Competitive Bidding in Renewable Energy Projects

Three Day Programme on “Renewable Energy Regulation” – Organised by ASCI

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Contents

- Background
- Experience in Solar Competitive Bidding
- Experience in Wind Competitive Bidding
- Recent Regulatory & Policy Developments
- Challenges & Keys Issues
- Way Forward
RE Capacity Addition Targets

NAPCC

• NAPCC target of 5% for RE Procurement in 2010
• Target to increase by 1% each year to reach 15% by 2020

CEA perspective plan for FY 2032

• CEA has projected RE capacity additions till 2032
• RE penetration level to increase by 8%, 18% up to 20% by 2032

RE Invest 2015

• Targets 175 GW by 2022
• Includes 60 GW from Wind, 100 GW from Solar and 15 GW from other RE
• 90% of the targeted RE capacity addition planned from Wind and Solar source which are inherently variable in nature

COP-21, Paris

• Reducing carbon emission intensity levels by 35% by 2030 compared to 2005 levels.
• INDCs Commitment- 40% of the total installed power generation capacity would be from non-fossil fuel sources by 2030.

NTP Amendments

• 8% of electricity consumption shall be from solar energy by Mar’22.
• RGO (Renewable Generation Obligation): New coal based plants to establish RE capacity
• Promotion of micro grids and ancillary services for RE
• Waiver of interstate charges for wind and solar
## RE Capacity Addition Target – National and State perspective

<table>
<thead>
<tr>
<th>Technology</th>
<th>Potential (MW)</th>
<th>Targets (MW)</th>
</tr>
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<tbody>
<tr>
<td>Solar</td>
<td>749,000</td>
<td>100,000</td>
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<tr>
<td>Wind</td>
<td>103,000</td>
<td>60,000</td>
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<tr>
<td>Bio-energy</td>
<td>25,000</td>
<td>10,000</td>
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<tr>
<td>Small hydro power</td>
<td>20,000</td>
<td>5,000</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>897,000</strong></td>
<td><strong>175,000</strong></td>
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### Capacity allocation in GW

- **Solar**
- **Wind**
- **Biomass**
- **SHP**

- **Maharashtra**
- **Uttar Pradesh**
- **Andhra Pradesh**
- **Tamil Nadu**
- **Gujarat**
- **Rajasthan**
- **Karnataka**
- **Madhya Pradesh**
- **West Bengal**
- **Punjab**
- **Haryana**
- **Delhi**
- **Bihar**
- **Orissa**
- **Jharkhand**
- **Kerala**
- **Chhattisgarh**
- **North Eastern Region**
- **Jammu & Kashmir**
- **Others**
- **Uttarakhand**
- **Himachal Pradesh**
- **Goa**
- **Telangana**

- **6%** solar
- **34%** wind
- **57%** biomass
- **3%** SHP
RE Potential (Wind & Solar) – National and State perspective

**Solar Potential**
India has potential for **748 GW** (considering deployment on 3% of wastelands)

**Wind Power Potential**
- Potential of over 302 GW (at 100 meter above ground level)
**Solar & Wind Sector development at a Glance (1/2)**

### Status of Target Achievement of Wind & Solar

**Wind**
- Expected capacity addition ~4-5 GW/Year to meet

**Solar**
- Expected capacity addition ~12-15 GW/Year to meet

#### Wind
- Installed Capacity as on 31/12/2018: 35 GW
- Under Implementation: 7 GW
- Tendered: 2 GW
- Balance 4 Target: 16 GW

#### Solar
- Installed Capacity as on 31/12/2018: 25 GW
- Under Implementation: 14 GW
- Tendered: 23 GW
- Balance 4 Target: 38 GW
Solar & Wind Sector development at a Glance (2/2)

**Solar PV**
- Govt. has revised target for Grid Connected Solar Power Projects from 20 GW to 100 GW by FY 2021-22 under NSM.
- ~25.21 GW is the total Installed Capacity as on December, 2018, with a historic lowest tariff of Rs. 2.44/kWh in July, 2018.
- Remaining capacity addition is planned to bid out in FY 19 & FY 20 & remaining 2 years for its execution.
- 47 Solar Parks of ~27 GW has been approved for 21 States upto Nov, 2018. As on date 4.2 GW have been installed inside various Solar Parks.

**Wind**
- ~35 GW is the total Installed Capacity as against 60 GW Target as on December, 2018, with a historic lowest tariff of Rs. 2.43/kWh.
- FiT regime shifted to CB from 2017, post notification of Wind CB Guidelines in Dec, 2017.
- W-S Hybrid Policy issued in May, 2018 & 1st 1.2 GW Greenfield tender was floated by SECI with a Tariff discovery of Rs.2.67/kWh.
- Off-Shore Wind Potential identified off the coasts of Gujarat & Tamil Nadu by NIWE.
- 1st LiDAR was commissioned at Gulf of Kambhat, Gujarat.
- EoI for offshore was floated by NIWE for 1 GW offshore wind farm at Gulf of Khabhat, Guj.
## Brief overview of NSM Guidelines notified by MoP

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<thead>
<tr>
<th>Phase 1 (2010-13)</th>
<th>Phase 2 (2013-17)</th>
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<tbody>
<tr>
<td><strong>Target (Utility Scale Solar)</strong></td>
<td><strong>Batch-I</strong></td>
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<tr>
<td>1000 MW to 2000 MW</td>
<td>750 MW</td>
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<td>FY 16-1250 MW</td>
<td>FY 17-1250 MW</td>
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<tr>
<td><strong>Scheme</strong></td>
<td>VGF</td>
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<tr>
<td><strong>Others</strong></td>
<td>84 MW (under Migration scheme) &amp; DCR (30% under Solar Thermal)</td>
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- Capacity Addition of at least 8 to 10 GW per annum is necessary if target of Utility Scale 60 GW by 2022 is to be achieved.
- Shortfall in RTPV/Decentralised Solar target of 40 GW may translate to higher target for Utility scale solar.
Competitive Bidding Experience - Solar
### Competitive Bidding framework (Solar) – 1/2

<table>
<thead>
<tr>
<th><strong>Preparatory Activities</strong></th>
<th><strong>Location</strong></th>
<th><strong>PPA Terms &amp; conditions</strong></th>
<th><strong>Model</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of 100% land at bidding stage-procession within 7 months from PPA</td>
<td>Solar Park</td>
<td>25 years</td>
<td>Ground Mounted</td>
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<tr>
<td>Clearances (Environmental/Forest)</td>
<td>Non-Solar Park</td>
<td>No unilateral termination allowed</td>
<td>Roof Top</td>
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<tr>
<td>Grid Connectivity</td>
<td>Taluka wise (e.g. Karnataka)</td>
<td>No PPA amendment allowed</td>
<td>Capex (Turn-key Basis)</td>
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<td>District/ Substation wise (e.g. Telangana)</td>
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<td>Developer (or RESCO)</td>
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<thead>
<tr>
<th><strong>Bidding Parameters &amp; Process</strong></th>
<th><strong>Timelines and milestones</strong></th>
<th><strong>Qualification &amp; Bidding conditions</strong></th>
<th><strong>Curtailment compensation</strong></th>
</tr>
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<tbody>
<tr>
<td>Bid Size 50 MW</td>
<td>Issue of RFP to PPA – 150 days</td>
<td>Past track record; timely execution etc</td>
<td>Back down- compensation @min 50% of PPA tariff</td>
</tr>
<tr>
<td>Tariff (single part) based</td>
<td>Financial Closure – 7mths from PPA</td>
<td>Financial criteria - (at least 20% of est. cap cost)</td>
<td>Grid Unavailability- compensation through excess power procurement</td>
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<tr>
<td>Fixed / Escalating</td>
<td>CoD – 13 mths from PPA</td>
<td>EMD, PBG</td>
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<td>VGF based</td>
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<tr>
<td>Single stage two envelope process followed by e-Reverse Auction</td>
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<tr>
<th><strong>Overarching framework for bidding in solar</strong></th>
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- **Experience summary**

- **Wind Bidding guidelines Overview**
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<tr>
<th>JNNSM Phase 1 Bidding</th>
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<tr>
<th></th>
<th>JNNSM Phase I Batch I</th>
<th>JNNSM Phase I Batch II</th>
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<tbody>
<tr>
<td>Managed by</td>
<td>NVVN</td>
<td>NVVN</td>
</tr>
<tr>
<td>Capacity Allocation</td>
<td>PV: 150 MW (PPA signed only for 140MW) CSP: 470 MW</td>
<td>PV: 350 MW (PPA signed for 340 MW)1 CSP: Nil</td>
</tr>
<tr>
<td>Allocation method</td>
<td>Reverse bidding on benchmark tariff (per kWh): PV: INR 17.91/kWh, CSP: INR 15.31/kWh</td>
<td>Reverse bidding on benchmark tariff (per kWh): INR 15.39/kWh</td>
</tr>
<tr>
<td>Commissioning time</td>
<td>PV: 12 months, CSP: 28 months</td>
<td>13 Months</td>
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<tr>
<td>period</td>
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<tr>
<td>Project allocation</td>
<td>Dec-10</td>
<td>Dec-11</td>
</tr>
<tr>
<td>No. of bids submitted</td>
<td>PV: 343, CSP: 55</td>
<td>PV: 183</td>
</tr>
<tr>
<td>Total capacity of the</td>
<td>PV:1715</td>
<td>PV:1890</td>
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<tr>
<td>bided submitted</td>
<td></td>
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</tr>
<tr>
<td>No. of projects selected</td>
<td>PV: 30, CSP: 8</td>
<td>PV:26</td>
</tr>
<tr>
<td>Maximum capacity by a</td>
<td>PV: 5 MW, CSP: 100 MW</td>
<td>50 MW</td>
</tr>
<tr>
<td>bidder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of the winning</td>
<td>PV: INR 10.95/kWh - 12.76/kWh, CSP: INR 10.49/kWh - 12.24/kWh</td>
<td>PV: INR 7.49/kWh - 9.44/kWh</td>
</tr>
<tr>
<td>bids</td>
<td></td>
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<tr>
<td>Weighted average of</td>
<td>PV: INR 12.16/kWh , CSP: 11.48/kWh</td>
<td>PV: INR 8.77 / KWh</td>
</tr>
<tr>
<td>the winning bids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects commissioned</td>
<td>PV: 140 MW, CSP: 50 MW</td>
<td>PV:330 MW</td>
</tr>
<tr>
<td>Prominent project</td>
<td>PV: All project developers allocated 5 MW, CSP: Rajasthan sun technique energy pvt. ltd, KVK energy ventures private limited - each 100 MW</td>
<td>PV: Welspun Solar - 50MW, Azure Power - 35MW, Green Infra Solar: 35MW</td>
</tr>
<tr>
<td>Developers</td>
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</table>
Competitive Bidding Experience- JNNSM (Ph-I)

- Reverse Bidding process is strictly not conformity with S63 provisions.

- In Batch-1 (SPV), many bidders (571 MW of 2911 MW) opted for ‘zero discount’

- In Batch-2 (SPV), 75 of 184 bidders (960 MW of 2185 MW) opted for ‘zero discount’

- Key success factors and Support framework for NVVNL framework
  - Assured long term off-take through trading co. (NVVNL) with bundled power
  - Payment security mechanism backed by MNRE
  - Appropriate Risk allocation and mitigation mechanism
### JNNSM Phase 2 Bidding (Batch-I, II, III)

<table>
<thead>
<tr>
<th>JNNSM Phase 2 Batch 1</th>
<th>JNNSM Phase 2 Batch 2</th>
<th>JNNSM Phase 2 Batch 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managed by</strong></td>
<td>SECI</td>
<td>NVVN</td>
</tr>
<tr>
<td><strong>Minimum and Maximum Project Capacity</strong></td>
<td>Min: 10 MW, Max: 50 MW</td>
<td>Min:10MW Max: 50 MW</td>
</tr>
<tr>
<td><strong>Allocation method</strong></td>
<td>Reverse bidding for viability gap funding demand. Maximum VGF: INR 25 million/MW</td>
<td>Reverse Bidding on CERC Benchmark Tariff (through e-reverse auction)</td>
</tr>
<tr>
<td><strong>Commissioning time period</strong></td>
<td>13 Months</td>
<td>13 Months of the date of signing of PPA.</td>
</tr>
<tr>
<td><strong>Maximum capacity by a bidder</strong></td>
<td>100 MW</td>
<td>500 MW</td>
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</tbody>
</table>
Q3 2018 saw commissioning of 1,188 MW of utility scale solar capacity, up 65% over Q2 2018

Source: Bridge to India
Trend of price discovery through Competitive Bidding framework (Solar)

- Weighted Average Tariff (in Rs/kWh)
- Capacity (in MW)
Competitive Bidding Regime –
Analysis & Key Learnings from the Wind Auction Process

- Central v/s State Auctions
Overview of Competitive Bidding Framework – Wind Projects

**Bid Size**
- Inter-State bid capacity 25 MW
- Inter-State bid capacity 50 MW

**Bidding Parameters & Process**
- Tariff (single part) based
- Single stage two envelope process
- Single stage two envelope process followed by e-Reverse Auction

**Preparatory Activities**
- Identification of 100% land at bidding stage-procession within 7 months from PPA
- Clearances (Environmental/Forest)
- Grid Connectivity

**Qualification & Bidding conditions**
- Past track record, timely execution etc.
- Financial criteria - (at least 20% of est. cap cost)
- EMD, PBG

**Timelines and milestones**
- Issue of RFP to PPA – 105 days
- Financial Closure – 7mths from PPA
- CoD – 18 months from PPA

**PPA Terms & conditions**
- 25 years
- To declare CUF upfront and allowed one time revision in first year of CoD
- Allowed to repower plant

**Curtailment compensation**
- Offtake constraints due to Grid Unavailability-
- Offtake constraints due to Back down

**Payment Security**
- LC (equiv. of 1 Month billing)
- PSF (equiv. of 3 Months billing)
- SGG (to cover energy charges plus termination compensation)(optional)
Competitive Bidding – An Experience till now

Competitive Bidding for the Wind Projects was introduced in November, 2016, making the Wind Energy Sector entirely Market Driven.

Resulted in withdrawal of regulated tariffs & financial aids available to WPDs in form of AD & GBIs.

Positive Outlook – Wind Tariffs fell to an all time low, resulting in greater wind power offtake.

Increased focus on technological innovation by the manufacturers for further bringing down the Levelised Cost & increasing the PLF.

Biggest Challenge pertains to Grid Connectivity allocation and access.

Leads to significant cost overruns during project development & possibly idle capacity post commissioning of the project, due to lack of Transmission Connectivity.

Challenges further amplified by Short-Term milestones created by the Competitive Bidding that questions the viability of Wind Projects.
In the past three years, around ~7500 MW of Wind capacity projects has been awarded thru CBG framework.

Price discovery has hit low end ~ Rs 2.5 pu and ticket size of project has varied from 50 MW to 250 MW.
From the above graph it is seen that Adani Green has the maximum capacity of **1415 MW**

The lowest Capacity is with K.P Energy of **30 MW**
Range of Bid wise awarded tariff

Bid Wise Tariff (Rs./kWh)

- Average Bid wise quoted tariff range from **Rs.3.46/kWh** for SECI 1 to **Rs.2.43/kWh** for Tamil Nadu
- The range of **Maximum** quoted tariff for State level Bids (vix. Maharashtra, Gujarat and Tamil Nadu) varies from **Rs.2.52/kWh (MH)** to **Rs.2.45/kWh (Gujarat & Tamil Nadu)**
## Wind Projects under Bidding & Planning Calendar

<table>
<thead>
<tr>
<th>Bid</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<tr>
<td></td>
<td>2016-17</td>
<td>2017-18</td>
<td>2018-19</td>
<td>2019-20</td>
<td>2020-21</td>
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<tr>
<td>Capacity (MW)</td>
<td>1000</td>
<td>2450</td>
<td>2950</td>
<td>4950</td>
<td>6950</td>
<td>7450</td>
<td>11050</td>
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<td>SECI-1 (1000)</td>
<td>Bid-Feb-17</td>
<td>PPA-Sept-17</td>
<td>Commission-Sept-18</td>
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<tr>
<td>SECI-2 (1000)</td>
<td>Bid-Oct-17</td>
<td>PPA-May-18</td>
<td>Commission-May-19</td>
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<tr>
<td>SECI-5 (1200)</td>
<td>Bid-Dec-18</td>
<td>LOA-Jan-19</td>
<td>PPA-Mar-19</td>
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<tr>
<td>SECI-6 (Hybrid) (1200)</td>
<td>Bid-Aug-18</td>
<td>LOA-Oct-18</td>
<td>PPA-Jan-19</td>
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<td>NTPC (1200)</td>
<td>Bid-Dec-17</td>
<td>LOA-Jan-18</td>
<td>PPA-Nov-18</td>
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<td>Maharshta (500)</td>
<td>Bid-Dec-17</td>
<td>LOA-Jan-18</td>
<td>PPA-Nov-18</td>
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<td>Gujarat (500)</td>
<td>Bid-Aug-17</td>
<td>LOA-Oct-17</td>
<td>Commission-Aug-19</td>
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<tr>
<td>Tamil Nadu (450)</td>
<td>Bid-Aug-17</td>
<td>LOA-Sept-17</td>
<td>Commission-Apr-19</td>
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<td>Date of Announcement</td>
<td>Agency</td>
<td>Capacity (MW)</td>
<td>RFS Status</td>
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<td>24 December 2018</td>
<td>Maharashtra</td>
<td>500</td>
<td>Not Issued</td>
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<td>28 November 2018</td>
<td>Tamil Nadu TANGEDCO</td>
<td>500</td>
<td>Not Issued</td>
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<tr>
<td>31 December 2018</td>
<td>SECI-Tranche -6</td>
<td>1200</td>
<td>Issued</td>
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**Announcements**

- India finalizes bids for setting up over 8,000 MW wind power projects through SECI & NTPC: RK Singh
- Beside above projects, bids of 500 MW each have been finalized by the states of Tamil Nadu, Gujarat, and Maharashtra
Factors affecting Solar and Wind tariff through Bidding Process

- Bankability of PPA: Tri-patriate Agreement between, State Govts, RBI and SECI.
- FDIs: Number of foreign investors are investing aggressively.
- Solar Parks: Development of solar parks reduced number of issues.
Industry standard open, transparent bidding process

e-bidding platform

Reverse Auction platform.

Project specific elaborated technical specifications.

Continuously updating the technical specs along with market trends and best practices.
Ongoing Challenges faced by Solar & Wind Power Developers
Some other developments related to Bidding

- **Postponing of solar bids on several occasions, poor response to bids**
  - 1 GW solar PV tender by MSEDCL (postponed 4 times)
  - Karnataka (once), allowed 550 MW out of the 1200 MW bid for which prices received were below ceiling rate. But no reverse bidding.

- **‘Change in Law’ uncertainty; pass through of safeguard duty of imported panels**
  - MNRE later issued a clarification (2/4/18) to the solar bidding guidelines stating, "As per Clause 5.7.2 of said Guidelines, the term 'Change in Law' includes any change in the rates of any Taxes which have a direct effect on the Project. To remove uncertainty, it is hereby clarified that the term 'change in the rates of any taxes' as mentioned in clause 5.7.2 of solar bidding guidelines includes "change in rates of taxes, duties and cess."

- **Cancellation of solar bids by GUVNL**
  - Sep, 2017, 500 MW, price Rs 2.65-2.67/kWh
  - March, 2018, 500 MW, price Rs 2.98-3.06/kWh
  - Eventually GUVNL board resolved to cancel the bid, as “discovered were on the higher side” as per clause 3.22 of the RFS which allows the procurer the right to annul the bidding process “at any stage without assigning any reasons”
Delay in meeting Conditions Subsequent

- **MPPMCL**
  - Procuer cancelled the PPA due “delay in achieving conditions subsequent” and invoked bank guarantee for the same delay. Essentially a 16 day delay in procuring 100% in the developers name even after a 9 month extension beyond the 210 day timeline.

- **High Court: ReNew Clean Energy Private Ltd Vs MPPMCL & Ors**
  - Renew Power filed a Writ Petition (12432 of 2017) at the MP HC against the respondent’s stand regarding cancellation of PPA due to “delay in achieving conditions subsequent” of project and invocation of bank guarantee for the same delay.
  - The Court maintained that MPPMCL’s invocation of bank guarantee was valid as per clause 2.1 in the PPA, and while the reasons for delay did not come under force majeure, the petitioner had no alternate remedy for the same.
  - Hence, while the prayer of quashing the order of termination was allowed, the HC upheld the invocation of bank guarantee by MPPMCL for the delay.

- **Supreme Court: MPPMCL Vs ReNew Clean Energy Private Ltd & ANR**
  - In response to this, MPPMCL filed a Civil Appeal at the SC to rescind the PPA. The Court upheld the HC’s verdict and ordered the respondent to pay the fine of Rs. 119 million in the form of invoked bank guarantee while still setting aside the order on termination of contract.
Land Acquisition

Wind Developers who have won projects in Gujarat through SECI Tranche IV 2000 MW are in bind, since they have been asked to achieve Financial Closure by 3 January, 2019 (The same has been extended by 2 Months – News Article)

• Developers after the award of Contract, approached Govt. of Gujarat for leasing of Land.
• With a scarcity of sites that have adequate wind speed in Gujarat, the State Govt. decided that the it will lease land solely to its own utility, GUVNL and not for Centrally allocated projects, whose power can be supplied anywhere in the country through ISTS.

“We are keen to have an amicable solution to the issue, but SECI should have first consulted the state as to whether we can give land or not,” said a senior Gujarat government functionary dealing with the issue. “We want the entire sector to develop. It is in the overall benefit of the state and the country, so we will allot the land.”

• SECI’s 2,000 MW wind auction in April left its developers to decide where they wanted to locate their projects. Since the best wind energy sites are available mostly in Gujarat and Tamil Nadu, most of the winners sought to set up projects in Gujarat.
• SECI has since conducted another 2,000 MW wind auction in June, followed by a 1,200 MW auction in September, many of whose winners too are keen on Gujarat-based sites.
• Of the total of 7,000 MW of wind projects auctioned by SECI this year, around 3,500 MW are expected to be in Gujarat.

*Source : Economics Times
### Salient Features of CERC F&S Regulations

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>To maintain grid discipline and grid security as envisaged under Grid Code through commercial mechanism for deviation settlement through drawl and injection of electricity by users of the grid.</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>Applicable to Solar and Wind Generators which are Regional entities</td>
</tr>
<tr>
<td><strong>Forecasting</strong></td>
<td>Multiple forecasting by both the RLDC/REMC and Solar and Wind Generators/ (QCAs on behalf of Gen) for better confidence level/lower Forecast Errors.</td>
</tr>
<tr>
<td><strong>Frequency of revision of schedule per day</strong></td>
<td>1 revision for each time slot of 1.5 Hrs. starting from 00:00 hours of a particular day maximum of 16 revisions during the day.</td>
</tr>
<tr>
<td><strong>Definition of Forecasting Error</strong></td>
<td>Error (%) = (Actual Generation – Scheduled Generation) / (Available Capacity) x100</td>
</tr>
<tr>
<td><strong>Tolerance limits</strong></td>
<td>Within +/-15% band.</td>
</tr>
<tr>
<td><strong>Data telemetry</strong></td>
<td>Required at the Wind turbine/Solar inverter level. Parameters such as turbine availability, power output and real-time weather measurements (Wind speed, temperature, pressure etc.) must be provided by the Generator.</td>
</tr>
</tbody>
</table>
Final Regulations notified by following States...

- Andhra Pradesh
- Chhattisgarh
- Jharkhand
- Karnataka
- Rajasthan
- Tripura
- Uttarakhand
- Uttar Pradesh
- Madhya Pradesh
- Maharashtra
- Telangana
- Assam, Mizoram
- Sikkim, Manipur, Meghalaya

- Around 4 states have notified procedures
- Implementation of F&S at State level underway
Co-existence of FITs, RECs, CBG framework

Renewable Attributes

- Preferential Tariff regime
- APPC + REC regime
- Captive/Third Party RE Wheeling
- Competitive Bidding ??

Regulated

Market determined

Electricity Component

RPO target setting and Enforcement is crucial

RE resource specific RPO target setting and stringent enforcement is crucial
Conclusion

❑ Highly competitive price discovery under bidding process, both for solar and wind.

❑ Transmission connectivity and LTA could soon become a bottleneck and major risk factor.
   □ New framework to minimise risk, better risk allocation
   □ Lesser risk for solar since resource not very site-specific, existence of solar parks.
   □ CTU/STU must proactively plan and build transmission corridors for renewable energy, considering long term targets and likely resource locations.

❑ Will soon need newer bidding frameworks for offshore wind, wind-solar hybrids, wind/solar + storage etc.

❑ Further, will need to prepare for competition across renewables (wind vs solar etc.) and further still competition across all generation sources (renewables vs coal, gas etc.)

❑ Long term targets and frequent bids necessary until DISCOMs internalize least cost planning incl. renewables.
Thank You

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