Enabling the energy transition in emerging economies

Evidence from India

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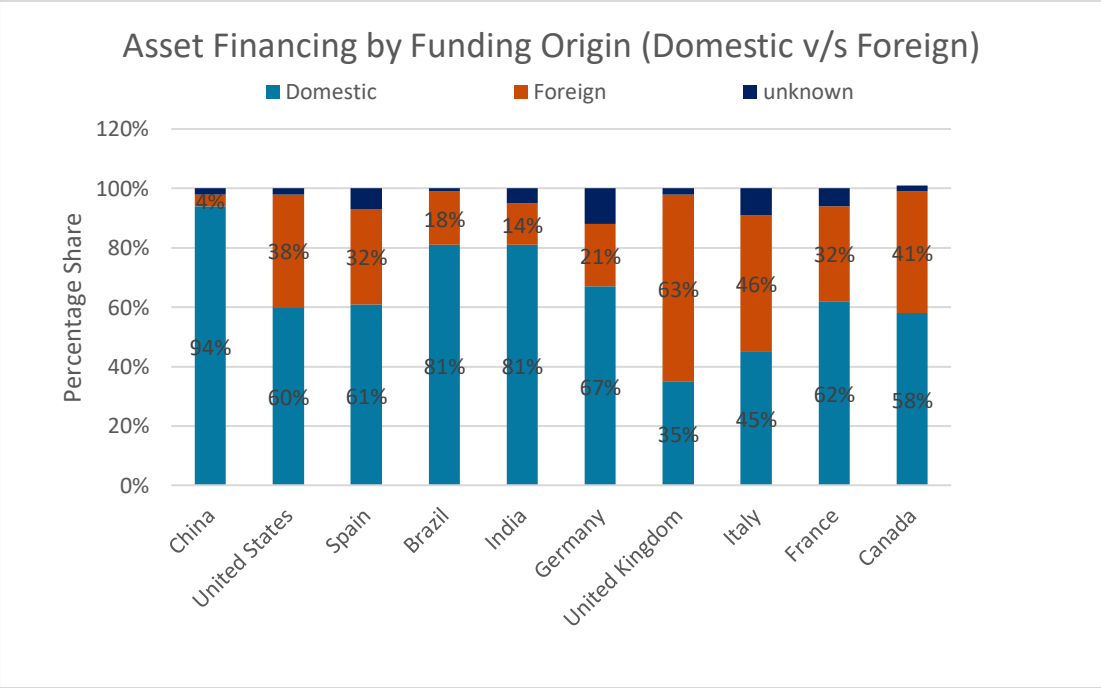
Establishing the mismatch

- In 2018, global energy investment stood at more than USD 1.8 trillion
- Only a third of that, USD 620 billion, was invested in low carbon energy

- 15% of the world's population, got 40% of the world's energy investment in 2018 – in high income countries
- Energy consumption in developing countries has doubled in the last 15 years, and will grow another 30% in the next fifteen years

- Developing countries around the world have ambitious policy commitments, and climate action plans
- Coal contributes 26 times more to the total primary energy supply in non-OECD countries than renewable energy sources



Chawla and Ghosh, 2019

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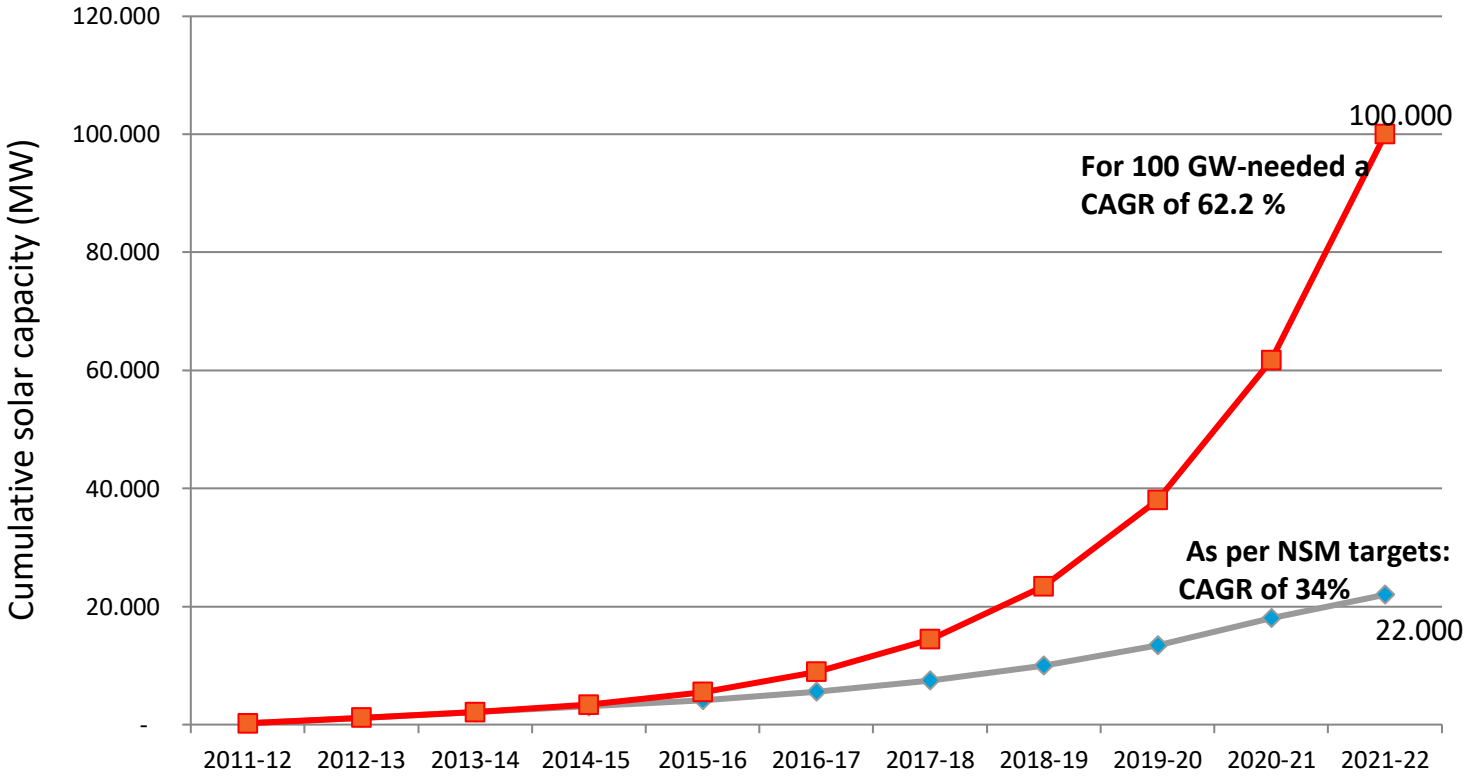
Tapping every ray of the sun



- In getting to 100GW of solar capacity, the required CAGR of 62.2% will mean cumulative installed capacity doubling every 18 months.

SOURCE: CEEW (2014)

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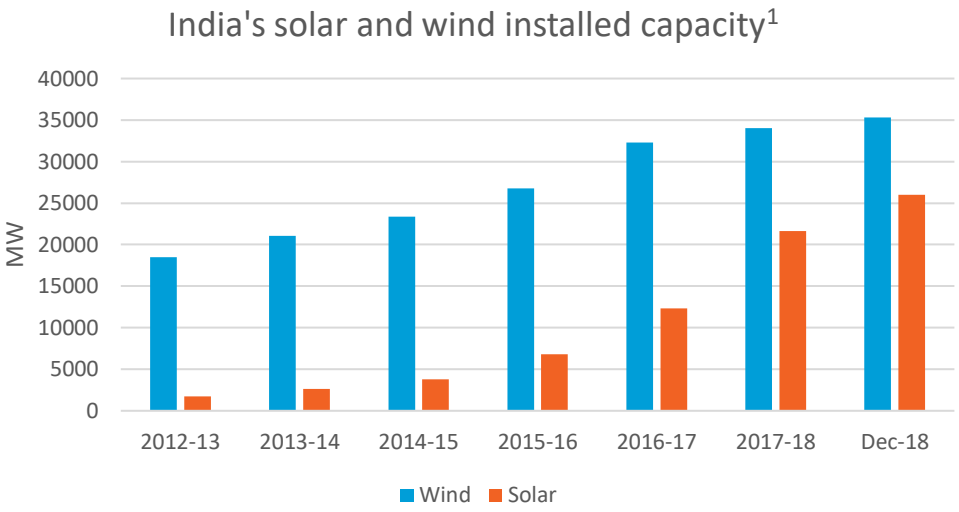
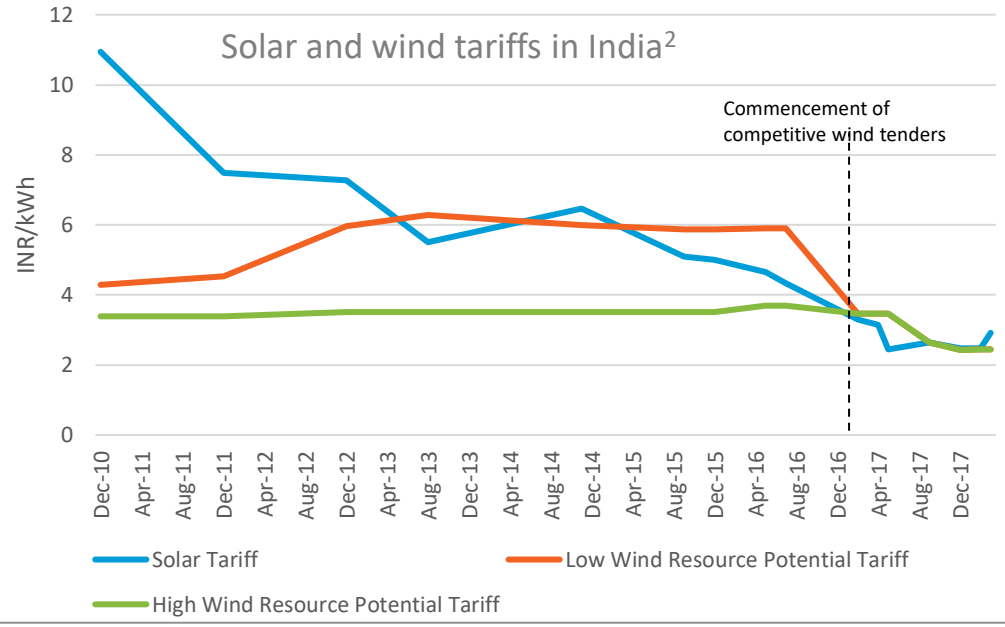
India’s renewable energy journey





- Enhanced policy thrust on solar since 2014-15 has driven sharp increase in solar installed capacity
- Solar and wind tariffs have stabilised below USD c 4/kWh
- 87.7 GW of installed RE capacity (not including 45.7 GW of large hydro) is already operational, and 62 GW of solar and wind capacity is in the pipeline

1 Source: Central Electricity Authority & Ministry of New & Renewable Energy

2 Source: CEEW Analysis

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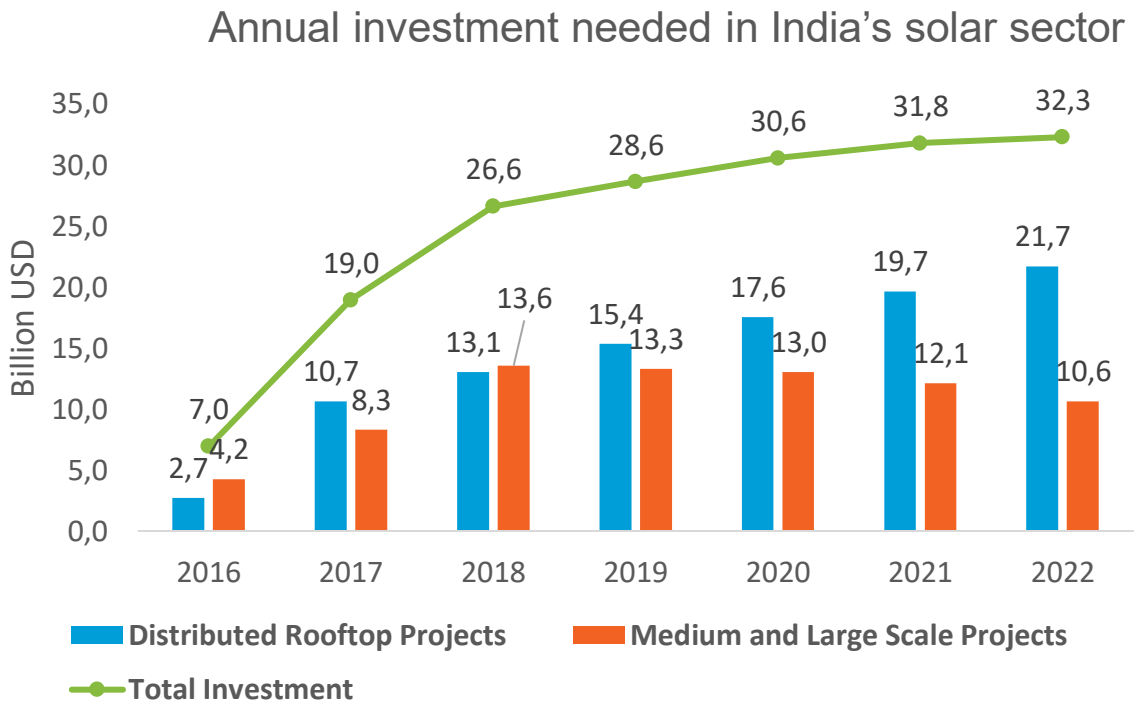
Investment requirements ….. to fund a revolution

- COVID-19 related disruptions are likely to push energy investments in 2020 down by USD 400 billion, investments in India to decline to lowest since 2015

- Investment in solar PV and wind have stayed stable, but spending on other aspects that will enable the transition such grids, storage, flexibility are likely to decline in a post COVID-19 paradigm



1 Source: BNEF (2018); Chawla (2016); IEA (2020)

2 Incudes large hydro investments

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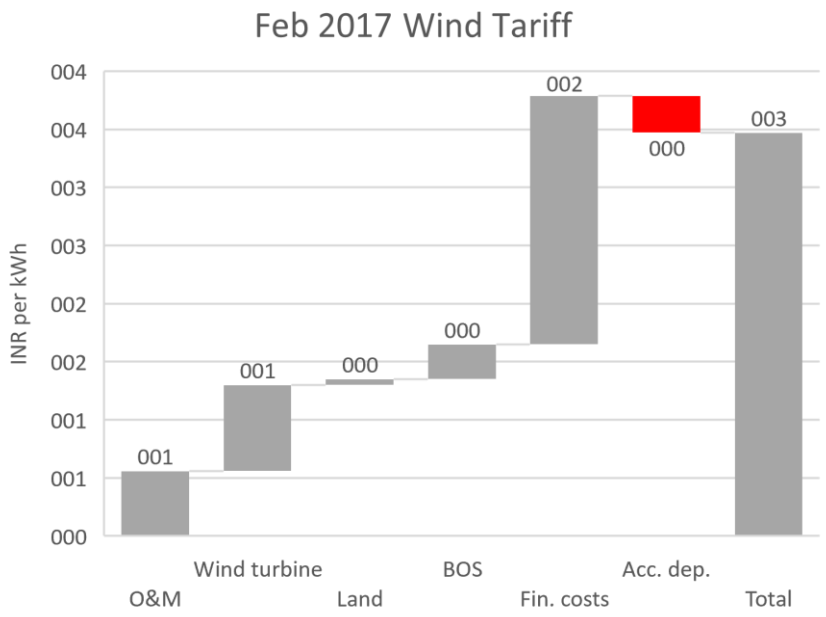
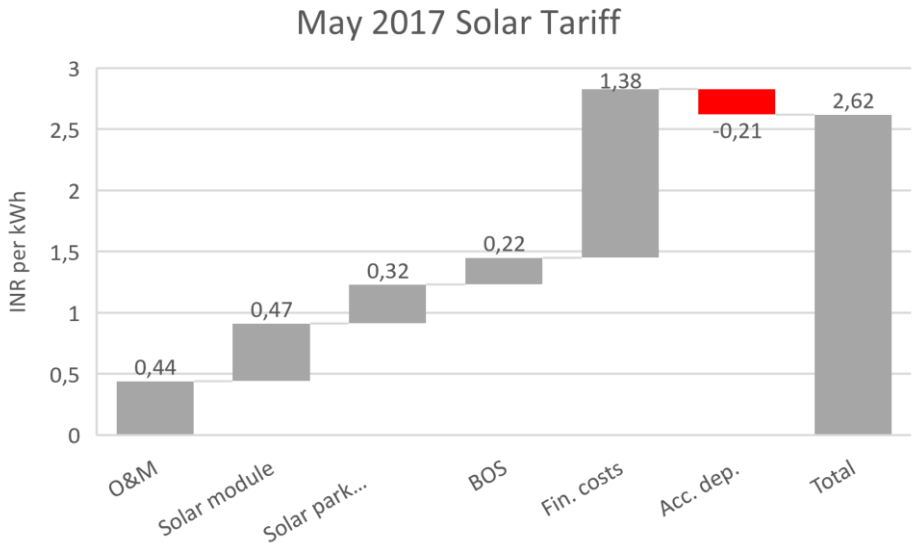
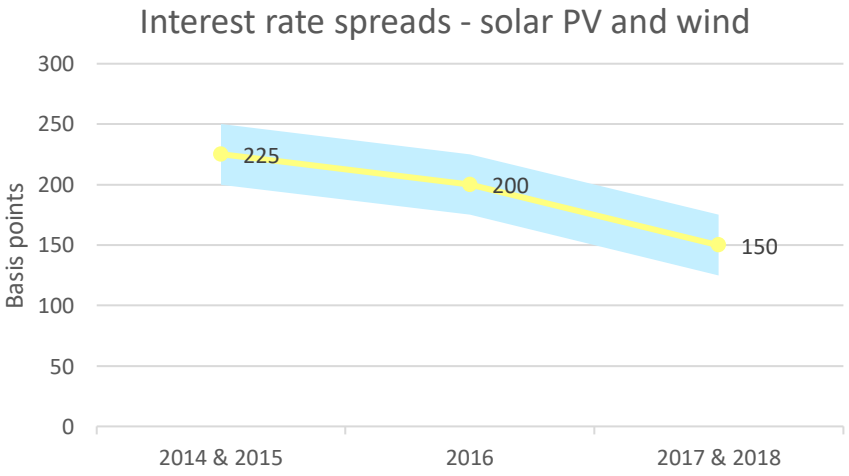
Anatomy of an RE tariff: risk perceptions determine costs of finance







- Financing costs constitute 50-65% of Indian RE tariffs
- PV module/wind turbine costs account for only around 20% of RE tariffs

- Interest rate spreads for lending to RE projects have declined by 75-125 bps from 2014-2018, tariffs from USD 9 cents to 4 cents/kWh

Chawla et al, 2019

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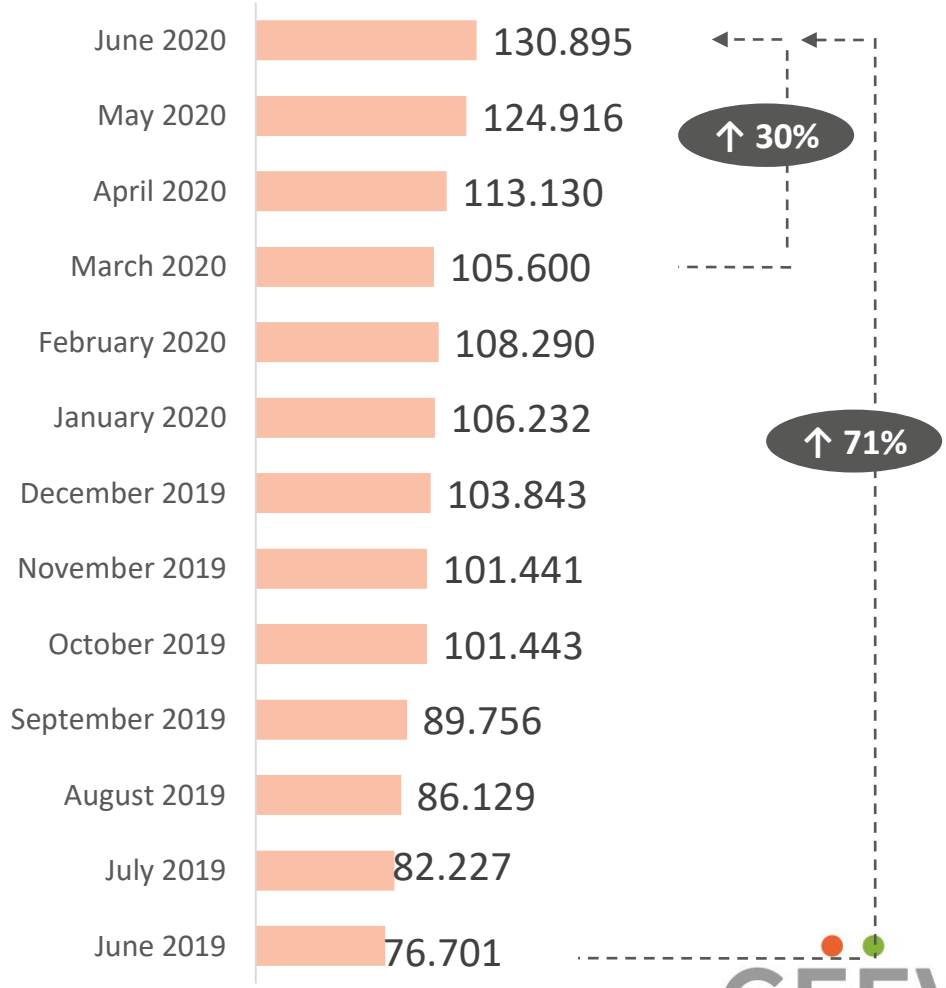
Risks identified by the market

- Offtake Risk (Delays or defaults in payments)
- Curtailment risk
- Foreign exchange risk
- Land acquisition and construction risk
- Policy uncertainty and change in law risk

Amount overdue by discoms to power producers (INR cr)



Source: Authors

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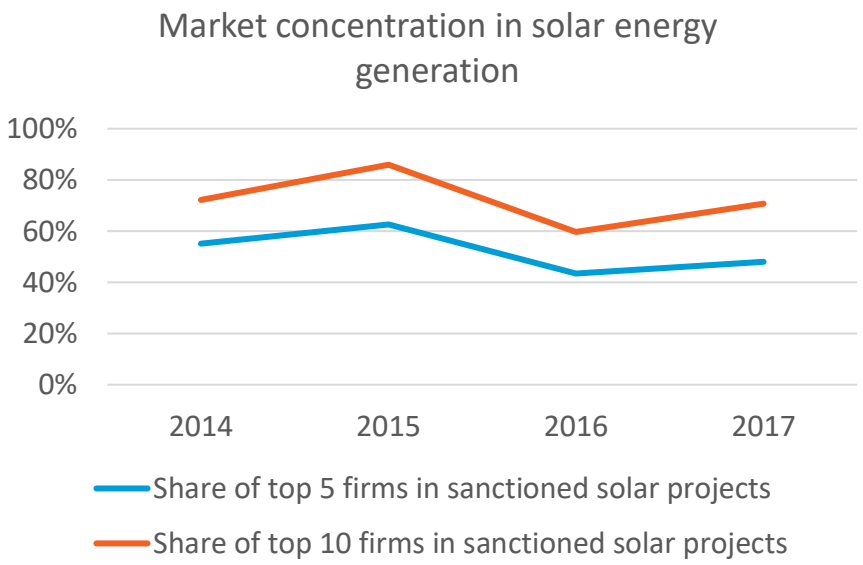
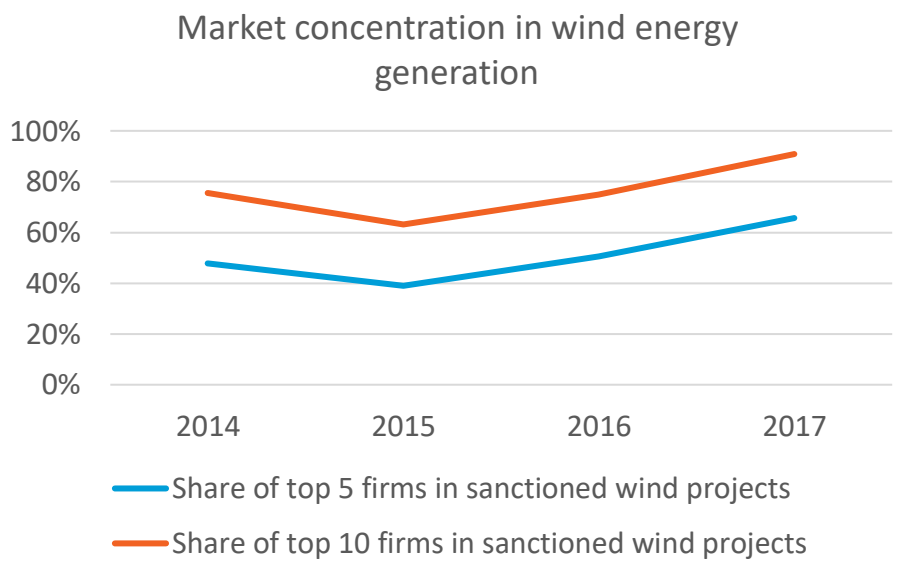
Greater market concentration among RE developers

Access to finance on favourable terms is key

- Well-established industry players with access to favourable sources of finance through foreign sources of capital, balance sheet strength or by virtue of being state-owned enterprises have been instrumental in driving RE deployment in India





Source: CEEW and IEA (2018)

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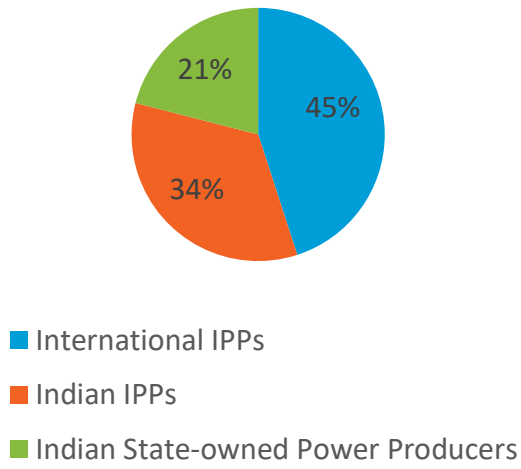
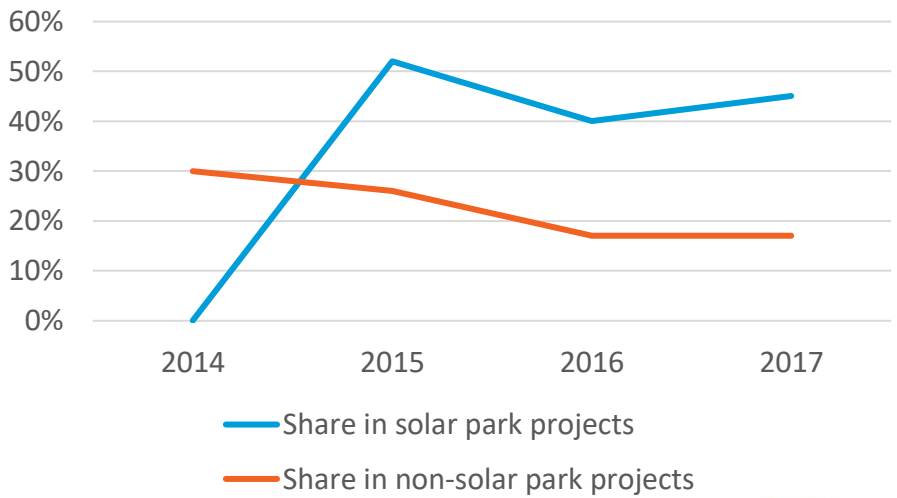
The role of solar parks

- Over half of solar PV projects sanctioned in 2017 were based on solar parks.
- Share of solar parks in overall projects sanctioned rose from 38% in 2015 to 54% in 2017
- High solar park charges are a matter of concern for the industry

Share of projects at solar parks (2014-2017)



Solar investments by international IPPs



Source: CEEW and IEA, Clean Energy Investment Trends Report, June 2018

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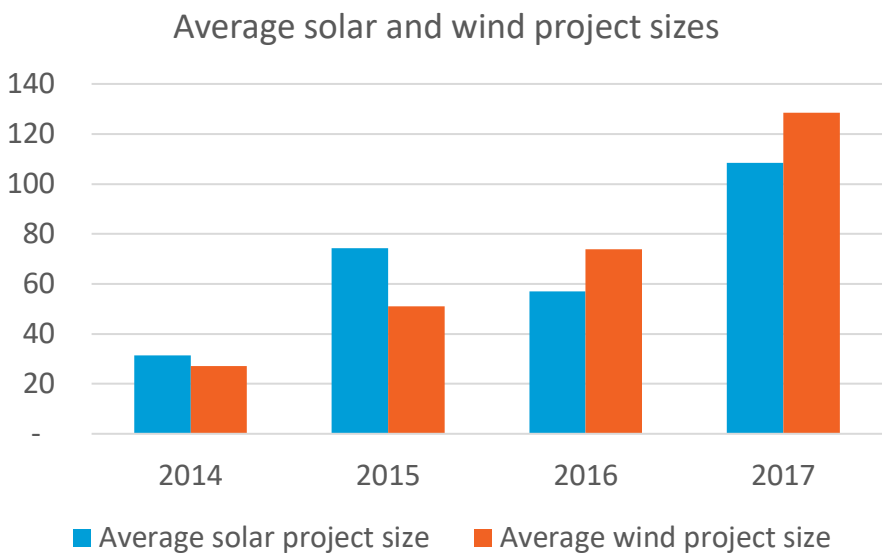
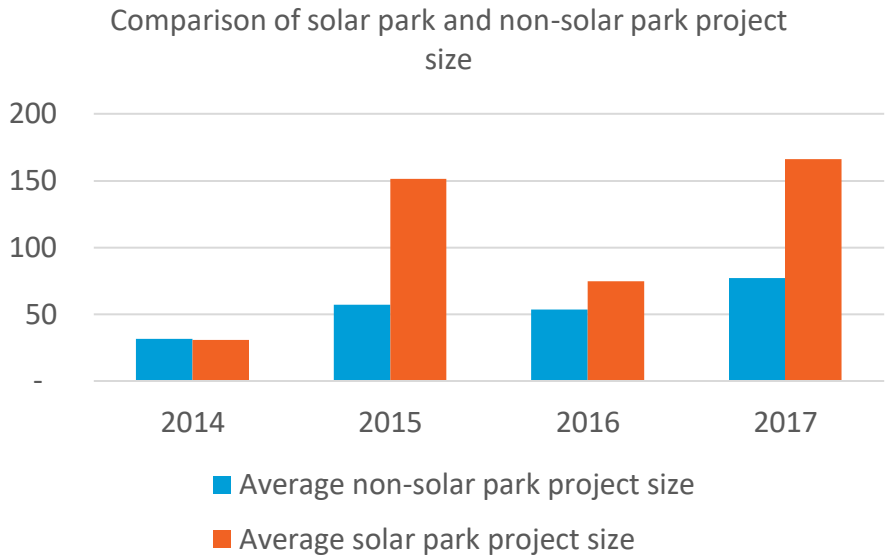
Ambitious targets and support policies have enabled bigger project sizes

- The tendering of larger capacities and an overall supportive policy framework has helped drive an increase in average project size for both solar and wind energy
- Challenges in acquiring contiguous land with high solar/wind potential could limit future growth in project sizes





Source: CEEW and IEA, Clean Energy Investment Trends Report, June 2018

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Strategic use of public money to advance the transition

Budgetary allocation	Financial cooperation	Fiscal incentives
• Capitalisation of ministries and departments • Capitalisation of incentive schemes	• Establishing preferential G2G lines of credit • Offering sovereign guarantee for sectoral credit schemes	• Tax holidays • Accelerated depreciation benefits • Waiver of duties and charges
Finance intermediation	**Taxation**	**Viability gap funding**
• Low cost lending through public NBFCs, green banks, or development banks • Sovereign or sub-sovereign issued green bonds for re-lending	• Trade barriers to protect domestic industry • Carbon tax and levies • Import duties	• Capital subsidies • Gap funding • Direct benefit transfers

Renewing our vows on renewables

- No backsliding
  - Continue raising ambition
- No failed contracts
  - Tackle risk perceptions
- No lost electrons
  - Deal with integration
- No false binaries
  - Deployment versus manufacturing
  - Coal versus RE or Efficient TPPs *and* RE

Thank you

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