### ELECTRICITY COMMITTEE MONDAY 9:00AM



### **Energy Markets at a Crossroads?**

A conversation on the future of electricity markets and the role of state regulators.

### MODERATORS



DeAnn Walker Chairman Texas PUC



### PANELISTS



Mike Jacobs Union of Concerned Scientist



Allison Silverstein Independent Contractor



Mason Emnett Exelon Corporation

## DEANN WALKER

Texas PUC Chairman



Source: https://www.aect.net/texas-electricity/





DeAnn is an ex-officio member of the Board of Directors of the Electric Reliability Council of Texas and the Texas Reliability Entity and a member of the Regional State Committee for the Southwest Power Pool. She is a member of the National Association of Regulatory Utility Commissioners, serving on the Electricity Committee, and the Advisory Council of the New Mexico State University Center for Public Utilities.

## ALISON SILVERSTEIN



Alison Silverstein is a consultant, strategist, researcher and writer on electric transmission and reliability, energy efficiency and technology adoption issues. She has worked for decades to enable and exploit the use of energy efficiency, demand response, distributed generation, renewables and various advanced grid technologies.

Silverstein organized, researched and wrote DOE's "Staff Report on Electric Markets and Reliability" (8/17) and co-authored, "A Customerfocused Framework for Electric System Resilience" (5/18) and "Customer-Focused and Clean – Power Markets for the Future" (10/18). She served as project manager for the North American Synchrophasor Initiative,

### MIKE JACOBS



Mike Jacobs is the lead on Electricity Markets and Regulatory efforts in the Climate and Energy Program at the Union of Concerned Scientists (UCS). Prior to coming to UCS, Mr. Jacobs worked as the markets and policy director at a number of renewable energy and energy storage companies, and the American Wind Energy Association (AWEA). In these positions, he developed strategies for wind integration using battery storage, and new and existing transmission. While with AWEA, he led settlement efforts at the Federal Energy Regulatory Commission to streamline generator interconnection rules. He has served on the boards of Vineyard Power Co-op, Solar Grid Storage, Wind on the Wires, the Wind Coalition, Interwest Energy Alliance and the Northern Maine Independent System Administrator.

## MASON EMNETT



Mason oversees the development and implementation federal regulatory strategy for Exelon Corporation, the nation's largest producer and distributor of clean energy. He is responsible for achieving Exelon's policy objectives in matters before the Federal Energy **Regulatory Commission and Environmental** Protection Agency. Prior to joining Exelon, Emnett was Senior FERC Counsel for NextEra Energy, Inc., where he provided legal support and strategic advice on federal regulatory matters. Before joining NextEra in 2014, Emnett served as Deputy Director of the Office of Energy Policy and Innovation at the Federal Energy Regulatory Commission, where he led the development of regulations and rules governing wholesale electric markets and the provision of interstate transmission service.



# THOUGHTS ON WHOLESALE ELECTRIC MARKETS

Alison Silverstein Alison Silverstein Consulting NARUC Electricity Committee November 18, 2019

### Wholesale electric markets

### Balancing or juggling?

The early view – just balance supply & demand using competition and prices

But balancing is hard



And electric markets are way harder than



### Current competitive electric markets are challenged



Insufficient demand participation in market



### Market design factors

# What competes in the market?

Which supply resources? Which demand resources? Type, size, owners, aggregators, ...

#### What are market rules?

Energy and ancillary service products Price calculation method, elements Dispatch rules and speed Resource bid parameters

#### Missing money mechanism?

Type -- capacity payments or ORDC?

What qualifies to receive payment and why?

#### Who and how much to buy?

Amount in spot market v. selfsupply or bilateral Amount self-scheduling (so out of market)

## Outside factors that affect markets



Technology & economics	Macro policies	State & RTO policies	Societal and customer choices
<ul> <li>Technology development advances and associated economic costs (renewables, inverters, demand response, storage, EVs)</li> <li>Fuel costs</li> <li>Trade and economic development policies</li> <li>Speed of storage capabilities and cost</li> </ul>	<ul> <li>Carbon price</li> <li>Clean energy mandates</li> <li>Energy efficiency standards</li> <li>Federal subsidies (tax and royalty payments and policies)</li> <li>Support for energy production (gas, wind, etc.)</li> <li>Fuel and electricity delivery infrastructure support</li> </ul>	<ul> <li>Transmission construction &amp; interconnection</li> <li>Energy efficiency codes, standards, funding</li> <li>TOU rates, advance meters</li> <li>DG interconnection policies, net metering</li> <li>Reliability adequacy requirements &amp; IRPs</li> <li>Infrastructure support or abandonment</li> </ul>	<ul> <li>Customer preferences (carbon, clean energy, personal resilience)</li> <li>Customer economic capacity to adopt DER resources</li> <li>Rate and capability of customer defection from utility</li> <li>Social equity and environmental justice</li> </ul>

### Conclusions

- Competition works but
- Current market design is not working well
- We need market changes for the next 20+ years with high decarbonization, variability and uncertainty
- Don't ignore extra-market factors
- Don't expect markets to solve everything



# **Decarbonizing the Generation Stack**

Aligning Wholesale Electricity Markets with Environmental Policy

W. Mason Emnett Vice President, Competitive Market Policy

NARUC Annual Meeting November 18, 2019



#### The carbon challenge



Annual Economic Damages in 2090				
Sector	Annual damages under RCP8.5	Damages avoided under RCP4.5		
Labor	\$155B	48%		
Extreme Temperature Mortality	\$141B	58%		
Coastal Property◊	\$118B	22%		
Air Quality	\$26B	31%		
Roads◊	\$20B	59%		
Electricity Supply and Demand	\$9B	63%		
Inland Flooding	\$8B	47%		
Urban Drainage	\$6B	26%		
Rail◊	\$6B	36%		
Water Quality	\$5B	35%		
Coral Reefs	\$4B	12%		
West Nile Virus	\$3B	47%		
Freshwater Fish	\$3B	44%		
Winter Recreation	\$2B	107%		
Bridges	\$1B	48%		
Munic. and Industrial Water Supply	\$316M	33%		
Harmful Algal Blooms	\$199M	45%		
Alaska Infrastructure◊	\$174M	53%		
Shellfish*	\$23M	57%		
Agriculture*	\$12M	11%		
Aeroallergens*	\$1M	57%		
Wildfire	-\$106M	-134%		

Source: Fourth National Climate Assessment, U.S. Global Change Research Program (2018).



#### **States are taking action**

13 states and the District of Columbia have a Governor Executive Order or legislation enacted targeting 100% clean electricity (11) or 100% RPS (2+D.C.)



22 states have 100% clean electricity targets, deep GHG reduction targets, or both, encompassing 44% of US electricity sales and 53% of US residential electricity customers.



#### **The New England example**

Figure 2: State-Sponsored Resources v. Competitive Market Resources (Estimated Energy Production, MWh)



Figure 5: Estimated Percentage Energy Market Revenue Reductions for Select Combined Cycles Due to Increased Clean Energy Resources (2017)



Source: Promoting Competitive Power Markets and Growing Zero-Emission Resources in New England, A. Joseph Cavicchi (Nov. 7, 2018)



Source: Achieving 80% GHG Reduction in New England by 2050, Jürgen Weiss and J. Michael Hagerty (Sept. 2019).



### **The California example**

-\$5 to \$0

12%

10%

8%

6%

4%

2%

0%

1 2 3

4

Percent of hours

■ \$0 to \$1



-\$10 to -\$5

-\$15 to -\$10

-\$20 to -\$15



2017

2018

#### Figure E.11 Estimated net revenue of hypothetical combined cycle unit

Source: Annual Report on Market Issues and Performance, CAISO Department of Market Monitoring (May 2019).

\$40 \$20

\$0

2016

#### **Figure 9. New Build Selected Resources Results**

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24



Source: Long-Run Resource Adequacy under Deep Decarbonization Pathways for California, E3 (June 2019).







### QUESTIONS?



DeAnn Walker Chairman Texas PUC



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