

RESTRUCTURING POWER SECTOR: A PATHWAY TO FUTURE SUSTAINABLE DEVELOPMENT IN INDIA

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ABSTRACT

Power development in India commenced at the end of the 19th century with the commissioning of electricity supply in Darjeeling during 1897, followed by the commissioning of a hydropower station at Sivasamudram in Karnataka during 1902. In the Pre – Independence era, the power supply was mainly in the private sector that too restricted to the urban areas. With the formation of State Electricity Boards during five year plans, a significant step was taken in bringing about a systematic growth of power supply industry all over the country. A number of multi – purpose projects came into being, and with the setting up of thermal, hydro and nuclear power stations, power generation started increasing significantly. Since independence, the growth of Indian Power Sector has been noteworthy. The increasing installed power capacity from 1,362 MW to over 1, 00,000 MW and electrification of more than 5, 00,000 villages are impressive. In spite of this achievement, very high level of technical and commercial losses and level of commercial approach in the management of utilities created an unsustainable financial operation. The present paper explores the restructuring power sector in India and the sustainable development through low financial expenditure.

Keywords: Power Sector, restructuring power sector and sustainable development.

INTRODUCTION

The most important problem faced by the power sector in the irrational and unremunerative tariff structure. Out of total energy generated, only 55% is billed and ultimately 41% is realized from the consumer end. Lack of competition and monopoly status has made all the SEBs ineffective and commercially unviable leading to erosion of its internal resource generation. The Government of India in the mid-term review of the Tenth plan recognized the fact that under-performance of the energy sector can be a major constraint in delivering a growth rate of 8% GDP during the plan period. To achieve Economic Growth, we need to and have to use more and more energy. Understanding energy cost is vital for creation of awareness and savings calculation. It calls for Management of Energy and the objective of which is to achieve and maintain optimum energy procurement and utilization, by minimizing energy costs and wastes (without affecting production & quality) and to reduce environmental effects. Very concerted efforts in a planned manner are to be established for Energy Management. Strategy needs to be established based on the target of energy conservation. Increasing pressure of population and increasing use of energy in different sectors of the economy is an area of concern for India. Despite the global financial crisis, India's energy demand continues to rise. The end users of electricity like household, farmers, commercial establishments, industries are confronted with frequent power cuts, both scheduled and unscheduled. Power cuts, erratic voltage and low or high supply frequency have added to the 'power woes' of the consumer. These problems enumerate from:

1. Inadequate power generation capacity, 2. Lack of optimum utilization of the existing generation capacity, 3. Inadequate and aging sub-transmission links, 4. Inadequate and aging sub-transmission & distribution network leading to power cuts and local failure/faults, 5. Large scale theft and skewed tariff structure, 6. Slow pace of rural electrification, 7. Inefficient use of electricity by the end consumer, 8. Lack of grid discipline

PRESENT SCENARIO

The power sector has been suffering from serious problems which were identified as far back as fifteen years ago. Though a number of corrective measures have been taken, they have yet to yield the desired results. The outcome is that the power sector faces an imminent crisis in almost all states. No State Electricity Board is recovering the full cost of power supplied, with the result that they make continuous losses on their total operations. These losses

cannot be made good from state budgets, which are they under severe financial strain. As a result the SEBs are starved of resources to fund expansion and typically end up even neglecting essential maintenance. The reasons for the huge losses of the SEBs are well known. Power tariffs do not cover costs because some segments, especially agriculture, but also household consumers, are charged very low tariffs, while industry and commercial users are overcharged. However, the overcharged segments do not always pay the high charges because of theft of electricity, typically with the connivance of the staff in the distribution segment, is very high. Of the electricity charges billed only 80% are actually collected. These large issues were hidden by claiming a large absorption of electricity in agriculture which is un-metered which enabled SEBs to claim T&D losses of around 24%. However, when actual losses were calculated more precisely in states undertaking power sector reforms, it was found that the actual T&D loss were as high as 45-50%. Operational efficiencies in generation are also very low in some states. Overstaffing is rampant. Political interference in the management of SEBs has become the norm in most states, making it difficult to ensure high levels of management efficiency. If electric power is to expand to support 8% growth, a substantial expansion in domestic coal production will be needed. As a step towards reformation of the SEBs, the Government of India enacted the Electricity Regulatory Commissions Act 1998 in July 1998. One of the objectives of this Act was “improving the financial health of the SEBs which are losing heavily on account of irrational tariffs and lack of budgetary support from the state government.”

THE ELECTRICITY ACT, 2003

The provisions of this Act have been brought into force with effect from 10 June, 2003 [with this, The Indian Electricity Act, 1910, The Electricity (Supply) Act, 1948 and The Electricity Regulatory Commissions Act, 1998 stand repealed]. The main features of the Act are: 1. Generation has been relicensed and captive generation freely permitted. Hydro projects would, however, need concurrence from the Central Electricity Authority, 2. No license required for generation and distribution in rural areas, 3. Transmission Utility at the Central as well as State level, to be a government company – with responsibility for planned and coordinated development of the transmission network, 4. Open access in transmission with provision for surcharge for taking care of current level of cross subsidy with the surcharge being gradually phased out. 5. Distributing licenses would be free to undertake generation and generating companies would be free to take up distribution. 6. The State Governments are required to unbundle the SEBs. However, they may continue with them as distribution licensees and State Transmission Utilities, 7. Setting up of the State Electricity Regulatory Commissions (SERCs) made mandatory, 8. An Appellate Tribunal to hear appeals against the decision of the CERC and SERCs. 9. Metering of electricity supplied made mandatory. 10. Provisions relating to theft of electricity made more stringent. 11. For rural and remote areas, standalone systems for generation and distribution permitted. 12. The Central Government to prepare a National Electricity Policy and Tariff Policy. 13. The Central Electricity Authority to prepare a National Electricity Plan.

THE ENERGY CRISIS

A universal problem the modern technological world requires energy. The use of energy is involved in all aspects of industrial endeavor. Like all other attributes of the earth, energy is a finite resource. The ability of any nation to survive in the long-run depends upon its ability to produce and properly manage an abundant supply of low-cost safe energy. How we live and where we live are virtually affected by the scale of energy provision. The role of economic growth can be greatly facilitated through increased availability of energy at reasonable prices. The economic well-being of a country is closely linked to its level of consumption. The present energy problem which, in fact, has the dimensions of a crisis, has come about for two reasons: one is the growing demand for energy and the other is the growing world population. It is now recognized that energy must be treated as the previous commodity that it is, both at home and in the factory. With the ever widening gap between the demand and supply of energy, due to fast depleting fossil fuels on the one hand and phenomenal growth in energy requirements on the other, the need for energy conservation has become imperative. The first international conference of the Watt Committee on Energy held in UK in April, 1992, has expressed the view that half the energy currently used could be saved quite easily through a mix of measures. The three major concerns of the policy matters in dealing with the energy sector problems should be: 1. Increasing availability of energy resources to meet growing demand in an optimal manner. 2. Minimizing environmental impact from use of resources. and 3, Promoting efficient use of energy resources.

FACING THE CHALLENGES: DEMANDS SUPPLY MISMATCH

The energy intensity of India is over twice that of the matured economies, which are represented by the OECD (Organization of Economic Cooperation and Development) member countries. India's energy intensity is also much higher than the emerging economies – the Asian countries, which include the ASEAN member countries as well as China. We are the world's 11th biggest energy producer, accounting for about 2.4% of the world's total annual

energy production and again, we are the world's 6th largest energy consumer accounting for about 3.3% of the world's total energy consumption. Seeing purely in our context, if India reaches 5000 KWH per Capita, which it should, because after all, that is our right – right to development; if that happens, India alone would require additional electricity that would constitute 40% of the present total world electricity production. This would amount to a tenfold increase in our electricity production. We thus have to cope up with a much bigger challenge even as compared to other developing countries, even China. We must have strategy to face the Demand-Supply mismatch in power sector. The Power Finance Corporation Limited (PFC) was incorporated on 16 July, 1986 as part of Government of India's initiative to enhance funding of power projects in India, with an objective to provide financial resources and encourage flow of investments to the power and associated sectors, to work as a catalyst to bring about institutional improvements in streamlining the functions of its borrowers in financial, technical and managerial areas to ensure optimum utilization of available resources, to mobilize various resources from domestic and international sources at competitive rates, to strive for up gradation of skills for effective and efficient growth of the sector, and to maximize the role of return through efficient operations and introduction of innovative financial instruments and services for the power sector. It works as Nodal Agency for Government Schemes.

ENSURING SUSTAINABLE DEVELOPMENT

Our mother earth closes nothing, refuses nothing and shuts none but we, human beings through the development process has consumed natural resources, generated pollution primarily from 19th century till date and even today, if scientists are to be believed, Mother Earth has reached an alarming stage where the problems of global warming, rising of sea levels, drastic trends of climate changes is a threat to the very existence of human life on Earth. The industrial processed has generated gases which have generated a blanket over the Earth trapping heat by the process known as Greenhouse Effect which experts believe is linked to the global warming and climate changes. Kyoto Mechanism has created an architectural frame work for market based management of global atmosphere and thus has taken a positive step for a cleaner future. The concept of Sustainable Development dates back a long way but it was at the UN Conference on Human Environment (Stockholm, 1972) that the International Community met for the first time to consider global environmental and developmental concerns and needs. United Nations Conference on Environment and Development (UNCED), also called Earth Summit, held at Rio de Janeiro laid the foundation for global deliberations on environment and sustainable development. The Summit agreed on Agenda 21 and the Rio declaration which led to agreement on two legally binding conventions on Biological diversity and the Framework Convention on Climate Change (FCCC). India had signed the United Nations Framework Convention on Climate Change (UNFCCC) on June 10th, 1992. The Kyoto Protocol has identified three flexibility mechanisms to lower the overall costs to achieve the emission targets. They are:

- I. Clean Development Mechanism (CDM)
- II. Joint Implementation (JI) and
- III. Emission Trading.

Government Initiatives the ministry of Power is primarily responsible for the development of electrical energy in the country. The ministry is concerned with perspective planning, policy formulation, processing of projects for investment decisions, monitoring of the implementation of power projects, training and man-power development and the administration and enactment of legislation with regard to thermal and hydro power generation, transmission and distribution. In all technical matters, the Ministry of Power is assisted by the Central Electricity Authority (CEA). A number of policies and initiatives have been taken by the Government of India so as to strengthen India's position in the world scenario. Some of them which need mention are: 1. Capacity Addition target of 78,700 MW for the 11th plan fixed by the Planning Commission. 2. The Installed power generation capacity has increased from about 1,400 MW in 1947 to 2,09,276 as on 31-10-2012. 3. 50,000 MW Hydro Electric Initiative launched by the Government in 2003-04. 4. 20,334 MW Hydro Capacity Addition during 12th plan (2012-17). 5. Setting up of Ultra Mega Power Project (UMPPs) with a view to provide power to all at a reasonable rate and ensuring fast capacity addition. 6. The National Electricity Policy has been notified. 7. Cabinet Committee on Economic Affairs (CCEA) approved the Restructured Accelerated Power Development and Reforms Program. 8. Automatic approval for FDI (RBI Route) for 100% investment of foreign equity is permitted in generation, transmission and distribution and trading in power sector. 9. Launching of Rajiv Gandhi Grameen Vidyutikaran Yojana scheme of Rural Electricity Infrastructure and Household Electrification in March, 2005. 10. The Ministry has set up the Solar Energy Centre (SEC) near Delhi. 11. The Development of Solar Cities. 12. International corporation activities in Renewable Energy.

FUTURE LIES IN RENEWABLE ENERGY

There are several important alternative sources of energy – some renewable, some long lasting, some free from CO₂ production, and some totally unexplored by us at present. These sources are listed below: 1. Wind energy, 2. solar energy, 3. Hydro-power, 4. Agricultural biomass and community wastes, 5. Gas from solid wastes (waste-to energy plants), 6. Coal Gas, Natural Gas, LNG, CNG, LPG, 7. Shale Gas, 9. Biofuels from oil-bearing plants, 10. Nuclear energy, 11. Geo thermal energy.

The Government has been promoting private investment in setting of projects for power generation from renewable energy sources through an attractive mix of fiscal and financial incentives, in addition to the preferential tariffs being provided at the States level. These include capital/interest subsidy, accelerated depreciation and nil/concessional excise and custom duties. Further, the Government is encouraging foreign investors to set up renewable power projects on a 'Build-Own and Operate' basis with 100% foreign direct investment. The annual turnover of the renewable energy industry, including the power generating technologies for wind and other sources, has reached a level of around Rs. 550 billion. The feasibility of a larger application of renewable energy, to that of the present assessments, would depend on how rapidly the costs decline and efficiencies increase. As a result, research and technology development have been accorded high priority in the national renewable energy program and mission mode research has been planned for developing solar, bio-energy and hydrogen technologies. International Cooperation activities in renewable energy are aimed at sharing of experiences and expertise with other countries, promoting scientific and research cooperation in technologies of interest to the country. During 2011-12 the Ministry entered into Memorandum of Understanding with Bangladesh, Egypt, Uruguay and a program of cooperation was signed with Spain.

SOLAR POWER

New hope Generation of electricity from the Sun is a flagship program of the Government. The solar market potential is huge, while only a fraction of the aggregate potential has so far been realized. India has one of the world's largest programs in solar energy which includes R & D, demonstration and utilization, testing and standardization, industrial and promotional activities, processed material for solar cells, inverters, charge controllers etc. The solar sector is expected to see an increased participation and collaboration especially in the technology and manufacturing space. As a tropical country which receives much sunlight, India tops the world (along with California and Hawaii in the US) in its potential for developing solar energy systems. Spain, Italy, Australia and China come next on the list. However, in actual implementation Germany and Spain top the list at present. The Jawaharlal Nehru National Solar Mission envisages establishing India as a global leader in solar energy. An ambitious target of 20,000 MW of solar power by the year 2022 has been set under the mission. The plan outlay for the Ministry of New and Renewable Energy increases by 61% from Rs. 620 crore in 2009-10 to Rs. 1,000 crore in 2010-11. The Mission support research, development and innovation to achieve grid-parity in the shortest time-frame. The mission will be implemented in three phases. The first phase is up to March, 2013, the second till March, 2017 and the third phase will continue till March, 2022. Around 1000 MW of grid connected solar power capacity has already been set up. SunBorne Energy, funded by General catalyst and Khosla ventures, is set to make solar power affordable and widespread across India. The company is partnering with MNRE on an R & D project to indigenize and decrease the cost of solar plants. Over the next decade, the plant is to cut the costs in half, making solar power competitive with other sources. SunBorne's affordable solar power can help India grow without risking the environment or energy security.

THE WAY FORWARD

The world has tapped only a small percentage of its vast renewable energy resources. Policy efforts need to be strengthened in order to encourage a massive scale up of renewable technology so as to build a long term, stable, low carbon economy. Countries all over the world fully recognize the imperative to promote widespread adoption of renewable energy into their Country's energy sources to promote sustained economic growth, social development and environmental stewardship. It is estimated that renewable energy could contribute at least half of electric power in each of the large economies by 2050. Power sector in India will witness a boom in the coming decades with huge FDI coming up in both conventional and non-conventional power generation sector. This sector is estimated to grow at a rate of 25% year on year in the coming years. Government has taken various electrification programs which are considered in the context of socio-economic development of India. The Ministry of Power has taken Missions like 'Power for all by 2012' and 'Rural Electrification Supply Technology (REST) Mission' which will accelerate the electrification for all villages and household through decentralized technologies and conventional grid connection. Solar energy castor looks to have a very viable prospect for investment in the coming years as the Government is showing its firm stance towards the use of renewable energy resources. As per Kyoto Protocol and Copenhagen

Convention, Government has taken initiatives to reduce carbon footprints and encourage non-polluting energy production technique. In order to have sustainable management of power sector we need: 1. Carbon Reduction by using LED Lights, 2. Earning through Carbon Credit, 3. Government to take an imitative stand, 4. Enhancement of Grid Efficiency, 5. Awareness of the Financial Benefits of Energy Efficiency, 6. Create Incentives to Save Energy, 7. Incentives to Promote Renewable Energy Sources and 8. Adoption of Lucifer (Jugnu – emits light without consuming any energy) Products.

CONCLUSION

The most important factor which can act as a constraint on economic growth of a country is the availability of energy and power (including generation, transmission and distribution). India is both a major power producer as well as a major power consumer. Investment in power sector is a must to enhance the infrastructural capacity of a country to sustain the process of its economic growth. The Government of India liberalized this sector and opened it before the foreign and private participants to raise adequate funds for the power sector. A quick view of the ownership pattern in this industry tell us that the State Government owned generating utilities accounted for 41.51% of the total capacity, while the Central Government owned power utilities accounted for 29.67% and private players accounted for only 28.82%. This sector calls for centralized restructuring. One of the prime areas that need focus should be the development of nationwide grid network. Since India suffers high transmission and distribution losses, the country needs to properly manage the operation. Further we need to secure energy resources to sustain us and our future generations for a long time into the future and most importantly be able to do so without harming the environment and disturbing the climate. This is a question of our very survival in the present day very competitive, selfish and unkind world. We need to move towards a safe and secure energy future. The potential for renewable energy technologies is immense. The elimination of inefficiency and wastage shall reduce the power cost and consumers shall get sufficient and affordable (low cost) quality power for consumption, economic growth and prosperity. Energy independence has to be the nation's first and highest priority and India must be determined to achieve this.

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