

De-Centralized and De-Carbonized: Efficient Power Market Entry and Exit

WRI-RFF Workshop
November 28, 2018

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Hint: Markets Have Buyers

THIS



NOT THIS



Disclaimer

1. Speaking for no one else.
2. Speaking only about 2025 and beyond, after any transition period during which market participants in today's structure and design are able to change their business models to fit new ones.

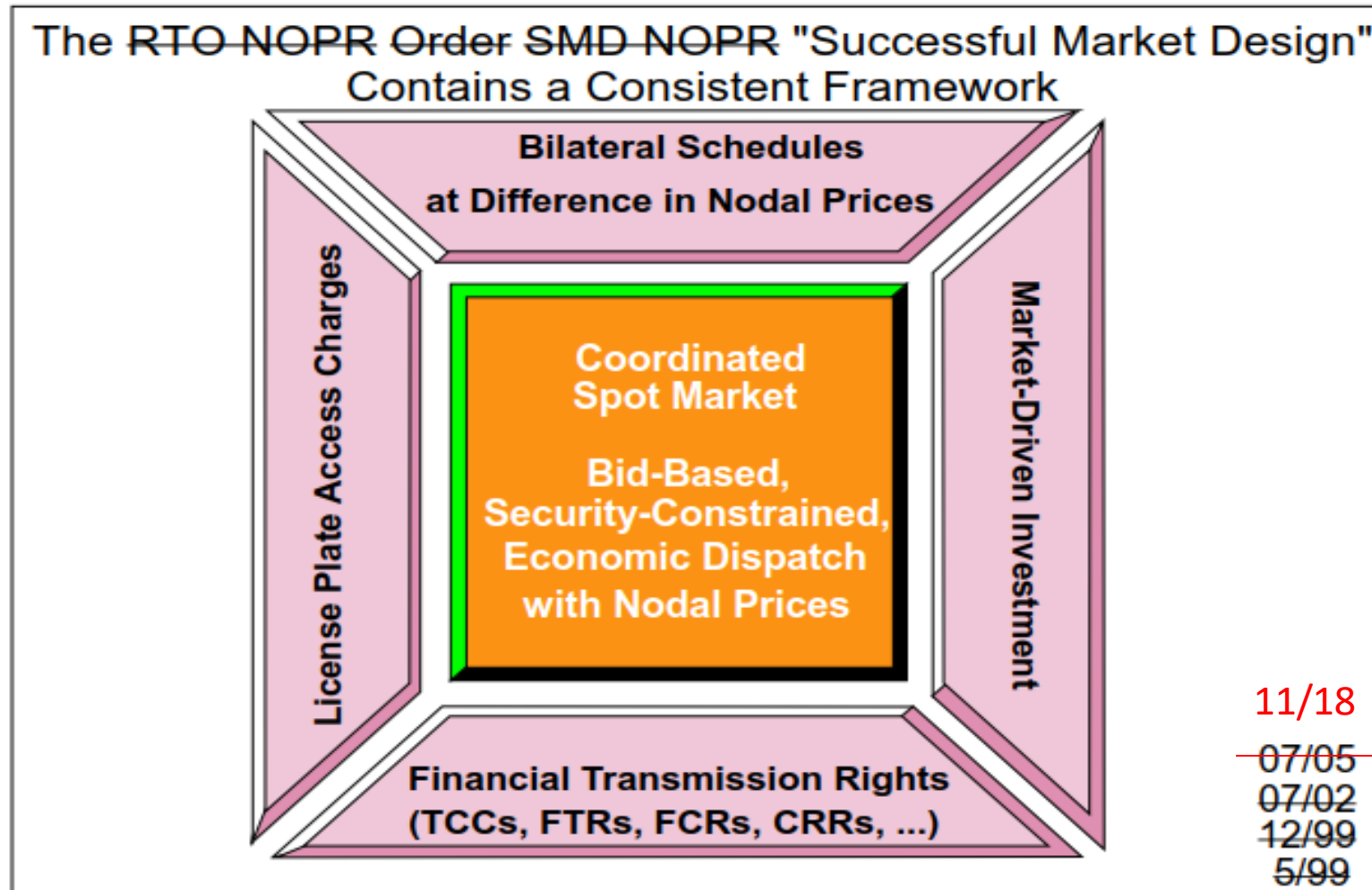


Market Structure (Who Does What)

- Environmental regulators internalize externalities
- RTO balances power system and administers spot market
 - Procures reliability services based on engineering definitions, not stakeholder politics or FERC Commissioner interests
- LSEs hedge by buying short and long term power
- State PUCs oversee hedging for some or all customers (if state chooses)
- RTO or other planning authority plans transmission for reliability and efficiency
- Gencos build projects to sell the electricity products at the times and places customers want
- Financial participants offer risk management products



Standard RTO Market Design Still Robust



W. Hogan, On an "energy only" electricity market design for resource adequacy" (2005)



Key Market Design Features with High Renewable Penetration

- Flexible
 - Fast (e.g., 5 minute) dispatch, scarcity pricing
- Fair
 - Technology neutral service definitions
- Far
 - Large geographic areas with seamless trading
- Free
 - Bilateral contracts and state policy allowed



See https://windsolaralliance.org/wp-content/uploads/2018/11/WSA_Market_Reform_report_online.pdf



Economic Policy Guideline

- Policy intervention justified when there is a market failure, and when the particular intervention improves efficiency
 - Coordinated spot market needed because of network externalities, natural monopoly, and public goods. Most industries don't have these.
 - Transmission planning needed because of the public good failure with a shared AC network.
 - Centralized resource adequacy originally justified because power at peak was a public good (non-rival, non-excludable). Is it still?
- So is any further FERC-authorized RTO function needed, or can we let market participants do the rest?



Making Generation Financeable

- **Revenue risk reduction through:**
 - Physical bilateral (PPA)
 - Synthetic PPA
 - Swaps
- **Remaining risks can be managed with clear responsibility assigned**
 - Municipals, coops, IOU LSE buyers, or competitive retail suppliers with sufficient financial wherewithal as creditworthy counter-parties
 - LSEs, gencos, financial participants can mitigate:
 - Prices over time—long term and time of day/season
 - Prices over space—congestion, or “basis” risk
 - Transmission planners: reduce inefficient congestion



Testimonial #1

“Bilateral hedging activity and premium forward pricing provides a considerable revenue stream for generators beyond realized real-time pricing and the Operating Reserve Demand Curve (ORDC). This is an efficient market solution for entities wanting to avoid price risk... futures markets capture the risk that things may not go according to plan and very high prices may materialize. The market is exceptionally good at rationalizing these types of risks and pricing them appropriately, as the reaction to lower planning reserve margins demonstrates.”

Texas Industrial Energy Consumers (TIEC)

http://interchange.puc.texas.gov/Documents/48551_25_993729.PDF p. 4.



Testimonial #2:

Typical Generator Finance in ERCOT

“The Project entered into a hedge arrangement for the output of the project simultaneously with financial close, providing certainty of revenue for the majority of the Project’s output for a 12 year period from the commencement of commercial operations (“COD”), with settlement at the [redacted] trading hub. The Project also entered into a basis hedge for a period of 3 years post-COD, mitigating exposure to transmission congestion risk through to the completion of approved transmission upgrades in [year redacted].”

Investor prospectus for a wind farm in Texas



Alternative Feasible Approach 1: Capacity Obligations + Market

- Mandatory Capacity Obligations on LSEs
- Challenges:
 - Poor at flexibility. Flexibility is becoming the scarce generation resource, not capacity or energy.
 - PJM: “the [Capacity Performance] construct is not intended to reward the flexibility attributes that are essential to efficiently meet operational needs.” (PJM Comments to FERC in DOE NOPR docket RM18-1)
 - Utilities don’t join RTOs if resource adequacy jurisdiction is taken away from states (1/3 of US outside of RTOs, much of industry is not FERC jurisdictional)
 - Some states threatening to pull out of RTOs due to state policy mitigation
 - RTO “capture” with incumbent domination of stakeholder committees
 - Incumbent old dirty plants never exit
 - RTO management’s incentive is to support large reserve margins paid by load



Alternative Feasible Approach 2: Regional Regulated Utility

- Regional Integrated Resource Planning with central dispatch
 - Up front guaranteed cost recovery
- Challenges:
 - Subject to political meddling to favor incumbent conventional generation, particularly in the transition
 - No accountability, cost over-runs. Vogtle, Kemper, etc.
 - Incumbent old dirty generation does not exit
 - Governance

