

PFS Web Conference  
100 GW of Solar Power by 2022 – Roadmap to target



**Dr. Ashok Haldia**  
MD & CEO,  
PTC India Financial Services Ltd.

Welcome address & opening remarks for panel discussion



**Mr. Gaurav Sood** MD,  
Solajire Direct Energy India  
Pvt. Ltd. (GDF).



**Mr. Hitesh Doshi** Chairman &  
MD, Waaree Energies Ltd.



**Mr. Chetan Sharma** President  
Finance and Strategy, ESSEL Infra. Ltd

Date : Friday, October 30, 2015  
Time : 16:00 - 18:00 PM (IST)

**REGISTER NOW @ PFS**

Indian Renewable Energy sector has recently seen a number of policy measures and reforms for green and sustainable development. The revision of solar power target of 1,00,000 MW by 2022 is an ambitious target to make India one of the largest green energy producers in the world. The total investment in this ambitious target will be around Rs. 7 Lac crores and can be achieved by mutual support between the Power Project Developers, Financers and Power Purchasers.

To discuss the issues and roadmap to achieve the target, PFS invites you to a web conference on the Solar Power Sector - "100 GW of Solar Power by 2022 - Roadmap to target"

The web conference will also include a panel discussion, where experts from the industry will further touch upon the challenges in the sector and the way ahead.

The web conference will address the following questions:

- Tall targets: Lenders perspective w.r.t achieving target of 100 Giga Waat. Can lenders meet solar huge fund requirement? Key aspects lenders look while financing solar power projects.
- Solar EPC Scenario: EPC contractor perspective w.r.t achieving target of 100 Giga Waat. Key challenges faced by EPC players amid reducing tariffs, increasing module costs, profit margins, domestic content etc.
- Solar Developers Perspective: Issues & Challenges faced by developers in putting up solar power project.

**Hosted by:**

- **V S Bisht**, EVP, PFS
- **Sitesh Kumar Sinha**, VP, PFS
- **Gaurav Kaushik**, AVP, PFS

**About PFS**

PFS has been promoted by PTC India Ltd (PTC) as a company incorporated under the Companies Act 1956, and registered with RBI as a NBFC. It has been set up as a special purpose investment vehicle to provide total financing solutions to the energy value chain which inter-alia includes investing in equity and/or extending debt to power projects in generation, transmission, distribution, fuel sources, equipment manufacturers and EPC contractors and carbon credit finance. PFS also provide fee based services in the energy space. The vision of PFS is to be the most preferred financial services partner in the entire energy value chain. PFS strongly believes in partnering and forging strong relationship with credible stake holders to provide complete financial services for all links in the energy value chain. .

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For any assistance/ query, please call:

**Rakesh Kalsi**

+91 11 26737418

[rakeshkalsi@ptcfinancial.com](mailto:rakeshkalsi@ptcfinancial.com)

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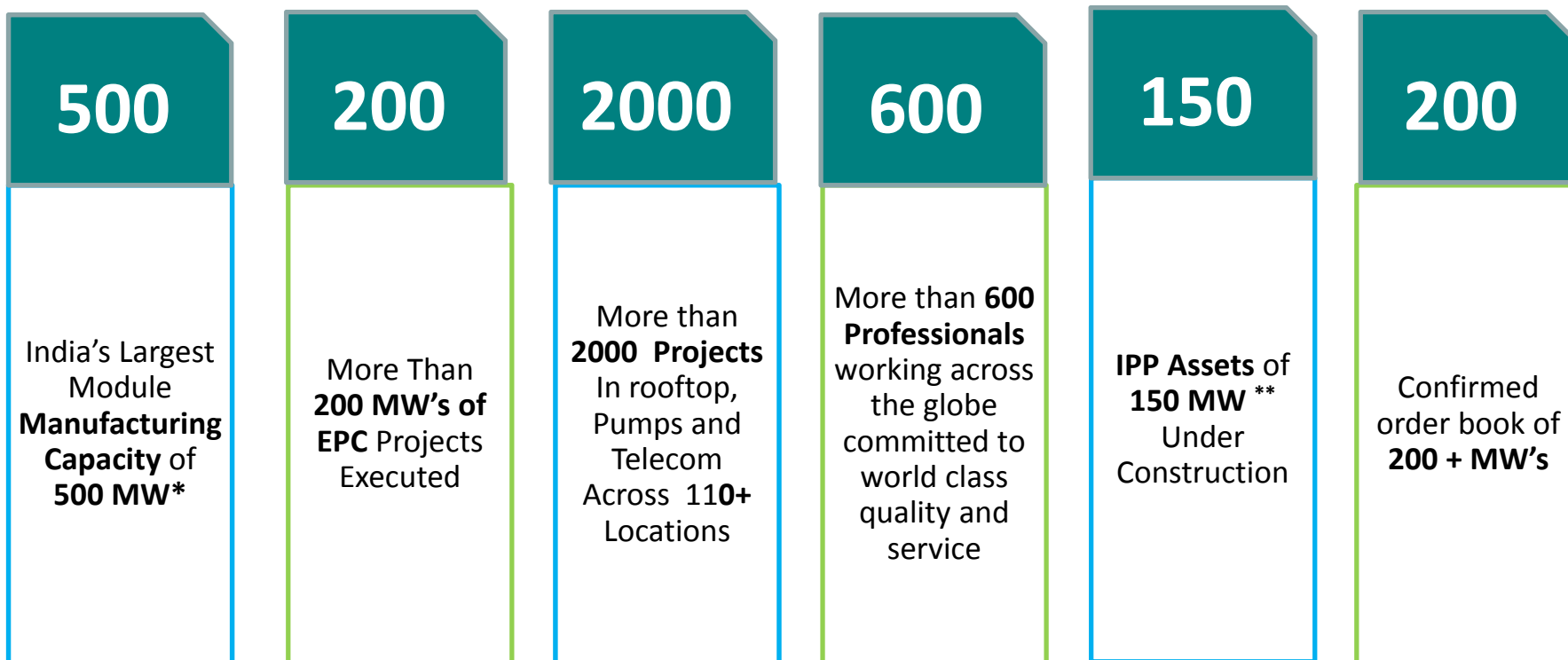
PFS Investors Relations



## **100 GW of Solar Power by 2022** – Roadmap to target

**- Hitesh Doshi**  
*Chairman & Managing Director*

## Waaree Energies Ltd. : Credentials



## Journey Towards 100 GW – Where India stand's today

**40 GW**  
– Utility  
Scale

**40 GW**  
– Roof Top

**20 GW**  
– Less than  
1 MW size  
projects

***Projects Commissioned***  
– ***4678 MW***

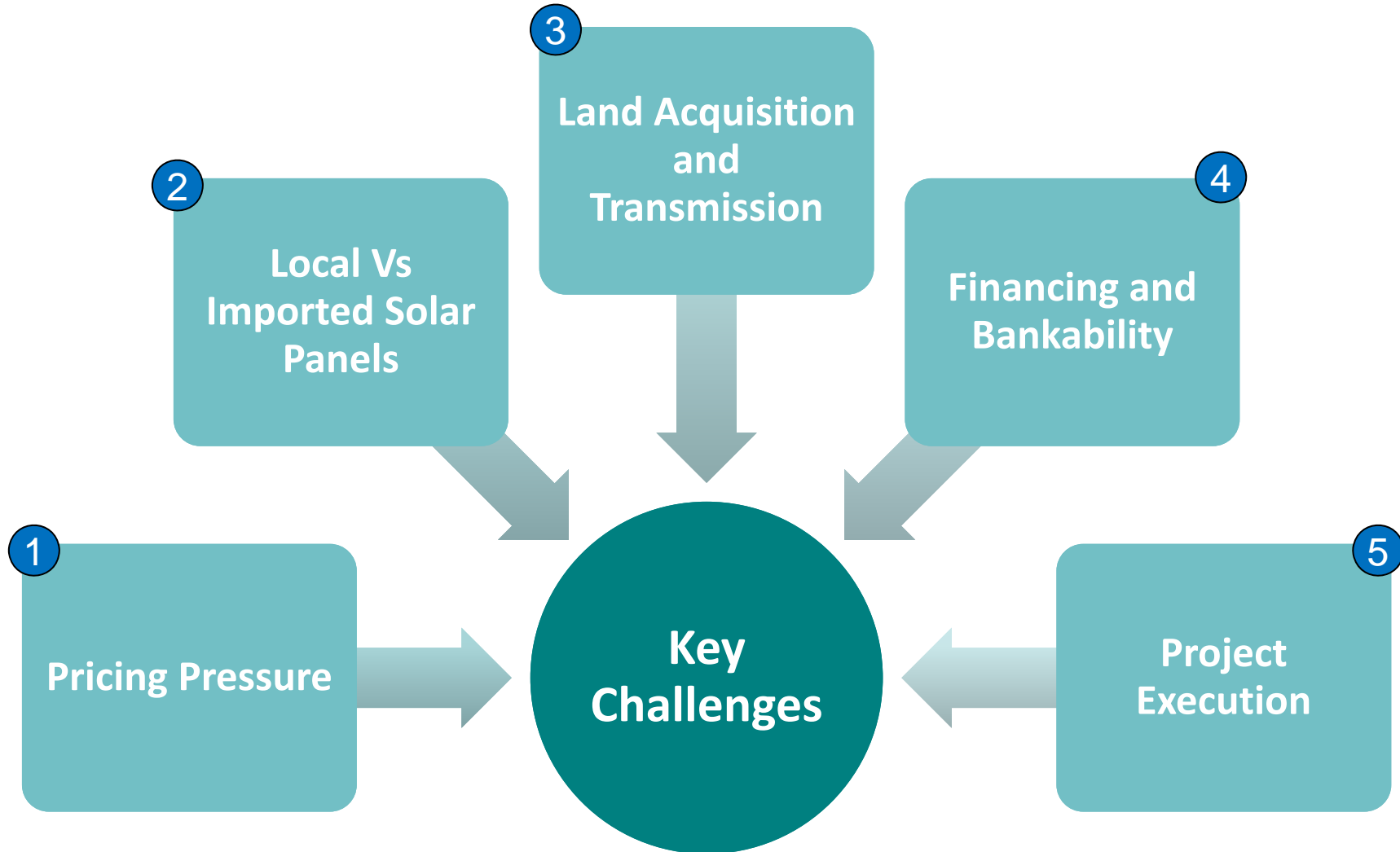
***Projects Under Development***  
– ***8707 MW***

***Tenders in Progress***  
– ***4060 MW***

***Solar fundamentals are becoming compelling in India, and investments are bound to grow dramatically***

***India could become one of the largest renewable energy producers in the world by 2022.***

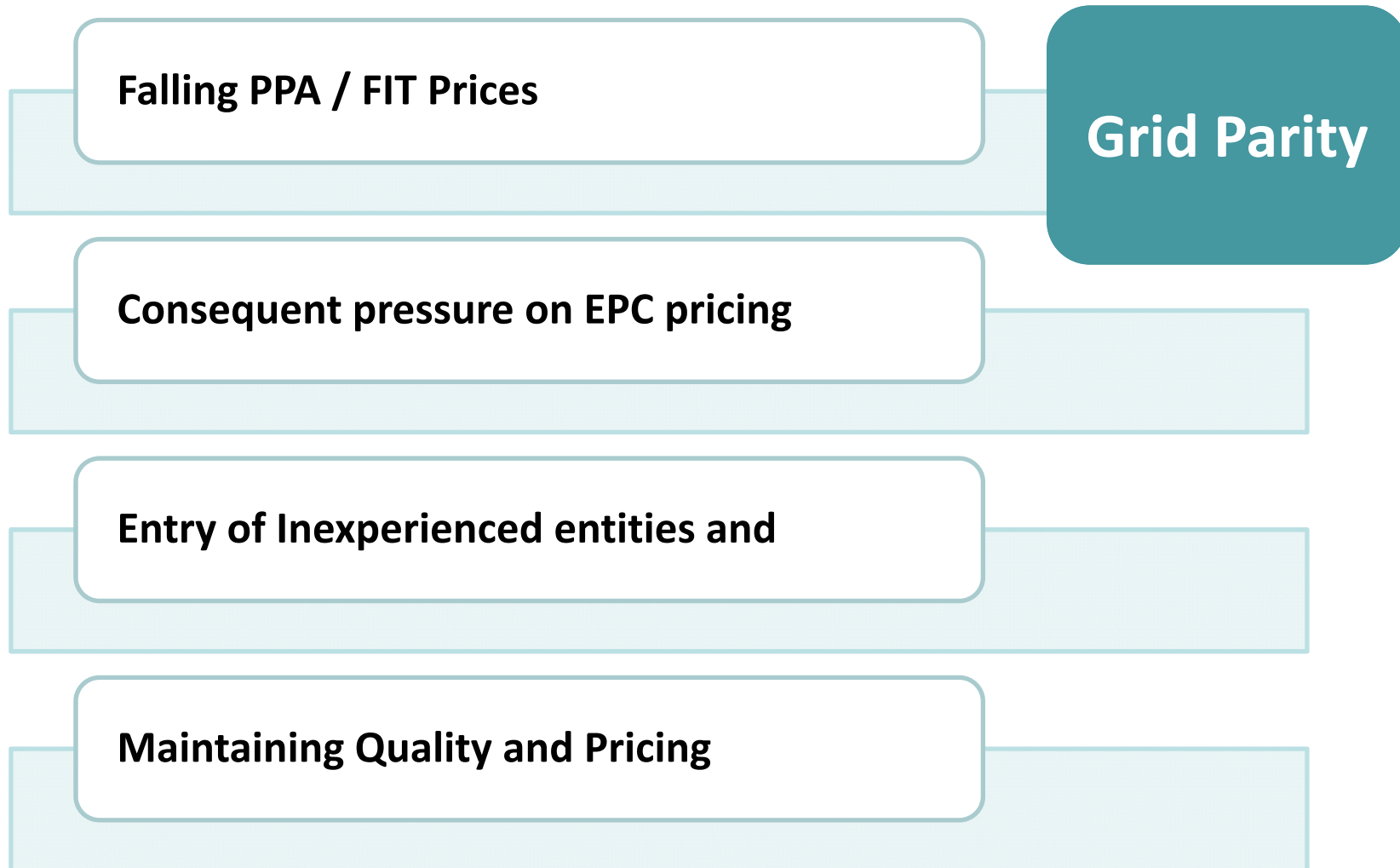
# EPC Contractors Perspective : Key Challenges



Journey towards 100 GW , Challenges to beat

1

## Pricing Pressure



# Local Vs Imported Solar Panels

**Constraints of Domestic Cell manufacturers**

**Make in India ??**

**Quality issues & warranty claims of imported Modules**

**Timely Availability and Logistics issues**

**Taxes on domestic manufacturers Vs no duties on imported**

3

## Land Acquisition and Transmission

Complications in land acquisition and right of way issues

Perpetual  
Land Issues

Grid Availability and connectivity

Issues related with Transmission lines

Permissions from concerned authorities



## Bankability and Financing

**Bankability of PPA and Project**

**IRR at Indian  
Interest  
Rates**

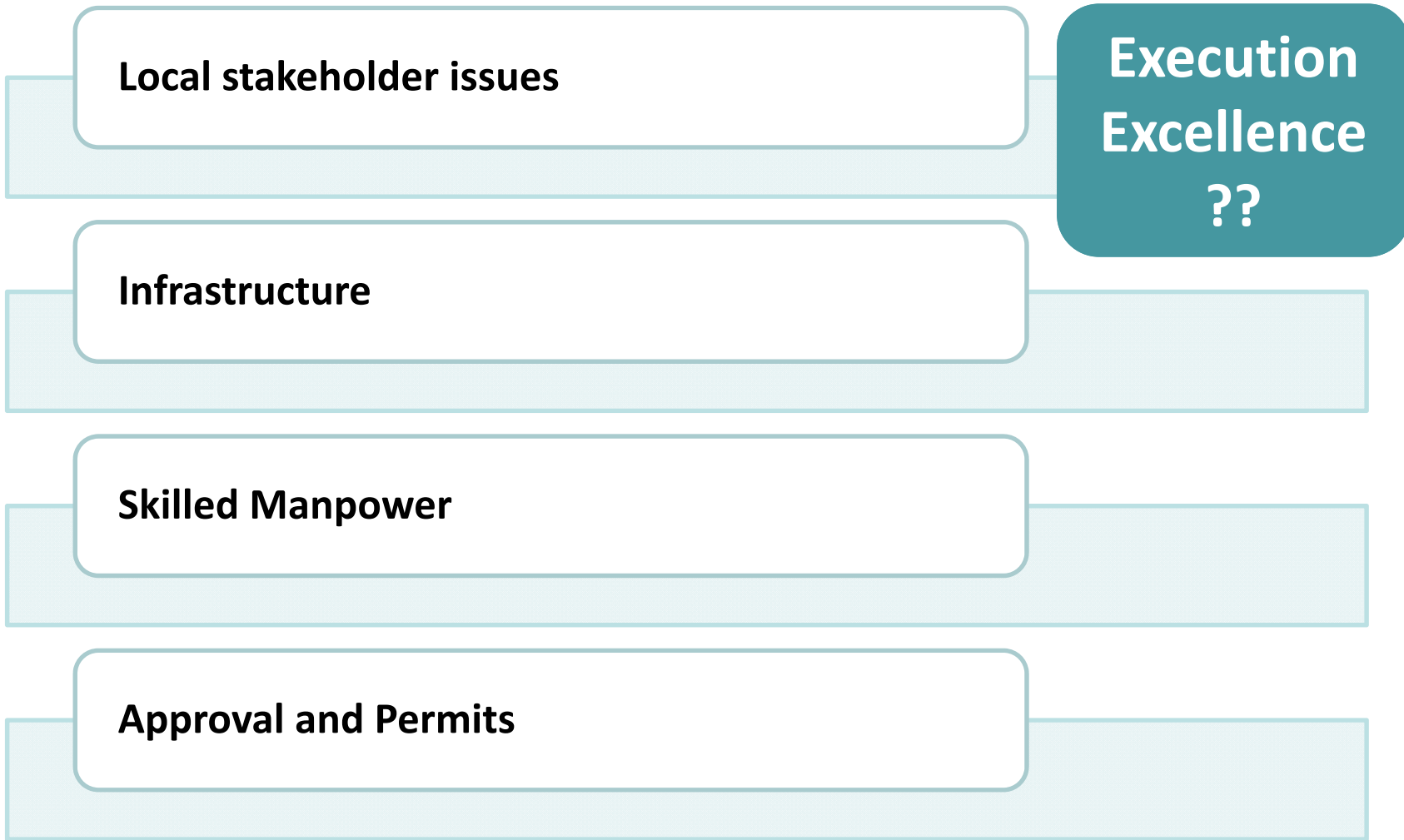
**Equity Capital**

**High Interest Rates**

**Delay in Financial closure**

5

# Project Execution



100 GW

Trials &  
Tribulations

Success

***Thanks !!***

[www.waaree.com](http://www.waaree.com)



Confidentiel



# Developing Solar Power Projects

## Issues & Challenges

October 2015

# Solairedirect at a glance

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- **Solairedirect's mission is to offer a solar MWh that is reliable, efficient, responsible and, above all competitive with other sources of energy**



**No.1 Power producer** dedicated to solar electricity in France



**250 employees** worldwide



**250 GWh** generated since inception



Presence on **5 continents**



**39 solar parks** in operation or under construction\*



**\$1,38 Bn** raised for project financing\*



**545 MWp** of installed capacity\*



**ISO 9001, ISO 14001, ISO 26000, OHSAS 18001**

\* March 2015

# Acquisition by Engie

- Engie (formerly known as GDF Suez) acquired 95% stake in Solairedirect France in August 2015

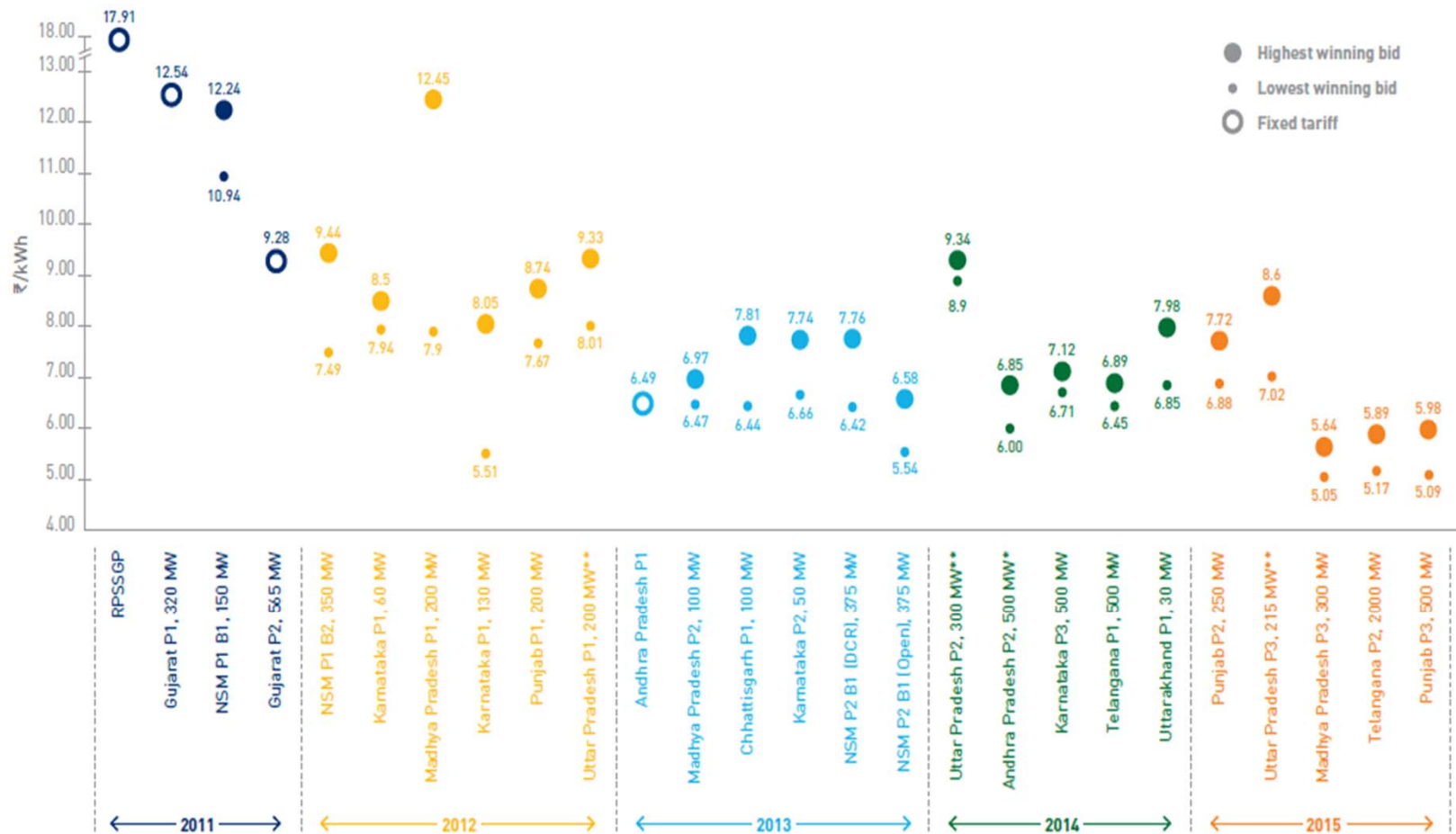
## About Engie





# Solar PV Tenders – Tariff Trends

Winning bid range for solar tenders



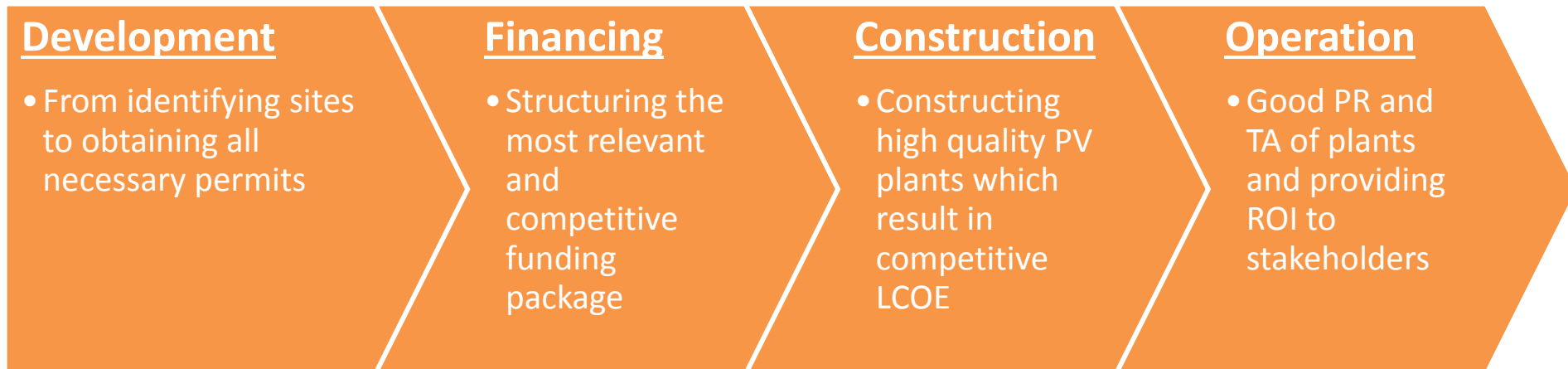
\*Original tariffs in Andhra Pradesh have an escalation of 3% per year for 10 years. For the purpose of this analysis, levelised tariff has been calculated based on an EIRR of 16%.

\*\* Unlike most states that have a PPA tenure of 25 years, the tenure in Uttar Pradesh is 12 years.

- Falling trend in tariffs reinforces our commitment towards highly competitive tariffs and grid parity and this being era of mass-solar.

# Various Stages Of Developing Solar Projects In India

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# Developing Solar Projects in India - Development



Lack of clarity on substation in tenders or RfP



Availability of Land nearby substation



Creating mortgage on private land on lease



Conversion to Non-Agricultural land



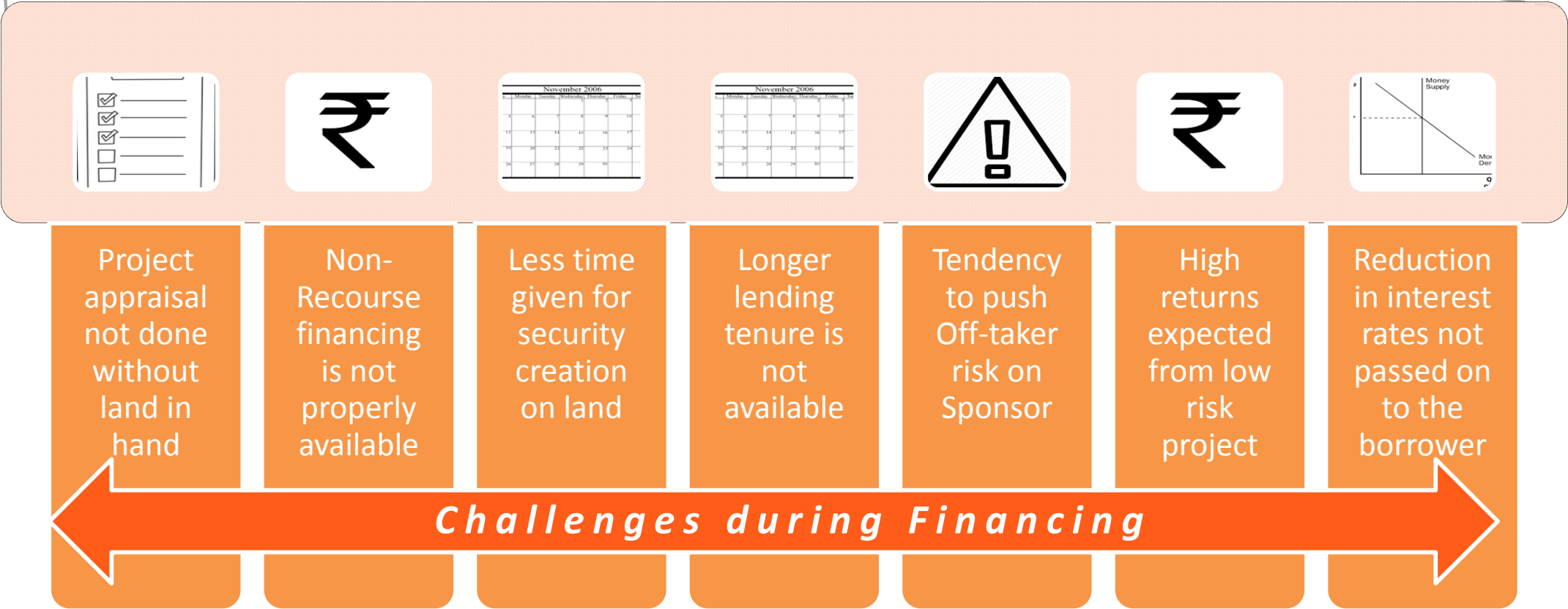
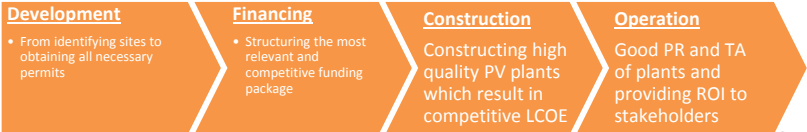
Getting required permits and clearances



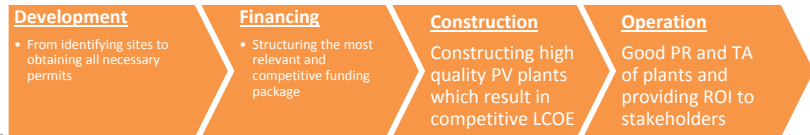
Single window clearance still not efficient

*Challenges during Development*

# Developing Solar Projects in India - Financing



# Developing Solar Projects in India - Construction



Social and local issues resulting in delays and damage to project



Right of way for transmission line



Grid infrastructure not available



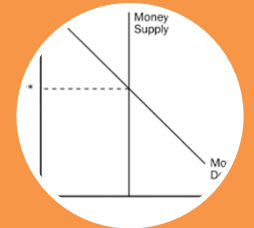
Tight project implementation timelines



Scope of work is not clearly defined in tenders



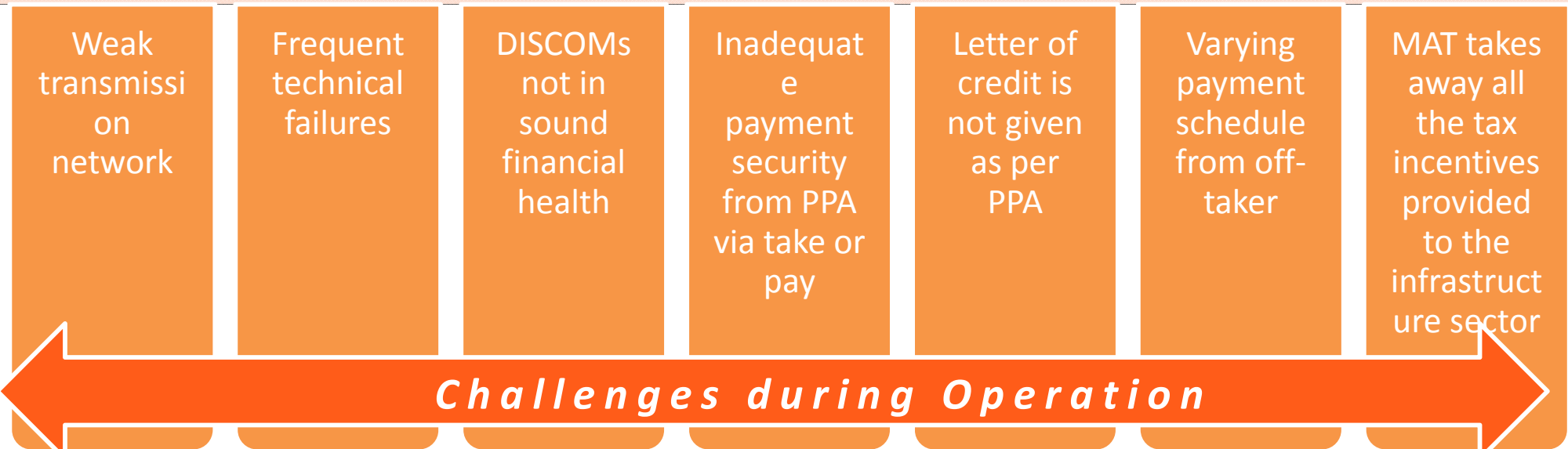
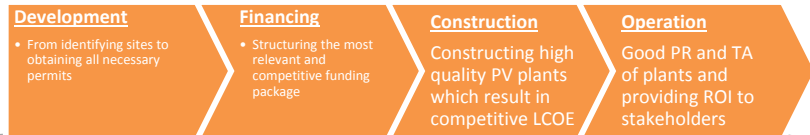
Permits and clearances required are not same across states and tenders



Supply bottlenecks due to huge increase in number of tenders

*Challenges during Construction*

# Developing Solar Projects in India - Operation



# Developing solar projects in India

## Sustainable cost reduction strategies used



# Some Solutions

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- Solar Parks are the way forward where land and evacuation is provided by the Govt.
- Investors and Lenders need to understand the low construction risk and operational risk in the solar projects
  - Low level of project risk should demand for lower returns
- Longer lending period
  - Due to RBI regulations lending is restricted to only 15 years, while project PPA is 25 yrs
- Relaxation of MAT for infrastructure sector
- Payment security should be ensured via PPA
  - Stringent conditions to be put in case of termination by off-taker
  - Payment timelines need to be adhered
- Implementation infrastructure to be put forward by off-taker or implementation agency
- Scope of solar developer should be clearly defined
- Clearances and Permits needs to be properly listed out and should be given via single window clearance







**Solarizing India**

# Challenges & Issues faced by Developer for Solar Power Plant: Project Execution Risk

- Land availability and acquisition.
- Delay in Financial Closure.
- Higher Cost of Funds.
- Grid Interaction and Transmission risk.

# Land Availability & Acquisition

- To meet the solar targets, another big impediment is likely to be the land acquisition hurdle.
- Every 1MW requires approx. 5 acres of land; therefore 100GW would require 2,000 sq.km. of land (equivalent to Delhi and Mumbai put together), when the country is already embroiled in a raging debate over the land acquisition law and its compensation.
- Conversion of Fertile Land (eg. Punjab & Haryana State) for Solar Power Projects doesn't create value on economy front.
- Land Acquisition process includes land identification, site evaluation, negotiation with land aggregators, approvals from local & Govt. authorities, sale deed execution, mutation entries, title search reports, adjudication of executable documents with local authorities and final document execution.
- Lenders insists for land mortgage as PDC (pre-disbursement condition) whereas process involves Govt. approvals which is time consuming.

# Delay in Financial Closure

- Sector is worried by the weak financials of State Discoms;
- State Discoms have huge accumulated losses due to high T&D losses, non-remunerative tariffs, subsidized supplies, etc.;
- Cost of renewable power (Rs.6-7/unit) is currently higher as compared to conventional power (Rs.4-5/unit);
- Solar power capacity would require around USD 40bn worth of debt for the country to reach the 60GW of utility-scale solar it aims to install by 2022;
- The majority of this is planned to come from international sources such as the World Bank as well as investments by international solar companies.
- Non standardized Power Purchase Agreement across the states.

# Delay in Financial Closure

- The Indian banking system is laden with dubious debts of ~INR 2.7tn, as well as additional unrecognized stress. Additionally, the banking system is already close to the sectoral ceiling of ~15% for the infra sector. Of the INR 60tn of bank advances, more than INR 9.5tn has been advanced to the power sector.
- The Government of India may also approach bilateral and international donors and the Green Climate Fund to achieve this solar energy target.
- Meanwhile, the public sector banks (PSBs) in India have committed INR 600 bn (USD 10bn) towards the revised solar energy target, with the State Bank of India and PNB making major commitments.
- PSU Bank are presently concentrating on NPA management and new proposals are not prime focus.

# Higher Cost of Funds:

- Renewable energy projects at present ROI @12-13% p.a. can't sustain.
- When country is envisaging renewable energy sector development in line with developed economies, cost of funds also needs to be brought down to greater extent.
- Sector needs to be made priority sector for funding and access to funds needs to be enlarged.
- Presently sector is classified under Infra sector and the Banks/FIs easily reach threshold levels.
- RBI and Govt. policies needs to be gelled for betterment of sector such as Dollarised PPA proposed recently for mitigation of FOREX risk.

# Higher Cost of Funds

- Bond market in Indian at present is shallow.
- Currently Renewable Sector constraints excess to funds.
- At present, developers of renewable energy projects needs to approach same set of investors for both development stage (under construction) and mature stage (post commissioning).
- Investor base needs to be expanded such as IDFs, credit enhancement, etc.
- Yield Co. Funds to be introduced in line with other developed economies.
- India needs active maturation of bond market.
- Other financing options such as Buyers Credit / Suppliers Credit / ECB / etc. needs to be made easily available in the sector.



# Grid Interaction & Transmission Constraints

- RPO (Renewable Purchase obligation) not strictly enforced.
- Limited grid capacity.
- Policy target of 25GW solar vs. peak demand of 11GW.
- Risk of power oversupply and low utilization rates for developers.
- Transmission and Evacuation risk due to lower sub-station peak demand capacity.
- ROW approval under section 68 and 164 of Indian Electricity Act 2003 very critical.
- State Discoms intent to dishonor High Cost PPAs entered with developers in past.