CHAPTER - 6

ELECTRICITY / POWER IN INDIA

Overview

- India has an installed power generation capacity of 155,000 MW
- The total demand for power is expected to cross 950,000 MW by 2030
- The government plans to add about 78,000 MW of installed generation capacity by 2012
- Main sources of power in India include thermal power, hydro power and nuclear power
- Private sector contributes around 13.5% to total power generation
- The per capita power consumption in India is 612 kWh
- Only 44% of rural households have access to electricity
- The Government of India is working towards the objective of 'Power for All by 2012

Power transmission

- Transmission of electricity is defined as bulk transfer of power over a long distance at a high voltage, usually 132 kV or more
- Transmission in the country is divided into five regional transmission system:
  - Northern region (HQ Delhi): largest in area
  - Norther eastern region (Shillong) : Highest hydro:thermal power ratio (1:1)
  - Eastern region (HQ Bangalore)
  - Southern region (HQ Bangalore)
  - Western region (HQ : Nagpur)
- The interconnected transmission system within each region is called the Regional Grid. The eastablishment of a National Grid has been planned
- Power transmission is handled by the Power Grid Corporation of India Ltd. (PGCIL)
- Four of the five Regional Grids now operate as a synchronous grid (western, northern, eastern and norther eastern). The Southern Grid is connected to the sysnchronous grid separately through HVDC links
- Each Regional Grid functions under a Regional Load Despatch Cenre. Additionally, a National Load Despatch Cenre has been established in New Delhi to coordinate efforts to establish the National Grid

Power distribution

- Transmission and distribution (T&D) losses in India reach 33%
- Losses include technical losses such as unplanned lines, overloading, and commercial losses such as theft, pilferage etc
- The Accelerated Power Development and Reform Programme (APDRP) was initiated in 2001 to bring down T&D Losses below 15%
- Power distribtion is the responsibility of State Electricity Boards (SEBs)

- The Maharashtra State Electricity Board (MSEB) is the second largest power generating utility in India, after the National Thermal Power Corporation (NTPC)

GOVERNMENT UNDERTAKING IN POWER SECTOR

All entities function under the Ministry of Power unless otherwise noted

National Thermal Power Corporation (NTPC)

- The NTPC is the largest power generating utility in India. Its installed generation capacity is around 30,000 MW
- It was established in 1975 and is headquartered in New Delhi
- It has 18% of national installed capacity but contributes 28% of national power generation
- It has 15 coal-based and 7 gas-based power generating plants
- The largest coal based plant is the Talcher-Kaniha plant in Angul, Orissa (3000 MW)
- The largest gas based plant is the Dadri plant in Uttar Pradesh (817 MW)
- The NTPC has forayed into hydro power projects as well. Hydro projects under implementation by the NTPC are
  - Koldam in Himachal Pradesh (800 MW)
  - Loharinag Pala in Uttarakhand (600 MW)
  - Tapovan Vishnugarh in Uttarakhand (520 MW)

National Hydro Power Corporation (NHPC)

- The National Hydro Power Corporation Ltd. (NHPC) is a Mini Ratna enterprise responsible for developing hydro power in India
- It was established in 1975 and is headquartered in Faridabad
- The NHPC has completed 13 hydro power projects worth installed capacity of 5000 MW and is in the process of implementing 11 more projects
- The largest hydro plant is the Indira Sagar across the Narmada river in Madhya Pradesh (1000 MW)
- The Subansiri (Lower) project across the Subansiri river in Assam is the largest hydroelectric project undertaken in India. Expected to complete in 2010, it will have an installed capacity of 2000 MW

Nuclear Power Corporaiton of India (NPCIL)

- The Nuclear Power Corporation of India is responsible for generation of nuclear power in India. The NPCIL is the only power utility company in India that uses nuclear energy
- The NPCIL was established in 1987 and is headquartered in Mumbai
- The NPCIL functions under the Department of Atomic Energy (Ministry of Science and Technology)
- The NPCIL operates 17 nuclear power plants with an installed capcity of 4120 MW. Additionally it has five reactors under construction with capaticy of 2660 MW
- The NPCIL also operates a 10 MW wind power project at Kudankulam in Tamil Nadu (site of upcoming nuclear project)

Power Grid Corporation Ltd. (PGCIL)

- The Power Grid Corporation of India Ltd. is one of the largest power transmission utilities in the world
- It was established in 1989 and is headquartered in New Delhi
- The PGCIL is a Navaratna enterprise
- The PCCIL conducts about 45% of India's electricity on its power lines. It has over 71,500 km of transmission network circuitry.

- The PGCIL operates five Regional Grids (see above). It is also working towards establishing a National Grid in India

Rural Electrification Corporation Ltd (REC)

- The Rural Electrification Corporation aims to finance and promote rural electrification projects in the country
- It was established in 1969 and is headquartered in New Delhi
- The REC provides loans to SEBs and state power utilities for investment in rural electrificaiton schemes
- The REC is the nodal agency for the implantation of the RGGVY

Policies and Programmes

All policies and programmes fall under the Ministry of Power unless otherwise noted

National Electricity Policy

- Launched in 2005
- The objectives of the Policy include
  - Provide access to electricity to all housholds by 2010
  - Power demand to be fully met by 2012. Energy and peaking shortages to be overcome
  - Supply of reliable and quality power at affordable rates
  - Minimum lifeline consumption of 1 unit per houshold per day by 2012
  - Per capita availability of electricity to be increased to over 1000 units by 2012
  - Financial turaround and commercial viability of electricity sector
  - Protection of consumer's interests
- The Policy also required the Central Electricity Authority (CEA) to frame a National Electricyt Plan every five years, which covered
- The Policy seeks to address multiple issues including the following
  - Rural electrification
  - Power generation, transmission and distribution
  - Recovery of cost and subsidies
  - Technology development and R&D
  - Power sector reforms including private sector participation
  - Energy conservation
  - Renewable energy sources
- In order to implemtn the policy, the RGGVY scheme was launched by the Rural Electrification Corporation

Rural Electrification Policy

- Launched in 2006
- Objectives include
  - Provision of access to electricity to all housholds by 2009
  - Quality and realible power supply at reasobable rates
  - Minimum household consumption of 1 unit per household per day by 2012
- As per the policy, all state government were required to prepare and notify a Rural Electrification Plan to achieve the Policy goals

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)

- Thr RGGVY was launched in 2005 to implement the National Electricity Policy
- The RGGVY is implemented by the REC
- The RGGVY provides 90% Union Government subsidy for rural electrification projects including
  - Rural Electricy Distribution Backbone (REDB): The REDB is to act as the primary infrastructure for the distribution of electricity in rural areas. Each Block to have at least one 33/11 kV substation
  - Village Electrification Infrastructure (VEI): at least one distribution transformer in each village
  - Decentralised Distributed Generation (DDG) System: these systems are to act as stand-alone power generation and distribution mechanism where supply from the grtid is not possible or not cost-effective
- The RGGVY provides for free connection to all households below the poverty line
- The Scheme says that there shall be no discrimination in the hours of supply between urban and rural areas. This should help in development of rural industries, health care and education facilities
- The Scheme targets the electrification of 125,000 un-electrified villages