Making Quantum Progress with Solar Photovoltaics in Viet Nam – Key Components

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FOCUS

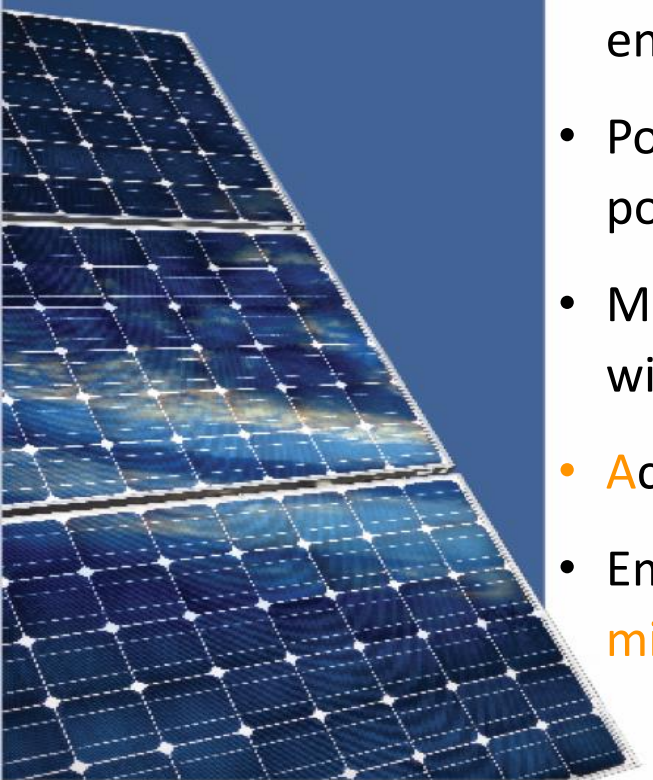
To provide a broad perspective on the **industrial, financial and institutional factors** influencing the quantum progress of

Solar Photovoltaics (PV) in Viet Nam in the long run

Agenda

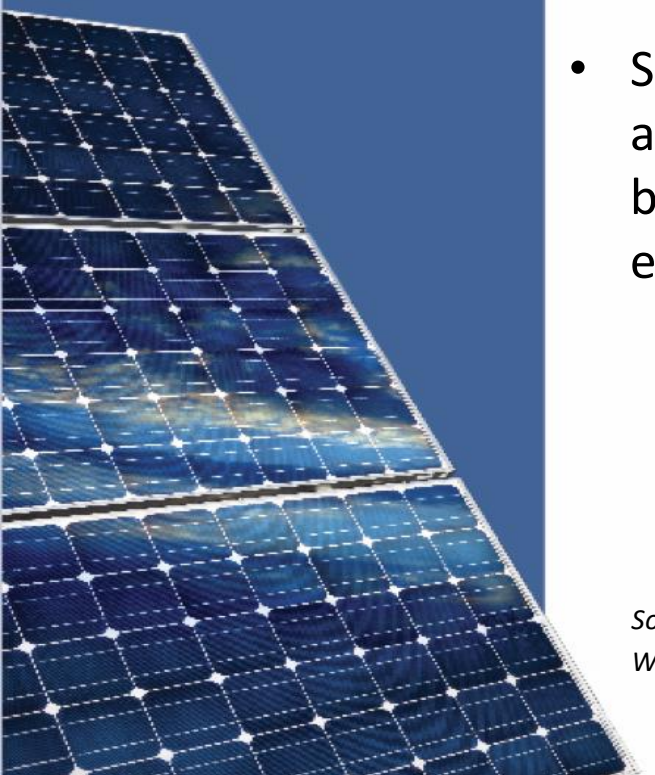
1. Evolution of Solar PV in Viet Nam
2. Key Drivers of Viet Nam's Solar PV Quantum Evolution
3. Solar PV Prospects

Vietnam – Overview



- Young population with > 90 million inhabitants
- Large & young workforce of around 60% of total population
- Fast growing economy (1st in ASEAN in last two decades), 6%-8% p.a. in average
- **Resource-centric** economy, **fossil-reliance** energy
- Politically stable & reform-oriented business policy
- Member of ASEAN Economic Community (AEC) with about 650 million inhabitants
- Access to South China Market
- Emerging domestic market due to growth of middle class

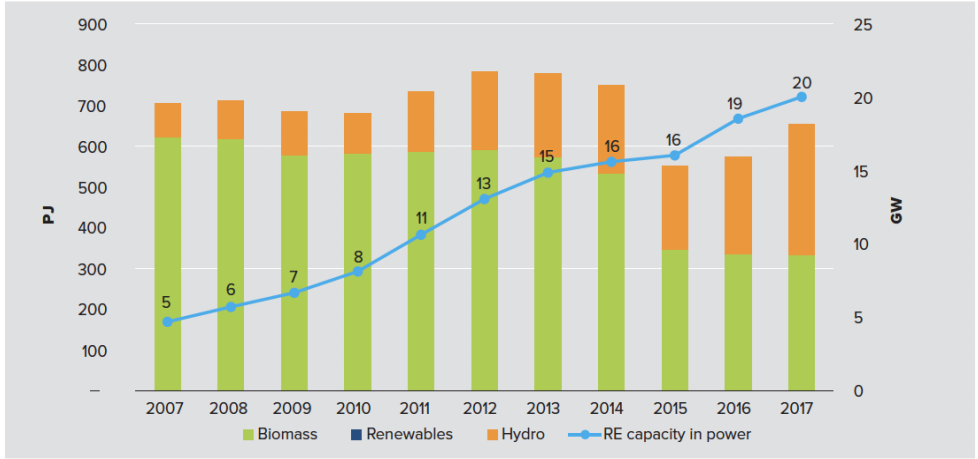
Evolution of Solar PV in Viet Nam



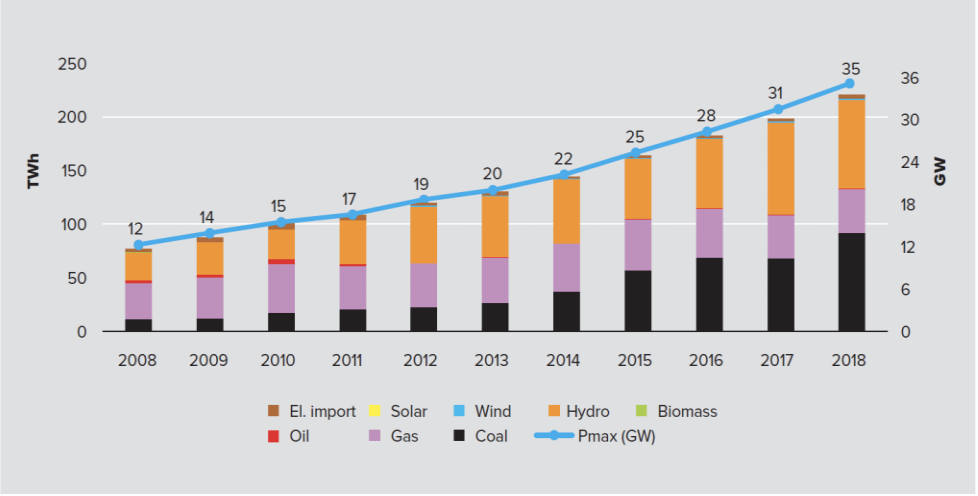
- 10% p.a. increase of energy demand, and expected to continue until 2030.
- Renewable energy (RE) accounts for 21% of Viet Nam's energy supply (17 GW), mainly Biomass and Hydro over the last decade
- Since 2018, preferential credit policies and pricing incentives with FIT, solar PV becomes new efficient sources of clean energy development

Source: EREA & DEA: Vietnam Energy Outlook Report 2019 (2019), Wood Mackenzie (2019)

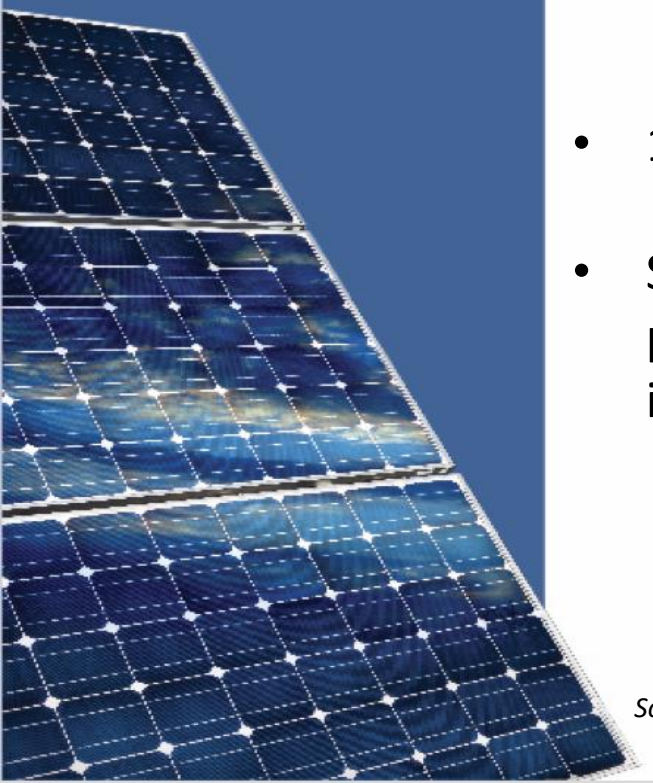
Renewable energy sources and their share in TPES (2007- 2017)



Power production by fuel type and peak load (2008-2018)



Evolution of Solar PV in Viet Nam



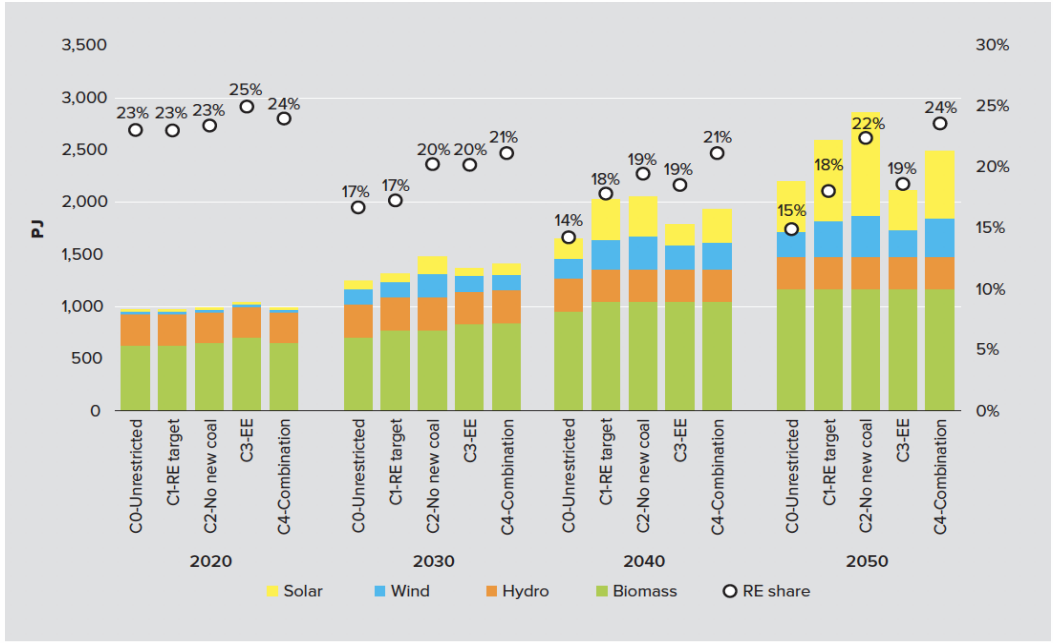
Quantum

- Solar PV grows at ***38-fold*** after FIT 1 (9.35 US cent/kWh) in 2019 (2018: 134 MW)

Quantum

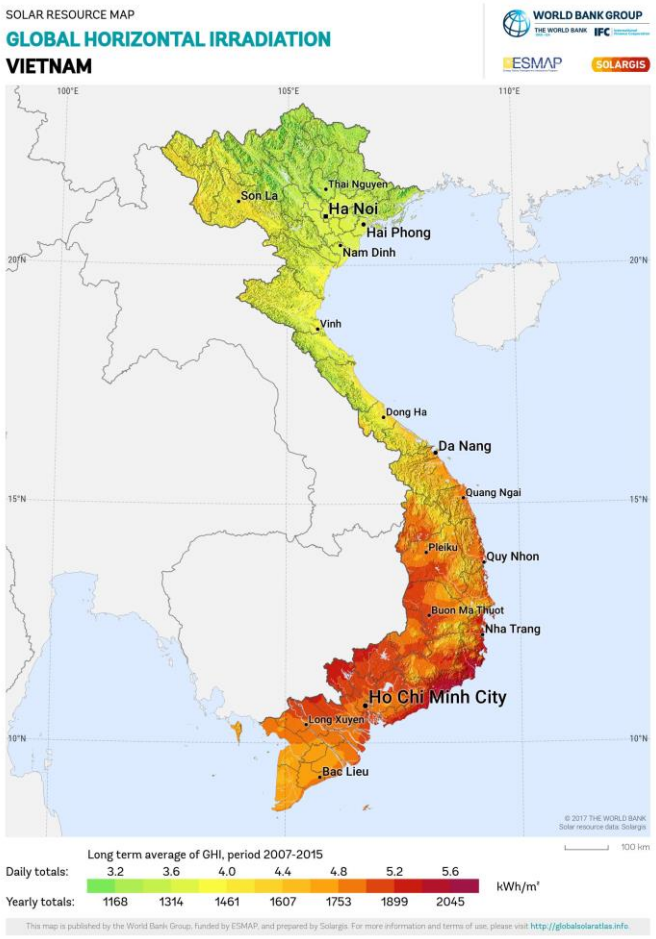
- Additional **38.8 % growth** after FIT 2 (8.38 US cent/kWh)
  - 2019: 5.2 GW
  - 2020: +1.5 GW *(Estimated)*
- 12 GW targets to install by 2030
- Share of PV solar in total electricity production aims at **6%** in **2030, 20%** in **2050**

Forecasts of Solar energy and its share in TPES (2020 -2050)



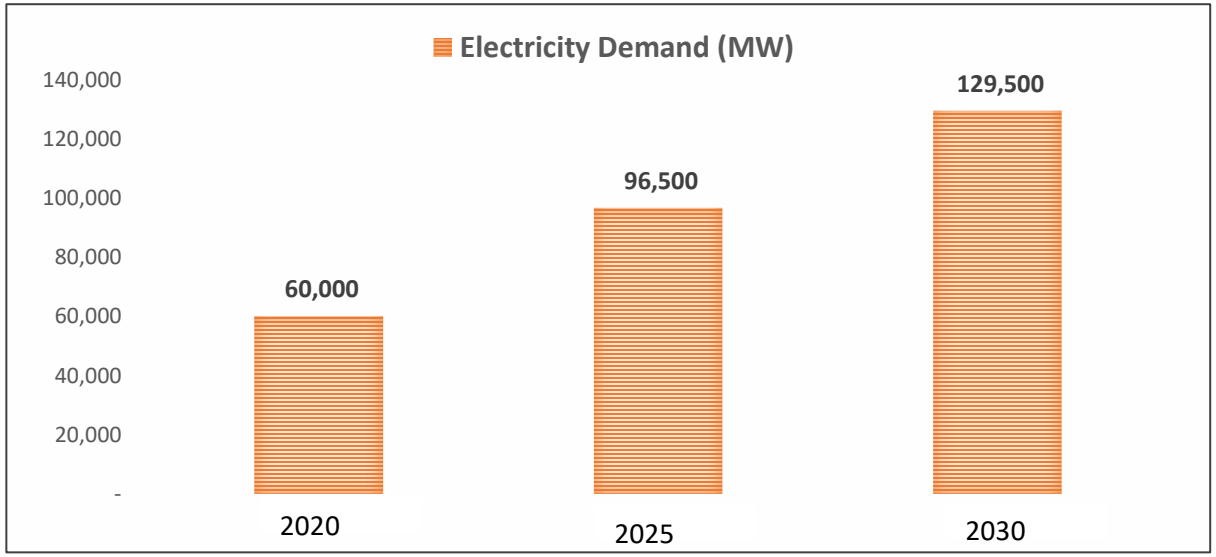
Source: EREA & DEA: Vietnam Energy Outlook Report 2019 (2019), Decision 2068/QĐ-TTg

Key Drivers for fast growth of Viet Nam's Solar PV

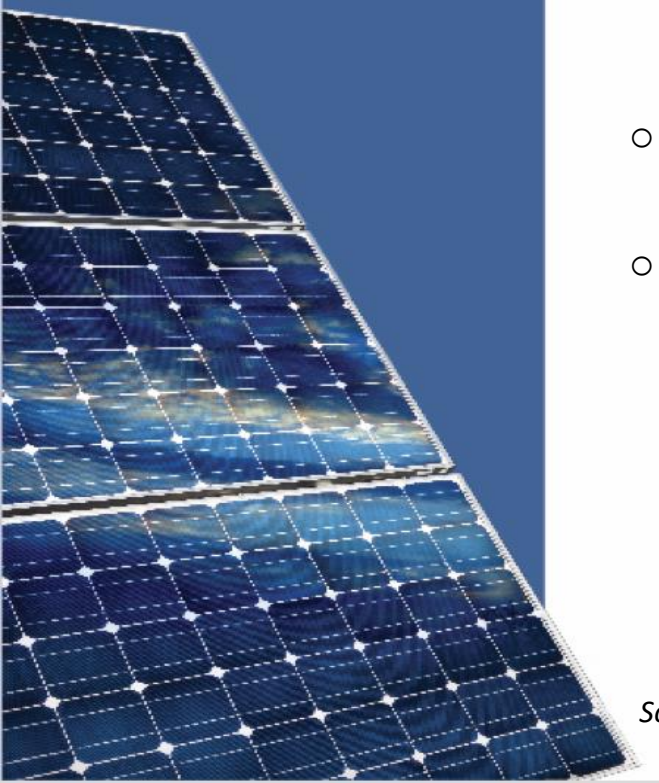


Source: World Bank (2020), Decision 2068/QĐ-TTg

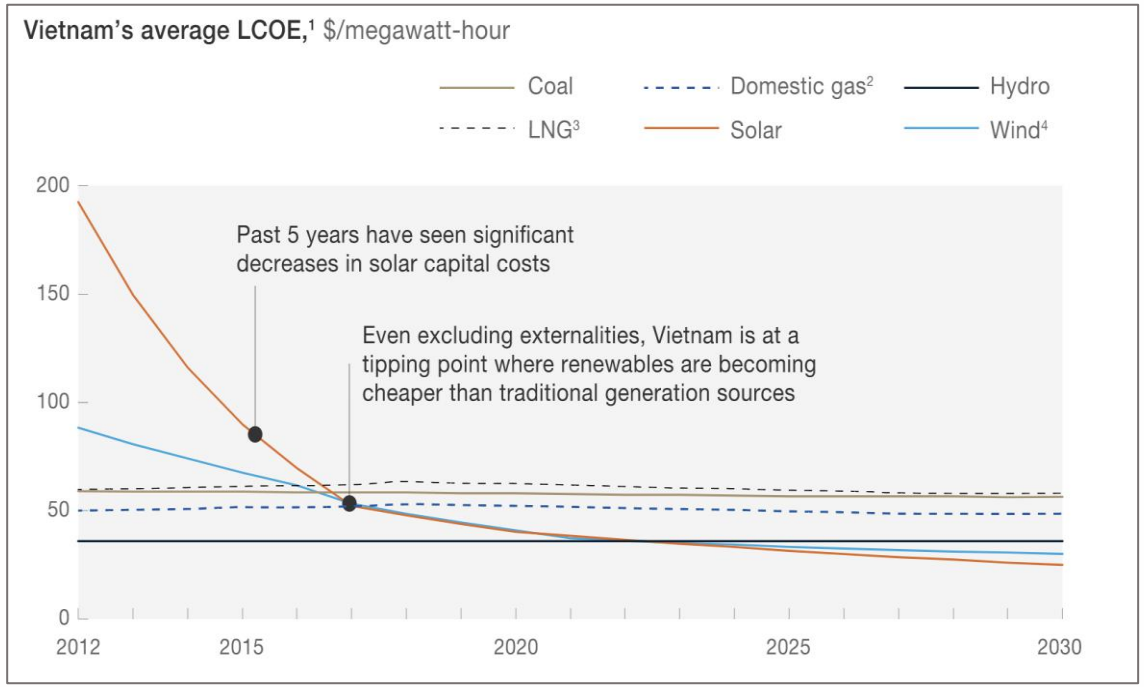
- **"Solar–ready" country** for PV, solar irradiation:
  - 4.0 – 5.0 $kWhm^{-2}d^{-1}$ in Southern region
  - 3.5 – 4.5 $kWhm^{-2}d^{-1}$ in Central region
  - 3.0 – 3.5 $kWhm^{-2}d^{-1}$ in the Northern region
- **Escalated power shortage:**
  - **7,000 MW new power required** p.a. until 2030 due to continuing increased FDI in manufacture, expansion of industrial zones



Key Drivers of fast growth of Viet Nam Solar PV



- Solar PV is **the lowest average LCOE** for Viet Nam to pursue low-carbon pathway aspiration
- **Preferential & incentivising policy**
  - Attractive tariff:
    - FIT 1: by 30 Jun 2019
    - FIT 2: by 31 Dec 2020
  - Flexible PPA models with template & clear instructions
  - Rooftop PV is the new potential source and exempted from operating license for power generation (< 1 MW system)



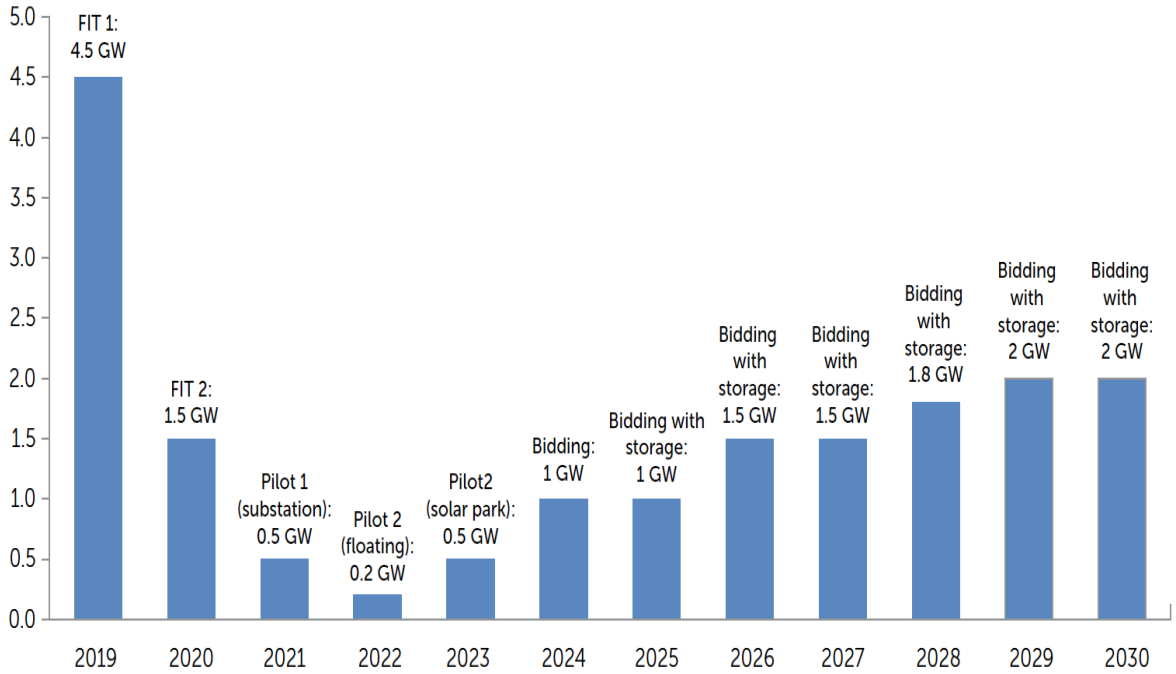
Source: McKinsey, World Bank (2018)

Source: Decision 132020/QD-TTg; Circular No. 18/2020/TT-BTC

Vietnam Solar PV Outlook

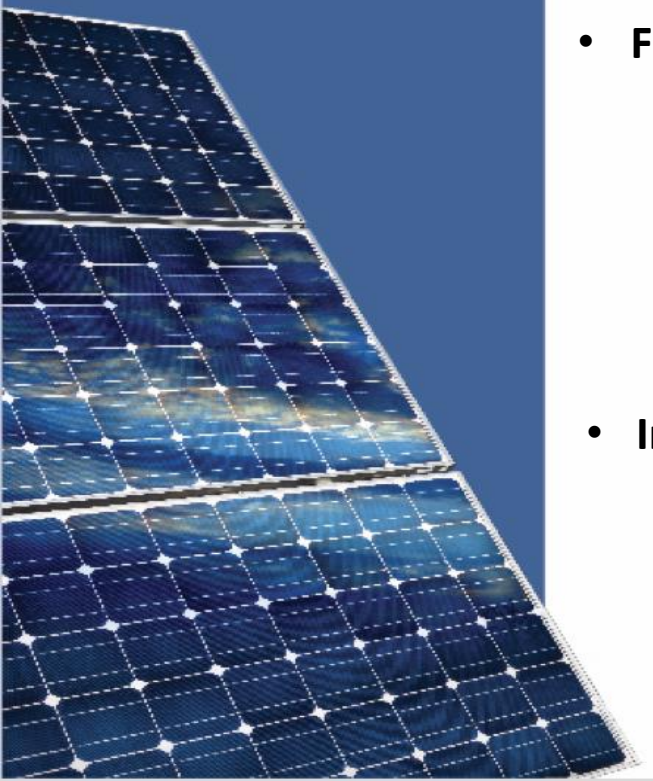
- A competitive bidding program is being drafted
- Energy storage system (ESS) is the enabler to continue further deployment of Solar PV, especially Rooftop PV for C&I
- A stable and sustainable growth strategy for Solar PV is urgently needed

Solar PV Installed Capacity Forecast (2020-2030)



Source: Vietnam Solar Competitive Bidding Strategy and Framework, World Bank (2019)

Vietnam Solar PV Outlook



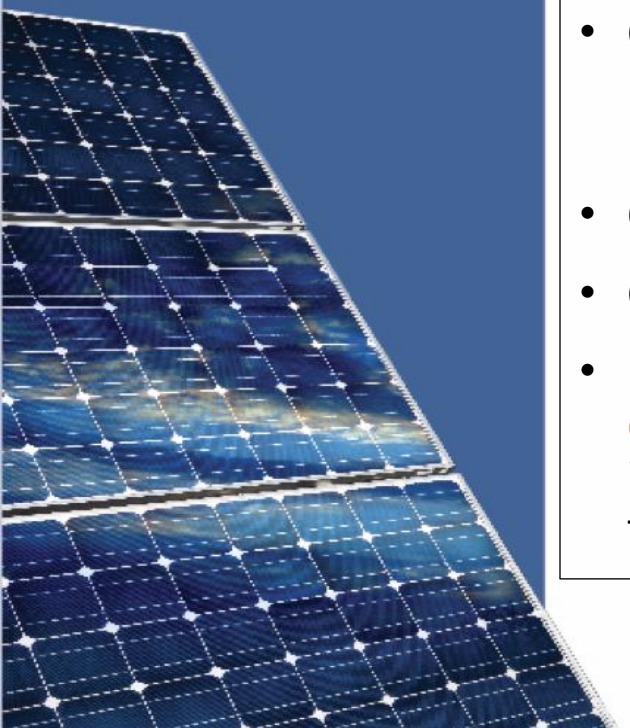
Key challenges posed to the sustainable progress of Solar PV:

- **Institutional**
  - Ambiguous pathway & pricing mechanism for future energy prices
  - Complex regulatory framework causing delays in large-scale project
  - Lack of human capacity development program and regulations
  - Lack of cross-sector regulatory framework to govern social-economic-environmental impacts
  - Unclear and untimely guidelines on technical procedures, standards & regulation on engineering, T&C and O&M

- **Financial**
  - Huge capital demand vs. critical short-term shortage of financial resources
  - Unstable sources of capital/funding
  - Questions about bankability of existing PPA causes hesitation of foreign investors
  - Limited sources and unfavorable terms from local banks

- **Industry/Technology**
  - Lack of qualified human resources
  - Insufficient grid capacity
  - Immature capacity for Solar asset management
  - Immature supporting industries

Vietnam Solar PV Outlook



Recommendations

Institution/ Policy framework

- Clear & transparent guidance on bidding procedures, pricing mechanism, timing, selection criteria
- More programmatic and long-term approach to IPP/PPP
- Clear instruction on Investment Law regarding various sectors: IPP, PPP, Local, etc.
- Continue import duty preferences
- Corporate tax preferences
- Develop solar PV roadmap, encompassing supporting industries, human capacity, and technical standards

Finance/Investor

- Unlock new sources of finance
- Increase availability of long-term domestic capital
- Ease constraints facing domestic commercial banks
- Consider long-term stability of system vs cost-minimization

Industry

- Innovative methods of installation
- Improving expertise
- Intensive training on PV System, Installation, O&M and HSE
- Focus on long-term reliability and quality of solar PV system

Pointers

- **Solar PV prospect**
  - Maintain stable development momentum
  - Attract various sources of finance/funding to minimize risks
  - System long-term stability is the key efficiency

- **Long-term** implications
  - **Sustainable** PPA models are needed
  - Consider **trade-offs** in resource scarcity & environmental impacts (land, alternatives to agriculture)
  - Careful **attention** to **downside risks**
  - Rapid **rise** in **private**-sector **debt**

Thank you for your attention!