POWER GRID CORPORATION OF INDIA LTD.
(A Govt. of India Enterprise)
Welcomes Officials of BRICS Member Countries

Chennai
November 18, 2016
POWERGRID

- Overview
- Technology Development
- Diversification
  - Telecom
  - Consultancy (Domestic)
  - Consultancy (International)

Sustainability & Corporate Social Responsibility (CSR)

Recognition- Awards & Accolades
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About POWERGRID

- Incorporated in 1989
  - Assets from various CPSEs (NTPC, NHPC, NEEPCO, THDC, NLC and NPC) transferred during 1991-1993. Started commercial operation in 1992-93

- Five Regional LDCs transferred to POWERGRID by GoI during 1994-1996

- Central Transmission Utility (CTU) of the country, since 1998

- Accredited ‘Navratna’ status, by Govt. of India, in 2008

- Listed on BSE & NSE
  - Shareholding (Jun’16): GoI-57.90%; Public: 42.10% (FPIs-26.49%, DII-8.44%, others-7.17%)

- Consistently rated “Excellent” by GoI, since signing of its first MoU in 1993-94

- Credit Ratings
  - Domestic: Highest i.e. AAA by CRISIL, ICRA & CARE
  - International: BBB(-); Outlook: Stable by S&P and Fitch Ratings – in line with Sovereign Ratings
### Physical Parameters (as on 31.08.16)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Lines</td>
<td>1055 Nos.</td>
</tr>
<tr>
<td></td>
<td>131,728 ckm</td>
</tr>
<tr>
<td>Substations</td>
<td>213 Nos.</td>
</tr>
<tr>
<td></td>
<td>266,163 MVA</td>
</tr>
</tbody>
</table>

### Financial Parameters (FY15-16)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Fixed Assets</td>
<td>USD 22.4 bn ( ₹ 150,052 cr.)</td>
</tr>
<tr>
<td>Turnover</td>
<td>USD 3.2 bn ( ₹ 21,281 cr.)</td>
</tr>
<tr>
<td>Profit After Tax</td>
<td>USD 0.9 bn ( ₹ 6,027 cr.)</td>
</tr>
</tbody>
</table>

### Global Presence:
- Footprints in 18 countries

Fastest Growing Electric Utility in Asia for 3 successive years
3rd Fastest Growing Electric Utility in the World

Source: Platts Top 250 Global Energy Company Rankings, 2016
**Areas of Operation**

**Transmission**
- Owns and operates ~90% of India’s ISTS
- Inter-State, Inter-Regional and Transnational links
- Green Energy Corridors
- Development of 1,200kV UHV-AC

**Grid Management** (through 100% subsidiary, POSOCO)
- Real-time grid operation
- Optimum scheduling & dispatch
- Energy accounting & settlements
- Provides non-discriminatory short term open access
- Administering Renewable Energy Certificate mechanism

**Telecom**
- Leverages POWERGRID’s nationwide transmission infrastructure
- Owns and operates more than 36,500 kms. of telecom network
- Implements GOI’s strategic initiatives:
  - National Knowledge Network (“NKN”)
  - National Optic Fiber Network (“NOFN”)

**Consultancy**
- Leverages in house expertise for providing services in areas of transmission, distribution and telecom
- Provides services to:
  - State power utilities, private sector and government utilities domestically and internationally including in Asia, Africa and other SAARC countries
Growth since Commercial Operation - Physical

- S/S  -ckm  -MVA

As on Mar’16
✓ 255,348 MVA
✓ 129,354 ckm
✓ 207 S/S

As on Mar’93
✓ 12,201 MVA
✓ 22,228 ckm
✓ 39 S/S

Last 5 yrs
GROWTH SINCE COMMERCIAL OPERATION - FINANCIAL

- Gross Fixed Assets
- Income
- Profit after Tax

As on Mar’16/FY16
✓ GFA: USD 22.4 bn [₹ 150,052 cr.] (Mar’16)
✓ Income: USD 3.2 bn [₹ 21,281 cr.] (FY16)
✓ PAT: USD 0.9 bn [₹ 6,027 cr.] (FY16)

As on Mar’93/FY93
✓ GFA: USD 0.53 bn [₹ 3,521 cr.] (Mar’93)
✓ Income: USD 0.09 bn [₹ 634 cr.] (FY93)
✓ PAT: USD 0.04 bn [₹ 236 cr.] (FY93)

Last 5 yrs
Development of Synchronous National Grid

- **One of the largest Electricity Grids operating at single frequency in the world**
- **March 2003** West synchronized with East & North-East
- **October 1991** East & North-East synchronized
- **August 2006** North synchronized with Central Grid
- **Dec'2013** South synchronized with NEW Grid

**Inter-Regional (I-R) Capacity (MW, as at the end of)**
- IX Plan: 5,050
- X Plan: 14,050
- XI Plan: 27,750
- Jun-16: 61,150
- XII Plan(*): 72,250

* Planned
To facilitate Grid integration of large scale renewables

~ 33GW capacity addition envisaged through wind & solar

GEC Plan includes Trans. Strengthening, Dynamic Reactive Compensation, Energy Storage, establishment of Renewable Energy Management Centre and Smart grid applications etc.

POWERGRID implementing Inter-State portion: USD 2.2 bn [₹ 15,000 cr.] - funded by KfW, ADB

Evacuation System for Solar Parks

- Evacuation System for Solar Parks of >20GW envisaged
- POWERGRID assigned to implement evacuation system for 9 Solar Parks
- Implementation commenced
- TS for Andhra Pradesh UMSPP commissioned
POWERGRID

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Recognition- Awards & Accolades
New Technology in Transmission

Adoption of Higher Voltages

- 765kV HVDC (2007)
- ±800kV HVDC (2015)
- 1200kV UHVAC (2016)

STATCOM

Smart Grid (WAMS-PMU)

Reconductoring

WAMS = Wide Area Measurement System, PMU = Phasor Measurement Unit
Implementation of ±800kV HVDC Bi-pole line

- World’s longest multi-terminal ±800kV HVDC
- Power Transfer capacity: 6000 MW
- Part of NE-N/W Interconnector Project
- Line length of Biswanath Chariyali – Agra tr. Line: ~ 1750 km
- States covered enroute: Assam, West Bengal, Bihar, Uttar Pradesh
- Line traverses through Chicken’s Neck (only 21km wide stretch) in West Bengal
- More than 40 rivers crossed en-route
Indigenous Development of 1200kV UHVAC

- Developed indigenously
- Through Public Private Partnership (PPP) with 35 Indian manufacturers in open collaboration
- Field trials since 2012
- Power flow commences in Apr’16
- Feedback satisfactory

World’s highest voltage, 1200kV UHV AC, test charged at Bina, Madhya Pradesh
Use of New Technology in Transmission

Use of Unmanned Aerial Vehicles (Drones)

National Transmission Asset Management Centre (NTAMC)
- Established at Manesar, Gurgaon
- 120 sub-stations remotely operated from NTAMC

Aerial Patrolling using Helicopters

Hot Line Maintenance

Emergency Restoration System (ERS)
Continuous Learning – Key to sustaining success

POWERGRID Academy of Leadership (PAL) –
A Centre for Innovation, Continuous Learning & Capacity Building

A World Class Training Institute

Simulation and Lab facilities
Smart Grid Knowledge Centre
Energy Efficiency Demo
Substation Automation System
R&D Center Manesar
Material Science Lab
Advance Diagnostics
WAMS Testing

Fulfilling learning needs -
Technical, Managerial and Behavioral

Benefitting both internal and external stakeholders
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Recognition- Awards & Accolades
Telecom

Infrastructure & Licenses
- Infrastructure
  - Fiber Optic Network: ~ 36,500km
  - Points of Presence: 595

- Licenses/Registrations
  - NLD (National Long Distance)
  - ISP (Internet Service Provider) - Category ‘A’
  - IP-I (Infrastructure Provider)

Services Offered
- Point to Point dedicated Bandwidth Leased Lines
- MPLS-VPN
- Internet Leased lines
- Dark Fiber
- Tower Space

Clientele
- NLDOs/ILDOs
- Unified Access Providers (incl. all Leading Telcos)
- Global IT Companies
- ISPs
- Central & State Govt. incl. PSEs
- Corporates incl. MNCs

Notable Projects

MPLS
- Commercial launch in Apr’14
- Clients – from both CPSUs & Pvt. Sector. In-house requirement for NTAMC and ERP

National Knowledge Network (NKN)
- Project completed - Under Operation

National Optical Fiber Network (NOFN)
- Execution in 4 States

MPLS = Multi Protocol Level Switching, VPN = Virtual Private Network
Consultancy (International)

Footprints in 18 countries

Under Execution

15 Assignments
Project Cost: ~ USD 250 mn

Major On-going assignments

• EPC Consultant: CASA 1000 Project *(Funded by the World Bank)*
• HVDC Back-to-Back Stn.- Bangladesh *(Funded by ADB)*
• Implementation Support for 4 (Four) TL & S/S Projects – Nepal *(Funded by ADB, WB, KfW)*
• Engg. & Project Management for TL & S/S – Kenya *(under GoI Line of Credit)*
• Evacuation System for Punatsangchu I & II HEP in Bhutan (funded by GoI)
### Major International Assignments (Completed)

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Turnkey Execution of 220 kV Transmission Line &amp; substations; Capacity Building</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Indo-Bangladesh I/C - 1x500MW HVDC B2B &amp; associated TLs; Feasibility Studies &amp; Capacity Building</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Consultancy Assignment for Design &amp; Construction of 400kV D/C Transmission Lines; Capacity Building</td>
</tr>
<tr>
<td>Nepal</td>
<td>Consultancy Services for Implementation Support for 220kV/ 400kV Transmission Lines and Capacity Building</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Supply of Goods and Related Services for 230kV TS (under GoI Line of Credit)</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Consultancy Assignment for Feasibility study for Interconnection of India Sri Lanka Electricity Grids</td>
</tr>
<tr>
<td>UAE</td>
<td>Engineering Consultancy Services for construction of 2 Nos. 400 kV GIS Substations and associated Transmission Lines for DEWA</td>
</tr>
</tbody>
</table>
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<tr>
<td><strong>Ethiopia</strong></td>
<td>Management Contract for Establishment &amp; Management of Ethiopian Electric Power Company; Identification of Strategic High Voltage TS</td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
<td>Feasibility Studies of Transmission Lines &amp; Capacity Building</td>
</tr>
<tr>
<td><strong>Nigeria</strong></td>
<td>Consultancy for Telecom &amp; S/S Automation System; Capacity Building</td>
</tr>
<tr>
<td><strong>CASA</strong></td>
<td>Feasibility Study for 500 kV Transmission Strengthening in Tajikistan Grid for CASA-1000 Project [Afghanistan, the Kyrgyz Republic, Pakistan &amp; Tajikistan]</td>
</tr>
</tbody>
</table>
Areas of Consulting Services

- Transmission System Planning & Feasibility Studies
- Environmental & Social Studies
- Design & Engineering
- Contract/ Procurement Services
- Project Management & Construction Supervision
- Capacity Building
- Asset Management (Operation & Maintenance)
- Other Services (*)

(*) Other Services

- Owners’ & Lenders’ Engineer Service to Utilities and Funding Agencies
- Preparation of Grid Code
- Preparation of Tariff Mechanisms
- Smart Grid Solutions
- Energy Efficiency Solutions
- Legal & Technical Advisory in Power Transmission
- Advisory in Market Analysis, Implementation of Renewable Energy Certificate Mechanism
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Sustainability

Environment & Social Policy & Procedures

- Committed to the goal of sustainable development and conservation of nature & natural resources.
- Strictly follows the basic principles of Avoidance, Minimization and Mitigation in dealing with environmental and social issues.
- Restoration and enhancement undertaken, wherever necessary

Certifications

- OH & SMS ISO 18001:2007
- EMS ISO 14001:2004
- SAS SA 8000:2008
- QMS ISO 9001:2008
- IMR PAS 99:2006
- ISO/IEC 27001:2013

World Bank has selected POWERGRID's ESPP as the first candidate for 'Use of Country Systems' in India

Signatory to Integrity Pact of Transparency International since 2009

1st Company among Power Sector CPSUs to publish Sustainability Report
**Corporate Social Responsibility**

**Major Thrust Areas for CSR**

- Rural Development
- Skill Development
- Education
- Health
- Environment

**Major CSR Projects**

- Construction of ~9,500 toilets in ~4,250 schools in 7 States under ‘Swachh Bharat Mission’ of GoI
- Construction of 10 storeyed, 325 bedded Dharmashala (Resting Place) at AIIMS Trauma Centre, New Delhi
- Improving Rural Livelihoods through Farmer-centric Integrated Watershed Management on 10,000 hectares of land in AP & Karnataka through ICRISAT (The International Crops Research Institute for the Semi-Arid Tropics)
- Skill Development to 1500 handicapped persons (through NHFDC) and > 5000 youth (through NSDC)
- Installation of Hand Pumps, Borewells & Solar Street Lights in villages
- Supply of Solar lanterns to 10,000 students in villages
- Scholarships to ~ 5,500 Students
- Supply of Aids and appliances to ~ 2000 persons with disabilities

- During FY16, USD 18 mn was spent on CSR activities
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Major Awards & Accolades

- Recognised as ‘One of the Best Companies to Work For, 2016’ by ‘Great Places to Work’
- Commendation Certificate at Rajiv Gandhi National Quality Award 2013 in large scale service industry in utilities sector
- ‘Star PSU of the Year’ by Business Standard Annual Awards 2014
- ‘Most Valuable Company Award’ and ‘Best Performing Company Award’ in Navratna category at India Today PSUs Awards 2015
- Dun & Bradstreet Awards: PSU Award 2015 & Infra Awards 2015
THANK YOU