Comments on CERC Staff Paper on Market Coupling in India

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A market reform in the Indian power sector is overdue as market is stagnated at less than 10% of total generation. Out of the total market size of around 1500 TWhr, the share of exchange-traded electricity is a meagre 7%, or around 100 TWhr, and the remaining portion is transacted through long-term bilateral Power Purchase Agreements (PPAs) or on Over-the-Counter (OTC) platforms such as DEEP or PUShP, among others. The forward market (settlement against physical delivery) and derivatives (futures - where only financial settlements take place) do not exist as they are yet to be approved by CERC or SEBI, respectively. Currently, three Power Exchanges (PXs), namely Indian Energy Exchange Ltd. (IEX), the Power Exchange of India Ltd. (PXIL), and the Hindustan Power Exchange Ltd. (HPX), are operating under the framework of PMR 2021, with IEX being the dominant one, accounting for around 89% of the total exchange-traded volume.

CERC staff paper has been floated soliciting views on the Introduction of Power Market Coupling. The stated objectives of Market Coupling include the discovery of a uniform market clearing price for the Day Ahead Market, Real-time Market, or any other market as notified by the Commission; optimal use of transmission infrastructure; maximization of economic surplus, after taking into account all bid types, and thereby creating simultaneous buyer-seller surplus. However, the real concern appears to be the limited market share of the two PXs other than IEX. Regulatory intervention to change market design to increase volume of non-performing power exchanges is highly unjustified.

The staff paper has outlined the Market Coupling Operator as an entity to be notified by the Commission for the operation and management of Market Coupling subject to the provisions of the regulations. The word “notified” indicates that either an ex-officio person or institution is intended to be notified as MCO. The probability of an institution like GRID INDIA (formerly known as NLDC or POSOCO) being selected appears to be higher.

A Comparative Analysis: EU vs. India Power Market

The concept of market coupling was initially introduced in the EU power market with the primary objectives of integrating different geographical markets (countries) and optimizing cross-border transmission infrastructure. This integration aimed to achieve price convergence between these integrated markets. Market coupling in CWE and NWE actually began as Price Coupling of Regions (PCR) with a collaborative approach initiated by the Transmission System Operators (TSOs, which own and manage the transmission system) and the Power Exchanges (PXs) of the regions/countries. Price coupling of regions in Europe uses common algorithms and IT standards for PXs. The European power market comprises many exchanges such as EEER, Nord Pool, etc., operating across numerous EU countries. These exchanges are also designated as nominated Electricity Market Operators (NEMO), and the volume of power traded on these exchanges is high, both in terms of size as compared to India. For example, around 5197 TWhr of energy was traded on EEX in 2021, out of which 629 TWhr was in the spot market, and the remaining 4568 TWhr was in the derivative segment. Similarly, on the Nord Pool exchange, 1077 TWhr of energy was transacted. European countries/regions like Germany have exchange-traded power shares as high as 60%, while other regions (Nordic, etc.) typically maintain a share of 25%-30%.

In the European exchanges, regions are divided into bidding areas by the relevant TSOs to manage congestions in the electricity grid. Bidding areas can have a balance, deficit, or surplus of electricity. Electricity flows from areas where the price offered is lower towards areas where demand is high and the price offered is higher. If the transmission capacity between bidding areas is not sufficient to achieve full price convergence across the areas, congestion can lead to bidding areas having different prices. If the flow of power between bidding areas is within the capacity limits set by the transmission system operators, area prices in these different bidding areas will be identical. All suppliers/producers are paid according to the calculated area price, and similarly, all consumers pay the same price. The exchanges also determine the System Price, which is an unconstrained market clearing reference price for the region. It is calculated without any congestion restrictions by assuming transmission capacities to be infinite.

Flows between the regions, as calculated through area price calculations, are taken into account in the system price calculation. These flows are used when calculating the System price, either as import/sales or as export/purchase orders. Most standard financial contracts (futures) traded in the region use the System price as their reference price for settlement.

On the other hand**, **in India, there is no concept of Transmission System Operator (TSO) and Grid India (formerly NLDC/POSOCO) is the authorized Independent System Operator (ISO). We have a national grid and common power market, and for trading purposes, it is divided into 13 bidding areas with interconnected transmission systems. The power market operates on a voluntary model where three PXs operate at the national level only, and around 7% (~ 100 TWhr) is traded on PXs with different prices for different areas in different PXs***. In fact, the proposed Market Coupling for the Indian market primarily equates to 'price coupling' of different power exchanges only***. As a result, ***market coupling in India would only apply to approximately 7%, leaving the remaining 93% of energy with varying prices under PPAs***. Above all, ***unlike the European market, the proposal to introduce market coupling is not a collaborative initiative of the three PXs*** with the objective to integrate different geographies.

Challenges and Concerns

Under the proposed coupled power exchanges, existing power exchanges ***(PXs) would function as intermediaries and merely collect the bids, forwarding them to the Market Coupling Operator (MCO) for price discovery and conveying the price discovery results and cleared transactions***. This arrangement, **besides being anti-competitive, would provide power exchanges with no incentives to improve their product offerings, innovate, or further develop the market**. Consequently, it could ***negatively impact investment flows and hinder market development***. On the other hand, the ***MCO, being a monopoly entity without direct customer interaction, would lack incentives to introduce innovative products***. This may be the main reason why the financial securities regulator SEBI has not implemented market coupling for security trading exchanges like NSE, BSE, etc. as arbitrage in price of securities between the exchanges enhance the competition and market efficiency.

In the Indian context, the objectives of market coupling are largely fulfilled, as all regions are already geographically integrated, utilizing a common transmission infrastructure efficiently. Introducing a centralized market setup with a single entity or MCO would come at a cost in terms of time and resources.

Indeed, ***market coupling not only discourages innovation but also narrows the competitive landscape to focus solely on pricing, side-lining the crucial aspect of deepening market volume, which is integral to market development***. Instead of striving to enhance market volume and share through inventive and customized trading solutions and products, ***Power Exchanges (PXs) may resort to capitalizing on their competitors' resources, investments, and innovations. Within such a framework, PXs may become hesitant to invest in future innovations***. In summary, this approach represents a regressive step in terms of fostering healthy competition among exchanges and instead of fostering innovation and competition, the proposed introduction of market coupling ***might inadvertently promote free-riding behaviour***.

While official regulations regarding this matter are yet to be published, designating an entity as a Market Coupling Operator (MCO) carries significant implications. The Indian power market differs notably from its European Union counterpart. In the European Union, Transmission System Operators (TSOs) play a pivotal role in coupling exchanges to facilitate power flow between interconnected regions (countries) and in settling financial products, including future contracts. In contrast, India currently lacks financial products of this nature and does not have TSOs in its framework. Instead, the country relies solely on Independent System Operators (ISOs) or GRID India (formerly NLDC or POSOCO), which are entrusted with grid management functions under Section 26 of the Electricity Act.

It is worth noting that ***GRID INDIA or NLDC is explicitly prohibited from engaging in the trading business as per the first proviso of Section 26(2). This prohibition raises concerns about potential conflicts of interest, particularly in their involvement in price discovery, which is an integral part of trading. An ISO, when designated as an MCO, shall face a significant conflict of interest, as it could seek to benefit from cost savings in its ancillary services, which occur after the gate closure of bids and balancing***.

Similarly, sponsoring ***unsubstantiated benefits of Market Coupling with SCED (Security constrained economic dispatch) are deceptive as Indian power market is voluntary and mixing with SCED would tantamount to interfering with price discovery under section-63 and will have legal and regulatory consequences in terms of its adoption.***

Furthermore, the transfer of competences and jurisdiction from exchanges to a System Operator, whether independent or not, may not be an advisable course of action before meticulously evaluating the consequences of such a transition, as it is perceived as anti-competitive and has the potential to introduce complications and challenges that might undermine the efficiency and fairness of the market.

The methodology employed in price discovery algorithms will serve as the linchpin of the entire process and will ultimately dictate whether market coupling can effectively yield a genuine market surplus. Consequently***, there arises a necessity to develop a new, shared algorithm to underpin the implementation of the market coupling framework. This will necessitate a complete reset, effectively nullifying the investments made by exchanges thus far, as well as the knowledge and experience garnered by the trading community, encompassing both buyers and sellers, along with institutions.***

The involvement of a third party as an MCO could lead to discrimination, with potential adverse effects on Power Exchanges (PXs***). The designated MCO may operate without requiring a license or paying license fees, while still benefiting from a share of PXs' trading revenue and capitalizing on their innovations***. ***Introducing an additional entity into the process after the bidding gate closures and the actual clearing/dispatch stages could result in increased time and costs*** for market participants. As renewable energy (RE) penetration continues to rise, the efficient management of Real-Time Markets (RTM) will become even more crucial for the further development of the market.

Establishment of an ***MCO could potentially lead to a single point of market failure, as it may stifle the development of diverse systems for short-term electricity markets that could serve as backup solutions. It's important to note that activating demand reduction by ISOs before the balancing timeframe could distort intraday market prices, which should ideally remain the primary signal for the efficient development of flexibility solutions***.

To further develop the power market, particularly in anticipation of the integration of significant solar and wind energy generation capacity, it is necessary to introduce innovative market products.

Conclusion

The ***current circumstances do not favour the introduction of market coupling in Indian power exchanges solely for the purpose of price discovery***. Market coupling, even if implemented, is unlikely to have any significant impact on electricity transaction prices in India due to the relatively low share of exchange trade and entire volume with one exchange. Introduction of Market Coupling ***at current stage and shape will disrupt the sequence of power market reforms. Implementing market coupling before achieving a substantial market share of exchange-traded power is unlikely to add value, enhance market depth or increase social welfare***. ***Moreover the high implementation costs and the risk of market disruption and failure, make it counterproductive. It could potentially increase operational expenses, introduce inflexibilities, and stifle innovation within the market***.

Instead, focus should be on increasing the volume and share of electricity traded in the PXs and increasing the inter-regional transmission capacities to reduce the congestion and constraints. Reduction of constraints in transmissions is likely to yield more benefit as area clearing price will tend towards the unconstrained System Prices. While products like G-TAM (Green Term Ahead Market) and G-DAM (Green Day Ahead Market) hold significant potential, relying solely of current shelf of products to raise the exchange trade share to the optimal level of 25-30%, will take many years. Therefore ***adding new products including forward market & derivatives is essential***. The suggested Market Coupling should not be implemented as it fails to achieve any objective and provide any benefit to either exchange participants or end consumers.