



Energy Efficiency in Capacity Auctions: A Historical Review of Value

Grace Relf

October 2017

Energy Efficiency as a Resource Conference



The American Council for an Energy-Efficient Economy is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors.

Our research explores economic impacts, financing options, behavior changes, program design, and utility planning, as well as US national, state, & local policy.

Our work is made possible by foundation funding, contracts, government grants, and conference revenue.

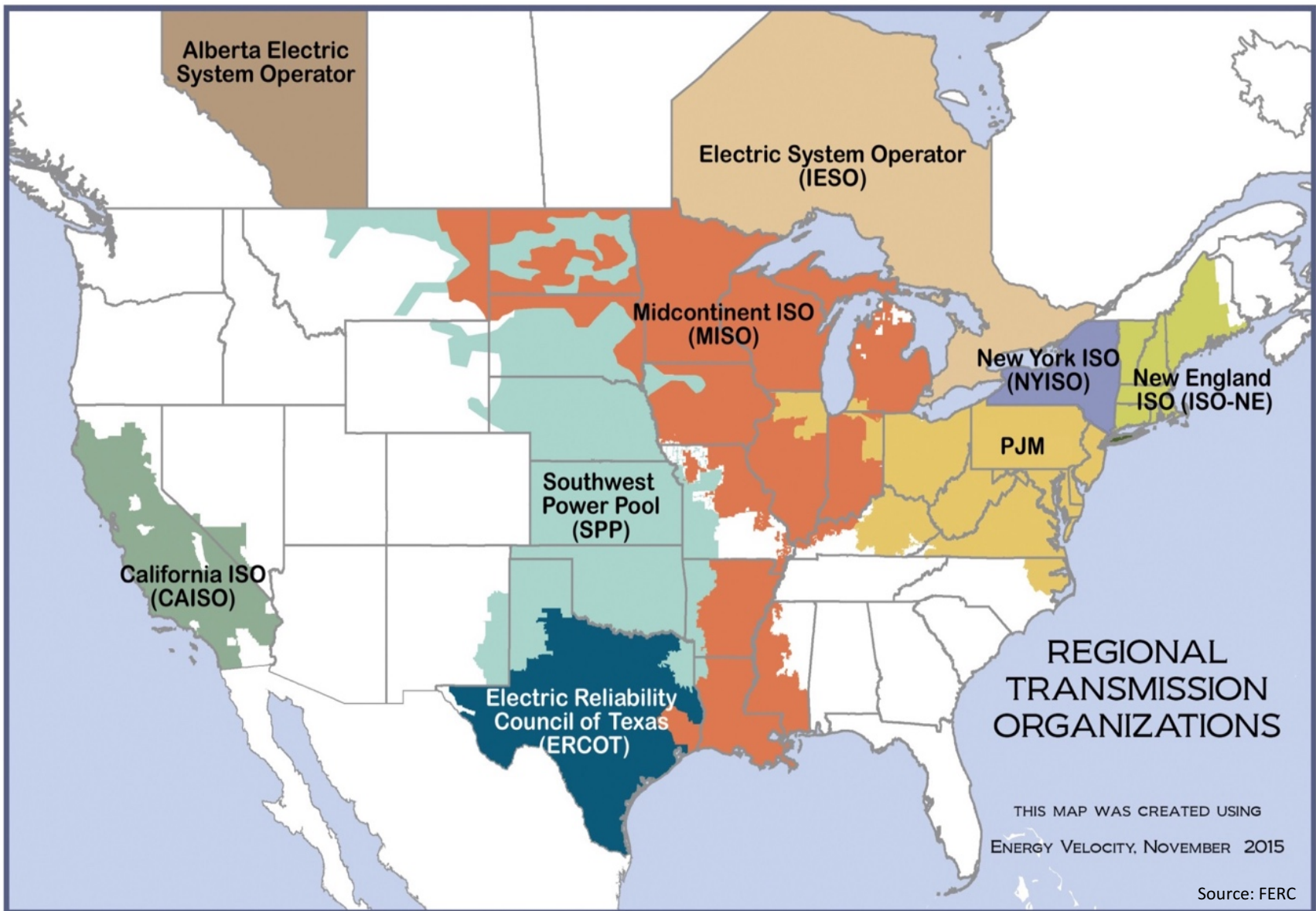
aceee.org @ACEEEdc

ACEEE
American Council for an Energy-Efficient Economy

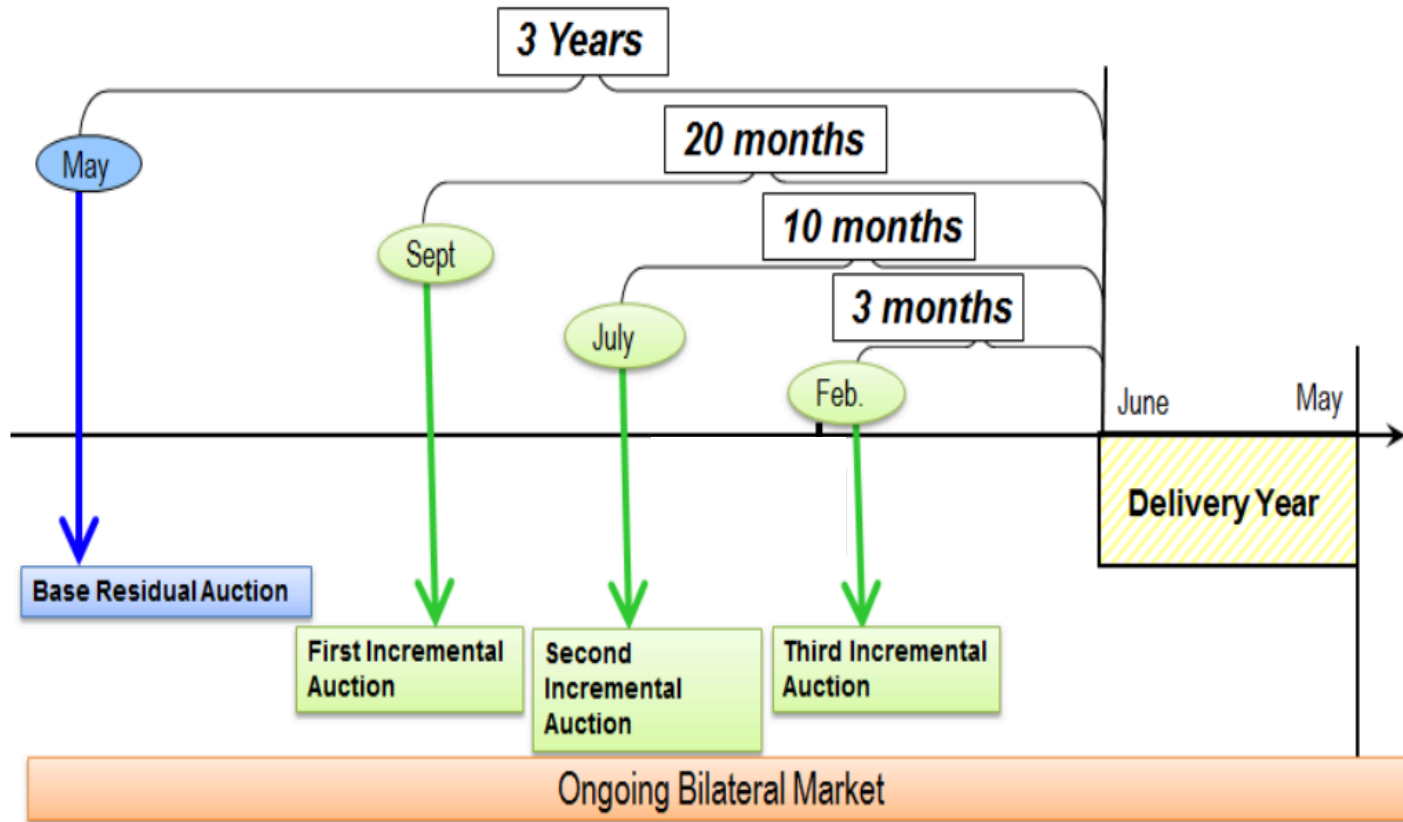
Agenda

- The PJM & ISO-New England capacity auctions
- Energy efficiency in load forecasting
- Auction results, value, and retail rate impacts
- Demand reduction induced price effect
- Conclusions

Capacity auctions: Overview



The PJM Base Residual Auction (BRA)



Source: PJM

The ISO-NE Forward Capacity Auction (FCA)

- Same 3-year in advance timeline structure as PJM
- 15 interim auctions
- Divides New England into capacity zones

PJM's Load Forecast

- Load forecasts inform reliability requirements
- PJM has historically over-forecast load
- In response, PJM revised its forecasting process to include energy efficiency
- Efficiency resources that qualify for each auction are added back to the forecast to avoid double counting

ISO-NE's Load Forecast

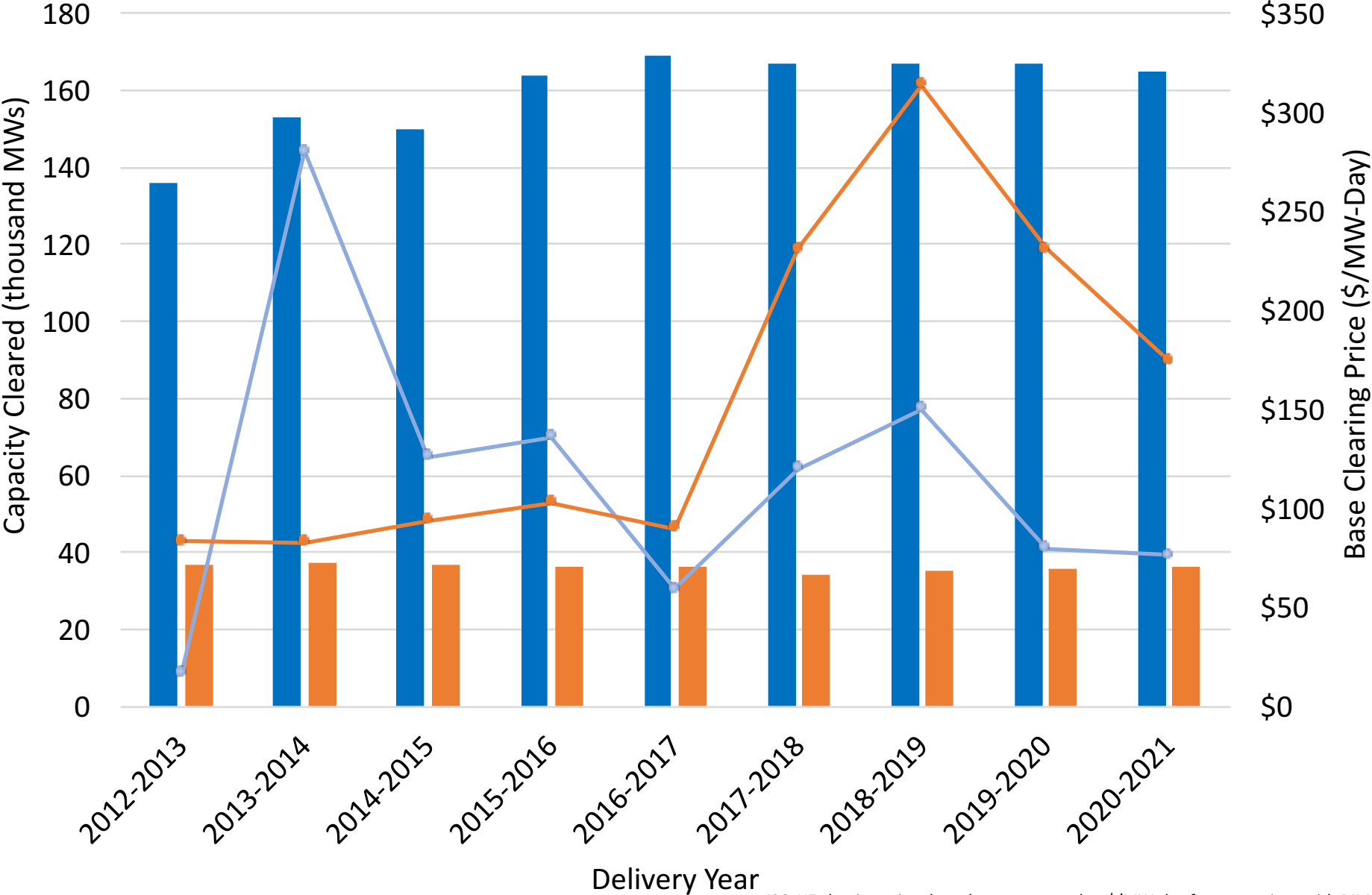
- Future efficiency is projected based on utility efficiency budgets and the cost of saved energy
- Each resource is assigned an “availability score” to meet reliability requirements

Efficiency is assigned an availability score of 100%.

ISO-NE's Load Forecast

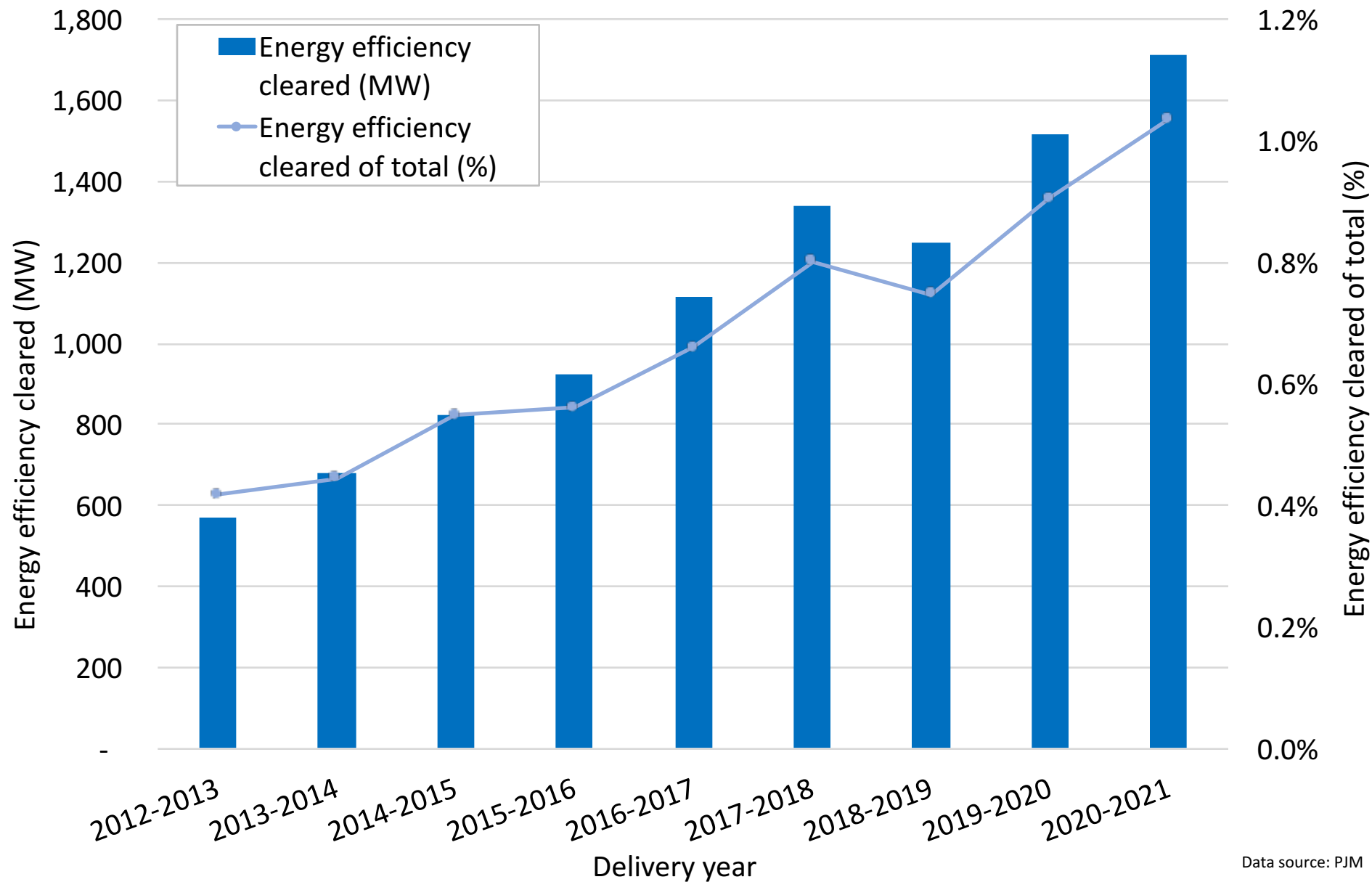
- Peak demand is consistently over-forecast by 10-20%
- Energy efficiency is consistently under-forecast
 - Forecast pro-rates savings based on the percentage of budget spent by utilities
 - Forecast does not adjust utility budgets for inflation
- Correcting these factors increases efficiency by 700 MW over five years

Historical Results

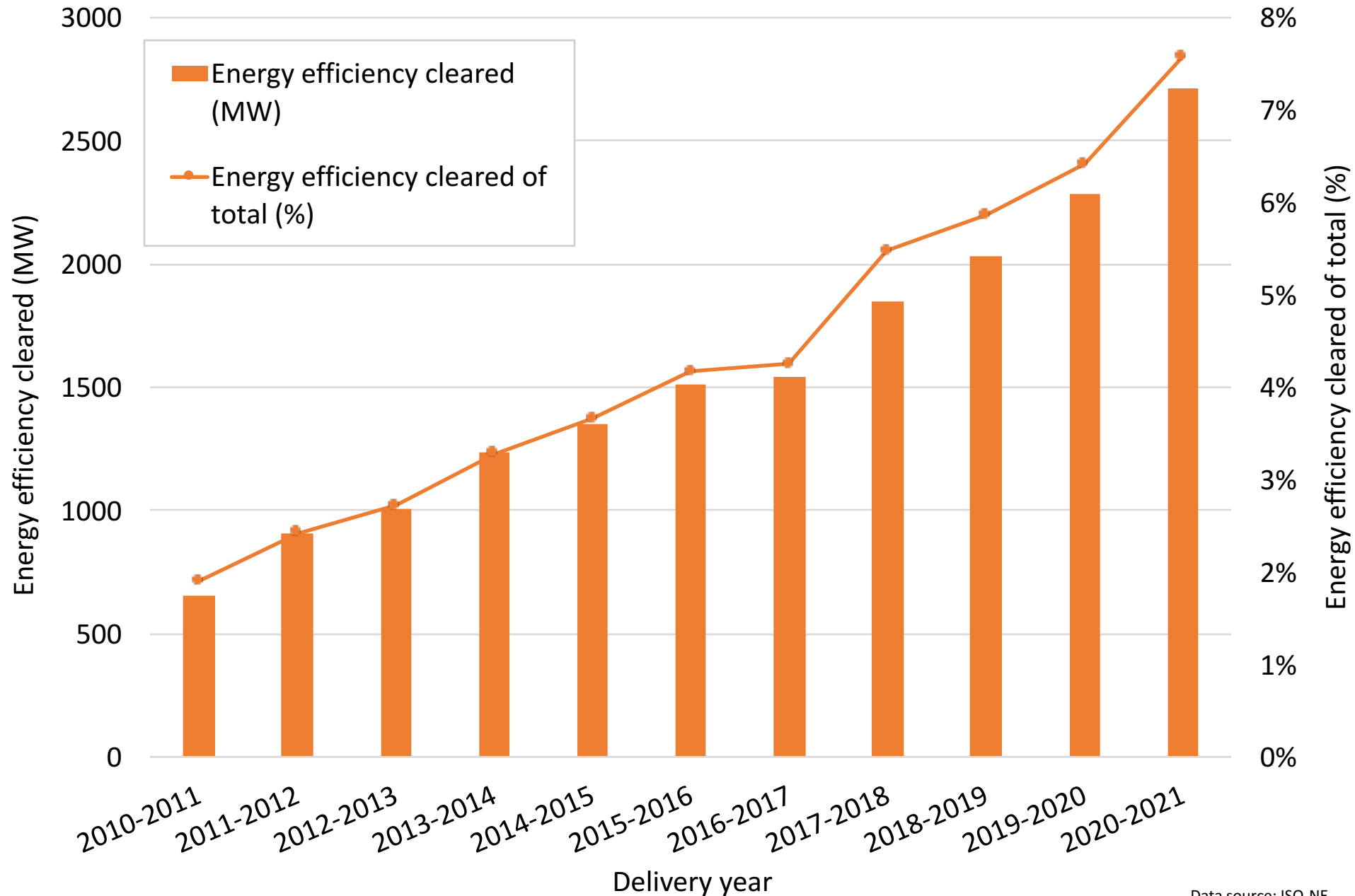


ISO-NE clearing prices have been converted to \$/MW-day for comparison with PJM.

Efficiency in PJM's BRA



Efficiency in ISO-NE's FCA



Value of Demand Resources in the BRA

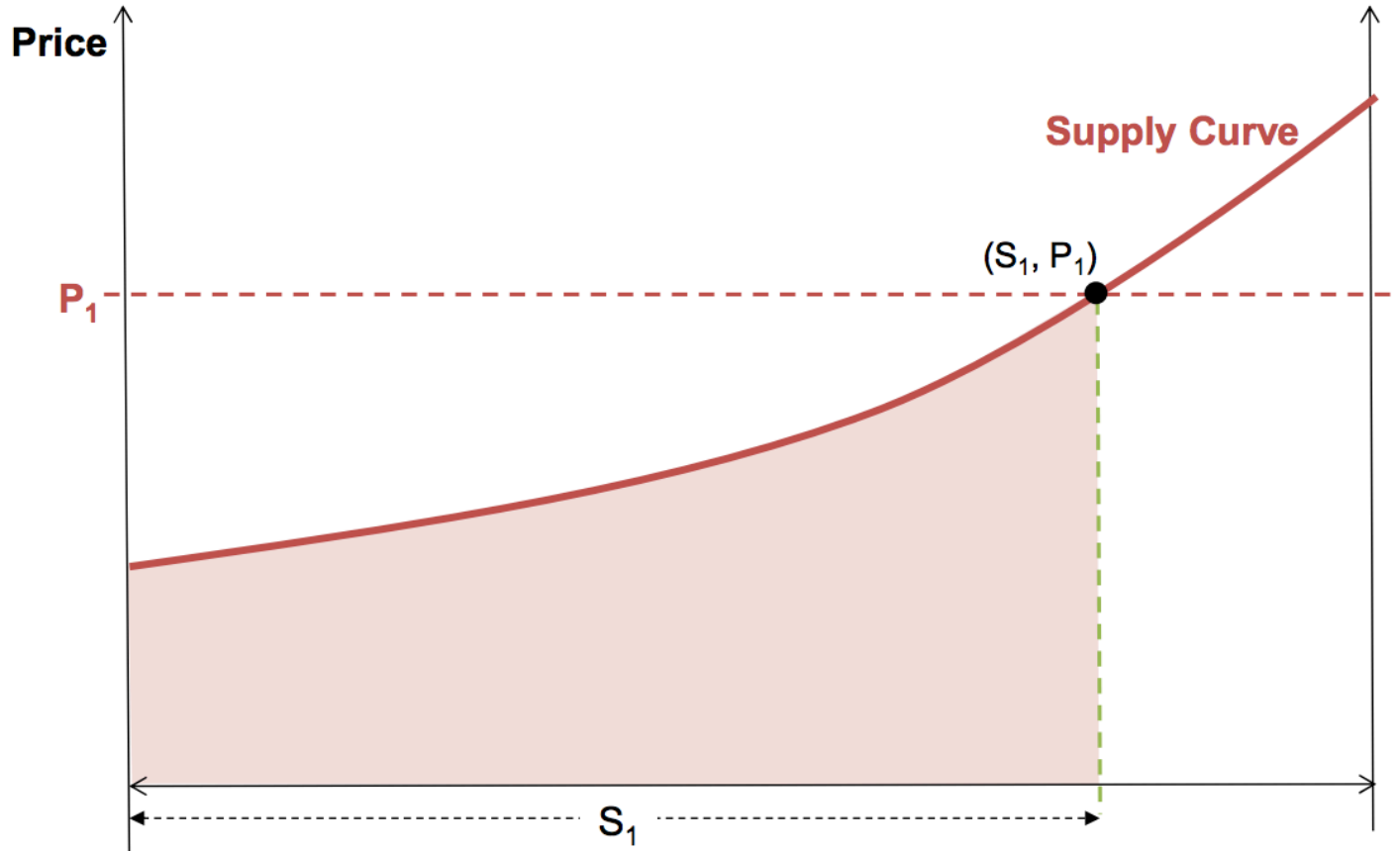
- Auction results are sensitive to the inclusion of demand resources
- Energy efficiency and demand response put downward pressure on bids

The inclusion of demand resources in the BRA reduced payments to suppliers by \$9 billion (124%) in the 2017/2018 delivery year.

Customer Rate Impacts: Baltimore Gas & Electric

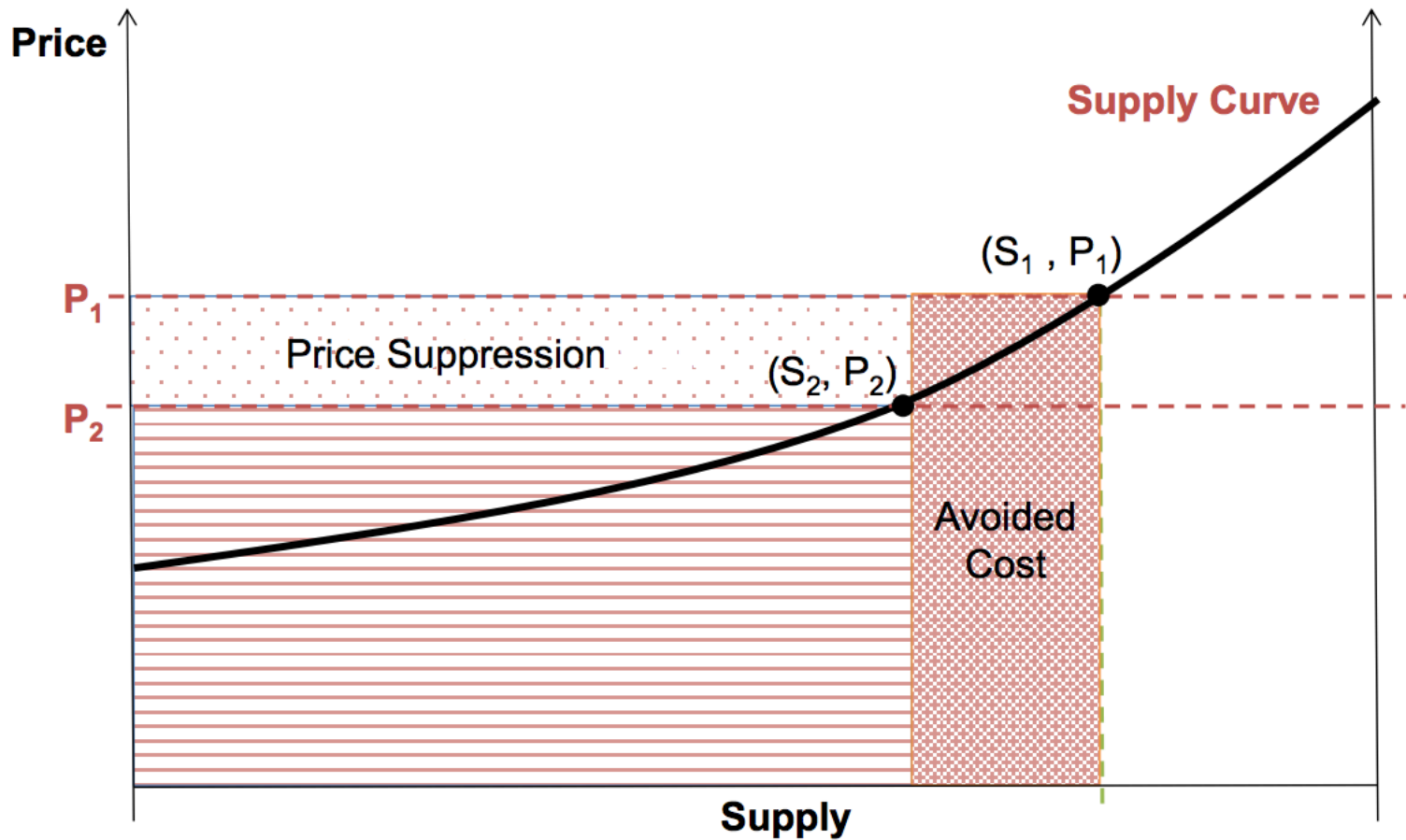
- 2017/2018 delivery year
 - Capacity costs – 13% of avg. residential bill
 - 1.7 cents per kWh
- 30% increase in capacity clearing price
 - Bill increase – 4%

Demand Reduction Induced Price Effect (DRIPE)



Source: Chernick and Plunkett 2014

Demand Reduction Induced Price Effect (DRIPE)



Source: Chernick and Plunkett 2014

DRIFE Examples

- Ohio:
 - Savings of \$1.3 billion through 2020 by meeting efficiency regulatory standards
- New York:
 - Savings of \$600 million to \$1.5 billion per year from increased efficiency

Incremental savings are small, but accrue to significant savings across a system or region.

Conclusions

- Efficiency is increasing
- Efficiency reduces demand and suppresses wholesale and retail prices
- Payments to energy efficiency providers drives investment in efficiency

Including energy efficiency in capacity auctions and load forecasting creates significant value for the PJM and ISO-NE regions.

Upcoming ACEEE Conferences

ACEEE Workshops at VERGE 17	September 19	Santa Clara, CA
2017 Behavior, Energy, and Climate Change Conference	October 15	Sacramento, CA
2017 Conference on Energy Efficiency as a Resource	November 1	Litchfield Park, AZ

The top convener in energy efficiency.

aceee.org/conferences

