

# Markets in South Africa

## Distribution Energy Trader (DET)

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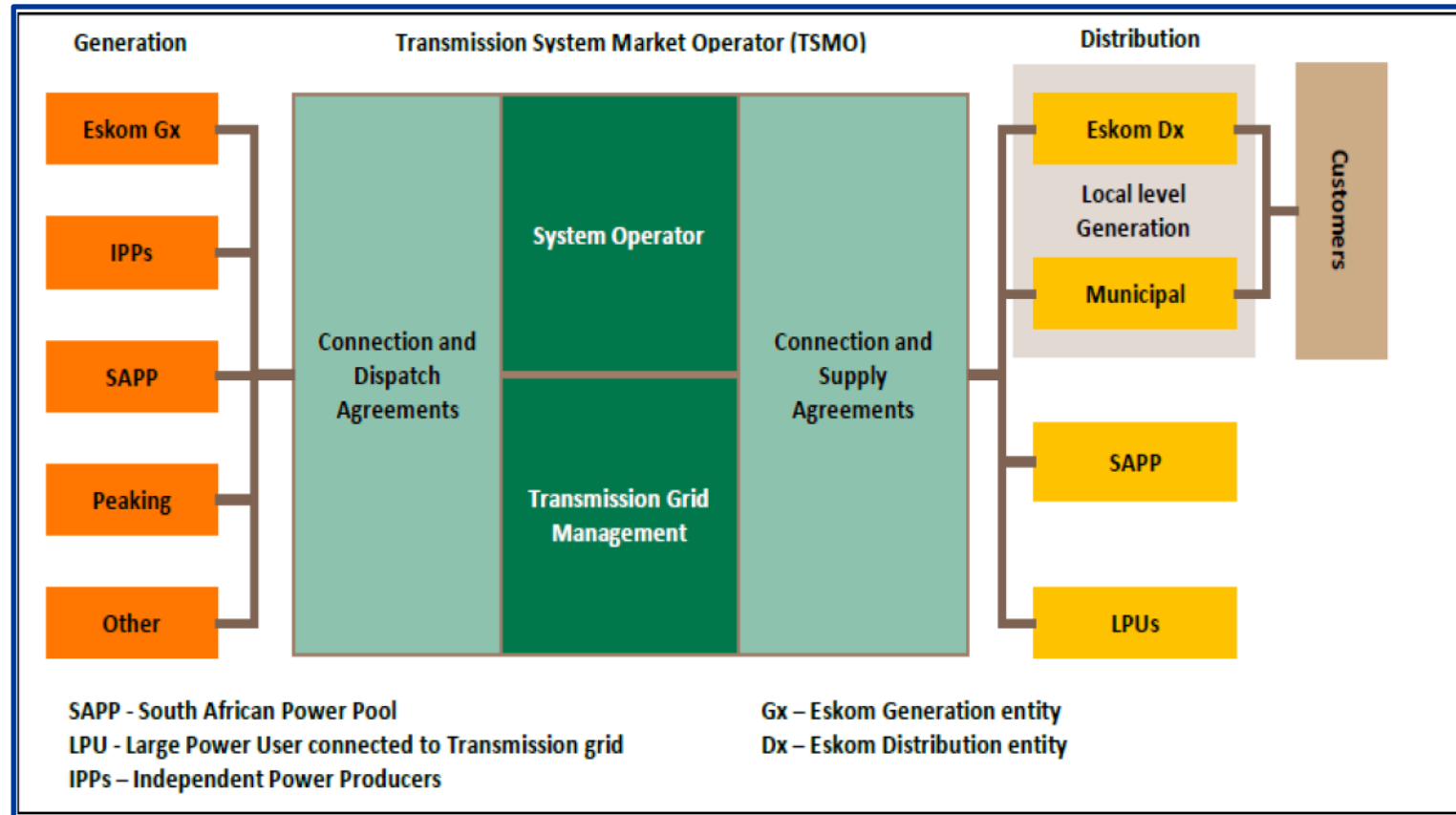
## □ South Africa electricity industry restructuring in progress

### ❖ Objectives

- financial sustainability,
- increased operational efficiency and
- improved power system reliability

## □ ERA bill was amended to reflect the creation of a transmission system and market operator (TSMO) signaling the move from a **single buyer model** to a **competitive multi market model**

- ❖ to promote competition and
- ❖ drive down costs in the electricity industry sector



- ❑ Process of buying and selling electricity between different parties, such as generators, distributors, and consumers.
- ❑ Done through various market segments
  - ❖ day ahead market (DAM),
  - ❖ the intra-day market (IDM),
  - ❖ the balancing market (BM),
  - ❖ ancillary services market (ASM)
  - ❖ bilateral contracts, between two parties
- ❑ Ways to trade depend on
  - ❖ market design,
  - ❖ the network topology,
  - ❖ the regulatory framework
  - ❖ environmental objectives
- ❑ **Two common trading models:**
  - Bilateral trading:**
    - ❖ Trade directly between generators and consumers, or between intermediaries.
    - ❖ Long-term contracts or short-term spot transactions

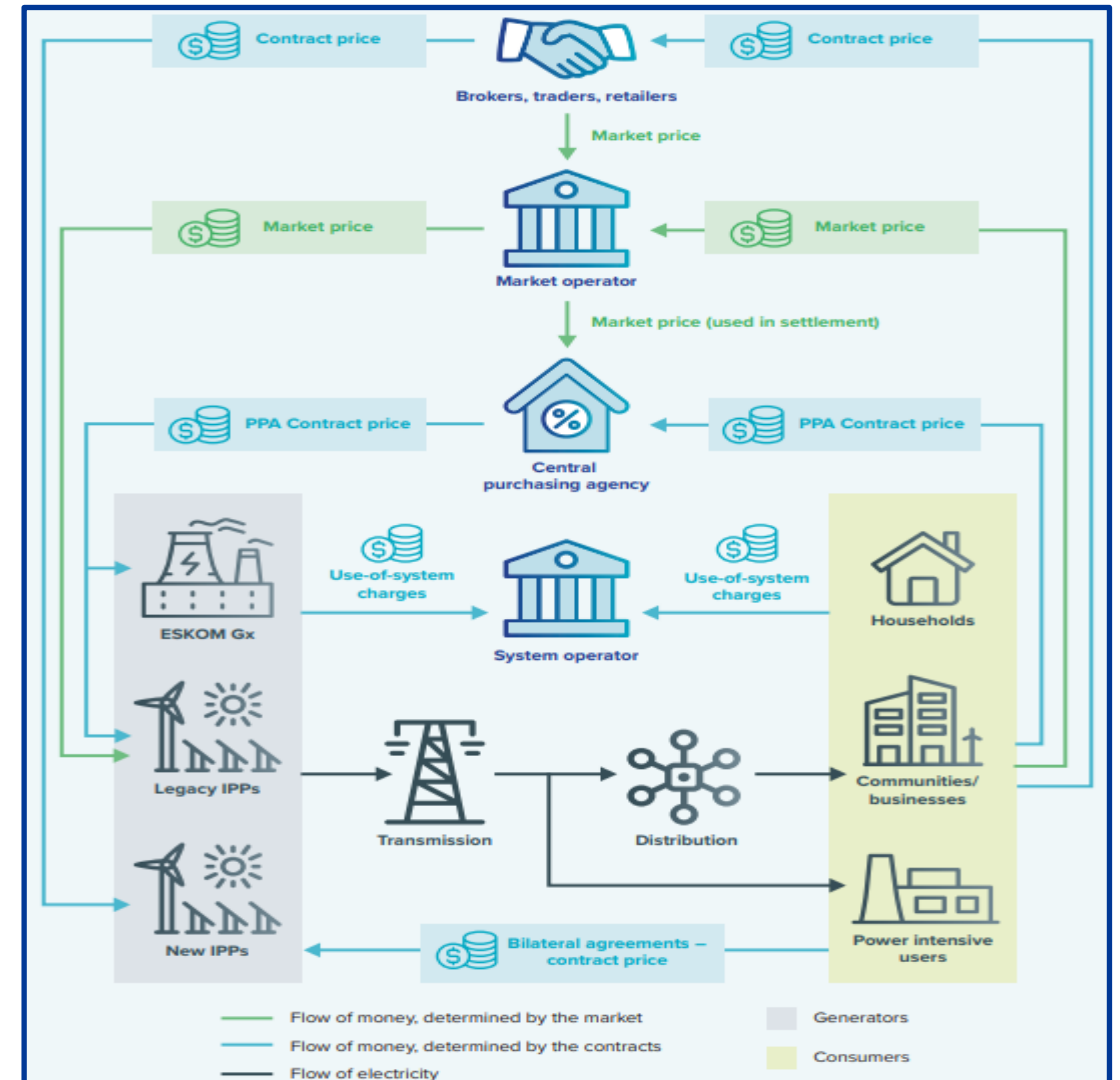
## Centralized trading:

❖ Trade through a **centralized market platform**, operated by an **TSO or MO**

- Coordinates the dispatch of power plants
- Manages the congestion and
- reliability of the transmission network.

## ❖ Different market segments

- day-ahead,
- real-time,
- ancillary services,
- capacity,
- financial transmission rights





## Locational/System marginal pricing (LMP):

- ❖ Pricing method in centralized markets that
- ❖ reflects the marginal cost of supplying electricity at each location on the network,

## Consists of

- ❖ generation costs
- ❖ transmission losses
- ❖ congestion constraints

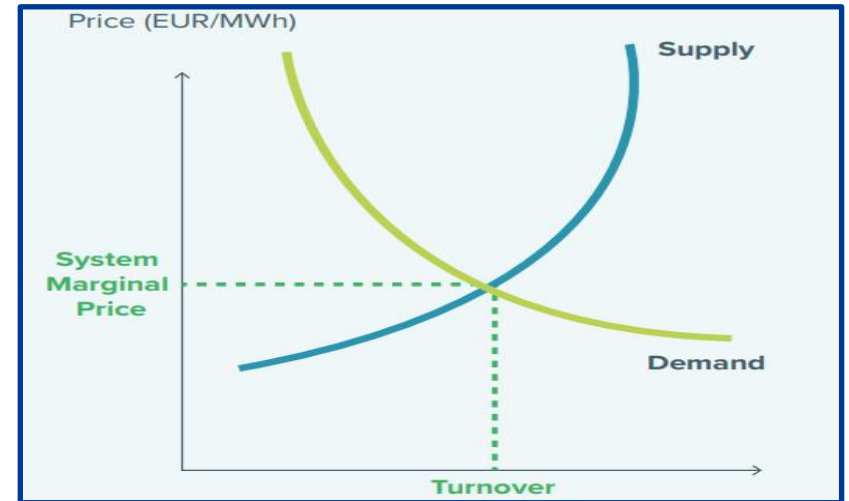
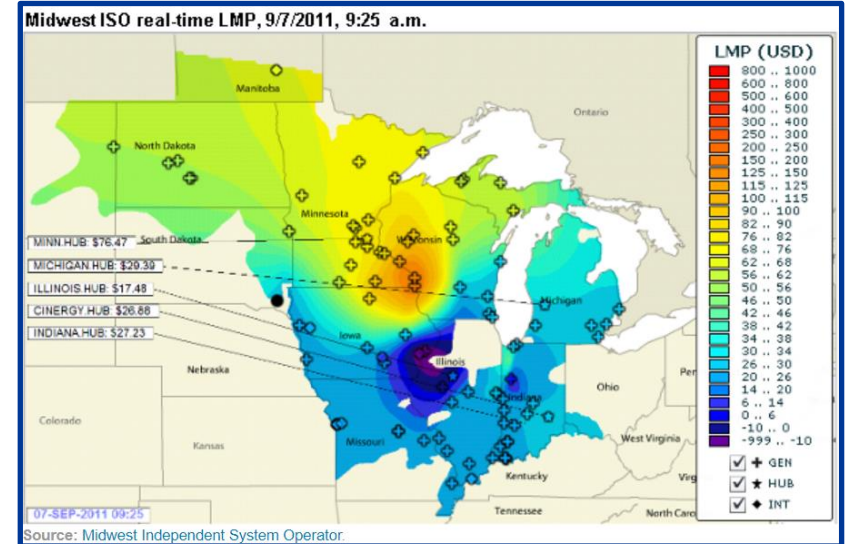
LMP is used to determine the **settlement prices** for **generators** and **consumers** in each **market segment**

## System marginal pricing (SMP):

- ❖ Pricing method in centralized markets that
- ❖ reflects the cost of electricity at single reference point

## Consists of

- ❖ generation costs



## Methods of Trading

- ✓ Through a non-discriminatory platform, allowing market participants to trade hourly or daily
- ✓ Private power purchase agreements (PPA) where licensed or registered generators contract directly with customers or traders
- ✓ Regulated PPA by generators with the TSO or buyers as determined by the Department of minerals and Energy (DMRE)

## Process

- Is regulated by the National Energy Regulator of South Africa (NERSA),
- Issuing of licenses to electricity traders and
- approves the use of system agreements (UoSAs) between traders and municipalities
- licensed electricity traders in South Africa are
  - POWERX,
  - Enpower,
  - Etana, and
  - The Energy Exchange
- Buy from Independent power producers (IPPs), sell to commercial & industrial consumers for carbon footprint reduction
- Pay for use of distribution networks to wheel the electricity from the generators to the consumers

- ❑ The process of **creating rules and institutions** that govern
  - the production
  - transmission
  - distribution
  - consumption of electricity
- ❑ Electricity markets are complex and dynamic
  - ❖ balancing of supply and demand
  - ❖ coordination of multiple actors
  - ❖ consideration of environmental and social impacts
- ❑ The objectives of a market
  - ✓ **Short-run efficiency:** Best use of existing resources; meet demand at the lowest possible cost
  - ✓ **Long-run efficiency:** Efficient investment in new reliable, clean, affordable resources
  - ✓ **Security:** Ensuring power system quality and reliability
  - ✓ **Fairness:** Equal access for all participants and fair treatment to the market

## Market Types

### ❑ Wholesale

- ❖ Involve the sale of electricity among generators and resellers, consumers

### ❑ Retail - involve the sale of electricity directly to consumers

## Supply and Demand of electricity

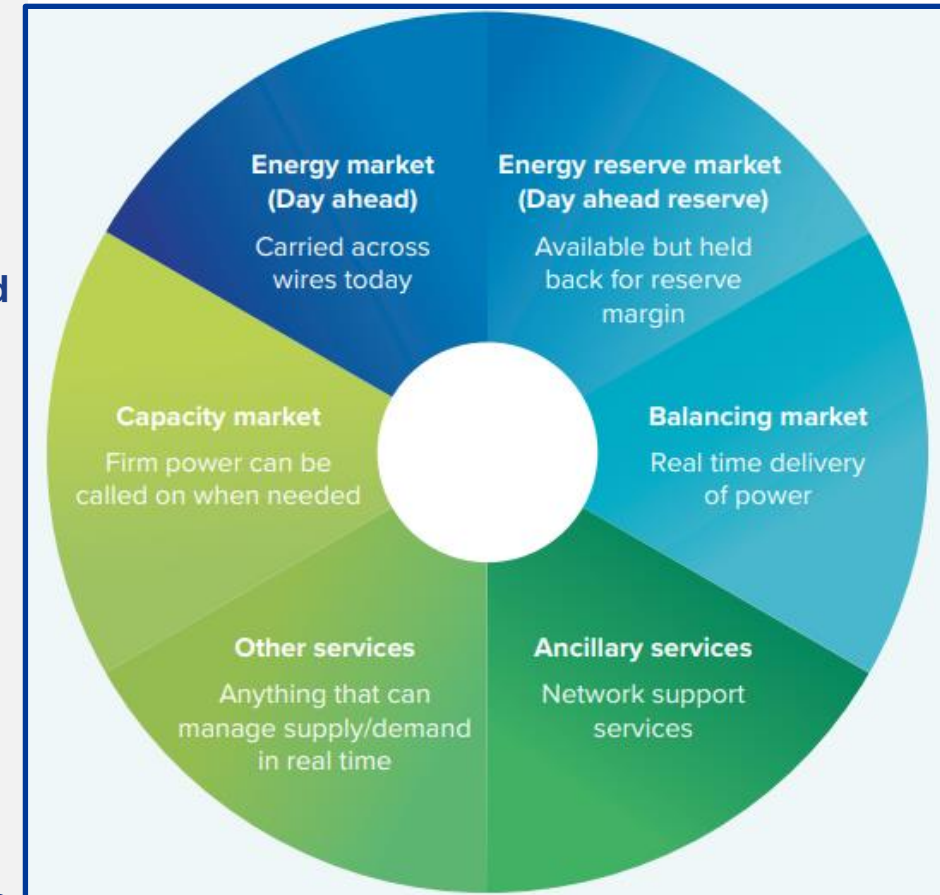
### ❑ Capacity and energy markets are mechanisms that help to ensure the **reliability and efficiency**, provides incentives for generators and consumers

### ❑ Energy markets

- ❖ Refers to the actual amount of electricity produced and consumed
- ❖ Pay generators for the electricity they produce and sell to consumers
- ❖ Reflect the supply and demand of electricity at any given time
- ❖ Generators to produce electricity efficiently and competitively
- ❖ Facilitate the integration of renewable sources that have low or zero marginal costs

### ❑ Capacity markets

- ❖ Refers to the ability of power plants or other sources to produce electricity when needed
- ❖ Investments in new or existing power plant during peak demand periods
- ❖ Prevent the closure of existing power plants that may be needed for system security





# Conceptual overview of the different types of electricity markets regarding their time dimension

## Forwards and futures Market

- ❑ Long-term markets, years before up to the day before the delivery of electricity
- ❑ Tool for reducing exposure to price fluctuations in short-term markets

## Day-Ahead Markets (DAM)

- ❑ Basis of electricity trading one day before the delivery
- ❑ Day-ahead balance requirement of the entire bidding zone

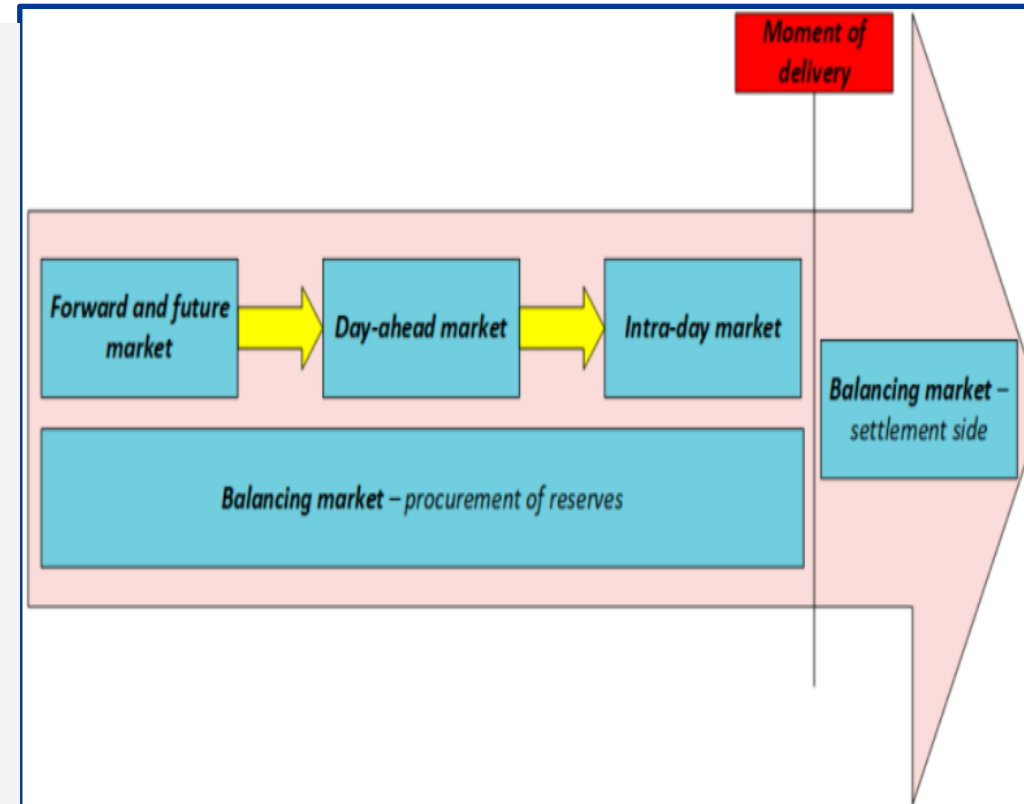
**planned generation = equal forecasted demand + the difference imports & exports**

## Intra-Day Markets (IM)

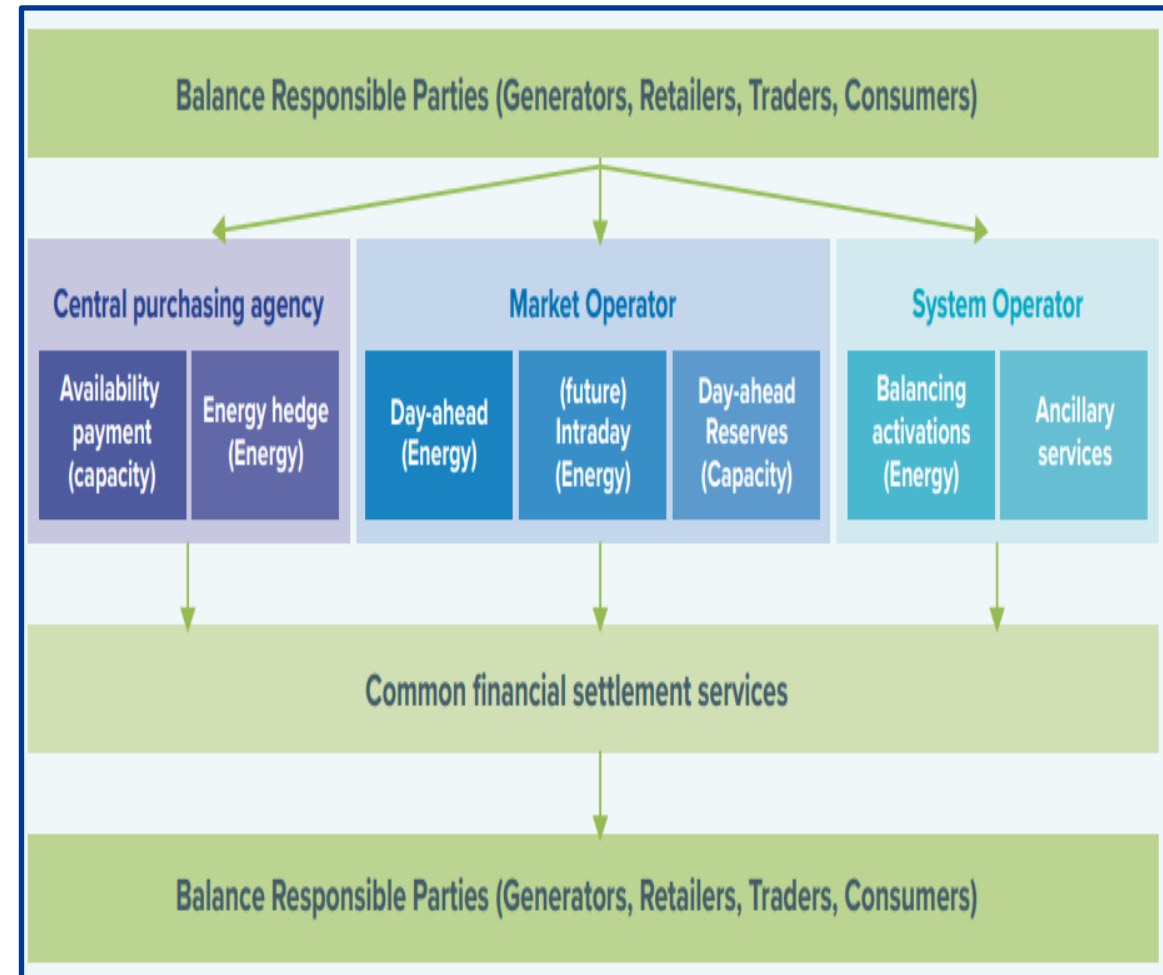
- ❑ Electricity is traded on the delivery day
- ❑ Supplement the DAM and secure the balance between the supply and the demand
- ❑ Unexpected events eg power plant outage or inaccurate forecast
- ❑ Reduce gap between the day-ahead contracts & actual produced/consumed volume
- ❑ The role of the TSO is to maintain a real-time balance by activating reserves.

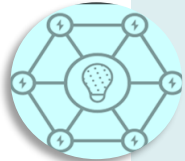
## Balancing Markets (BM)

- ❑ TSO to procure reserves
- ❑ Balancing markets can be reserve procurement or financial settlement of imbalances
- ❑ Reserve procurement is a reservation of spare capacity used for balancing
- ❑ Financial settlement of imbalances penalization, market participants causing imbalance
- ❑ Financial awards for market participants for imbalance mitigation (reserve providers)



- ❑ Central Purchasing Agency (CPA) is a market support entity to fulfil role of counterpart to contracts necessary to facilitate the transition to a competitive market as well as a special purpose vehicle managing non-market agreements or services aligned with the competitive market. It will be financially responsible for the existing Power Purchase Agreements with IPPs (legacy contracts) and will participate as a balance responsible party in the market for the electricity produced under these agreements. It can also enter into new PPAs with IPPs to enhance system stability.
- ❑ Market Operator (MO) managing markets, balancing mechanism and financial settlements
- ❑ System Operator (SO) manages the real-time balancing of supply and demand and performs the function of metering agent for the Market Operator and market participants. In a competitive market environment, the System Operator will use trades reported from the Market Operator to manage the real-time processes required for the physical balance of the power system
- ❑ Balance responsible parties (BRP) responsible for ensuring balance in real time. Participant's pay the costs associated with any imbalance caused due to the difference between real and predicted supply or demand





- Optimization of Dx energy purchases and energy trading by:
- Procuring lower priced energy for sale to retail customers.
  - Selling energy services (Grid Flexible services)

## Core activities

- Trading
- Facilitating aggregators
- Financial settlements
- Market analysis
- Hedging
- Business development (opportunity identification and closure)
- Contracting
- Sales

## Revenue streams

**Energy purchase optimization**

**Energy sales**

# Thank you Questions??

