Four Reforms for a More Active Demand Side in Connecticut

2022 Comprehensive Energy Strategy: Technical Session 5 on Active Demand Response

Connecticut Dept. of Energy & Environmental Protection

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Nov. 3, 2022

Real & Potential Sources of Value for Demand Response Providers

- ISO-NE capacity markets – tied to auction outcomes

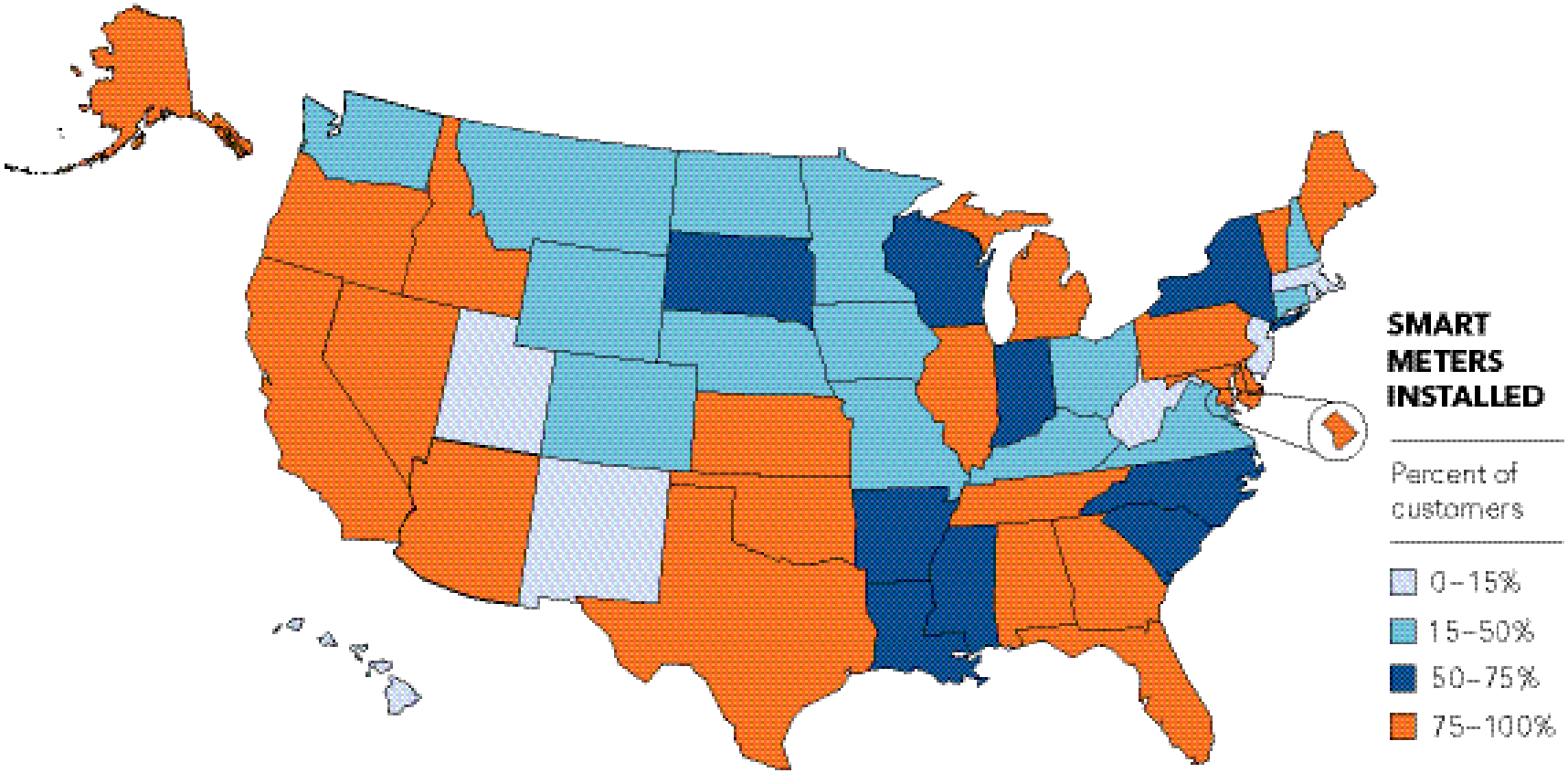
				Price ($/kW-month)					
Resource ID	Resource Name	Load Zone	Resource Type	FCA10 2019-2020	FCA11 2020-2021	FCA12 2021-2022	FCA13 2022-2023	FCA14 2023-2024	FCA15 2024-2025
40867	CT West	CT	ADCR	$ 7.03	$ 5.30	$ 4.63	$ 3.80	$ 2.00	$ 2.61
40865	CT East	CT	ADCR	$ 7.03	$ 5.30	$ 4.63	$ 3.80	$ 2.00	$ 2.61
40866	CT North	CT	ADCR	$ 7.03	$ 5.30	$ 4.63	$ 3.80	$ 2.00	$ 2.61

				Annual Price ($/kW)					
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- Avoided transmission costs – tied to 12-CP billing
- Avoided energy costs – dependent on time-varying retail energy rates that reflect savings from wholesale market
- Supplemental utility incentive programs (e.g., “Connected Solutions”) – program rules around number, duration, and timing of calls for Winter & Summer

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Smart Meter Deployment – 2022



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Don’t do Smart Meters just to have Dumb Rates

- Former Commissioner Rob Powelson (PA PUC/FERC): “To be frank, it is pointless to have smart meters if you are still going to have ‘dumb’ rates.” (2009)
- By statute in Connecticut, United Illuminating and Eversource are required to offer a Time-of-Use rate option, as are competitive energy suppliers
  - This requirement applies only to C&I Eversource, due to 1M residential & 120k bus. customers lacking smart meters.*
  - UI/Eversource TOU tariff (Rate 7) has 2 tiers. Trans & Generation costs time variable; distribution is not.
  - Rate design doesn’t express strong on-/off-peak ratio ~3:2
- TOU products are opt-in and adoption is extremely low, even where AMI metering is available
- Without universal AMI deployment and default adoption of TOU, demand response unlikely to be robust

*PURA Docket 13-07-18,

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Why are Time-of-Use Rates important?

1. If retail rate design does not contain signals for an "active demand response," then DR more likely is relegated to ISO markets

- Unhealthy dependency on capacity revenues
- Demand should be demand, and in retail markets. Demand should not only find its expression as jerry-rigged supply

2. TOU is a foundation for retail product differentiation

- DER products marketed to customers on the basis of savings under TOU
- Retailers offering flat-rate or hedges
- Should not be up to third parties to persuade customers to opt-in to a more cost-reflective TOU rate

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Why is TOU important? (cont'd)

3. Demand flexibility can shape load, reducing need & cost for capacity & transmission, including both *incremental cap-ex* & *allocation of sunk costs to load*

- Shifting to off-peak well-documented when strong incentives exist. In MD pilot, 4:1 to 6:1 ratios between on-/off-peak led to "9.3 percent to 13.7 percent in the summer months and by 4.9 percent to 5.4 percent in the winter months." Staff, MD PSC, *Re: PC44 Rate Design Work Group Leader's Report and Recommendations on Full-Scale Time of Use Rate Offerings* (June 3, 2022)

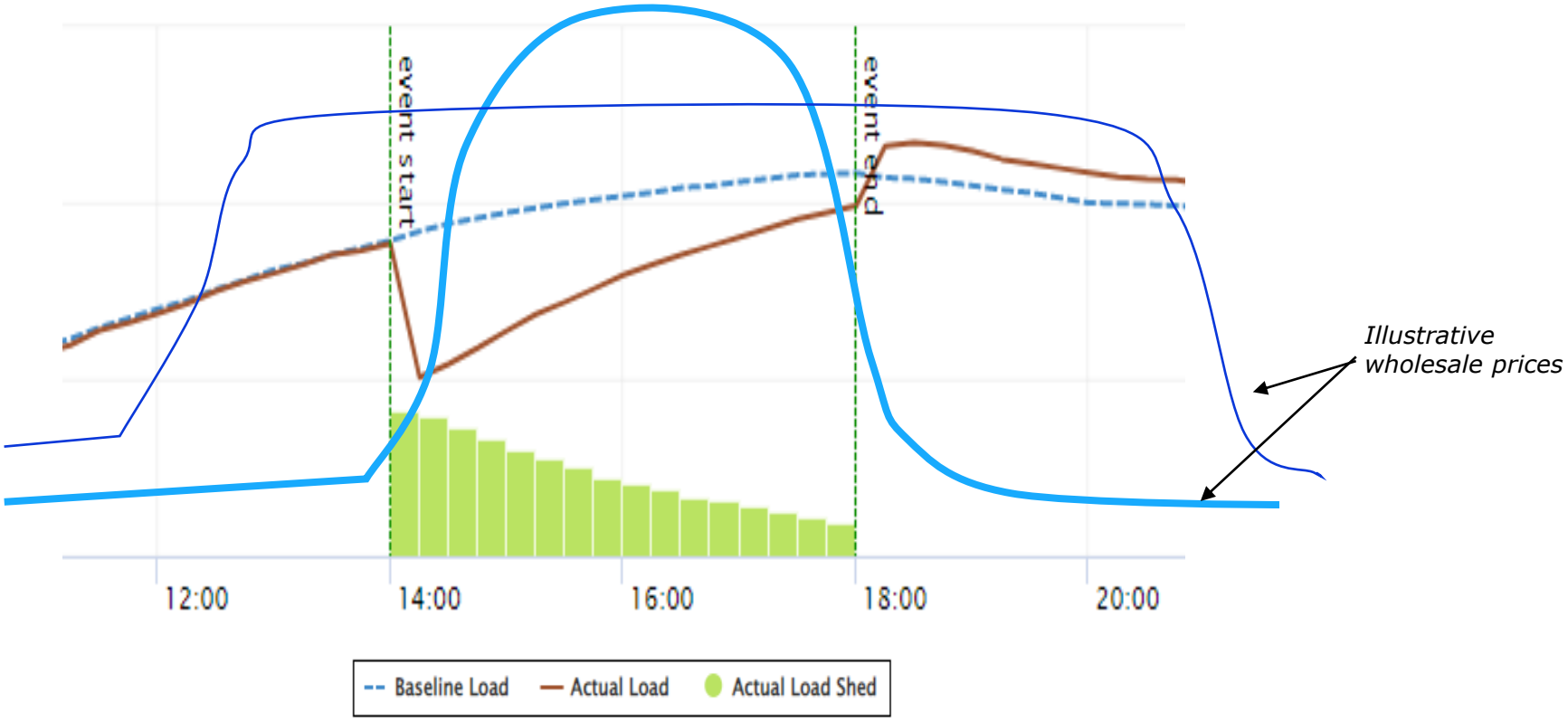
4. TOU may be a more equitable approach

- Research suggests LMI customers perform no worse than any other customers classes in presence of TOU, and in some circumstances are advantaged by it
- "The Pilot results indicated that customers, both overall and low- and moderate-income customers specifically, responded to the rate by shifting usage off-peak." MD PSC Staff in PC44

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Example of a Third-Party Retail Program (with Active DR Characteristics)

- NRG's Reliant Degrees of Difference ("DOD") Program: device control DR using smart thermostat, offered through retailer program
- DOD results in a demand decrease of 20% to 30%. So if 1,000 customers participated, potential for ~1 MW total reduction in demand when deployed.
- It would be highly beneficial to evaluate ways to facilitate supplier programs that incentivize behavioral demand response.



Two Extremes of Retail Rate Design for Mass Market

Competitive retailers' products that give inducements for demand flexibility

Real-Time Prices Direct to Consumers (e.g., Griddy)

Tiered, time-of-use rates + Critical Peak Pricing

Flat Rates (serving >90% of U.S. customers today)



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Reform: Regulated Utilities

- ***Reform #1: Complete rollout of AMI hardware & functionality***
  - Before Connecticut can have robust demand response or wide adoption of time-of-use rates, they must complete the rollout of smart meters to all customers
  - Ensure utility back office is capable of settling load-serving entities' customer accounts based on *actual load data* and not load profiles
  - In tandem with hardware installation, default customers who are on utility service to Time-of-Use rate, to prevent the "smart meter but dumb rate" phenomenon

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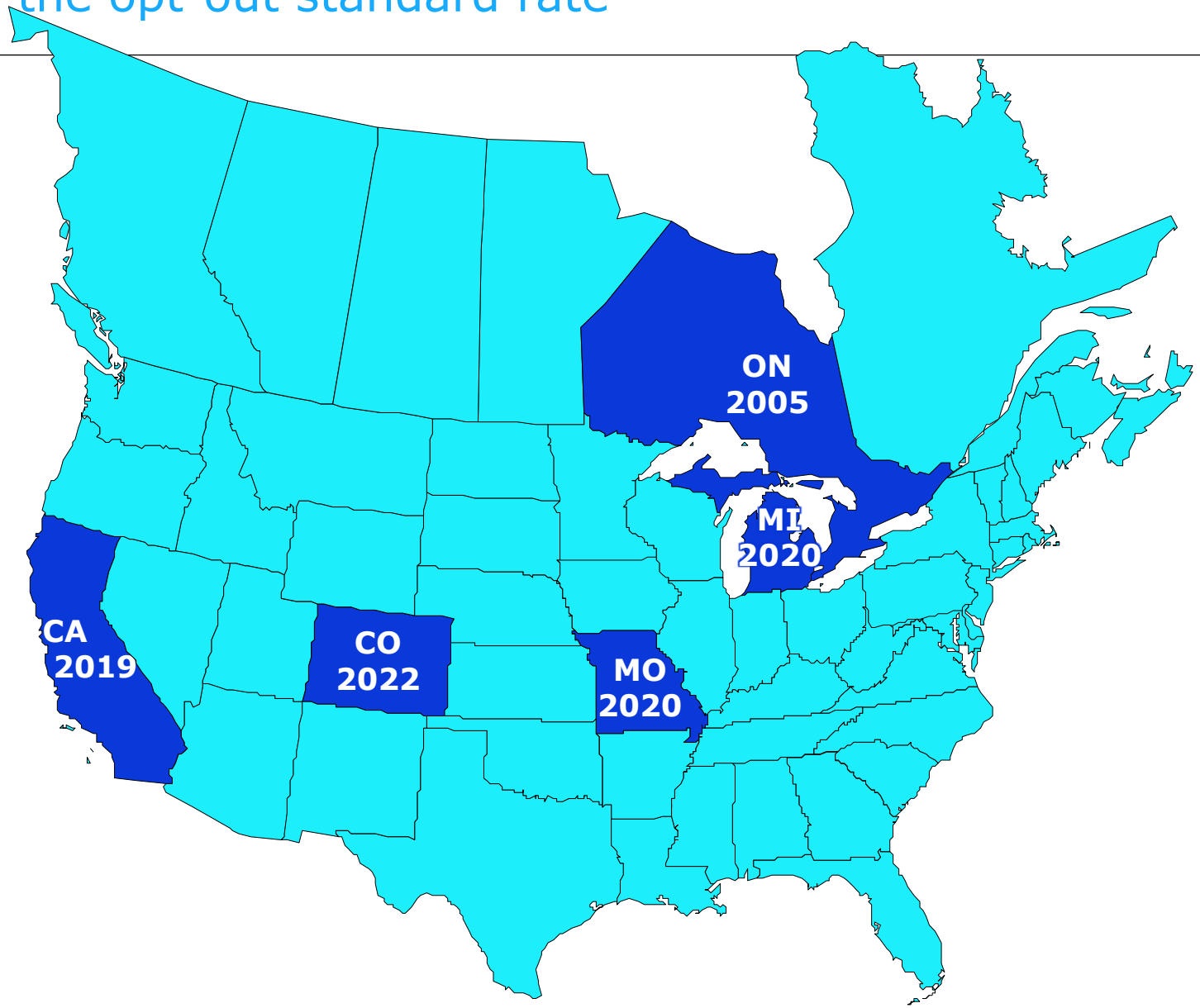
Reform: Regulated Utilities cont.

- *Someone, somewhere* should have a consistent, price-based incentive for demand to respond to supply.

- ***Reform #2: Opt-out time-varying rates***
  - Regulated rate should reflect both routine (e.g., tiered TOU) and extraordinary (e.g., "Oil Peak Day") wholesale-market & long-run marginal cost dynamics
  - Like in Colorado (Xcel) & Missouri (Ameren), when a customer gets a smart meter installed, they should be defaulted to TOU.
  - Ontario, California, Michigan all provide additional examples for TOU as the default rate
  - Customers who prefer something other than TOU can opt-out by selecting a third party product

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Smart by default: Some states have made time-of-use rates the opt-out standard rate



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Reform: Competitive Retail/DER Markets

Reform #3: ***Create direct relationship between customer & "demand" providers***

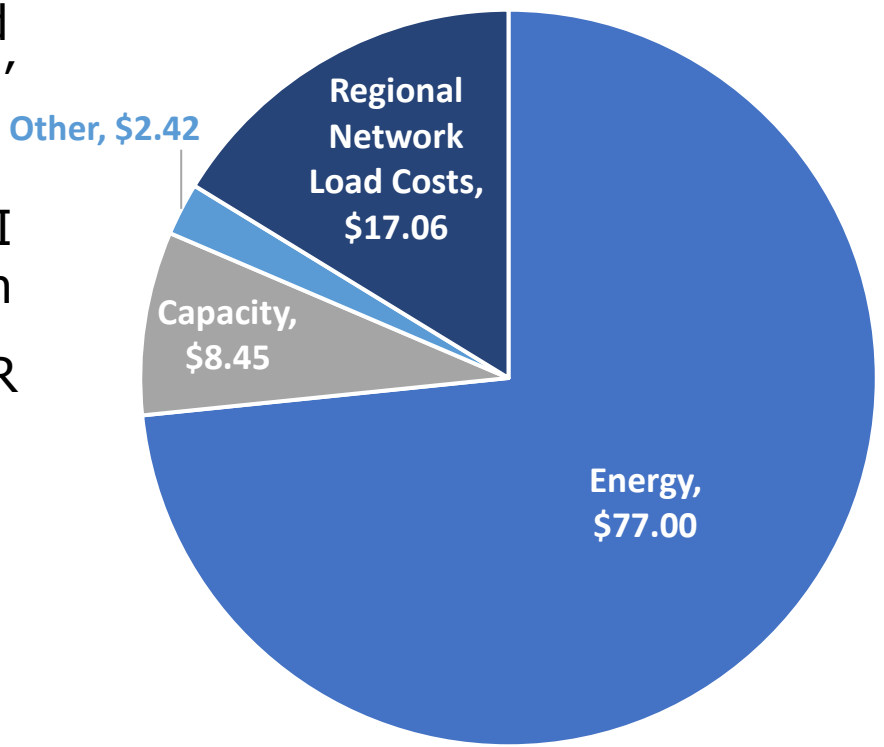
- Customer billing continues to occur through T&D utilities.
- Supplier-consolidated billing is a complement to allow third parties to actively intermediate TOU rate elements (which in presence of successful retail/DER offerings may never be seen by retail customers, even while they create incentives for demand flexibility).
- Consider whether transmission & capacity costs should be billed to Generation Services. Ensure that retailers have opportunity to intermediate these costs

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The Pieces of the Pie that aren't on the Table

- Retailers would have a more profound incentive to deploy DR to residential customers if billed ISO charges on their customers' actual, cumulative demand
  - again, only possible with AMI & back-office implementation
- In our estimation, successful DR programs can save
  - ~2-3% of energy costs
  - ~10% of transmission costs
  - All capacity costs
  - (Since CT Distribution rates are not time-varying, no opportunity to save)

Average Connecticut ISO-NE Costs, Sept '21 – Aug '22



Information compiled from: *ISO New England Wholesale Load Cost Report September 2022*. https://www.iso-ne.com/static-assets/documents/2022/10/2022_09_wlc.pdf and *ISO New England Monthly Regional Network Load Cost Report August 2022*. Table 8-1. https://www.iso-ne.com/static-assets/documents/2022/10/2022_08_nlcr_final.pdf

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Reform: Nudge Automated Devices

Though results suggest Customers are behaviorally responsive to TOU, they can be further empowered to respond to price signals through home automation.

Just like rates aren't smart by default, many major appliances also not 'smart' by default

Reform #4: ***Nudge Smart Devices***

- Standards for certain demand-flexible appliances (e.g., West Coast states)
- Regulatory programs for Energy Efficiency should target subsidizing cost of smart thermostats and other devices that can be interoperable across retail providers

Concluding Thought: The Role of Demand in Modern Electricity Markets

- Regulation's attempts to date to activate demand have often been to jerry-rig demand as a supply resource

- The goal should be a two-sided market where demand acts as demand. That happens when either:
  - Retail prices mirror a utility's cost structure
  - A competitive retail market structure exists to take full responsibility for the full cost to serve demand

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