PRESENTATION
ON COMPETITIVE WHOLESALE POWER MARKET (CTBCM) OF PAKISTAN

CENTRAL POWER PURCHASING AGENCY (CPPA)
SEP 22, 2020
# Scheme of Presentation

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Part-1

History of Competitive Market Development
**WAPDA Strategic Plan**
- Enhance capital formation
- Improve efficiency and rationalize prices, and
- Move towards full competition by providing the greatest possible role for the private sector through privatization

**First Power Policy**
- Enabled Private Participation in Generation
- Offered generous incentives
- Several deals and capacity additions

**NEPRA Act**
- Enactment of NEPRA Act
- Formation of Independent Regulator (NEPRA) to oversee the restructuring process

**Unbundling of WAPDA**
- Thermal Power Generation Companies
- Perform Supply Business
- Perform distribution, construction, expansion, maintenance operation of the distribution system

**Power Sector Reforms (Historical Perspective)**
- 1992:
  - WAPDA Strategic Plan
- 1994:
  - First Power Policy
- 1997:
  - NEPRA Act
- 1998:
  - Unbundling of WAPDA

**PEPCO**
- Transition Management Company
- Oversee the corporatization & privatization
- Formed Business Plan for Restructuring process

**GENCOs (4)**
- LESCO
- GEPCO
- FESCO
- IESCO
- MEPCO
- PESCO
- HESCO
- QESCO
- TESCO
- SEPCO

**DISCOs (10)**
- NTDC
- Transmission Network Operator
- System Operator
- Planner
- Power Procurer
- Power Market Development

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- **NTDC was granted Transmission License to perform five functions:**
  1. TNO
  2. SO
  3. Planner
  4. Metering Service Provider
  5. Contract Registrar/PEX Administrator

- **Per licensing requirement, NTDC was mandated to develop the whole sale market (CTBCM) by 2008**

- **National Power Policy 2013**
  - “… Innovative business and regulatory models will be deployed to weaken the monopolies, increase efficiencies, and decrease costs through competition. Wheeling charges and wholesale markets may be introduced to introduce multiple buyers and sellers in the marketplace.”

- **Legal formation of CPPA. However, functioned as Department of NTDC from 2009 to 2015.**

- **ECC’s Decision April 2015**
  - CPPA through consultation prepare CTBCM Model and Plan by June 2017
  - The CTBCM is for wholesale market
  - Will be approved by NEPRA
  - Commercial Operations date: June 2020

- **CPPA Operationalized**
  - CPPA formed Market Development Department

- **The model and plan submitted to NEPRA for review**
  - Request for ECC in amending timelines
  - New NEPRA Act Amendments
  - MO’s Authorization
  - Comments
  - Partnerships

- **CPPA prepared and submitted the model and plan to Board in July 2017**
  - The Board formed a Special Committee
  - The Special Committee evaluated the plan
  - Board principally approved CPPA’s re-structuring and allowed submission of CTBCM submission to NEPRA
  - Consultations with SECP

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Market Development History

2015
Apr 2015
ECC Decision Point 9
(To Prepare CTBCM)

2016-2017
Numerous Consultation being done for making the model

2017
Apr 2017
Special committee including MoE (PD), MoF, CPPA & NEPRA constituted to evaluate the proposed model

2018
Mar 2018
Submitted CTBCM to NEPRA for approval after evaluation of special committee and approval of CPPA board

2019
Dec 2019
CTBCM Model approved by NEPRA

2020
Sep 2020
After approval of CTBCM Plan by NEPRA 1.5 years extension granted by ECC

2022
March 2021
CTBCM COD

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Part-2
International Perspective
Every Market is UNIQUE in terms of Design!

- **Type of Pool**
- **Market Architecture**
- **Types of Products**
- **Dispatch**
- **Contractual Arrangement**
- **Pricing Mechanism**
- **Institutional Arrangement**
- **Types of Customers**
- **Types of Suppliers**

### Countries and Markets

- **AEO**
  - Gross pool
  - Price Based
  - ISO Model
  - 7 day ahead scheduling

- **NYISO**
  - Day Ahead Market
  - Real Time Market
  - Security constraints
  - Economic Dispatch
  - Price Based Pool

- **PERU**
  - Gross pool
  - Cost Based
  - ISO Model
  - Real Time Mandatory Pool

- **ARGENTINA**
  - Gross pool
  - Hourly Marginal Price
  - ISO Model
  - Ancillary Services Payments

- **BRAZIL**
  - Real Time Market for Imbalance Settlement
  - Weekly System Marginal Price
  - System Operator and Market Operator are Separate

- **INDIA**
  - Hybrid Structure
  - Long term PPAs
  - Day Ahead Market
  - Regional, State & National SO
  - Exchange exist

- **DENMARK**
  - Hybrid Structure
  - Long term PPAs
  - Day Ahead Market
  - Regional, State & National SO
  - Exchange exist

- **TURKEY**
  - Net Pool
  - Day Ahead Market
  - Intraday Market
  - Real time Market

- **Philippines**
  - Gross Pool
  - IMO is independent & SO is part of Transmission Company
  - Hourly Ahead Market
  - Real time Market

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  - ISO Model
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Pakistan’s Electricity Market Framework

- **Legal**
  - Constitution
  - NEPRA Act 2018
  - Electricity Act 1910

- **Policy**
  - Power Policy 2015
  - RE Policy 2019
  - Power Policy 2013, NEP

- **Regulatory**
  - Rules
  - Regulations
  - Codes and Guidelines

- **NTDC**
  - Transmission Network Operator (TNO)
  - Metering Service Provider

- **NTDC System Operator**
  - System Balancing
  - Expansion Planning and Forecasting
  - Operational Planning & Forecasting

- **Market Operator**
  - Billing and Settlement
  - Market & Product Development
  - Contract Registration

- **Other Service Providers**
  - IAA
  - SPT

- **DISCOs**
  - Distribution Network Operator (DNO)
  - Base Supplier
  - Metering Service Provider

- **Market Participants**
  - Generators
  - Traders
  - Competitive Suppliers
  - BPCs

**Markets Transition**
- Vertically Integrated
- Single Buyer
- Single Buyer Plus
- Competitive Wholesale & Retail

**Framework Alignment:**
- Legal, Policy & Regulatory

**Institutional Work:**
- Roles Alignment
- People capacity
- Processes automation
- Technology deployment

Market Transition is a ‘Big Undertaking’
Competition requires liberalization (private participation) to achieve desired results!
Part-3

Stages of Market Development
Players in the Market

Consumers

1. Regulated Tariff Consumers
   (all consumers)

2. Eligible Consumers
   (large consumers with choice)

Suppliers

1. DISCOs as Supplier
   (can sell at regulated tariff only*)

2. Competitive Supplier
   (can sell to only eligible consumers at non-regulated prices)

*DISCOs are deemed last resort suppliers for a period of five years under NEPRA Act
Single-Buyer Model and Wholesale Competitive Market

Current Structure: Single Buyer Model

Power Generation Companies → Single Buyer → DISCOs as Supplier → All Consumers

Approved Structure: Competitive Wholesale Market Model

Power Generation Companies → Wholesale Market → DISCOs as Supplier → Competitive Suppliers → Traders

1st Stage: Wholesale (CTBCM) Mar 2022

26.6 Mln Consumers, 84% share in energy sales

2000+ Eligible Consumers, 16% share in energy sales

Single Buyer in Pakistan?
Competitive Wholesale and Retail Markets

1st Stage: Wholesale (CTBCM) Mar 2022

Approved Structure: Competitive Wholesale Market Model

2nd Stage: Retail

All Consumers have choice
Part-4
Competitive Market Design
CTBCM – Features

- New PPAs
- Existing PPAs
- Service Providers
- Centralized New Capacity Procurement
- Grid Code
- Commercial Code, others
- Non Payment Risks
- Agent separated from MO
- Market Participants
- Capacity Obligations
- Centralized Economic Dispatch
- Balancing Mechanism
- Contract Registrar
- K Electric
- Competition for and in the Market
- Low Performing Discos
- Credit Cover (collateral)

CTBCM Features:
- Capacity Obligations
- Non Payment Risks
- Agent separated from MO
- Market Participants
- Centralized Economic Dispatch
- Balancing Mechanism
- Contract Registrar
- K Electric

Grid Code Commercial Code, others

New PPAs

Existing PPAs

Service Providers

Centralized New Capacity Procurement

Balancing Mechanism

Centralized Economic Dispatch

Balancing Mechanism

Contract Registrar

K Electric

Market Participants

Non Payment Risks

Agent separated from MO

Centralized Economic Dispatch

Balancing Mechanism

Contract Registrar

K Electric

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1. The CTBCM is constructed around bilateral contracts.

2. The System Operator will establish marginal prices for trading including settlement of imbalances.

3. DISCOs will procure power through competitive bidding organized by Independent Auctioneer (IAA) resulting in reduced purchase price for DISCOs.

4. Eligible Consumers will be free to procure power from Competitive Suppliers.
4 Major Design Parameters

• **Products Traded in the Market and System Reliability:** Two main products, Energy and Capacity, Energy traded to supply consumption and Firm Capacity Traded to ensure medium and long-term security of supply

• **Pricing Mechanism:** Cost-based pool model with single market clearing price based on marginal cost principle

• **Power Procurement:** 100% capacity obligations, procurement for regulated consumers is subject to IGCEP and Procurement Plan, Eligible Consumers free to contract bilaterally on their own terms and conditions

• **Market Architecture:** Bilateral Contracts complimented with balancing mechanisms for capacity and energy
CTBCM is wholesale competitive electricity market where electricity will be traded in bulk quantities on competitive prices

Main Features:

• Establishment of an independent and impartial Market Operator
• Dispatch Operations improved through strengthening of System Operator
• Tool based Security Constrained Economic Dispatch
• Generation adequacy ensured through Capacity Obligations
• New Capacity for DISCOs procured through centralized auction by Independent Auction Administrator (IAA)
• Introduction of Credit Covers to cover non-payment risks in the market
• Government Support for low performing DISCOs
• Balancing Mechanisms introduced to trade imbalances on market prices
CTBCM Main Features

• Rules and Regulations established for **Market Participants** and **Service Providers**

• **Legacy PPAs/EPAs** will be **commercially allocated** to the DISCOs and will be legally administered by the Special Purpose Trader (SPT)

• Introduction of **flexibilities** in new contracts

• **Contract Registrar** to check **validity** of contracts and **verify capacity obligations** of the market participants

• **New Commercial Code** to govern the operations of MO

• **Existing Commercial Code amended** to govern the operations of SPT as per new market design

• **Amendments** in certain sub-codes of **Grid Code** to reflect the market design i.e. SDC, Metering, DRC and Planning

• **Strengthening of Institutions** i.e. MO, SO, IAA, DISCOs

• **Institutionalization** of data to enhance **transparency**
Capacity Obligations

• **Capacity Obligations** are introduced to ensure **Security of Supply and Generation Adequacy** in the system.

• Market **participants representing Demand** will have the obligation to **contract in advance** sufficient capacity (contribution to system peak and system reserves) to serve its load.

• Each market participant will be **accountable** for its **demand projections**.

• These capacity obligations is a contribution to ensure **medium and long term security** of supply.

• Obligations for each demand participant will be **calculated in advance** by MO based on an approved criteria.

• Capacity Obligations will be **verified** by the **Contract Registrar** function of the MO.
• All future procurements for regulated customers will be subject to competitive procurements (to the extent feasible)

• The competitive process will be subject to NEPRA’s regulations and oversight

• The IAA will consolidate requirements from all DISCOs and will run competitive auctions as per process approved by NEPRA

• After successful completion of the bidding process, the IAA will nominate successful bidders which will then be required to approve their tariffs from NEPRA

• After approval of such tariffs, NEPRA will be bound to pass through these costs to end-customer tariffs of the DISCOs.
Part-5
CTBCM Implementation Plan and Monitoring
Entities Actions & Responsibilities in the CTBCM Plan

Approval by NEPRA

1. Detailed Design
2. CTBCM Implementation Timelines

NEPRA
(Preparation, Modification of Rules & Regulations, timely approval codes and prepare guidelines)

MoE (PD)
(Review and Revision of Power Policies, Development of New Rules)

NTDC / System Operator
(SO Licensing, Institutional Strengthening, Connection Agreement, SMS metering, Amendments of Grid Code, Data Publishing)

PPIB/AEDB
(Revision of security package, Market based contracts drafts, Institutional Strengthening, IAA Registration)

DISCOs
(Institutional Strengthening, Connection Agreements)

CPPA/MO
(Bifurcation of CPPA, Capacity building, MO licensing, Prepare Commercial Code)

Moving towards target date of CTBCM

Q1 2020
SEP 2020
Q3 2021
Q1 2022
Apr 2022

Testing and parallel Run

Q1 2020
Q3 2021
Q1 2022

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(SO Licensing, Institutional Strengthening, Connection Agreement, SMS metering, Amendments of Grid Code, Data Publishing)

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Implementation & Monitoring

CCoE

Market Implementation & Monitoring Group (MIMG) Board

Market Implementation Support Committee (MISC) of CPPA Board

Working Groups of Power Sector Entities

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Thanks
Market Structure: Pakistan has a single-buyer market structure in place.

Buyer: Central Power Purchasing Agency Guarantee (CPPA-G) Ltd.
Today – Single Buyer

• Today: each Disco has one contract with CPPA-G (PPAA)

• PPAs/EPAs costs are equally shared

• Costs allocated monthly: share of energy and of peak demand of a Disco within the total for all Discos.

• Same regulated purchase price for energy & capacity

• Wholesale price transferred as a cost to regulated retail electricity tariffs (plus fuel cost adjustments)

• All discos have the same system transmission charge