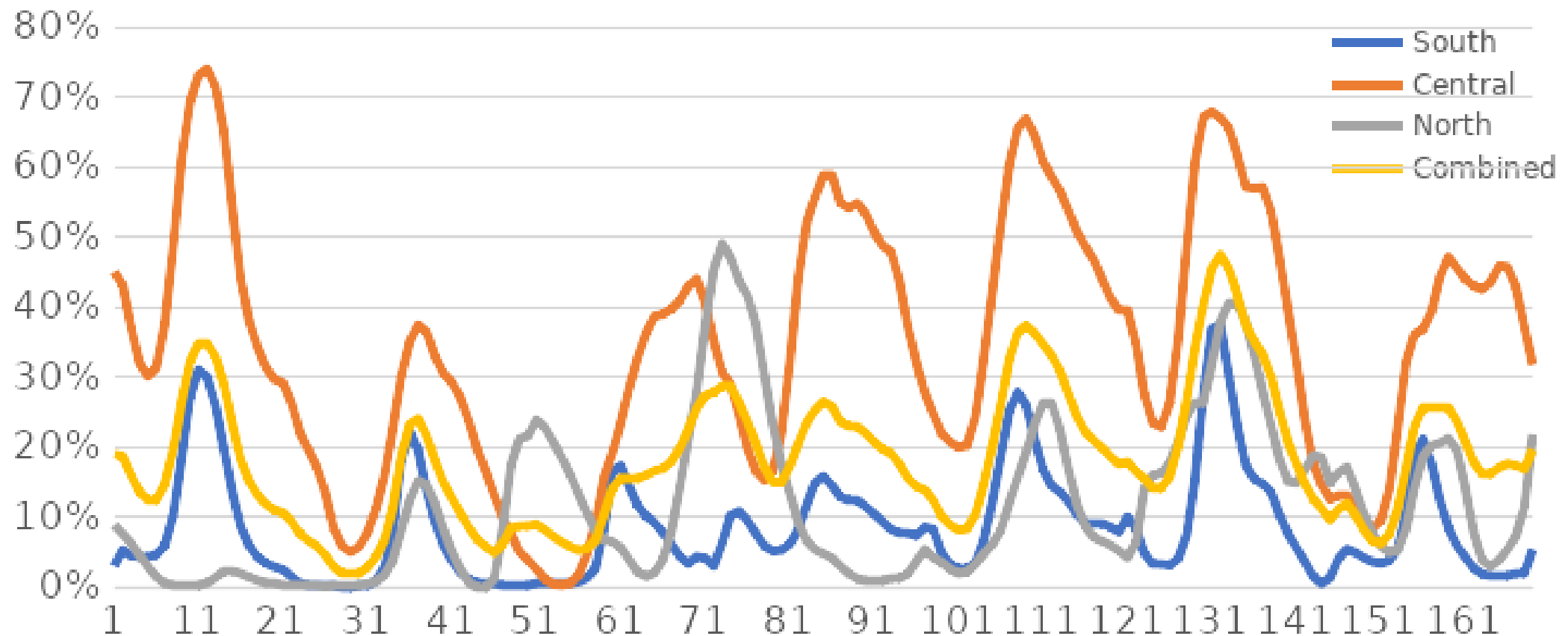


# Hourly energy mix in 2030

## Red River Delta region, Factor three - Windless week



# Regional distribution reduces variability



First week of January. Source : renewables.ninja

# Solutions to variability

- Adapt operational practices
- Upgrade the grid
- Distribute and diversify renewables
- Gas to power
- More offshore wind
- Interconnects
- Storage and other innovations

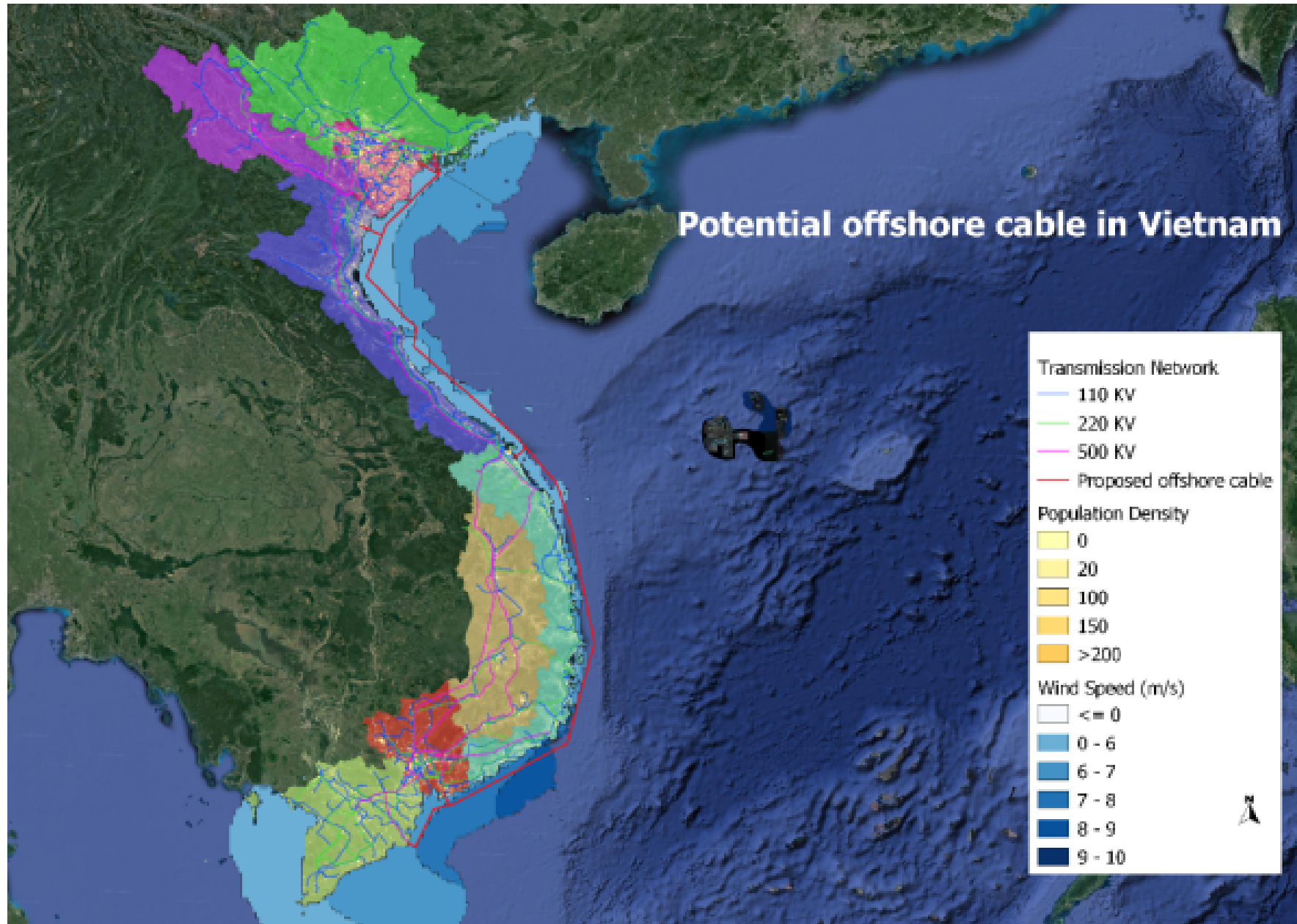
**4) Offshore wind large potential  
require infrastructure planning  
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# Offshore wind : 2 GW/yr after 2025

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# How to connect offshore wind ?



# Conclusions

- 1) Considering the amount of variable power generation sources already under construction and the amount foreseeable, increasing flexibility of the electric system should be a guiding principle of the PDP8.
- 2) The 2030 wind energy targets should be increased considerably compared to the existing plans, towards 12-15GW onshore, 10-12GW offshore.
- 3) Infrastructure development planning for deployment of offshore wind energy at several GW per year should start immediately.



**420MW  
Tay Ninh  
Open  
Sep 7, 2019**

**Thank you**