"Indian Electricity Regulation- Current and Prospective Challenges"

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Preamble

Power, also known as electricity, is the most visible form of energy that is often associated with progress in modern civilization. It is an important part of a country's infrastructure that determines its economic development. The rate of increase in power demand is generally higher than the rate of increase in GDP. According to studies, the power supply must grow at a rate of around 12% per year in order to achieve an annual GDP growth rate of 8%.

Evolution of the Regulatory regime

The real evolution of regulatory regimes in India commenced with liberalization of the Indian economy and unleashing of market forces. The electricity regulator came into being with the enactment of the Electricity Regulatory Commission Act, 1998 and thereafter, the Electricity Act, 2003 (hereinafter, the 2003 Act). Some believe that the regulatory regime in India is in a nascent stage and is still evolving and therefore, it is subject to a lot of challenges. Although it is considered that the challenges of the regulators will never subside as electricity sector is very dynamic sector, as it is market driven having technology & its usage at its core and therefore, challenges for a regulator to maintain a general equilibrium safeguarding the interests of all the stakeholders is a tall order. In this context, it becomes even more interesting to observe as to how the Indian electricity regulators continue to keep a grip over the industry amidst market dynamism and newer technologies becoming imperative. While the technological and economic advancements have also happened all over the globe, the Indian regulators have some very peculiar issues which cannot be addressed in reference to the other countries.

Post the enactment of the 2003 Act, role and functions of the electricity regulator have become both diversified and streamlined. A regulator under the 2003 Act is entrusted with discharging the functions as a legislator, an administrator as well as a judicial body. It has to legislate law; it has to redress the issues under that law and has to ensure that the law and the directions given thereunder are complied with. To deliver all these functions the regulators must be fully autonomous. However, its autonomy to this day, even after 22 years of first rolling-out a regulatory regime for power sector is still a topic of debate.

There have been instances where political intervention in regulatory regime is often raised as an issue for swift and independent working in the power sector. Be it tariff determination, investment approvals, issuing regulations etc, it

is imperative that such functions must be completely unbiased and neutral to the political agendas floating around. However, to remain neutral during the times of elections and otherwise too in a highly politically sensitive country like India where 'Bijli' and 'Paani' runs at the top of an election manifesto, is a task of highest integrity & perseverance.

Besides this, autonomy of the regulator is always subject to threat in the States where financial dependencies of Electricity Regulator is on the State Government. This dichotomy where a regulator who is dependent on the budgetary assistance of the State Government is also required to regulate the power utilities which are government undertaking, is mostly the scenario in India and is indicative of not a very healthy and encouraging environment for power sector and its players to grow. In situations like this, the regulator must become self-reliant as is in some of the States in the country where the regulator maintains its finances through license fees etc. and does not need States assistance.

Current scenario & challenges

The dependency on the State Government is not just limited to seeking financial support and budgetary allocation, but for increasing manpower, the State Regulatorily Commission has to seek approvals from the respective State Government. The Regulator has so many functions, however, it is known to have very less manpower. Electricity sector is very dynamic and to keep a pace with it w.r.t laws and its implementation, the regulator needs to have a big brigade to churn out better results from the utilities it is regulating. It is seen across India that State Electricity Regulatory Commissions do not have more than fifteen officers to execute its function under the 2003 Act. Skilled & specialized human resource is significant to the working of the regulator and cannot be compromised at all. Although, under the 2003 Act, power to engage consultants and experts for its swift working is with the Commission, the challenge is that these engagements are short term and on contractual basis. Any skilled professional will not desire to engage itself with the regulator having to know no future prospects, and for the regulator to keep engaging new professionals who do not bring any institutional history is counterproductive and is a time taking exercise. Therefore, the regulator must be able to make staff structure where each employee has a growth pattern specified. This motivates the new recruits and is healthy for the efficient working of the organization.

Another very peculiar issue faced by electricity regulators is to ensure compliance of the regulations and its directions by the power utilities. With limited manpower and hesitance in taking penal action the regulators sometimes are not very successful in ensuring compliance with the utilities. Due to this, matters linger for years, and the quality of the work is compromised. It is therefore, suggested that since the electricity regulators exercise all powers of a court in discharging their quasi-judicial functions, they must vision for an earnest and effective disposal of the matters brought before them, and must not exhibit any reluctance to utilize their penal powers vested under provision of the 2003 Act.

It is also a major challenge for electricity regulators to strike a balance between the competitive spirit of the power utilities and interest of the consumers. As the regulator has to cater to the interest of all the parties involved in the business of electricity generation, transmission and distribution. Where the regulator has to ensure that the generator, transmission licensee and distribution licensee get decent electricity tariff, it also has to ensure that the consumers do not suffer from tariff hike. To practically juggle this equilibrium in maintaining competition, attracting investment and ensuring consumer protection, is a challenge which the regulator have to face at all times. And in doing so, it is not possible to make all the parties involved satisfied. To pacify the needs and ambitions of all the stakeholders in the sector is therefore, relentless job of a regulator.

A new age challenge which regulator faces is introduction of technologies. With most of the power utilities in the country being government undertakings and its employees/staff not being tech savvy, seeking reports and other documents from such becomes a strenuous task. This impacts the timely working of the regulator. Likewise, while the Government at the Centre pushes for implementation of newer technologies such as smart metering etc, the work force engaged with the power utilities is not skilled enough. This often results in unbaked implementation of policies and delayed compliances, which in turn reverses the clog of regulatory progress.

Challenges in any regulated sector are also an indicator of development. It is essential that each of these challenges are effectively addressed within a finite time. Any delay in resolving such hurdles causes stagnancy, which is not healthy for growth of the industry as a whole. The job of a regulator is to meet all these challenges in time, thereby achieving a balance of interest of all stakeholders and at the same time, pushing the agenda of innovation, competition and growth.

The Electricity (Amendment) Bill, 2022 was introduced in Lok Sabha on August 8, 2022. The Bill amends the Electricity Act, 2003. The Act regulates the electricity sector in India. It sets up the Central and State Electricity Regulatory Commissions (CERC and SERCs) to regulate inter-state and intra-state matters, respectively. Key provisions under the Bill are:

- Multiple discoms in the same area: The Act provides for multiple distribution licensees (discoms) to operate in the same area of supply. The Act requires discoms to distribute electricity through their own network. The Bill removes this requirement. It adds that a discom must provide non-discriminatory open access to its network to all other discoms operating in the same area, on payment of certain charges. The central government may prescribe the criteria for determining the area of supply.
- Power procurement and tariff: Upon grant of multiple licenses for the same area, the power and associated costs as per the existing power purchase agreements (PPAs) of the existing discoms will be shared between all discoms.
- To meet any additional power requirements, a discom may enter into additional PPAs after meeting the obligations of existing agreements. Such additional power need not be shared with other discoms. Under the Act, in case of multiple discoms in the same area of supply, the SERC is required to specify the maximum ceiling for tariff. The Bill adds that the SERC will also specify a minimum tariff for such cases.
- Cross-subsidy Balancing Fund: The Bill adds that upon grant of multiple licenses for the same area, the state government will set up a Cross-subsidy Balancing Fund. Cross-subsidy refers to the arrangement of one consumer category subsidising the consumption of another consumer category. Any surplus with a distribution licensee on account of cross-subsidy will be deposited into the fund. The fund will be used to finance deficits in cross-subsidy for other discoms in the same area or any other area.
- The Bill specifies that the above matters related to the operation of multiple discoms in the same area will be regulated in accordance with the rules made by the central government under the Act.
- License for distribution in multiple states: As per the Bill, the CERC will grant licenses for distribution of electricity in more than one state.
- Payment security: The Bill provides that electricity will not be scheduled or despatched if adequate payment security is not provided by the discom. The central government may prescribe rules regarding payment security.
- Contract enforcement: The Bill empowers the CERC and SERCs to adjudicate disputes related to the performance of contracts. These refer to contracts related to the sale, purchase, or transmission of electricity.

Further, the Commissions will have powers of a Civil Court.

- Renewable purchase obligation: The Act empowers SERCs to specify renewable purchase obligations (RPO) for discoms. RPO refers to the mandate to procure a certain percentage of electricity from renewable sources. The Bill adds that RPO should not be below a minimum percentage prescribed by the central government. Failure to meet RPO will be punishable with a penalty between 25 paise and 50 paise per kilowatt of the shortfall.
- Selection committee for SERCs: Under the Act, the Chairperson of the Central Electricity Authority or the Chairperson of the CERC is one of the members of the selection committee to recommend appointments to the SERCs. Under the Bill, instead of this person, the central government will nominate a member to the selection committee. The nominee should not be below the rank of Additional Secretary to the central government.
- Composition of Commissions and APTEL: The Bill increases the number of members (including the chairperson) in SERCs from three to four. Further, at least one member in both the CERC and SERCs must be from law background. Under the Act, Appellate Tribunal for Electricity (APTEL) consists of a chairperson and three other members. The Bill instead provides that the APTEL will have three or more members, as may be prescribed by the central government.

Major challenges of a power grid and their solutions

Electricity is a powerful thing. In order to use its benefits, it is necessary that the amount of electricity in the grid corresponds with actual consumption needs. Due to the ever-increasing demand and growth in popularity of such advances as electric vehicles, there are several challenges power grid operators need to face.

1. **Growing amount of renewable energy sources**
   It is expected that by 2050, 62 % of generated energy will be covered by renewables. In comparison, the amount of green energy generated in 2019 represented 27 % of the worldwide production. However, connecting renewable energy sources (RES) with the grid is not as simple as it may seem and their effectiveness is entirely dependent on weather conditions. From this point of view, RES are considered an unstable energy source and their operation, without an advanced management system, can cause a serious grid imbalance.
   Solution: Electricity accumulation. Batteries or other energy storage systems that can store unused energy and save it for later need. Artificial intelligence can improve prediction systems and thus allow for more accurate weather or energy consumption forecasts. With this approach, utility companies can improve the planning of their clients' electricity needs and smart energy management solutions can turn green energy into a reliable alternative to fossil fuels.

2. **Electricity transmission losses**
   Electricity distribution over long distances increases the temperature within power lines and thus causes significant energy losses in the form of heat. In the end, these losses are paid for by everyday electricity consumers and prevailing losses including distribution losses in India is 19%.
   Solution: Energy decentralization. A shift from electricity production in a few big power plants to a system of small local energy sources that ensure energy is consumed as close as possible to its source, even on the level of individual residential buildings, e.g. prosumers.

3. **Electromobility**

Electric vehicles (EV) are still rare, but the fast advances in technology are increasing their popularity. However, EV charging can take a significant amount of time and if we can't allow spending half a day at the gas station, we need to use a supercharger which consumes an immense amount of energy. To compare, one full charge using a supercharger equals the launch of 70 air-conditioning units at once. Such an instant change in power demand is a huge problem for the grid.

Solution: Smart grid. Online connection of various sources such as solar panels, batteries, EV chargers or other equipment. Through the analysis of collected "Big data" in real-time, it is possible to speed up the reaction time to the changes in the power grid and thus ensure high quality and stable energy supply. Or in other words, devices can dispose of unused energy to benefit other equipment that is in need of it.

4. **Threat of cyber-attacks**

Digitalization of the energy sector has its side effects as well. There have already been cases detected when a group of hackers infiltrated systems of energy companies and exposed thousands of households to a controlled blackout.

Solution: Blockchain. The potential of distributed databases to eliminate cyber-attacks proved to be so efficient that even international financial institutions e.g., J.P. Morgan and Nasdaq consider its implementation. Similarly, as during energy generation decentralization in which the responsibility for the grid operation is not in the hands of a single supplier, distributed databases mean that an attack on one single point in the grid, e.g., one power plant, cannot interfere with the operation of the entire system.