Chapter 17
Restructuring Power Industry in India

Kashika Dubey Pathak
Bansal Institute of Research and Technology, India

ABSTRACT
Since the beginning of the nineties decade, many nations have undergone a change in the method of operations of the power network. The power sector was switched to open access market from vertically integrated market. The reasons for this change are many and they differ from nation to nation. The developing countries faced the problem of high demand growth along with irrational tariff policies and lack of efficiency in managing the power system. On the contrary, the developed countries restructured the power sector to provide electricity at lower prices and give the customers a number of operators to choose from. In short, the goal of restructuring is to encourage competition in the market along with providing consumers with more choices in purchasing economic energy and economic benefits. This might seem to be less complex but involves several issues which are discussed further. This chapter describes this restructuring of power sector with special reference to Indian scenario.

1. INTRODUCTION
The need to restructure the electric power industry was felt to give economic access of power to the consumers as well as facilitate its easy generation (Khaparde 2004). It was realized by the investors that the competitive market and the reduced government regulatory costs would result in increased power supplies at low prices. Thus, sufficient competition amongst the generation sector has developed, which also gives consumer a number of choices to choose from.

The electricity is usually generated at the central station by rotating a magnet inside of a coil of wire. This electricity, is then, transmitted from the station to long distance substations (that deliver the power to consumers) over high voltage transmission lines. At a generating plant, electric power is “stepped up” to several thousand volts by a transformer and delivered to the transmission line. At numerous substations on the transmission system, transformers step down the power to a lower voltage and deliver it to distribution lines. The type of transmission structures used for any
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2. POWER INDUSTRY IN INDIA

Electricity is one of the major components of infrastructure that plays a crucial role in the development of the nation. India stands 5th in position in terms of power generation. About 65% of the electricity consumed in India is generated by thermal power plants, 22% by hydroelectric power plants, 3% by nuclear power plants and rest by 10% from other alternate sources like solar, wind, biomass etc (The Electricity Act, 2003). 53.7% of India’s commercial energy demand is met through the country’s vast coal reserves. In India, sources for power generation range from commercial sources such as coal, lignite, natural gas, oil, hydro and nuclear power to other viable non-conventional sources such as wind, solar, and agriculture and domestic waste. With development of the nation at a fast pace and an increase in population every year, the demand for electricity is also growing at a rapid rate and is also expected to increase further in the years to come. It is expected that by 2030-35, energy demand in India will be the highest among all the nations. Government of India has also started several projects like the Jawaharlal Nehru National Solar Mission to attract investors to India.

Power Sector in India has undergone severe changes since the enforcement of the Electricity Act, 2003 (The Electricity Act, 2003). It has paved the way for competitive and open access market. Basically, the Power sector has three foundations to its support: Generation, Transmission and Distribution. The Generation of Power is divided amongst Central, State and Private Sectors. The main focus in Electricity generation is mainly concentrated on generation that involves low cost, optimization of capacity utilization, upgradation of technology and complete utilization of non-conventional resources.

Transmission of electricity involves bulk transfer of power over a long distance at high voltages. The entire country has been divided into five regions for transmission systems, namely, Northern Region, North Eastern Region, Eastern Region, Southern Region and Western Region. The Interconnected transmission system within each region is also called the regional grid.

In India, many of the state governments provide electricity at subsidized rates or even free to some sections. This includes for use in agriculture and for consumption by backward classes. The subsidies are mainly as cross-subsidization, with the other users such as industries and private consumers paying the deficit caused by the subsidized charges collected. One of the major disadvantages of providing subsidized electricity has resulted in the financial losses to the state governments.

3. ISSUES IN INDIAN POWER SECTOR

India being a developing nation faces a lot of problems in meeting the rapidly growing demand of power consumption. Some of them are:

1. Limited Fuel Resource: In India, electricity is mainly produced at the thermal power stations where the main source of electricity production is coal. As per a study, the Indian power sector used about 400 million tonnes of coal in 2011–2012. However, the production of coal is insufficient to meet the growing demand of power consumption. This shortage is being addressed by importing coal from other nations (Figure 1).

2. Shortage of Core Components: There is inadequate of availability of some core equipments needed in power production such as
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