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Instruments to mitigate transition risks towards liberalized electricity markets: An international perspective

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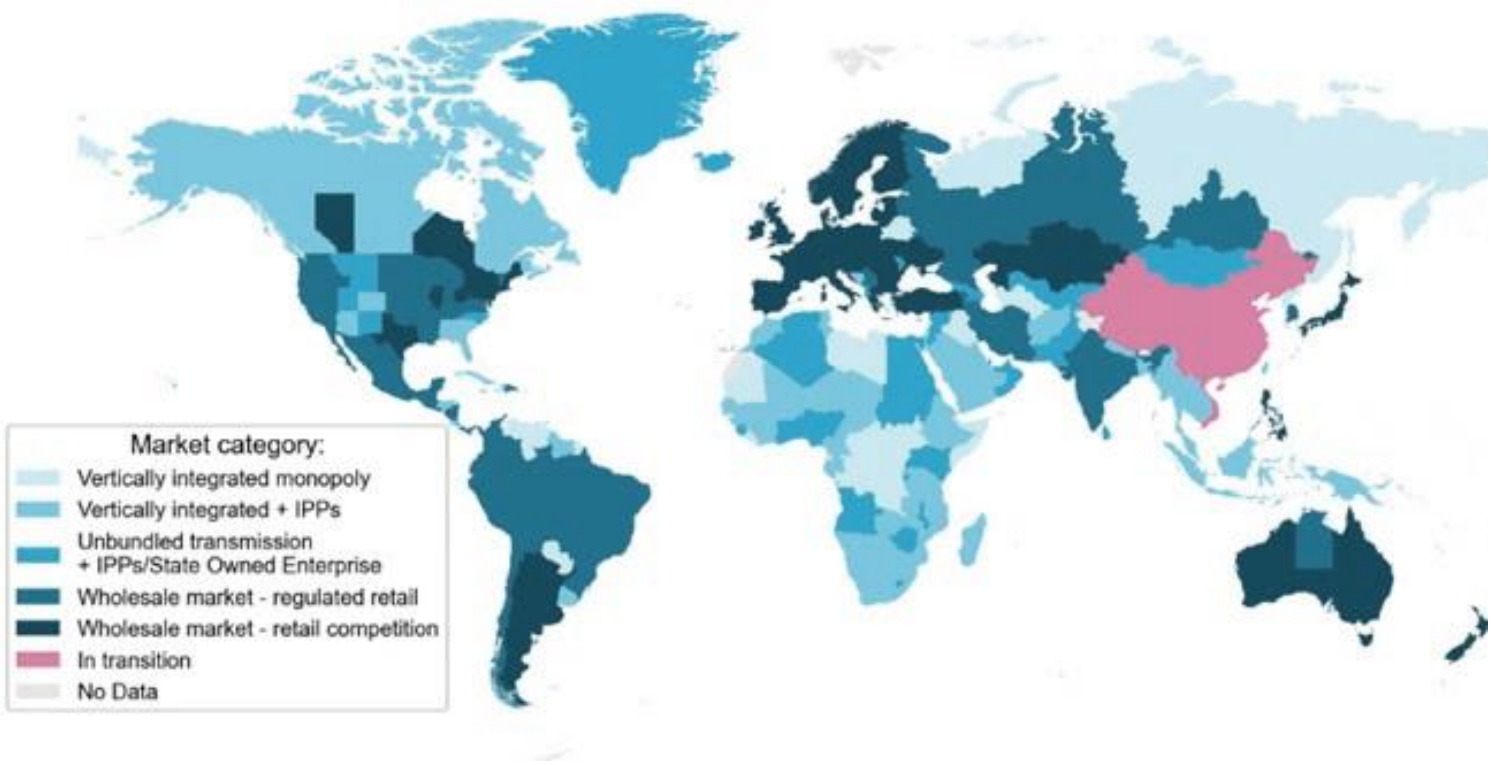
Presentation Outline

- ❑ International Trends with Electricity Market Reforms
- ❑ Key Decisions and Questions
- ❑ Electricity Market Instruments
- ❑ Country Examples

Over the past few decades most large electricity systems across the world have transitioned away from the vertically integrated utility monopoly.



Source IEA, 2022

About half of electricity is produced in systems that have opened their markets to competition - and the share will increase to ~75% once China completes the current transition to an open market.

Several decisions need to be discussed and agreed on when planning to introduce a new electricity market structure that works for all.

Key decisions to consider:

1. How to ensure the **wholesale and retail markets interact** efficiently in both the short term and the long term?
2. Which regulations can **protect consumers** in a more liberalized power system?
3. How can **tariffs and pricing** enable efficient system operation and still incentivize longer-term infrastructure investments?
4. How to adapt **power sector planning** to an evolving power system with higher levels of uncertainty and new participants?
5. What is required to level the playing field for **low carbon energy** and new technologies to meet decarbonisation goals?
6. How can **market-based mechanisms** be leveraged to shift risks to the private sector?
7. Which **adequacy mechanisms** could be used to ensure system reliability?

Common questions come up when making reforms to an electricity market structure.

What is the purpose of wholesale electricity markets?

- Platform for trading electricity and related services to promote competition
- Can help **achieve certain policy goals** such as increasing private sector investment, & removing operational inefficiencies to minimize electricity costs , BUT they WILL NOT, by themselves, achieve other policy objectives, like decarbonisation or adequacy. That is why market design is important
- No one-size-fits-all design

How will roles and responsibilities change in the new market?

- Government, regulator & unbundled utility still play key roles in new market
- Power sector planning for generation transmission & distribution moves away from vertically integrated utility
- Some electricity market aspects will remain regulated while others will be competitive.
- The **level of competition introduced varies** for each regional power sector and may be phased in over time

Will electricity tariffs and prices go up or down with reforms?

- Liberalisation will lower total system costs and improve efficiency; **puts downward pressure on tariffs and prices** compared to monopoly
- Bills are influenced by other factors (e.g. cross-subsidies, fuel price)
- Not an easy yes/no answer for all customers as price impacts vary so deeper analysis and forecasting can help answer this question

Instruments exist to address many of common transitions risk and enable policy goals such as efficiency, affordability, price predictability.

Mapping policy objectives to specific instruments

Policy objective	Instruments to achieve the objective	Instrument description
Long-term and short-term cost minimization 	Wholesale markets (unbundling, market monitoring)	Wholesale markets ensure efficient electricity trading by separating production from distribution, and monitoring competition.
Market power prevention 	Market monitoring, unbundling, legacy contracts	These measures prevent monopolistic behavior by monitoring competition, ensuring fairness, and phasing out old anti-competitive contracts.
Clean energy deployment 	Renewable portfolio standards, renewable energy auctions	Standards require a percentage of energy to come from renewables; auctions incentivize cost-competitive clean energy projects.
Resource adequacy 	Scarcity pricing, capacity remuneration mechanisms	Scarcity pricing increases market prices during shortages; capacity mechanisms ensure there is enough supply to meet demand.
Final consumer price stability 	Hedging contracts, long-term and mid-term auctions	Hedging and auctions protect consumers from price volatility by fixing prices over specified periods.
Affordable rates for vulnerable populations 	Budget transfers, cross subsidies	Budget transfers provide direct financial support; cross subsidies balance costs between consumer groups.

Source: C. Ahlfeldt, A. Hernandex, B. Sáenz. Key Decisions to Consider for Electricity Sector Liberalization, RAP on behalf of the PCC, March 2025.

There is no one-size-fits-all solution for electricity markets.

Key power system features by country :

Chile 	• **Competitive wholesale market since 1982;** prices set via spot market and long-term contracts • Large users (>500 kW) can freely contract with generators or traders, while small users remain under regulated tariffs • Distribution is privatized, with private companies operating in concession areas and procure energy via market bidding
Brazil 	• Initial liberalisation lacked coordination resulting in **2001 supply crisis;** Full unbundling & more reforms made in 2004 • **Creditworthy private distribution companies** (DISCOM) don't require government guarantees • Transmission is centrally planned **and auctioned via 30-year** contracts • Nat'l Dev Bank enables renewables via financing, risk tools, and local supply chain support
India 	• National wholesale market with **~50% private IPP generation and recent grid upgrades** • Large users (>1MW) access power via PPAs or traders while smaller users can choose green power from local DISCOMs • **86% of trade still** through long-term PPAs requiring reform alignment • Privatisation of DISCOMs has improved operational performance
Guatemala 	• **Wholesale market trades power and energy** across 6 **markets** (spot, bilateral, deviations, grid services, & 2 cross-border) • Transmission is planned 30 years ahead and built via public tenders, funded through tariffs • **Distribution is privatized**, with private companies that operate under regulatory oversight
Mexico 	• Independent system operator runs wholesale market trading energy, capacity, clean energy certificates, & grid services • Still use long-term auctions (15-year) for generation (capacity and energy) and grid expansion (assets revert to state) • Market participants (>5 MW) may trade directly in the market, while qualified users (>1 MW) can choose private retailers

Source: C. Ahlfeldt, A. Hernandex, B. Sáenz. Key Decisions to Consider for Electricity Sector Liberalization, RAP on behalf of the PCC, March 2025.

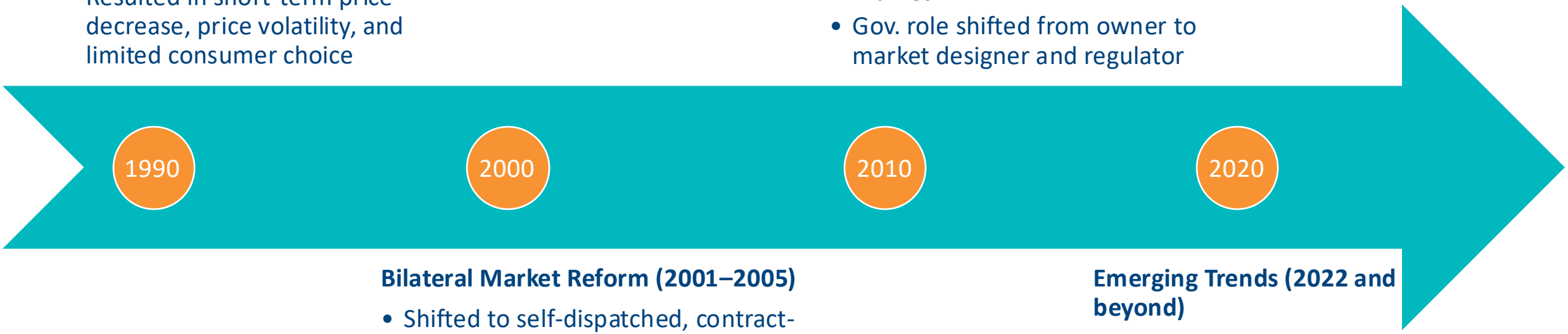
Please keep in mind: market liberalization is work in progress: Eg: The UK market continues to evolve beyond initial design.

Early Liberalisation via "The Pool" (1990s)

- Privatisation & centralized trading
- Resulted in short-term price decrease, price volatility, and limited consumer choice

Decarbonisation Era (Post-2013)

- Introduced Contracts for Difference (CfDs) Capacity Market
- Gov. role shifted from owner to market designer and regulator



Bilateral Market Reform (2001–2005)

- Shifted to self-dispatched, contract-based trading with Forward, Spot, Balancing, and Imbalance markets.
- Consumers gained negotiation power, but lack of capacity market hurt investment & system reserves.

Emerging Trends (2022 and beyond)

- Transition to proactive Distribution System Operator to manage distributed energy resources
- Exploring regional electricity markets and managing monopolistic consolidation (The Big Six)

Source: J. Liu, J. Wang, J. Cardinal. (2022). Evolution and reform of UK electricity market.https://www.sciencedirect.com/science/article/pii/S1364032122002313

In conclusion, Markets can be powerful tools for progress, but they must be carefully designed, and they must be paired with the right instruments to deliver broader public value.

Thank you!