

Rajasthan Rajya Vidyut Prasaran Nigam Ltd.
Rajasthan's Initiatives

Power Transmission in India
Requirements, Plans, Technologies and Regulation
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A
presentation
by

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POWERLINE

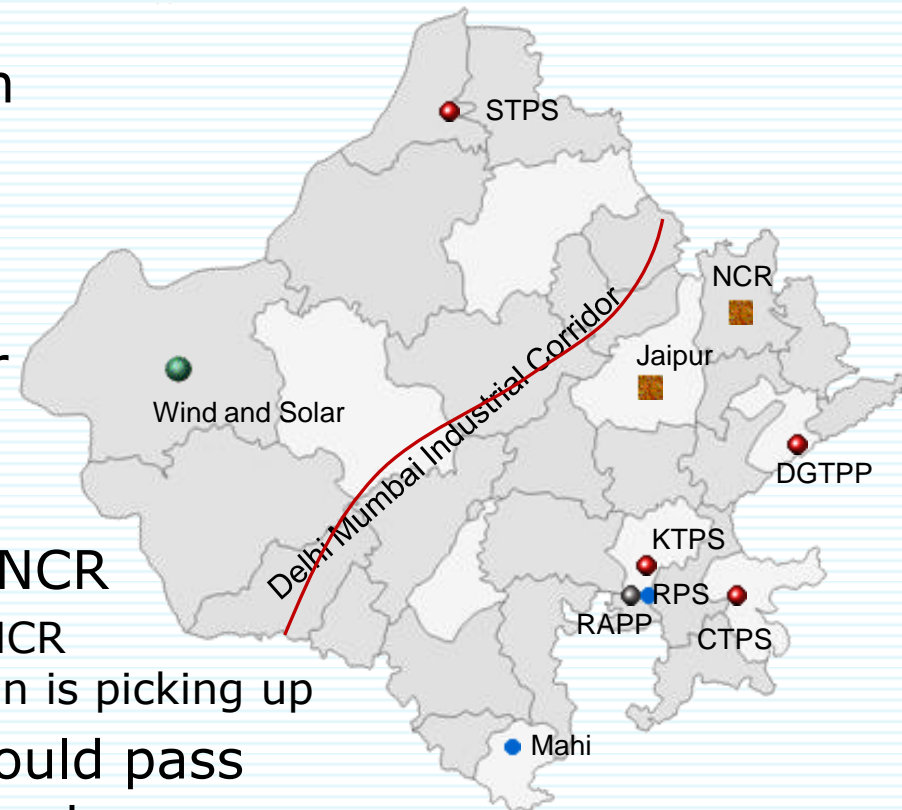


Rajasthan

- Largest state in the country, Diverse geography
 - Desert in west, Hilly terrain in south east
 - Economy
 - Agriculture dependent on ground water causing heavy burden on power system
 - Industry is based on rich mineral resources- Mining and processing industry viz. Cement, Marble, Zinc, Copper and Rock Phosphate.
 - Discovery of mineral oil in western Rajasthan
 - Power supply position is satisfactory
 - No power-cut on industry and in Urban area
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Rajasthan

- Rajasthan is the largest state in India
- High cost of transmission
- Conventional generation sources concentrated in south/south-east, north
- Renewable sources in far west
- Load is concentrated in urban areas of east and NCR
 - North Eastern part lies in NCR where rapid industrialisation is picking up
- Large section of DMIC would pass through Rajasthan leading to industrial growth



Generation Capacity Addition

- Capacity available to Rajasthan rose from 3998 MW (Mar 2001) to 10215 MW (Mar 2012)
 - Ambitious capacity addition programme for 12th plan
 - State sector projects- 9610 MW through RVUN
 - Private Sector- 5380 MW
 - 1080 MW Lignite TPS by M/s Raj WestPower- 540 MW
 - 4x135 MW commissioned, Remaining 4x135 MW in XII plan
 - Case 1 bidding- 1200 MW
 - 1200 MW contracted from 1320 MW Kawai TPS of M/s Adani Power
 - 1000 MW : Process started
 - Case 2 bidding- 2640 MW
 - 2x660 MW Banswara TPS
 - 250 MW Giral lignite based TPS
 - 70 MW Gurha lignite based TPS
 - 1000 MW Keshoraipatan gas based TPS
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Renewable Energy

- Immense potential for Wind and Solar in Jodhpur, Jaisalmer and Barmer
- Capacity addition in renewable energy

Capacity addition	Wind	Biomass	Solar
Upto March 2012	2067 MW	91 MW	198.5 MW
Target for 12 th Plan	2215 MW	160 MW	3680 MW

Rajasthan's Transmission System

- Focused attention to Transmission in post reform era

	<u>EHV GSS</u> (220 kV & 132 kV)	<u>EHV Line</u> (ckt km)	<u>400 kV GSS</u>	<u>765 kV GSS</u>
■ 2001	214	16,581	1	0
■ 2012	409	28,365	9	2 (Under Order)

Existing transmission system can handle 18000 MVA,
7605 MW peak demand already handled

Rajasthan's Transmission System

- Strong and robust transmission system capable to cater present load
 - State grid survived even under the major system disturbances of Northern Region
 - System availability is 99.8% in 2010-11
 - Best reactive power management in Northern Region
 - Efficient grid management resulting almost flat load curve
 - Transmission losses within state reduced from 4.72% in 2002-03 to 4.2% in 2011-12, even after increase in peak demand
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Evacuation System

- RVPN committed for evacuation of power from upcoming plants
 - Transmission system would be ready matching with commissioning of Generation

 - Huge investment in transmission
 - 12th plan- Rs. 12600 Cr.
 - 2012-13- Rs. 2800 Cr.
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Evacuation System

- New 765 & 400 kV system under progress/sanctioned
 - Two 765 kV GSS and 440 ckt km line from Anta to Phagi
 - 765 kV system for the first time in state for evacuation of three large power plants
 - Chhabra
 - Kawai
 - Kalisind
 - 11 new 400 kV GSS under progress/sanctioned
 - Evacuation of renewable energy
 - Transmission system developed for 2000 MW
 - Further plan for evacuation of 4000 MW by 2014-15
 - Investment of Rs. 2900 Cr.
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Modern Technology for Urban Area

- Compact Hybrid GIS/ GIS in Jaipur and Jodhpur
 - 132 kV Hybrid GIS at SMS Stadium, Jaipur commissioned : smallest substation (2100 m²)
 - 132 kV Hybrid GIS at 220 kV Indira Gandhi Nagar, Jaipur commissioned (12000 m²)
 - 132 kV GIS under execution at New Jhotwara and PWD Bungalow, Jaipur
 - 7 more Hybrid GIS/GIS
 - 2 Nos. 220 kV GIS and 5 Nos. 132 kV Hybrid GIS/GIS
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Modern Technology for Urban Area

□ EHV XLPE Cables in Jaipur & Jodhpur

■ 220 kV Cable

- LILO of 220 kV Sanganer Heerapura line to 220 kV Mansarovar GIS 2x2.4 km
- 220 kV Heerapura to 220 kV NPH Jaipur GIS 11.8 km

■ 132 kV Cable

- 132 kV NPH to 132 kV PWD Bldg. Jaipur 2x3.7 km
 - 132 kV IG Nagar to 132 kV MNIT GIS 8.35 km
 - LILO of PS8- Jodhpur line to 132 kV Chpasani 2x3.97 km
 - 132 kV Engg. College, Jodhpur GIS to 132 kV NPH, Jodhpur 2x4.47 km
 - 132 kV Engg. College, Jodhpur GIS to 132 kV OPH, Jodhpur GIS 2.46 km
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Optimum Use of Assets

□ Telecom Tower Infrastructure Provider

- Developer selected through International competitive bidding for 3 zones and agreements executed
 - Around 74000 towers made available to TTIP
 - Provision of escalable Fixed charges and sharing of revenue
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Optimum Use of Assets

□ OPGW

- Large scale plan for use of Wide-band data communication
 - Additional capacity for other providers
 - Process for selection of partner for use of optical fibre started
 - Consultant appointed and feasibility report ready
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Going Green...

- Rooftop Solar PV panel
 - 100 kWp Rooftop Solar PV panel at Vidyut Bhawan, Jaipur
 - Solar power for substation auxiliary
 - 500 kWp Solar power for auxiliary consumption at each 765 kV GSSs
 - Energy efficiency
 - Energy efficient lighting for 765 kV GSS Control Room Buildings and Streets
 - LED, Mag coupled, CFL lighting
 - Control room building designs confirming to ECBC 2007
 - Use of Star rated equipments
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Transmission Projects in Private Sector

- Private sector participation as per MoP standard Bid process
 - RVPN as Bid Process Coordinator
- Three projects already awarded to selected Transmission Service Provider
 - Encouraging response
 - Transmission Service Agreement executed for two projects
- Two new projects to be offered to private sector
 - Bids invited



Open Access

- ❑ Rajasthan is among few states which introduced Open Access
 - ❑ Open Access Regulations notified by RERC in May 2004
 - ❑ Open Access on transmission and distribution available to all consumers above 1 MVA capacity
 - ❑ Legal frame work exists
 - Procedures developed and published on website
 - Charges determined regularly by RERC
 - Surcharge determined as per provisions of Tariff Policy
 - ❑ Reduced every year
 - ❑ Reached to 20% of opening value in 2010-11
 - ❑ Around 250 MW capacity being wheeled through Intra state Open access
 - ❑ Around 100 inter state Open access transactions in a month using state's grid
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Smart Grid for RE Transmission

- Renewable Generation is subject to vagaries of nature and therefore highly variable
 - Advance tools are required to be incorporated for generation forecast, scheduling and reactive power management
 - Transmission network to be provided with
 - Reliable communication system with Optical Fibre/wideband connectivity
 - Intelligent meters and devices
 - Switchable Reactors for Reactive Power Management
 - Substation Automation System & SCADA
 - Additional features to be incorporated in the transmission system would entail additional cost
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Key Issues and Concerns

- ROW and Land Acquisition
 - ROW for lines
 - Delays in clearances
 - Land acquisition for GSS
 - Land availability and prices in Urban area
 - Skilled Manpower
 - Paucity of contractors
 - Timely supplies by Manufacturers
 - Development of In-house skilled manpower
 - Rapid Capacity Addition
 - Transmission to meet pace with Generation Capacity Addition
 - Renewable Energy
 - Despatch issues of in-firm power
 - No incentives for development of evacuation of low CUF power, whereas generation is incentivised
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Thank You

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**RAJASTHAN RAJYA VIDYUT
PRASARAN NIGAM LIMITED**