Pakistan's Power Sector Deregulation: How CTBCM is Transforming the Market

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Due to its unique characteristics and economies of scale, the power sector across the globe has traditionally prospered under the monopoly model. Generating stations ranging in size from a few kilowatts to several gigawatts, along with thousands of kilometres of transmission lines, have been built under this model. There were also significant technological advances under this model that enabled power generation in resource-rich, far-flung areas and its transmission to load centres near metropolitans in bulk quantities.

However, in the 1970s, economists started to argue that this model had run its course, and with technological advancements, it was possible to introduce competition in certain segments of the electricity supply chain. It was considered appropriate that transmission and distribution (the transportation part) remain a natural monopoly; however, competition could be introduced in generation as well as in the retail supply side. Chile was the first country to introduce these reforms in 1982, followed by the UK and other countries, and now we see deregulated electricity markets in many regions across the globe.

Similar to other countries, the power sector in Pakistan was also developed under the monopoly model, where the Water and Power Development Authority (WAPDA) was responsible for managing all segments of the power sector in the country except in the city of Karachi, where the Karachi Electricity Supply Company (KESC) managed all segments of electricity supply. In order to attract private investment, Pakistan also decided to deregulate its power sector in 1992 (WAPDA Restructuring Plan 1992) to establish a competitive electricity market where the private sector could buy and sell electricity in a competitive environment.

The first power policy was issued by the government in 1994 to enable WAPDA to purchase power from private generating plants (also called Independent Power Producers or IPPs). The National Electric Power Regulatory Authority (NEPRA) was established in 1997 as an independent regulator for the deregulated sector. WAPDA was restructured by unbundling its generation, transmission, distribution, and supply roles. After restructuring, WAPDA was assigned only the role of hydel generation, while other functions were assigned to separate corporate entities.

NEPRA mandated the National Transmission and Despatch Company (NTDC), currently the National Grid Company, while issuing its transmission license, to establish a competitive wholesale market in Pakistan by 2004. However, these efforts could not be materialized at that time. The competitive market development reform was reignited when the Central Power Purchasing Agency (CPPA-G) was established as a separate entity and given the mandate to develop the competitive wholesale electricity market-the Competitive Trading Bilateral Contract Market (CTBCM) - in Pakistan. CPPA-G, with the help of international consultants provided by the Asian Development Bank (ADB), developed the market design and allied framework, which were approved by NEPRA for a trial run in 2022. CPPA-G has completed the trial run and submitted the final report to NEPRA. NEPRA is now in the final stages of granting approval for the start of the commercial operations of the CTBCM.

Inside CTBCM

The CTBCM has been designed considering the local peculiarities of the power sector of Pakistan, such as the long-term Power Purchase Agreements (PPAs), current demand-supply balance, and the payment culture. It has been tailored to suit the existing conditions and has all the ingredients to evolve towards more advanced stages through consistent improvements over time. The CTBCM offers the following at the start:

- Any Bulk Power Consumer (having a sanctioned load of at least one MW) can purchase electricity from a supplier other than the host Distribution Company (its current and only supplier) at an agreed rate and other terms and conditions. This new supplier has to pay the Use of System Charge over and above its generation or purchase cost for injection and withdrawal from the transmission and distribution network. This opens new avenues for industries to source their electricity at their own choice, i.e., they can source from specific technologies (meeting green energy targets), stabilise their energy price by entering into fixed price contracts with suppliers, and agree on different packages with them. You can assume an analogy with the telecom sector, where different telecom operators compete with one another, and customers are free to choose the packages that suit them.

- The existing Distribution Companies (in their roles as Suppliers of Last Resort) will no longer be procuring through the CPPA-G, but they will follow a rigorous process to procure for themselves and ensure least-cost procurements for their customers. They can't procure from any generation plant which is not selected by the Indicative Generation Capacity Expansion Plan (IGCEP) on the least-cost criteria. This is a paradigm shift in how the power sector was being planned historically, which caused the boom-and-bust cycles. Once the legacy burden is over, the sector will expand in a streamlined manner where every activity will be coordinated to ensure that there are neither surpluses nor deficits.
- Any generating plant can offer its electricity to the market at a rate cheaper than the existing generation plants and will get priority in the economic dispatch. This will reduce the overall generation cost for the entire grid. This transaction is called merchant generation.

The Bottleneck

In 2015, there were acute power shortages in the country, and the government was desperate to bridge the gap between demand and supply. The government took two decisions during this era. On one hand, it decided to liberalize the electricity market by having a competitive wholesale electricity market in the country, and on the other hand, it embarked upon an ambitious plan to enhance the generation capacity by procuring through the single buyer model. As the China Pakistan Economic Corridor (CPEC) was in full swing during this era, the government made bold assumptions regarding demand growth in the country and expedited the enhancement of generation capacity under the IPP regime.

However, a few years down the road, different experts, including system planners, started to question the assumptions for such ambitious capacity expansion, and terms like "capacity trap" or "surplus capacity" were coined and debated heavily in policy discussions. However, in order to attract private investments, the government had already offered certain incentives, including the protection of fixed capacity payments to secure the investment.

For the new market, which was just being set up at the time, this state of affairs created a huge bottleneck. It was argued that with the establishment of this market, new entrants offering cheaper prices would attract customers away from existing suppliers, resulting in customer churn, while the cost of the existing agreements, which are largely fixed, had to be borne by the remaining customers or the government. In the presence of diminishing demand, rising prices, and financial constraints of the government, this issue lingered on for several years without any practical solution.

The Balanced Approach

Recently, the government has taken a serious initiative to address this long-standing issue and to operationalize the CTBCM in a responsible manner, meaning that no stakeholder is unduly burdened through these reforms. A techno-commercial analysis was performed through the IGCEP to ascertain a quantum that has minimal impact on the overall system, and the analysis showed that this quantum stands at 800 MW of demand.

Based on this finding, the government initiated the necessary amendments to the National Electricity Plan and the Supplier Rules 2023 to pave the way for the smooth operationalization of the market. In order to ensure transparency and fairness, it has been decided that this quantum of demand will be allocated through multiple auctions over a period of five years.

The Future

The launch of the CTBCM will sow the seeds for a well-planned, transparent, and competitive electricity market in Pakistan. While some may argue that the initial design is very simple, based on bilateral contracts without any revolutionary measures to solve the issues of surplus capacity, rising prices, and T&D issues, one should keep in mind that revolutions are seldom sustainable, while evolutions always are. Through gradual and incremental improvements, the CTBCM can achieve its ultimate goal of bringing choice and convenience to the doorstep of electricity customers.

In the short run, the industry, especially exporters, can use the CTBCM to meet their green energy compliance requirements, while captive generating plants, especially renewables, can transport electricity from one location where they have surplus to another location in the grid. In the medium term, the CTBCM will help optimize system costs through a focus on efficiency, accountability, and transparency, while in the long run, it will transform the sector into an efficient, liquid, and competitive power market.

These assertions are not just claims but are based on meticulously articulated goals, milestones, and roadmaps to achieve these targets. This year will not only mark the operational launch of the initial design of the CTBCM but will also initiate the ambitious plan to transform the current power sector from its existing state towards an efficient and reliable system, ensuring affordable and competitive electricity rates for consumers across the country.

***About the Author: Abrar Hussain** is an engineer by profession and currently serves as the Director of Market Design and Simulations at the Independent System and Market Operator (ISMO) of Pakistan. He has been actively involved in Pakistan's power sector deregulation initiatives for over a decade and has contributed to the development of the legal, policy, and regulatory frameworks required to establish a competitive and liquid electricity market in the country.*