



# **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
  - IPO in Sept. 2007 and FPOs in Nov. 2010 & Dec. 2013
  - 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

# POWERGRID Today

## Physical Parameters (as on 31.08.16)

Transmission Lines	1055 Nos.
	131,728 ckm
Substations	213 Nos.
	266,163 MVA

## Financial Parameters (FY15-16)

Gross Fixed Assets	USD 22.4 bn ( ₹ 150,052 cr.)
Turnover	USD 3.2 bn ( ₹ 21,281 cr.)
Profit After Tax	USD 0.9 bn ( ₹ 6,027 cr.)

**Global Presence:** Footprints in 18 countries

**Fastest Growing Electric Utility in Asia for 3 successive years**  
**3<sup>rd</sup> Fastest Growing Electric Utility in the World**

Source: Platts Top 250 Global Energy Company Rankings, 2016

# Areas of Operation

## Transmission



## Grid Management

(through 100% subsidiary, POSOCO)



## Telecom



## Consultancy



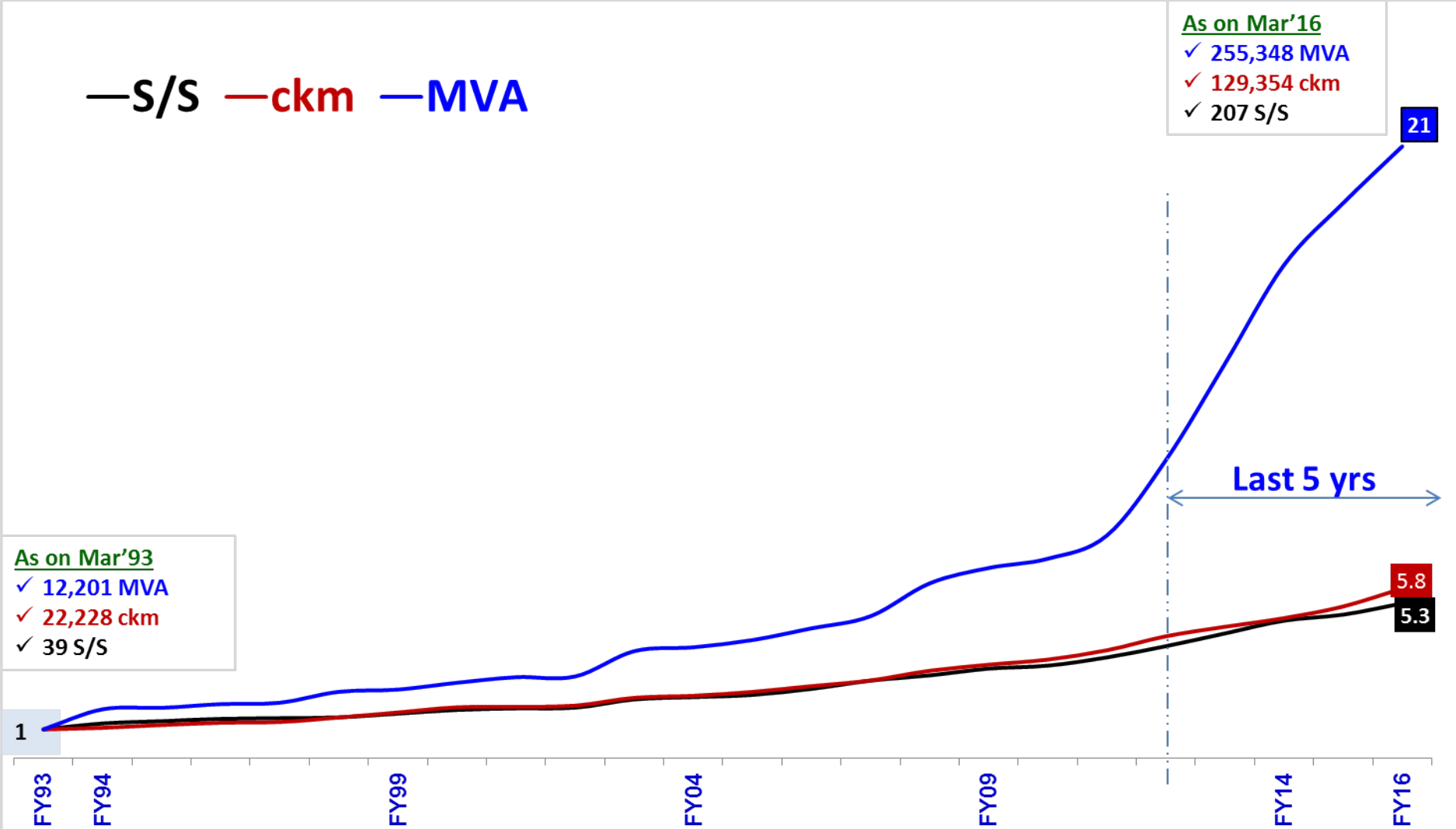
- Owns and operates ~90% of India's ISTS
- Inter-State, Inter-Regional and Transnational links
- Green Energy Corridors
- Development of 1,200kV UHV-AC

- Real-time grid operation
- Optimum scheduling & dispatch
- Energy accounting & settlements
- Provides non-discriminatory short term open access
- Administering Renewable Energy Certificate mechanism

- 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")

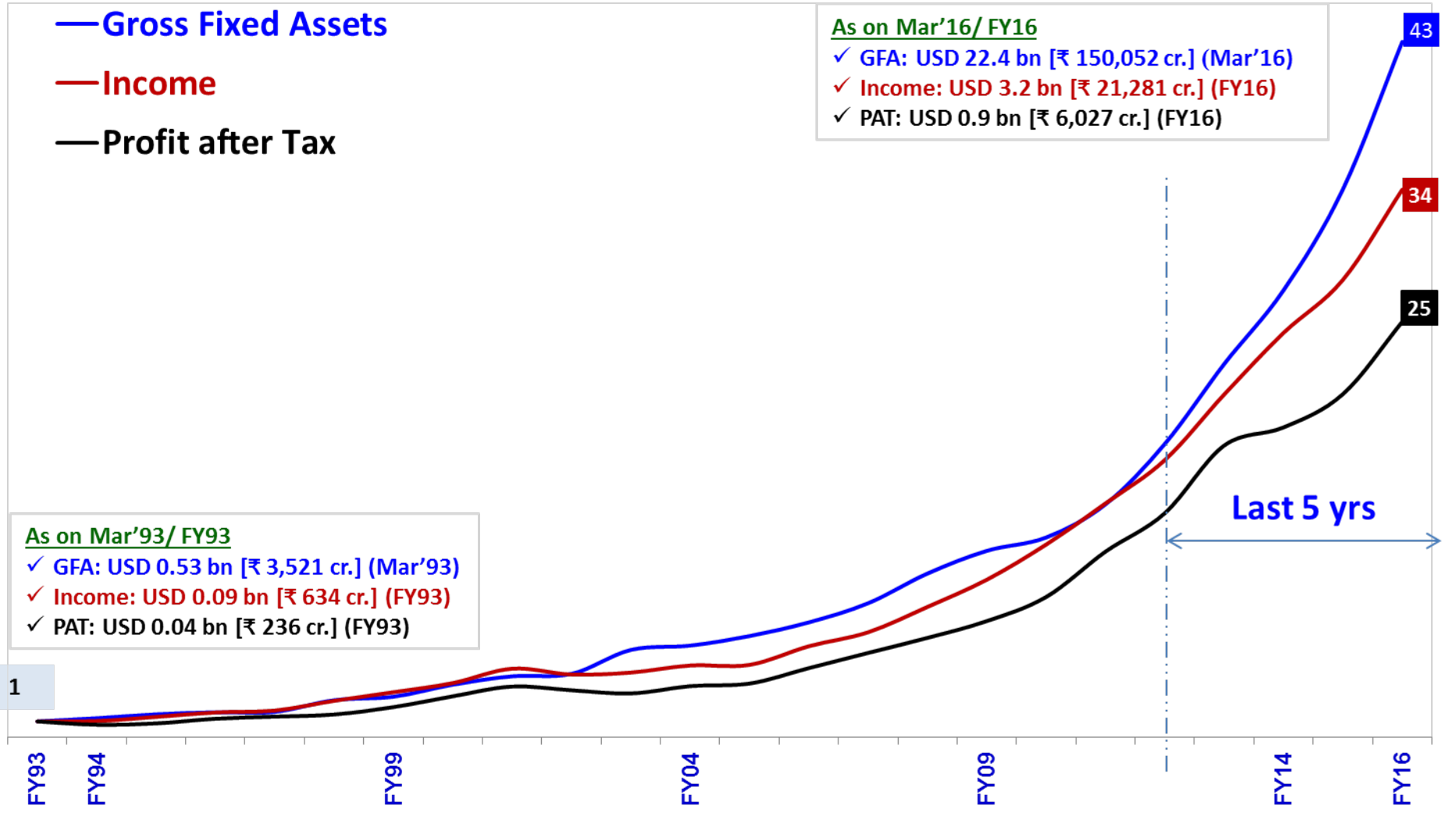
- Leverages in house expertise for providing services in areas of transmission, distribution and telecom
- Provides services to:
  - State power utilities, private sector and government utilities domestically and internationally including in Asia, Africa and other SAARC countries

# Growth since Commercial Operation - Physical



# POWERGRID Overview

## Growth since Commercial Operation - Financial





# Development of Synchronous National Grid



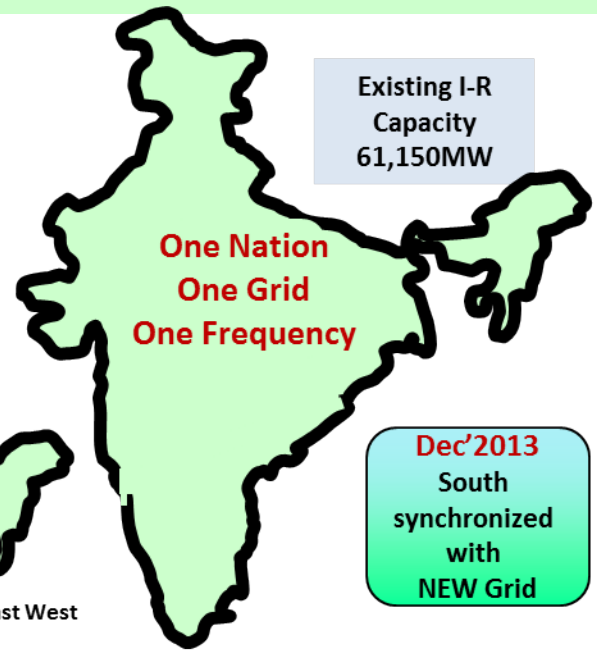
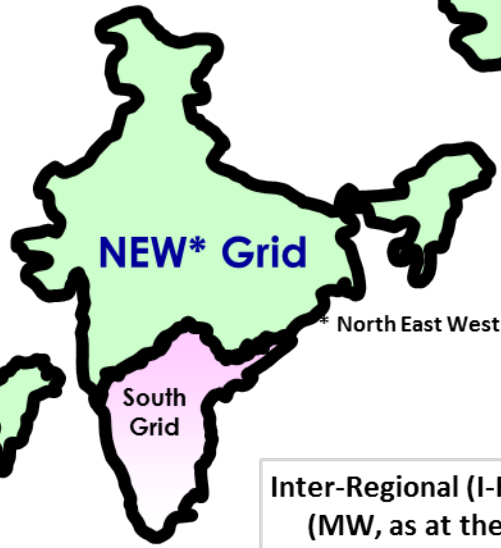
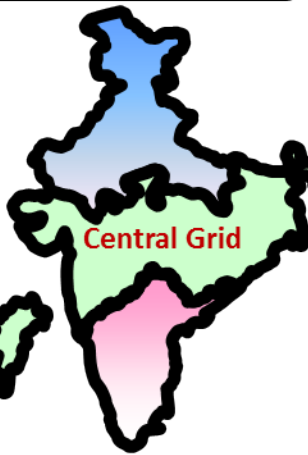
One of the largest Electricity Grids operating at single frequency in the world

August 2006  
North synchronized with Central Grid

March 2003  
West synchronized With East & North-East

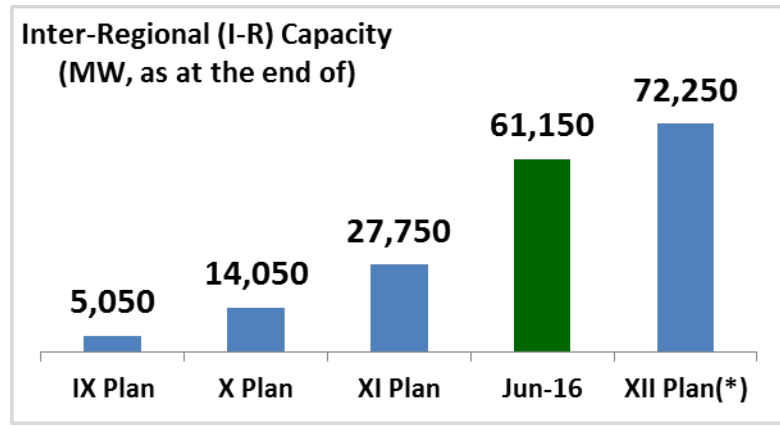
October 1991  
East & North-East synchronized

5 Grids  
5 Frequencies



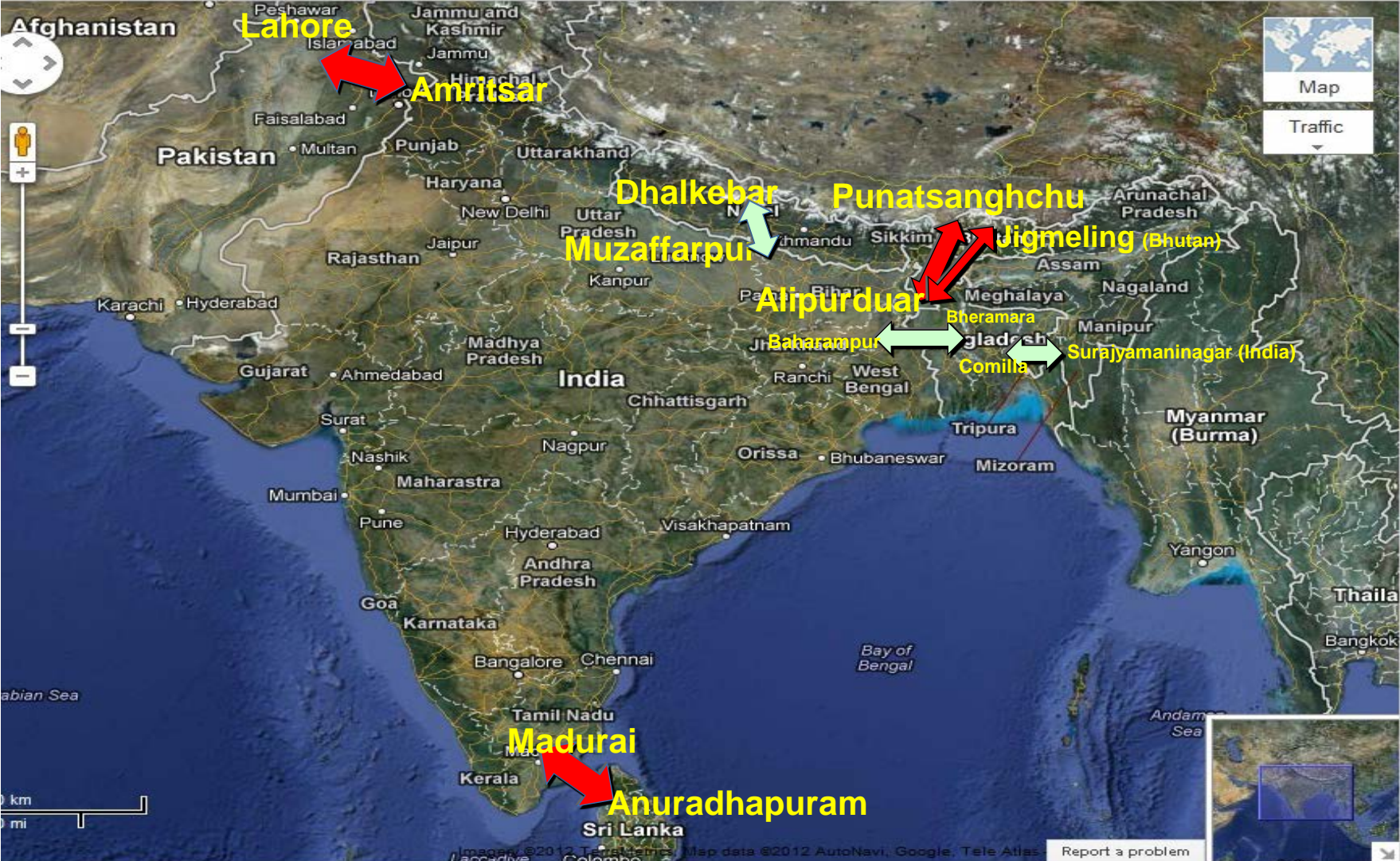
Existing I-R Capacity  
61,150MW

Dec'2013  
South synchronized with NEW Grid



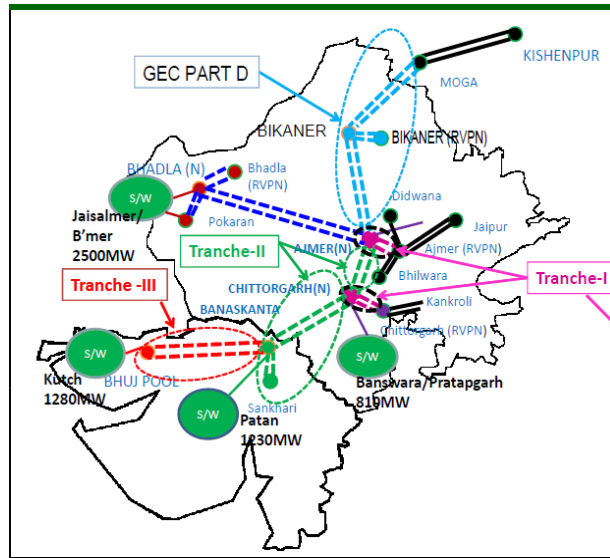
\* Planned

# Linkages with SAARC Countries



# Renewable Integration- Green Energy Corridors

## Green Energy Corridors-I



## Green Energy Corridors-II



- ✓ 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 UMSPS commissioned

Evacuation System by POWERGRID				
Andhra Pradesh	Rajasthan	Gujarat	MP	Karnataka

## POWERGRID

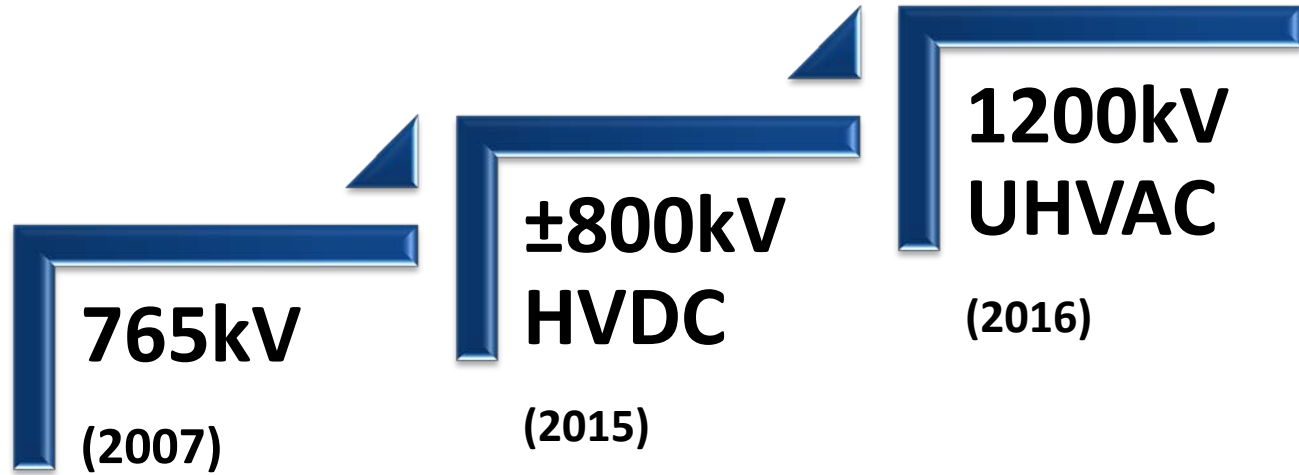
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# New Technology in Transmission

Adoption  
of Higher  
Voltages



STATCOM

Smart Grid  
(WAMS-PMU)

Reconductoring

WAMS = Wide Area Measurement System , PMU = Phasor Measurement Unit

# Implementation of $\pm 800\text{kV}$ HVDC Bi-pole line



- World's longest multi-terminal  $\pm 800\text{kV}$  HVDC
- Power Transfer capacity: 6000 MW
- Part of NE-N/W Interconnector Project
- Line length of Biswanath Chariali – Agra tr. Line:  $\sim 1750\text{km}$
- 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)**



**Aerial Patrolling  
using Helicopters**

## **National Transmission Asset Management Centre (NTAMC)**

- Established at Manesar, Gurgaon
- 120 sub-stations remotely operated from NTAMC



**Hot Line  
Maintenance**



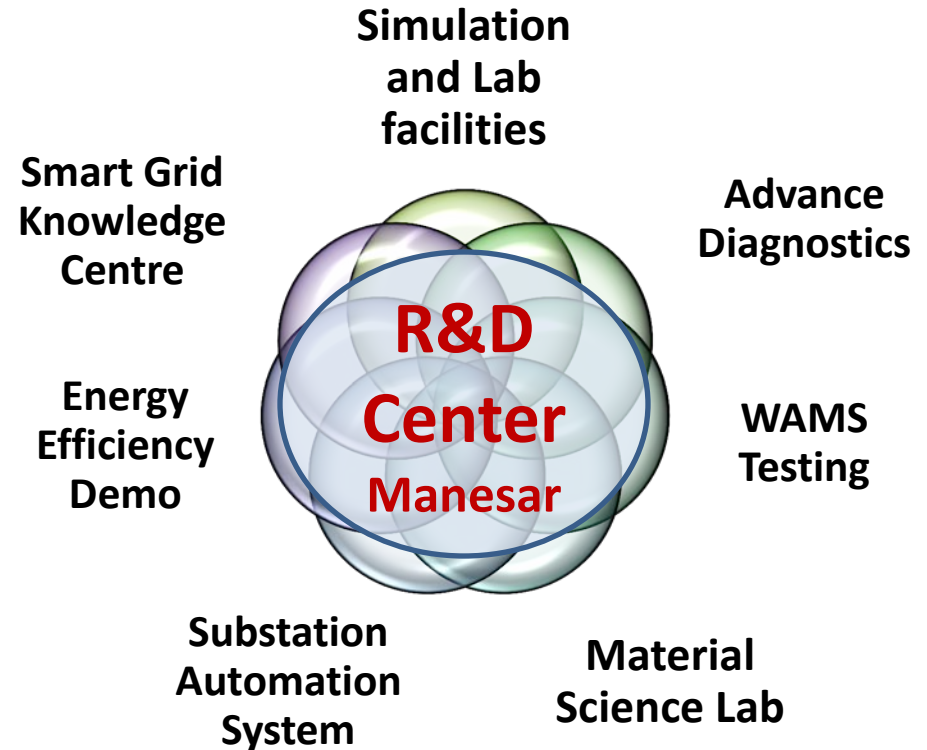
**Emergency  
Restoration System  
(ERS)**



# Continuous Learning – Key to sustaining success

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

## A World Class Training Institute



**Fulfilling learning needs -  
Technical, Managerial and  
Behavioral**

**Benefitting both internal and  
external stakeholders**

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## 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)

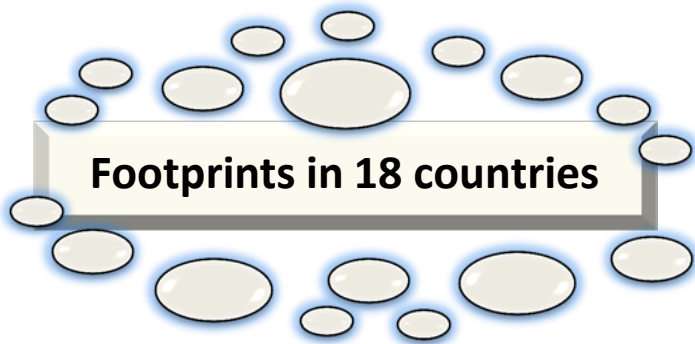
- Execution in 4 States

MPLS= Multi Protocol Level Switching, VPN = Virtual Private Network

Under Execution



15 Assignments  
Project Cost: ~ USD 250 mn



Afghanistan – Bangladesh – Bhutan – Congo – Ethiopia – Nepal – Nigeria – Kazakhstan – Kenya - Kyrgyz Republic – Myanmar – Pakistan – Senegal - Sri Lanka – Tajikistan - Tanzania – UAE - Uzbekistan

## 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)



<b>Afghanistan</b>	Turnkey Execution of 220 kV Transmission Line & substations; Capacity Building
<b>Bangladesh</b>	Indo-Bangladesh I/C - 1x500MW HVDC B2B & associated TLs; Feasibility Studies & Capacity Building
<b>Bhutan</b>	Consultancy Assignment for Design & Construction of 400kV D/C Transmission Lines; Capacity Building
<b>Nepal</b>	Consultancy Services for Implementation Support for 220kV/ 400kV Transmission Lines and Capacity Building
<b>Myanmar</b>	Supply of Goods and Related Services for 230kV TS (under GoI Line of Credit)
<b>Sri Lanka</b>	Consultancy Assignment for Feasibility study for Interconnection of India Sri Lanka Electricity Grids
<b>UAE</b>	Engineering Consultancy Services for construction of 2 Nos. 400 kV GIS Substations and associated Transmission Lines for DEWA

# Major International Assignments (Completed)



## Ethiopia

Management Contract for Establishment & Management of Ethiopian Electric Power Company; Identification of Strategic High Voltage TS

## Kenya

Feasibility Studies of Transmission Lines & Capacity Building

## Nigeria

Consultancy for Telecom & S/S Automation System; Capacity Building

## CASA

(Central Asia South Asia Region)

Feasibility Study for 500 kV Transmission Strengthening in Tajikistan Grid for CASA-1000 Project [Afghanistan, the Kyrgyz Republic, Pakistan & Tajikistan]

## 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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## 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

*1<sup>st</sup> Company among Power Sector CPSUs to publish Sustainability Report*

# Corporate Social Responsibility

## Major Thrust Areas for CSR

Rural  
Development

Skill  
Development

Education

Health

Environment

- During FY16, USD 18 mn was spent on CSR activities

## 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

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## Major Awards & Accolades

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- **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**
- **‘Best Performing Utility in Power Sector’ by Central Board of Irrigation & Power in 2014 & 2015**
- **Award for ‘Best Governed Co.’ in 2014 & Certificate of Recognition for ‘Excellence in Corporate Governance’ by ICSI in 2013**
- **‘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*