



Investment trends & regulatory challenges

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Energy Access



Renewables



Power Sector



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Low-Carbon Pathways



Risks & Adaptation

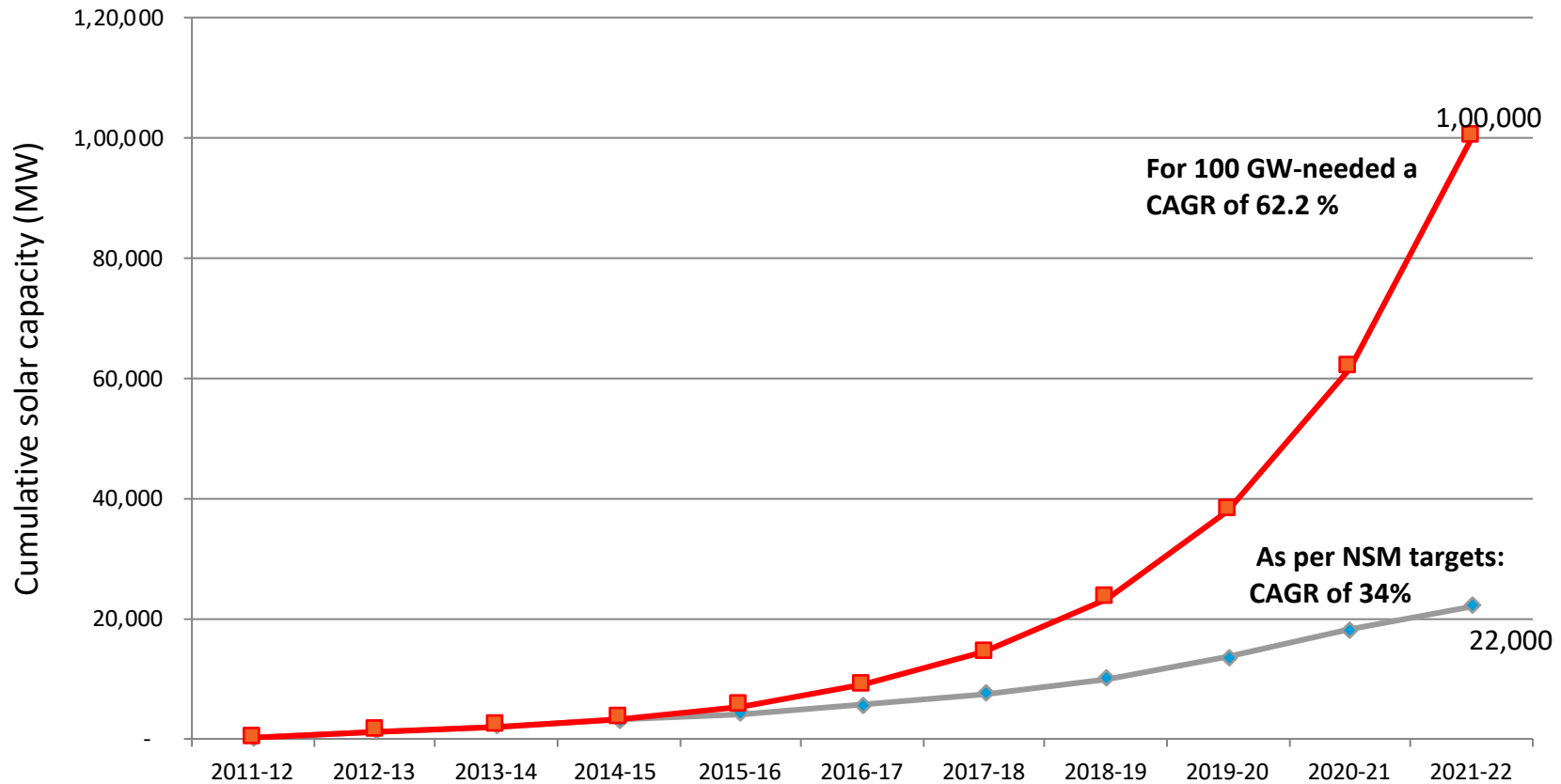


Technology, Finance, & Trade



Centre for Energy Finance

Tapping every ray of the sun

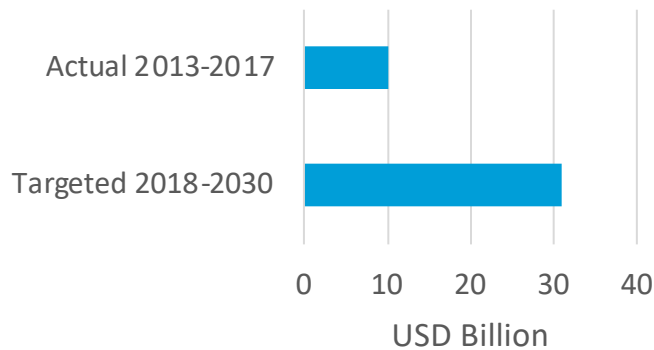


In getting to 100GW of solar capacity, the required CAGR of 62.2% will result in cumulative installed capacity doubling every 18 months.

India's clean energy ambitions require considerably higher capital flows

Renewable energy

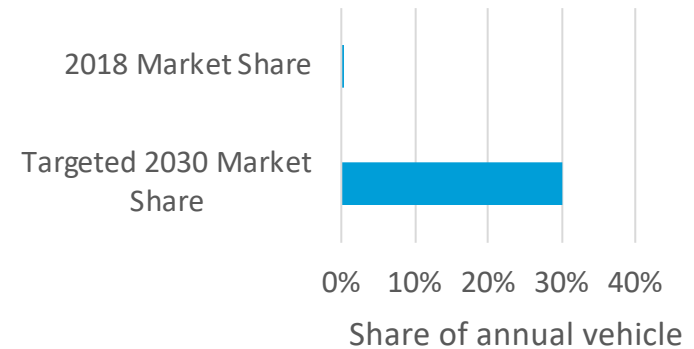
Comparison of annual RE investment flows with requirements for targets



- Additional investments by states needed in:
 - Transmission infrastructure
 - Solar parks

Electric mobility

Comparison of present EV sales with stated government ambition

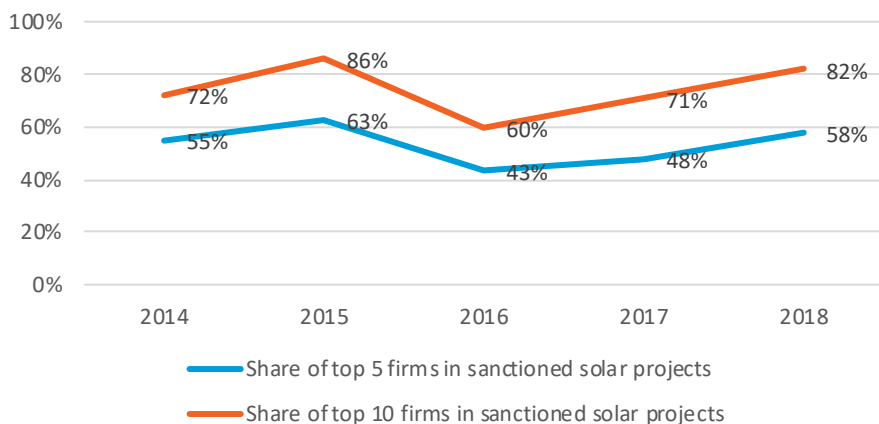


- Investments needed across the value chain:
 - Component manufacturing
 - Battery manufacturing/assembly
 - Charging infrastructure
 - Mobility services
 - After-sales services

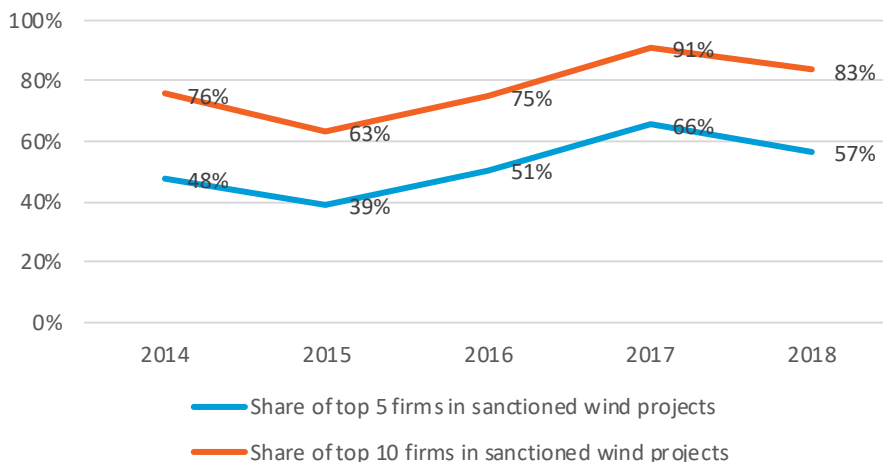
Clean Energy Investment Trends

Market concentration of developers sanctioning new projects remains high

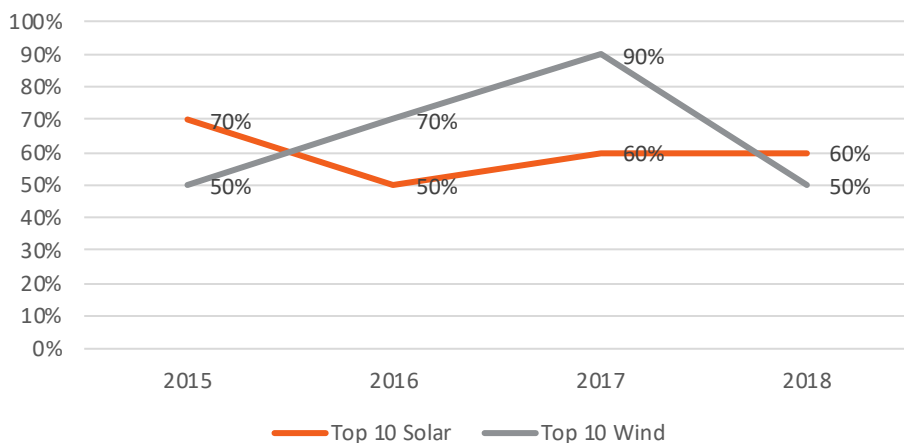
Market concentration in solar PV



Market concentration in wind

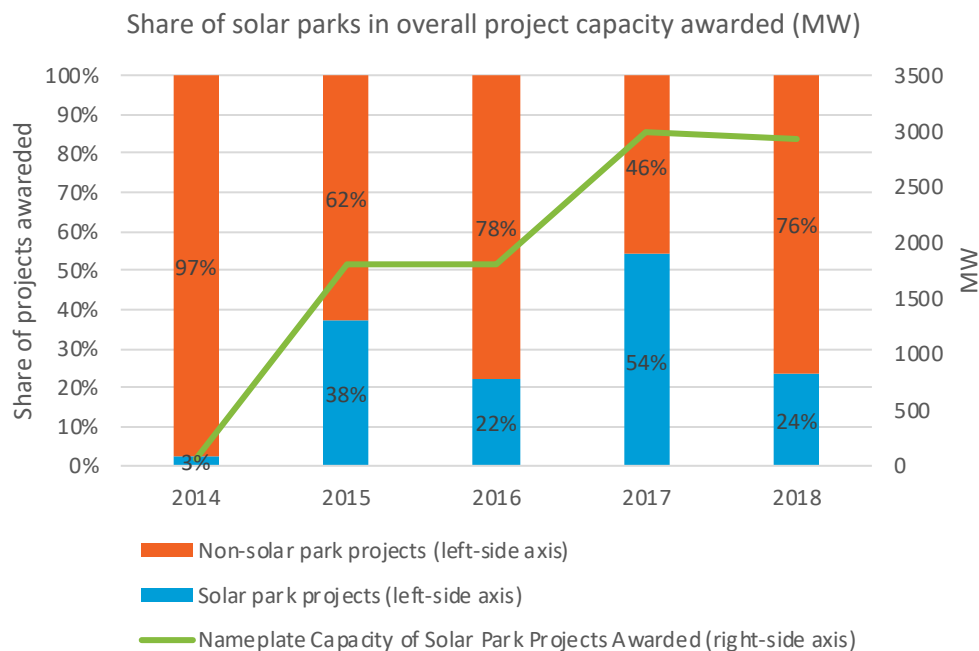


Churn rate for the top solar and wind developers



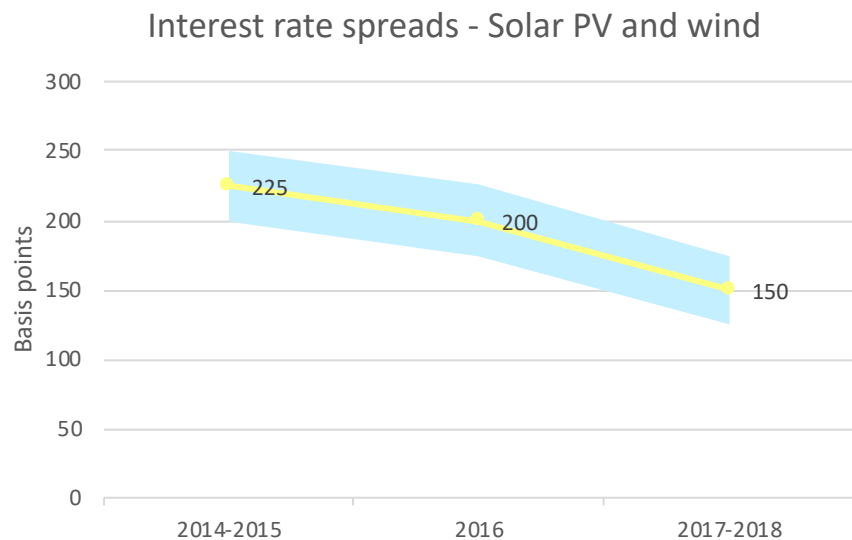
- Even top developers have limited capacity to finance new projects every year
- Considerations of portfolio diversification across locations and offtakers could be impacting bidding patterns
- Industry consolidation in the wind industry is reflected in reduced churn in 2018

Reduced interest in solar parks

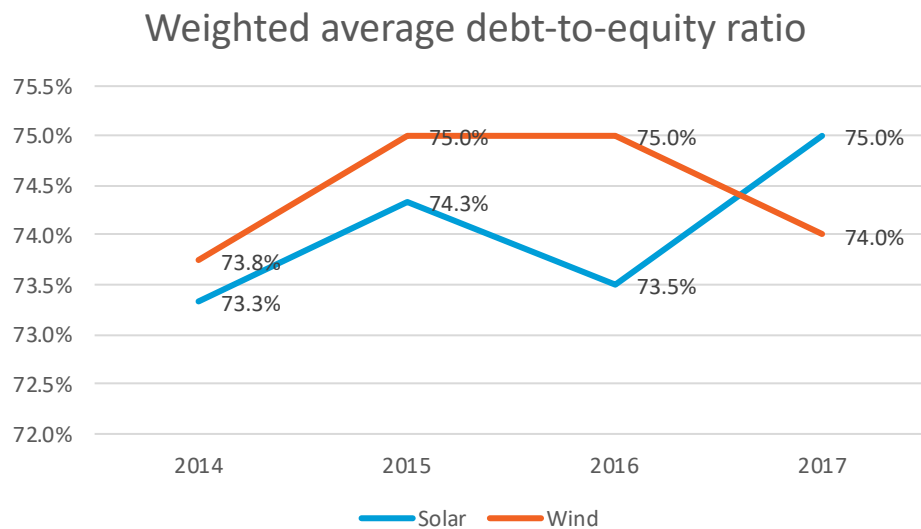


- Persistent challenges in land acquisition and setting up transmission infrastructure have delayed the development of solar parks
- High solar park charges are a matter of concern for the industry
- Reduction in quantum of project capacity awarded through this route.
- SECI has now taken a more active role in park development itself through the introduction of a new mechanism - Mode 7 - for park development

Debt financiers' risk perceptions for renewable energy projects have declined



Interest rate spreads from benchmark rates for lending to solar PV and wind projects have declined by 75-125 basis points from 2014-2018



Capital structures for solar PV have become more debt-heavy whereas those for wind have remained stable

Roadblocks to Investment



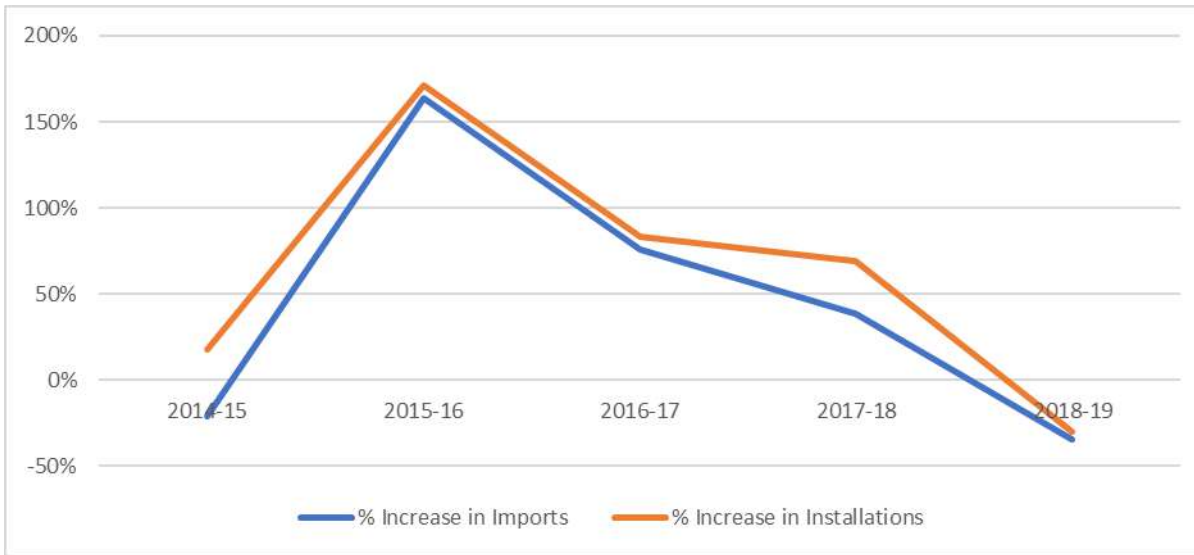
- There are no off-take risk mitigation instruments dedicated to RE
- The existing instruments burden both issuers and users with high transaction costs and complex application processes causing prohibitive delays
- Existing risk-mitigation instruments do not comprehensively address the specific roadblocks faced by private investors

Andhra Pradesh – reducing investor confidence

As per AP tariff order for FY 19-20	No. of units to be supplied (In MU)	Existing average tariff (INR/unit)	Revenue from sale of under existing tariff (INR crore)	Proposed tariff (INR/unit)	Revised revenue from as per proposed tariff (INR crore)	Potential revenue impact on developers (INR crore)
	(I)	(II)	(III) = (I) * (II)	(IV)	(V) = (I) * (IV)	(VI) = (III) – (V)
Wind Power	8,866	4.63	4,105	2.25	1,995	-2,110
Solar Projects (SPD)	1,230	5.90	726	2.44	300	-426
Solar Parks	5,933	4.10	2,433	2.44	1,448	-985
Solar NRVNL	38	10.67	40	2.44	9	-31
Total/ average	16,068	4.55	7,304	2.34	3,752	-3,552

Source – CEEW CEF analysis basis tariff orders of AP for FY 19-20

Safeguard duty – increasing uncertainty



- In one year of implementation, the government has collected INR 3200 cr
- Lack of clarity on what will happen after Aug 2020 can lead to speculative bidding
- Same HS code for solar cells and modules reduces our understanding about the impact of safeguard duty
- For any new investments in manufacturing, longer term market and regulatory support and clarity in implementation is essential.

Share of imports of cells, whether or not assembled into modules, from exporters

Country	Share of imports (Period of investigation)	Share of imports (Aug 2018 – Jun 2019)
China	86.3%	76.9%
Taiwan	2.5%	1.4%
Malaysia	6.5%	0.5%
Singapore	1.1%	6.0%
Thailand	0.1%	4.5%
Vietnam	0.4%	6.0%

11 Note 1: Share of imports refers to the share in terms of value, sourced from Ministry of Commerce and Industry website.

Note 2: The period of investigation refers to the period which the DGTR considered in its safeguard duty investigation. This corresponds to the period spanning FY 2014-15 to FY 2017-18.

Key challenges & risks – Planning

- **Transparency**

- Real time data on land availability, transmission network, development for evacuation infrastructure and a clear roadmap of projects is not available
- Co-ordination delays between central and state government agencies often lead to delay in projects

- **Inconsistent & unclear policies**

- Retrospective change in policies are a major red flag for investors (AP and other states renegotiating or cancelling PPA's)
- Lack of clarity on GST created lot of challenges for companies.

- **Manufacturing**

- Solar module manufacturing industry needs strategic fiscal support and a strong domestic public procurement programme.
- Unclear roadmap and project implementation challenges have reduced capacity utilisation of wind turbine manufacturers
- Focus on energy storage is urgent otherwise, India will be a price taker, not a price maker - with limited profits accruing to domestic industry.

Key challenges & risks – Execution

- **Bid cancellation & delays**
 - Nearly 5 GW of solar projects witnessed cancellations in 2018, primarily due to increased tariff
 - Such instances should not be allowed because price was discovered via a transparent competitive bidding process.
 - Increased in market uncertainty, has translated into an increase in tariffs discovered at renewable energy auctions from the record lows realised in 2017
- **Development of evacuation infrastructure**
 - Increasing, availability of evacuation infrastructure is becoming a concern.
 - Transparency on infrastructure availability and development of greenfield projects is critical for the successful integration of RE power into the grid.
 - Important to strategically plan the sites of RE deployment in order to minimise the overall cost to the economy, rather than merely optimising for the levelised cost of electricity.

Key challenges & risks – Operational

- **Delay in payments**
 - Payments should be made according to invoice date and not on case to case basis (First In First Out should be followed)
- **Scheduling & Forecasting**
 - Should be strengthened by incorporating generation losses due to unexpected weather conditions
- **Curtailement**
 - Instances of curtailment is now spreading to many states, many questioning the “Must Run” status of RE.
 - Curtailement requests should not be verbal and on technical grounds only

Thank you

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