TRANSMISSION OPPORTUNITIES, CHALLENGES & WAY FORWARD

Confederation of Indian Industry
NEW DELHI
November 2, 2012

RAJEEV DALELA
Demand far outstrips supply

- **Low demand base:** Per capita consumption at 704kwhr, less than 30% of the global average.

- **High deficits:** Peak deficits have remained high between 10% and 14% over the last five years.

- **Economic growth to boost demand:** To sustain a GDP growth trajectory of 8-9% power sector needs to grow at least 8.1% per annum.

- **Supply side:** The planned capacity addition of 76 GW in 12th Plan i.e. 1.5 times of the capacity addition during 11th plan.
Transmission Sector: 12\textsuperscript{TH} Plan

- New Transmission Schemes Planned for 12th Plan Period - 119,000 – 126,000 ckm
- Increase in Transmission Sector investment by 71% during the 12th plan with an increase in the share of Power Sector investment from 13% to 21%.
- Huge Investment projection in 12th plan - Rs 1,80,000 Cr
  - Central - Rs 1,00,000 Cr, State - Rs. 55,000 Cr & Private - Rs. 25,000 Cr.
  - Inter-State (incl. Pvt) 125,000 crore & Intra-State 55,000 crore
- Inter-Regional Transmission Capacity Programme up to 12th Plan of 75GW and country wide synchronous Grid by 2014.
- Thrust on 765kV and HVDC Transmission System in the 12th Plan / 13th Plan Period. Approx 27% of new line addition at these voltage level as against of 10% in 11\textsuperscript{th} plan.
- Development of 1200kV transmission system

<table>
<thead>
<tr>
<th>Transmission lines additions (in circuit KMs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>HVDC Lines</td>
</tr>
<tr>
<td>765 kV</td>
</tr>
<tr>
<td>400 kV</td>
</tr>
<tr>
<td>220 kV</td>
</tr>
<tr>
<td>Total</td>
</tr>
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Source: CEA Monthly Report, India
PGCIL : 12TH Plan

- PGCIL 12th plan capex outlay of Rs. 100,000 crs with share of 57% in total Transmission spend as against 39% in the 11th plan.

- Investment Approvals received for Schemes worth Rs.84,000 cr., Contracts awarded for Rs.70,000 cr.

- Funds tied up for 22,000 cr debt requirement out of total projected 70,000 cr debt.

- Discussion underway with State Govts. to develop Intra State Transmission for Bihar, Odisha, Chhattisgarh, Manipur, UP, MP, Tamil Nadu, Karantaka

- PGCIL appointed Implementation & Supervision consultant for 6 states of NER with project cost 8400 Crs.

- High Focus on projects under TBCB projects, Successfully secured two projects floated after National Tariff regulation.

### PGCIL Capex Plan - 12th plan

<table>
<thead>
<tr>
<th>Project/ Schemes</th>
<th>Capex (Rs Cr.)</th>
<th>Capex ($ bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Sector Generation</td>
<td>20,000</td>
<td>3.9</td>
</tr>
<tr>
<td>UMPP</td>
<td>14,000</td>
<td>2.8</td>
</tr>
<tr>
<td>IPP</td>
<td>55,000</td>
<td>10.8</td>
</tr>
<tr>
<td>Grid Strengthening</td>
<td>11,000</td>
<td>19.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100,000</strong></td>
<td><strong>37.2</strong></td>
</tr>
</tbody>
</table>

*Source : PGCIL, India*

### PGCIL Capex Targets/Achievement (in '000 cr)

<table>
<thead>
<tr>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7</td>
<td>8.2</td>
<td>10.6</td>
<td>12.1</td>
<td>17.9</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>20</td>
<td>21</td>
</tr>
</tbody>
</table>

*Yearly Targets & Achievements*
Upcoming Business opportunity

• Green Energy Corridors - Grid Integration of Renewable Energy
  42,000 cr investment in transmission for 40 GW
  Planning intra state/ inter state transmission requirement and mechanism for forecasting
generation & Demand side management .
  • Intra State TS Strengthening – 20000 cr
  • Inter State TS strengthening - 22000 ct

• Transnational Interconnections – Towards SAARC GRID
  Development of cross border interconnection with Neighboring countries.
  Steps have been initiated to establish New transmission links with Bangladesh, Nepal, Bhutan
& Indo – Sri Lanka under sea link

• Private Investment
  Investment Planned during 12th Plan Rs 25,000 cr. through IPTC route as against Rs 20,000 crs
in 11th plan mostly through JV and partly through IPTC.

• Major intra state grid strengthening and capacity enhancement expected from various states through BOO
  and EPC route.
Sector Capacities & capabilities

- **Contractors** – Globally 6 out of the leading 10 EPC contractors are from India with global presence and capability to work at 765 KV and above level.
- **Tower Manufacturing capacity** – Existing capacity of more than 2mn MT and capacity enhancement underway by many players to meet future demand.
- **Design Capability** – Extensive experience of designing the system at 765 kV D/C & 1200 kV S/C, PGCIL providing consultancy to various utilities globally.
- **Tower Testing Capability** - Testing facilities available at more than 10 locations capable of Testing tower up to 1200 kV level and is recognized world over and covers max. operating voltage level available globally.
- **Project execution experience** – proven capabilities of executing project in diverse terrain both within and outside India using advance construction technologies. Advanced project management practices being adopted globally for planning and execution.
Challenges & Way Forward

- Right of Way has become perennial problem across states leading to inordinate delays in Project Implementation. Requires policy reform under applicable Indian Telegraph Act, 1885.

- Forest clearances: Project being cross country forest is unavoidable. However being least/ no impact work regulation needs be relaxed and norms regarding tower heights and design can be considered for faster clearances.

- Encourage use of Modern Construction Technologies, with emphasis on greater mechanization to reduce time and cost for construction.

- Skilled Manpower: Efficient inflow of right skills and manpower. Greater industry participation required in opening/Adopting ITI and training institutes.

- Encourage use of Modern project management tools followed by timely monitoring and corrective actions to avoid delays and consequential losses.
Challenges: Private Developers

- Delay in finalisation of New Schemes due to changes in tariff regulations, bidding norms and generation project delay impacting sector attractiveness and low visibility of project pipeline.
- Large number of clearances, no integrated processing leading to delays, reduction in revenue earning period, and cost uncertainty.
  - BPC role needs to be redefined and mechanism needs to be established for providing single window clearances inclusive of License, tariff adoption, Section 164 clearance and land acquisition for sub-station.
- Reducing the bid cycle time and associated cost overrun due to delays which are beyond bidder’s control.
- Encourage adoption of innovation, cost efficient latest technologies available globally.
- Allow certain risk such as commodity, currency to be pass through thereby eliminate speculation and encourage sustainable & fair Tariff.
- Improve project bankability and create funding opportunities.
Challenges: EPC Contracts

- Complexity and magnitude of work needs to define project completion period.
- Non standard and outdated specifications being followed by many State utilities.
- No Mechanism to address the contractual issues arising during the currency of the contract and often handled in arbitrary and high handed manner.
- Adopt Modern Project management practices in planning and monitoring for smooth project Execution.
- Route shall be finalized before award through dedicated office and timely applying for various environmental and forest clearances to curtail project Delays.
- Completion of Engineering and design before award of project.
- No time frame for commercial closure of contracts after the project is commissioned, leading to huge cost to the contractors.
EPC Contracts: Suggestions

- Revision of bidding framework/evaluation criteria on capability and performance

- Develop Specifications to encourage:
  - Technology usage
  - Incentive for faster execution
  - Safety compliance
  - Mechanization

- Contract Conditions to be relooked to address Contractual risk sharing framework on fair and equitable basis as in case of most International contracts.

- Just & Fair Compensation for Delays by the owner.

- Easier and quicker contract closure, should be a contract milestone.

- Delayed payment compensation especially in case of State utilities.

- Dispute Resolution mechanism to be more robust and fair.
• **Private Sector Participation** – All new transmission schemes in future would be implemented through **competitive bidding process** as far as possible.

• **Right of Way** –
  • To **reserve transmission corridor** in High density populated area like metros and other upcoming urban areas, to meet future demand.
  • **Town planning** for new sub urban area and industrial centres to have provision for laying transmission line should be kept in mind.
  • **Land compensation** for the land occupied by Transmission tower at prevailing market rate. Central Government may issue notification on consultation.

• **Forest Clearance**
  • Exemption/relaxation for obtaining consent of Gram Sabhas,
  • Delegated of powers of Regional MOEF for approval to be enhanced,
  • Expediting Stage II approval after Stage I approval.
Key Recommendation of Working Group on Power: 12\textsuperscript{th} Plan (2012-17)

- Measures to meet Challenges in the Sector
  - \textbf{Increase in transmission voltage},
  - \textbf{Up gradation of transmission line},
  - \textbf{High capacity 400 kV multi circuit/ bundle conductor lines},
  - \textbf{Compact towers},
  - \textbf{Increase in current through HTLS conductor}

- Funding through grant for setting up TL for \textbf{evacuation of power from Renewable Energy Source (RES)}, to encourage RES rich states.

- \textbf{Training infrastructure} has been identified as paramount importance and argued to utilities to invest 0.25\% of profit annually for meeting training expenses.
Technology trends

Move to higher voltage
- High Intensity (MW/m) transmission corridor by increasing
- 800 kV HVDC and 765 kV DC high capacity corridors under execution
- Development of 1200 kV transmission system for future demand

Increase in Current Carrying Capacity
- Multi Conductor Bundle Line
  - 400 kV, 765 kV, 800 kV, 1200 kV
- High Temperature Low Sag (HTLS) Conductors
  - ACSS, ACAR, INVAR, GAP
- Re-conducting existing line, New lines
- Enhanced capacity, high corrosion resistance, low loss

Design Improvement
- Compact/ Narrow base towers, Tall towers
- Pole type towers
- Multi circuit towers
THANK YOU