IMaCS has brought out an Industry Update on the Indian Power Sector, April 2014. The full report is available at www.imacs.in

EXECUTIVE SUMMARY

The power sector in India has the fifth largest electricity generation capacity in the world, and it is among the core sectors of the country. It facilitates development in various other sectors like agriculture, manufacturing, construction and services among others. Between April 2000 and January 2014, it has attracted Rs. 404 billion worth of Foreign Direct Investment (FDI) inflows. India's fast paced economic growth and its increasing rate of industrialisation has fuelled the demand for energy. During the Eleventh Five Year Plan (2007-12), about 55 GW generation capacity was added, which was around two times the capacity addition during the Tenth Five Year Plan (2002-07). This highlights the significant development in the capacity addition. The distribution sector which is mainly dominated by the state owned utilities has been dealing with losses. Also, even after actual capacity addition exceeding targets in the recent years, the country still faces significant power shortages throughout the year due to losses in distribution (overall power deficit in FY2013 was 8.7% and peak deficit was 9.0%).

In the last decade, the electricity sector in the country has moved from being a mostly vertically integrated structure with the State Electricity Boards (SEBs) owning the generation, transmission and distribution businesses to a more unbundled corporate structure. As compared to about 23 integrated utilities or SEBs that existed before the electricity reforms began, there are now more than 90 utilities/companies. These comprise state owned generation, transmission and distribution companies; private utilities engaged in generation and distribution in particular cities and central government owned power generation and transmission companies. It also includes industrial power generators (captive power units) that own small plants that cater to the electricity needs of their companies and Independent Power Producers (IPPs). Trading of power is facilitated by inter-state and intra-state trading licensees and the two power exchanges. At present, out of 21 states in which all matters relating to generation, transmission and distribution of electricity were managed by the respective SEBs, all the states except Jharkhand and Kerala have reorganised their SEBs.

IPPs sell power to utilities within or outside the state where they are located. Intra-state transmission is the responsibility of the state transmission utilities (STUs), while Power Grid Corporation of India Limited (POWERGRID) handles most of the inter-state transmission. Most of the new inter-state and a few intra-state transmission lines are being awarded under competitive bidding. As of now, only a few transmission lines are developed and managed by companies in the private sector or joint sector. Distribution of power is mostly owned by state distribution companies (discoms), although, there are a few privately owned companies that undertake distribution of power in some states or cities. Most states have set up State Electricity Regulatory Commissions (SERCs), which regulate the electricity sector and determine the tariff for distribution and transmission companies as well as the tariff of the generation plants which sell the power to the distribution companies in the state. The Joint Electricity Regulatory Commission (JERC) performs a similar role for the State of Goa and Union

Territories. The Central Electricity Regulatory Authority (CERC) fulfils this responsibility for the central power utilities. The Apellate Tribunal for Electricity is established to hear appeals against the orders of the adjudicating officer, SERCs, JERC and CERC. Apart from these organisations, there are privately owned power trading companies that facilitate the trading of power between regionally separated companies and utilities at a margin determined by the CERC.

At present, amongst the utilities, the public sector comprising the SEBs, state and central government owned generation organisations control around two-thirds of the installed generation capacity of the utilities. It also includes most of the transmission and distribution except in Delhi and few other cities.

The deteriorating financial condition of SEBs and ongoing power shortages in the country led the Government of India (GoI), in 1991 to amend the Electricity Act (EA), 1910 and the Electricity (Supply) Act (ESA), 1948. This was also done to attract private investment in power generation and distribution. It facilitated the tapping of domestic and foreign capital markets; provided assured returns on investment and reduced legal hassles to allow the private investors to set-up generation capacities. These investors could also operate as licensee in distribution segments, which were hitherto a monopoly of the SEBs. Private power initiatives in generation banked on long-term power purchase agreements (PPAs).

Recognising the need for accelerating the reform, the Electricity Act, 2003, was enacted in June 2003. The Act replaced the three existing legislations governing the power sector, namely Electricity Act, 1910; Electricity (Supply) Act, 1948, and the Electricity Regulatory Commissions Act, 1998 (ERC, 1998). Following the Electricity Act, 2003, several additional rules and laws have been passed relating to the overall framework under which the sector must operate, tariffs, treatment of displaced people, and hydro power development. The corresponding laws and policies are The National Electricity Policy, 2005; The Tariff Policy, 2006; The Resettlement and Rehabilitation Policy, 2007; The New Hydro Policy, 2008. The revised Mega Power Policy and the Ultra Mega Power Policy have started an era of high capacity installations in the country.

The financial health of the distribution sector is pivotal for the financial viability of the entire value chain of the power sector as it delivers to the end consumer. The key issues are inadequate tariff revision vis-à-vis the rising costs of supply; high level of receivables from the sale of power (total receivables of SEBs, discoms and other utilities selling directly to consumers increased from Rs. 646 billion as on 31st March, 2010 to Rs. 807 billion as on 31st March, 2011 and further to Rs. 1,077 billion as on 31st March, 2012). Other issues are delays in release of subsidy by the state governments; operational inefficiencies and insufficient investment in improving infrastructure. The efficiency of the distribution system as measured by the extent of aggregate technical and commercial (AT&C) losses remains low, along with inefficient grid quality. While there has been some success in controlling the AT&C losses in recent years, they still remain high in absolute terms. The overall AT&C losses for utilities selling directly to consumers increased marginally from 26.0% in the year 2010-11 to 27.0% in 2011-12, which poses a significant challenge to the distribution utilities. The aggregate book

losses for all utilities selling directly to consumers increased from Rs. 285 billion in the year FY2010 to Rs. 492 billion in FY2011 and further to Rs. 578 billion in FY2012.

The Ministry of Power launched Accelerated Power Development Programme (APDP) in 2000-01 wherein additional central plan assistance was made available to states undertaking distribution reforms in a time bound manner. In March 2002, APDP was rechristened as APDRP with urban focus and introduction of reforms element. Incentive scheme was introduced to incentivise utilities achieving cash loss reduction. The AT&C losses during this programme reduced from 38.8% in 2001-02 to 29.2% in 2007-08. Restructured Accelerated Power Development and Reforms Programme (R-APDRP) was launched in 2008 with a capital outlay of Rs. 515 billion. Its aim was to incentivise states/utilities for a sustainable reduction in losses and reduce the AT&C losses in urban areas to below 15%.

In the last few years, the Indian power sector has endured an economic downturn, along with problems like high borrowing costs; funding crunch amid delays in land acquisition and project approvals such as environmental clearances. Other problems include lack of power purchase agreements; fuel shortages that increased the dependence on imports of coal and also an increase in the price of foreign coal. Although thrust is being accorded to maximise generation, both from conventional and non-conventional sources, coal based generation will continue to be the main stay of electricity generation. The dominance of coal in India's generation capacity is mainly because of significant reserves of coal. The power sector is the largest consumer of coal in India, accounting for around 75% of total coal demand and 77% of domestic off-take. Although domestic coal production has registered growth in the last few years, the gap between domestic demand and supply has worsened, resulting in higher imports. In order to meet the coal requirement of increasing capacity addition, domestic coal availability/supply has become a big challenge for the all stakeholders. During FY2013, power utilities reported a generation loss of 15.8 billion units due to shortage of coal.

A significant proportion of future capacity additions are expected to be based on coal, however, over the long-term, the share of coal-based generation is expected to decline from 66% in FY2009 to 61% in FY2032. Among other fuels, coal is expected to continue as a dominant fuel for power generation because of several factors like abundant and exploitable coal reserves, shorter power plant development period, competitive cost of generation, new technology developments to increase plant efficiencies. Yet it would primarily serve the base load requirement. In future however, coal based power generation could stand to lose some of its competitiveness. This is due to stricter environmental norms, the introduction of pollution tax, growth of renewable energy sources, and new technology adoption risks.

During the Twelfth Five Year Plan period an estimated 75 GW of capacity addition of power will be added. The share of the state sector in the capacity addition is planned at about 18%. The estimated fund requirement for generation, including renewables, has been estimated at about Rs. 6,386 billion including Rs. 2,725 billion for advance action for the Thirteenth Five Year Plan projects.

There is high potential for generation of renewable energy from various sources – wind, solar, biomass, small hydro and cogeneration bagasse. India faces a significant challenge in providing access to adequate, affordable and clean sources of energy, especially cooking fuel to a large section of the population, most of who live in rural areas. As per the 2011 Census, almost 85% of rural households were dependent on traditional biomass fuels for their cooking energy requirements.

India's installed grid-interactive renewable power systems have increased steadily from about 2,860 MW in 2000-01 to 30,177 MW in January 2014. Wind installations have increased from 1,348 MW to 20,298 MW during this period. Though, the industry is fairly new in terms of growth, it is less prone to economic cycles because of the unmet electricity demand in the country as well as fixed tariffs and off-take contracts. Significant capacity potential, favourable incentives, technology advantage, ease of installation and substantial development capabilities have made wind farm development more attractive to investors. Consequently, the trend is expected to continue in the medium to long term until other competing systems are able to offer similar benefits.