

Restructuring and Souk Drawing of Power Segment in India

V. Srinivasan and T. Saravanan

Bharath University, Chennai, India

Abstract: After enactment of Electricity Act 2003, the power utility sector in India is changing from monopoly to a competitive industry. The reformation of power utility sector has paved path for the development of a power market in India in the recent years. Now it has become essential to design an appropriate power market applicable to Indian utility sector in this transition phase. The design of the power market should consider the idea of leading market models that has proved successful in different parts of the world, along with localized issues, which are very specific to the country.

Key words: Availability based Tariff • Power marker • Day-Ahead spot Market • Electricity Act 2003 • Real Time Market

INTRODUCTION

Reformation of Power Sector under Electricity Act 2003: The power situation in India is still reeling and there is a huge shortage of power although the installed power generation capacity has grownup 80times till independence, Different policy, measures and efforts were taken since the introduction of Electricity Act 1910, Electricity Supply Act 1948, Electricity Regulatory Commissions Act 1998 and Electricity reforms of 1990s but they could not bring much success. Introduction of Electricity Act 2003 (passed in June of year 2003) provides a liberal and sustainable framework aimed at development of the Power sector in India. It is an act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and Prior to Electricity Act 2003, majority of programs addressed the piecemeal reforms [1]. The new electricity act has all the elements of systematic reforms and has the potential of re-defining the power system in India.

The long-standing traditional structure of the industry was based on the economic theory that electric power production and delivery were natural monopolies and that large centralized power plants were the most efficient and inexpensive means for producing electric power and delivering it to customers. Large power generating plants, integrated with transmission and distribution systems, achieved economies of scale and consequently lowers the operating costs.

The unbundling process started a few years back and at present many of the State Electricity Boards (SEBs) are unbundled in GENCO, TRANSCO and DISCOMs. All GENCOs and TRANSCO are Govt. controlled. In some states, the Distribution companies are Govt. controlled and in few states, the Distribution companies are privatized. The Unbundled structure is depicted in the Figure 1.

Post Electricity Act 2003, Generation is de-licensed and the generating companies are allowed to set up generating plants in accordance with National Electricity Plan. Generators are free to sell power to any user.

Post unbundling, the transmission is to be handled by Central and State Transmission utilities (CTU/STU) and the transmission business will remain as a regulated monopoly. Electricity Act 2003 provides non-discriminatory open access to the Transmission System. Electricity Act 2003 also made provision for open access in Distribution system. Distribution companies will act as a common carrier providing non-discriminatory open access. Act also recognized trading as a distinct licensed activity. At present there is number of traders operate in inter-state power trading. If there is a need, the regulator may fix the trading margin for the Trading Company. In short the basic objectives of the reform program defined by the framework contained in the Electricity Act 2003 are aimed at:

- Attracting enough private investment to this sector, in generation, transmission and distribution to meet the growing demand for power.

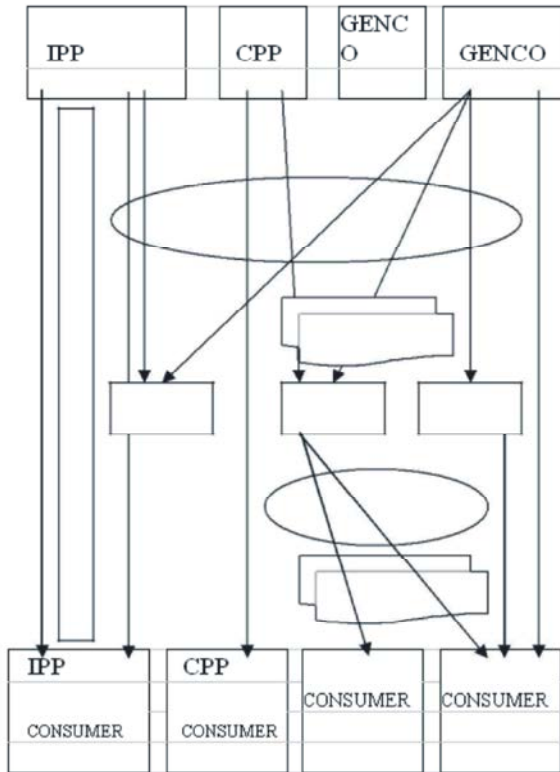


Fig. 1: Unbundled structure of Electricity sector

- Establishing a regulatory environment which will ensure that generation costs are kept at a minimum through a process of competitive bidding for setting up of capacity and also ensure that adequate incentives are provided for improvements in operational efficiency, cost reduction and enhancement in the quality of customer service in the transmission and distribution sectors.

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Challenges of Indian Utilities in Post EA 2003: The Key issues that need to be addressed by majority of Indian Utilities during the transition phase of reformation & restructuring can be classified into four categories:

Structural Issues Including: Overall long term and short term market design Optimum size of generation and distribution companies Formation of trading company or companies Compatibility with future market structures

There are several prerequisites for competitive markets to operate efficiently. First there must be no market power. This means that no buyer or seller acting alone or in collusion with others can influence prices in any significant or long lasting way. Market power may present itself as horizontal market power, i.e. any one player has too much control over a given market; or as vertical nature, in which case control of a monopoly service, for example transmission, is used to influence the price of competitive generation. Second, given the nature of electricity markets and the physics of the transmission system, all participants in a competitive market must have equal access to transmission with non-discriminatory and efficient prices. Finally, buyers and sellers should have access to all relevant information and all costs must be internalized.

There are mainly two distinct market concepts that prevail today in the power market namely Single market concept and Two-market concept. Single market concept is based on centralized dispatch contract. In centralized dispatch, the system operator controls the entire power market and the schedules are based on generator offers and demand bids [2]. The single market concept has been adopted in PJM (Market system for Pennsylvania, New Jersey and Maryland) market in USA.

In a two-market model, the market participants control their own schedule and the market operates on a Day-Ahead spot Market as well as a Real Time Market. In the Day ahead spot market, the price is the electricity energy price, whereas in the Real time market the price represents the capability of the system to balance supply (generation) and demand (Load). The real time market operates by the Load Despatch Centre (LDC).

Two critical factors for a competitive power market is 1) Existence of Multiple buyers and sellers and 2) Sensitive response of demand and supply to prices - Whatever be the market model, the key to a successful market design is to ensure proper price signals that send clear economic signals to the market. This will ensure economically rational behaviour from the market

participants in terms of adding / closing generation, installing new transmission line or responding through demand reductions.

Appropriate market design in Indian context should consider the following characteristics of the Indian power sector.

Most of the power being traded in wholesale power market today is either through bilateral or multilateral contracts. Also, as of today there is a limited demand response. It also seems that the present condition in the country is not suitable for retail competition. In this view it is not very easy to design an appropriate power market suitable for Indian power sector. Some of the factors that must be considered for the design of the power market are described below: India is a power deficit country and there is still a considerable mismatch in demand and supply whereas most of the standard market models Since most of the trading arrangement in India is through bilateral trading arrangement, there is a very limited surplus power available in the open market. Due to socio-economic structure of the country there exists a huge cross-subsidy in the usage of power. The cross subsidy issue is to be addressed properly while designing a sustainable market model.

Present Transmission capacity of the country is not suitable in an integrated trading scenario and this must be taken into consideration in terms of adopting zonal (regional) trade or integrated market model till the time the transmission capacity gets augmented.

This balancing function is currently performed vastly by the ABT (Availability based tariff) mechanism. However, it is envisaged that in the near future, the SLDC or RLDC must use a real-time market for energy to resolve imbalances. A transparent spot market not only helps keep the system reliable and lowers costs but also provides important price and other information to all market participants on an equal and open basis. It also gives the public a timely way to assess the functioning of the market. These markets will also facilitate customer response to prices as well as ease the introduction of some renewable and other innovative supply technologies.

Structures of Global Power Market: The power markets operating in different parts of the world can be broadly classified into four basic generic structures.

- Monopoly model
- Single-buyer model
- Third-party or open-access model
- Power pool (wholesale market or spot market) model

The monopoly model offers little scope for competition. Hence, the choice centres on the other three models. Each of these generic models may have variations within itself in respect of the agency responsible for management of the market and its governance and regulation.

In a single-buyer model, a single entity purchases power from all generators on a competitive basis and in turn sells it to the supply entities. This model has the following advantages:

- It is simple and has minimum transaction costs. It facilitates design of equitable bulk supply tariff.
- Planning for capacity addition and strengthening of transmission systems is better coordinated.
- Splitting of existing contractual agreements with different generation companies is not necessary.

The demerits associated with this model are listed below.

- Competition is limited.
- The buyer may not have the incentive to seek out the most economical source of supply.

The above drawbacks can be overcome to some extent through the adoption of a competitive bidding system for power purchase by the single buyer and imposition of an appropriate regulatory control. For effective competition, it would be necessary that supply is not constrained and that no large generator commands excessive market power. Many developing countries are found to prefer a single-buyer model, especially during the transition phase of the reform [3-7].

Under the open-access model, the generators are in a position to enter into direct contract with distributors or large consumers without the need of an intermediary buyer. This, however, requires an open access to the transmission system. It is also important that the access to transmission is regulated and pricing policies are compatible, transparent and efficient. The main merit of this model is that it provides a better platform for competition that would eventually help bring down the cost of supply. However, implementation of this model would entail the following.

- Transmission system development would become more complex with increased uncertainty in planning.
- The concern for stranded costs would increase.
- Transaction costs would be higher.
- Regulatory control on transmission access and pricing would be critical.

This model is being adopted in many countries where there is adequate redundancy in the generation and transmission system and the thrust is towards increasing competition especially at the wholesale level.

The power pool model envisages different generators selling to a pool and the distributors or large consumers buying from it. The pool functions as a marketplace for trading. An open access transmission system is a prerequisite for this model too. Compared to the other models, this one offers the best framework for competition. These pools are designed to maximize competition in generation, compete on price not cost and remain open to all market participants. These are fundamentally different from the tight power pools that have been operating for many years in the US which were created to improve reliability, minimize operating costs and facilitate decision-making by vertically-integrated utilities. The new type of pools are operating in England and Wales, Victoria (Australia), Alberta (Canada) and Scandinavia (Norway and Sweden) and at least 10 more countries are reportedly planning to operate these. The successful operation of these pools would require highly developed information and decision support systems and a strong reliance on the market forces. Although classified together, these pools present many variations regarding complexity of operation, governance and regulation.

CONCLUSION

The reformation & restructuring of Power Utility Industry is a process which can be broadly characterized as liberalization, which in turn means the introduction where possible of significant degrees of competition may be introduced. The Electricity Act 2003 with its de-licensing in generation, provision for open access in transmission and distribution has provided the basis for designing an effective power market. There are different successful market models adopted by different countries worldwide, however, there are certain considerations specific to the country that need to be considered while designing the best-suited market model. The ultimate objective of the power market is to produce symmetries and discipline required for adequate investment and to ensure a reliable and reasonably priced supply to the consumers.

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