

# ARE “WE” ASKING TOO MUCH OF ELECTRICITY MARKETS?

CEE 4th Mid-Year Meeting, June 28, 2016

# CEE Funding

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*Cedigaz ▪ Chevron Corporation (Global Gas, Africa/Latin America) ▪ Electric Power Research Institute  
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## State of Texas

*State of Texas Advanced Resource Recovery Program/Office of the Comptroller*

## U.S. Government

*Department of State – Energy Bureau (Mexico Upstream Oil & Gas Technical Assistance)*

## The University of Texas at Austin

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ExxonMobil Upstream Commercial Overview<sup>1</sup> and other corporate programs) ▪ UT Energy Institute*

# “Our” Asks – Cognitive Dissonance?

- “Cheap” electricity (efficiency)
  - Wholesale v retail
- High reliability (e.g., NERC criteria of 1-in-10-yrs → reserve margin: 10-20% capacity above peak demand)
- “Clean” electricity
  - Air emissions
  - Land impact
  - Water impact
  - Solid waste
- Secure grid

# Major Uncertainties in the Power Sector

- An inventory of ~114 GW of wind and ~34 GW of solar (SNL)
  - Extension of PTC & ITC (BNEF: \$73B increase in investment → 19 GW of wind and 18 GW of solar between 2016 and 2021)
- Renewable Energy Buyers Alliance: 60 GW by 2025
- KPMG survey of energy executives:
  - 62% believe half of US power from clean energy sources by 2045
  - 41% of utility executives expect "significant change" towards a significantly more distributed, unbundled system
- Interest in DER (Brookings: "Net metering is a net benefit")
- Declining cost of PV (utility-scale and rooftop)
- Long-term PPAs offered by IOUs, munis, coops

# Competitive Price Formation is Partial

- Energy-only markets are the exception, and
  - Price caps limit their effectiveness
  - There is no/incomplete demand-side participation (FERC Order 745?)
- Capacity markets “fill the gap,” but
  - They can be inefficient
  - Non-transparent uplift payments are still needed
- Prices are also distorted by
  - Renewables (federal and local subsidies, RPS programs, long-term PPAs)
- Retail prices have not followed wholesale prices down

# “The Times They Are A-Changin’” – Creative Destruction?

- “Early” retirements raise reliability concerns, inducing more out-of-market solutions (Ohio, Maryland, New York, Illinois)
- DER reduces revenues for utilities → regulatory corrections
  - DR and EE might have similar impacts if provided by non-utility competitors
  - Load profiles might change significantly with uncertainty of market prices
- Gas-power harmonization?
- Large grids where wind & solar balance each other
  - Can needed transmission be built (ROW, jurisdiction)? Who pays?
  - Grid security?
- Storage can be a game-changer but large uncertainties exist regarding technology, cost, market rules, minerals value chain issues

CEE submitted a grant application to DOE NETL to study storage economics (in collaboration with Prof. Erich Schneider, UT Austin Dept. of Mechanical Engineering).

# So, What Future Should We Expect?

## Consumption of NG in Power Generation (2014=1)

