Forming Expectations about Price Formation

Travis Kavulla
Regulatory Majordomo, NRG Energy
Dec. 12, 2019

Harvard Electricity Policy Group
Somewhere Outside Tucson, Arizona
SAFE HARBOR:

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Please note: If you invest in NRG, you are taking a risk based on our projections – so if you don’t like that, consider investing in a regulated utility where the risk of these projections is shifted to captive customers.
NRG At A Glance

DIVERSITY

- Approximately 35 generating assets in 8 states
- Approximately 3.7 Million customers

STABILITY

- Fortune 500 company
- Over $9 Billion in revenue

SUSTAINABILITY

- 50% carbon emissions reductions by 2025*
- Net-zero carbon emissions reduction by 2050*

*Using 2014 as a baseline

STRENGTH

- Over 4,500 full-time employees

SAFETY

- 7 facilities with VPP Star rating

As of 6/30/19 and pro forma for the Stream acquisition, which closed on 8/01/19 and included approximately 450,000 customers.

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NRG At A Glance

**RETAIL LOAD**
2018 TWh Sold

- 38 TWh Texas Mass
- 20 TWh Texas C&I
- 8 TWh Northeast Mass
- 1 TWh Northeast C&I

**GENERATION CAPACITY**
By fuel type – North American Portfolio

- 43% Natural Gas
- 34% Coal
- 16% Oil
- 5% Nuclear
- 2% Renewables

As of June 30, 2019
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• **Holy moly, this actually works**
  • Supply faces a strong incentive to be available when needed.
    • 44% of RT energy market revenue in a 6-month period, March to August 2019, comes from a single 5-day stretch (Aug. 12-16)
  • Load faces a strong incentive to cover its position through self-supply or third-party commercial arrangement
    • IMM estimates that only ~10-20% of load is “unhedged” to real-time price.
    • That estimate does not reflect retailers’ assumption of price risk for their customers’ load (who are mostly on fixed-price contracts). Actual unhedged load on a combined wholesale/retail basis is much lower still.
    • Those retailers (e.g., Griddy) with truly unhedged customers got angry calls & lost market share! Turns out customers have a mind of their own and don’t require a paternalistic government to speak for them!
• **Demand flexibility**

  Larger, more sophisticated C&I customers select index pricing products because they are comfortable with the risk/volatility.

  The competitive retail market is enabling growth in demand response products. ERCOT reported 1.2 million customers on price responsive products (TOU, DR) in 2018.

• **Supply procurement**

  Appropriate new capital investment is encouraged. NRG signed 1,400 MWs of 10-year solar PPAs this summer based on tradeable & estimated forward prices.
### ERCOT: A renewables bonanza?

#### Solar

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Take a Bow, Y’all

• The authors of *Priorities for the Evolution of an Energy-Only Electricity Market* (May 2017) should take a bow!

• As should the regulators who agreed to adopt its most important recommendations in a two-phase implementation (March 2019, March 2020).

• The ERCOT market stands as a major accomplishment for those who want to see competitive markets survive.
FOR IMMEDIATE RELEASE

PJM Files Reserve Pricing Reforms for the Future of a Flexible, Reliable Power System
Proposal Before FERC Seeks Proper Pricing for Valuable Reserves

(Valley Forge, Pa.– March 29, 2019) – PJM Interconnection today proposed energy and reserve market reforms to fairly value the crucial energy reserves that support a reliable electrical grid with the flexibility required for the continued evolution of the resource mix in the nation’s largest bulk power system.
Texas: Reliability...achieved?

Even if one assumes that projections of renewable build are over-optimistic, by 2021’s CODs, reserve margins see an uptick.

So what about 2020?
A few issues worthy of attention in ERCOT

- Environmental law vs. scarcity
  - Texas CEQ “Notice of Enforcement Discretion”
- Transmission ratemaking vs. energy pricing
  - 4-CP, and peak load vs. peak net load
- CDR projections vs. reality
- Will a CREZ 2.0 be needed to make this all work?
“Reliability Through Markets”: A Great ERCOT Slogan...
...Which is actually CAISO’s! (Several re-brands ago)
• Beth Garza asks in her slides: “Did market participants effectively manage their price exposure?” in relation to ERCOT’s summer
  • The beauty of ERCOT is that the people who care the most about the answer to this question are market participants
  • But in California, government still “owns” this question

• California:
  • doesn’t have a full competitive retail market to pass off the business & risk of hedging
  • has IOUs who are largely financially indifferent as to whether they’re making good/bad bets on energy supply
  • have local-government-sponsored CCAs that are making bets—but with other people’s money, and with an eye toward beating the IOU “price to compare,” not necessarily on medium/long-term viable hedging practices
California’s Energy Market(s)
California’s “Resource Adequacy” Extravaganza

Market participants in California are increasingly unmoved by energy price signals – and look to RA contracts to make ends meet.


CPUC, 2018
RA’s Price is Increasing

CPUC, 2018
Coming Up Short?

CPUC, 2018
• Parties have different, changing views of what “RA” is
  • When California began using ELCC, RA contribution of renewables dropped significantly.
  • Some other states continue to use simpler “exceedance” benchmarks for renewables.
  • Parties usually do not calculate RA as a function of a value of resources in relation to the regional interconnection – but often still as a standalone firm.

• The rise of ad hoc resource decisionmaking
  • California rescues its Once Through Cooling plants
  • Rules on RA imports to California tightening up
  • Coal plant closures—not clear that capacity is being considered in this context

• CAISO: More productization, rather than strict focus on energy – if successful, ultimately could create a more centralized, short-run market for RA-like things
What’s the Point of Price Formation if...

• 1 in 4 Americans live in a jurisdiction that’s declared a 100% clean-energy goal

• The **implementation policies** of ambitious state electricity standards are taking the form of government-led procurements

• These contracts:
  • Have long terms (usually ~20 years), insulating generators from market’s churn
  • Are priced substantially above what the wholesale market would itself support (NJ’s offshore wind Year 1 price = x3 wholesale price)
  • Are the result of processes that range from completely ad hoc (one-off proposals) to quasi-competitive (an RFP process to obtain the contract, but restricted to certain qualified technologies – rather than based on carbon emissions saved)
  • Have counterparties who are financially indifferent
Back to the Future: Regulatory ‘The Price is Right’ in New Jersey

What is sold as a competitive process for large-scale renewable build-out... is not.

It’s a return to “revenue requirement” regulation.

2 OREC PURCHASE PRICE
The OREC Purchase Price was defined in the rules at N.J.A.C. 14:8-6.1 and 6.5.(a).12 as the price per OREC (megawatt hours (MWh)) paid for a Qualified Offshore Wind Project. Hence, the OREC Purchase Price reflects the all-in costs of the project, i.e., the total project capital and operating costs offset by any state or Federal tax or production credits and other subsidies or grants. The OREC Purchase Price is fixed for the first 20 years of project operation and paid on a dollar per MWh for delivered energy. The rules at N.J.A.C. 14:8-6.5.(a).12.(iii) and (vii) required applicants submit an OREC Pricing Schedule with a fixed OREC price for each year of the proposed 20 year term of operation. The first year OREC price is typically the lowest price that may be subject to a rate of inflation over the life of the project. The levelized OREC Price, which reflects the rate of inflation, is the OREC Price used to evaluate projects on a competitive basis. LAI also evaluated the LNOC, which is the OREC Price less the expected value of energy, capacity and environmental attributes. The levelized net OREC Price represents the net price paid by ratepayers. It is expressed on a nominal dollar basis over the 20-year OREC term using a discount rate equal to 7%.

It’s like old-school utility regulation – but with none of the transparency!
Price Formation a la RPS

Absent a carbon price, it may be a reasonable “second-best” to pay a price premium for emissions-free energy – we even have a product for it: The REC.
Some Closing Thoughts

NRG has endorsed Brattle’s concept of a Forward Clean Energy Market – which clears “Clean Energy Credits” through forward auctions and thus can inform lower-priced offers into capacity markets (where they exist) and merchant entry into energy markets.

If State RPSes/CESes are not rationalized, the nuance of price formation is going to be a footnote to a flood of state contracting activity (at least until states find that their preferred supply doesn’t meet demand).

A major, overlooked component is that the buyers need to care about cost – regulated utilities, default suppliers, and state entities don’t (or at least not as much as those in a competitive market).

Put another way: Without retail choice, ERCOT’s market design might not work.