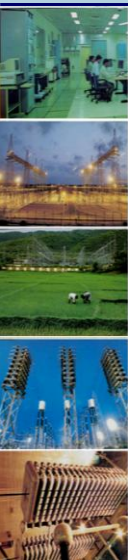


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**Central Transmission Utility of India**

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**As per World Bank - 3<sup>rd</sup> Largest Transmission Utility in the World**

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**Gross Block - 3<sup>rd</sup> Largest Central Public Sector Enterprise (CPSE)**

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**Profit - 6<sup>th</sup> Largest CPSE**

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**Turnover- Largest Service Sector CPSE (excl. trading companies)**

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**Fastest Growing Electric Utility in Asia for 5 consecutive years**

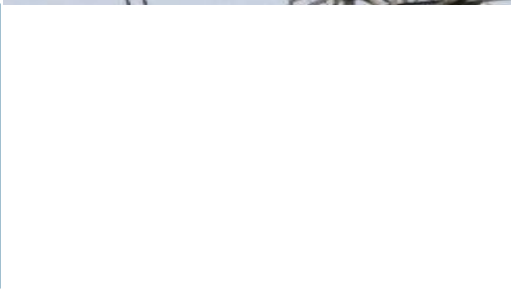
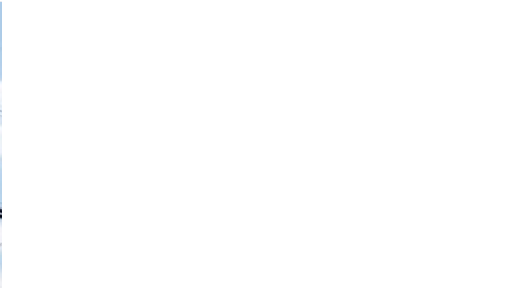
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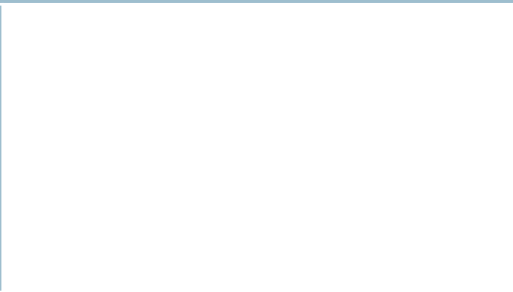
**Highest placed Indian Service Company in FORBES 2000 list (2018)**

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# POWERGRID Overview



## Vision

**“World Class, Integrated, Global Transmission Company With Dominant Leadership in Emerging Power Markets Ensuring Reliability, Safety & Economy”**

### Central Transmission Utility

- Owned 56.34% by Government of India<sup>1</sup>
- Undertakes transmission of electricity through inter-State transmission system (ISTS)
- Discharges all functions of planning and co-ordination relating to ISTS

### National Transmission Dominance

- Pan-India Transmission network with cross-border interconnections
- Operates ~85% of inter-State transmission system

### Stable Returns

- Low operational risk with limited exposure to general business cycles
- Cost plus tariff for regulated assets (>95%) including projects in hand enables the Company to recover its entire costs

### Strong Execution Track Record

- Extensive experience & expertise in implementing transmission projects
- Rated consistently “EXCELLENT” against GOI MoUs since FY 1994

### Diversification

- In-house expertise in transmission sector consultancy (both domestically and internationally)
- Telecom business on existing transmission assets

### Credit Ratings

- Domestic: AAA (CRISIL, CARE, ICRA)
- International: Baa2 (Moody's) / BBB- (S&P, Fitch)- at par with sovereign

**Transmission Lines**  
~149,300 ckm

**765kV AC & ±800kV HVDC**  
21%

**System Availability**  
99.81%

**Employees**  
9,773

**Sub-Stations**  
237 Nos.  
**Transformation Capacity**  
344,790 MVA

**Telecom Network**  
47,700 km

**Reliability**  
0.60 Tripping/ Line  
(Unplanned)

**Inter-Regional Power Transfer Capacity**  
~ 77,690 MW  
(~90% of India's total capacity)

Above data (except Availability & Reliability) as on Sep.30, 2018  
Availability & Reliability data as on March 31, 2018

## Key Financials

(Year ended 31<sup>st</sup> March / Half Year ended 30<sup>th</sup> September)

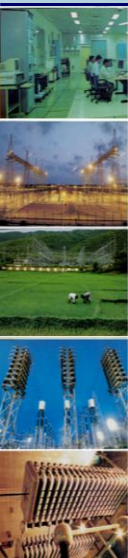
### Income Statement <sup>(2)</sup>

(In US\$ mn)	FY17	FY18	HY19
Revenue	3,953	4,574	2,523
EBITDA	3,619	4,175	2,246
Profit for the year	1,156	1,267	700

### Balance Sheet <sup>(2)</sup>

(In US\$ mn)	FY17	FY18	HY19
Total Debt	18,018	20,019	21,448
Cash	496	233	352
Net Debt	17,522	19,786	21,095

Market Capitalization of US\$ 15.24bn as on November 19<sup>th</sup>, 2018<sup>(3)</sup>



## Transmission EHV/ HV Networks (c. 96% of FY 2018 revenue from operations)

- Associated Transmission System for UMPPs, CGS, IPPs
- Grid strengthening schemes
- Inter-State, inter-regional and cross-border links
- High Capacity Transmission corridors for IPP Projects
- Green Energy Corridors
- Transmission Scheme for Ultra Mega Solar Power Parks

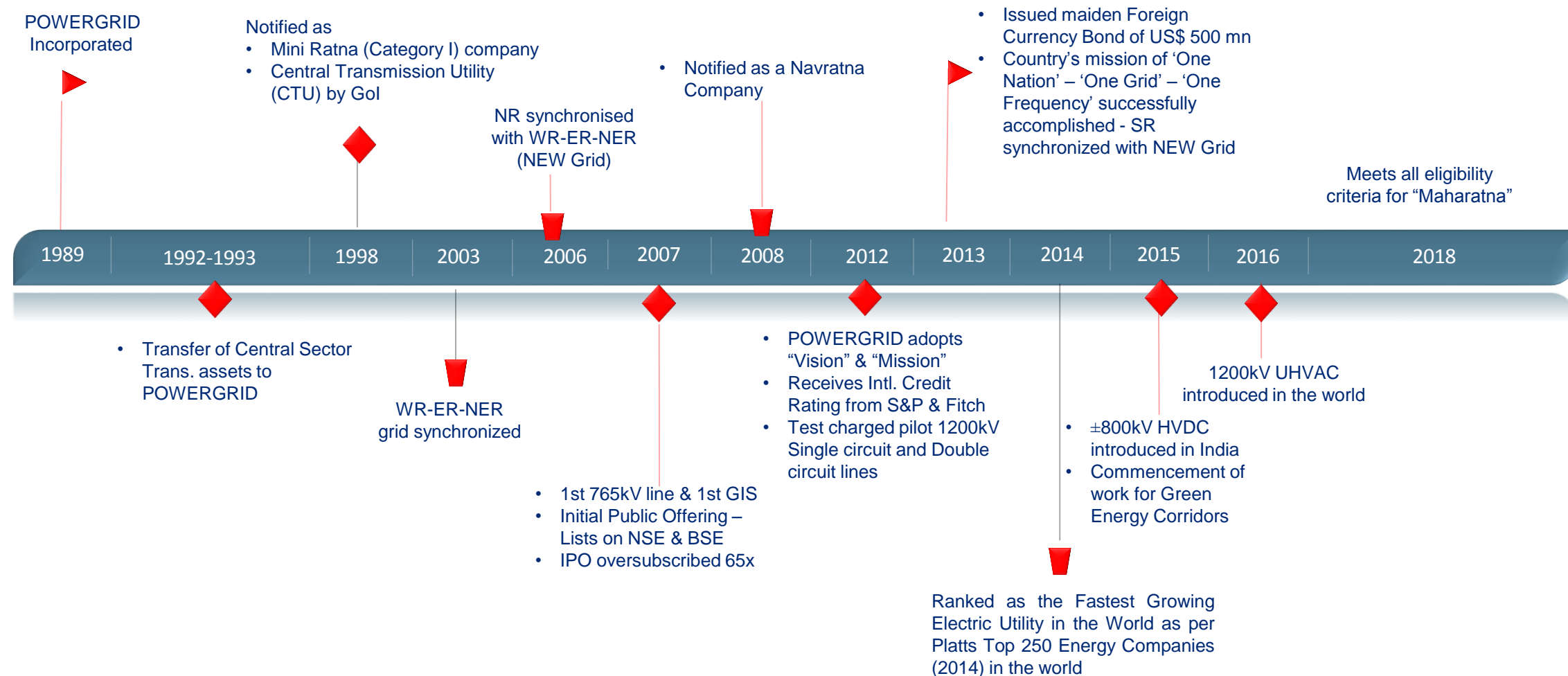
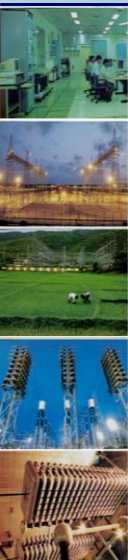
## Consultancy (c. 2% of FY 2018 revenue from operation)

- In-house expertise in the Transmission, Distribution and Telecom sectors, including Project Planning, Design, Engineering, Load Dispatch, Financing and Project management
- Providing consultancy for implementation of intra-state transmission network
- Provides services to State Power Utilities, Private Sector and Government utilities in the domestic market and in various countries in Asia and Africa

## Telecom (c. 2% of FY 2018 revenue from operation)

- Telecom business leverages POWERGRID's nationwide transmission infrastructure by utilizing spare Optical Fibres available in the Optical Ground Wire (OPGW)
- Owns and operates more than 47,700 kms of telecom networks connecting 680 PoPs
- Point to point bandwidth leasing, ISP services and MPLS
- Executing agency for major projects of GoI - National Knowledge Network (NKN) & National Optical Fibre Network (NOFN)

# Major Corporate Milestones



## Platts' 50 Fastest Growing Global Energy Companies Rankings

(as part of Top 250 Global Energy Company Rankings)



2014



2015



2016



2017

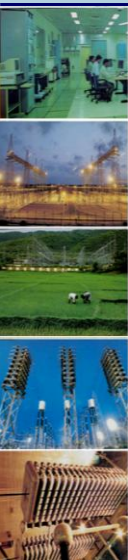


2018

**POWERGRID – Fastest Growing Electric Utility in Asia for 5 consecutive years**

- 3<sup>rd</sup> Fastest Growing Electric Utility, globally in 2018
- Only Company to feature in Top 5 Fastest Growing Electric Utilities, globally during last 5 years





## Environment & Social Policy & Procedures (ESPP)

Committed to the goal of sustainable development and conservation of nature & natural resources.

Basic principles of Avoidance, Minimization and Mitigation in dealing with environmental & social issues.

Alignment with UN Sustainability Development Goals

## Adoption of Higher Voltages & New Technologies for Sustainable Growth

### Reduction in Land Requirement

- Cost Saving; Faster Execution through GIS

### Reduced Carbon Footprint

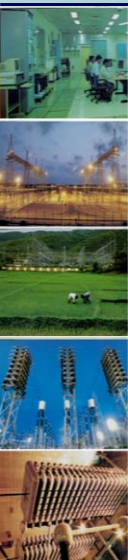
- Forest Area reduced from 6% in 1998 to 2.26%

### Optimized Right of Way use

- Increasing carrying capacity of line per unit of ROW

1<sup>st</sup> organization in the world, whose safeguard policy, ESPP has been accepted by two major multilateral agencies viz. The World Bank (2009) & ADB (2017)

POWERGRIDS CSR Policy is aligned towards inclusive growth, with thrust areas being Healthcare, Rural Development, Sanitation, Education, Skill Development and Environment



## Rated Baa2 by Moody's

“....Power Grid’s Baseline Credit Assessment (BCA) of baa2 is supported by (1) the strong and established regulatory framework in India, (2) the company's solid financial profile, (3) its cost-plus tariff structure, (4) its payment security mechanism, (5) long track record of strong operational performance, and (6) strong project execution capabilities.

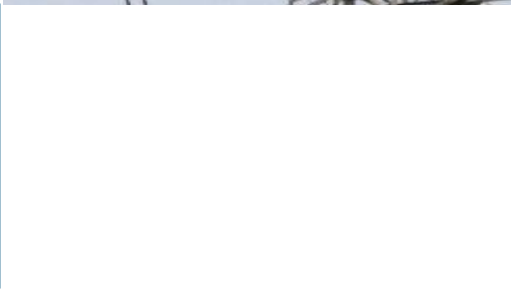
Under our Joint Default Analysis approach for government-related issuers (GRIs), our assessment of the likelihood of government support for the company is Very High....”

## Rated BBB- by Fitch

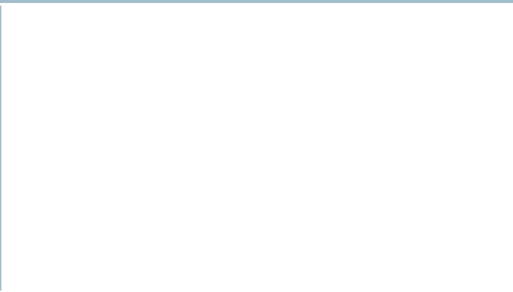
“....Fitch Ratings assesses POWERGRID's standalone profile at 'BBB' as it benefits from the cash flow certainty gained from its dominant market position and regulated business model. POWERGRID has managed its counterparty risk well, despite the weak financial position of many of its customers.....”

## Rated BBB- by S&P

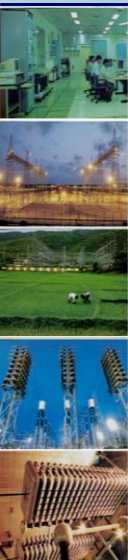
“....The rating on PowerGrid reflects the company's supportive regulatory framework, near monopoly in interstate transmission, and stable margins and cash flows. PowerGrid has maintained its dominant position in the transmission sector even though the sector is being increasingly opened to private sector. The company continues to win a fair share of competitive bids and has been executing a large number of projects and commissioning capex.....”



# Credit Highlights



# Credit Highlights



- 1 Strategic Importance to National Economy and Government of India ('Gol')
- 2 Stable, Consistent and Well Defined Regulatory Framework
- 3 Dominant Market Position in Transmission Sector in India
- 4 Successful Track Record in Executing and Operating Projects
- 5 Other Business Verticals Provide Diversification
- 6 Experienced Senior Management and Competent Workforce
- 7 Renewable Energy Focus to Drive Strong Growth in Power & Transmission Sector in India
- 8 New Business Initiatives
- 9 Strong Financial Profile
- 10 Debt Structure and Liquidity Position



# Strategic Importance to National Economy and Government of India (“Gol”)

**POWERGRID, being a ‘Central Transmission Utility’ of the Gol, plays a critical role in inter-State power transmission and is one of the ‘Navratna’ companies for the Gol, now eligible for ‘Maharatna’ status**

## Significant Ownership of Gol

- Gol shareholding of 56.34% as of 30<sup>th</sup> September 2018
- ‘Navratna’ status empowers the Company an enhanced autonomy in its operations, investments and decision making vis-à-vis other public sector companies; ‘Maharatna’ status to further enhance autonomy

## Role as Nodal Transmission Agency

- Nodal agency for implementation and operation of open access in inter-State power transmission
- Currently operates ~85% of India’s inter-State transmission system
- Owns and operates one of the world’s largest single country synchronous grid
- Facilitates “One Nation, One Grid, One Price” across the country, most of the time

## Strong Government Linkages

- Tripartite Agreements executed by Gol with the RBI and State Governments to ensure timely payment of dues by State Electricity Boards (SEBs) leading to 100% collection efficiency; Agreements in place till 2026 with majority of States
- As of March 2018, Gol guarantees ~19% of POWERGRID’s debt
- Strong support in Project execution through e-Samiksha’ and ‘Pragati’ portals

## Role in Nationally Critical & Strategic Assignments

- Green Energy Corridors to facilitate RE Integration and assist Gol in achieving 175GW RE target by 2022
- Setting up strategic trans-national grid infrastructure – including Nepal, Bhutan, Bangladesh
- Project Management Consultant for Transmission & Distribution Infra. Project in NE, Sikkim and J&K (Leh and Ladakh)
- One of the implementing agencies for ‘BharatNet’ (National Optical Fibre Network)
- Successfully completed Gol’s National Knowledge Network (‘NKN’)

## Role in Distribution Reforms

- Facilitating distribution reforms through Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS) works on behalf of the Gol
- Acts as ‘nodal point’ in prestigious “India Smart Grid Task Force” Secretariat for Gol’s activities related to Smart Grid including assisting distribution utilities in formulation of Smart Grid pilot project and deployment of smart grid applications

- POWERGRID operates in a stable & consistent regulatory framework governed by Central Electricity Regulatory Commission's ('CERC') regulations, enabling predictable cash flows with very low business risk
- 96% of POWERGRID's revenue is regulated by CERC

## Transmission Tariff based on cost plus basis

- Meeting CERC's operational benchmarks enables the Company to recover its operating costs, including debt servicing charges
- Current tariff setting period provides for Return on Equity (RoE) @ 15.5% to be grossed up with effective tax rate, till March 31, 2019
- Timely completion of projects enables POWERGRID to earn additional incentive of 0.5% on regulated returns
- Incentive linked to transmission network availability beyond thresholds

## Stable Regulations

- CERC has a long track record of setting tariffs (since 2001) with tariff components being well defined
- Regulatory Framework laid out for five years
- Transparent tariff setting mechanism – CERC publishes statement of reasons behind any changes in tariff particulars

## Tariff Recovery

- Transmission charges allocated to all the customers based on CERC's Transmission Pricing Methodology for inter-State transmission in India (also known as PoC-'Point of Connection charges' )

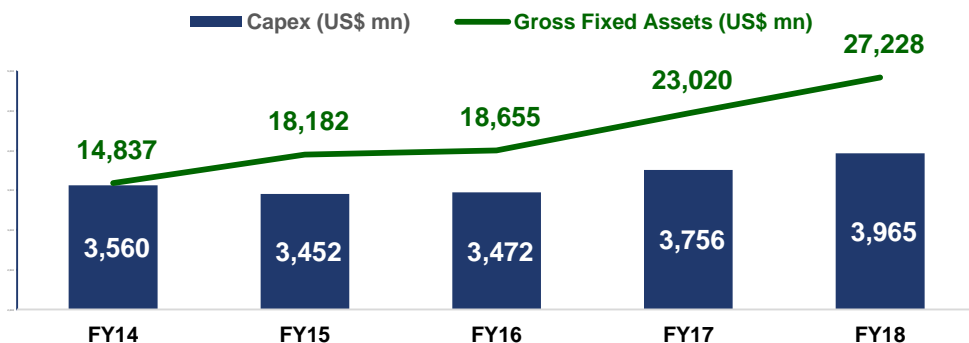
**POWERGRID is authorised under Indian Telegraph Act, 1885, to install towers without acquisition of land**

### Market Leader in inter-State power transmission in India...

- ✓ **POWERGRID owns and operates ~85% of India's inter-State and inter-regional electric power transmission network**
  - **~149,300 circuit km** of transmission network (>90% of the total EHV  $\geq 400$  kV level) transmission network)
  - **344,790 MVA** of transformation capacity with 237 substations
  - **~ 77,690 MW** of national grid inter-regional capacity (~90% of the total inter-regional capacity)
- ✓ **POWERGRID's competitive advantages**
  - **Strong track record** of more than 25 years in the transmission space and a pioneer in 765kV AC,  $\pm 800$ kV HVDC in India and technological development of 1200kV UHVAC
  - **Widespread network** of substations across India, which gives the Company an edge to build and maintain transmission network efficiently
  - **Strong Financial Profile**

**Highest market share** in tariff based competitively bid out projects in inter-State transmission in terms of annual levelised tariff

## Strong Execution leading to consistent growth in Asset Base



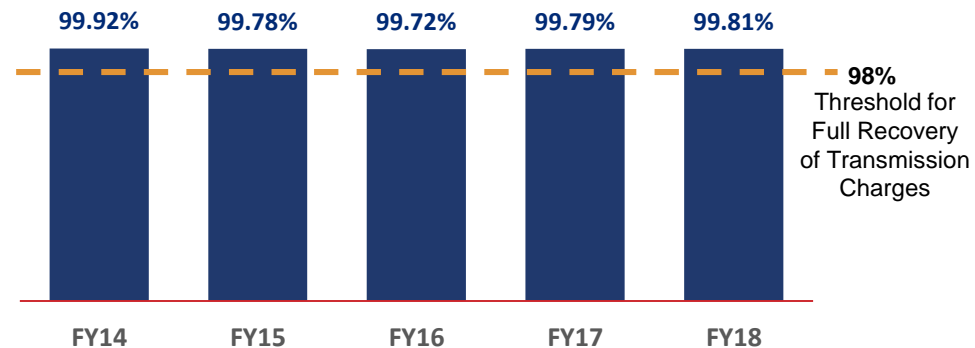
## Major Projects Introduced

- ±800kV HVDC in India (2 projects completed; 1 under progress)
- High Capacity Corridors facilitating One Nation, One Grid One Price, most of the times in the country
- Preparing the Grid for RE Integration - GEC, STATCOMs, SVCs

Execution Parameters	Mar'13	Mar'18	
Tr. Line (ckm)	67,000	148,149	2.2x
I-R Capacity (MW)	17,000	77,690	4.6x
Xf Cap. (MVA)	73,000	331,163	4.5x
Sub-stations	111	234	2.1x

Consistently received “Excellent” Rating as a part of the MoU with the Ministry of Power, GOI since 1993-94

## State-of-the-art Techniques ensuring world class Availability



Reliability: 0.5-0.7 tripping/ line over last 5 years

## Technologies in Asset Management

- Remote Operation of Substations- NTAMC/ RTAMC
- Drones for Line Patrolling
- Helicopters for maintenance
- Hot Line Maintenance
- Emergency Restoration System
- GIS Mapping of TLs



## Consultancy and Telecom also provide revenue diversification

### Telecom Business

- One of the leading utilities in the country with an optic fibre network of over **47,700 kms** using optical ground wire (OPGW) on power transmission lines and about 680 Points of Presence.
- Leasing domestic bandwidth to more than a hundred customers including all major cellular operators, Government departments, Defence establishments, corporates, Internet Service Providers, Educational Institutions, telecom companies including international companies.
- Partnering with the Gol in its strategic initiatives like National Knowledge Network, BharatNet (National Optic Fiber Network)

### Consultancy (Domestic & International)

- Leveraging its expertise in the transmission business, POWERGRID has provided one-stop consultancy services to domestic and international clients in the power transmission sector
- Domestic:
  - ❑ As on 31 March 2018, POWERGRID was engaged in providing consultancy services to its clients for projects worth USD 281 million
  - ❑ POWERGRID has provided Consultancy services for Gol's programmes namely Power for All, Saubhagya, DDUGJY, Railway Electrification etc. for improving power infrastructure in areas of distribution and rural electrification
  - ❑ Development works in the North Eastern region, Sikkim, J&K & IPDS works in Old Kashi area
- International:
  - ❑ POWERGRID is providing services in a number of countries from Asia and Africa such as Afghanistan, Ethiopia, Nepal, etc. 15 running consultancy assignments, mostly secured through competitive bidding
  - ❑ Consultancy to World Bank funded CASA-1000 Project (HVDC) for Kyrgyz Republic, Tajikistan, Afghanistan & Pakistan
  - ❑ Consultancy to ADB funded project in Nepal

## Experienced Senior Management

Extensive Domain Experience & Expertise

Has played a leadership role for development of sector

## Skilled & Motivated Employees

Strong Blend of Experience & Motivation

High Level of Commitment of Employees

Low Levels of Attrition

### Thrust on attracting best talent for entry-level positions

- Recruitment through Campus selection & competitive screening process

### Continued Thrust on Human Resource Development

- Investments in Learning & Development Infrastructure- World Class Training Facility 'POWERGRID Academy of Leadership'- PAL, and Regional Employee Development Centres at 5 locations across India
- Continuous Learning Programs conducted for both internal stakeholders as well as its customers and sector participants

### Thrust on Innovation, Research & Development

- Innovation Portal for Employees to give suggestions across various functions
- State-of-the-art 'POWERGRID Advanced Research Centre - PARTeC

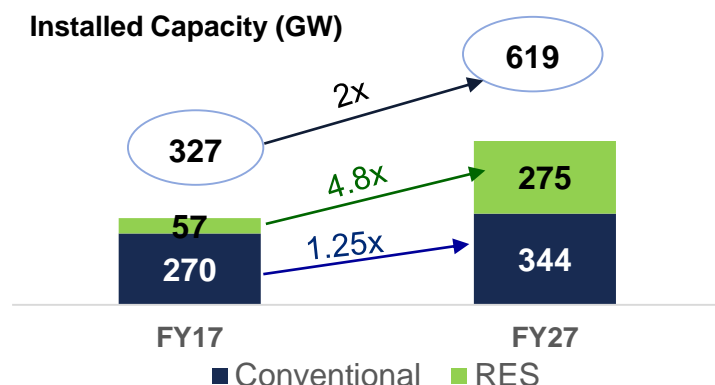


**Leveraging HRD Infrastructure - Trainings arranged for 20 State; 5 Private Utilities & 4 International Utilities till now**

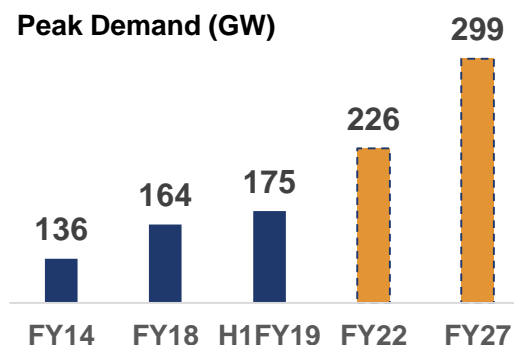
In line with the economic growth & extensive policy support, the generation sector in India is expected to grow rapidly...

## RE policy focus to drive incremental capacity addition to fulfill increasing demand

### Installed Capacity (GW)



### Peak Demand (GW)



## Primary Growth Drivers for Power and Transmission Sector in India

- Per Capita Consumption to increase from 1150 units in 2018 to 3000 units by 2040
- RE Integration: 175 GW by 2022; 275 GW by 2027
- Intra- State Transmission; Cross-border interconnections for Seamless SAARC Grid
- **‘Saubhagya’ Scheme** to ensure household electrification by 31-Dec’18 & other reform based initiatives of GoI like UDAY, IPDS, DDUGJY, 24x7 Affordable Power for All by 2019

- ✓ India is currently the 3<sup>rd</sup> largest producer & 3<sup>rd</sup> largest consumer of electricity in the world with installed capacity reaching 344GW (Sept 2018)
- ✓ Under Paris Climate Agreement, India has committed to achieve 40% cumulative Electric power capacity from non-fossil fuel based energy resources by 2030.
- ✓ RE Capacity to grow from 72 GW presently to 175GW by 2022 and 275GW by 2027
- ✓ RE capacity growth brings with it issues of intermittency, volatility, variability and storage, thereby leading to challenges for grid stability. Transmission Planning for RE to ensure addressing these issues
- ✓ POWERGRID presently executing Green Energy Corridors which include high power capacity transmission corridors and evacuation systems for Ultra Mega Solar Parks
- ✓ To achieve this growth target, POWERGRID, has set a capex target of c. INR 500 billion (c. USD 7.7 billion) over 2018-2021

20-year Perspective  
Transmission Planning  
Report (Feb’16)- CEA

**“...Roughly quadrupling of transmission systems from present capacities...”**

**“...Massive transmission corridors may be needed towards NR & SR...”**

## Driving Forces

- Continued Thrust on Seamless & Flexible Grid Interconnection
- Thrust on RE for Energy Security & Climate Change
- Development of Smart Cities
- Railways & DFC works
- Improving Financial Health of DISCOMs
- Digital India



**Intra-State Transmission**



**Smart Cities**



**Wire Business**  
(An upcoming opportunity)



**EV Charging Infrastructure**



**Leveraging Telecom Infrastructure**



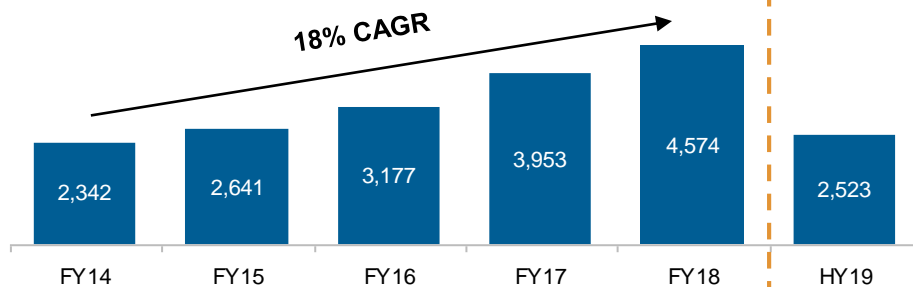
**Battery Storage**



**POWERGRID's revenue from operations has grown at a CAGR of 18% during FY14-FY18, and the company has maintained an EBITDA margin in excess of 88% during this period**

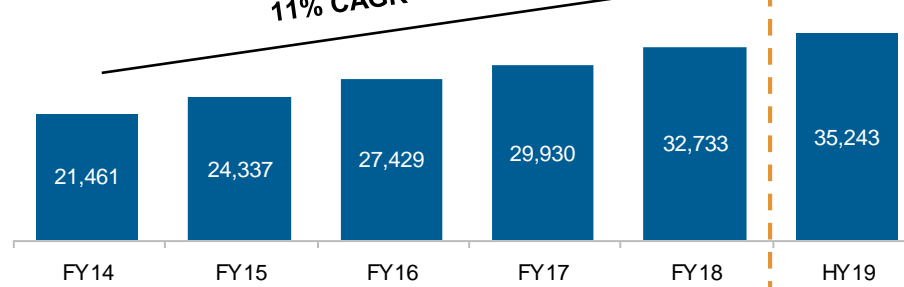
## Revenue from Operations

(USD mn)



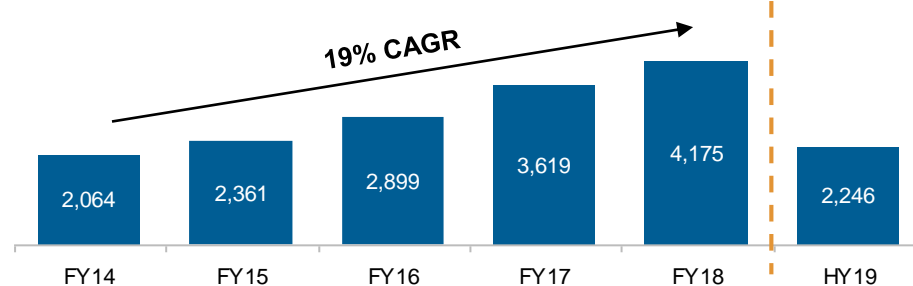
## Total Assets<sup>1</sup>

(US\$ mn)



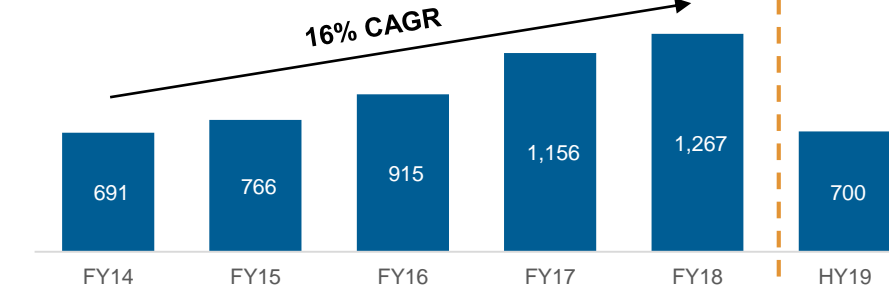
## EBITDA

(USD mn)



## Net Income (PAT)

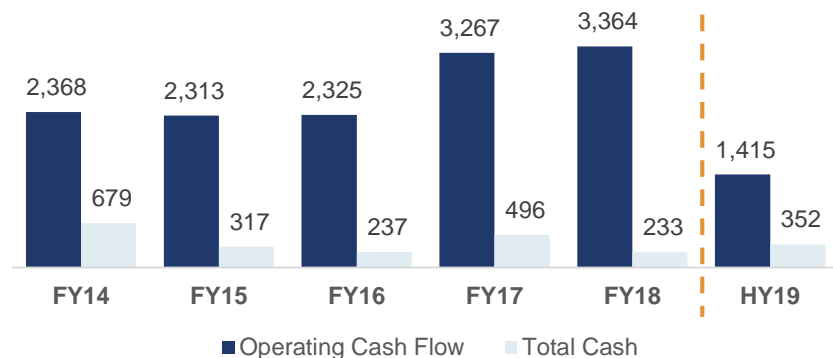
(USD mn)



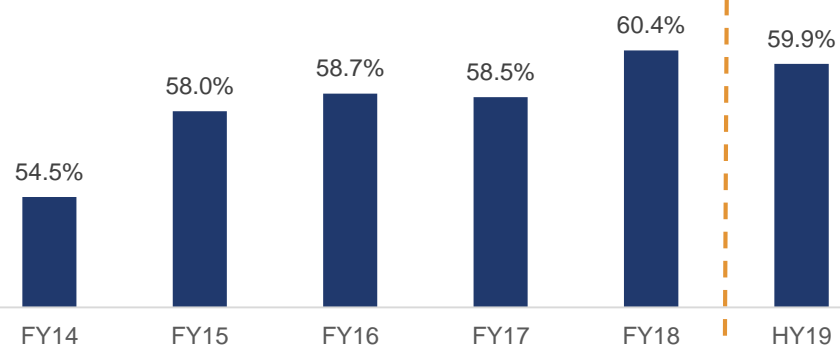
## Credit Metrics Summary

### Operating Cashflows & Total Cash

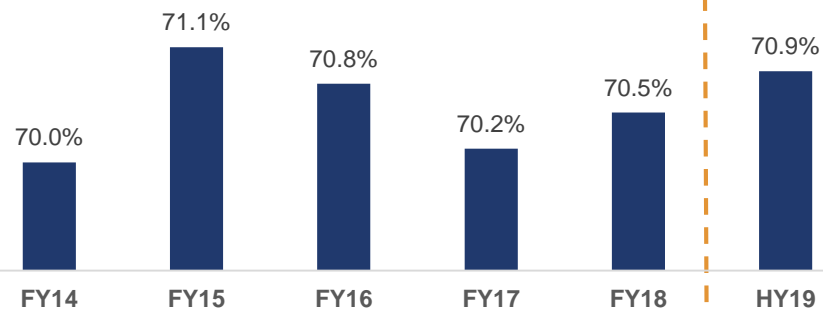
(US\$ mn)



### Net Debt / Asset Base

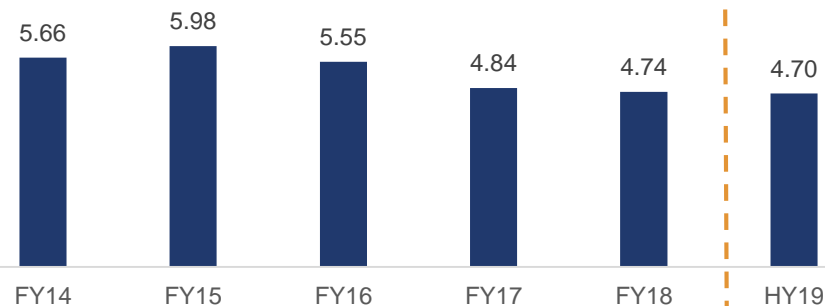


### Total Debt / Total Capital<sup>1</sup>

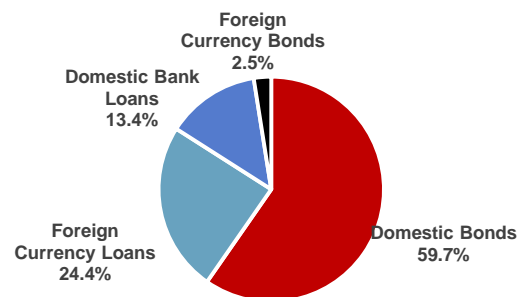


### Net Debt/ EBITDA<sup>2</sup>

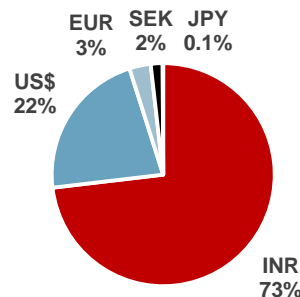
(x)



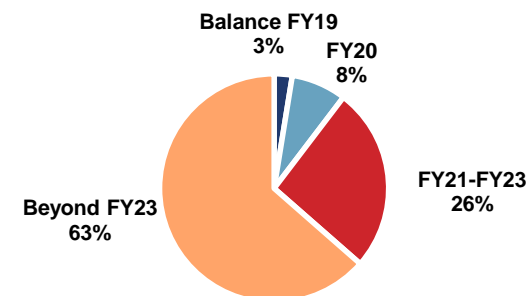
## Sources of Debt (%) as on 31-Mar-18



## Borrowing Currency (%), 31-Mar-18



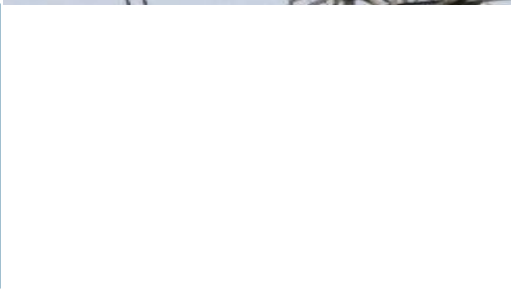
## Debt maturity Profile (USD mn) 30-Sep-18



Secured-Unsecured mix has moved from 0.95x to 0.88x over FY14-18

## Current Lending Base

- ✓ Tapping several onshore sources of debt funding through domestic INR bonds, banks & financial institutions
- ✓ Foreign currency borrowings in USD, JPY, SEK and EUR via multilateral & bilateral agencies like World Bank and Asian Development Bank
- ✓ Undrawn lines of approx. USD 2.695 billion as on 30<sup>th</sup> September, 2018.
- ✓ CERC Tariff Regulations permit recovery of hedging cost or exchange rate fluctuations for interest payment and repayment of foreign currency loans corresponding to debt component admitted in capital cost



# Financial Overview

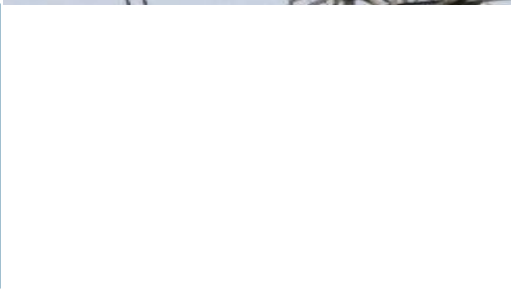
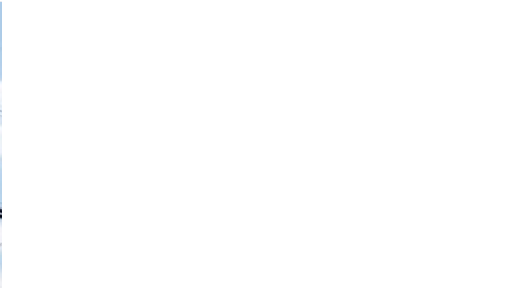


# Financial Summary - Standalone Financials

(US\$ mn)	For the year ended 31 March					For six months ended 30 September
	FY14	FY15	FY16	FY17	FY18	HY19
<b>Income Statement</b>						
<b>Net Sales</b>	2,342	2,641	3,177	3,953	4,574	2,523
<b>EBITDA</b>	2,064	2,361	2,899	3,619	4,175	2,246
<b>EBITDA margin</b>	88%	89%	91%	92%	91%	89%
<b>EBIT</b>	1,450	1,579	1,949	2,440	2,714	1,477
<b>Profit for the year</b>	691	766	915	1,156	1,267	700
<b>Balance Sheet</b>						
<b>Total Assets</b>	21,461	24,337	27,429	29,930	32,733	35,243
<b>Total Debt</b>	12,372	14,428	16,336	18,018	20,019	21,448
<b>Cash &amp; Equivalents</b>	679	317	237	496	233	352
<b>Net Debt</b>	11,692	14,111	16,099	17,522	19,786	21,906
<b>Net Worth</b>	5,298	5,868	6,736	7,657	8,366	8,792
<b>Cash Flow Statement</b>						
<b>Operating Cash Flow</b>	2,368	2,313	2,325	3,267	3,364	1,415

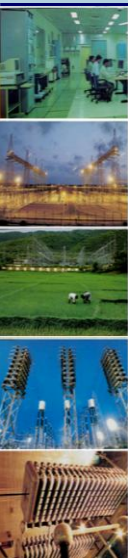
• Source: Company annual reports. FY16-17 & FY17-18 and HY18-19 data is based on standalone financials.; Operating Cash Flow – excluding Other Income  
 • Note: U.S. dollar translations have been made on the basis of the RBI Reference Rate as at 28<sup>th</sup> March, 2018 of INR 65.0441= US\$ 1.00



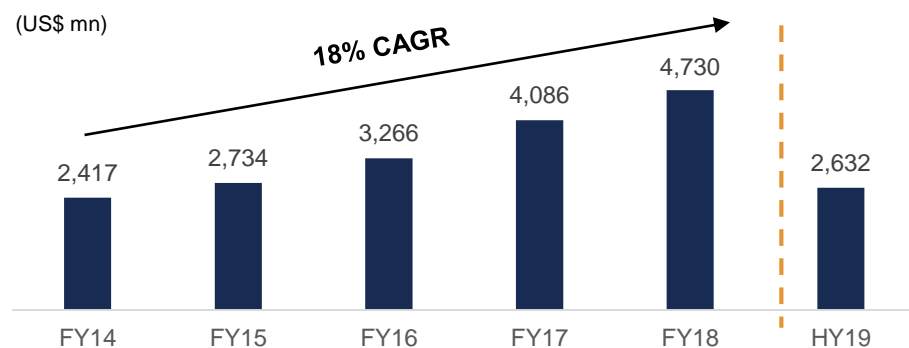


# Appendices

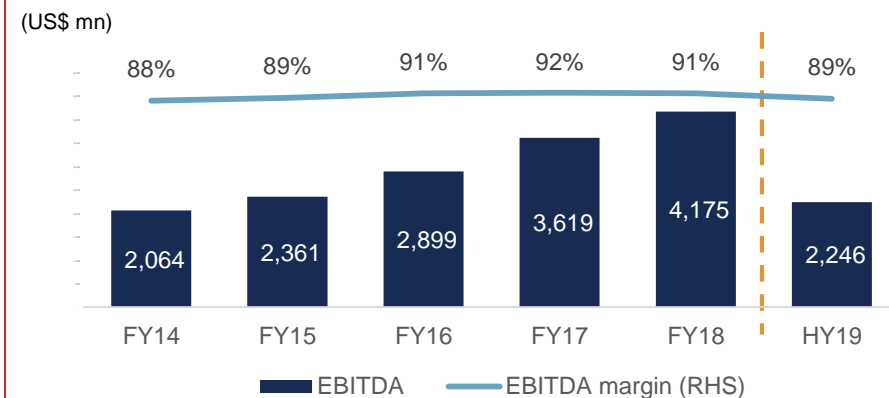




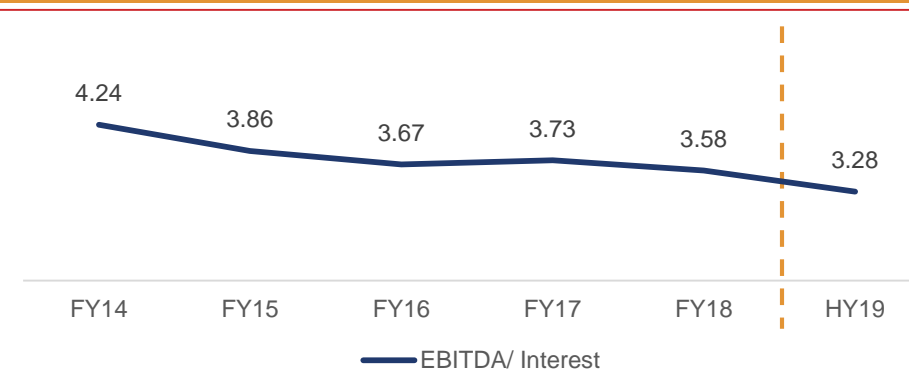
## Turnover



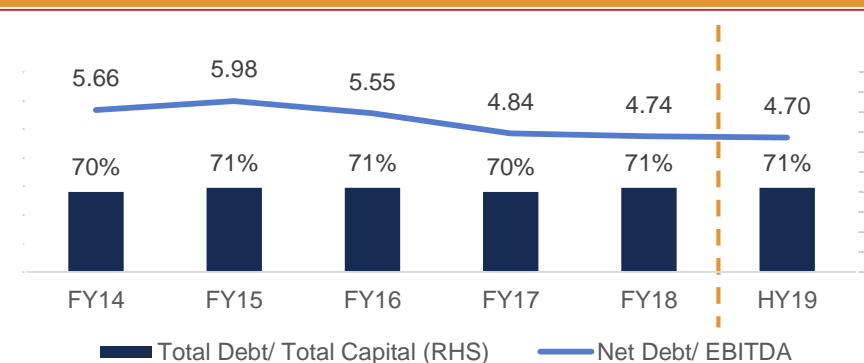
## Profitability



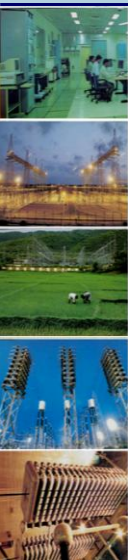
## Interest Coverage Ratios



## Financial Leverage<sup>(1)</sup>



# Structure of Indian Electricity Sector

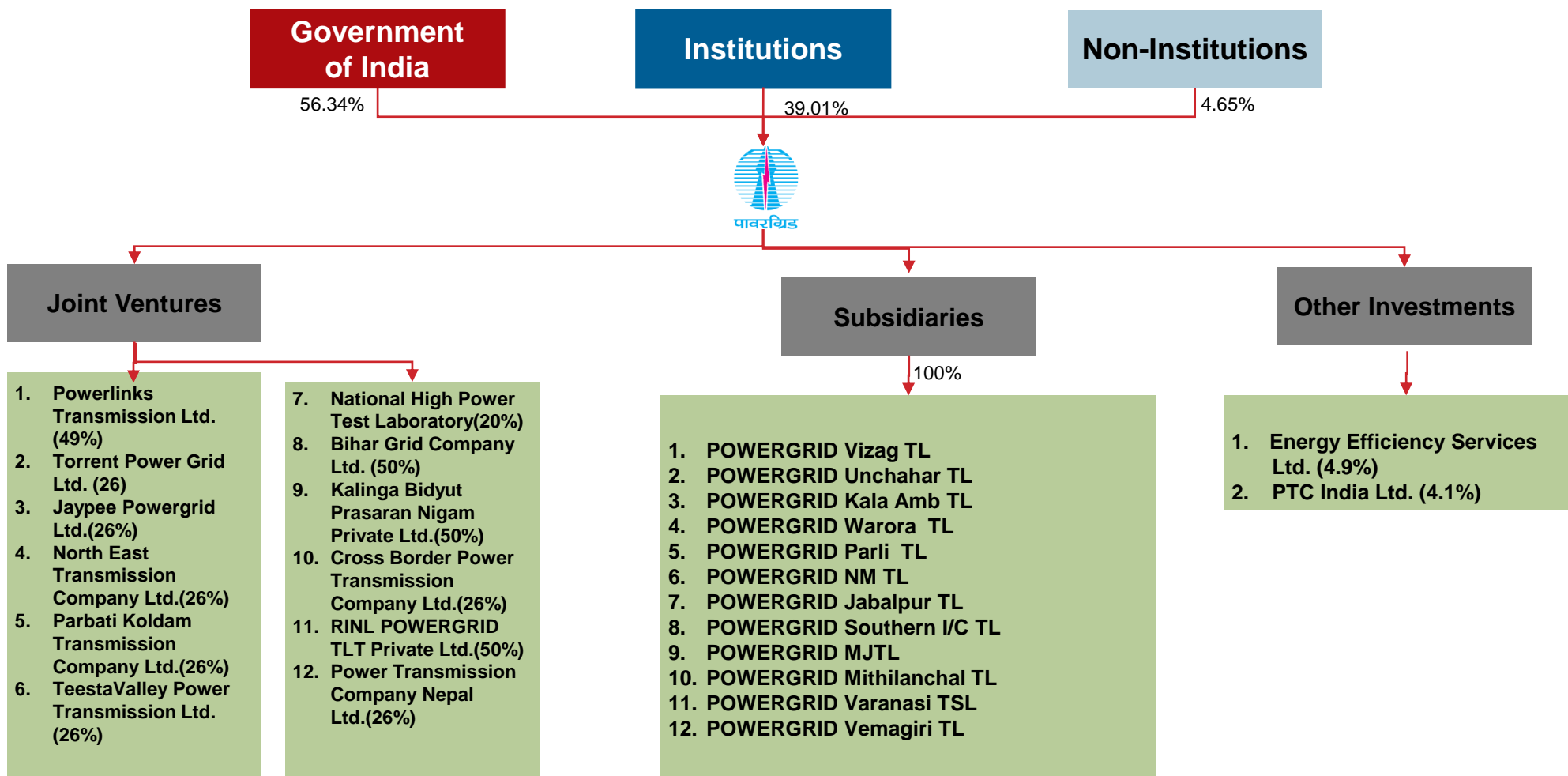
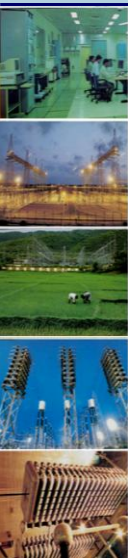


<b>Policy Making</b>	Central Government	CEA	State Governments
<b>Regulators</b>	CERC	SERCs	JERCs
<b>System Operators</b>	NLDC	RLDCs	SLDCs
<b>Generation</b>	Central Generating Stations	State Generating Stations	Private Sector
<b>Transmission</b>	CTU (Issuer)	STUs	Private Sector
<b>Distribution</b>	State Distribution Licensees		Private Distribution Licensees
<b>Markets</b>	Trading Licensee	Power Exchanges	Bilateral Markets
<b>Others</b>	Financing	R&D (CPRI)	Training (NPTI)

NLDC – National Load Dispatch Centre; RLDC – Regional Load Dispatch Center; SLDC – State Load Dispatch Centre

CERC - Central Electricity Regulatory Commission, SERC - State Electricity Regulatory Commission ; JERC – Joint Electricity Regulatory Commission

STUs – State Transmission Utilities



The management team of POWERGRID is highly experienced and qualified to execute the Company's strategic plan

## Senior Management



**Shri I.S Jha**  
**Chairman & Managing Director**

- Well known power system Professional with 36 years of experience, Mr. Jha is an electrical engineer from NIT, Jamshedpur.
- Prior to his present assignment, he served as Director (Projects) of the Company from September, 2009
- Mr. Jha has successfully served as Executive Director (Engineering) in the company and has also worked as Executive Director - Corporate Monitoring Group and held the position of Executive Director-North Eastern Region.



**Ravi P. Singh**  
**Director- Personnel**

- Over 36 years of work experience in the power sector handling various multi disciplinary functions like HR, Telecom, Contracts, Materials, etc.
- He has previously held the position of Executive Director (Human Resource), Executive Director (Eastern Region-II)
- Prior to joining POWERGRID, Mr. Singh worked for 10 years in NTPC.



**Shri K. Sreekant**  
**Director- Finance**

- Appointed as a Director on the board in Sept, 2016, Mr Sreekant has about 32 years of experience in the power sector involving all facets of Finance & Accounting function and in particular, long term financial planning, investments appraisal, formulation of capital budgets, etc
- Prior to joining POWERGRID, Mr Sreekant served as the General Manager of Finance at NTPC.



**Ms. Seema Gupta**  
**Director (Operations)**

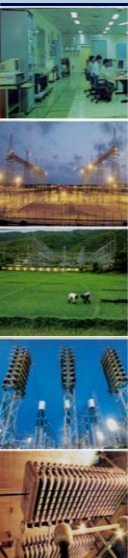
- Prior to taking up this assignment, Ms. Seema Gupta served as Executive Director(Northern Region-I) in the company
- More than 34 years of experience in Power sector and has handled multi disciplinary functions like Commercial, International Business, Corporate Monitoring, etc.
- Before joining POWERGRID in 1991, Ms. Seema worked with NTPC for 7 years



**Shri R K Chauhan**  
**Director (Projects)**

- Mr Chauhan has a diverse experience of over 33 years in EHV AC&DC transmission system,
- He served for 10 years in NTPC prior to joining POWERGRID
- Mr. Chauhan has been instrumental in development of National Grid which is considered as the backbone of the country's Electricity market.





## CERC Tariff Norms for 2014-19

### Salient Features and Components of Tariff

- Cost plus tariff
- Debt-Equity ratio of 70:30 for investments

### Annual Fixed Charge

- RoE (Return on Equity) @ 15.5% to be grossed up with effective tax rate
  - Addl. 0.5% RoE for projects completed within the time stipulated by regulator
- Interest on Loan –as per actuals on normative debt
- Depreciation 90% allowed– Weighted average ~5.28% for 12 yrs rest spread over useful life (straight line method)
- Operation and Maintenance- Unit O&M rates specified for different configuration & voltage level of lines (S/C or D/C, with single, double, triple, or quadruple conductor) and voltage level of substations (bays)
- IWC (Interest on Working Capital)

### Other Charges

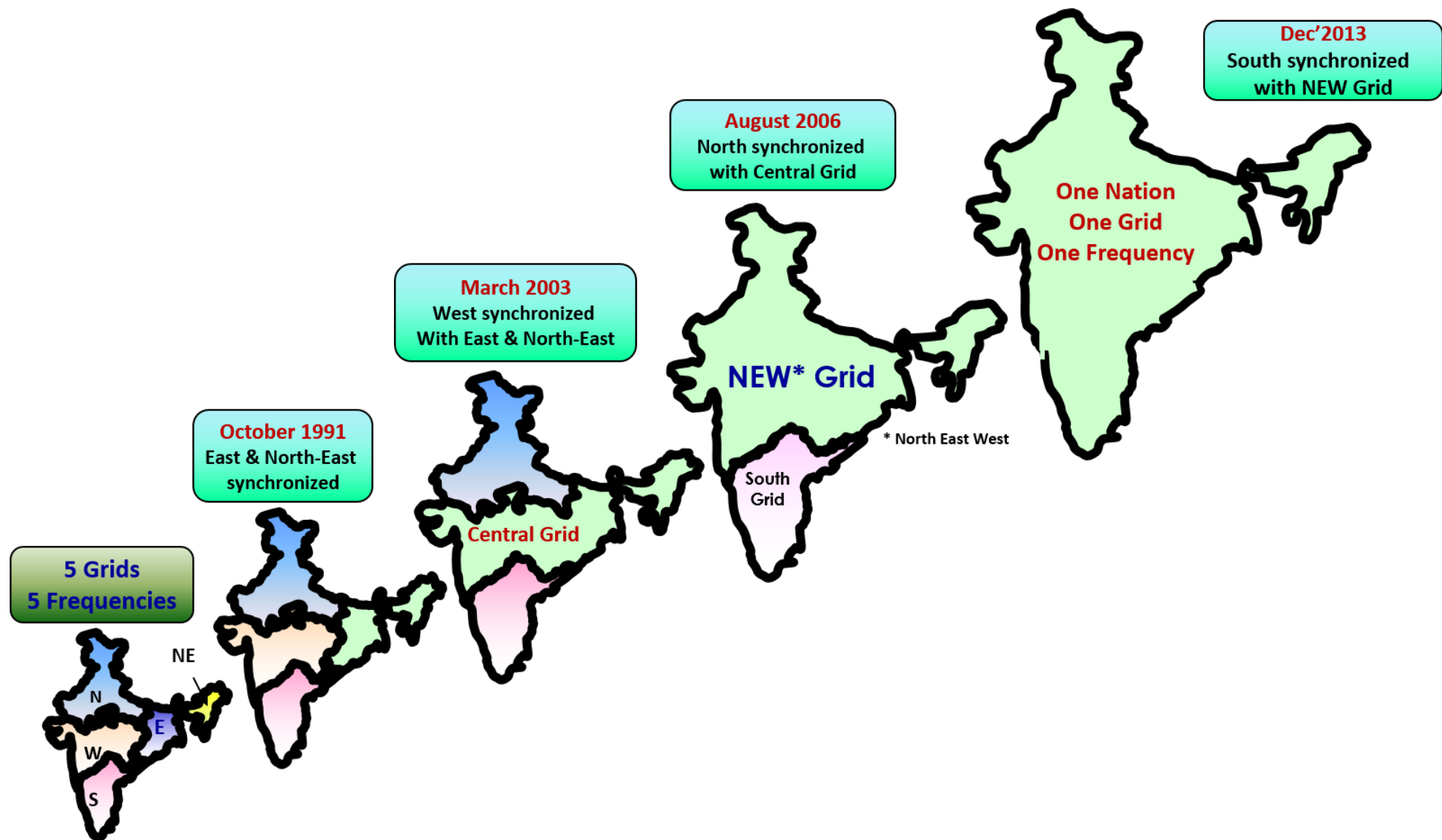
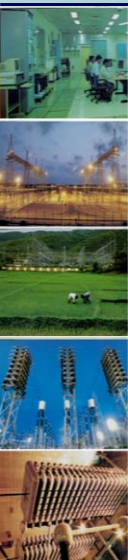
- Availability based Incentive
- FERV is pass through

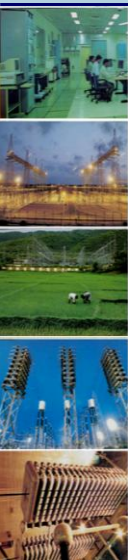
## Sample Calculation of Tariff

- **Capital Cost of the Project : INR 100 Crs**
  - Loan 70
  - Equity 30
  - Rate of Interest (IOL) say 9.5% p.a.
  - Repayment of loan 12 yrs
  - IOWC say 12.25%
  - O&M (Line & Bay details) Bay – 2 no 400 kV Bays  
Line – 400 kV D/C 35 km  
(Twin Conductor)
  - Actual Availability say 99.5%

Tariff Component	As per CERC Regulations 2014-19
ROE	$30 \times 0.1961 = 5.883$
IOL	$70 \times 0.095 = 6.65$
Depreciation	$100 \times 0.0528 = 5.28$
O&M Expenses	Bay : $0.6871 \times 2 = 1.3742$ Line: $0.00806 \times 35 = .2821$ Total = 1.6563
IOWC	1 month O&M = 0.14 15% O&M = 0.248 2 months receivables = 3.30 IOWC = $3.82 \times 0.125 = 0.46$
Total	= 19.91+ Incentive = $19.91 \times (99.5/98.5)$ = $19.91 \times 1.0102 = 20.11$

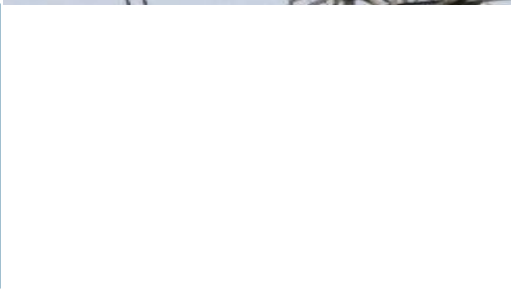
# Evolution of Synchronous National Grid





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