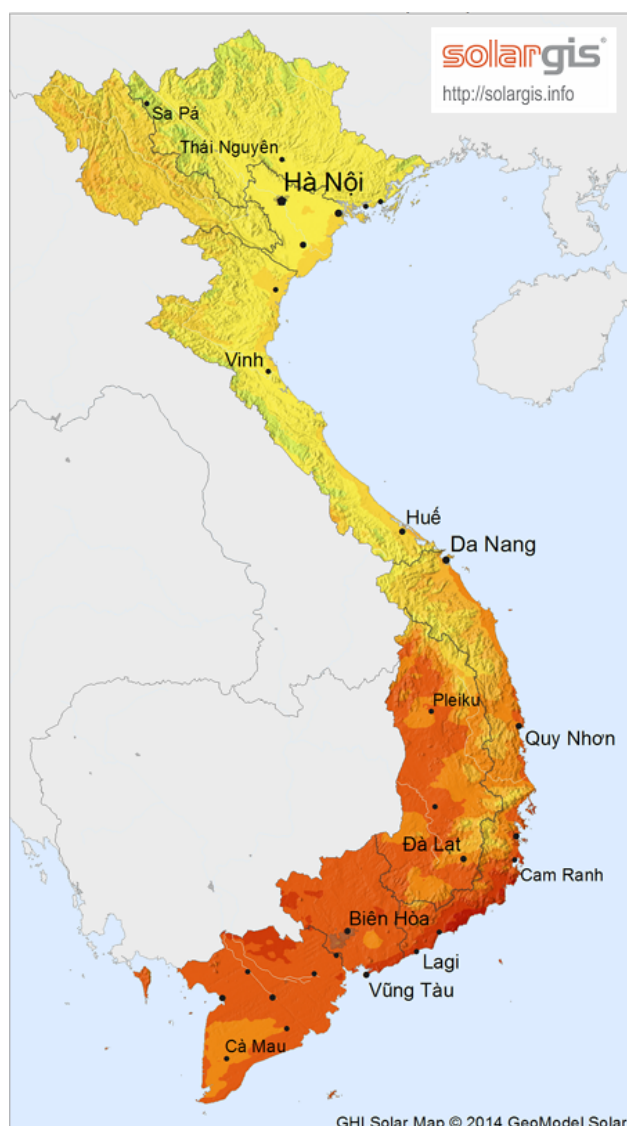


Solar Market Brief: Vietnam



Population	92.7 million
GDP per capita	US\$ 2,110
GDP Growth (2007-2015)	6.02 %
Inflation Rate (2007-2015)	9.63 %
Sovereign Rating	BB- (stable)
FDI	US\$ 4018 Million
Ease of Doing Business	82 of 190
Corruption Perception Index	113 of 176

Country facts framework

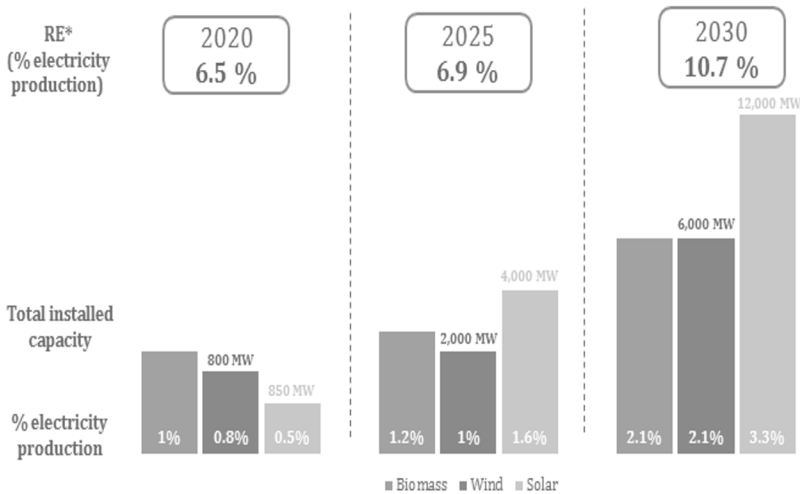
- Among top 5 most climate vulnerable countries worldwide
- Lower-middle-income country
- 66% of population lives in rural areas, with a rapid urbanization process ongoing
- One of the most dynamic emerging countries in East Asia
- Favorable resources and dynamically changing market conditions for renewables
- No restrictions on foreign ownership

Key Electricity Market Facts

- The overall power demand is predicted to increase by 11% /year in next 5 years
- The power production is currently dominated by coal (34.4%), followed by hydropower (30.4%) and gas (30%)
- Highly exploited hydropower with decent grid coverage provides storage capacity as a complement for to-be-deployed solar power

Generation (2015)	164 TWh
Peak Load (2015)	28.1 GW
Total Capacity (2015)	39.4 GW
PV capacity (2017)	<10 MW

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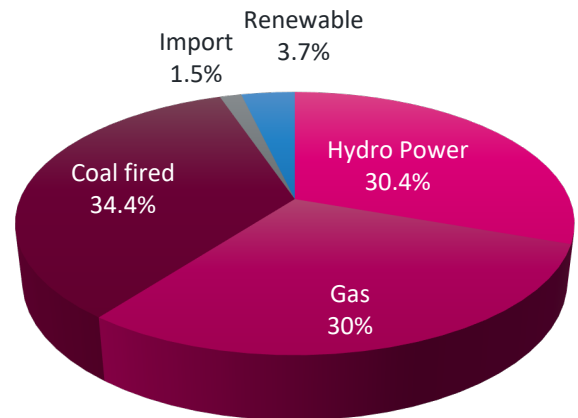
Source: GIZ Energy Support Programme

- Revised targets of renewable share of 7% by 2025 and 10% by 2030
- Above average solar resources: DNI (1500kWh/m²/a) and GHI: (2000 kWh/m²)
- Estimated technical solar potential: 56 000 MWp
- 20 years PPA tariff for solar power, set up by government, is 9.35 USct/kWh (Feed-In-Tariff (FIT) & Net Metering)

Regulatory framework

- EVN, state-owned utility, holds monopoly for developing and managing of transmission and distribution (single-buyer of electricity)
- ERAV looks after power planning, supervision, regulation and licensing
- Deregulation in 2005 has opened up energy market for private players to attract local and foreign investments
- IPP and BOT stand for 40% of installed capacity and over 20% of generation.

Shares in Electricity Generation 2015 (164.31 TWh)



Fiscal incentives for renewable energy projects (Decision 11/2017 as of April 11, 2017)

- FIT and net metering credit (large rooftop) for 20 years PPA (9.35USct/kWh) adjusted to VND/USD exchange rate
- Preferential corporate income tax (CIT) with exemptions for wind & solar
- Import tax exemptions for entire solar systems/parts of solar systems
- Accelerated depreciation rates (1.5. times faster than other projects)
- Land-use tax/charges exemptions
- Exemptions from environmental protection fees

Solar Market Brief: Vietnam

Suntrace' view on the market

- The Vietnamese electricity market undergoes a fundamental change towards higher private sector participation in renewable energy generation. Commercial Tariffs during peak hours are high, providing a strong rationale for renewable electricity generation to cover mid-day (solar PV) and evening peak loads (wind). Further, energy-intense manufacturing provides attractive business cases without subsidies. Average commercial tariffs, for instance during normal daily hours are on average (i.e. averaged across voltage levels) 10.32 USct/kWh and for peak hours 17.53 USct/kWh which are both above the current FIT of 9.35 USct/kWh.
- While EVN is still the largest player in electricity generation there is already a substantial share of private players in the market (fully-foreign owned, joint-venture or BOT investment) as initial liberalization steps have already been taken as early as 2005. As the country is moving towards full liberalization we suggest to enter at this early stage for renewables and to set up a partner network for one of Asias promising renewable investment destinations.
- The country will most likely revise the recently introduced incentive schemes for large-scale PV power plant PPAs and possibly introduce competitive tender schemes starting 2020-2022.
- Investors who would like to benefit from this initial short time frame of regulatory certainty should focus on PV projects that have a high probability to achieve COD in the next two years. Teaming up with advanced local developers may be a successful approach to benefit from this incentive round. Be prepared for high value expectations of local developers though, as the industry is young and experienced developers in this sector do not abound.
- Further, on the challenge side expect a lengthy permitting process - in particular, with grid access and licensing - and a local banking sector far from being able to deliver long term inexpensive debt. International lenders are likely to request credit enhancements to improve the offtaker bankability and to address the expected shortcomings of the standard PPA.
- Currently, there are more than 115 utility scale projects under development (~17GW) with different degrees of maturity. Knowledge of the technology is still a challenge but neither equipment nor qualified engineering staff should be an issue per se.
- High and further increasing electricity prices provide a strong economic rationale for PV. A favourable investment environment and substantial GW of planned PV capacity in the next 12 years should make Vietnam an attractive market for developers and investors in the short (2 to 5) as well as over the mid-term (5 to 10 years) with a continuous deal flow. Main business models are initially FIT/net metering – PPAs with a perspective for private, direct PPAs. The sub-investment grade rating of the country may lead asset investors to seek for political risk insurance, depending on risk appetites.

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