Resource Adequacy in “Energy-Only” ERCOT

Shams Siddiqi, Ph.D.
Crescent Power, Inc.
(512) 619-3532
shams@crescentpower.net

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Background on ERCOT

Electric Reliability Council of Texas (ERCOT) is:
- ISO with over 60 GW peak load, 70 GW generation
- Consists of about 85% of the load in Texas
- Its own interconnect that is an electrical island with several DC ties to neighboring system
- Wholesale deregulated in 1996
- Had a self-mandated 15% Reserve Margin requirement for all utilities until 1999
- Stakeholders in 2000 decided to eliminate the 15% Reserve Margin requirement
- Retail deregulated in 2002 – creation of ERCOT-operated single control area
- Public Utility Commission of Texas (PUCT) in 2006 reaffirmed the Energy-Only market design in ERCOT
Resource Adequacy History in ERCOT

- Before 1996, rate-of-return regulation had incentive for utilities to over-invest - PUCT ensured prudence
- After 1996 and introduction of IRP process, utilities reduced costs and avoided the onerous IRP process
- Reserve Margin experienced a steady decline till 1999
- "Paper" capacity and under-forecasted demands reported
- Consequent high prices resulted in a flurry of investment
- ERCOT eliminated Reserve Margin requirement in 2000 becoming an Energy-Only market
- Capacity glut resulted in calls to revisit Energy-Only design
- PUCT in 2006 reinforced its commitment to Energy-Only design
- Favorable investment environment: transmission upgrades paid by load, easy permitting process, etc.
Why an Energy-Only design?

- Market trades electrical energy - Energy-Only markets maintain this “pure” commodity market structure
- Regulatory Capacity viewed as artificial product mandated by regulators
- Regulatory Capacity intended to transfer money to resources under tight energy offer mitigation
- Forward-looking regulatory requirements are difficult to impose on a retail deregulated market like ERCOT
- Regulators recognize difficulty of undoing a subsidy
- Scarcity prices ensure no “free riders” - convert resource adequacy into a “private good”
- Energy-Only market encourages decentralized decision-making
Why an Energy-Only design?

- ICAP schemes are dependent on regulatory determination of amount and type of capacity needed - re-introduce potential for “stranded costs”
- Stakeholders viewed Regulatory Capacity as a legacy of tight, cost-based pools used to share Reserve Capacity obligations
- Enhancements to ICAP methods lead to greater regulatory intervention
- Regulatory process to determine the type, amount, location, characteristics of capacity resembles the failed IRP process
- PUCT concluded that Capacity Markets represent additional regulation, rather than a market approach to providing incentives for investment. These markets have been costly to customers, and there have also been questions about whether they are effective in inducing developers to invest in new generating facilities
Two-Step Mitigation & Scarcity Pricing

- Texas Two-Step method in SCED mitigates against the exercise of locational market power arising from congestion on non-competitive constraints while ensuring that scarcity prices are not mitigated.
- Automatic mitigation that does not rely on subjective judgments by the system operator or arbitrary measures in the system design.
- By not suppressing scarcity prices, the Texas Two-Step method perfectly complements the “Energy-Only” market-based resource adequacy approach of the ERCOT market.
Texas Two-Step

Two-step SCED process:

- Step 1: System optimally dispatched with Competitive Constraints and no mitigation to produce “Reference Prices”
- Step 2: System optimally dispatched with offers mitigated at greater of Reference Price or Mitigated Offer Cap and all Constraints modeled (SCED) to determine LMPs and dispatch instructions
Design to support Energy-Only market

- PUCT in 2006 ordered following design elements to ensure success of Energy-Only design (similar to Australian market):
  - Publish Statement of Opportunities (SOO): 5- to 10-year projection of resources, transmission facilities, and load
  - Projected Assessment of System Adequacy (PASA): for every week of the subsequent three years and every hour for the next week: load forecast by zone, ancillary service needs, transmission constraints, and resources by zone
  - Publish quantities and prices of offers and bids for energy and ancillary services and resource output after 2 days
  - Scarcity pricing mechanism (SPM): Set system-wide offer cap at $3,000/MWh (HCAP) as long as profits of a 10 MMBtu/MWh heatrate Peaker (Peaker Net Margin or PNM) is less than $175,000/MW; if PNM exceeds $175,000/MW, system-wide offer cap is reset at greater of $500/MWh or 50 times natural gas price for the remainder of that annual resource adequacy cycle
Design to support Energy-Only market

- HCAP is set high enough to encourage forward contracting to avoid scarcity prices
- Reliability Unit Commitment costs charged to those entities that are short capacity
- ERCOT credit requirements set to encourage bilateral contracting
- Forward contracting is recognized as best means of ensuring new investments
Questions