

What is an Power Exchange?

An Exchange is a platform on which buyers and sellers come together to transact. It is **not** the market but a **host** to the market. Its core function is to ensure fair and transparent transactions as well as efficient dissemination of price information to its stakeholders.

What are the aims of Power Exchange?

To retrieve the excess generation from surplus region and transmit to a deficit region at a market clearing price (MCP). The MCP is discovered based on the principles of demand and supply. Prior to Exchange operation, this was done by electricity traders on negotiation basis.

Why Power Exchange is needed?

In market driven economy market forces are contradictory. Buyer wants low price, seller wants otherwise. These conflicting forces determine the correct price of a commodity at a given time.

In today's scenario electricity is no more a service, it is a commodity. On an electronic power exchange, buyers and sellers of electricity from the length and breadth of the country can converge without revealing their identity.

For this we need a nation wide platform to allow the Electricity Market to be driven by genuine market forces of demand and supply.

Currently Indian Energy Exchange (IEX) and Power Exchange India Limited (PXIL) are two power exchanges serving as optional, electronic, nationwide platforms for trading of Electricity.

What Benefits does Exchange bring to the Electricity Market?

The Exchange has brought a true market driven economy in Electricity sector of India. Ours is a power deficit country, but some regions have surplus power because of abundant hydro potential or coal reserve. Today our country's Transmission System is electrically integrated; therefore it is possible to transmit power from the most remote area of one region to the load centre of any other region. In Pre-Exchange scenario this power trading was conducted purely on bilateral basis. Along with transmission losses and UI risks, payment uncertainties prevented the true market driven economy in electricity market. Power Exchange wipes off all these issues by:

- Empowering the Market to discover a uniform market clearing price (MCP) and market clearing volume (MCV).
- Evenly distributing transmission losses at both ends.
- Enabling participants to hedge against UI risks.
- Guaranteeing secure & timely payment to sellers.
- Generously improving the market environment to encourage investment in new generation capacity, thus helping make India a power-surplus country.

Is there any Statutory authority to regulate IEX and PXIL?

Yes, IEX and PXIL are approved and regulated by Central Electricity Regulatory Commission (CERC) which is a statutory authority constituted under the Electricity Act 2003 with quasi judiciary role. The activities are regulated under the various regulations and

procedures notified by CERC including the Power Market Regulations 2010, as amended from time to time.

What are the Modes of Power Trading?

- Long term PPA for 25 Years.
- Bulk Power supply agreement.
- Bilateral through power traders.
- Short term bilateral contracts where both Buyers & Sellers are identified before hand & the prices are decided by negotiation.

- Through Power Exchange platform, where prices are discovered through competitive bidding and the power is sold to and brought from the single large countrywide pool.

What are the products offered?

Presently, the exchange offers products to enable transactions in electricity in the following two segments: Day-Ahead Market (DAM) allowing transactions in electricity for a day in advance and Term-Ahead Market (TAM) which further comprises of Day-Ahead Contingency, Intra-Day, Daily, Weekly with contracts ranging from the same day to up to 11 days in advance.

It is also assisting in accelerating deployment of renewable energy by enabling transactions in Renewable Energy Certificates (REC). It also proposes to facilitate transactions in Energy Saving Certificates (ESCerts) in the near future.

Who can transact at the exchange?

Only the Exchange Members, who have been admitted as such by IEX or PXIL, are eligible to enter into Contracts, and undertake transactions relating to such Contracts on the respective exchange. Persons, who are not Exchange Members, can participate as Clients through a registered Exchange Member

What are the technical requirements?

The technical requirements to start trading are as below:

- Standing Clearance from State Load Dispatch Center (SLDC) of State/UT
- Presence of ABT (Availability based Tariff) Meter

How the Power will Flow?

The power will flow through the existing STU/CTU network depending on the location of the entity's injection/drawl point.

Who will control or regulate the power flow?

The National Load Dispatch Centre (NLDC), Regional Load Dispatch Centre (RLDC) & State Load Dispatch centre (SLDC) controls and Regulates the power flow.

Does one need to be a Member to transact?

Not necessarily. Even if you are not a Member, you can transact through a Member, i.e. by becoming a Client of a Member. Members, however, can trade and clear directly on their behalf as well as on behalf of their Clients.

Who is eligible to become a Member?

Entities falling under the category of Interstate generating stations, distributing licensees, electricity traders, brokers and State-embedded entities like IPPs, CPPs, Open access consumers are eligible to become Members.

Does a Member need to be connected to any transmission system?

No. Members need not be connected to transmission system. A Member can transact on behalf of his Clients connected to the grid.

Can anyone become a Client? What are the eligible categories?

The following two categories of Client of the Members can be registered:

- Grid-connected Client: A Client who is eligible to buy or sell electricity and is connected to the grid. The entities including but not limited to, Distribution Licensees, Generators, Consumers and Open Access Users can become Grid-connected Clients.
- Trader Client: A Client who is eligible to trade in electricity under the Electricity Act, 2003 and has a legally valid power purchase/sale agreement, which gives the Client the right to purchase and sell electricity. A Trader Client will register each power purchase/sale agreement with the Member who will be registering the same with the Exchange and receive a separate registration identification code. The entities such as trading licensees can become Trader Clients.

What are the main features of the Day-Ahead Market (DAM)?

The Day-Ahead-Market (DAM) is the electricity trading market for delivery on the following day. The prices and quantum of electricity to be transacted is determined through a double-sided closed auction bidding process. Following are the main features of DAM:

- 15 minute time block wise bidding for next day
- Trading is on all days irrespective of holidays
- Order entry / revision /cancelation can be done on D-1 (a day before delivery) from 10:00 hrs to 12:00 hrs related to Delivery Day (D day)
- Contract Features

- Area Clearance Price (ACP) is used for settlement of the contracts.
- Cleared Volume
- Total Contract Value: Cleared Volume multiplied by ACP
- Final settlement adjusted for any force majeure deviations
- Delivery Point
 - Periphery of Regional Transmission System in which the grid-connected entity, is located
- Minimum volume step: 0.1 MW
- Minimum price step: Rs 1 per MWh (0.1p/kWh)
- Bids can be single and/or block including linked bids:
 - Single bids/Portfolio Order: 15-Minute bids for different price and quantity pairs can be entered through this type of order. Partial execution of the bids entered is possible.
 - Block orders: Relational Block Bid for any 15-min block or series of 15-min blocks during the same day can be entered. Although no partial execution is possible i.e. either the entire order will be selected or rejected.

How is the market clearing price determined?

All purchase bids and sale offers are aggregated in the unconstrained scenario. The aggregate supply and demand curves are drawn on Price-Quantity axes. The intersection point of the two curves gives Market Clearing Price (MCP) and Market Clearing Volume (MCV) corresponding to price and quantity of the intersection point. Results from the process are preliminary results. Based on these results the provisional obligation and provisional power flow is calculated. Funds available in the settlement account of the Members are checked with the Clearing Banks and also requisition for capacity allocation is sent to the National Load Despatch Center (NLDC). In case sufficient funds are not available in the settlement account of the Member then his bid (s) is deleted from further evaluation procedure.

Based on the transmission capacity reserved for the Exchange by the NLDC on day-ahead basis by 2.00 PM, fresh iteration is run at 2.30 PM and final Market Clearing Price and Volume as well as Area Clearing Price and Volume are determined. These Area Clearing Prices are used for settlement of the contracts.

Why is the Area Clearing Price (ACP) different from the Market Clearing Price (MCP)?

Grid bottlenecks are relieved by comparison of the calculated contractual flow with the transmission capacity available for spot trading, and if the flow exceeds the capacity, the prices are adjusted on both sides of the bottleneck so that the flow equals the capacity. If the flow does not exceed the capacity, a common Market Clearing Price (MCP) is established for the whole area.

If the flow exceeds the capacity at the common price for the whole market area, it is split in a surplus part and a deficit part and Area Clearing Price (ACP) is determined for each part. The ACP is reduced in the surplus area (sale > purchase) and increased in the deficit area (purchase > sale). This will reduce the sale and increase the purchase in the surplus area. In the same way, it will reduce the purchase and increase the sale in the deficit area. Thus, the needed flow is reduced to match the available transfer capability. This method of managing congestion is also known as market-splitting. Initially, the electrical regions are defined as bid areas since inter-regional links are most likely to be congested, however, each electrical region of the country has been divided further into two or more bid-areas so as to accommodate any exigencies of congestion in intra-regional transmission system. As on date, there are 12 pre-defined bid areas in the country.

How are the transmission charges and losses handled?

Regional/inter-State transmission charges are levied as per CERC Regulations and state transmission charges are levied as per the concerned State Electricity Regulatory Commission (SERC) Regulations. Similarly losses are be accounted for at the time of scheduling and the percentage loss applied is as per the rates decided by CERC/SERC.

What are the contracts offered in Term Ahead Market (TAM)?

Term-ahead market (TAM) includes products allowing participants to transact for delivery of electricity for duration up to 1 week. It enables participants to purchase electricity for same day through intra-day contracts, for next day through day-ahead contingency, on daily basis for rolling seven days and on weekly basis to manage their electricity portfolios for different durations in a better way.

Contract	Trading	Matching
Intra-day Contracts	Trading on delivery day few hours before delivery.	Continuous trading session.
Day-ahead Contingency Contracts	Trading to a day before delivery and after DAM auction.	
Daily Contracts	Trading up to 1 Week in advance for any calendar day.	

Weekly Contracts	Trading up to 11 days in advance.	Open Uniform Price Auction
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What are the services provided by the power traders?

- a. Facilitating to reduce geographical, seasonal & daily gap between demand and supply
- b. Bilateral power trading contracts between generators, traders and customers
- c. Co-ordination with various intervening agencies e.g. Central & State Transmission Utility, Load Despatch Centres and regulators
- d. Payment security mechanisms as per contract
- e. Portfolio Management (Collective scheduling/sale of CPP power of States)
- f. Contract Management
- g. Consultancy in above areas for optimisation of power sale/purchase requirement and tender participation
- h. Market intelligence data support and sharing the latest trends in power sector