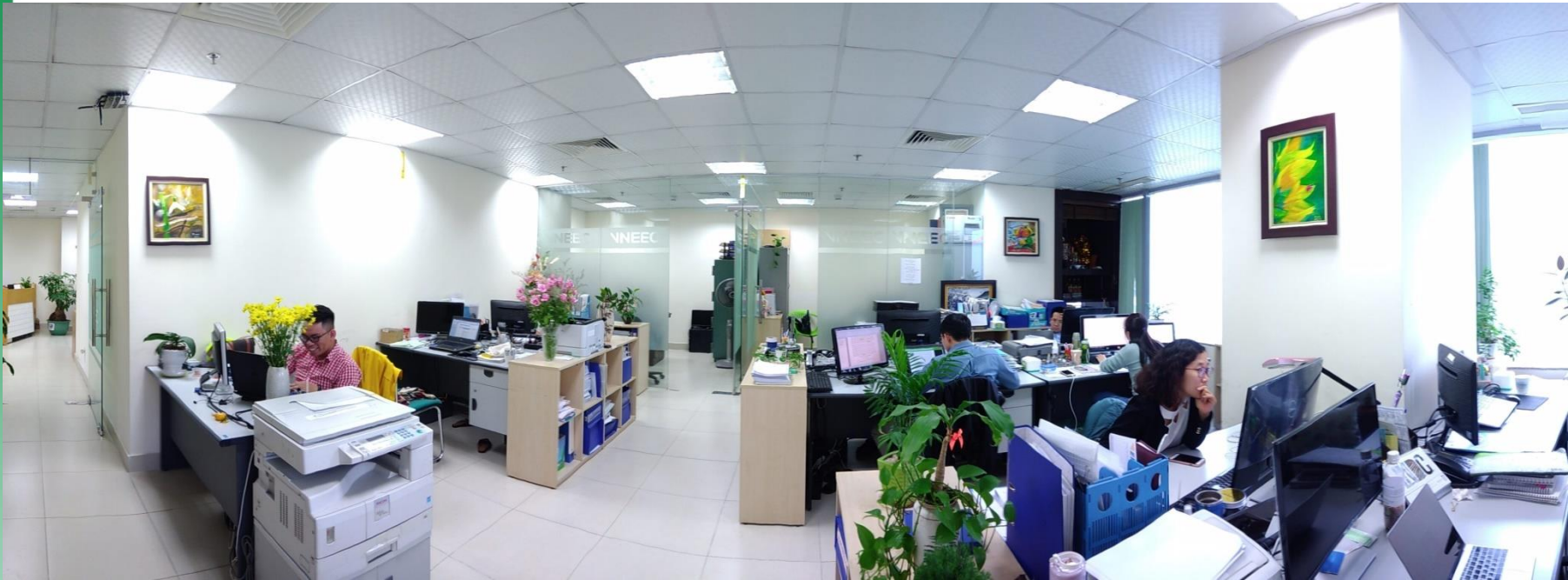


Achieving the NDCs through energy transition acceleration
Side event – COP25, Madrid, December 2019

Renewable energy mitigation options and the contribution toward the NDC targets - The case of solar power in Viet Nam

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VNEEC at a flash



- **Founded in Sept. 2006**
- **Ownership: Private owned**
- **Main business: leading consultancy company in Viet Nam in climate change, GHG emission mitigation, carbon credits, ozone layer protection, renewable energy and energy efficiency**

RE mitigation options in Viet Nam NDC

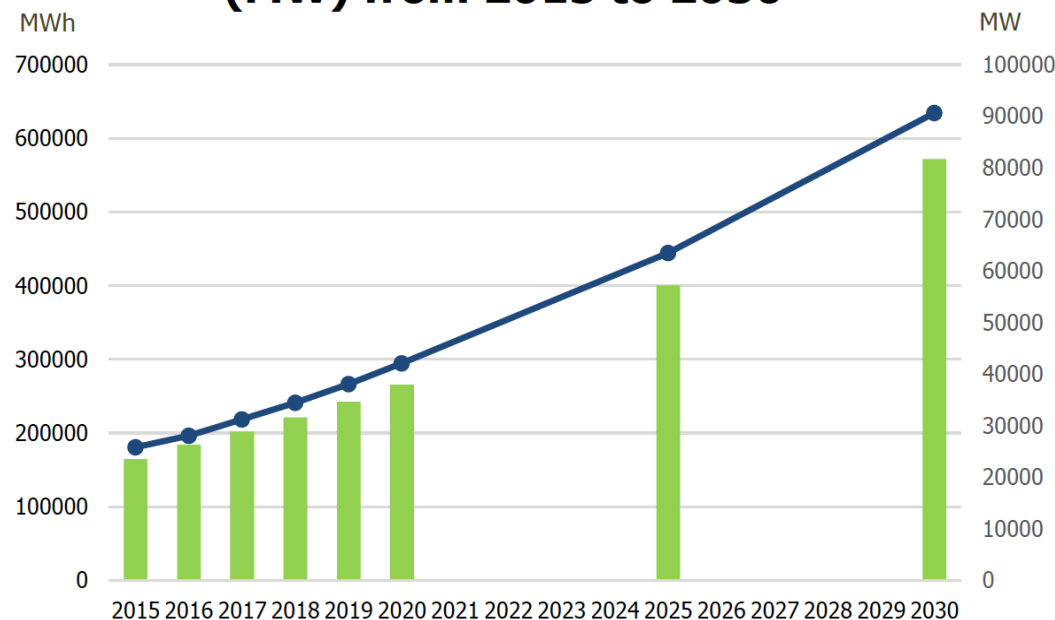
Mitigation Options	Assumption
E11, Biomass power plants	By 2030 the capacity for thermal biomass power will reach 2,000 MW (compared to 60MW in the BAU) to replace coal-fired thermal power
E12, Small hydropower plants	By 2025, the capacity for hydropower will increase by 2,400 MW (compared to BAU) to replace imported coal-fired thermal power.
E13, Wind power plants by domestic funding	By 2030, the wind power capacity will reach 100 MW (compared to BAU) to replace coal-fired thermal power.
E14, Wind power plants by international support	By 2030, the wind power capacity will reach 6,070 MW to replace coal-fired thermal power.
E15, Biogas power plants	By 2030, the capacity for biogas power will reach 150 MW to replace coalfired thermal power.
E17, Solar PV power plants	By 2030, the solar power capacity will reach 2,000MW to replace imported coal-fired thermal power.

Viet Nam power system – energy production and peak load

Average Growth Rate (%)

	2016-2020	2021-2025	2026-2030
Peak Load	10.26	8.57	7.39
E. Production	10.07	8.57	7.39

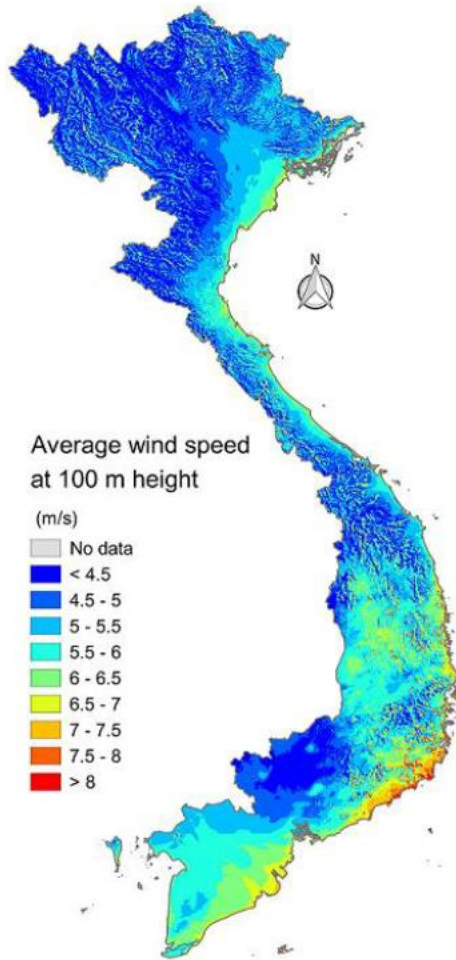
Energy production (MWh) and Peak load (MW) from 2015 to 2030



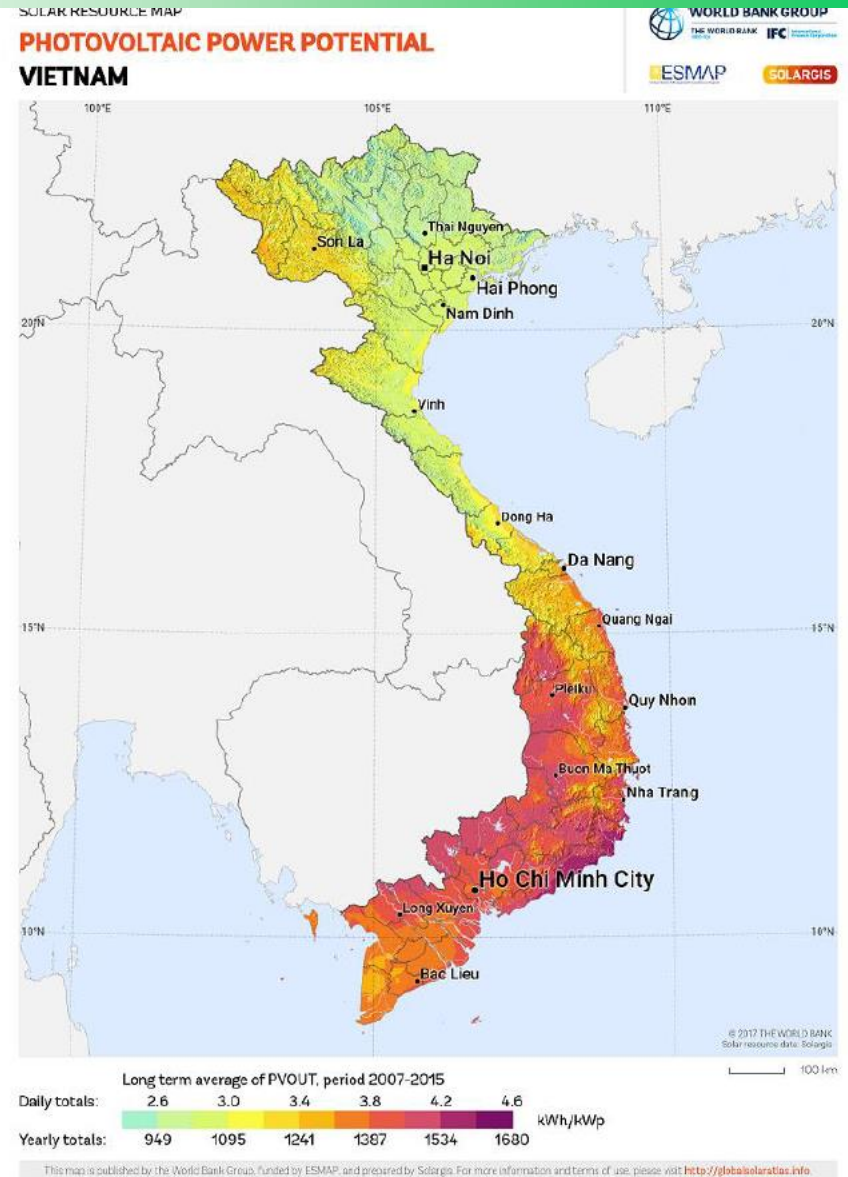
	2015	2016	2017	2018	2019	2020	2025	2030
Energy production	164312	184073	201866	221145	242264	265400	400327	571752
Peak load	25828	28067	31188	34462	38081	42080	63471	90651

Source: National Load Dispatch Center (NLDC),
Electricity of Viet Nam (EVN), 2019

Wind and solar potential and areas

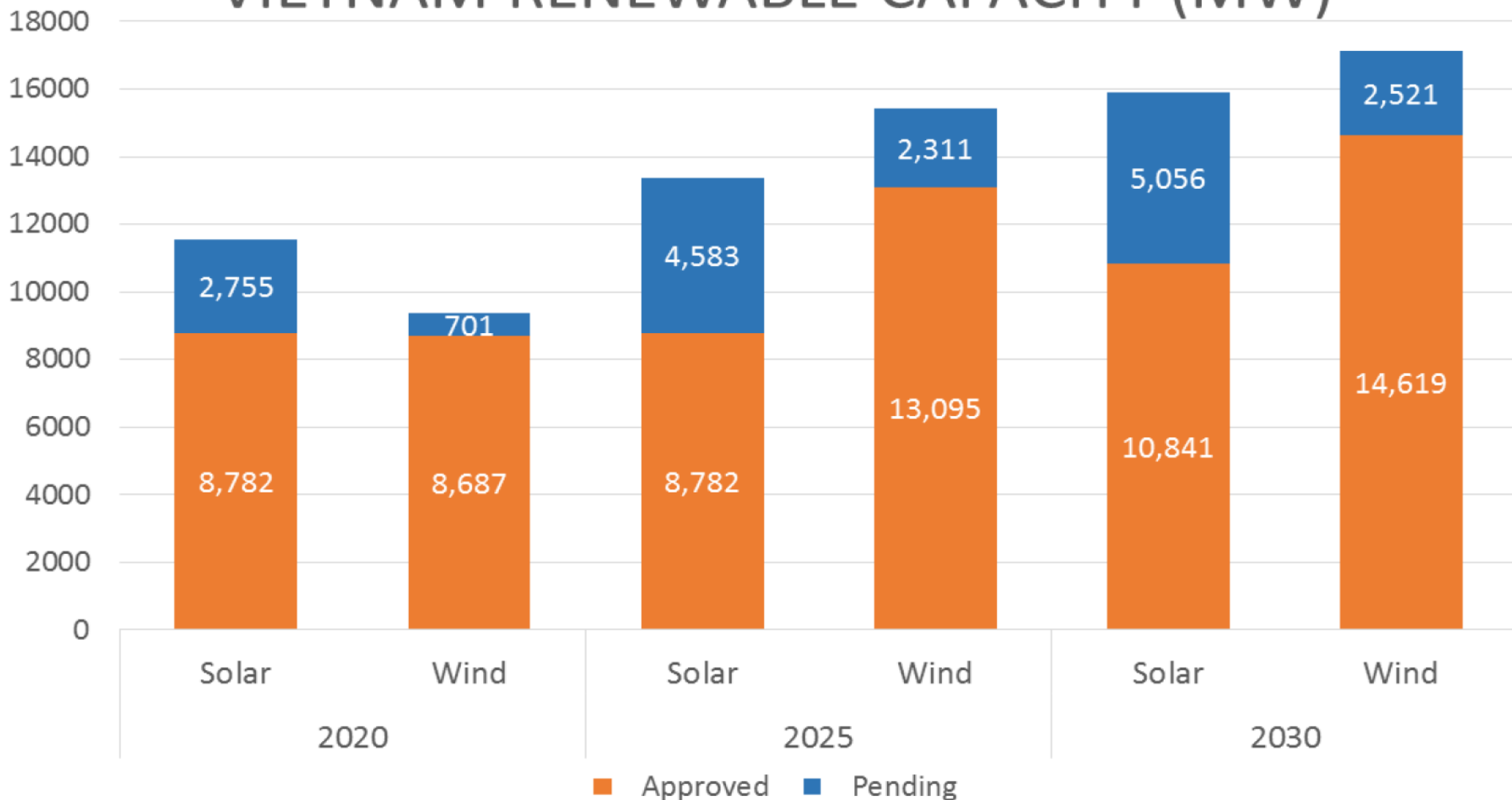


Wind maps: <https://energypedia.info/>
Solar maps: <https://solargis.com/>



Solar and wind capacity and potential

VIETNAM RENEWABLE CAPACITY (MW)

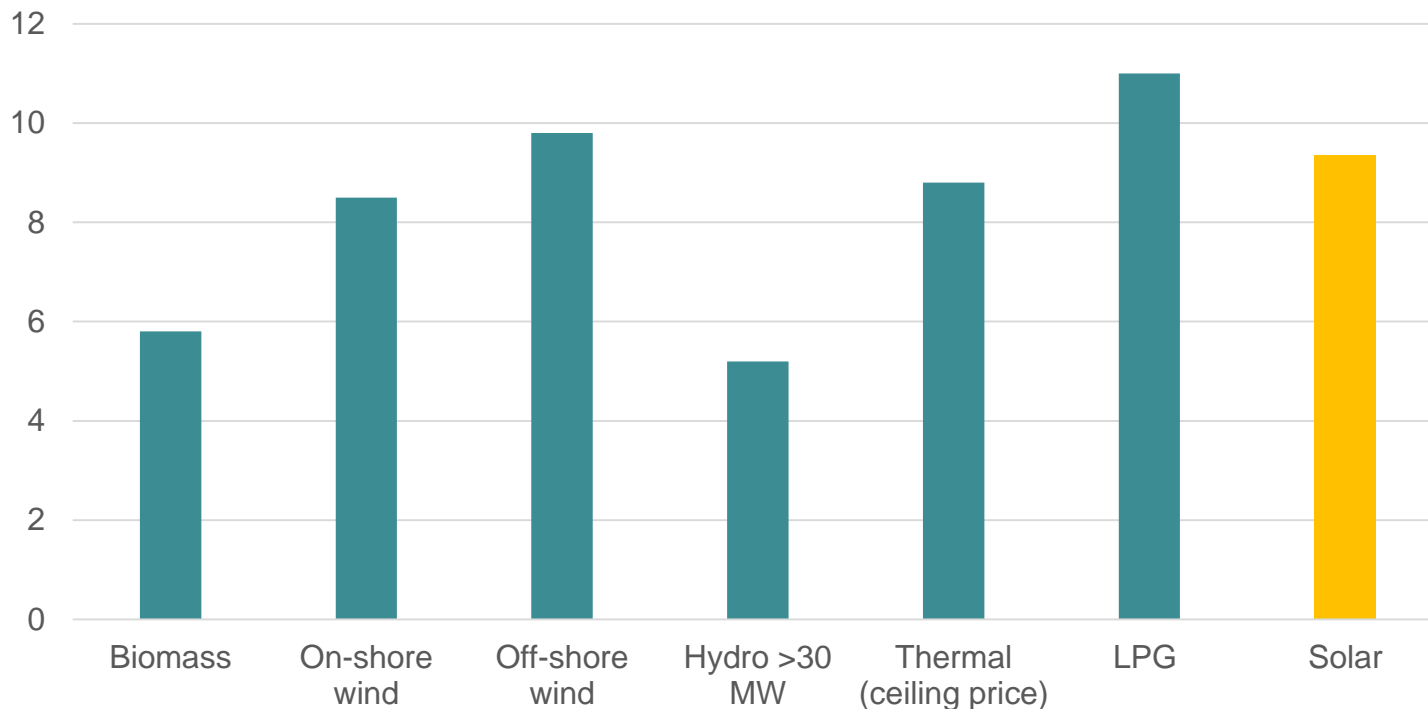


Source: National Load Dispatch Center (NLDC),
Electricity of Viet Nam (EVN), 2019

Solar power development in Viet Nam - FIT

- Prime Minister's Decision 11/2017/QG-Ttg dated **11 Apr 2017** regulated the **FIT for solar at 9.36 cent/kWh** (cut-off date 30 Jun 2019).
- Until that time, **only 1 MW solar** was connected to the grid.

cent/kWh

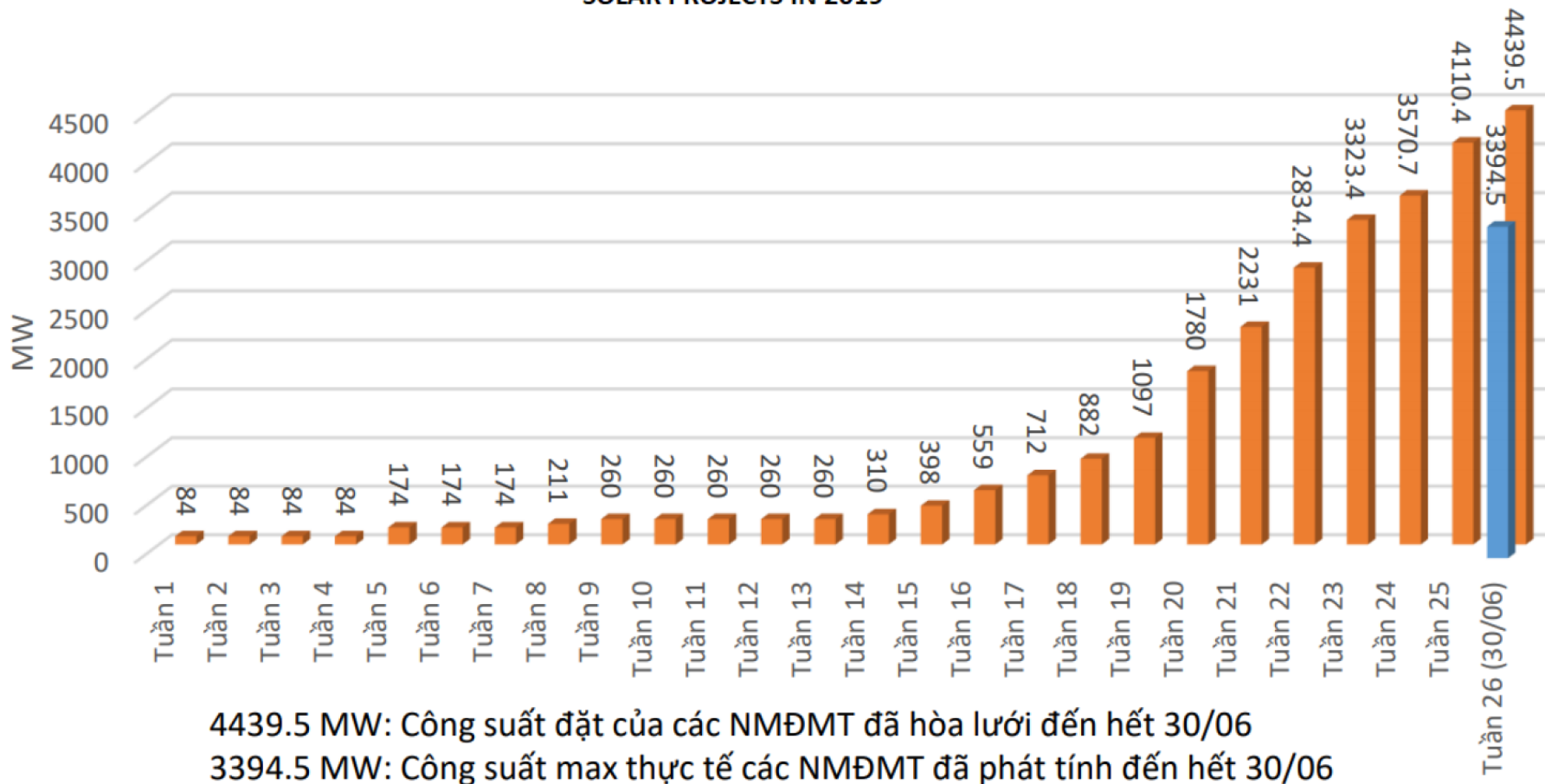


Solar power development in Viet Nam – Status (1)

- In June 2019, **87 solar plants** with **total installed capacity of 4,543.8MW**, accounting for **8,3%** of total capacity of the national electricity system.
- About **260 solar projects** with the **total capacity of 28,300MW** are awaiting for approval.
- In the Revised National Power Development Master Plan VII: the total capacity of solar was planned **850MW in 2020**.
- In NDC: **By 2030**, the solar power capacity will reach **2,000MW** to replace imported coal-fired thermal power

Solar power development in Viet Nam – Status (2)

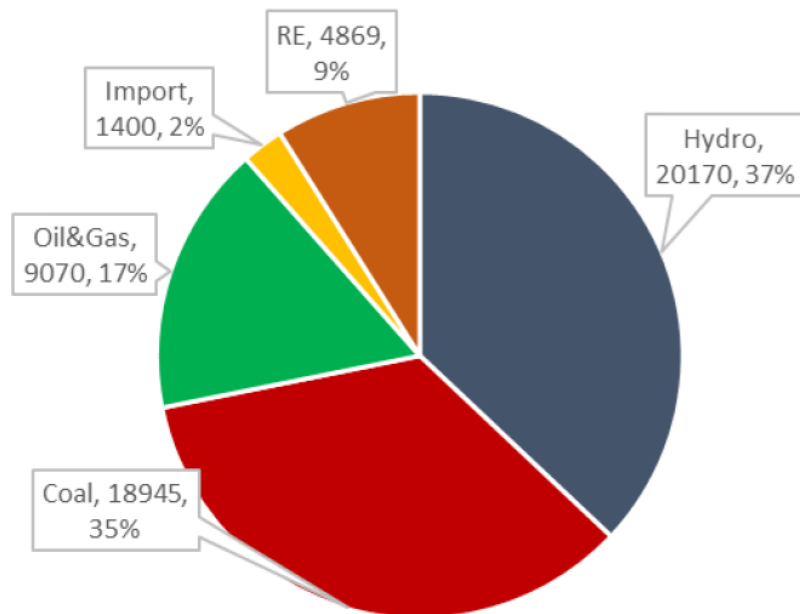
SOLAR PROJECTS IN 2019



Source: National Load Dispatch Center (NLDC),
Electricity of Viet Nam (EVN), 2019

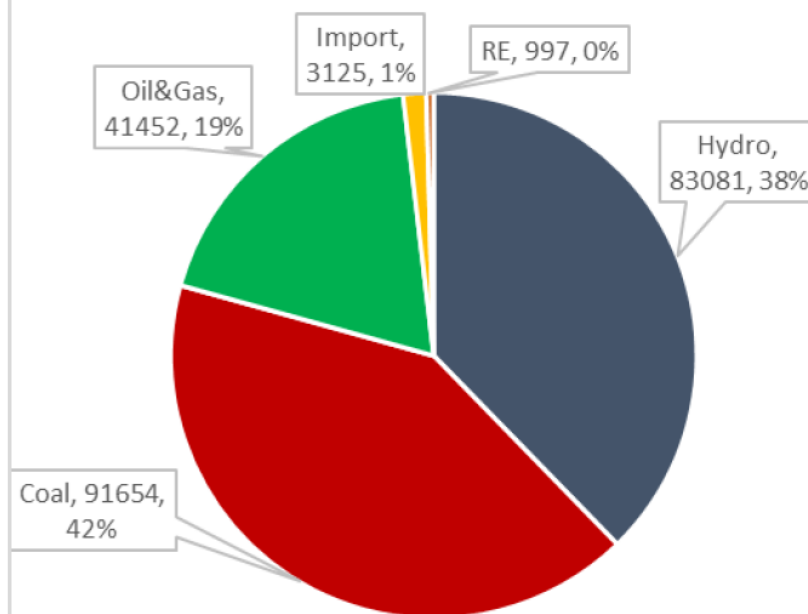
Viet Nam power system – capacity and energy production

Power Capacity
Total: 54884 MW



■ Hydro ■ Coal ■ Oil&Gas ■ Import ■ RE

2018 Energy Production
Total: 220310 GWh



Data:08/2019

Source: National Load Dispatch Center (NLDC),
Electricity of Viet Nam (EVN), 2019

Solar power development in Viet Nam – Problems (1)

Congestion:

- The national grid **was overloaded** since the 2nd quarter of this year.
- Several solar plants had to **operate at about only 60% of their maximum capacity**. Max daily output of all solar plants is about the capacity of 1,200 MW thermal plant.
- “*Binh Thuan Wind Power Association has petitioned the MoIT and EVN not to cut the capacity of Phu Lac and Binh Thanh 1 wind power projects in the province. **Blamed the overload on the scores of solar power projects** in some provinces – such as Binh Thuan and Ninh Thuan – as well as the lack of synchronisation between the planning and execution stages of power source and grid projects.*”

Renewable energy projects in Ninh

Thuận face overloaded electricity grid

Solar power providers left with excess

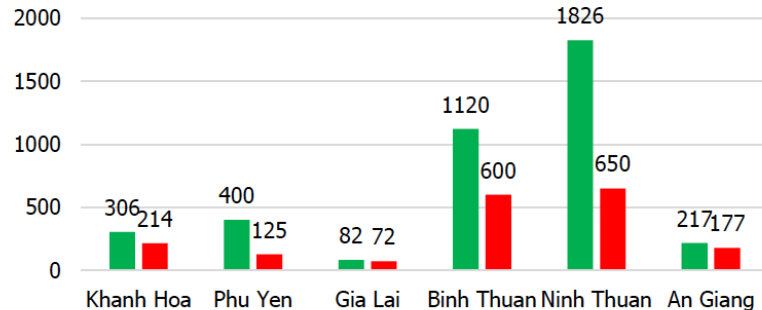
Solar power a victim of its own success

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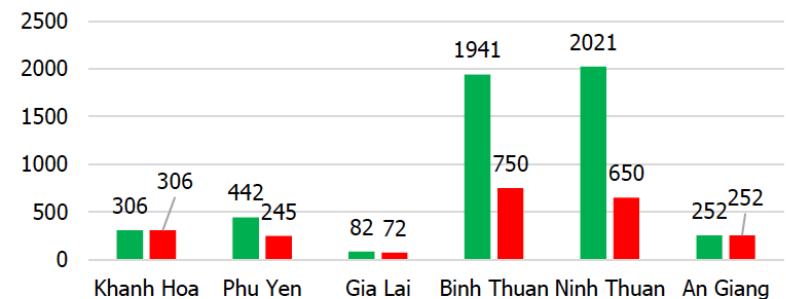


Solar power development in Viet Nam – Problems (2)

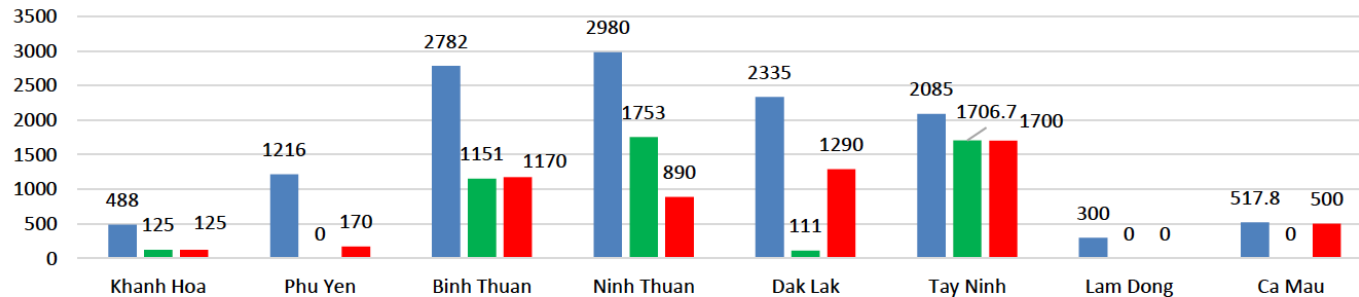
June 2019



December 2020



2030



■ Registered capacity (MWAC)
■ Approved capacity (MWAC)
■ Usability (MWAC)

- **Frequency Stability:** operating hour 1,600/year vs. 6,000 of thermal and 4,500 of hydro power
- **Voltage Control**
- **Reserve for Forecasting Errors**
- **Power Quality:** Harmonics problem

Solar power development in Viet Nam – Solution

- **Adjust the FIT** (categorizing by regions, types and applying auction scheme for new projects)
- **Improve and expand the transmission system and capacity:** mid and long-term (approx. 9.3 billion USD is required in 2016-2020 and triple in 2021-2030)
- Other technical solutions

■ FIT IN LATEST DRAFT MoIT DECISION DIVIDED INTO TWO IRRADIANCE REGIONS

Type of solar project	Region 1 FIT		Region 2 FIT	
	VND/kWh	US cent/kWh	VND/kWh	US cent/kWh
Floating solar power project	1,758	7.69	1,655	7.24
Ground-mounted solar power project	1,620	7.09	1,525	6.67
Rooftop solar power project	1,916	8.38	1,803	7.89

Thank you!

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