Vietnam Initiative
for Energy Transition

Options for wind power in Vietnam by 2030

Minh Ha-Duong
CIRED

Paris, 14 Oct 2019

Photo credit: Khanh Linh

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.

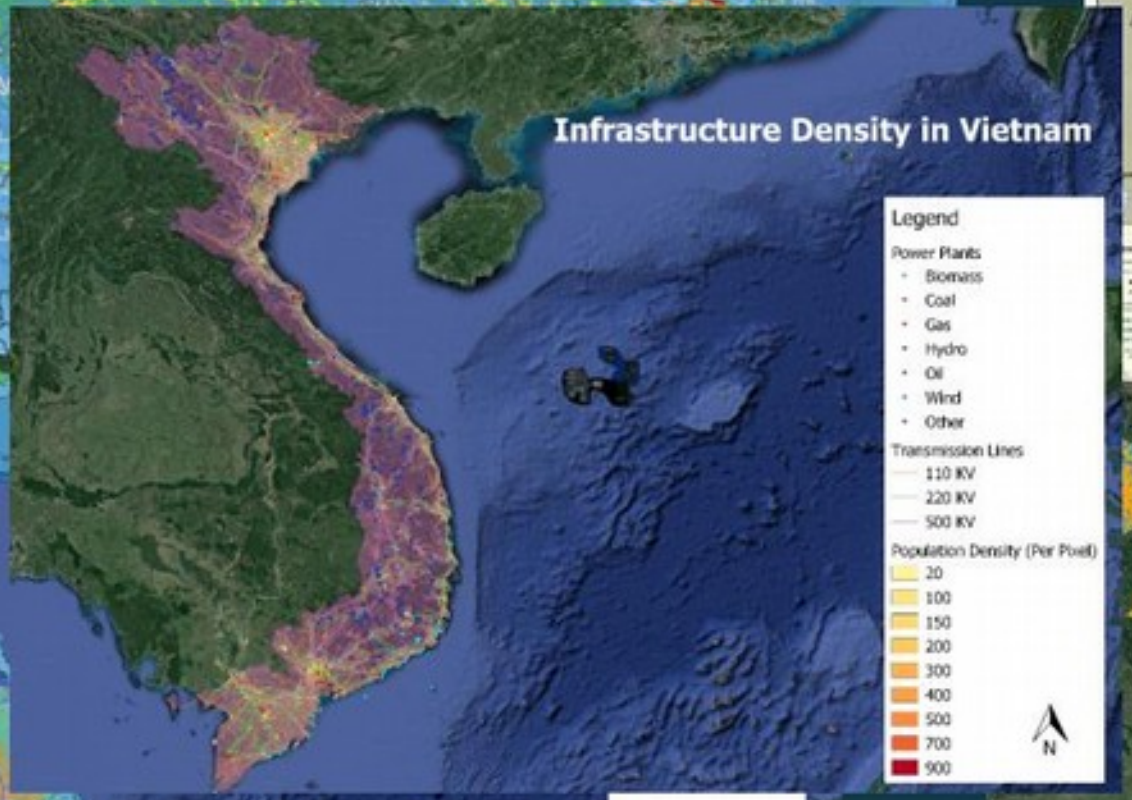
We commit to a 8% GHG reduction by 2030

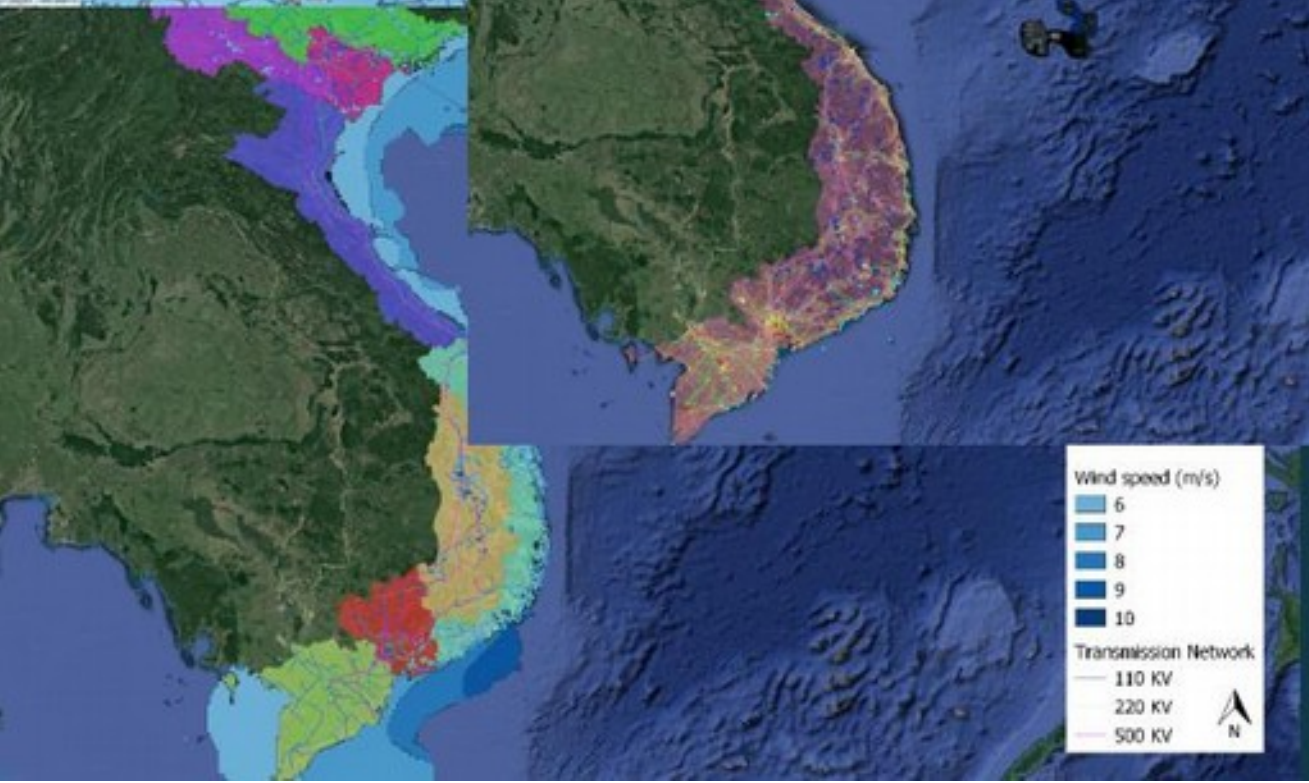
(compared to 320% baseline increase, not including industrial processes, INDC)

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

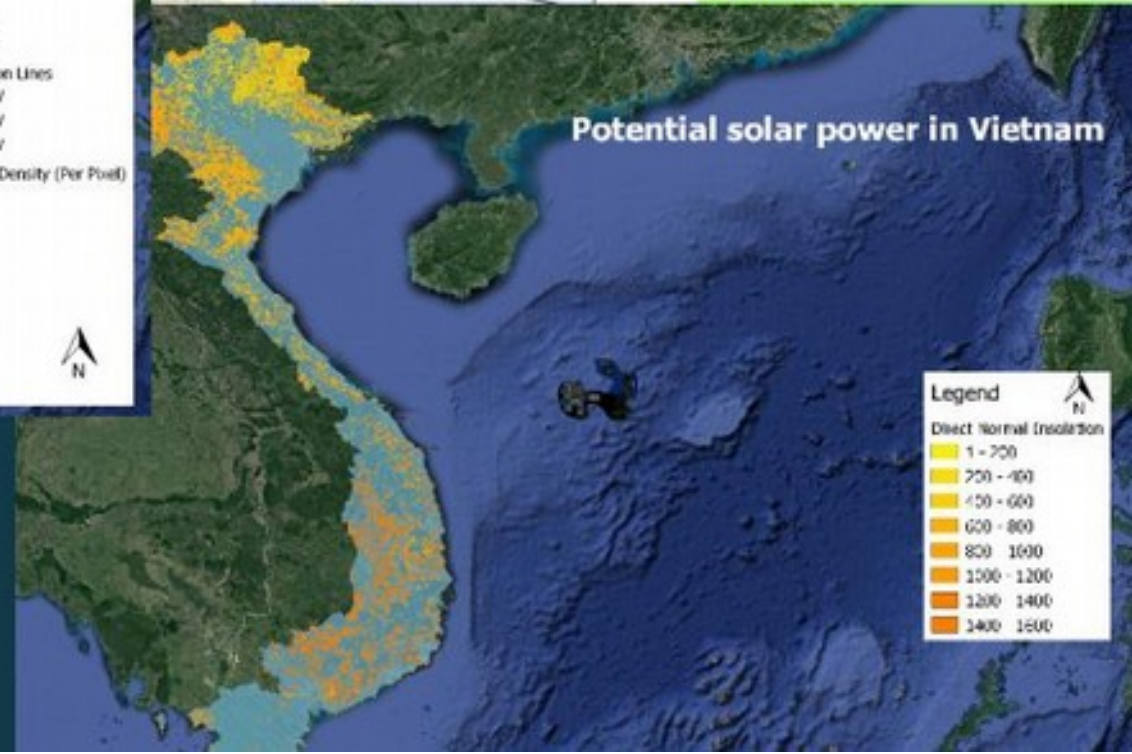
Cat Hai – Hai Phong LNG Terminal
- Capacity: 1-3 MMTA
- Schedule: 2030 - 2035

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

My Giang – Khanh Hoa LNGTerminal
- 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

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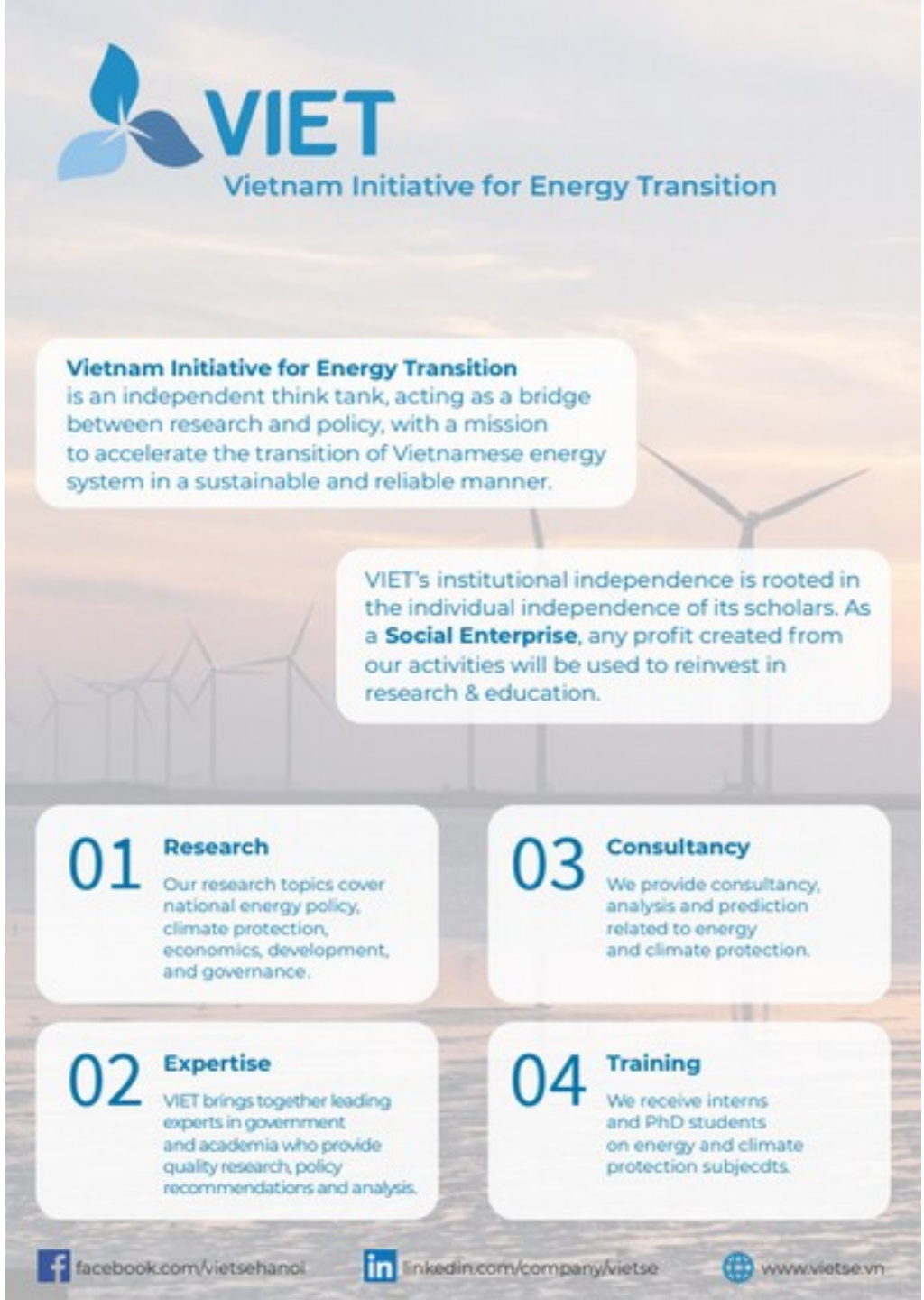
INITIATIVE FOR
ENERGY
TRANSITION

An independent think tank to provide

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



MSc. Ngo To Nhien
Senior associate, Director

Dr. Ha-Duong Minh
Executive chairman, research

Dr. Nguyen Trinh Hoang Anh
Senior associate

MSc. Truong An Ha
Analyst

Dr. Nguyen Hoai Son
Analyst

MSc. Tran Hoang Anh
Analyst

MSc. Trung Quan Tran
Communication officer

Ms. Nguyen Hai Yen
Financial officer

Mr. Tong Minh Quan
Data intern

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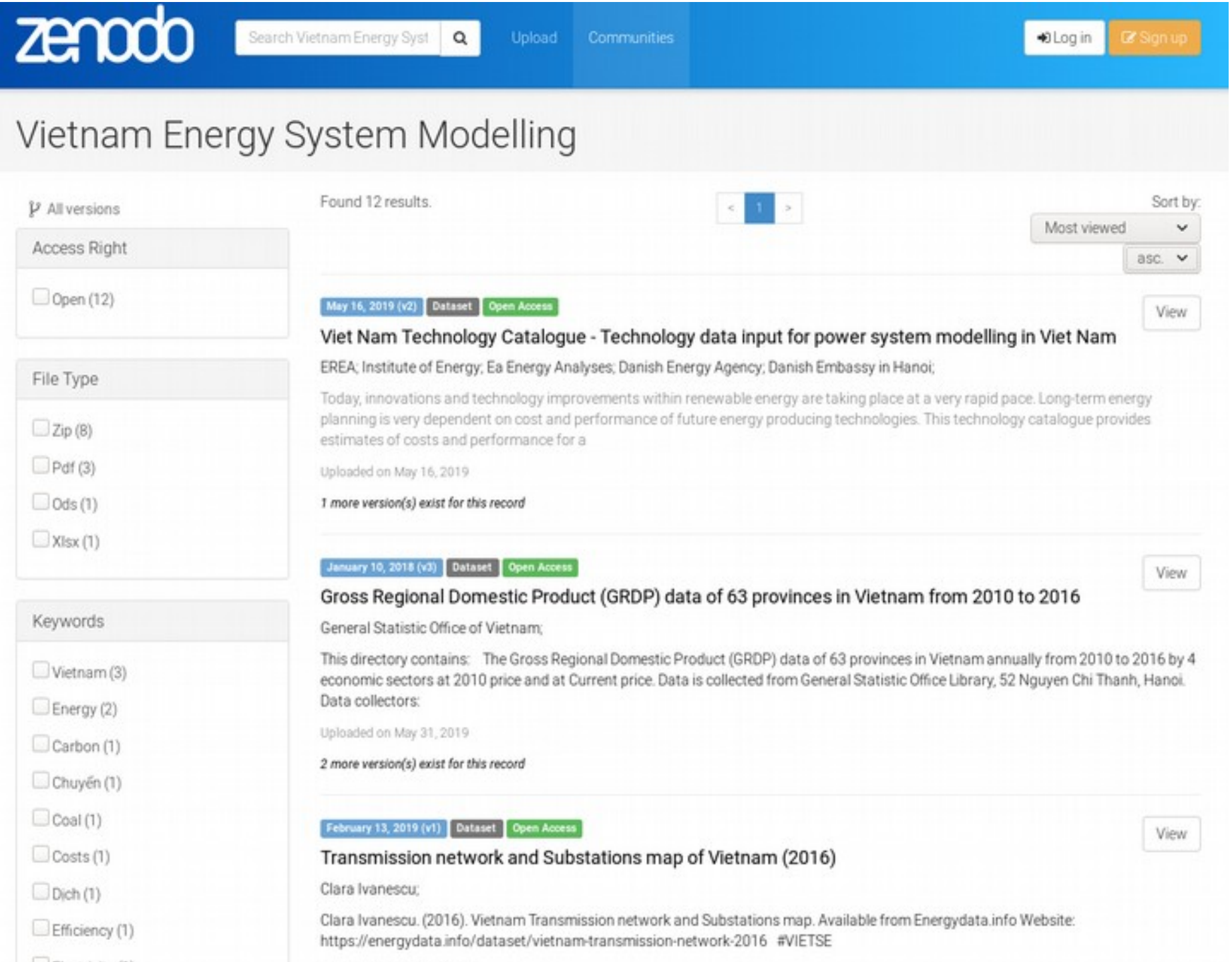
1 year Achievements

Research

- Truong, Patrizio, Leduc, Kraxner, and Ha-Duong (Apr. 1, 2019). *Reducing emissions of the fast growing Vietnamese coal sector: the chances offered by biomass co-firing*.
  Journal of Cleaner Production 215, pp. 1301–1311 (pdf).

- Hoai-Son Nguyen (2019) *Exploring the determinants of household electricity demand in Vietnam in the period 2012 – 16*.
  PhD thesis.

- Truong (2019) *Sustainability indicators for biomass energy in Vietnam*.
  PhD thesis.



Open access to model dataset and results.

Online access on Zenodo.org

Expertise and policy briefs

- Ha-Duong and Ngô Tố Nhiên (June 4, 2019). *Policy briefs on RE Law and Auctions in Vietnam*. Tech. rep., p. 27.

- Ha-Duong, Truong (2019) *Seven insights for Vietnam's power sector energy transition*. Position paper.

Communications at

- 11th Vietnam Economist Annual Meeting (VEAM 2019) Da Lat University, 2019-06-17/18.
- 7th International Symposium on Environment and Energy Finance Issues (ISEFI-2019)
  2019-05-23/24, Paris.
- ASEAN - China Think tanks network (NACT)
  2019-04-16, Hanoi.
- Vietnam Sustainability Forum (VSF) 2019. Invited keynote.
  2019-01-18, Ha Noi.
- Solar and Energy Storage World 2018. Keynote opening talk.
  2018-11-08, Ho Chi Minh City.

Stewarding key Wikipedia pages

List of power stations in Vietnam

From Wikipedia, the free encyclopedia

The following page lists some of the **power sta**

Contents [hide]

Năng lượng tái tạo ở Việt Nam

Bách khoa toàn thư mở Wikipedia

Việt Nam có tiềm năng đặc biệt lớn ở việc khai thác các nguồn **Năng lượng tái tạo** như: Thủy điện, điện gió, điện mặt trời, điện sinh khối. Trong đó, thủy điện được tập trung phát triển gần như tối đa tại Việt Nam. Tính đến cuối năm 2018, thủy điện là nguồn năng lượng chủ lực của nước ta, chiếm tới hơn 40% tổng công suất điện quốc gia.[1] Loại trừ thủy điện cỡ vừa và lớn, thủy các dạng năng lượng tái tạo khác (bao gồm thủy điện nhỏ) chi
biến trước sự thay đổi của th
hành, đóng lưới nhờ vào cơ c
trời quy mô không lớn được
4460 MW, chiếm hơn 8% tổn
suất điện gió trên Việt Nam
đang trong giai đoạn xây dự
khối, việc sản xuất điện thươ
triển vọng cho việc phát triể
rác thải đô thị và nông nghiệ
mục đầu tư tái tạo để có thể

Mục lục [ẩn]

Energy in Vietnam

From Wikipedia, the free encyclopedia

Vietnam is a dynamic developing economy, with a relatively high growth rate. The energy sector plays a key role in promoting the country's socio-economic development. Vietnam has a diverse energy fuel resource of various types such as coal, natural gas, petroleum, hydropower and renewable energy sources such as solar energy, biomass energy, wind energy, etc.

Yaly Hydropower Dam

Contents [hide]

Six events organized

- TỌA ĐÀM CÂU CHUYỆN NĂNG LƯỢNG (The story of energy)
  2019-08-24, Hanoi.
- Special session on Energy at 11th Vietnam Economist Annual Meeting
  2019-06-17/18, Da Lat.
- Alternative power development plan modeling workshop
  2018-12-12, Hanoi.
- Capacity building on energy, environment and climate
  2018-12-01/02, Hanoi.
- Tọa đàm về Hội nghị COP24 và NDC Media Talk: COP24 & NDC 2
  2018-11-24, Hanoi.
- Training Seminar on Energy planning and sustainable development
  2018-10-18/19, Hanoi


II. QUY MÔ HỆ THỐNG NGUỒN MIỀN
EVN
NETWORK OF ASEAN-CHINA THINK-TANKS (NACT)
MEETING OF THE NACT WORKING GROUP ON
"REGIONALCOOPERATION FOR SUSTAINABLE ENERGY DEVELOPMENT
II. KIỂM KÊ QUỐC GIA KHÍ NHÀ KÍNH
LỄ TRAO GIẢI CUỘC THI
&

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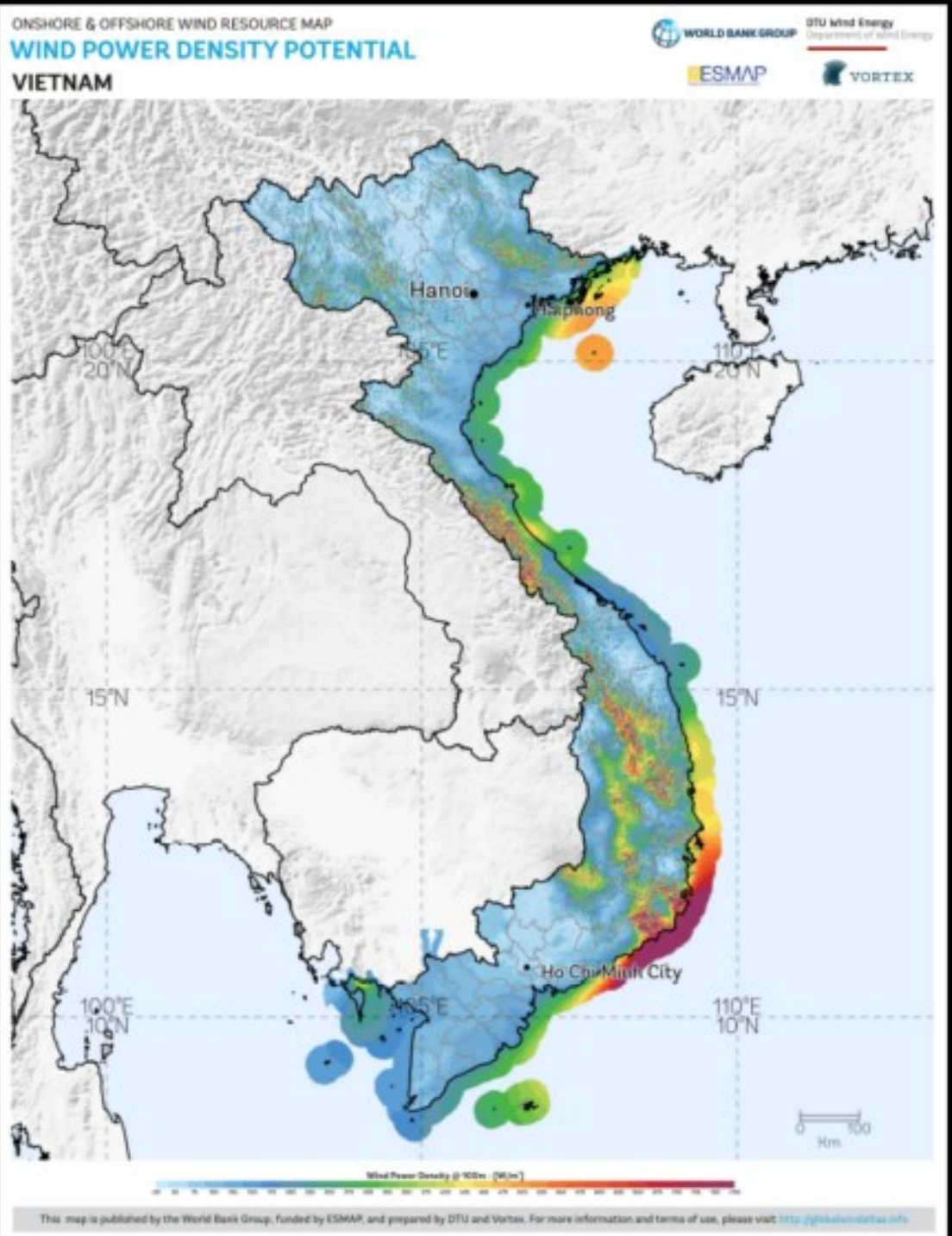
Wind power

Highlights

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

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

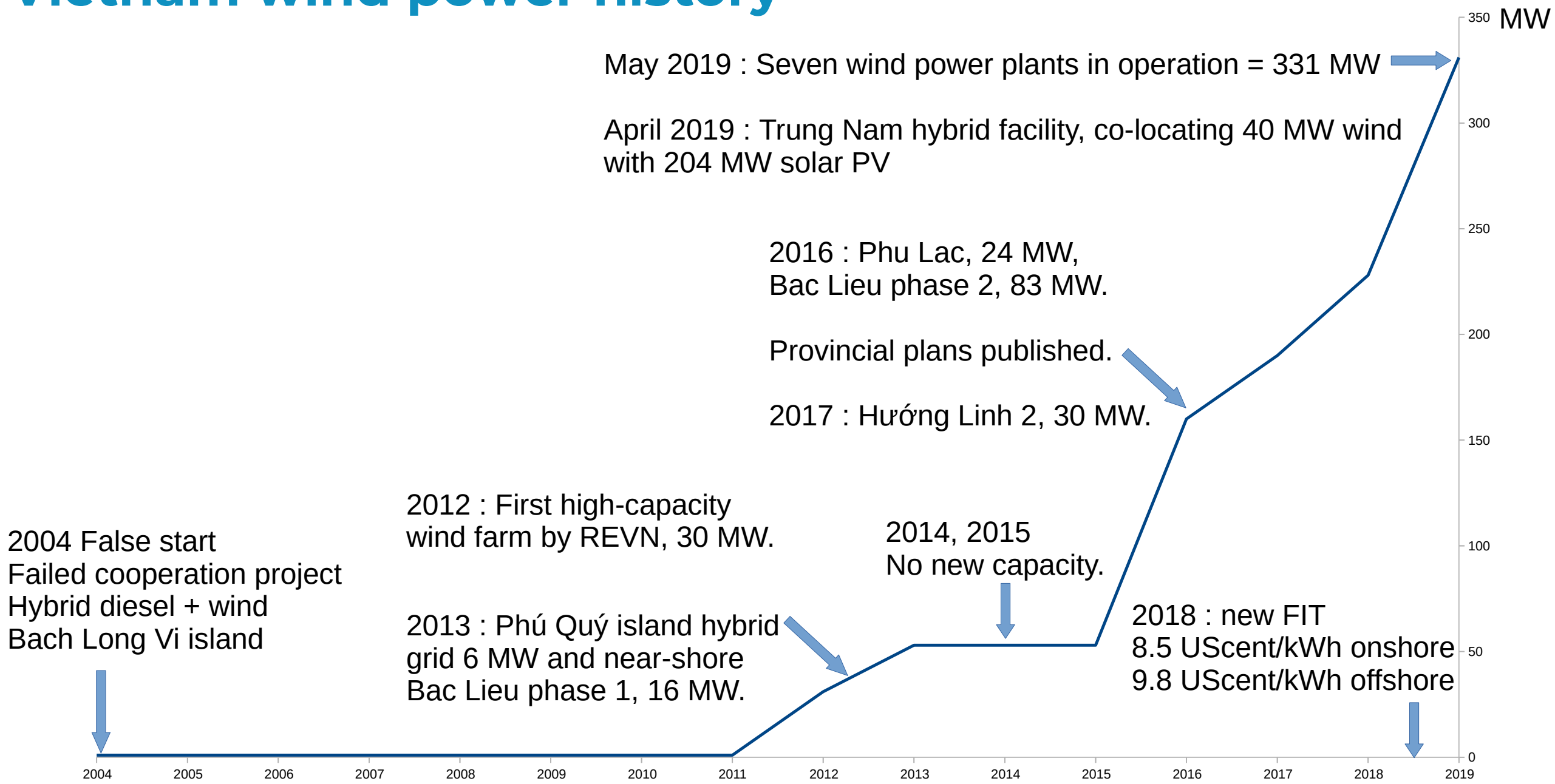


←Physical potential

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
Total	**42.0**	**609.8**

Vietnam wind power history

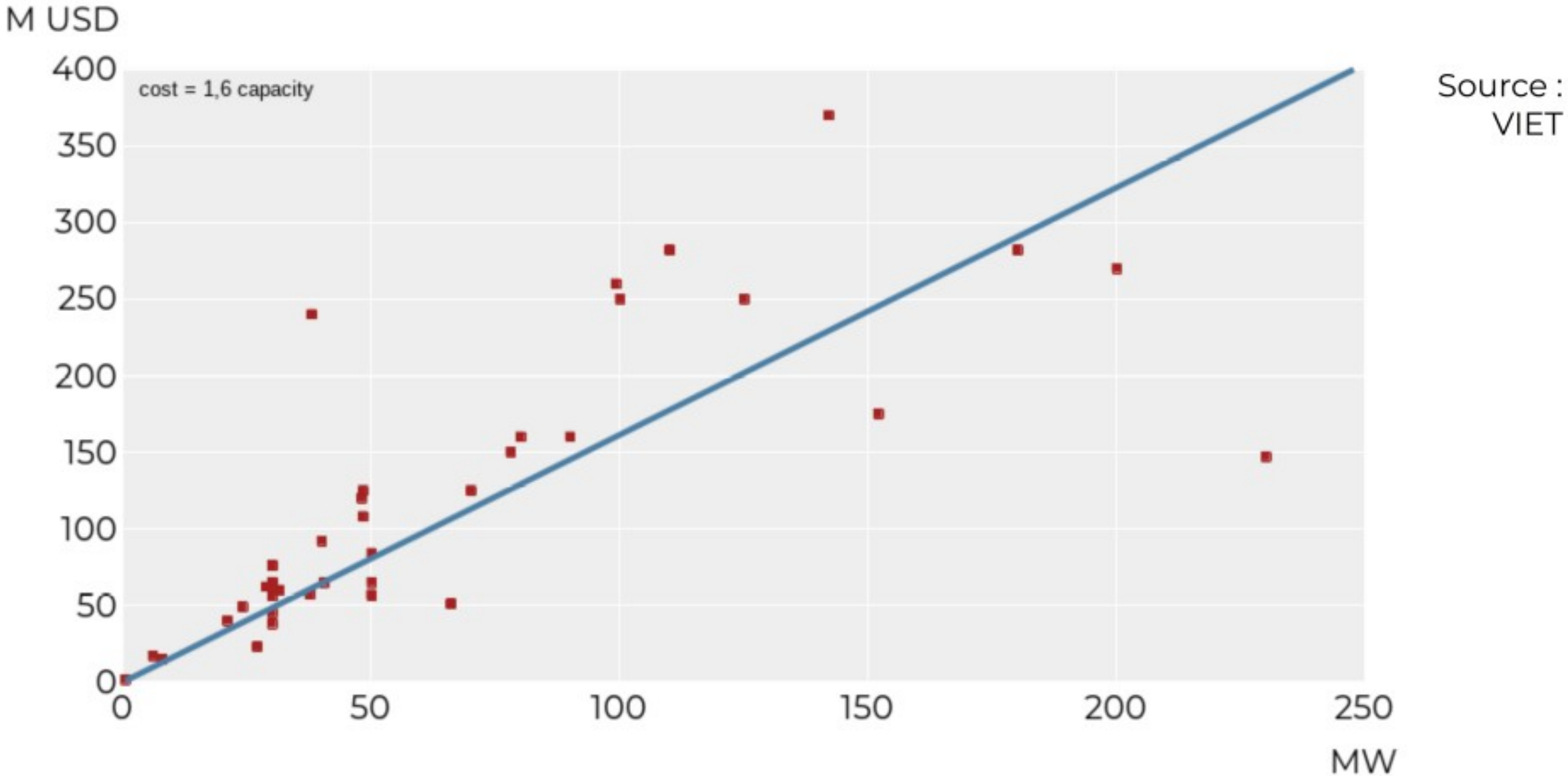


Project pipeline

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
Total	**10 880**	**129**	**84**

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

Wind announced at 1600 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 1 GW of offshore wind per year.
- In the *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.

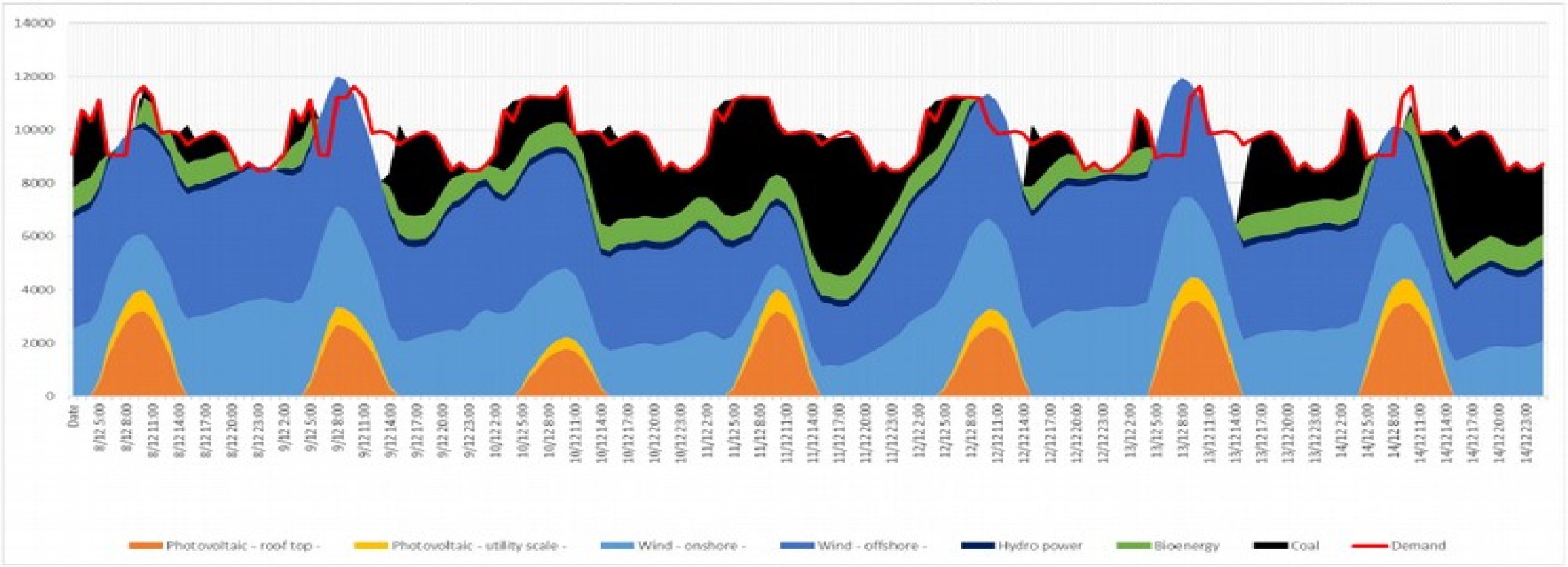
Three scenarios

	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	**6.1**	300	1000	**0.15**	7	28
New Normal	**16.6**	730	3200	**9.5**	260	2100
Factor Three	**21.6**	1530	3625	**20.9**	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

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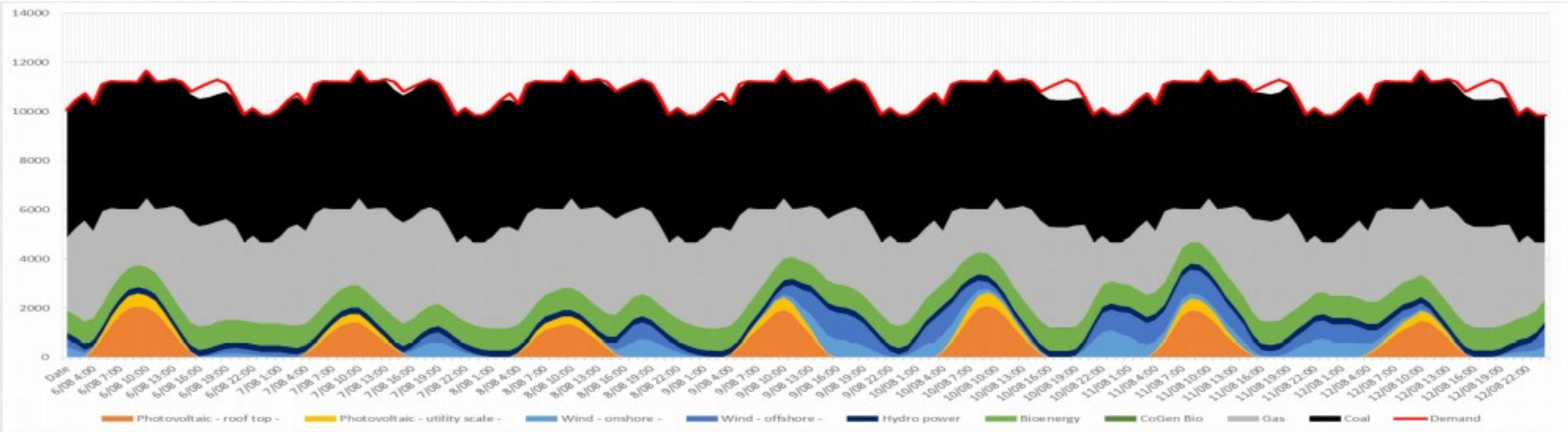
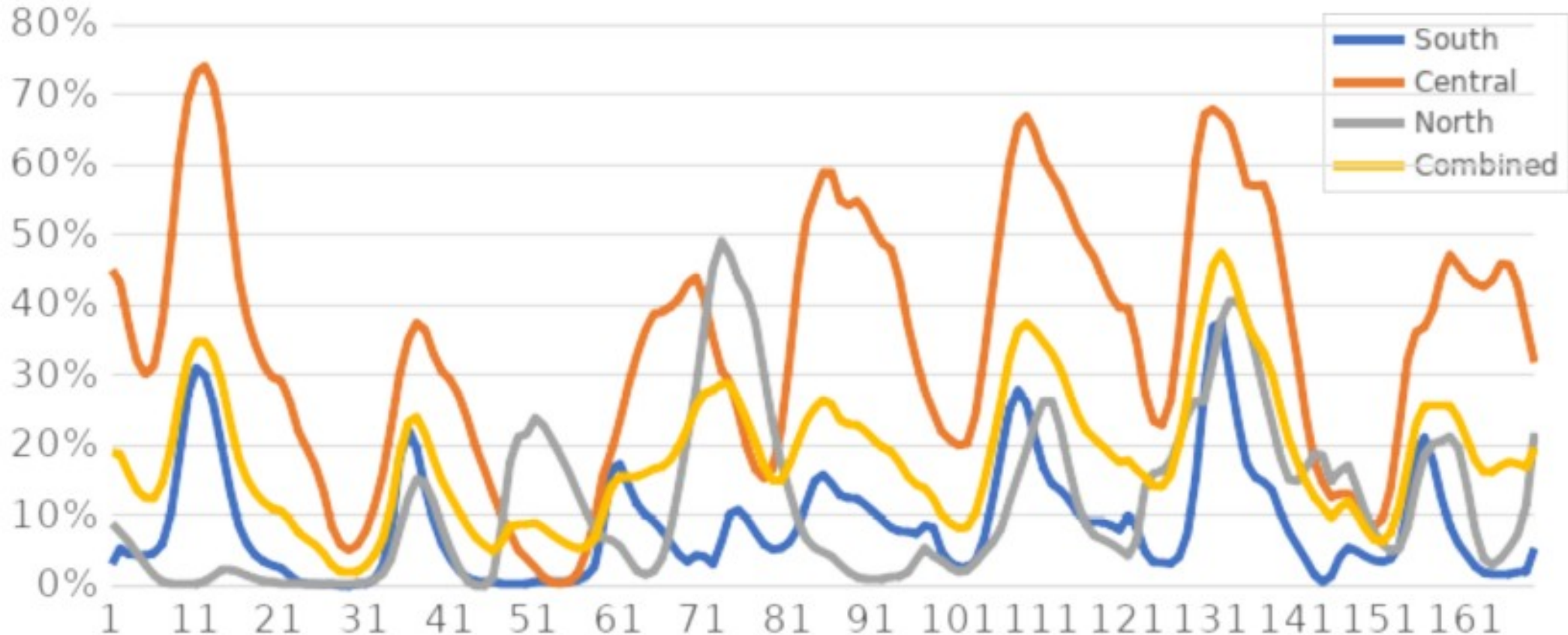


Regional distribution reduces variability



First week of January. Source : renewables.ninja

Solutions to variability

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

4) Offshore wind large potential require infrastructure planning starting soon.

Offshore wind : 2 GW/yr after 2025

	Onshore wind			Offshore wind		
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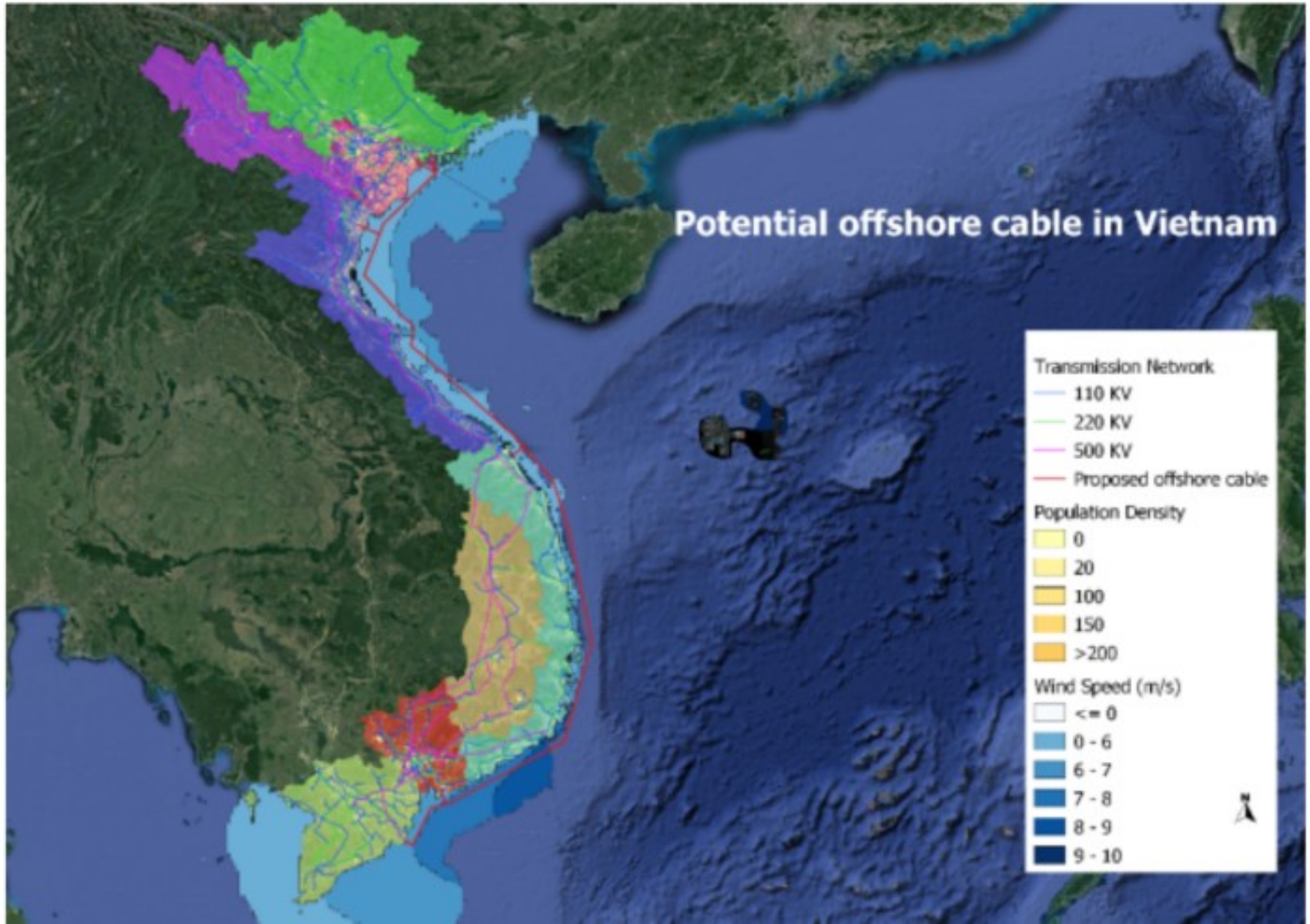
How to connect offshore wind ?



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

Photo by VnExpress/Quynh Tran.