UNDERSTANDING CTBCM

A Guide to Pakistan's Competitive Trading Bilateral Contract Market (CTBCM)

Alternate Development Services
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CEO's Message

Pakistan's energy sector is entering a defining period of transition. The Competitive Trading Bilateral Contract Market (CTBCM) represents the country's most significant electricity market reform in decades, opening a pathway toward direct power procurement, greater market transparency, renewable energy integration, and improved industrial competitiveness.

For Pakistan's export-oriented industries; particularly the textile, apparel, sports goods, and manufacturing sectors; energy is no longer only a cost of production. It is increasingly linked to sustainability compliance, carbon reporting, supply-chain resilience, and access to international markets. Firms that understand emerging energy-market structures today will be better positioned to compete tomorrow.

This guide has been prepared by Alternate Development Services (ADS) to help industrial stakeholders navigate CTBCM in clear and practical terms. Rather than presenting only regulatory language, it translates the evolving framework into actionable understanding for business leaders, finance teams, sustainability managers, and industry associations. The objective is not to promote unrealistic expectations, but to enable informed decision-making based on the official market framework currently being implemented by ISMO and regulated by NEPRA.

CTBCM should be viewed as a strategic opportunity that requires preparation, analysis, and disciplined engagement. The market is opening gradually, participation carries technical and financial responsibilities, and the long-term value will depend on how effectively firms assess the full cost structure, contract arrangements, and renewable energy pathways available to them.

I commend Muhammad Usman Bin Ahmed and the ADS research team for developing this timely and industry-focused resource. Their work reflects ADS's commitment to supporting Pakistan's energy transition through evidence-based research, stakeholder engagement, and practical policy communication.

As Pakistan moves toward a more competitive and sustainable electricity market, I encourage industrial associations, bulk power consumers, and export-sector firms to study this guide carefully, participate in the ongoing consultation process, and begin preparing their organizations for the opportunities and responsibilities that CTBCM will bring.

The firms that understand CTBCM earliest, prepare seriously, and engage constructively will be the firms best positioned to benefit from Pakistan's energy transition and the evolving global marketplace.

Amjad Nazeer,
Chief Executive Officer,
Alternate Development Services (ADS)

Foreword

Pakistan's power sector is at a turning point. After years of planning, the Competitive Trading Bilateral Contract Market; commonly known as CTBCM; is now moving from policy design into active implementation. The Independent System and Market Operator (ISMO) has begun the process of stakeholder consultation, framework guidelines have been approved, and the first auction of wheeling capacity is expected under a clear regulatory timetable (June or July 2026). The Framework Guidelines for Wheeling Auctions, 2025 were formally notified through S.R.O. 92/(I)/2026 on 22nd January 2026 in the Gazette of Pakistan Extra Ordinary Part-II. ISMO has published its Draft RFP for the first wheeling auction covering 200 MW. The competitive market is open.

For Pakistan's industrial community; particularly firms in the textile, sports, apparel, and other export-oriented sectors; CTBCM is not an abstract regulatory development. It is a structural reform which will change how electricity is procured, priced, and contracted. Understanding it early can help firms engage more effectively, plan more strategically, and avoid costly misunderstandings.

This guide was prepared to fill a practical communication gap. Most existing documentation on CTBCM is technical and regulatory in nature; written for engineers and policy specialists. This guide is developed for industry leaders, sustainability managers, compliance officers, and association representatives who need to understand the market without being energy-sector experts. Every value in this guide is sourced directly from official ISMO documents: the Framework Guidelines (SRO 92/(I)/2026), the Draft RFP, the Letter of Award template, the Use of System Agreement (Annex-XII), Connection Agreements (Annex-X and Annex-XI), and the Connection Process (Annex-XXIV).

The Framework Guidelines for Wheeling Auctions, 2025 were gazetted as S.R.O. 92/(I)/2026 on 22 January 2026. The legal authority derives from Section 31 of the NEPRA Act 1997 (XL of 1997), Clause 5.5.2(g) and 6.1.3 of the National Electricity Policy 2021, Rule 5 of the Eligibility Criteria (Electric Power Supplier Licenses) Rules 2023, and Strategic Directive 87 of the National Electricity Plan 2023-27.

The guide is structured to be read from beginning to end, or to be consulted section by section depending on the reader's need. It covers what CTBCM is, how it works, who participates, what the auctions mean, what buyers and sellers must do, and how industry can realistically prepare.

A word of caution: CTBCM is still in the early stages of commercial operationalisation. Some rules remain subject to final determination by NEPRA and ISMO. This guide is based on publicly available information as of May 2026 and should be read alongside official ISMO and NEPRA documentation. This guide reproduces only what official documents actually state. Where a figure is illustrative, it is stated as such. Where rules are draft or subject to NEPRA finalization, this is stated. Verify all participation requirements directly with ISMO before any commercial or legal decision.

WHY THIS GUIDE MATTERS NOW

The CTBCM Framework Guidelines came into force on the Competitive Market Operation Date (CMOD) announced by NEPRA, with the Framework Guidelines for Wheeling Auctions 2025 subsequently approved in **22 January 2026**. This upcoming first auction introduces a 400 MW (revised from 200 MW) allocation out of a total 800 MW rollout planned over five years. Firms that understand CTBCM now will be better positioned than those that engage only after the first auction is complete. Thus, firms that begin preparation now will be positioned to participate; firms that wait risk missing the first allocation window. Register on auctions.ismo.gov.pk today.

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Executive Summary

Pakistan's electricity sector is undergoing its most significant structural reform in decades. Pakistan's Competitive Trading Bilateral Contract Market (CTBCM) replaces the single-buyer electricity model with a competitive wholesale market in which bulk power consumers (large industrial units specifically, those with demand of 1MW above) can procure electricity directly from licensed generators and competitive suppliers through bilateral contracts, transporting power through the national grid via 'wheeling.' CTBCM marks a structural shift in Pakistan’s electricity sector, offering *wholesale open electricity market framework*. Independent System Market operator (ISMO) administers auctions, registrations, contract oversight, dispatch coordination, and settlement; NEPRA regulates it; the legal foundation is S.R.O. 92/(I)/2026, gazetted *22 January 2026*. The reform is backed by the National Electricity Policy 2021, the National Electricity Plan 2023–27, the Framework Guidelines for Wheeling Auctions 2025, and the operational setup created through ISMO. In practical terms, the market is now moving from policy design into implementation, with a live auction platform, published templates, defined connection timelines, and node-specific renewable data already available to participants.

For *Pakistan's export-oriented industries*; especially textiles and sports/apparel; electricity is a major production cost. The existing system offers limited flexibility for self-sourcing or competitive procurement. CTBCM opens a pathway for bulk consumers to negotiate directly with power suppliers, potentially access renewable energy, and manage energy costs more strategically. This has direct implications for export competitiveness.

Thus, for industry, the opportunity is significant but conditional. CTBCM gives large consumers, especially textile, sports, and other export-oriented firms, a legal route to negotiate bilateral electricity supply, unlock corporate PPAs, and document cleaner energy sourcing for *Scope 2 reporting* and buyer-side sustainability compliance. Already-connected buyers have a simpler route because a valid Connection Agreement can make them broadly compliant on the grid side. At the same time, the market is not open-access in a simplistic sense: wheeling capacity is finite, participation is competitive, and the commercial value of the market depends on whether the full landed cost still leaves room for savings.

This guide presents the auction framework as opportunity with discipline. The first auction is only the opening tranche of a wider program: the aggregate wheeling quantum is 800 MW over five years, with the first auction covering 200 MW(modified 400 MW), and a single participant can hold no more than 160 MW cumulatively across all auctions. Bid values are discovered competitively, but participation requires substantial financial readiness, including a PKR 300,000/MW bid bond, a PKR 1,500,000/MW performance guarantee, and financial-soundness conditions that can be difficult for smaller firms to meet. That means the market is accessible, but not lightweight.

The biggest commercial caution is that CTBCM is *not a guarantee of cheaper electricity*. The bilateral Bid Value is only one part of the cost stack. Grid charges, surcharges, metering-related charges, market/system operator fees, cross-subsidy burdens, stranded-cost recovery, and the ongoing use-of-system framework all matter. NEPRA hearing repeatedly show why the proposed uniform UoSC structure has become such a sensitive issue: the market may look uniform on paper, but if cross-subsidies, DSS, loss gross-up, and additional charges are embedded into wheeling, the result can be a cost-recovery tool for the legacy power system rather than a genuinely competitive platform for industrial procurement.

This is why BESS is not a side issue but a core design element. Standalone solar and wind cannot reliably meet firm-capacity obligations during critical hours, especially when evening peaks coincide with zero solar output. ISMO’s direction toward a practical minimum storage rule rather than a highly complex scaling formula is therefore important: the current policy logic favors around *10% BESS capacity* with at least 2 hours of discharge duration, alongside rules that distinguish between DC-coupled and AC-coupled systems, charging restrictions, and settlement treatment. In other words, storage is becoming the bridge between variable renewable generation and a market that values firm delivery.

Key Takeaways

- CTBCM moves Pakistan from a government-managed electricity supply chain to a regulated competitive market where buyers and sellers contract directly.
- The first allocation of wheeling capacity (800 MW) is expected to be auctioned under a framework approved in December 2025, with NEPRA finalising wheeling charges.
- Bulk power consumers (1 MW demand or above) are eligible to participate, but participation has specific registration, technical, and compliance requirements.
- Winning an auction allocation itself does not guarantee cheaper electricity; it grants access to the open market. Whether costs are lower depends on bilateral contract terms, wheeling charges, and grid surcharges.
- Industrial firms should begin internal readiness assessments now: understanding eligibility, establishing compliant metering, and engaging legal and commercial advisors familiar with power-sector contracting.
- The first auction is a learning opportunity for the market. Industry should engage, but should not make major investment decisions based on overly optimistic assumptions about auction outcomes or cost savings.
- CTBCM also supports renewable energy procurement pathways, making it relevant to firms with decarbonisation commitments or ESG-linked buyer requirements.

WHAT THIS GUIDE COVERS

This guide explains CTBCM's market structure, the auction mechanism, buyer and seller roles, renewable energy pathways, benefits, limitations, and practical readiness steps for industrial firms. It is not a legal or regulatory advisory document. All firm-specific decisions should involve qualified advisors and official guidance from ISMO and NEPRA.

Section 1: Background: Why CTBCM Matters

1.1. Pakistan's Power Sector: The Starting Point

For most of Pakistan's history as an independent state, electricity has been managed through a vertically integrated, government-controlled system. Power is generated by public and private producers, purchased by a central government buyer (historically the Central Power Purchasing Agency (CPPA-G)), and distributed to consumers through regional Distribution Companies (DISCOs). Consumers have had no ability to choose their electricity supplier; they receive whatever power their DISCO provides, at regulated tariffs.

This model has created serious structural problems: excess generation capacity with expensive 'capacity payments,' high electricity costs passed to consumers, limited accountability for distribution inefficiency, and no incentive mechanism for competitive pricing. Industrial consumers; who represent a disproportionate share of electricity consumption; have borne a heavy cost burden, directly affecting their export competitiveness.

1.2. The Case for Reform

The Government of Pakistan recognized these problems over many years. The **National Electricity Policy 2021** and the **National Electricity Plan 2023–27** formally established the basis for competitive market reform. The Cabinet Committee on Energy (CCOE) approved the CTBCM design in January 2021, ratified by the federal cabinet. The Prime Minister directed the restructuring of CPPA-G and NTDC in 2024 to create ISMO as the operational institution for the competitive market [1].

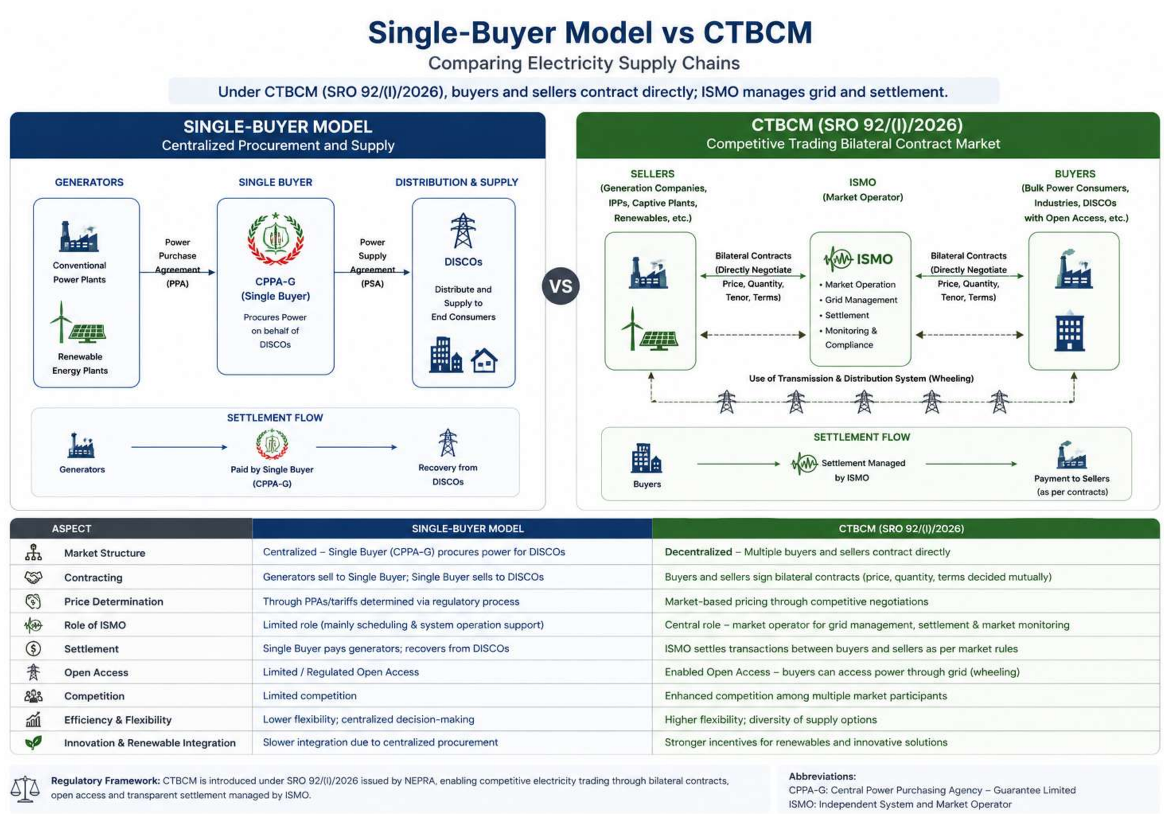

Figure 1: Comparing electricity supply chains under Pakistan's existing single-buyer model and under CTBCM [1][1]

[1] The images have been generated using generative AI-imaging tool after collection of data from official ISMO/NEPRA sources and hearings and/or academic sources enlisted.

Table 1: Comparison between single buyer model and CTBCM (under new framework guidelines) [2]

Single-Buyer Model (Existing)	CTBCM (Framework Guidelines, SRO 92/(I)/2026)
CPPA-G buys all power centrally	Bulk consumers contract directly with competitive suppliers/generators
No consumer choice of supplier	Eligible Auction Participants access 200 MW (first auction)
Uniform NEPRA-regulated tariffs	Prices negotiated through bilateral contracts and market mechanisms (Bid Value in PKR/kWh negotiated and bid competitively)
No energy wheeling; consumers must buy through DISCO	No cap or floor on Bid Value (Framework Guidelines, Clause 3.3)
Bid Value not applicable	Bid Value fixed for 1-year Payment Period; paid to Distribution Licensee
No open access for industrial firms	Grid Charges (5 components) + Surcharges payable for grid use
No corporate PPAs for renewable energy	Corporate PPAs legally enabled under CTBCM framework
No competitive pressure on pricing	Competition among suppliers should moderate prices over time
Capacity payments borne by all consumers uniformly	Stranded cost obligations still apply; a key ongoing challenge

1.3. What This Means for Bulk Industrial Consumers

Industrial consumers; especially large textile complexes, spinning mills, composite mills, sporting goods manufacturers, and export processing zones; are among Pakistan's highest electricity users. They are precisely the stakeholders for whom CTBCM was most urgently designed.

- Under CTBCM, these firms gain the legal right to procure power from competitive suppliers rather than being tied exclusively to their local DISCO.
- This opens possibilities for negotiating better prices, securing renewable energy supply, and managing energy risk more flexibly.
- It also introduces new obligations: registration, metering compliance, capacity commitments, and contractual discipline.
- Most importantly, CTBCM is a transition; not an overnight switch. The market will operate alongside the existing DISCO-based system for the foreseeable future.

KEY CAUTION

CTBCM is not a guarantee of cheaper electricity. Total cost = negotiated Bid Value (PKR/kWh) PLUS Grid Charges (5 components per Rule 5(2)(a) Supplier Rules 2023) PLUS Government Surcharges (Section 31(8) NEPRA Act). Grid Charges and Surcharges continue to be payable AFTER the 1-year Payment Period as well. Complete cost modelling is essential before any participation decision.

Thus, it is a market structure that enables competition. Whether costs fall; and by how much; depends on wheeling charges, market depth, the quality of bilateral contracts, and broader power-sector dynamics. Firms should engage with realistic expectations.

Section 2: What is CTBCM?

2.1. A Simple Definition

IN SIMPLE TERMS

CTBCM is Pakistan's new competitive electricity market. Under CTBCM, large electricity consumers can choose who they buy power from; directly contracting with generators or licensed suppliers; instead of being required to buy from the government-managed distribution network. Power is physically delivered through the national grid, with costs for using the grid paid as 'wheeling charges.' Practically, this cost is paid as Grid Charges (five official components) and Government Surcharges; plus the Bid Value paid to the Distribution Licensee for the 1-year Payment Period.

2.2. The Logic of a Competitive Bilateral Contract Market

The word 'bilateral' is key. A bilateral contract is a direct agreement between two parties; a buyer (industrial consumer or bulk power consumer) and a seller (generator, captive power plant, or competitive supplier). The terms; price, volume, duration; are negotiated between the two parties, not set by the government.

The word 'competitive' refers to the fact that multiple sellers are available in the market, and buyers can choose among them. Competition is expected to exert downward pressure on prices over time. However, this only works if there are enough sellers, clear rules, and transparent information; conditions that take time to develop.

The phrase 'trading' refers to the ability to transact electricity; not just consume what is generated locally, but move power across the national grid from where it is produced to where it is consumed. This is the function that 'wheeling' serves [3].

2.3. Official Definitions (Framework Guidelines, Clause 2.1)

Table 2: The concept of CTBCM and wheeling [2]

Term	Official Definition
Wheeling	Use of the distribution and/or transmission network to transmit electricity under the Open Access regulations.
Aggregate Wheeling Quantum	800 MW quantum to be auctioned over 5 years from CMOD. May be revised by the Federal Government.
Auction Quantum (First Auction)	200 MW (modified 400 MW); the quantum to be allocated in the first single auction under this RFP.
Bid Quantum	Portion of Auction Quantum in MW that an Auction Participant intends to acquire. Max cumulative: 160 MW.
Bid Value	Offer in PKR/kWh paid OVER AND ABOVE Grid Charge and Surcharges (if any). Min 3 decimal places. Cannot be negative. Fixed during Payment Period.
Grid Charge	NEPRA-determined charges per Rule 5(2)(a) Supplier Rules 2023: (1) transmission, (2) distribution, (3) M&SO fee, (4) metering service, (5) cross subsidy.
Surcharges	Levied by Federal Government under Section 31(8) NEPRA Act. Payable in addition to Grid Charges and Bid Value.
Payment Period	1 year from Transaction Start Date — Successful Participant pays Bid Value to relevant Distribution Licensee.
Transaction	Undertaking of wheeling by a Successful Auction

	Participant under the Guidelines and Applicable Documents.
Use of System Charges (UoSC)	Charges approved/determined by NEPRA; paid monthly by Competitive Supplier to Distribution Licensee under the 10-year Use of System Agreement.

2.4. Who Buys Power?

Under CTBCM, Bulk Power Consumers (BPCs) are the primary 'buyers'. These are entities specifically with an electricity demand of 1 MW or more, which register with ISMO as market participants. They secure the right to source power from competitive suppliers through a registered bilateral contract. They use the grid to receive that power, paying wheeling charges for this service. The more details are enlisted in **Section 6**.

2.5. Who Sells Power?

Sellers in CTBCM include licensed electricity generators (including Independent Power Producers (IPPs), licensed competitive suppliers who aggregate and resell power, and; under certain conditions; entities with their own captive generation. To sell into the CTBCM market, a seller must be registered and licensed by NEPRA and meet technical eligibility conditions, listed in **Section 7**.

2.6. How the Market Functions: An Overview

ISMO operates as the system and market operator. It does not buy or sell power itself. Instead, it administers market rules, runs the wheeling allocation auctions, manages grid dispatch, calculates imbalances, and oversees settlement. NEPRA sets the regulatory framework within which ISMO operates.

In practical terms: a buyer and seller agree on a bilateral contract. The contract is registered with ISMO. The power flows through the national transmission and distribution grid. ISMO tracks what was contracted versus what was actually consumed or generated. Imbalances are settled through a marginal price mechanism [4].

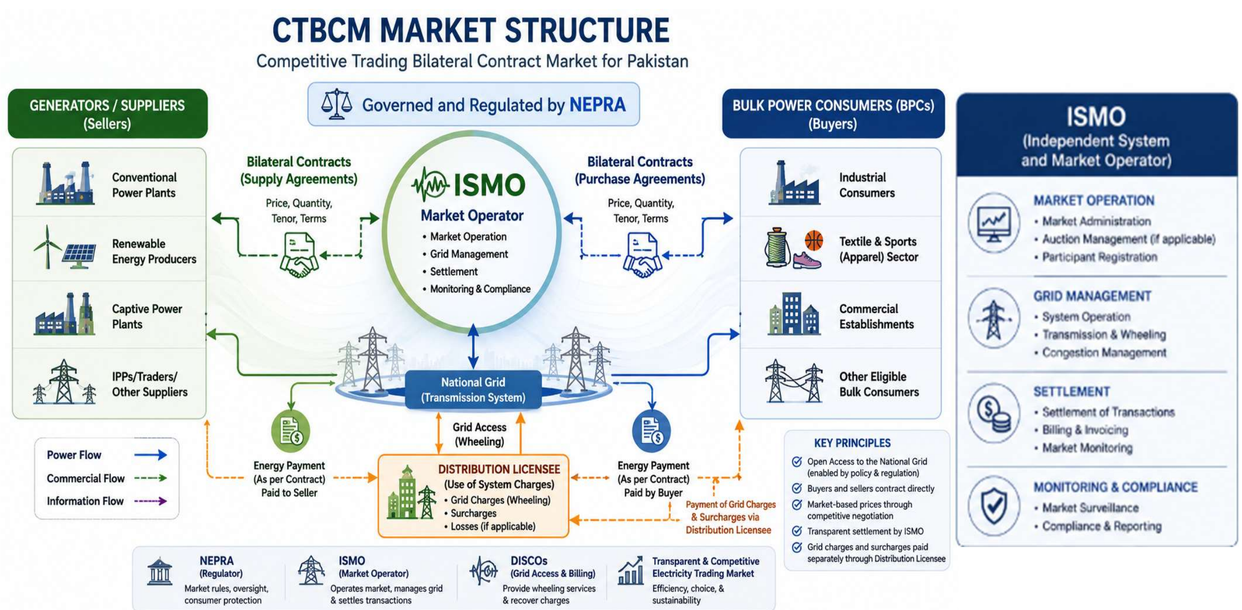

Figure 2: How the CTBCM market is structured: buyers and sellers contract directly; ISMO manages the grid, dispatch, and settlement. (Bilateral contracts (PKR/kWh) – 1 year payment period, to be paid to distribution licensee) [4].

Section 3: How CTBCM Works – Step by Step

Understanding CTBCM as a process helps demystify it. Below is a simplified walkthrough of the key steps from market design through to energy delivery and settlement [5].

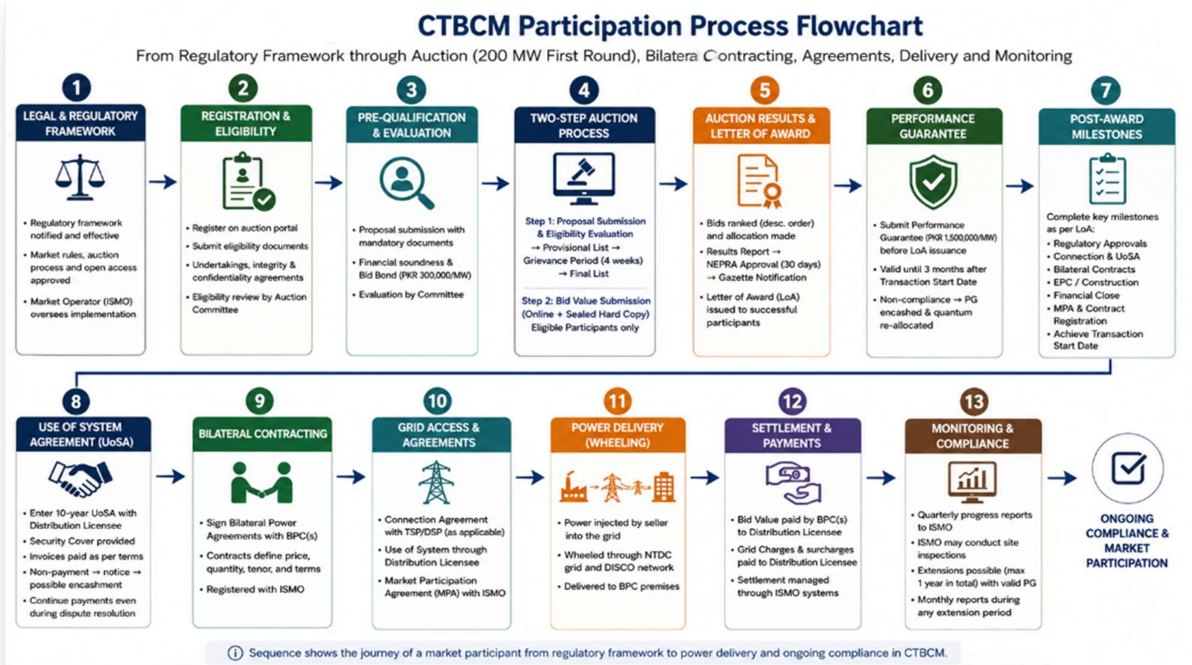

Figure 3: Step-by-step process from market design to energy delivery under CTBCM – from regulatory framework through auction (400 MW first round), bilateral contracting, agreements, delivery, and monitoring [5-17].

Step 1: Market Design and Regulatory (Legal) Framework

- NEPRA establishes regulatory rules for CTBCM through its Market Operations Regulations and related instruments.
- ISMO is established as the market and system operator, responsible for administering the market on a day-to-day basis.
- The Framework Guidelines for Wheeling Auctions 2025 set out the rules for allocating wheeling capacity through competitive auctions.
- S.R.O. 92/(I)/2026 formally notifies the framework guidelines for wheeling auctions.
- ISMO submits the Auction Process to NEPRA within 7 days of notification; NEPRA approves within 30 days (Clause 5.1.ii).
- The guidelines become effective from CMOD as announced by NEPRA and remain valid for 5 years or until amended.
- In case of inconsistency, the NEPRA Act, NE Policy, NE Plan 2023–27, and the CTBCM framework prevail (Clause 6.1).
- NEPRA also determines the wheeling and grid charges that participants must pay for use of the national transmission and distribution network [2].

Step 2: Open Access, Registration, Pre-qualification and Eligibility

- 'Open access' means the national electricity grid is available for use by eligible market participants and is not exclusively reserved for DISCOs.
- For buyers, open access means the right to receive power from any registered seller, wherever that seller is connected to the grid, as long as wheeling capacity is available.

- For sellers, open access means the right to inject power into the grid and have it delivered to a contracted buyer, subject to technical and grid operational constraints.
- Open access is not unlimited or unconditional; wheeling capacity is finite, which is why it is allocated through auctions.
- Both buyers and sellers must register as *market participants* with ISMO before they can participate in CTBCM.
- Registration requires submission of prescribed eligibility documents, and ISMO publishes templates on its website.
- Prequalification verifies that participants meet minimum technical and commercial standards before auction participation or bilateral contract registration.
- Eligibility broadly includes:
  i. SECP-registered company or government body corporate;
  ii. Eligibility for a competitive supply license or other open access user status;
  iii. Two undertakings: compliance undertaking (Annex-VI) and milestones undertaking (Annex-VII);
  iv. Any additional requirements in the Auction Process.
- For buyers (bulk power consumers), eligibility broadly includes minimum demand threshold, valid grid interconnection, compliance metering, and no overdue DISCO obligations.
- For sellers (generators, suppliers), eligibility includes NEPRA licensing, technical interconnection studies, and agreement with relevant bulk power consumers.
- **EXCLUSION**: Entities holding/having applied for distribution AND SOLR licences, or their affiliates/subsidiaries/JVs, are NOT accepted as Competitive Suppliers (RFP, Section 6.2.1.ii).
- **INSOLVENCY:** Participants, affiliates, shareholders, and directors must have no defaults in the last 5 years (RFP, Section 7.1 / Annex-VIII).
- A Covenant of Integrity (Annex-XXII) must be signed by the Auction Participant and each Director individually.
- A Confidentiality Agreement (Annex-XXIII) with ISMO is mandatory (5-year term or until obligations expire) [5,7-13].

WHAT TO CONFIRM

The specific documents required for ISMO registration; including forms, financial guarantees, and technical standards; are published by ISMO and are subject to revision. Always verify current requirements directly at ismo.gov.pk or through ISMO's helpdesk before beginning the registration process.

Step 4: The Wheeling Auction Process (Two-Step)

- The wheeling auction allocates the available wheeling capacity among eligible participants. The initial auction concerns 800 MW (over 5 years) of wheeling demand.
- ISMO runs annual auctions with no price cap or floor on bids. Participants submit bids indicating how much they are willing to pay per kilowatt-hour above grid charges and surcharges.
- The wheeling quantum is allocated to those bidders offering the highest contributions over and above the base grid charges.
- ISMO may impose concentration limits to prevent any single bidder from capturing a disproportionate share of the available capacity.

Official auction structure

OFFICIAL AUCTION STRUCTURE (RFP, SECTION 6.3)

STEP 1: Proposal Submission and Eligibility Evaluation: all mandatory documents, financial soundness, Bid Bond (PKR 300,000/MW), milestones undertaking submitted; Auction Committee evaluates; Provisional List published on ISMO website; 4-week Grievance Redressal Period; Final List published.

STEP 2: Bid Value Submission (Eligible Participants only): Bid Values submitted simultaneously online (auctions.ismo.gov.pk; PRINCIPAL submission) and in sealed hard-copy envelope at ISMO head office on specified date and time. Online submission is the principal submission; any discrepancy with hard copy = bid INVALID.

Note: Criteria for BESS inclusion in auction (alongside renewables) is also devised by ISMO and will be publicized in final RFP in due course (as decided in ISMO hearing on 14 May 2026). i.e. for inclusion of renewables in auction 10% storage capacity must be declared (down from 20% in actual proposal).

Step 1: Proposal Submission and Eligibility Evaluation

- All mandatory documents are submitted.
- Financial soundness is assessed.
- Bid Bond and milestones undertaking are submitted.
- The Auction Committee evaluates the proposals.
- A Provisional List is to be published on ISMO's website.
- A grievance redressal period follows.
- The Final List is then published.

Step 2: Bid Value Submission

- Only eligible participants proceed to bid value submission.
- Bid Values are submitted simultaneously online on auctions.ismo.gov.pk and in sealed hard-copy envelope at ISMO head office on the specified date and time.
- Online submission is the principal submission; if there is any discrepancy with hard copy, the bid is invalid.

Bid Bond

- Amount: PKR 300,000 per MW of bid quantum.
- Bank: scheduled bank with minimum short-term rating of AA+.
- Validity: 12 months from issuance, to be renewed 3 months before expiry if the auction is still in progress.
- The bank must honor ISMO's demand on the same day raised, without recourse.
- **Encashment** may occur for failure to provide the Performance Guarantee in time, withdrawal after the proposal deadline, false or forged documents, or failure to extend validity as required.
- **Return**: The bond is returned when the participant is declared unsuccessful, upon successful Performance Guarantee submission, or if the auction is cancelled.

Grievance Redressal

- The Provisional List is published after evaluation.
- Grievances must be submitted within 1 week of Provisional List publication through ISMO's electronic platform.
- The grievance redressal period runs for 4 weeks.
- The Auction Committee resolves grievances within the prescribed period.
- The Final List is published within 1 week after closure.
- Eligibility decisions are FINAL AND BINDING. Participants are ESTOPPED from challenge (Annex-IX).
- Disqualification may lead to NEPRA reporting, Bid Bond or Performance Guarantee encashment, and blacklisting for up to 5 years (RFP, Section 12).

Bid Value Submission and Allocation

- Bid Value is submitted in PKR/kWh and must include a minimum of 3 decimal places.
- Bid Value cannot be negative.
- A concentration limit applies: maximum 20% of 800 MW, or 160 MW per participant, cumulative across all auctions (RFP, Section 7.6.i).
- **Node limits**: South VRE Quantum Study published. Node-specific capacity limits apply; review before bidding (RFP, Section 9.6).
- Ranking is in descending order of bid value.
- In the case of tie bids, up to 3 additional bidding rounds may be held; if the tie persists, allocation may be *pro-rata*.
- If the auction is under-subscribed, all bids may be accepted, and the unallocated quantum may move to the subsequent auction.
- The Auction Results Report moves from ISMO to NEPRA for approval, followed by Gazette notification and issuance of the Letter of Award [5].

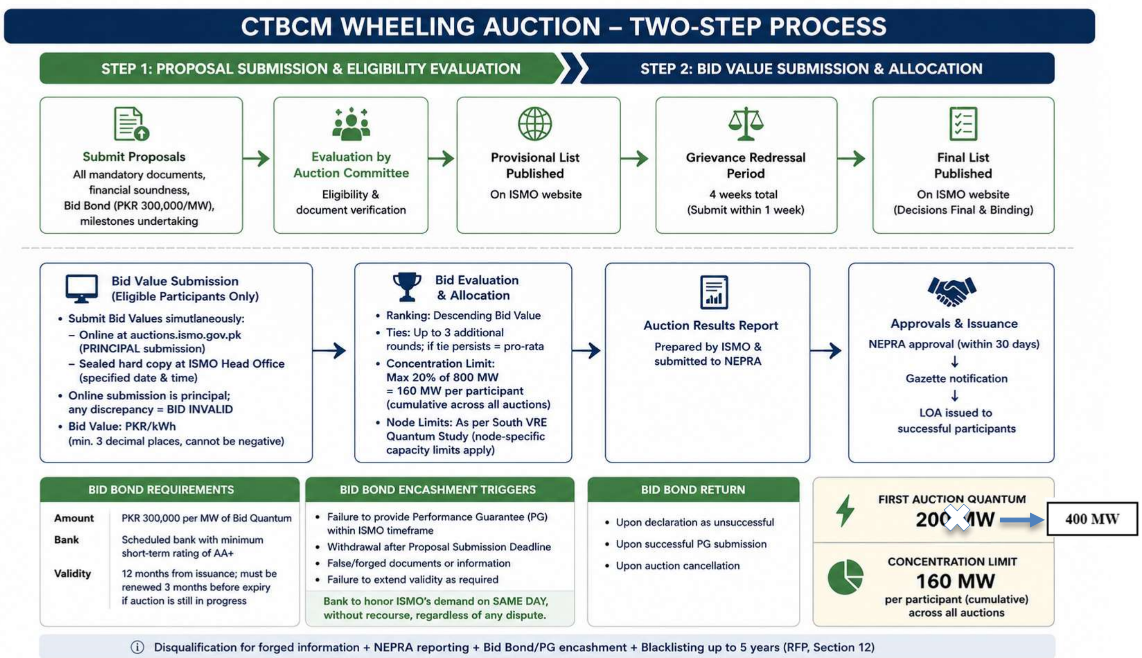

Figure 4: CTBCM Wheeling Auction: Two-Step Process. *Step 1*: Proposal + evaluation. *Step 2*: Bid Value submission and allocation [5].

Step 5: Performance Guarantee (PG)

- **Amount**: PKR 1,500,000 per MW of allocated quantum.
- The Performance Guarantee must be submitted before issuance of the Letter of Award (LoA).
- It must be issued by an AA+-rated bank.
- A separate Performance Guarantee (PG) is required per Transaction Start Date.
- Validity runs from issuance until 3 months after the Transaction Start Date.
- **Return** is made within 15 business days of ISMO's verification that the Transaction Start Date has been achieved (RFP, Section 8.2.3.iv).
- If connection studies confirm that interconnection is technically impossible, the PG is returned, and the quantum is re-allocated.
- Encashment may occur for failure to initiate the transaction, failure to achieve milestones, breach of Letter of Award, or failure to maintain validity.

- Allocated quantum is STRICTLY NON-TRANSFERABLE.
- Any attempt to transfer makes the Letter of Award void ab initio and the Performance Guarantee is encashed.
- If a successful participant fails to return the signed Letter of Award, the Performance Guarantee is encashed and the quantum is re-allocated.

Step 6: Post-Award Milestones

Once the Letter of Award is issued, the participant must complete the following broad steps:

- **Transaction size**: Confirm the MW of firm capacity bid.
- **NEPRA approvals**: Obtain generation concurrence or competitive supplier license, enroll with ISMO, and apply for temporary firm capacity certificate.
- **Connection agreement and use of system agreement**: Sign the connection agreement with the relevant transmission or distribution system operator, the use of system agreement with the relevant DISCO, and the Market Participation Agreement with ISMO.
- **Engineering, Procurement & Construction (EPC) contracts**: Execute EPC contracts and procurement schedules where needed.
- **Financial agreements**: Ensure lender funding agreements become effective by the required financial closing date.
- **Market Participation Agreement (MPA) and contract registration with ISMO**: Sign the Market Participation Agreement and register the bilateral contract with ISMO.
- **Transaction start date**: Complete construction, install AMI meters, achieve commissioning and COD, and begin transaction delivery.
- **Bilateral contracts**: Sign bilateral contracts with bulk power consumers (BPCs) and complete financial close where applicable.
    - Once a buyer secures a wheeling allocation through the auction, they negotiate and sign a bilateral power purchase contract with a seller of their choice.
    - The bilateral contract must be registered with ISMO. ISMO does not set the price in the bilateral contract; that is negotiated between buyer and seller.
    - The contract must include technical schedules (volumes, delivery points, imbalance arrangements) aligned with ISMO's market rules.

All these milestones are enclosed in **Table 3**.

Table 3: Post-Auction (Award) Steps [5-6,8]

Condition (LOA Clause 9)	Description (Annex-VII 7-Category Structure)
a. Transaction Size (MW)	MW of Firm Capacity bid.
b. NEPRA Approvals	Generation Concurrence / Competitive Supplier License from NEPRA; enrolment application to ISMO; temporary firm capacity certificate application. (Annex-VII Category 2)
c. Connection Agreement + Use of System Agreement	Connection Agreement with TSP/DSP (Annex-X/XI); UoSA with relevant DISCO (Annex-XII, 10-year term); Market Participation Agreement (MPA) with ISMO.
d. Bilateral Contracts	Bilateral Contracts with BPC(s); financial close (project financing, if applicable). (Annex-VII Category 3)
e. EPC + Construction Contracts (if applicable)	EPC contract execution; equipment procurement schedules. (Annex-VII Category 4)

f. Financial Close (if applicable)	Effectiveness of lender funding agreements; Required Financial Closing Date.
g. MPA + Bilateral Contract Registration with ISMO	MPA signed with ISMO; Bilateral Contract registered with ISMO; Initial Firm Capacity Certificate application.
h. Transaction Start Date	Construction complete; AMI meters installed; commissioning and COD achieved; Transaction commences. (Annex-VII Categories 5-7)

Step 7: Use of System Agreement (UoSA) & Wheeling

- 'Wheeling' is the transportation of electricity through the national grid from the seller's injection point to the buyer's consumption point.
- Wheeling charges are paid by the buyer to the grid operator. These charges cover transmission and distribution costs, as well as applicable surcharges and cross-subsidy contributions.
- The level of wheeling charges is a major variable in CTBCM economics. An indicative rate of approximately Rs. 12.55 per unit has been publicly fixed in August 2025, though this figure is subject to official NEPRA determination and has been contested by industrial consumers. Also, wheeling economics is complex from what is expected, and recent NEPRA hearing (11 June 2026) addresses most of the concerns related to use of system charges (UoSC), its components and different wheeling charges for various clusters (B2, B3 etc.) and will be discussed in Section 2 below.
- Buyers should model their total cost of supply carefully, including bilateral contract price plus wheeling charges plus any additional surcharges.

Power injected by the seller flows through the national grid and DISCO distribution network to the buyer's premises, while the bid value and applicable grid charges are paid through the relevant system and billing structure.

- The Use of System Agreement has a 10-year **term** (UoSA, Article 10.1).
- The parties are the Distribution Licensee and the Competitive Supplier Licensee.
- The agreement becomes effective when security cover is provided, Market Commercial Code conditions are satisfied, and applicable documents related to the buyer connection are fulfilled (UoSA, Article 7.1).
- The **invoice due date** is the 15th day from invoice issuance, or the next business day if that is not a business day (UoSA, Article 1.2(xxiv)).
- If payment is *not made*, the Distribution Licensee notifies the buyer within 3 business days after the due date.
- If payment remains unpaid after 10 business days from the due date, the security cover may be encashed (UoSA, Article 7.9).
- Security cover equals A × Factor, where Factor = 2 and A is the Distribution Licensee's estimate of the monthly use-of-system charge amount (UoSA, Article 7.14).
- Security cover may be provided by irrevocable standby letter of credit or another mutually agreed mode.
- Security cover must be **replenished** within 10 business days if used (UoSA, Article 7.15.5).
- Failure to replenish may allow the Distribution Licensee to terminate the agreement.
- After termination, the security cover is returned within 30 business days once no remaining obligations exist (UoSA, Article 10.5).
- The Competitive Supplier must continue paying invoices in full even during dispute resolution (UoSA, Article 7.7).
- Force majeure in the Use of System Agreement follows the 60 consecutive days threshold and 7 business days' notice (UoSA, Articles 9.1.2.vi and 9.3).

- For a new bulk power consumer, the Competitive Supplier must notify the Distribution Licensee at least 15 business days in advance (UoSA, Article 7.2.1).
- Grid charges and surcharges are paid via the Distribution Licensee [5].

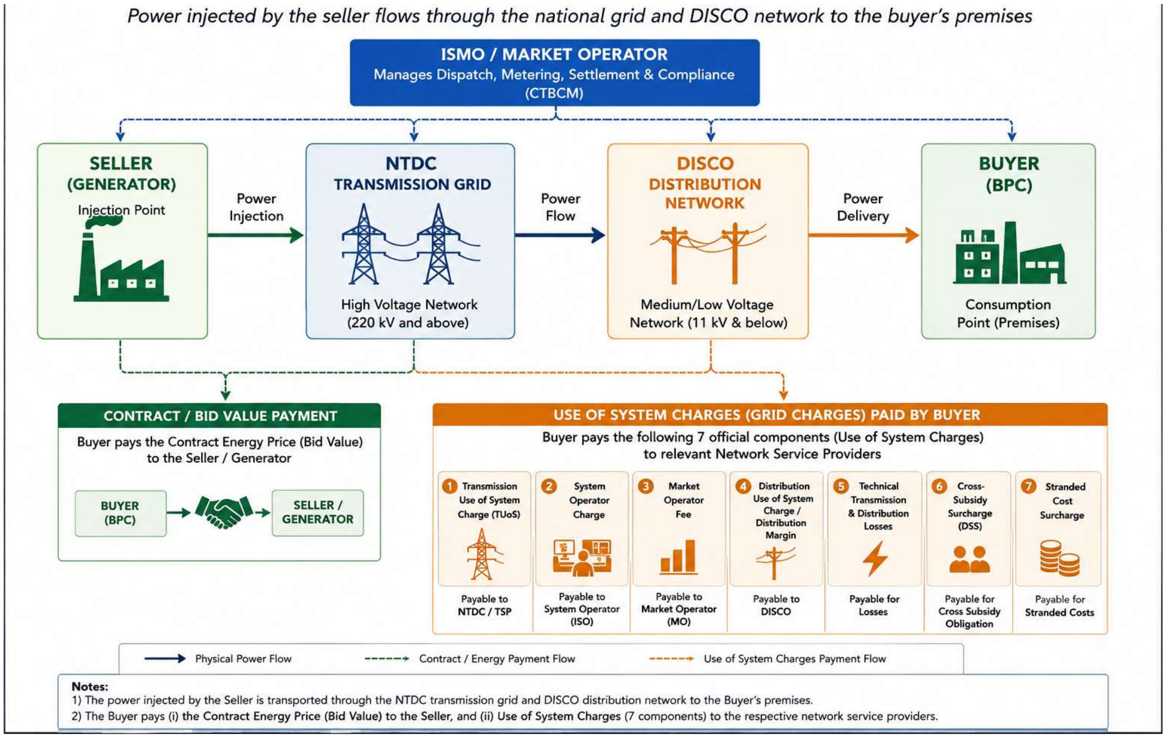

Figure 5: Illustration of the wheeling process: power injected by a seller flows through the national grid to the buyer's premises.

Step 8: Settlement, Payments, Monitoring, Reporting and Compliance

- ISMO calculates a System Marginal Price (SMP) for each settlement period based on actual dispatch and demand.
- If a buyer consumes more than their contracted volume, or a seller generates less, the difference is settled at the SMP, which may be higher or lower than the bilateral contract price.
- Buyers and sellers both have incentives to honour their contracted volumes closely to avoid imbalance costs.
- ISMO and NEPRA monitor participant behaviour, data accuracy, and compliance with market rules throughout the contract period.
- Non-compliance; such as repeated imbalance exceedances, metering failures, or misrepresentation; may result in penalties, suspension, or removal from the market.
- Participants are expected to maintain accurate metering, report data to ISMO as required, and honour contractual and regulatory obligations on an ongoing basis.
- Successful auction participants submit quarterly progress reports to ISMO on their status toward the Transaction Start Date (RFP, Section 17).
- ISMO may conduct site inspections at any time, and participants must cooperate fully.
- The maximum extension across all periods combined is **1 year** (RFP, Section 18.i).
- Extension requests must be made at least 3 months before the deadline.
- The delay must be beyond the participant's control. The Performance Guarantee must remain valid and may need extension and enhancement if the delay is not attributable to ISMO.
- Monthly reports are required during any approved extension period (LOA, Clause 7.x.d).

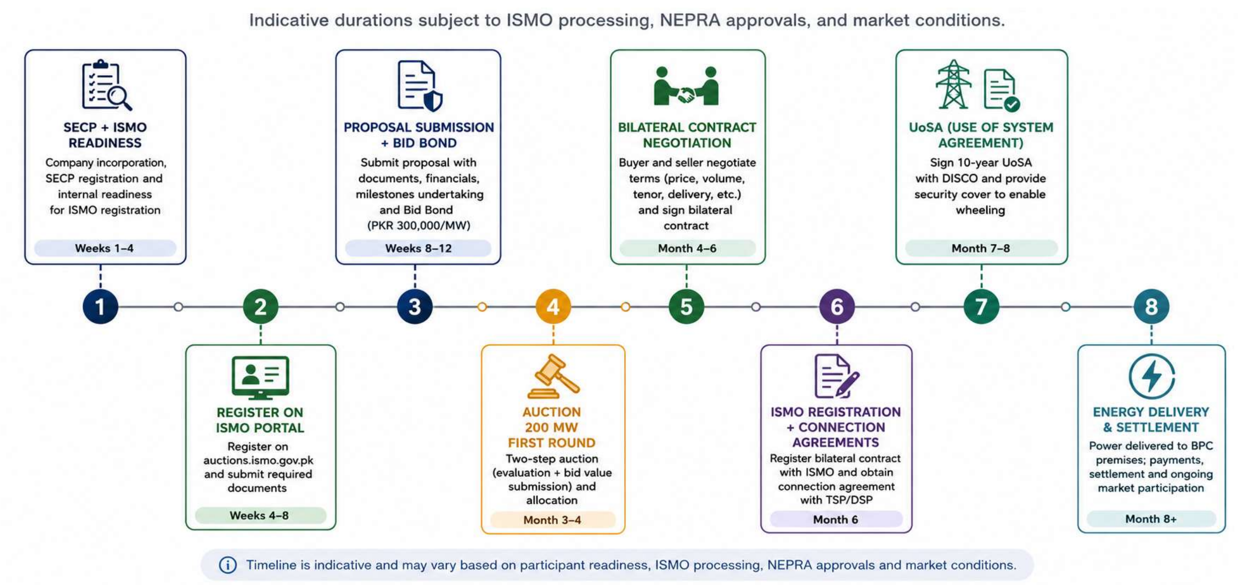

Figure 6: Indicative timeline from initial registration to active energy delivery under CTBCM, subject to ISMO processing, NEPRA approvals, and market conditions [5,6].

Section 4: Who Are the Key Actors?

CTBCM involves a range of institutions and market participants. Understanding each actor's role helps industry know who to engage, what obligations each actor has, and how different parts of the market connect [18-20].

4.1. Independent System and Market Operator (ISMO)

- ISMO is the central technical and commercial institution of CTBCM, created by restructuring CPPA-G and NTDC's market functions. It operates as a State-Owned Enterprise under the Power Division.
- ISMO manages grid dispatch, administers the competitive electricity market (including auction management, contract registration, and settlement), and conducts long-term planning.
- For industry: ISMO is the institution firms register with, submit auction bids through, register bilateral contracts with, and report to for compliance purposes.

4.2. National Electric Power Regulatory Authority (NEPRA)

- NEPRA is the electricity sector regulator. It issues licences to all market participants, approves tariffs and charges (including wheeling charges), and sets the regulatory framework for CTBCM.
- NEPRA determines the Competitive Market Operation Date (CMOD); the date from which CTBCM commercial operations begin.
- For industry: NEPRA's determinations on wheeling charges and market regulations directly affect the economics of participation. Industry associations should engage NEPRA's consultation processes on key regulatory decisions.

4.3. Distribution Companies (DISCOs)

- DISCOs currently supply electricity to all consumers in their service territories. Under CTBCM, bulk consumers who exit the DISCO supply chain will still use the DISCO's distribution network for wheeling.
- DISCOs face financial implications from CTBCM: if large industrial consumers exit, the cost burden on remaining consumers may increase; the 'stranded cost' challenge.
- For industry: industrial consumers who shift to CTBCM continue to pay DISCO-related wheeling and grid charges. Relations with the local DISCO remain practically relevant for connection, metering, and grid service purposes.

4.4. Generators and Independent Power Producers (IPPs)

- Generators produce electricity and can register as competitive suppliers in the CTBCM market. This includes thermal, hydro, and renewable energy generators (solar, wind).
- Under CTBCM, generators can bypass the old CPPA-G purchasing arrangement and contract directly with bulk power consumers.
- Renewable energy generators are particularly relevant for industrial buyers with decarbonisation commitments.

4.5. Competitive Suppliers

- A competitive supplier is a licensed entity that aggregates and resells electricity from multiple generators to multiple buyers.
- For smaller bulk consumers who lack the scale or expertise to negotiate directly with generators, a competitive supplier may be the practical route to CTBCM participation.
- Competitive suppliers must hold a valid NEPRA licence to operate.

4.6. Bulk Power Consumers (BPCs)

- BPCs are the primary buyers in the CTBCM market — industrial and commercial entities with electricity demand of 1 MW or more.
- BPCs register with ISMO, participate in wheeling auctions, negotiate bilateral contracts, and manage ongoing compliance obligations.
- Textile mills, composite units, spinning facilities, garment manufacturers, sports goods producers, and export processing zones are all potential BPCs.

4.7. Captive Power Plants

- Many industrial firms in Pakistan operate captive power plants generating electricity for their own use. Under CTBCM, captive plants with surplus generation may; under certain conditions and with appropriate licensing; participate as sellers.
- This is an area where regulatory details are still evolving and should be confirmed with NEPRA directly.

The key technical roles are listed below:

Table 4: Technical Role and Obligations of Relevant Stakeholders in CTBCM [18]

Actor	Role and Key Obligations Under CTBCM
ISMO	Market and System Operator. Administers auctions, runs auctions.ismo.gov.pk, issues LOAs, registers bilateral contracts and market participants, manages grid dispatch, oversees settlement, monitors Successful Auction Participants quarterly. Address: ISMO Building, Pitras Bukhari Road, H8/1, Islamabad. Email: info@ismo.gov.pk.
NEPRA	Regulator. Issues licenses, determines Grid Charges, approves Auction Process (30 days) and Auction Results Report (30 days), announces CMOD. NEPRA Tribunal is the exclusive binding dispute resolution mechanism (Section 11, NEPRA Act).
Distribution Licensee (DISCO)	Operates distribution network. Counterparty to Connection Agreement (Annex-XI for BPCs; Annex-X for generators) and Use of System Agreement (Annex-XII). Receives Bid Value from Successful Participants for 1-year Payment Period. Issues monthly UoSC invoices to Competitive Supplier.
Competitive Supplier	NEPRA-licensed seller (Section 23E NEPRA Act). Must hold valid competitive supply license. Contracts with BPCs, signs UoSA with Distribution Licensee, pays UoSC monthly. Excluded: entities holding/having applied for distribution AND SOLR licenses (or affiliates/subsidiaries/JVs).
Generator	IPP or renewable energy producer. May sell directly to BPCs via bilateral contracts. Requires NEPRA generation concurrence or license. Responsible for arranging own grid interconnection; ISMO bears no responsibility for delays.
Bulk Power Consumer (BPC)	Industrial/commercial electricity consumer procuring under CTBCM. Signs Connection Agreement with DISCO. Supplied by Competitive Supplier. BPCs already connected to grid are deemed compliant with Grid Code and Distribution Code; need only valid Connection Agreement (UoSA, Article 4.3). Disconnected at own cost

	if Competitive Supplier defaults on UoSC.
Auction Committee	ISMO-notified committee. Evaluates proposals, declares Eligible Auction Participants, resolves grievances. Decisions are final and binding; participants estopped from challenge (Annex-IX).
Metering Service Provider (MSP)	Responsible for commercial metering system, meter reading and validation at metering points, and transferring values to Market Operator per Applicable Documents.

WHY IT MATTERS FOR INDUSTRY

Most industrial firms will interact primarily with ISMO (for registration and auction participation), NEPRA (for regulatory context), their local DISCO (for grid connection and metering), and their chosen generator or competitive supplier (for bilateral contracting). Understanding each actor's authority and limitations saves time and prevents misinterpretation.

Section 5: Auction and Participation Guide

IN SIMPLE TERMS

The auction is not primarily a mechanism for buyers to select a seller. It is a mechanism for ISMO to allocate the available wheeling capacity; i.e., the right to use the national grid to transport competitively procured electricity; among competing applicants. Winning the auction gives a buyer the right to use that grid capacity. The bilateral electricity contract is negotiated separately.

5.1. What Is the Auction For?

The auction allocates the available wheeling quantum; currently 800 MW (across 5 years), among market participants. This represents the total amount of electricity that can be transported through the grid under CTBCM bilateral arrangements at any one time. Demand for this capacity exceeds supply, which is why an auction is used: those who offer the highest contribution above grid charges and surcharges receive the allocation.

5.2. Who Is Eligible to Participate?

- Entities registered with ISMO as market participants; either as buyers (bulk power consumers) or sellers (licensed generators or competitive suppliers).
- For buyers: entities must meet the minimum demand threshold (1 MW or above) and satisfy ISMO's technical eligibility criteria.
- For sellers: entities must be NEPRA-licensed, technically compliant, and hold required interconnection agreements.
- Both buyers and sellers must submit bid bonds and performance guarantees as part of the auction process.
- Eligibility document templates are published by ISMO and must be submitted as part of the prequalification process before the auction.

5.3. What Does '800 MW' Mean in Practice?

The 800 MW refers to the aggregate wheeling capacity being made available for competitive allocation in the initial auction. It does not mean each participating firm will receive 800 MW; the quantum will be divided among successful bidders based on the auction outcome, subject to concentration limits ISMO has imposed. For most industrial firms, their individual wheeling requirement will be a fraction of this total.

KEY CAUTION

'800 MW' is a market-level figure. Individual firms should focus on their own demand requirements, not on the total quantum. A factory consuming 5 MW is competing for a share of 800 MW alongside many other participants.

What Can; and cannot; be Inferred from the Auction

Table 5: Key Information about Auction [5]

What the Auction Confirms	What Should NOT Be Assumed
Wheeling capacity is available and being allocated competitively.	That all participating firms will receive cheaper electricity immediately.
ISMO and NEPRA have the authority and framework to run the market.	That the full 800 MW will be won by industry; other participants also bid.
Participating firms gain access to a new procurement channel.	That wheeling charges will be low enough to make switching economically straightforward.

Market rules are transparent and subject to regulatory oversight.	That bilateral contracts will be easy to negotiate with generators immediately.
The market is open and competition is formally enabled.	That implementation will be smooth or risk-free in the early stages.

5.4. How to Avoid Unrealistic Expectations?

- Engage ISMO and NEPRA consultations and workshops to understand current rules before bidding.
- Conduct careful economic analysis; including bilateral contract price projections, wheeling charges, and grid surcharges; before deciding whether to participate.
- Recognise that the market is new: legal clarity, contract templates, and supplier options will all improve as the market matures.
- Treat the first auction as an exploratory step, not a definitive commitment to a fully realised competitive electricity regime.
- Use industry associations to pool knowledge and engage collectively with ISMO and NEPRA on practical implementation barriers.

5.5. Financial Requirements Summary

The key financial requirements are listed in **Table 6** below:

Table 6: Financial Conditionalities for Auction [5]

Requirement	Amount / Specification / Source
Bid Bond	PKR 300,000 per MW of Bid Quantum (RFP, Section 8.1)
Bid Bond bank rating	Minimum short-term AA+ (scheduled bank) (RFP, Section 8.1)
Bid Bond validity	12 months from date of issuance (RFP, Section 8.1.3)
Performance Guarantee	PKR 1,500,000 per MW of allocated quantum (RFP, Section 8.2)
PG bank rating	Minimum short-term AA+ (scheduled bank) (RFP, Section 8.2)
PG validity	From issuance to 3 months after Transaction Start Date (RFP, Section 8.2.3.ii)
PG return	Within 15 Business Days of Transaction Start Date verification (RFP, Section 8.2.3.iv)
Security Cover (UoSA)	2 × monthly UoSC estimate (UoSA, Article 7.14)
Security Cover replenishment	Within 10 Business Days (UoSA, Article 7.15.5)
Financial soundness (>1 yr company)	Min 'A' long-term credit rating (RFP, Section 7.1.5.b.ii)
Financial soundness (<1 yr, debt-financed)	Shareholder liquid assets ≥ 30% of project cost (RFP, Section 7.1.5.c.ii)
Financial soundness (<1 yr, self-funded)	Shareholder liquid assets ≥ 70% of project cost (RFP, Section 7.1.5.c.iii)
Auditor	Valid QCR rating from ICAP; not existing auditor (RFP, Section 7.1.5)
Tax statements	Income year 2025 (RFP, Section 7.1.5.c.ii/iii)

5.6. Mandatory Documents for Proposal Submission

The necessary documents for auction proposal submission are provided in **Table 7** below:

Table 7: Necessary Documents for Proposal submission for Auction [5]

Document / Annex	Requirement
Certificate of Incorporation + SECP Forms	SECP Certificate + latest MoA & AoA + Form A, Form 29, Form 20 filed in preceding year
Annex-IV or Annex-V	**Either**: Captive Plant self-use undertaking (Annex-IV) OR Competitive Supplier undertaking (Annex-V); confirming license eligibility
Annex-VI	Undertaking compliance with NEPRA Act, Supplier Rules 2023, Market Commercial Code, Grid Code, Distribution Code, and all Applicable Documents
Annex-VII	Undertaking with detailed milestones and timelines for 7 categories: Project Initiation, Regulatory Approvals, Commercial/Financial Close, Engineering/Procurement, Construction, Testing/COD, Transaction Start Date
Annex-VIII	Insolvency Declaration: no insolvency/liquidation/default by participant, affiliates, shareholders, or directors in last 5 years
Annex-IX	Acceptance of Auction Committee Decision: irrevocable estoppel from challenging eligibility decisions
Plan Document (RFP Section 7.1.4)	Comprehensive plan: Bid Quantum per year, generation technology/ownership, intended use, potential BPCs, Transaction Start Dates, milestone schedule
Financial Soundness Docs	Per Section 7.1.5: credit rating/auditor certificate/tax statements/shareholder liquid assets evidence
Annex-XVII	Shareholder undertaking: joint and several liability for any inaccurate information submitted
Annex-XXII — Covenant of Integrity	Signed by Auction Participant AND each Director individually
Annex-XXIII — Confidentiality Agreement	Required with ISMO; 5-year term or until obligations expire
Bid Bond (Annex-XX)	PKR 300,000/MW, 12-month validity, AA+-rated bank; bank honours demand same day
Authorized Signatory Details	Board resolution or power of attorney

Section 6: The Buyer Perspective

6.1. Who Is a Buyer?

In CTBCM terms, a buyer is a Bulk Power Consumer (BPC); any entity with a registered electricity demand of 1 MW or more that has chosen to register with ISMO and participate in the competitive market. Buyers procure power through bilateral contracts with registered sellers, receive that power through the national grid via wheeling, and pay wheeling charges and grid surcharges in addition to the bilateral contract price.

6.2. What an Industrial Buyer Needs to Check Before Entering CTBCM?

- **Demand size**: Does the firm meet the minimum threshold (1 MW)? Most meaningful participation is at a larger scale given compliance overhead.
- **Grid connection**: Is the facility connected to the national transmission system (NTDC) or a DISCO's distribution network? This affects wheeling logistics. If already connected: deemed compliant with Grid Code and Distribution Code; need only valid Connection Agreement with Distribution Licensee (UoSA, Article 4.3). No new connection studies are required.
- **Metering (AMI-compatible metering)**: Does the facility have NEPRA-compliant advanced metering that can support CTBCM settlement requirements? Primary and back-up systems compliant with Grid Code, Distribution Code, Commercial Code, and Metering Service Provider specifications.
- **Overdue obligations**: Are there outstanding dues or disputes with the existing DISCO? These must generally be resolved before CTBCM registration.
- **Internal capacity**: Does the firm have the expertise; or access to advisors; to manage bilateral contract negotiation, ISMO reporting, and financial settlement?
- **SECP company registration**; current and in good standing.
- A Competitive Supplier with valid NEPRA competitive supply license to sign a bilateral contract [5].

6.3. Readiness Conditions (Broadly)

BUYER READINESS: MINIMUM CONDITIONS

- Valid electricity connection to NTDC or DISCO grid with no overdue payments.
- NEPRA-compliant metering capable of supporting CTBCM settlement.
- Registered legal entity capable of entering binding power purchase agreements.
- Capacity to submit required documents to ISMO and maintain ongoing compliance.
- Sufficient electricity demand to justify participation costs.
- Access to legal/commercial advisory support for bilateral contract negotiation.

6.4. Documentation and Compliance Steps

Based on ISMO's published eligibility document templates and publicly available guidelines, buyers should generally be prepared to provide documentation broadly covering the following areas:

- Proof of legal registration (e.g. company registration, NTN).
- Evidence of electricity consumption and current DISCO connection.
- Technical information about the facility's metering and grid connection.
- Financial security documents, such as a bid bond or performance guarantee (for auction participation).
- Signed or draft bilateral contract with a registered seller (at contract registration stage).
- Any interconnection or technical agreements required by the local DISCO or NTDC.

Figure 7 shows the complete buyer pathway under CTBCM.

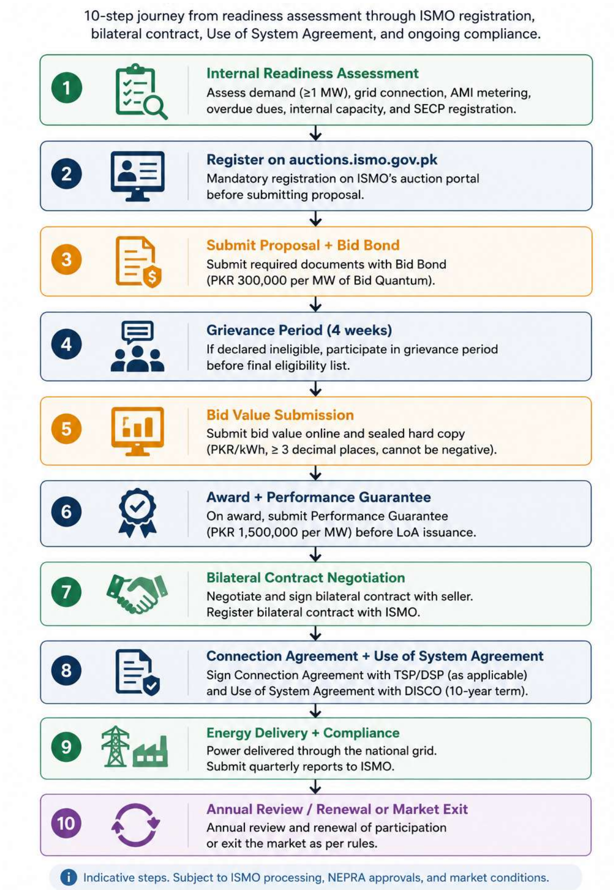

Figure 7: Pathway (A 10-step journey) for an industrial bulk power consumer (BPC) entering CTBCM as a buyer [5-17]

6.5. BPC-DISCO Connection Agreement: Key Terms (Annex-XI)

Specific requirements for BPC connection agreement are provided in **Table 8** below:

Table 8: Buyer requirements for connection agreement under CTBCM [5,10]

Provision	Official Term (Annex-XI)
Agreement Term	As long as DISCO Distribution License is valid (Clause 2.2.2)
Operating Committee	4 members, 2 per party; unanimity required; chairmanship rotates every 6 MONTHS; DISCO nominates first chairman (Clause 2.8.3)
Metering	AMI-compatible; primary + back-up; costs borne by BPC (Article VIII)
Interconnection Works notice	30 days' prior written notice before commencing BPC Interconnection Works (Clause 5.3.b)
BPC demand limit	Must not exceed Interconnection Capacity; DISCO gives 1-hour notice; if not remedied, DISCO may De-Energize (Clause 3.2)
Market Operator disconnection	DISCO disconnects on specified date/time; reconnects ONLY on Market Operator written notice (Clause 10.3)

Competitive Supplier UoSC default	DISCO notifies BPC and temporarily disconnects BPC until resolved. Disconnection/reconnection costs borne by BPC (Clause 10.4)
Force Majeure notice	Within 48 hours of becoming aware of FM occurrence (Clause 14.2)
Material breach default cure	90 days to remedy after notice (Clause 15.2.6)
Dispute resolution	Operating Committee (30 days) → Expert (min 20 yrs experience) → NEPRA Tribunal (binding, exclusive) (Article XVIII)

6.6. Practical Advantages for Buyers

- Access to a competitive market for electricity procurement, potentially enabling better pricing than uniform DISCO tariffs.
- The ability to negotiate directly for renewable or clean energy supply; important for firms with sustainability commitments or buyer-side ESG requirements.
- Greater supply security through direct contractual relationships with generators.
- Flexibility to structure contracts to meet production planning needs (volume, duration, delivery schedule).

6.7. Risks and Caution Points for Buyers

- Wheeling charges may offset a significant portion of any savings on the bilateral contract price. Careful financial modelling is essential before committing.
- Bilateral contracts require sophisticated commercial negotiation. Buyers without prior power-sector contracting experience will need qualified advisors.
- Imbalance costs; where actual consumption differs from contracted volumes; can add unexpected costs if production varies significantly.
- Early-stage market risks: limited seller options, evolving regulatory interpretations, and potential implementation delays.
- Exiting the CTBCM market once registered may involve obligations or transition arrangements. Understand exit conditions before entering.

WHAT THIS MEANS FOR INDUSTRY

Participation as a buyer is not purely a financial calculation; it is an organisational commitment. Firms that engage in CTBCM should involve their finance, legal, operations, energy management, and compliance teams. A part-time or ad hoc approach is unlikely to yield good outcomes.

CRITICAL RISK FOR BUYERS

If your Competitive Supplier fails to pay Use of System Charges (UoSC) to the DISCO; even if you have fully paid your supplier; the DISCO will temporarily disconnect your facility. All costs of disconnection and reconnection are borne by YOU as the BPC. Recovery from your supplier is your own bilateral commercial matter. Thorough vetting of Competitive Supplier financial strength and license status is your most important commercial decision.

Section 7: The Seller Perspective

7.1. Who Is a Seller?

A seller in CTBCM is any licensed entity that generates electricity and registers with ISMO to sell power under bilateral contracts to bulk power consumers. This broadly includes: Independent Power Producers (IPPs), renewable energy generators (solar, wind, hydro), licensed competitive suppliers, and; under conditions to be formally confirmed; industrial firms with captive generation plants that have surplus capacity.

7.2. Can a Firm with Its Own Generation Plant Become a Seller?

This is one of the most frequently asked questions from industrial stakeholders. The short answer, broadly, is: **potentially yes**, but with significant regulatory and technical requirements.

An industrial firm that operates a captive generation plant producing more electricity than it consumes may, in principle, be eligible to sell that surplus power into the CTBCM market. However, this requires: a NEPRA generation license (or exemption, depending on capacity), compliance with ISMO's technical eligibility conditions, an interconnection agreement with NTDC or the relevant DISCO, and the capability to inject power into the grid at a defined point. These requirements are non-trivial.

> **KEY CAUTION**
>
> Firms considering becoming sellers should obtain qualified legal and technical advice and consult NEPRA's licensing framework directly. The regulatory requirements for sellers are more demanding than for buyers. Do not assume that having a captive plant automatically qualifies a firm as a CTBCM seller.

7.3. Shareholder Lock-In Requirements Competitive Suppliers (LOA, Clause 5)

> **SHAREHOLDER LOCK-IN TIMELINE: COMPETITIVE SUPPLIERS ONLY**
>
> - From Proposal submission date until LOA receipt: NO change in shareholders or their shareholding in the company [5,6].
> - After LOA receipt: NO change until NEPRA issues the Competitive Supply License.
> - After NEPRA issues Competitive Supply License: Changes permitted per Applicable Documents procedures.
> - Any breach = LOA null and void ab initio + ISMO entitled to encash Performance Guarantee.
> - NOTE: Captive plants for SELF-USE (Annex-IV) are NOT subject to shareholder lock-in requirements.

7.4. Licensing and Registration Considerations

- Generators above certain capacity thresholds require a NEPRA generation license. Thresholds and categories are set out in NEPRA's regulatory framework and should be confirmed directly.
- Competitive suppliers require a NEPRA supply license.
- Both generators and suppliers must register as market participants with ISMO before participating in the CTBCM.
- *Technical compliance*; metering, protection systems, dispatch capability; is a prerequisite for registration.

7.5. Grid Injection and Wheeling Basics for Sellers

- A seller's power is injected at a defined grid connection point. NTDC manages transmission; local DISCOs manage distribution.
- The seller is responsible for ensuring their injection is consistent with the contracted bilateral volume. Discrepancies are managed through ISMO's imbalance settlement mechanism.

- Sellers bear the responsibility of dispatch compliance; generating the volumes they have contracted to supply during the specified periods.

7.6. Financial Soundness for Sellers (RFP, Section 7.1.5)

The financial clauses for sellers are illustrated in **Table 9** below:

Table 9: Required Seller Financial Soundness conditionalities [5, 12]

Company Type and Financing	Required Financial Documentation
Incorporated > 1 year ago	Minimum 'A' long-term credit rating issued in participant's name + QCR-rated ICAP auditor certificate (compliance with Eligibility Criteria (Electric Power Supplier Licenses) Rules 2023, Schedule 1) + audited financial statements and tax statements for previous 2 financial years
Incorporated < 1 year — DEBT financing	Combined net liquid assets of ALL shareholders ≥ 30% of total project cost + QCR-rated ICAP auditor certificate + tax statements (income year 2025) + Annex-XVII shareholder undertaking
Incorporated < 1 year — SELF-FUNDED	Combined net liquid assets of ALL shareholders ≥ 70% of total project cost + QCR-rated ICAP auditor certificate + tax statements (income year 2025) + Annex-XVII shareholder undertaking
Existing captive plant (self-use)	Legally binding financial capacity undertaking (Annex-XVIII)
New captive plant (self-use)	QCR-rated ICAP auditor certificate + Annex-XIX financial capacity undertaking

7.7. Connection Agreement: Generation Company/DISCO (Annex-X) Key Terms

Specific requirements for a seller connection agreement are provided in **Table 10** below:

Table 10: Seller requirements for connection agreement under CTBCM [9]

Provision	Official Term (Annex-X)
Agreement Term	Concurrent validity of: Generation License + DISCO Distribution License + MPA with ISMO + effective grid connection + life cycle of Generation Company and Grid Station (Clause 2.2.2)
Operating Committee	4 members, 2 per party; unanimity; chairmanship rotates every 12 MONTHS; DISCO nominates first chairman (Clause 2.8.3)
AMI Metering	Mandatory: primary + back-up; AMI-compatible; costs borne by Generation Company (Article XI)
Interconnection responsibility	Generation Company SOLELY responsible — ISMO bears NO responsibility for delays (Framework Guidelines, Clause 5.1.vii)
De-energisation without notice	DISCO may de-energise WITHOUT PRIOR NOTICE on System Operator's instruction for grid stability (Clause 8.1)
Market Operator disconnection	DISCO must IMMEDIATELY de-energise;

	reconnection only on Market Operator written notice (Clause 8.3)
Interconnection Works notice	30 days' prior written notice before commencing works (Clause 6.3.b)
Force Majeure notice	Within 48 hours; weekly reports during FM period (Clause 17.2)
Dispute resolution	Operating Committee (30 days) → Expert (min. 20 yrs) → NEPRA Tribunal (binding) (Article XXI)
Liquidated Damages	Amounts determined by NEPRA/Authority; sole and exclusive remedy for covered events (Article VI-A)

7.8. Connection Process Key Timelines (Annex-XXIV)

Complete timeline for connection process is shown in **Table 10** below:

Table 11: Official Timeline for connection process under CTBCM [16]

Process Stage	Official Timeline
Transmission: Completeness check of Intention Application	10 Business Days
Transmission: Kick-off meeting after acceptance	1 week
Transmission: Minutes of kick-off meeting	3 days
Transmission: Base cases provided to User	1 week after kick-off
Transmission: Draft Feasibility Study (technical study report (TSR))	4 weeks after base cases
Transmission: ISMO/Network Licensee (NL) review comments	1 week
Transmission: Final TSR after comments	1 week
Transmission: Formal Application after Intention Application stage	1 week
Transmission: System Impact Assessment Study (SIAS) base cases	2 weeks after kick-off
Transmission: SIAS Report	8 weeks after base cases
Transmission: SIAS Review	2 weeks
Transmission: Final SIAS after comments	2 weeks
Transmission: FAS by Network Licensee	2 weeks after SIAS
Transmission: ISMO review of FAS	1 week
Transmission: Final Facilities Assessment Study (FAS) after comments	1 week
Transmission: Offer to Connect acceptance by User	3 months from receipt
Distribution: Kick-off meeting	1 week of User's written request
Distribution: Intention Application submission after kick-off	3 weeks

Distribution: Evaluation of Intention Application	30 days
Distribution: Offer to Connect issued	15 days after approval
Distribution: Formal Application after Offer to Connect (OTC) acceptance	30 days; evaluation 30 days

Figure 8 shows the complete seller pathway under CTBCM.

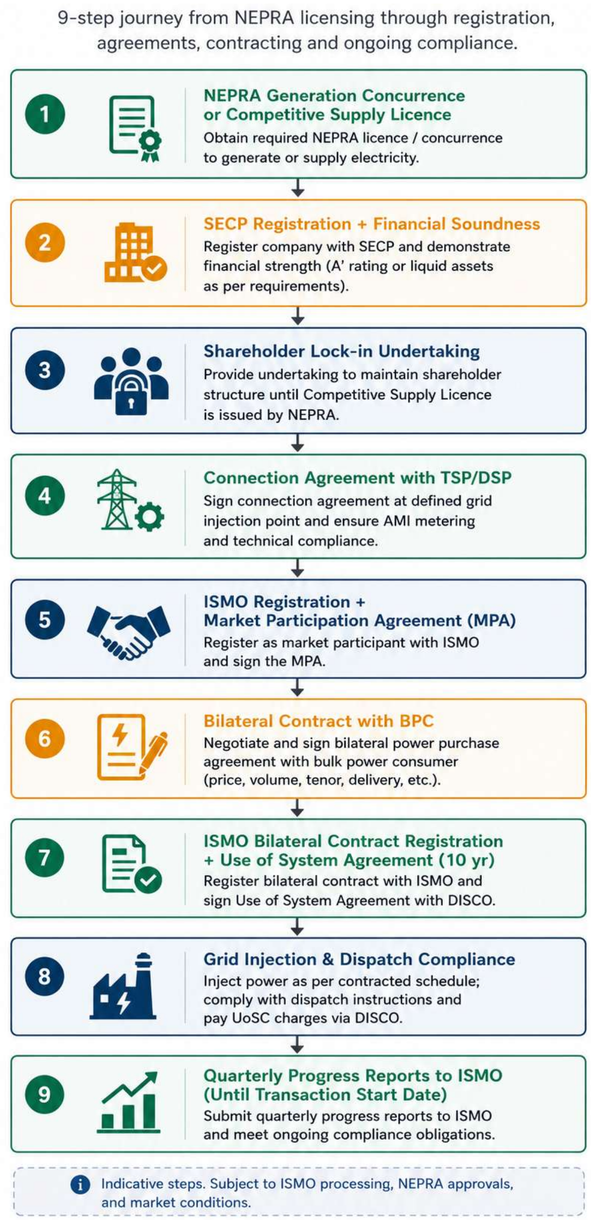

Figure 8: Pathway for a generator or captive plant entering CTBCM as a seller [5,12-15]

7.9. Seller-Side Risks and Obligations

- Technical and grid compliance obligations are significant. Sellers must maintain reliable generation and metering capacity.
- Imbalance costs can be material if generation is unreliable or inconsistent with contracted schedules.
- Licensing and registration processes involve time and cost. Early planning is important.

- The bilateral contract price is agreed between buyer and seller; but sellers must ensure their cost of supply is covered after accounting for grid charges and other obligations.

7.10. Practical Advantages for Sellers

- Direct access to a buyer market without routing all revenue through the government purchasing agency.
- Ability to negotiate contract terms; duration, price, volume; directly with industrial buyers.
- For renewable energy generators, CTBCM provides a pathway to sign corporate PPAs with industrial buyers, opening access to the growing ESG-linked industrial offtake market.

Section 8: Renewable Energy Pathways Under CTBCM

One of CTBCM's most strategically significant features for Pakistan's export-oriented industry is its potential to enable renewable energy procurement at scale. International buyers; particularly in apparel, textiles, and sporting goods; increasingly require suppliers to demonstrate credible clean energy sourcing; through RE100, Higg Index, SBTi, or EU supply chain sustainability directives. CTBCM can support this by providing the legal and contractual basis for this in Pakistan, but the pathway is not automatic or immediate.

- CTBCM formally enables corporate **Power Purchase Agreements (PPAs)**; long-term bilateral contracts between an industrial buyer and a renewable energy generator; providing the basis for Scope 2 emissions reporting under the GHG Protocol, CDP, and SBTi.
- Template bilateral contract mandatory clauses are published as *Annex-XIV* of the RFP, ensuring contractual alignment with the Market Commercial Code.
- **Open access**: BPCs can procure renewable electricity from generators anywhere on the national grid, subject to Connection Studies confirming feasibility.
- **South VRE Quantum Study**: ISMO has published a study on Variable Renewable Energy (especially wind) evacuation capacity from Pakistan's southern network. Node-specific limits apply; review the study before planning southern renewable procurement (RFP, Section 9.6) [5].
- BPCs already connected to the grid are deemed compliant; they need only a valid Connection Agreement with the Distribution Licensee, simplifying the path to renewable procurement (UoSA, Article 4.3) [11].
- For *textile and sports/apparel firms*: CTBCM is the mechanism through which firms can begin credibly documenting clean energy procurement; essential for maintaining access to export markets with sustainability requirements.

8.1. Captive Solar Under CTBCM

Many industrial firms in Pakistan have already installed or are considering rooftop or ground-mounted solar photovoltaic (PV) systems. CTBCM opens a potential additional pathway: where captive solar is large enough and technically eligible, firms may be able to wheel their own surplus generation or contribute it to bilateral contractual arrangements.

- Captive solar for self-consumption remains the simplest and most accessible renewable option for most firms today.
- Net metering arrangements operate under a separate NEPRA framework and are not the same as CTBCM participation.
- Larger firms with dedicated solar assets may explore CTBCM-linked wheeling once market rules for captive injection are fully clarified [5].

8.2. Open Access Procurement of Renewable Energy

CTBCM's open access framework, once fully operational, allows bulk consumers to procure electricity from renewable generators located anywhere on the national grid. A textile firm in Punjab could, in principle, procure solar power from a utility-scale plant in Sindh or wind energy from a coastal generator, delivered via wheeling.

- This is one of the most significant opportunities CTBCM creates for industrial decarbonisation.
- In practice, this depends on: availability of registered renewable generators as bilateral contract counterparties, adequate wheeling capacity, and economically viable wheeling charges.
- The current indicative wheeling charge level has been contested by industry as potentially limiting the economic case. This is a key issue for policy monitoring.

8.3. Corporate Power Purchase Agreements (PPAs)

A corporate PPA is a long-term bilateral contract between an industrial buyer and a renewable energy generator. Under CTBCM, the legal and contractual basis for corporate PPAs is formally established for the first time in Pakistan's power sector.

- Corporate PPAs allow industrial firms to lock in long-term renewable energy prices, hedging against electricity price volatility.
- They provide the contractual basis for Scope 2 emissions reporting under international standards (GHG Protocol, CDP, TCFD).
- For export-sector firms facing buyer-side sustainability requirements (e.g. RE100, science-based targets, EU supply chain sustainability directives), corporate PPAs are a credible tool.
- Corporate PPAs require sophisticated contract design. Legal expertise in power-sector contracting is essential [21,22].

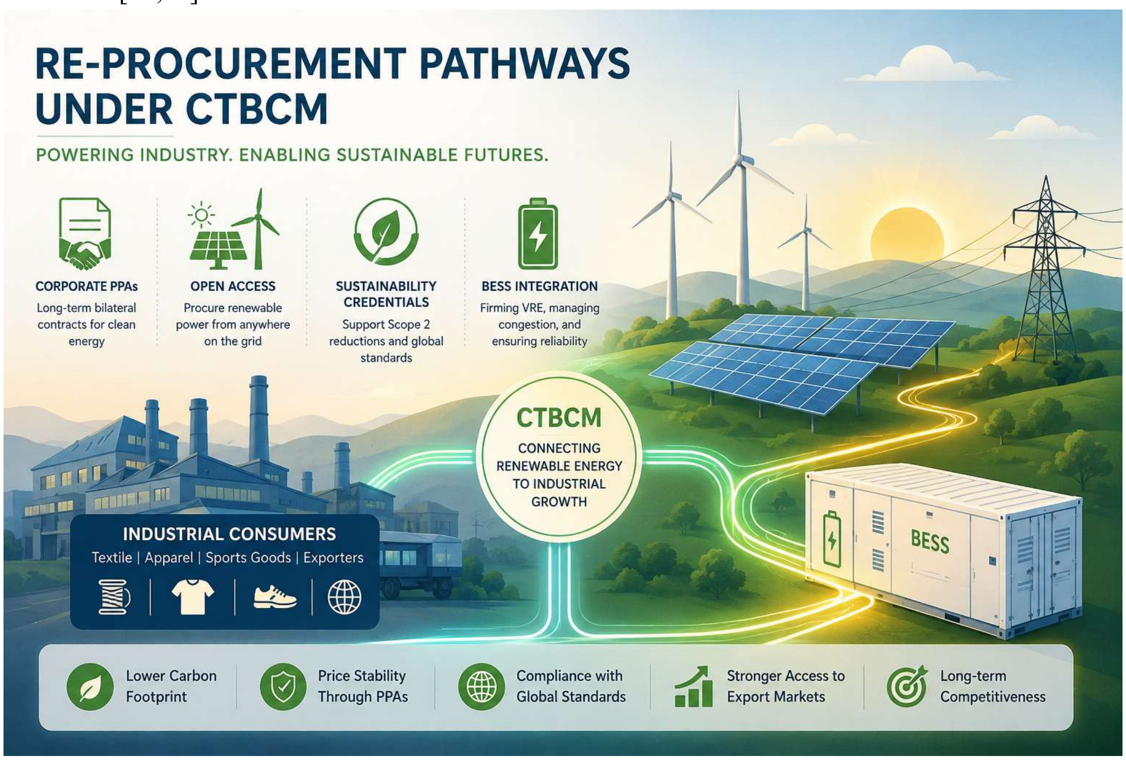

Figure 9: CTBCM initiating RE-procurement and energy storage pathways [23]

8.4. Where CTBCM Helps and Where Barriers Remain?

Table 12 shows RE-procurement opportunities and pathways under CTBCM:

Table 12: RE-Procurement under CTBCM: Opportunities and Barriers [24]

Where CTBCM Can Help (Renewable Pathways)	Where Barriers or Uncertainty Remain
Provides legal framework for direct renewable energy procurement.	Wheeling charges may limit cost competitiveness of renewable procurement.
Enables corporate PPAs between industrial buyers and RE generators.	Limited number of registered RE generators as sellers in early market period.
Supports Scope 2 emissions reductions through traceable contracts.	Rules for captive plant injection into CTBCM not yet fully clarified.
Aligns with international sustainability standards	Wheeling capacity constraints limit scale of accessible

(RE100, GHG Protocol).	renewable energy.
Government has signaled policy support for renewable integration under CTBCM.	Implementation timeline delays could affect planning for decarbonization commitments.

WHY IT MATTERS FOR TEXTILE AND SPORTS FIRMS

Many international buyers in Europe and North America now require suppliers to provide renewable energy credentials, report emissions, or commit to science-based targets. CTBCM is Pakistan's primary mechanism for enabling this at an industrial scale. Firms that begin the transition early; even at a modest scale; will be better positioned than those that wait for the market to fully mature.

8.5. Opportunities for Renewable Integration

- **Captive Solar and Wind:** Industrial firms that own on-site or nearby RE projects can fully utilize or even oversize them. Under CTBCM, if a factory builds a solar plant, it can sell any excess generation to the market. Conversely, if local solar is cheaper, the factory could contract to buy that renewable output.
    - *Where CTBCM helps:* It formalizes wheeling procedures, meaning a factory can have a long-term PPA with an RE generator elsewhere (subject to wheeling agreements). It also encourages competitive pricing of renewables in auctions.
    - *Barriers:* Many captive facilities are under utility billing schemes; they may need new licenses to "sell" to themselves via wheeling. Wheeling charges for captive RE can eat a large part of savings unless regulated (policy remains to be finalized). Approvals for captive RE projects may still be slow.
    - *Advice:* Factories should map out rooftop/bare land available, apply for necessary generation permits (NEPRA License or temporary permit), and in parallel engage DISCO on wheeling tariffs. Check if any preferential treatment is offered for renewables.
- **Open Access Procurement:** Under CTBCM, a factory can procure RE on an open access basis. For example, an apparel firm could sign a PPA with a solar/wind farm some distance away, using the grid to deliver power to its facility.
    - *Where CTBCM helps:* Ensures there is a marketplace framework (contracts, scheduling) for such deals. Potentially allows aggregated buying: multiple factories form an energy club to buy together for better terms.
    - *Barriers:* The same wheeling challenges apply: distributors must set transparent charges for open access. Also, individual industries may need to commit to minimum purchase levels to be bankable. Regulatory caps on "cross-subsidy" or safeguarding utilities might still apply until rules evolve.
    - *Advice:* Explore power purchase options with both local DISCO and competitive suppliers. Liaise with peers (e.g., through an industrial association) to form bulk demand for renewables. Keep an eye on policy drafts for mandated open access tariffs.
- **Corporate PPAs and Aggregation:** CTBCM could facilitate corporate PPAs: agreements between a company and a renewable project, possibly under an intermediary structure (like a power trader or utility PPA).
    - *Where CTBCM helps:* By legitimizing merchant sales and trading, it makes corporate offtake legal. Some markets in Asia (e.g. India's merchant PPA market) can serve as models.
    - *Barriers:* In Pakistan, corporate PPAs may still require involvement of DISCOs or system operator. There's no free-market Retail competition law yet. Also, industries face foreign exchange risk on international contracts.

- *Advice:* Investigate "wheeling auctions" or special corporate channels once they are announced. Consider small pilot projects first (e.g. group buy from a solar plant). Use the CTBCM framework to ensure any PPA is honored like a bilateral contract.

- **Bulk Renewable Sourcing:** Large multi-national firms with footprints in Pakistan (e.g. brand owners in apparel) might seek to source renewable energy for all their factories. CTBCM could allow such corporates to procure blocks of green energy on behalf of supply chains.
  - *Where CTBCM helps:* It provides a transparent market and standard contracts that multinationals prefer for reporting.
  - *Barriers:* Coordination is complex across sites and utilities; may require new business models (ESCOs or joint ventures). Policy support (like tax incentives for corporate RE) is still limited.
  - *Advice:* Engage supply chain. Work with energy consultants to assess green procurement aggregators or renewable energy certificates (RECs). Monitor if Pakistan will introduce RECs or similar tools under CTBCM.
- **Industrial Decarbonization Plans:** Some firms have sustainability goals (e.g. net-zero by 2030). CTBCM should be part of their roadmap. They should plan for gradually shifting portions of load to renewables as contracts allow.
  - *Where CTBCM helps:* Over time, by matching demand with new RE supply entering the market. Also, the automated market environment could help track and verify green energy usage.
  - *Barriers:* Short-term focus on reliability (e.g. ensuring 24/7 power) may compete with green procurement. On-grid storage or backup may be needed to manage intermittency.
  - *Advice:* Start internal discussions. Integrate CTBCM readiness into corporate energy planning. Perhaps set targets (e.g. 20% power from RE via open market by X year) to drive team actions [23,24].

> ***Key caution:*** *The pathways are promising but not fully paved yet. Incentives like net-metering or solar subsidies for industries might still be needed. CTBCM doesn't automatically waive wheeling charges, and grid constraints could limit how much RE can flow. Policy makers are aware of these barriers (e.g. focus on "institutional and procedural bottlenecks" as mentioned in government plans). Industries should advocate (via industry bodies) for any further simplifications: for example, simplified application processes for open access, transparent UoSC calculation, and avoidance of double-charging (no paying hefty transmission fee twice).*

(Sources: Regional examples suggest industries can succeed with corporate PPAs and open access if regulators set fair tariffs. Industry reports (e.g., on Europe/India) note hurdles of network charges [25,26]. For Pakistan: APTMA and others emphasize rational UoSC as key [27].)

8.6. Integration and Prioritization of Battery Energy Storage Systems (BESS)

The operationalization of the Competitive Trading Bilateral Contract Market (CTBCM) introduces a structural challenge for variable renewable energy (VRE) procurement. Although bulk power consumers (BPCs) can contract directly with independent solar and wind generators, the strict enforcement of capacity obligations under the Capacity Balancing Mechanism (BMC) creates serious commercial constraints for intermittent resources.

Standalone solar and wind plants cannot reliably provide firm capacity during system stress periods. Co-locating battery energy storage systems (BESS) solves this by converting variable generation into semi-firm, dispatchable power, improving both grid reliability and commercial bankability in wheeling-based renewable procurement [28].

1. Technical Imperative of BESS in RE Bilateral Wheeling

Under the BMC, every demand participant must secure verified firm capacity to meet its Annual Capacity Requirement (ACR) during designated Critical Hours (CH), which are typically the 50–100 most stressed hours in a year.

$$ACR = PD \times (1 + PL) \times (1 + RM)$$

Where:

- PD= average peak demand during system stress periods
- PL= transmission losses
- RM= minimum planning reserve margin

Since critical hours often occur during evening peak demand windows, typically 18:00 to 22:00, solar irradiance is zero at those times. As a result:

- Standalone solar plants receive an Actual Available Capacity (AAC) credit of 0% during critical hours;
- Wind plants, due to geographic and temporal volatility, usually receive only a very small firm capacity credit, often around 5% to 10%.

This creates exposure to capacity deficit charges, making pure VRE bilateral contracts unattractive unless firming support is added.

2. Firm Capacity Valuation for Hybrid VRE + BESS

A co-located BESS allows the plant to store off-peak or mid-day generation and discharge it during critical hours. The credited AAC of a hybrid facility during critical hours can be represented as [28]:

$$AAC_{hybri} = \frac{1}{N_{CH}} \sum_{t \in CH} \left(P_{VRE,t} + P_{BESS,discharg\ ,t} - P_{BESS,charg\ ,t} \right)$$

Where:

- N_{CH}= total number of critical hours identified by the system operator
- $P_{VRE,t}$= direct renewable injection at hour t
- $P_{BESS,discharge,t}$= battery discharge into the grid at hour t
- $P_{BESS,charg\ ,t}$= battery charging power during hour t

In practice, charging during critical hours should be zero or minimal, since the battery is expected to support the grid at those times [28].

Firm Capacity Rating Rules

1. **Injection Cap**: The credited firm capacity of the hybrid facility cannot exceed the sanctioned grid interconnection capacity at the pooling station.
2. **Sustained Discharge Requirement**: To claim 100% of the battery's nameplate power as firm capacity, the BESS must be able to discharge continuously at its rated MW output for the full critical-hour block, typically 2 hours or 4 hours.
3. **Partial Credit De-rating**: If the battery duration is shorter than the required critical-hour window, the credited firm capacity is reduced proportionally. For example, a 10 MW battery with only 2 hours of storage, when the critical hour window spans 4 hours, would be credited at 5 MW to ensure sustained support.

3. ISMO's BESS Prioritization Criteria and the Post-Consultation Pivot

During the May 2026 consultative process, ISMO evaluated how to allocate the planned 800 MW wheeling tranche at congested transmission nodes while encouraging storage-backed renewable projects.

Evaluation Pathways

Table 13: Proposed Options for BESS-characterization in wheeling Auctions (by ISMO) [28]

Option	Approach	Main Issue
Option 1	Voluntary storage integration	Does not resolve congestion and allows pure VRE projects to win allocations but later face curtailment
Option 2	Heavy peak-load shifting through large storage	Drives CAPEX and LCOE too high, making projects commercially unviable
Option 3	Optimized capacity-to-duration scaling	Technically best for grid flexibility, but too complex and uncertain for investors

Option 1: Voluntary Storage Integration

Storage is optional, and auction allocation is based only on the lowest levelized cost of energy (LCOE) of the generation asset.

Limitation:

This does not solve transmission bottlenecks. Pure VRE projects may obtain capacity but then face grid-forced curtailment during peak generation periods, increasing Non-Project Missed Volume (NPMV) claims and weakening market liquidity.

Option 2: Mass Peak Load Shifting

This approach mandates very large storage installations, typically 30% to 50% of plant nameplate capacity, so that the entire solar mid-day block can be shifted into evening hours.

Limitation:

The required CAPEX becomes too high, and the project loses the cost advantage needed for competitive bilateral green power agreements.

Option 3: Optimized Capacity-to-Duration Scaling

This option was initially considered the most technically efficient. Priority points were to be awarded using a composite matrix that considered:

- local congestion relief potential;
- storage-to-generation ratio;
- thermal constraints of the connecting substation node.

Technical rationale:

It allowed the system operator to defer transmission upgrades, reduce congestion, and minimize the need for out-of-merit thermal balancing.

Post-Consultation Pivot: 10% Mandatory Minimum Rule

Although **Option 3** was technically strong, industrial stakeholders, export consortiums such as APTMA, and IPPs raised concerns about cost predictability and regulatory risk. They noted that:

- the proposed Use of System Charge (UoSC) base rate of Rs. 6-8/kWh;
- combined with the Debt Service Surcharge (DSS) of Rs. 3.23/kWh;

creates a baseline wheeling cost of **Rs. 10-11/kWh** before generation cost is added.

When this is combined with a highly variable node-specific BESS scaling formula, projected equity IRRs fall to around **3% to 4%**, which is commercially unattractive.

To avoid freezing private investment while preserving grid security, ISMO replaced the complex scaling model with a streamlined rule:

- **Minimum storage power rating:** 10% of the plant's total nameplate capacity
- **Minimum discharge duration:** 2 hours

For example, a 100 MW solar project must include at least a 10 MW BESS with a minimum 2-hour duration.

4. Interconnection Topologies and Operational Settlement

The physical coupling of the BESS affects efficiency, clipping recovery, charging rules, and settlement treatment under CTBCM.

Table 14: Proposed Options for BESS-characterization in wheeling Auctions (by ISMO) [28]

Parameter	DC-Coupled System	AC-Coupled System
Physical integration	Battery connects directly to the DC bus behind the solar inverter	Battery has its own bi-directional inverter on the AC side at the pooling station
Round-trip efficiency	Higher, typically 85%–90%	Lower, typically 80%–85%
Clipping capture	Can capture inverter-clipped solar energy	Cannot capture clipped DC energy
Charging restriction	Battery charges only from co-located renewable generation	Battery may charge from renewable generation or from the grid
Settlement of losses	Internalized before the billing meter	Grid-charged energy is treated as a wholesale purchase at spot/BME price

DC-Coupled Systems

DC-coupled configurations are generally more efficient because they avoid some AC-DC conversion losses. They are also well suited for capturing clipped solar energy that would otherwise be wasted.

AC-Coupled Systems

AC-coupled systems are more flexible because the battery can charge from either the renewable plant or the grid. However, they suffer from lower efficiency due to additional conversion steps.

5. Charging Restrictions, Green Attributes, and Loss Settlement

To protect the integrity of green bilateral contracts and avoid market manipulation, ISMO restricts how BESS may be charged.

- If the battery charges from the grid, that charging energy is treated as a normal wholesale purchase and settled at the real-time Balancing Mechanism for Energy (BME) price.
- Only energy generated by the co-located solar or wind resource and later discharged by the battery retains its renewable classification for bilateral settlement and carbon accounting.

Round-Trip Efficiency and the 100/115 Rule

Because of battery conversion and chemical losses, a storage system with about 15% round-trip loss means that to deliver 100 MWh of firmed energy to the grid, the renewable plant must generate roughly **115 MWh** of raw electricity [28].

This has two important consequences:

1. The generator bears the loss in volume unless the PPA explicitly allocates it otherwise.
2. Bilateral pricing must account for the storage penalty to remain financially viable.

Degradation and Annual Recalibration

As batteries age, both energy capacity and discharge performance degrade. For this reason, the system operator requires annual capability testing so that the verified firm capacity rating can be updated for the next BMC cycle.

6. Strategic Grid and Commercial Benefits of Co-Located BESS

a) Elimination of BME Imbalance Exposure

Renewable generators face penalties when actual injections deviates from scheduled delivery. A co-located battery acts as a buffer by absorbing sudden generation drops caused by cloud cover or falling wind speed, helping the project meet its bilateral delivery profile.

b) Node-Level Congestion Relief

Wind corridors such as Jhimpir and solar clusters in South Punjab often face transmission congestion during high-output periods. A battery stores energy when grid capacity is tight and releases it later, helping bypass local bottlenecks and reducing curtailment.

c) Improved Bankability of Wheeling-Based RE

BESS strengthens the commercial case for CTBCM-based renewable procurement by making supply more dispatchable, improving firm capacity compliance, and reducing the likelihood of capacity deficit exposure.

Consolidated Conclusion

Under CTBCM, pure solar and wind projects are commercially disadvantaged because they cannot reliably meet firm capacity obligations during critical hours. Co-located BESS changes this by converting intermittent generation into dispatchable capacity.

ISMO’s final approach reflects a practical compromise:

- avoid overly complex storage scaling rules;
- require a predictable minimum storage threshold;
- preserve grid security at congested nodes;
- keep projects financially viable for private investors.

The resulting framework, centered on a **10% mandatory BESS capacity with at least 2 hours of discharge duration**, provides a balanced pathway for integrating renewable energy into competitive wheeling while supporting both grid reliability and market confidence.

Section 9: CTBCM: Benefits, Limits, and What Industry Should Realistically Expect

Pakistan's power market is changing under heavy cost pressure, with reforms aimed at easing sector debt while grid stress and rapid rooftop solar adoption are reshaping industrial demand patterns.

CTBCM opens a real market pathway for industrial buyers, but its value is strongest when the commercial rules, grid charges, and firm-capacity obligations are read together. In Pakistan's open-access setup, bulk consumers can procure electricity through bilateral contracts, while grid charges, market/system operator fees, cross-subsidy charges, metering charges, and stranded or capacity costs remain payable through the open-access route. The practical result is that CTBCM is not a "free market" in the simple sense; it is a structured market-opening mechanism with continuing system obligations. In the process you shared, already-connected BPCs also have a simpler entry path because a valid Connection Agreement can make them broadly compliant on the grid side, subject to the relevant conditions.

9.1. Main Benefits for Industry

- **Price competition:** For the first time, industrial buyers can negotiate electricity prices directly with sellers, rather than accepting administratively set DISCO tariffs. Over time, as the market deepens and more sellers participate, competitive pressure should moderate prices. Bid values are discovered competitively, with no cap or floor in the auction. The concentration limit also prevents a single participant from dominating the market (max. *160 MW per participant* cumulative), which supports broader access.
- **Supply flexibility:** The 1-year payment/commitment window gives participants a defined commercial horizon. Bilateral contracts can be tailored for volume, delivery terms, and other commercial conditions.
- **Renewable energy access:** CTBCM legally enables corporate PPAs and traceable bilateral sourcing, which can support Scope 2 emissions reductions and cleaner procurement pathways for export-oriented firms.
- **Market transparency:** Allocation through auction, followed by NEPRA approval and Gazette notification, makes the process more visible and rule-based than informal or purely negotiated access.
- **Simplified path for existing connected buyers:** Where a bulk consumer is already connected, the transition can be simpler because the firm is already aligned with basic grid and distribution-code requirements and mainly needs the relevant connection arrangement in place.
- **Export competitiveness:** Lower and more predictable energy costs, together with renewable credentials, can strengthen access to global buyers that increasingly expect decarbonization evidence.
- **Long-term Planning**: Bilateral contracts with defined terms allow firms to plan energy costs with greater certainty; important for capital investment decisions and financial planning.

9.2. Limitations, Bottlenecks, and Risks

- **Grid charges remain significant:** The full cost stack can still include 5 components (transmission, distribution, market/system operator charges, metering service charges, cross-subsidy, and government surcharges). These do not simply disappear **after the payment period**. It will be discussed in detail in **Section 8.3**.
- **Supplier default risk:** If the competitive supplier fails to pay the use-of-system charges, the BPC may face disconnection risk and related costs. This is one of the most serious operational risks for buyers.

- **High financial barriers:** Bid bonds, performance guarantees, and financial soundness thresholds can create a meaningful entry barrier, especially for newer firms or smaller industrial players. PKR 300,000/MW Bid Bond and PKR 1,500,000/MW PG represent material capital requirements. Financial soundness thresholds (**30%/70% liquid assets**) add further barriers for newer companies/SMEs.
- **Scale limits:** The concentration cap. limits how much capacity a single participant can secure, which matters for large consumers seeking scale.
- **Node and grid constraints:** Capacity may be restricted by node-specific limits and by transmission feasibility. That means access depends not only on demand, but also on where the power is injected and whether the grid can carry it. South VRE Quantum Study imposes geographic constraints on renewable energy access.
- **Lead times and implementation risk:** Connection studies, approvals, and agreement execution can take time. Early-stage market implementation should therefore be treated cautiously. For instance, *transmission connections* involve multiple formal study stages; total indicative lead time *6-12+ months* before Connection Agreement.
- **Stranded costs remain part of the system:** Legacy obligations are still reflected through grid and surcharge mechanisms, so CTBCM reduces some barriers but does not erase the old cost structure overnight.

9.3. Proposed UoSC Framework under CTBCM: A Hidden Barrier to Open Markets

The proposed uniform Use of System Charge (UoSC) framework (presented in NEPRA hearing dated 11 June 2026) is being presented as a fairness measure: one *common wheeling structure for all DISCOs and K-Electric*, so that bulk power consumers face a more consistent open-access market. On paper, that sounds like a level-playing-field reform. In practice, however, the framework does not simply price the use of the grid. It also absorbs legacy inefficiencies, stranded obligations, cross-subsidies, and debt-recovery charges into the wheeling bill. That is why many industrial stakeholders view the model not as a market enabler, but as a structural barrier to industrial decarbonization and competitive electricity procurement [29].

1. What ISMO is trying to do?

The policy intent is understandable. ISMO and the regulator appear to be trying to create a uniform open-access architecture in which all consumers can compare wheeling on the same basis, regardless of whether power is moving through a DISCO network or through K-Electric's area. The objective is to simplify market access, standardize settlement, and avoid a fragmented system where each utility applies a different wheeling logic.

In principle, this supports CTBCM by:

- making open access more administratively simple;
- reducing the appearance of tariff discrimination between regions;
- creating a common reference for bilateral trading;
- facilitating market transparency in billing and settlement.

The problem is that this "uniformity" is achieved by averaging very different cost structures into one nationalized charge. That means the framework may unify the price, but it does not unify the economics. Instead, it redistributes costs from legacy utilities onto the shoulders of industrial consumers.

2. Why the uniform UoSC becomes a hidden barrier

The central issue is that UoSC is not a pure infrastructure-use fee. It includes far more than the direct cost of wires and network services. In the proposed framework, the consumer is not only paying for *transmission and distribution* usage; the consumer is also absorbing historical system burdens that should not logically belong to a competitive power market.

For a **B-4 consumer**, the basic wheeling rate is already burdened by cross-subsidy. That means a significant share of the charge is not tied to physical network use at all. The presented UoSC Rs. **6.69/kWh base charge** includes a very large cross-subsidy component, while physical transmission and distribution costs form only part of the total. Once the *Debt Service Surcharge (DSS)* of Rs. 3.23/kWh is added, the effective starting point rises to around *Rs. 9.92/kWh* before the actual energy price is even considered [29].

That is the *core problem*: if the wheeling charge itself is already near or above the market price advantage that bilateral renewable procurement is supposed to create, CTBCM stops being a decarbonization tool and becomes a cost burden.

3. The main cost drivers embedded in the framework

a) Cross-subsidy burden

The most controversial element is the *cross-subsidy* embedded inside the uniform charge. Industrial consumers are effectively being asked to finance parts of the wider power sector through a wheeling route that was supposed to open competition, not extend legacy subsidy recovery.

This distorts the purpose of CTBCM. Instead of rewarding efficiency, it forces efficient consumers to carry costs unrelated to their own network use. For export-oriented industries, that is particularly damaging because it raises the cost of clean electricity at the exact moment they need it to remain globally competitive.

b) DSS and stranded-cost recovery

The DSS adds another fixed burden on top of the base UoSC. Since it is tied to existing grid debt and sector recovery, it functions less like a market charge and more like a system-wide penalty. From an investor's perspective, this matters because it creates a tariff floor that is difficult to model and impossible to eliminate through operational efficiency.

This is why industry stakeholders describe the framework as a failed model: the charges do not simply cover service, they also socialize stranded obligations. In effect, the market is being asked to recover old debt while still trying to look like a competitive open-access regime.

c) Loss gross-up and the "100/110" logic

The proposal also pointed to a gross-up settlement mechanism for T&D losses. Under this approach, if a consumer needs 100 units at the meter, the seller may have to inject 110 units into the grid to cover system losses. That means the *buyer indirectly pays for energy* that never reaches the delivery point.

This is a **major hidden cost**. It makes the effective delivered price higher than the quoted bilateral price and introduces distance and congestion effects into what is supposed to be a uniform market. A project located farther from the load center, or routed through a loss-heavy network, faces a materially worse economics profile even if the underlying generation cost is low.

d) Additional charges and the K-Electric gap

A major source of uncertainty is the use of "additional charges" to bridge the difference between uniform wheeling rates and the actual cost structure of specific networks, especially where K-Electric was not included in the original base determination. In the hearing notes, NEPRA appears to rely on an interim provision to apply these charges.

This is where the framework becomes especially problematic for investors. A fixed base rate is already difficult enough to finance. A base rate plus an open-ended adjustment formula is much worse. If additional charges are not defined by a stable, statutory, formula-based mechanism, then they become a regulatory variable rather than a commercial one. That makes project cash flows uncertain and raises the risk premium on all bilateral deals.

4. Why investors are worried?

The biggest investor concern is **not only that the charge is high, but that it is unpredictable**.

Industrial buyers and generators can usually absorb a high number if they can model it. What they cannot absorb is a charge that may change through periodic adjustments, provisional surcharges, network-specific differentials, or policy-based recoveries without a transparent long-term formula.

That uncertainty creates several practical problems:

- PPAs become harder to price.
- Equity IRR becomes difficult to defend.
- Financing becomes more expensive.
- Risk-adjusted returns fall below acceptable thresholds.
- Boards become reluctant to commit capital to renewable wheeling projects.

The response capture this clearly: once the full wheeling stack is considered, projected IRRs can fall into the 3% to 4% range, which is not attractive for industrial-scale decarbonization projects. In other words, even if the renewable generator offers a competitive energy price, the surrounding wheeling framework can erase the savings.

5. How stakeholders are responding?

The concerns raised by FPCCI, APTMA, industrial consumers, and likely many other BPCs are not about rejecting open access itself. They are about rejecting a market design that looks open but is economically overburdened.

Their main responses are essentially these:

- The framework must have a fixed or formula-based ceiling.
- Cross-subsidy recovery should not be pushed entirely into wheeling.
- Additional charges must be transparent, predictable, and time-bound.
- Legacy debt recovery should be separated from competitive market pricing.
- Losses should be settled in a way that reflects actual physical delivery, not merely averaged socialization.
- Investors need enough certainty to underwrite PPAs and project finance.

There is also a broader policy argument: if the goal is industrial decarbonization, then the wheeling tariff should be rewarded with efficient procurement, not neutralizing it. A market that charges roughly Rs. 9.92/kWh before energy cost is added will struggle to support broad-based renewable adoption, especially for export sectors that are already cost-sensitive.

6. Why the framework distorts industrial development?

A uniform rate can be useful if it reflects a truly fair service cost. But if it masks regional inefficiencies, congestion, and cross-subsidy recovery, it distorts investment signals. Instead of encouraging firms to locate efficiently, procure clean energy, and use the grid rationally, it punishes them for participating in the market at all.

That is why the framework is a hidden barrier rather than a visible one. It does not prohibit open access directly. Instead, it makes open access expensive, uncertain, and difficult to finance. The effect is the same as a barrier, only more subtle.

For industrial decarbonization, that is particularly damaging. Export sectors need predictable energy pricing, credible renewable credentials, and bankable long-term contracts. If the wheeling structure adds too many hidden charges, the market will fail to mobilize private capital at scale.

9.4. System Marginal Price (SMP) Risk: The Hidden Commercial Challenge in CTBCM Participation

As Pakistan's CTBCM moves from legal framework to live market, most industrial stakeholders are focused on the visible costs; Bid Value, Grid Charges, Performance Guarantee. Far less attention is being paid to one of the most consequential commercial risks in the entire framework: **System Marginal Price (SMP) exposure under the Energy Balancing Mechanism (EBM).**

This is not a theoretical concern. Per official ISMO data cited in the market, the SMP for a single hour in April 2026 reached **Rs. 94 per kWh**; a figure that puts the entire economics of a bilateral contract under stress if a participant is caught with even a modest energy imbalance at that moment [30,31].

Figure 10: System Marginal Price (SMP) for May 2026 (Source: ISMO [31])

- **What Is SMP and Why Does It Matter?**

Under CTBCM, bilateral contracts govern what a buyer and seller have agreed to trade. But electricity is a real-time commodity; actual generation and actual consumption rarely match contracted volumes perfectly, hour by hour. The gap between what was contracted and what was actually consumed or injected is settled through the Energy Balancing Mechanism at the **System Marginal Price**; a price determined by the marginal cost of the most expensive generation unit dispatched at that particular hour.

SMP is not fixed. It is not negotiated. It is not capped. It is whatever the system needs it to be at the moment of imbalance; and in a system like Pakistan's, which still carries significant thermal generation with imported fuel exposure and periodic supply stress, it can spike dramatically.

- **The Scale of the Problem**

Consider a textile mill with a 10 MW bilateral contract. If actual consumption in a given hour exceeds contracted supply by just 5%; that is 0.5 MW of imbalance; and the SMP at that hour is Rs. 94/kWh, the balancing charge for that single hour is approximately **Rs. 47,000**. Across a month of routine operational variation, with SMP averaging even Rs. 25–30/kWh during stress periods, cumulative balancing charges can run into millions of rupees for a mid-sized industrial facility.

This is not a worst-case scenario. It is a description of normal market behavior in a system still dominated by expensive thermal capacity and subject to fuel price shocks, seasonal demand peaks, and the kind of supply-side volatility Pakistan's grid routinely experiences.

- **Why CTBCM Amplifies This Risk?**

Under the existing DISCO-based system, consumers pay a regulated tariff regardless of system conditions at any given hour. Under CTBCM, competitive market participants are directly exposed to real-time price signals through the balancing mechanism. This is by design; it is what makes markets efficient over time. But it also means that **a firm that enters CTBCM without understanding its hourly demand and generation profile is not managing energy costs; it is speculating on the spot price.**

Several structural features of Pakistan's current power system make SMP exposure particularly acute:

- ✓ **Thermal dominance:** Pakistan's marginal generation unit is frequently an expensive oil or gas plant. When it sets the SMP, the price reflects full fuel cost plus system inefficiency.
- ✓ **Middle East price exposure:** International oil and gas price volatility feeds directly into the SMP during high-demand hours, as the April 2026 spike of Rs. 94/kWh illustrates.
- ✓ **Seasonal extremes:** Summer peak demand in June–August, combined with reduced hydro availability in certain years, consistently pushes SMP to elevated levels precisely when industrial production is highest.
- ✓ **Variable Renewable Energy mismatch:** A firm that contracts with a solar generator will experience systematic imbalance in the evenings when solar output drops but industrial load continues; unless storage or supplementary contracts are in place [30].

- **What CTBCM Participants Must Do**

SMP risk is not avoidable; but it is manageable with the right preparation:

- ➢ **Demand and generation profiling** is the foundation. A participant must understand their actual half-hourly consumption pattern across seasons and production cycles, and match this against the generation profile of their contracted supplier. The closer the match, the lower the balancing exposure.
- ➢ **Contract structuring** is the mechanism. Bilateral contracts should explicitly allocate balancing risk between the buyer and seller; specifying who bears the cost of imbalance, under what conditions, and up to what quantum. This is not a standard clause; it must be negotiated and is entirely absent from naive contract structures.
- ➢ **SMP sensitivity modelling** is the analytical tool. Before entering any bilateral contract, a firm should model the financial impact of SMP at Rs. 20, Rs. 50, and Rs. 94/kWh across different imbalance scenarios. The April 2026 data point of Rs. 94/kWh is not an outlier to be dismissed — it is a live market reference.
- ➢ **Portfolio strategy** is the long-term answer. Large consumers with complex load profiles may need multiple supply contracts; baseload, peaking, and possibly storage-backed; to manage imbalance systematically rather than responding to it invoice by invoice.

<u>**The Bottom Line**</u>

A firm that enters CTBCM with a well-negotiated Bid Value and a clean bilateral contract, but without a coherent SMP risk management strategy, has solved the simpler problem and left the harder one unaddressed. In a competitive electricity market, profitability will increasingly depend not on what price was contracted, but on how effectively energy imbalance is managed hour by hour. The SMP of Rs. 94/kWh in April 2026 is the market's opening statement on this point. Industrial participants would be wise to take it seriously [30].

9.5. Concluding policy position

CTBCM is best understood as a market-opening mechanism for industrial renewable procurement, not as a frictionless shortcut to cheaper power. It can help buyers source cleaner electricity through bilateral contracts and can support industrial decarbonization, but the commercial upside only becomes real when firms account for the full cost stack, contractual obligations, grid charges, and implementation delays. In other words, the opportunity is genuine, but economics must be modeled carefully and realistically.

The proposed UoSC framework is intended to unify the market, but its current design risks converting CTBCM into a cost-recovery tool for the legacy power system rather than a competitive platform for industrial renewable procurement. By embedding cross-subsidies, DSS recovery, loss gross-up, and uncertain additional charges into the wheeling bill, the framework weakens investor confidence, distorts locational signals, and reduces the commercial value of renewable PPAs.

The CTBCM open-access concept is still valuable, but only if the pricing architecture is made predictable and commercially rational. A viable reform path would require:

- a clear formula for additional charges;
- a capped and transparent treatment of legacy costs;
- separation of stranded liabilities from current wheeling economics;
- settlement rules that are easy to model in PPAs;
- and a tariff structure that supports, rather than suppresses, industrial decarbonization.

In its present form, the uniform UoSC framework may create the appearance of market openness while quietly preserving the very structural burdens that CTBCM was supposed to overcome. That is why stakeholders see it as a hidden barrier to open markets.

> **BALANCED PERSPECTIVE**
>
> CTBCM represents a genuinely important structural improvement in Pakistan's electricity sector. For large industrial consumers, it creates meaningful new options. But it is not a panacea. Firms should model their specific economics carefully, engage qualified advisors, and participate with realistic expectations. Particular attention should be paid to the evolving Use of System Charge (UoSC) framework, as cross-subsidies, debt-recovery components, and potentially variable additional charges may materially affect the economics of renewable wheeling and long-term investment returns. The most likely trajectory: *significant opportunity over the medium term, meaningful operational complexity and regulatory uncertainty in the near term*.

Section 10: Industrial Readiness Checklist

This checklist is designed to help firms assess their readiness to engage with CTBCM. It is a practical internal assessment tool. **Figure 10** and **Table 15** present comprehensive readiness measures for industries to participate in CTBCM.

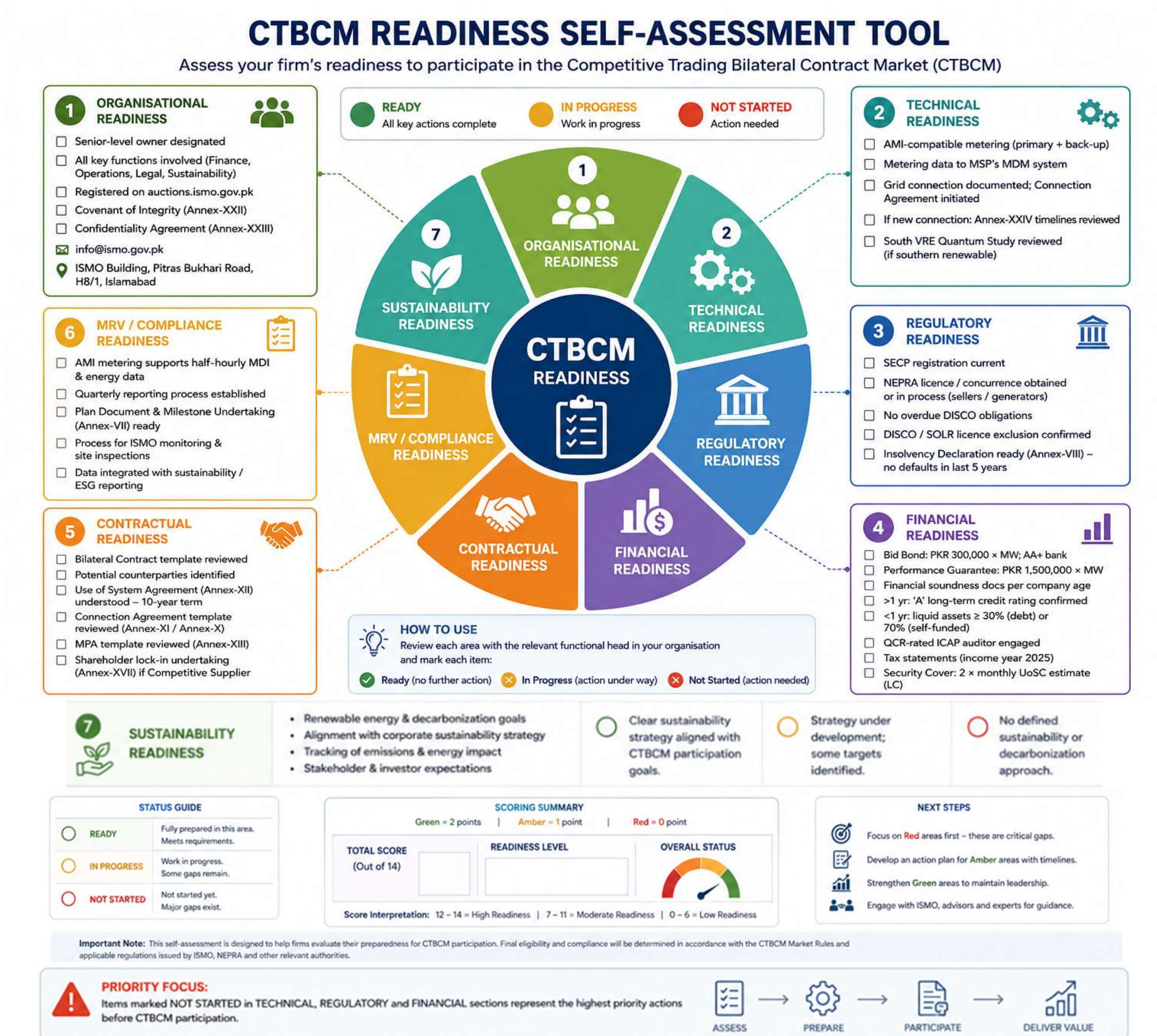

Figure 11: Self-assessment tool for firms evaluating CTBCM readiness across seven dimensions

Table 15: Critical Parameters in Assessing Industrial CTBCM Readiness

Area	Key Actions & Verification Points
Organizational Readiness	☐ Senior-level owner designated for CTBCM engagement? ☐ Finance, Operations, Legal, Sustainability all involved? ☐ Registered on auctions.ismo.gov.pk (mandatory before any proposal)? ☐ Covenant of Integrity (Annex-XXII) prepared for participant + each Director? ☐ Confidentiality Agreement with ISMO (Annex-XXIII) prepared? ☐ ISMO contact confirmed: info@ismo.gov.pk

Technical Readiness	☐ AMI-compatible metering (primary + back-up) installed; verified against Grid Code, Distribution Code, Commercial Code? ☐ Metering data communicable to Metering Service Provider's MDM system? ☐ Has an interconnection study been considered or initiated? ☐ Grid connection documented; if already connected, Connection Agreement initiated? ☐ If new connection required: Connection Process (Annex-XXIV) timelines reviewed? ☐ South VRE Quantum Study reviewed if planning southern renewable energy?
Regulatory Readiness	☐ SECP company registration current? ☐ Has the firm reviewed ISMO's eligibility document templates? ☐ NEPRA competitive supply license obtained or application in progress (sellers) ☐ NEPRA generation concurrence obtained or in process (generators)? ☐ No overdue DISCO obligations. ☐ DISCO/SOLR license exclusion confirmed (entity does NOT hold both licenses and has not applied for both)? ☐ Insolvency Declaration ready: no defaults by participant/affiliates/shareholders/directors in last 5 years (Annex-VIII)?
Financial Readiness	☐ Bid Bond capacity: PKR 300,000 × MW of Bid Quantum; AA+-rated bank identified? ☐ Performance Guarantee capacity: PKR 1,500,000 × MW of expected allocation? ☐ Financial soundness documentation prepared per company age and financing type? ☐ >1-yr company: 'A' long-term credit rating confirmed? ☐ <1-yr company: shareholder liquid assets ≥ 30% (debt) or 70% (self-funded) of project cost ☐ QCR-rated ICAP auditor (not existing auditor) engaged ☐ Tax statements income year 2025 prepared ☐ Security Cover capacity: 2 × monthly UoSC estimate in irrevocable standby letter of credit
Contractual Readiness	☐ Bilateral Contract template (Annex-XIV mandatory clauses) reviewed with legal counsel ☐ Potential counterparties (sellers/BPCs) identified ☐ Use of System Agreement template (Annex-XII) reviewed;10-year term, payment terms and Security Cover understood ☐ Connection Agreement template reviewed (Annex-XI for BPCs, Annex-X for generators) ☐ MPA template reviewed (Annex-XIII) ☐ Shareholder lock-in undertaking (Annex-XVII) prepared if Competitive Supplier
MRV / Compliance Readiness	☐ AMI metering supports half-hourly MDI and energy data for settlement

	☐ Quarterly progress reporting process established (post-award ISMO requirement) ☐ Plan Document (RFP Section 7.1.4) prepared with all 7 milestone category timelines ☐ Milestone Undertaking (Annex-VII) with specific dates ready ☐ Process for ISMO monitoring and site inspections established ☐ CTBCM participation data integrated with sustainability / ESG reporting
Sustainability Readiness	☐ Board-level renewable energy / decarbonization commitment established ☐ International buyer ESG requirements mapped (RE100, SBTi, Higg Index, bluesign, etc.) ☐ Scope 2 emissions accounting methodology understood (GHG Protocol) ☐ Corporate PPA framework understood in context of CTBCM bilateral contracting (Annex-XIV) ☐ Node-specific renewable energy capacity researched (South VRE Study reviewed)

HOW TO USE THIS CHECKLIST

Review each area with the relevant functional head in your organisation. Mark items as: Ready (no further action), In Progress (action under way), or Not Started (action needed). Items marked Not Started in the Technical, Regulatory, and Financial sections represent the highest priority actions before CTBCM participation.

Section 11: Technical Aspect: Market Design, Capacity Obligations and Capacity Balancing Mechanism

CTBCM treats **capacity** as a separate market product from **energy**. Energy refers to the actual electricity produced or consumed in each period, while capacity refers to the dependable generation available to meet peak demand and maintain system reliability. This distinction is important because a power system can have enough energy over a year yet still fail to meet demand during critical hours if dependable capacity is insufficient.

The design therefore creates a capacity responsibility on the demand side and a matching supply responsibility on the generation side. Demand-serving entities such as DISCOs, Base Suppliers, Competitive Suppliers, and Bulk Power Consumers must ensure that enough firm capacity is available to cover their load plus the reserve required for system security. Generators, in turn, contribute **Firm Capacity**, meaning the portion of their installed capacity that can be relied upon during critical periods. Firm capacity is not the same as nameplate capacity; it is the dependable capacity after considering availability, technology, maintenance, fuel constraints, hydrology, and operating conditions [20].

11.1. Capacity Obligation

The annual capacity obligation of a demand participant is calculated from its peak demand, transmission losses, and reserve requirement. The formula is:

$$\mathrm{ACR} = \mathrm{PD} \times (1 + \mathrm{PL}) \times (1 + \mathrm{RM})$$

where:

ACR = Annual Capacity Requirement
PD = Average Peak Demand during the critical hours, referred to the transmission system
PL = Average transmission losses
RM = Minimum Planning Reserve

The logic of the formula is simple. First, take the average peak demand observed during the system's critical hours. Then adjust it for transmission losses, because the participant must secure enough power at the delivery point, not just at the injection point. Finally, add the planning reserve so that the system has enough margin to remain secure even if part of the available capacity is unavailable.

For illustration:

$$\mathrm{ACR} = 14.6 \times 1.03 \times 1.16 = 17.44\ \mathrm{MW}$$

This means that the participant must secure **17.44 MW** of capacity to fully meet its annual obligation in that example.

11.2. Capacity Balance

After determining the obligation, the next step is to compare it with actual available capacity and any contractual capacity bought or sold. The capacity balance of each participant is calculated as:

$$\mathrm{CB}_i = \mathrm{AAC}_i - \mathrm{ACR}_i + \mathrm{CP}_i - \mathrm{CS}_i$$

where:

CB_i = Capacity Balance of participant i
AAC_i = Actual Available Capacity
ACR_i = Annual Capacity Requirement
CP_i = Capacity purchased through registered bilateral contracts

$$\mathrm{CS}_i = \text{Capacity sold through registered bilateral contracts}$$

This balance tells whether the participant has surplus capacity or a deficit.
If:

$$\mathrm{CB}_i > 0$$

the participant has surplus capacity and may offer it into the balancing mechanism.
If:

$$\mathrm{CB}_i < 0$$

the participant has a shortfall and must buy capacity to remain compliant.

11.3. Capacity Balancing Mechanism

The Capacity Balancing Mechanism is the settlement process used to clear these surpluses and deficits. It creates a market-based way to value capacity differences between what participants must hold and what they actually hold. The mechanism is designed around one annual settlement cycle, based on the previous year's critical system conditions.

Step 1: Identify Critical Hours

Critical hours are the hours in which the system is under maximum stress. These are the hours used to determine which generators actually contributed dependable capacity and which demand participants created the highest system requirement. In practice, these are generally the highest-load hours of the year, and the exact methodology is determined by the System Operator.

Step 2: Determine Actual Available Capacity

For each generator, actual available capacity is measured from performance during the critical hours. This is not simply installed capacity. A plant only receives credit for the capacity it can reliably offer when the system needs it most.

Step 3: Determine Capacity Requirement of Demand Participants

Each demand participant's capacity requirement is calculated using the formula above. This ensures that load-serving entities are responsible not just for energy supply, but also for system adequacy.

Step 4: Calculate the Capacity Balance

The Market Operator compares available capacity, contractual purchases, and contractual sales to determine the net surplus or deficit of each participant.

Step 5: Select the Reference Technology

The balancing price is linked to a **reference technology**, which is the least-cost technology capable of providing 1 MW of dependable capacity during the critical hours.
The levelized fixed cost of a candidate technology is expressed as:

$$\mathrm{LFT} = \mathrm{LIC} - \mathrm{RevMarket}$$

where:

$\mathrm{LFT} = \text{Levelized Fixed Cost}$
$\mathrm{LIC} = \text{Levelized Investment Cost}$
$\mathrm{RevMarket} = \text{Revenue expected from the energy market during critical hours}$

The reference technology is the one with the lowest value of LFT. This ensures that the capacity price is linked to an economic benchmark rather than being set arbitrarily.

Step 6: Determine the Capacity Price

The capacity price is formed from a demand curve and a supply curve.
The mandatory demand segment is priced at:

$$P^{mand} = 2 \times \text{LFT}_{ref}$$

where:

$$\text{LFT}_{ref} = \text{Levelized fixed cost of the reference technology}$$

The efficient demand level is:

$$\text{EDL} = \sum \text{CB}_{i-ve} \times \frac{1 + \text{RE}}{1 + \text{RM}}$$

where:

$$\text{EDL} = \text{Efficient Demand Level}$$
$$\text{CB}_{i-ve} = \text{Total deficit of participants with negative balances}$$
$$\text{RE} = \text{Efficient reserve level}$$
$$\text{RM} = \text{Minimum reserve level}$$

The final capacity price is capped at:

$$P^{cap} = 0.8 \times \text{LFT}_{ref}$$

The market-clearing price is therefore determined by the intersection of the supply curve and the demand curve, subject to the price cap.

11.4. Settlement Logic

Once the price is known, settlement is straightforward.

- If total surplus capacity is enough to cover the total deficit, then deficit holders pay the capacity price and surplus holders receive payment proportionally.
- If total surplus capacity is not enough, then the available surplus is allocated proportionally among the deficit holders, and any remaining shortfall becomes a compliance issue.

This mechanism ensures that capacity is not treated as a theoretical obligation only. It becomes a measurable, tradable, and enforceable reliability product.

11.5. Illustrative Numerical Example

Consider the following participant positions:

- **G1**: +60 MW surplus capacity
- **G2**: –150 MW deficit capacity
- **S1**: –105 MW deficit capacity
- **S2**: +32 MW surplus capacity
- **DISCO**: +230 MW surplus capacity
- **BPC1**: – 45 MW deficit capacity

Using a gas turbine as the reference technology, suppose the levelized fixed cost of the reference technology is:

$$\text{LFT}_{ref} = 6 \text{ million PKR/MW.year}$$

with:

$$\text{RM} = 12\%$$

and:

$$\text{RE} = 32\%$$

The mandatory demand price becomes:

$$P^{mand} = 2 \times 6 = 12 \text{ million PKR/MW.year}$$

The price cap becomes:

$$P^{cap} = 0.8 \times 6 = 4.8 \text{ million PKR/MW.year}$$

The efficient demand level is calculated from the total deficit and the reserve adjustment factor:

$$\mathrm{EDL} = \sum \mathrm{CB}_{i-ve} \times \frac{1 + 0.32}{1 + 0.12}$$

This example demonstrates the pricing logic of the balancing mechanism: capacity is priced according to scarcity, but the price is still linked to a realistic technology benchmark.

For a participant-level balance example:

$$\mathrm{CB}_{G1} = 87 - 0 + 0 - 96 = -9 \text{ MW}$$
$$\mathrm{CB}_{S1} = 0 - 58 + 60 - 0 = +2 \text{ MW}$$
$$\mathrm{CB}_{S2} = 0 - 37 + 36 - 0 = -1 \text{ MW}$$

These values show how the same participant may appear balanced in contractual terms but still end up with a surplus or deficit after actual availability is considered.

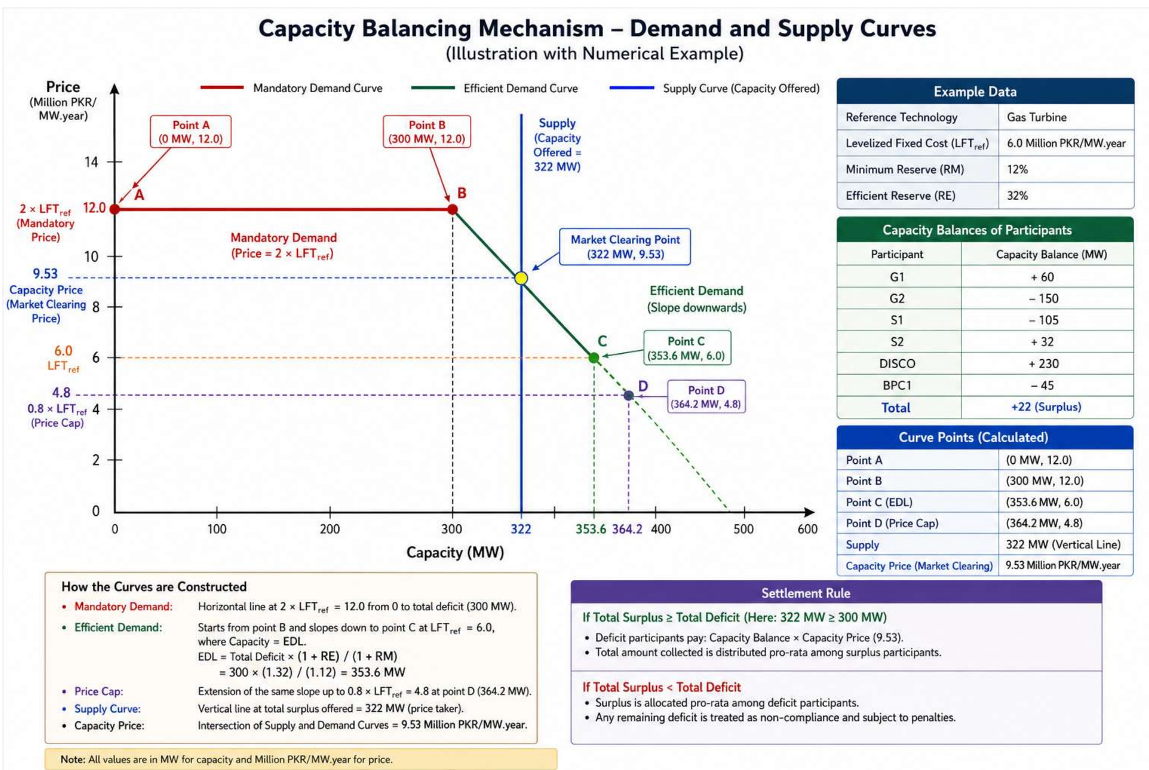

Figure 12: Capacity Balancing Mechanism for Market-clearing Price [20]

11.6. Overall Meaning of the Mechanism

The capacity obligation and balancing mechanism together form the reliability backbone of CTBCM. The obligation ensures that every load-serving participant secures enough dependable capacity in advance. The balancing mechanism then clears any residual mismatch in a structured market process. The result is a system that rewards dependable generators, disciplines demand-serving entities, and provides a transparent price for reliability.

Section 12: Common Questions and Misunderstandings

Q1. How much capacity is available in the first auction, and how is the 800 MW structured?

The first single auction covers **200 MW (now proposed to increase to 400 MW)** under the draft RFP wording you shared. The *aggregate wheeling quantum is 800 MW*, to be allocated over **five years** through multiple auctions starting from CMOD. This means the first auction is only an entry point, not the full program.

Q2. What does "800 MW" mean in practical terms?

It is the total wheeling capacity available for competitive allocation across the whole program, not a per-firm entitlement. Successful bidders receive only the quantity awarded to them in the auction.

Q3. What is the maximum quantum any single participant can hold?

A single participant may hold a maximum of **160 MW** cumulatively across **all auctions**, which is **20% of the total aggregate wheeling quantum**. This cap. applies regardless of how many auctions the participant joins.

Q4. What are the exact financial requirements?

The financial requirements are substantial. They include:

- **Bid Bond:** PKR **300,000 per MW** of Bid Quantum, issued by an **AA+-rated bank**, with **12-month validity**.
- **Performance Guarantee:** PKR **1,500,000 per MW** of allocated quantum, issued by an **AA+-rated bank**, valid until **3 months after the Transaction Start Date**; it is returned within **15 Business Days** after Transaction Start Date verification.
- **Financial soundness:**
    - companies older than 1 year need at least an **A long-term credit rating**;
    - companies younger than 1 year need either **30% debt-funded** or **70% self-funded** project cost in combined shareholder liquid assets.
    - These assets must be certified by a **QCR-rated ICAP auditor** who is **not the existing auditor**, based on **income year 2025** tax statements.

Q5. Who receives the Bid Value?

The **relevant Distribution Licensee (DISCO)** receives the Bid Value, not ISMO. Under the LOA clause you quoted, after each Transaction Start Date the successful participant pays the Bid Value to the relevant DISCO for **one year** from that date. Grid Charges and Surcharges remain payable **during and after** the Payment Period.

Q6. Does CTBCM guarantee cheaper electricity?

No. CTBCM creates the market structure for competition, but it does **not** guarantee cheaper electricity. The total cost is the sum of:

- the negotiated **Bid Value**;
- **Grid Charges**;
- **Surcharges**;

  and these continue beyond the one-year Payment Period. Firms must model the full stack before assuming savings.

Q7. What happens if online and hard-copy bids differ?

The bid becomes **invalid**. The online submission through the ISMO auction portal is the **principal submission**. Any discrepancy between the online and hard-copy versions renders the entire bid invalid, with **no post-submission correction**.

Q8. What is the Use of System Agreement (UoSA), and when does it activate?

The UoSA is a **10-year agreement** between the Distribution Licensee and the Competitive Supplier. It governs monthly UoSC billing and Security Cover. It becomes effective only when:

- Security Cover is provided;
- Market Commercial Code conditions are satisfied; and
- the applicable documents regarding BPC connection are satisfied.

The invoice is due on the **15th day** after issuance. If payment is not made, the DISCO notifies within **3 Business Days**, and Security Cover may be encashed after **10 Business Days** from the due date.

Q9. What happens if the Competitive Supplier does not pay the Use of System Charges?

The practical consequences fall first on the **BPC**. The DISCO may temporarily disconnect the BPC, and the costs of disconnection and reconnection are borne by the BPC. Recovery from the supplier is then handled bilaterally. If Security Cover is not replenished within **10 Business Days**, the Distribution Licensee may terminate the UoSA.

Q10. What is the Use of System Agreement risk profile for a BPC?

It is one of the biggest operational risks in CTBCM. A BPC depends on the supplier's compliance, but the immediate service interruption and reconnection costs can land on the consumer. That makes supplier due diligence and contract protection essential.

Q11. What are the total wheeling charges really made up of?

The base charge is only part of the full cost. For a B-4 (132 kV) consumer, the **Rs. 6.69/kWh** base rate (proposed on basis of June 2025 charges) includes a heavy **cross-subsidy component**. On top of that comes the **Debt Service Surcharge (DSS) of Rs. 3.23/kWh**, which lifts the starting point to around **Rs. 9.92/kWh** before the bilateral energy price is even added.

Q12. What is the main problem with the uniform UoSC framework?

Its core problem is that it does not reflect a pure cost-of-service model. Instead, it socializes legacy grid burdens, stranded costs, and non-recoveries through a uniform charge. That is why industry sees it as a structural barrier rather than a clean market reform.

Q13. What is the danger of the "gross-up" settlement mechanism for T&D losses?

Under the uniform loss framework, losses are grossed up to demand for settlement. In practical terms, if a facility needs **100 units**, the seller may have to generate and inject **110 units** to cover losses. Those extra units are not free; they are embedded in the consumer's delivered cost.

Q14. What is the "additional charge" issue, especially for K-Electric?

Because actual wheeling costs differ across networks, the framework uses **additional charges** to bridge the gap between the uniform rate and the actual cost structure. Where K-Electric was excluded from the base determination, NEPRA appears to use an interim mechanism to recover the shortfall. The main concern is that this charge is not yet a fixed long-term formula, so it creates significant tariff uncertainty.

Q15. Why are investors concerned about reliability and returns?

Because a framework with variable additional surcharges and no firm cap is difficult to finance. Investors cannot confidently model returns if the tariff may change through periodic policy adjustments. In the hearing notes, this uncertainty is seen as a major reason why equity IRRs can fall into the **3% to 4%** range.

Q16. Are there any statutory caps on wheeling charges?

Your hearing notes suggest that there is **no clear statutory cap** under the proposed model. That is a key issue, because without a cap, the framework can remain open-ended and difficult to price for long-term PPAs.

Q17. Does CTBCM solve the broader competitiveness problem for industry?

Not by itself. If wheeling charges are too high, too variable, or too dependent on cross-subsidy recovery, CTBCM can lose much of its industrial competitiveness benefit. This is why industry stakeholders argue that the market must reward efficient procurement rather than simply repackaging old sector liabilities.

Q18. Can our captive plant sell through CTBCM?

As a captive generator for self-use, potentially yes, under simpler undertakings. But selling to external BPCs requires a full **NEPRA competitive supply licence**, along with all Competitive Supplier obligations. It is not automatic.

Q19. Can a factory that generates its own power also sell power through CTBCM?

Potentially yes, in principle, but only if it meets the relevant technical and regulatory conditions, including interconnection requirements, licensing where applicable, and ISMO registration. Firms should not assume captive generation automatically gives them seller status.

Q20. Can already connected BPCs participate more easily?

Yes. BPCs already connected to the transmission and distribution system are deemed compliant with the relevant Grid Code and Distribution Code connection requirements. They need only a **valid Connection Agreement** with the Distribution Licensee, so they do not need to start from scratch.

Q21. What is the maximum extension, and how is it requested?

The maximum combined extension is **1 year**. The request must be made at least **3 months before** the scheduled milestone deadline, the delay must be beyond the participant's reasonable control, and a **double-value Performance Guarantee** is normally required unless the delay is attributable to ISMO, the network licensee, or a public sector entity. Monthly reports are required during the extension period.

Q22. Is the Confidentiality Agreement mandatory?

Yes. It is mandatory as part of the proposal. The term is **5 years from signing** or until all obligations from the auction participation expire, whichever is later. It covers technical, financial, legal, and commercial data shared with ISMO.

Q23. What reports are required after the LOA?

Quarterly Progress Reports must be submitted to ISMO. During any approved extension period, monthly reports are also required. ISMO may inspect the site at any time, and failure to meet critical milestones without valid justification can trigger notice and possible PG encashment.

Q24. What are the force majeure provisions across the agreements?

For the Use of System Agreement, the FM threshold is **60 consecutive days**, with **7 Business Days' notice**. For Connection Agreements, the FM notice is **48 hours** or **24 hours after communication resumes**, with weekly reports during FM. The final termination threshold in the Connection Agreements is to be filled in the executed versions.

Q25. What is the auction actually for: buyers or sellers?

The auction is primarily a mechanism to allocate **wheeling capacity**, meaning the right to use the national grid for independently contracted electricity. Both buyers and sellers interact with the auction system, but for industrial consumers the key outcome is how much of the wheeling quantum they can secure.

Q26. What is wheeling?

Wheeling is the transportation of electricity through the national grid from the point of injection to the point of consumption. The consumer pays wheeling charges for using the transmission and distribution network.

Q27. What does open access mean?

Open access means the grid is available, in principle, for use by eligible market participants rather than being reserved only for local utility supply. Under CTBCM, that is what allows a bulk consumer to source power from any registered seller.

Q28. What is the difference between a buyer and a seller under CTBCM?

A buyer is a **Bulk Power Consumer** that purchases electricity under a bilateral contract. A seller is a licensed generator or competitive supplier that provides electricity under a bilateral contract. They are distinct market roles, and the same entity can combine them only under the applicable licensing structure.

Q29. How long does the participation process take?

It depends on the firm's starting point. Registration may take several weeks to months, auction prequalification adds time, and negotiating and registering a bilateral contract takes further time. Realistically, firms should treat this as a **3–12 month process** from initial preparation to first delivery.

Q30. What should industry prepare in advance?

Before participating, firms should review metering and grid connection status, study the published ISMO templates, ensure there are no unresolved DISCO obligations, identify potential sellers or competitive suppliers, engage qualified legal and technical advisors, attend stakeholder workshops, and conduct full financial modelling.

Q31. What should NOT be assumed from the first auction?

Do not assume that the first auction will automatically reduce electricity bills, that all registered firms will secure allocations, that the rules will remain unchanged in later auctions, or that bilateral negotiations will be simple. The first auction should be treated as an entry point and a learning stage.

Q32. Do we still pay our DISCO if we participate in CTBCM?

For the volumes covered by the bilateral contract, the consumer no longer buys electricity in the traditional way from its DISCO. However, the consumer still pays wheeling charges and may retain some residual relationship with the DISCO for technical services. The exact treatment should be checked in the final implementation rules.

Q33. Is CTBCM relevant for smaller industrial firms?

The current minimum threshold for Bulk Power Consumer status is **1 MW** of demand. Smaller firms below that threshold cannot participate directly. They may need to consider aggregation or indirect procurement routes.

Q34. What happens if we register but later decide not to participate in the auction?

Registration and participation are separate. A firm can register without joining a specific auction, but it should still review whether any obligations, conditions, or fees attach to registration or prequalification.

Q35. How does CTBCM relate to net metering?

They are separate frameworks. Net metering is for smaller-scale self-generation and export credits, while CTBCM is a wholesale bilateral market for bulk consumers and registered sellers. They may complement each other for firms that have both rooftop solar and large procurement needs.

Q36. Where do we submit proposals and get more information?

Proposals are submitted through **auctions.ismo.gov.pk**, and registration on the platform is mandatory before submission. ISMO's office, email contact, and NEPRA's website are the primary official reference points. Clarifications should be sought in writing before the submission deadline.

Section 13: Practical Guidance for Textile and Sports Firms

Pakistan's textile and sports/apparel sectors are among the country's most energy-intensive export industries. Together they account for a substantial share of Pakistan's export earnings and employ millions of workers. They are also among the sectors most affected by electricity costs and most exposed to international buyer sustainability requirements. For these firms, CTBCM creates genuine new options; and genuine new obligations; that must be understood at the strategic level.

Table 16: Key Opportunities and conditionalities for export-oriented firms

CTBCM Opportunity for Export Firms	Key Condition or Caveat
Negotiate Bid Value (PKR/kWh) for competitive electricity procurement.	Must win auction allocation and negotiate favorable bilateral contract; Bid Bond PKR 300,000/MW required.
Corporate PPA with RE generator; meets buyer sustainability requirements.	Requires registered RE generator as counterparty + node capacity availability (South VRE Study).
Scope 2 emissions reduction; improves ESG ratings and buyer scorecards.	Requires traceable bilateral contract + GHG Protocol Scope 2 accounting compliance.
1-year Payment Period provides planning certainty.	Bilateral contracts must align with production planning cycle.
Existing connected facilities: simplified path; no new connection studies needed	Need only valid Connection Agreement with Distribution Licensee (UoSA, Article 4.3)
Quarterly and annual milestone reporting to ISMO	Dedicated CTBCM compliance function required internally

13.1. Why These Sectors Should Care

- Electricity cost is a significant component of production cost in spinning, weaving, processing, dyeing, finishing, and garment manufacturing. Any structural change in how electricity is priced and procured is a material business issue.
- International buyers; including major retail brands in Europe, North America, and Japan; increasingly require supply chain sustainability data, including energy sourcing and carbon emissions. Pakistan's textile and sports goods firms are directly affected by these buyer requirements.
- CTBCM is Pakistan's primary mechanism for enabling large-scale renewable energy procurement by industrial consumers. Firms that engage early will have a competitive advantage in meeting emerging buyer and regulatory sustainability standards.
- The risk of inaction is real: firms that remain entirely dependent on DISCO tariffs may face rising costs, regulatory pressure, and buyer-side scrutiny if CTBCM matures and competitors have shifted to competitive and clean energy procurement.

13.2. How CTBCM May Affect Competitiveness?

In the near term, CTBCM introduces new costs (registration, compliance, advisory) and new opportunities (price negotiation, renewable energy access). In the medium term, firms that participate successfully may benefit from:

- More predictable electricity costs through multi-year bilateral contracts.
- Access to renewable energy that meets buyer and certification requirements (e.g. Green Label, bluesign, Higg Index, science-based targets).

- Reduced Scope 2 emissions, enabling better performance in sustainability assessments used by buyers and financiers.
- Positioning as a credible sustainable supplier in competitive global markets.

13.3. How Firms Can Begin Internal Discussions?

- What is our firm's total electricity demand in MW and annual kWh? Does it justify PKR 300,000/MW Bid Bond cost?
- Are we SECP-registered and free of overdue DISCO obligations? Can we meet financial soundness thresholds?
- Which international buyers require renewable energy sourcing, and by when? Does this create urgency for CTBCM and corporate PPA?
- Have we identified a reliable Competitive Supplier with valid NEPRA license and financial strength to consistently pay DISCO Use of System Charges?
- Have we reviewed the South VRE Quantum Study for available renewable energy from accessible nodes?
- Are we already connected to the distribution/transmission system? If yes, is our path to CTBCM participation significantly simpler?

13.4. Functions Within the Firm That Should Be Involved

- **Senior Leadership / Board**: Awareness of CTBCM as a strategic issue; authorisation of readiness assessment and potential participation.
- **Finance**: Cost modelling; assessment of bid bond and performance guarantee requirements; bilateral contract financial analysis.
- **Operations / Facilities**: Metering status; interconnection documentation; technical readiness assessment.
- **Legal / Compliance**: Review of ISMO registration requirements; review of bilateral contract terms.
- **Sustainability / ESG**: Integration of CTBCM pathway into sustainability reporting; alignment with buyer requirements and certification standards.
- **Procurement / Energy**: Identification of potential bilateral contract counterparties; engagement with generators or competitive suppliers.

13.5. Transition Planning Considerations

- A phased approach is sensible: begin with readiness assessment, move to registration, participate in early auctions to build experience, then pursue bilateral contracting and renewable energy sourcing.
- Engagement through industry associations (e.g. APTMA, PSGA, or relevant sector associations) allows collective knowledge-building and joint advocacy on key regulatory issues such as wheeling charges.
- Firms that invest in metering upgrades and ISMO registration now will be better positioned when the auction cycle opens than those who begin preparation after the auction.
- Do not wait for the market to be 'perfect' before engaging. The market will improve through participation and collective feedback from industry.

PRACTICAL FIRST STEP

The most practical first step for any textile or sports firm is simple: check your electricity demand (is it 1 MW or more?), review ISMO's eligibility document templates at ismo.gov.pk, and attend the next ISMO stakeholder workshop. These steps cost very little and provide a foundation for all further decisions.

Section 14: Policy Implications

This section brings together the main policy signals emerging from the CTBCM hearing and the wider regulatory framework. The hearing record you shared shows that CTBCM is no longer just a concept; it is moving into implementation through gazetted rules, template agreements, an online auction platform, connection timelines, and node-specific renewable data. At the same time, the hearing also makes clear that the market will only work if the cost stack, settlement logic, and investor risks are communicated transparently and managed carefully. The National Electricity Plan 2023–27 already places open-access consumers inside a cost-recovery framework that includes grid charges, cross-subsidy charges, metering charges, capacity costs, and stranded-cost recovery, so the key policy issue is no longer whether these costs exist, but how transparently and predictably they are applied [28,29,32].

i. Confirmed positive developments

A major positive takeaway from the hearing is that CTBCM has progressed from policy intent to an operational structure. Your notes show that the Framework Guidelines for Wheeling Auctions 2025 have been formally gazetted, that the full suite of template agreements has been published, that the connection process now contains defined stage-wise timelines, that the electronic auction platform is live, and that ISMO has published the South VRE Quantum Study to provide node-specific capacity information. These developments matter because they reduce ambiguity, lower entry friction, and make it possible for industrial buyers and generators to begin real planning rather than relying on broad policy language. This also aligns with the National Electricity Plan's direction that existing wheeling consumers be integrated into the approved CTBCM framework and that bilateral transactions be facilitated through the Market Commercial Code.

ii. Why is communication now a policy issue, not just a stakeholder issue?

The hearing record strongly suggests that one of the main bottlenecks is not only regulation itself, but the gap between technical design and industrial understanding. CTBCM is complex, and many of its key instruments are written in specialist language. That means firms may formally be eligible while still being practically unable to assess the real economics or procedural burden. The policy implication is straightforward: ISMO and NEPRA should not assume that publishing rules alone is enough. Simple-language summaries, sector-specific notes, checklists, and regular workshops in industrial hubs like Faisalabad, Sialkot, Karachi, and Lahore would materially improve market readiness. This is especially important because the National Electricity Plan explicitly embeds open access, grid charges, capacity costs, and stranded-cost treatment into the regime; firms need to understand these elements before they commit capital.

iii. Wheeling charges are the critical economic variable

The single biggest economic determinant of CTBCM viability is the final wheeling charge structure. Your hearing notes correctly flag that even if a renewable PPA price is attractive, the delivered cost can become uncompetitive once grid charges, DSS, cross-subsidy, metering, and system costs are added. The broader policy record confirms that open-access consumers are expected to bear grid charges, market/system operator fees, cross-subsidy charges, metering service charges, and capacity costs. That means CTBCM is not simply a renewable procurement platform; it is also a cost-recovery mechanism for the power sector. For industry, the practical issue is whether the total landed electricity cost still supports export competitiveness and investment return. For regulators, the challenge is to preserve fiscal and utility recovery without making the open-access market economically self-defeating.

A transparent, formula-based, publicly explained wheeling methodology is therefore essential. The hearing record's concerns about cross-subsidies, uniform tariffs, and additional charges are not peripheral; they go to the heart of bankability. If the final charge stack is not predictable, long-term PPAs become harder to finance, and firms will either delay participation or restrict themselves to only the largest and most risk-tolerant consumers. The policy implication is that transparency is not just good governance; it is a market-enabling condition.

iv. Cross-subsidy and stranded-cost treatment need careful policy separation

The hearing notes make a strong point: CTBCM should not be misunderstood as a mechanism that eliminates the legacy costs of the power sector. The National Electricity Plan explicitly says that open-access charges include cross-subsidy charges and that stranded-cost recovery remains a policy matter. It also states that where reduced open-access charges are considered, fiscal space and compensation logic matter. In other words, the old sector burdens do not disappear; they are simply redistributed unless a deliberate policy framework separates competitive-market pricing from legacy recovery.

This has two important policy consequences. First, industrial stakeholders should not be led to expect that CTBCM will automatically deliver cheaper electricity. Second, regulators should avoid embedding too many legacy obligations into the wheeling charge if the policy goal is industrial decarbonization. A better approach would be to make the legacy-cost component explicit, time-bound, and separately disclosed, rather than hiding it inside a blended tariff that makes market signals difficult to read. The hearing record's concern about "hidden barriers" is therefore well founded.

v. Minimum demand threshold clarity is essential

Your notes identify an important procedural gap: the minimum BPC demand threshold is not clearly stated in the Framework Guidelines as shared in the hearing material. That matters because eligibility rules affect who can enter the market and how firms plan their future demand growth. The policy implication is that the threshold should be publicly and unambiguously defined in the operative regulation, not inferred from workshop slides or implementation discussion. Clear threshold rules reduce legal uncertainty, prevent dispute, and help firms decide whether to participate directly, aggregate demand, or wait until they cross the threshold organically.

vi. Participation barriers are not only technical; they are financial

The hearing record also shows that the entry requirements themselves can be a barrier, particularly for mid-sized firms. Bid bonds, performance guarantees, and financial soundness conditions may be reasonable from a risk-control perspective, but they still raise the cost of entry. The policy issue here is not that security requirements should be removed, but that they should not unintentionally exclude otherwise capable industrial participants. Collective participation structures, aggregation mechanisms, and association-backed entry models should therefore be considered. This is especially relevant in Pakistan's industrial landscape, where many firms are too small to behave like utility-scale players but too large to be treated like ordinary captive consumers.

vii. Competitive supplier default risk must be communicated plainly

One of the most serious operational lessons from the hearing is that supplier default is not just a bilateral problem between buyer and seller. It can have direct consequences for the BPC, including disconnection, reconnection costs, and security-cover encashment. That risk needs broader dissemination because many industrial firms may assume that once they sign a bilateral supply arrangement, the commercial risk stays entirely with the supplier. In reality, the consumer may face immediate operational disruption if UoSC obligations are not met. The policy implication is that official communications should highlight this default chain clearly, and PPAs should be drafted with explicit safeguards, default cure mechanisms, and backup supply provisions. The National Electricity Plan's insistence on a CTBCM-integrated framework makes this communication duty even more important.

viii. The market needs a realistic message for industry

The right policy message is neither overly optimistic nor discouraging. CTBCM does create real opportunity. It makes corporate PPAs possible, supports traceable renewable procurement, and offers a route for export-oriented industries to document cleaner energy sourcing. But the hearing also shows that the system still carries important frictions: wheeling charges, stranded costs, uncertainty in additional charges, connection delays, seller scarcity in the early market, and the need for robust due diligence. This is consistent with the broader CTBCM design as reflected in the National Electricity Plan and the official move toward integrating existing wheeling consumers into the new framework.

So the policy implication is to frame CTBCM as a medium-term transition platform rather than an immediate cost-reduction guarantee. Industry should see it as a structural opening that can improve competitiveness over time, but only if firms model the full delivered cost and if regulators preserve transparency and predictability in the charge stack.

ix. Why BESS policy matters here too?

The hearing's technical discussion of BESS should also inform policy interpretation. Because critical hours often occur when solar output is absent and wind is variable, standalone VRE cannot reliably meet capacity obligations. Your notes show that ISMO has already moved toward a practical minimum BESS rule instead of a highly complex storage-scaling formula. That is an important policy signal: the regulator is trying to avoid a design that is technically elegant but commercially unworkable. For industrial procurement, the implication is that storage-backed renewables are more likely to survive the settlement and capacity rules than pure intermittent resources.

x. Issues that should remain on the policy watchlist

Several items deserve continued monitoring: the final wheeling-charge determination, the first auction outcome, the evolution of the seller pool, the clarification of captive-plant participation rules, the treatment of imbalance settlement, and the speed with which sustainability-driven buyers create demand for auditable renewable procurement. All of these factors will shape whether CTBCM becomes a mainstream industrial decarbonization tool or remains a niche market for a small group of large, sophisticated participants. The official policy direction is supportive, but implementation quality will decide the market outcome.

Concluding policy view

CTBCM is a genuinely important reform. It creates a path toward open-access renewable procurement, corporate PPAs, and industrial decarbonization. But the hearing record shows that the market can only deliver on that promise if the regulator is transparent about wheeling charges, clear about minimum eligibility, explicit about stranded-cost treatment, and honest about default risk. The most important policy task now is to keep the market open without making it commercially opaque. In that sense, CTBCM is not just an energy reform; it is also a test of whether Pakistan can build a competitive electricity market that is understandable, financeable, and usable for industry.

Section 15: Conclusion

Pakistan's Competitive Trading Bilateral Contract Market represents a structural transformation in how electricity is bought and sold. After years of design and delay, it is now in active implementation. The legal framework has been developed, ISMO is operational, the auction framework has been approved, and wheeling charge determination is in process. The market is opening.

CTBCM represents one of the most important structural reforms in Pakistan's power sector in many years. It shifts the market away from the old single-buyer model and gives large industrial consumers a legal pathway to procure electricity through bilateral contracts, open access, and wheeled delivery across the national grid. For the first time, firms can actively consider direct procurement from generators or competitive suppliers, negotiate commercial terms, and pursue renewable energy sourcing in a way that supports corporate PPAs and cleaner supply-chain commitments. For export-oriented sectors such as textiles, sports goods, and other electricity-intensive industries, this is a meaningful development because it creates a pathway toward more traceable renewable procurement and stronger competitiveness in markets where sustainability credentials increasingly matter.

At the same time, CTBCM should be understood as a transition framework rather than a guaranteed cost-saving solution. The market is opening under real commercial conditions: the aggregate wheeling quantum is 800 MW over five years, the first auction covers 200 MW, and participation is limited by a cumulative 160 MW cap per participant. Entry also requires substantial financial readiness, including bid bonds, performance guarantees, metering compliance, and ongoing reporting obligations. These features make CTBCM serious and bankable, but not simple. Firms that treat it as a routine tariff alternative will likely underestimate the legal, technical, and financial discipline that the market demands.

The most important caution is that CTBCM is not the same as cheap electricity. The total delivered cost remains shaped by the bilateral Bid Value, grid charges, surcharges, cross-subsidies, losses, metering charges, and use-of-system costs. The hearing material makes clear that the proposed uniform UoSC structure is especially sensitive because it can embed legacy burdens, stranded obligations, DSS recovery, and uncertain additional charges into the wheeling bill. If those costs are not transparent and predictable, the market may appear open while remaining expensive and difficult to finance. In that case, CTBCM would still be a reform, but one whose economic benefits are constrained by the way legacy costs are passed through to industry.

The renewable-energy opportunity is strongest where CTBCM is paired with storage-backed delivery. Standalone solar and wind cannot reliably meet firm-capacity obligations during critical hours, especially when evening peaks coincide with zero solar output. That is why the hearing's technical direction toward a manageable BESS requirement is so important. A practical storage threshold, rather than an overly complex or overly large storage mandate, makes the market more usable while still preserving grid reliability. In commercial terms, this is the bridge between intermittent generation and firm industrial supply. It is also the reason CTBCM can support renewable procurement only if the technical and settlement rules are realistic enough for investors to underwrite.

The practical message is therefore clear. *CTBCM is a real opportunity, but it must be approached with full awareness of the cost pool, supplier-default risk, grid constraints, and implementation complexity*. It is best seen as a medium-term market-opening mechanism that can support industrial decarbonization, renewable sourcing, and better procurement flexibility, provided the regulatory framework remains transparent, predictable, and financeable. If wheeling charges are clearly defined, eligibility thresholds are unambiguous, stranded-cost treatment is openly separated, and settlement rules remain understandable, CTBCM can mature into a credible open-access market. If not, it may remain open in form while still constrained in economics.

Thus, CTBCM is *worth engaging with now*, but only with *careful modeling, regulatory awareness, and realistic expectations*. The system is already moving, the rules are becoming operational, and the opportunity is real. Yet the commercial success of participation will depend on how each firm handles the full cost stack, the contract structure, the storage requirement, and the evolving UoSC framework.

15.1. Key Messages

- CTBCM is real and moving forward. The first wheeling auction is expected in 2026 under a framework formally approved in 22 January 2026. Waiting to engage is a choice with costs.
- The economics are uncertain and firm-specific. Do not rely on general market commentary. Model your own firm's cost structure under realistic assumptions; including wheeling charges.
- Preparation takes time. Registration, metering compliance, and bilateral contract negotiation are not overnight processes. Start now.
- Renewable energy access is the long-term prize. Even if near-term cost savings are modest, the ability to procure renewable electricity through CTBCM aligns with global sustainability trends that will increasingly affect Pakistan's export-sector competitiveness.
- Engage through your association. Individual firms navigating CTBCM alone face higher costs and weaker bargaining positions than those who engage collectively through sector associations.
- Stay informed. CTBCM rules will evolve as the market develops. Follow ISMO and NEPRA announcements, attend consultation processes, and update your firm's strategy as new information becomes available.

The firms that understand CTBCM earliest, prepare most seriously, and engage most constructively in the policy process will be the firms best positioned to benefit from Pakistan's energy transition; not just in the short term, but over the decade ahead.

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Annex A: Glossary of CTBCM Terms

Term	Definition
Bid Quantum	MW that an Auction Participant intends to acquire. Max cumulative: 160 MW (20% of 800 MW). Source: Framework Guidelines, Clause 2.1.k; RFP, Section 7.6.i.
Bid Value	PKR/kWh, paid OVER AND ABOVE Grid Charge and Surcharges. Min 3 decimal places. Cannot be negative. Fixed for Payment Period. Paid to Distribution Licensee. Source: Framework Guidelines, Clause 2.1.j; LOA Clause 11.
Bulk Power Consumer (BPC)	An electricity consumer with a demand of 1 MW or more that registers with ISMO to participate in the CTBCM market as a buyer.
Captive Power Plant	A power generation facility owned and operated by an industrial firm for its own electricity consumption. Under certain conditions, captive plants may participate in CTBCM as sellers.
CMOD	Competitive Market Operation Date; the official date, announced by NEPRA, from which CTBCM commercial operations formally begin.
Competitive Supplier	A licensed entity that aggregates electricity from generators and sells it to bulk power consumers under bilateral contracts. Must hold a NEPRA supply licence.
CTBCM	Competitive Trading Bilateral Contract Market; Pakistan's wholesale electricity market reform framework enabling direct bilateral contracting between buyers and sellers.
DISCO	Distribution Company; regional electricity distribution companies that operate distribution networks and currently supply power to end consumers.
Grid Charges	Charges paid for the use of the electricity transmission and distribution network. Payable by all CTBCM participants for wheeling.
Imbalance	The difference between the contracted electricity volume and the actual consumption or generation during a settlement period. Settled at the System Marginal Price.
Grid Charge	5 components per Rule 5(2)(a) Supplier Rules 2023: transmission, distribution, M&SO fee, metering service, cross subsidy. Source: Framework Guidelines, Clause 2.1.n.
Letter of Award (LOA)	Formal communication issued by ISMO after NEPRA approval and Gazette notification. States allocated quantum (non-transferable), milestone conditions, and PG requirements.
ISMO	Independent System and Market Operator — the State-Owned Enterprise that manages Pakistan's electricity system operations and the CTBCM wholesale market.
NEPRA	National Electric Power Regulatory Authority — Pakistan's electricity regulator. Issues licences, sets tariffs and wheeling charges, and provides the regulatory

	framework for CTBCM.
Net Metering	A separate NEPRA framework (not CTBCM) allowing small-scale generators; primarily rooftop solar; to export surplus power and receive credits on their DISCO bill.
Open Access	The principle that the national electricity grid is available for use by any registered and eligible market participant, not exclusively reserved for DISCOs.
PPA (Power Purchase Agreement)	A bilateral contract for the purchase of electricity. Under CTBCM, a corporate PPA is a long-term bilateral agreement between an industrial buyer and a renewable energy generator.
Settlement	The process by which ISMO calculates, reconciles, and processes payments relating to bilateral contracts, grid charges, and imbalances among all CTBCM market participants.
Single-Buyer Model	The existing power sector arrangement where CPPA-G purchases all electricity from generators and supplies it through DISCOs. CTBCM replaces this model.
SMP (System Marginal Price)	The hourly price determined by ISMO based on actual dispatch and demand conditions. Used for settlement of imbalances.
Stranded Costs	Costs relating to existing power generation capacity that must be paid regardless of how much power is actually used (capacity payments under existing PPAs). Not eliminated by CTBCM.
Wheeling	The transportation of electricity through the national transmission and distribution grid from a seller's injection point to a buyer's consumption point.
Wheeling Charges	Fees paid for use of the national electricity grid under CTBCM. Determined by NEPRA and payable by bulk power consumers in addition to the bilateral contract price.

Annex B: Acronyms

Acronym	Full Form
AMI	Advanced Metering Infrastructure
APTMA	All Pakistan Textile Mills Association
BPC	Bulk Power Consumer
CMOD	Competitive Market Operation Date
CPPA-G	Central Power Purchasing Agency – Guarantee
CTBCM	Competitive Trading Bilateral Contract Market
DISCO	Distribution Company
DSP	Distribution Service Provider
EPC	Engineering, Procurement, and Construction
ESG	Environmental, Social, and Governance
FAS	Facility Assessment Study
GHG	Greenhouse Gas
ICAP	Institute of Chartered Accountants of Pakistan
IPP	Independent Power Producer
ISMO	Independent System and Market Operator
LOA	Letter of Award
MCC	Market Commercial Code
MDI	Maximum Demand Indicator
MDM	Metering Data Management
MPA	Market Participation Agreement
MSP	Metering Service Provider
NEPRA	National Electric Power Regulatory Authority
NTDC	National Transmission and Despatch Company
PG	Performance Guarantee
PPA	Power Purchase Agreement
QCR	Quality Control Review
RE	Renewable Energy
RFP	Request for Proposals
SCADA	Supervisory Control and Data Acquisition
SECP	Securities and Exchange Commission of Pakistan
SIAS	System Impact Assessment Study
SOLR	Supplier of Last Resort
SRO	Statutory Regulatory Order
SBTi	Science Based Targets initiative
TSP	Transmission Service Provider

TSR	Technical Study Report
UoSA	Use of System Agreement
UoSC	Use of System Charges
VRE	Variable Renewable Energy

Annex C: Verified Important Data extracted for record

Parameter	Official Value and Source
First Auction Quantum	400 MW (Draft RFP, Section 3 and 4)
Aggregate Wheeling Quantum (5-year total)	800 MW (Framework Guidelines, Clause 2.1.a)
Max per participant; cumulative all auctions	20% of 800 MW = 160 MW (RFP, Section 7.6.i)
Bid Value format	PKR/kWh, minimum 3 decimal places, cannot be negative (RFP, Section 7.4)
Bid Bond amount	PKR 300,000 per MW of Bid Quantum (RFP, Section 8.1)
Bid Bond validity	12 months from date of issuance (RFP, Section 8.1.3)
Bid Bond bank rating requirement	Minimum short-term AA+ (RFP, Section 8.1)
Performance Guarantee amount	PKR 1,500,000 per MW of allocated quantum (RFP, Section 8.2)
PG validity period	From issuance until 3 months after Transaction Start Date (RFP, Section 8.2.3.ii)
PG return timeline	Within 15 Business Days of Transaction Start Date verification (RFP, Section 8.2.3.iv)
Payment Period	1 year from Transaction Start Date (Framework Guidelines, Clause 2.1.q)
Bid Value paid to	Relevant Distribution Licensee — NOT ISMO (LOA, Clause 11)
Proposal validity	365 days from Proposal Submission Deadline (RFP, Section 9.4)
Grievance Redressal Period	4 weeks total; grievances within 1 week of Provisional List (RFP, Section 7.3)
Max extension (all periods combined)	1 year (RFP, Section 18.i)
Extension request lead time	At least 3 months before deadline (RFP, Section 18.ii)
Blacklisting for forged information	Up to 5 years (RFP, Section 12)
Electronic Platform	auctions.ismo.gov.pk
ISMO contact	ISMO Building, Pitras Bukhari Road, H8/1, Islamabad | info@ismo.gov.pk
Use of System Agreement term	10 years (UoSA, Article 10.1)
Security Cover formula	2 × monthly UoSC estimate (UoSA, Article 7.14, Factor = 2)
UoSC Invoice Due Date	15th day from invoice issuance (UoSA, Article 1.2(xxiv))
Non-payment: DISCO notifies supplier	Within 3 Business Days after Due Date (UoSA, Article 7.9)
Non-payment: Security Cover encashable	After 10 Business Days from Due Date (UoSA, Article 7.9)
Security Cover replenishment deadline	Within 10 Business Days (UoSA, Article 7.15.5)
Security Cover return after termination	Within 30 Business Days (UoSA, Article 10.5)

FM threshold in Use of System Agreement	60 consecutive days (UoSA, Article 9.1.2.vi)
FM notice in UoSA	7 Business Days (UoSA, Article 9.3)
FM notice in Connection Agreements	48 hours (Annex-X/XI, Article XVII/XIV)
BPC Connection Agreement term	As long as DISCO Distribution Licence is valid (Annex-XI, Clause 2.2.2)
New BPC advance notice to DISCO	At least 15 Business Days (UoSA, Article 7.2.1)
Confidentiality Agreement term	5 years or until obligations expire, whichever later (Annex-XXIII, Clause 6)
Financial soundness: >1-yr company	Min 'A' long-term credit rating (RFP, Section 7.1.5.b)
Financial soundness: <1-yr, debt-financed	Shareholder liquid assets ≥ 30% of project cost (RFP, Section 7.1.5.c.ii)
Financial soundness: <1-yr, self-funded	Shareholder liquid assets ≥ 70% of project cost (RFP, Section 7.1.5.c.iii)
Auditor requirement	Valid QCR rating from ICAP; not existing auditor (RFP, Section 7.1.5)
Tax statements required	Income year 2025 (RFP, Section 7.1.5.c.ii and c.iii)
Operating Ctte rotation; BPC agreement	6 months (Annex-XI, Clause 2.8.3)
Operating Ctte rotation; Generator agreement	12 months (Annex-X, Clause 2.8.3)
Grid Charge components (all 5 official)	(1) Transmission, (2) Distribution, (3) M&SO fee, (4) Metering service, (5) Cross subsidy (Rule 5(2)(a) Supplier Rules 2023)

Annex D: Suggested Documents for Further Reading

The following documents and sources are recommended for stakeholders seeking greater technical, regulatory, or policy depth. All official documents should be obtained directly from the issuing institution.

Document	Source / Access
Framework Guidelines for Wheeling Auctions, 2025 (SRO 92/(I)/2026, 22 Jan 2026)	Gazette of Pakistan Extra Ordinary Part-II; Ministry of Energy (Power Division)
Draft RFP for Consultation: Auction Quantum 200 MW (modified 400 MW)	ISMO; auctions.ismo.gov.pk
Annex-III: Letter of Award template	ISMO Draft RFP Annexures
Annex-X: Connection Agreement (Generator/DISCO)	ISMO Draft RFP Annexures; GEPCO stamp
Annex-XI: Interconnection Agreement (BPC/DISCO)	ISMO Draft RFP Annexures
Annex-XII: Use of System Agreement (Distribution Licensee/Competitive Supplier)	ISMO Draft RFP Annexures
Annex-XXII: Covenant of Integrity	ISMO Draft RFP Annexures
Annex-XXIII: Confidentiality Agreement	ISMO Draft RFP Annexures
Annex-XXIV: Connection Process (Transmission and Distribution)	ISMO Draft RFP Annexures
South VRE Quantum Study	ISMO; available on request
Eligibility Criteria (Electric Power Supplier Licences) Rules, 2023	NEPRA; nepra.org.pk
NEPRA Licensing (Electric Power Supplier) Regulations, 2022	NEPRA; nepra.org.pk
National Electricity Plan 2023-27 (Strategic Directive 87)	Ministry of Energy (Power Division)
National Electricity Policy 2021	Ministry of Energy (Power Division)
ISMO Contact	ISMO Building, Pitras Bukhari Road, H8/1, Islamabad | info@ismo.gov.pk | auctions.ismo.gov.pk
NEPRA Electricity Procurement, Open Access and Market Operations Regulations	Key regulatory instruments underpinning CTBCM participation rights.
GHG Protocol Scope 2 Guidance	For firms considering how CTBCM-sourced electricity interacts with corporate emissions accounting.
RE100 Technical Criteria	For firms exploring renewable energy procurement under international standards.

Annex E: Information to Confirm with ISMO / NEPRA Before Publication

DISCLAIMER

The following items are not yet specified in the official documents reviewed for this guide or are subject to change. Firms must confirm these directly with ISMO and/or NEPRA before making any commercial or legal decision.

Item to Confirm	Where to Confirm
CMOD date: when do the Guidelines formally come into effect?	NEPRA announcement
Grid Charge rates per component: final PKR/kWh under Rule 5(2)(a) Supplier Rules 2023	NEPRA determination
Minimum demand threshold for BPC status: which regulation and what is the figure?	NEPRA; Eligibility Criteria Rules 2023
Auction Calendar with specific dates for all 15 process steps	ISMO; auctions.ismo.gov.pk
Final RFP (non-draft): confirm any changes from Draft RFP reviewed in this guide	ISMO publication
Node-specific transmission capacity limits from South VRE Quantum Study	ISMO; published study
Specific dates for conditions (b) through (h) in LOA Clause 9: these are published by ISMO in the final RFP	ISMO; LOA issued post-auction
FM termination threshold for Connection Agreements (currently [•] in Annex-X and Annex-XI templates)	Final executed Connection Agreement
Status of ISMO Electronic Platform; auctions.ismo.gov.pk for current auction information	auctions.ismo.gov.pk
Published Auction Process document (Annex-II to RFP); submitted to NEPRA within 7 days of 22 Jan 2026 Guidelines notification	ISMO; NEPRA
Current registered Competitive Supplier pool and NEPRA-licensed sellers available for bilateral contracting	NEPRA; ISMO

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This guide is prepared for informational purposes only. It does not constitute legal, regulatory, financial, or technical advice. All information is sourced from publicly available official ISMO documents as noted throughout. Nothing in this guide creates any rights or obligations with respect to ISMO, NEPRA, or any other regulatory authority. Firms must obtain qualified independent legal, technical, and financial advice before making any decisions regarding CTBCM participation. All figures and requirements should be verified directly with ISMO (info@ismo.gov.pk) and NEPRA (nepra.org.pk) before acting upon them. Also, this guide is based on publicly available information as of May 2026.