

If electricity markets are so great, why are we always messing with them?

James Bushnell

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and NBER

Comments Drawn From

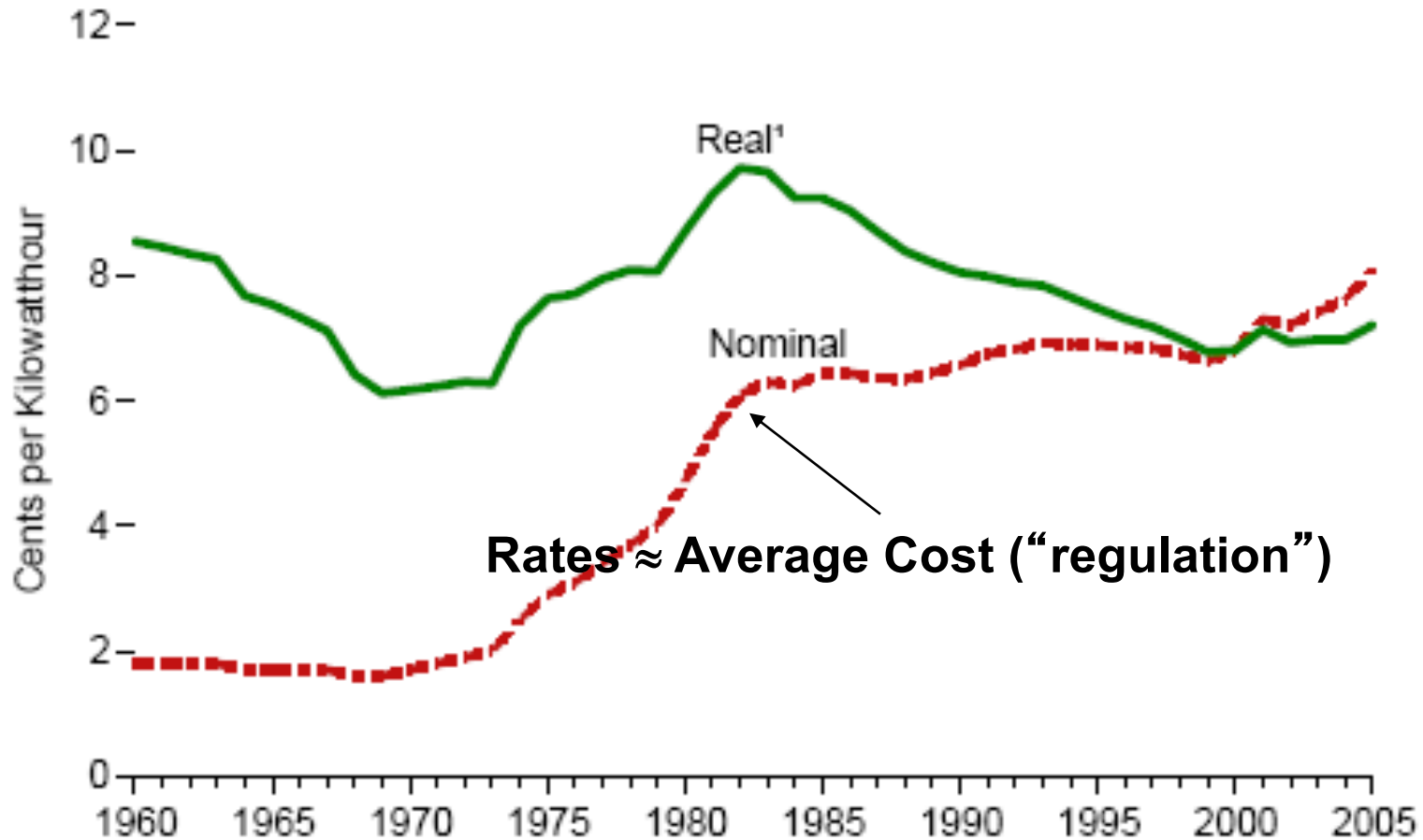
- “The US Electricity Industry after 20 Years of Restructuring.” (with Severin Borenstein). Annual Review of Economics. Vol 7, No. 1: 437-463. 2015.
- Severin Borenstein and James Bushnell, "Do Two Electricity Pricing Wrongs Make a Right? Cost Recovery, Externalities, and Efficiency" EI @ Haas Working Paper WP-294. September 2018.
- James Bushnell, and Kevin Novan. “Setting with the Sun: The Impacts of Renewable Energy on Wholesale Power Markets.” EI @ Haas Working Paper WP-292. June, 2018.
- Bushnell, Flagg, and Mansur. “Capacity Markets at a Crossroads.” UC Davis working paper. 2016
- And my last few blogs at <https://energyathaas.wordpress.com>

Borenstein & Bushnell (2015)

Central Premise

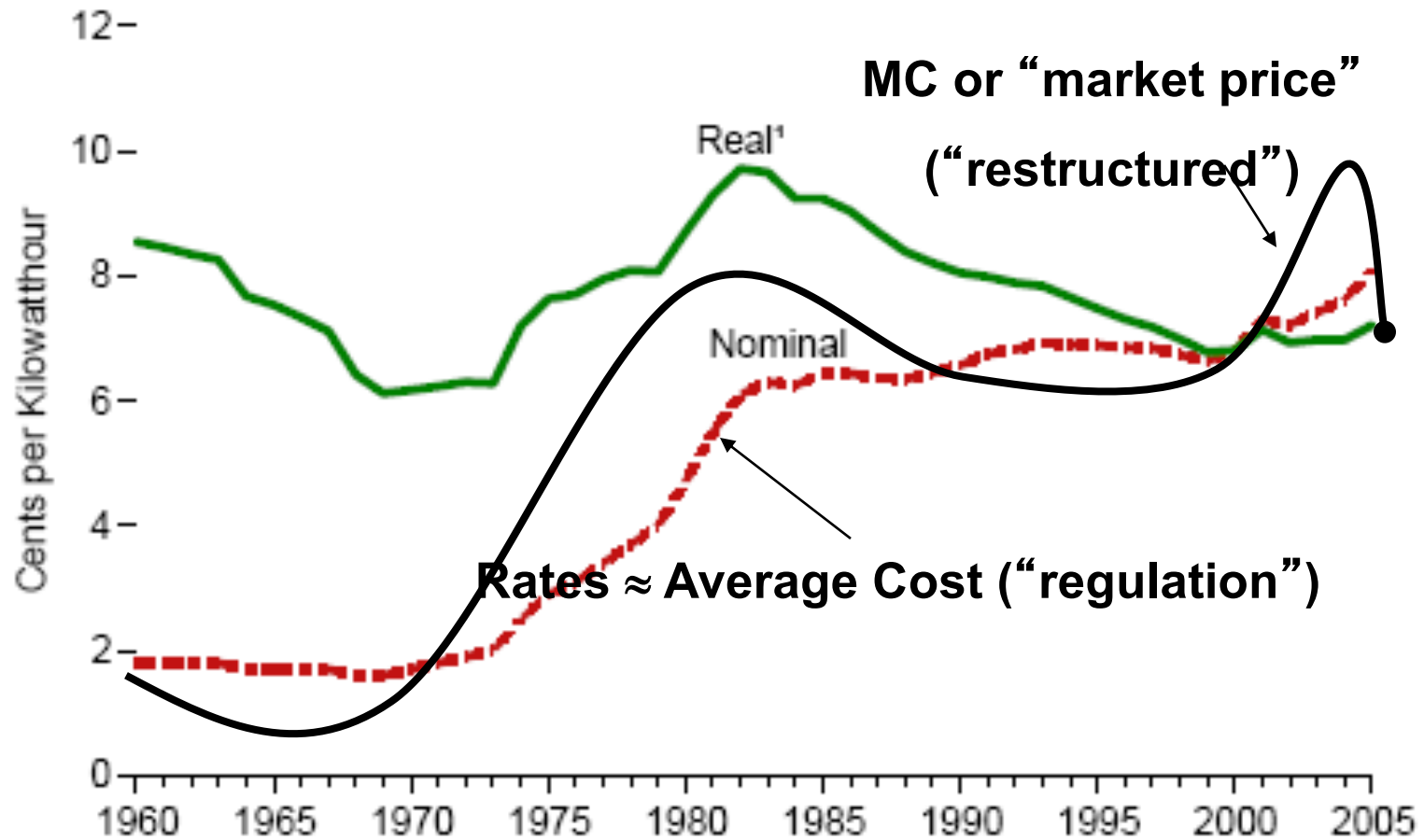
- The last 30 years of electricity policy have been largely influenced by attempts to avoid paying for fixed/sunk costs.
 - Regulated prices = average costs (“own”)
 - Market prices \sim marginal costs (“rent”)
 - The attractiveness of this strategy fluctuates over time.
- Pressure for disruptive change is highest when the gap between AC and MC is largest
- As “reforms” work it can reduce costs (sunk and otherwise) and provide benefits
 - But those efficiency gains are likely dwarfed by the transfers at stake,

Average Retail Price of Electricity, 1960-2005



Source: EIA, http://www.eia.doe.gov/emeu/aer/pdf/pages/sec8_38.pdf.

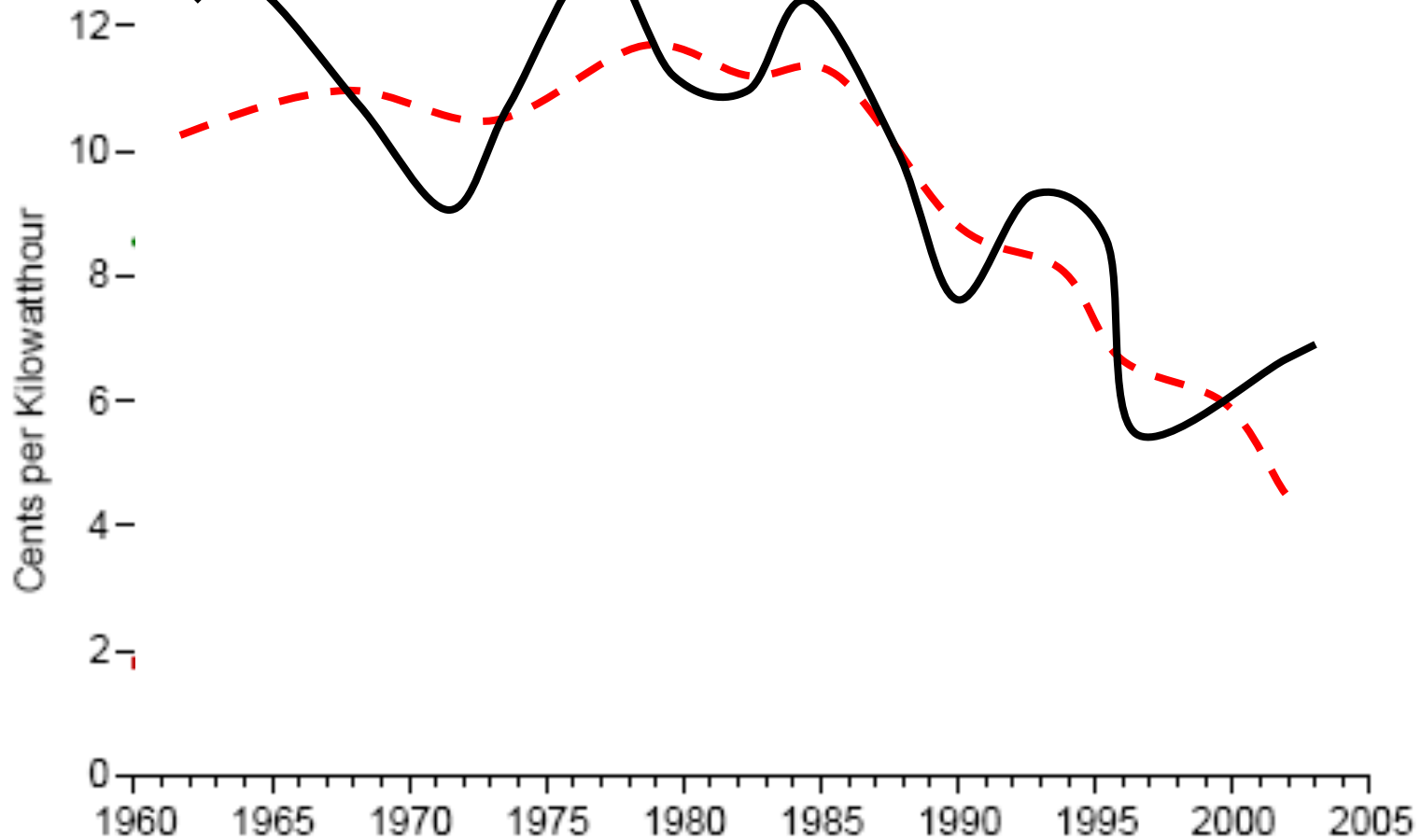
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UC DAVIS Source: EIA, http://www.eia.doe.gov/emeu/aer/pdf/pages/sec8_38.pdf.

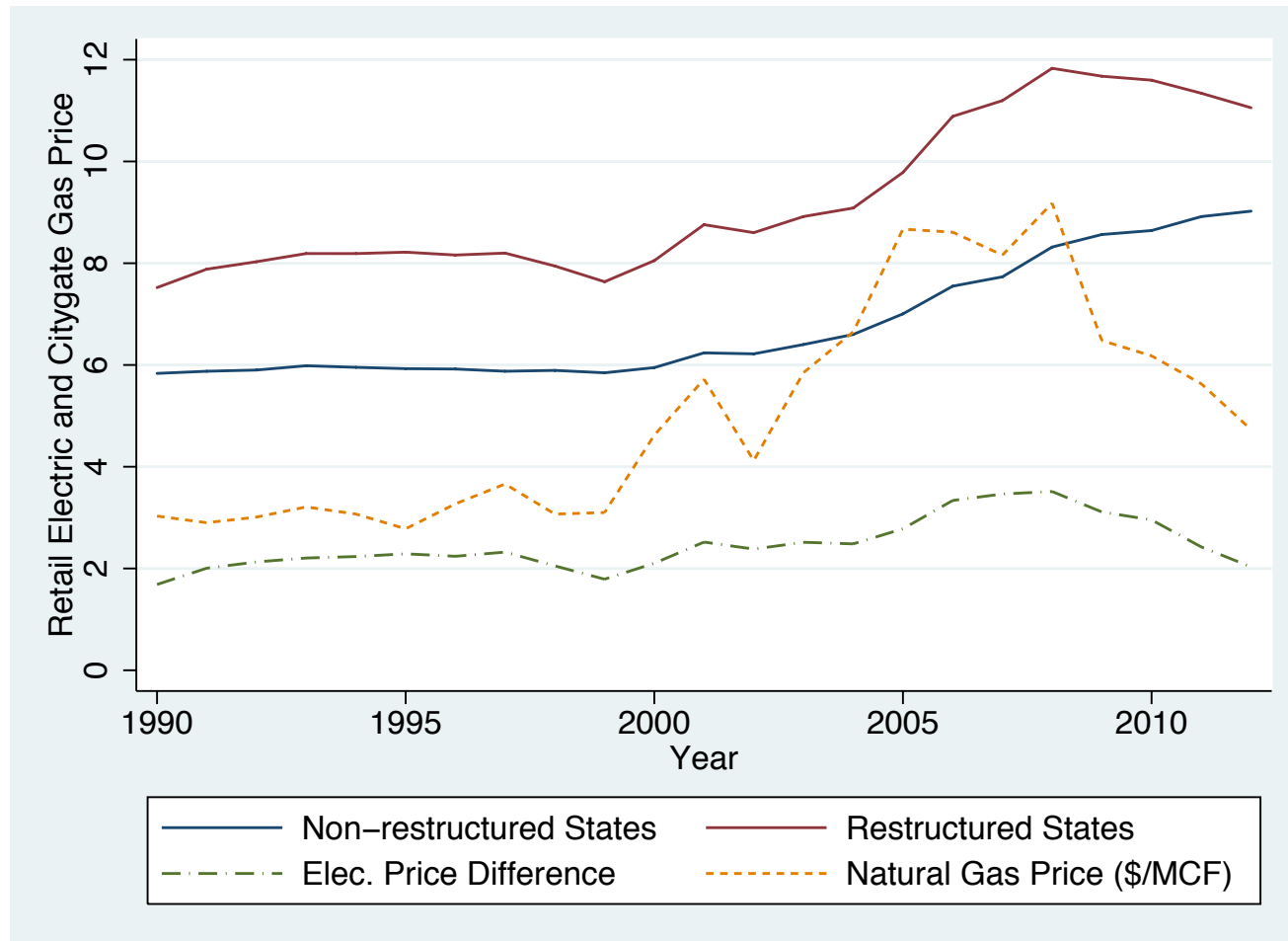
ENERGY ECONOMICS PROGRAM Source for Black Line: Artists Rendering (I.e. I made it up)

Theoretical (hoped for) Impact of Restructuring: both costs go down



Source: Completely fictional data made up by me.

Restructuring Linked Electricity to Gas Prices:



Restructuring and Federalism

- Restructuring (deregulation) meant “trusting the process” rather than controlling the outcome
 - Regulators and planning processes no longer decide the fate of generation plants
 - Markets were to dictate where and what generation gets built, and in theory what retires
- Local policy makers – and operators - have not always been happy with market outcomes
 - Policy makers are still prone to pick winners (or not losers)
 - Large customers often point to losses in times of high prices – would rather have regulation when prices are high
 - Generation investors point to large losses in times of lower prices – would rather have regulation when prices are low
 - System operators want to make sure no one gets angry at them

Business

California law would make state's electricity grid 100 percent carbon free by 2045

CXA La Paloma Files Complaint with Federal Energy Regulatory Commission Regarding California Wholesale Power Market Design

Flaws in California's electricity market have significantly increased electricity rates; created unfair conditions for incumbent generators

Bloomberg Environment

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Posted Sept. 13, 2018, 2:28 PM



- Illinois legislation aimed to save pair of Exelon plants
- Appeals Court upheld lower court ruling rejecting challenges to law

RTO Insider

Your Eyes and Ears on the Organized Electric Markets

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June 1, 2018

Borenstein & Bushnell (2015): Corollary

- The policy process is impatient - and memories of direct regulatory control too strong – to resist intervention over short-run outcomes.
 - Interventions beget more interventions and populist backlash
- Can markets as we know them survive this?

Question:

- Is he Talking About Capacity Markets?
- Answer: I'm not sure
- Discuss...

Markets in Crisis? Issues circa 2018

- **Low energy prices** are posing serious financial challenges for many classes of incumbent generation.
- Some of this generation *may* provide **value currently not reflected** in market prices (location, flexibility, low carbon – probably *not* baseloadability)
- Question is if/how markets **reward generation attributes** we previously took for granted.
- Many States (Federal govt?) are deploying policies to directly or indirectly aid financially struggling generation resources
 - These policies almost certainly impact regional market prices

What is motivating local policies?

- Buyer market power?
 - Large net buyers can economically benefit from overpayment for marginal supply if it lowers overall capacity (energy) prices
- Support for local communities?
 - Significant sources of local taxes and employment
 - Above market costs create larger negative, but much more diffuse economic impacts
- Environmental policies?
 - Mandates for (largely) renewable energy have reached the point where they are displacing incumbent generation rather than just influencing new investment
 - Quicker reductions in carbon; higher and misunderstood costs of policies
 - Best solution: policies that promote the environmental goal (e.g. low carbon) in a non-discriminatory manner that also does not distort prices.

State support is nothing new

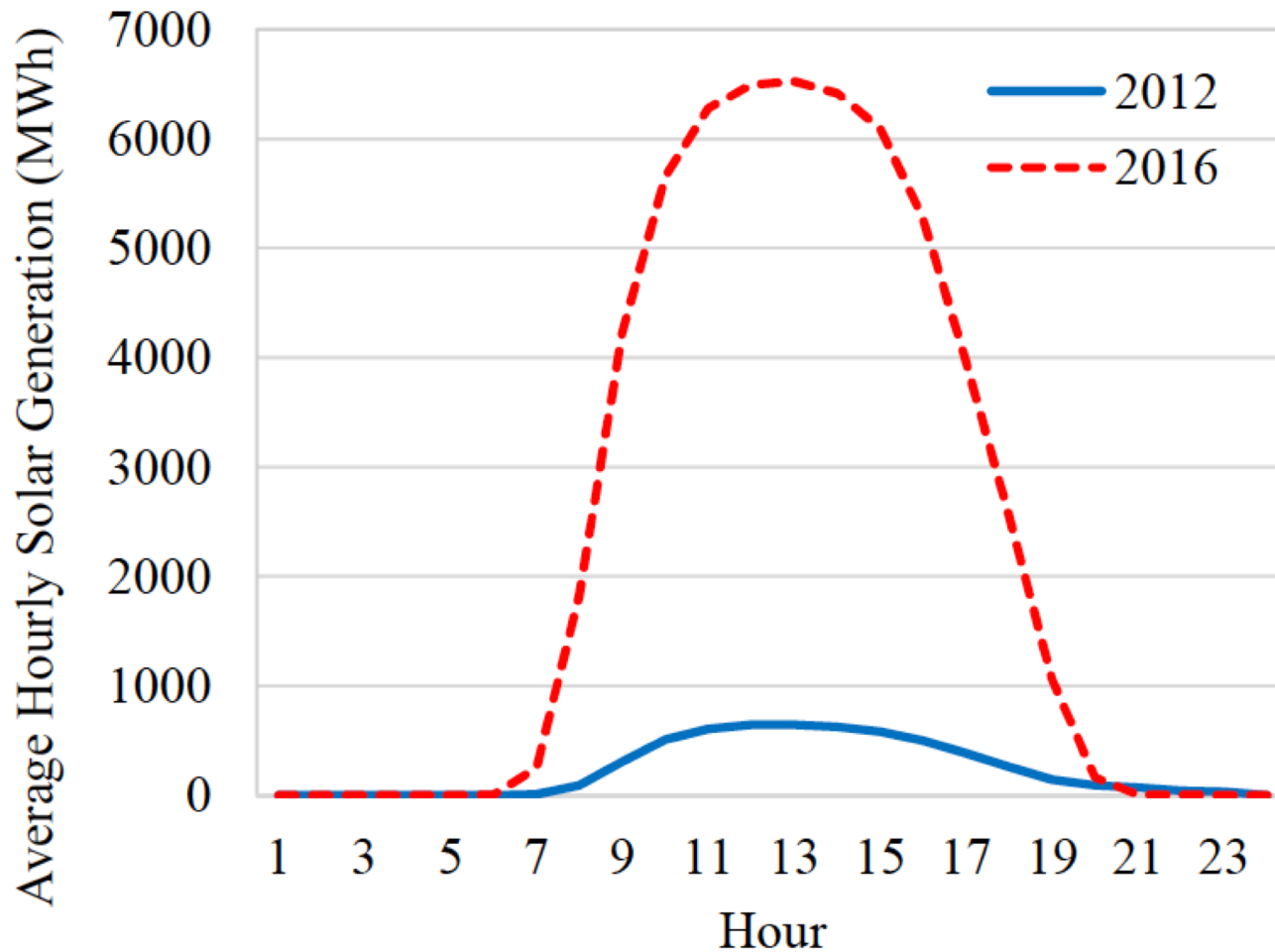
- Long history of tax competition between states to lure large firms/factories
 - Some economic justification (for States) if they can spur “agglomeration” benefits
 - *But* lots of destructive competition also
- Reasons to believe that economic benefits are modest
 - Deregulation may have led to as much/more job loss than closing the plants
 - Negative impacts of environmental and other amenity benefits

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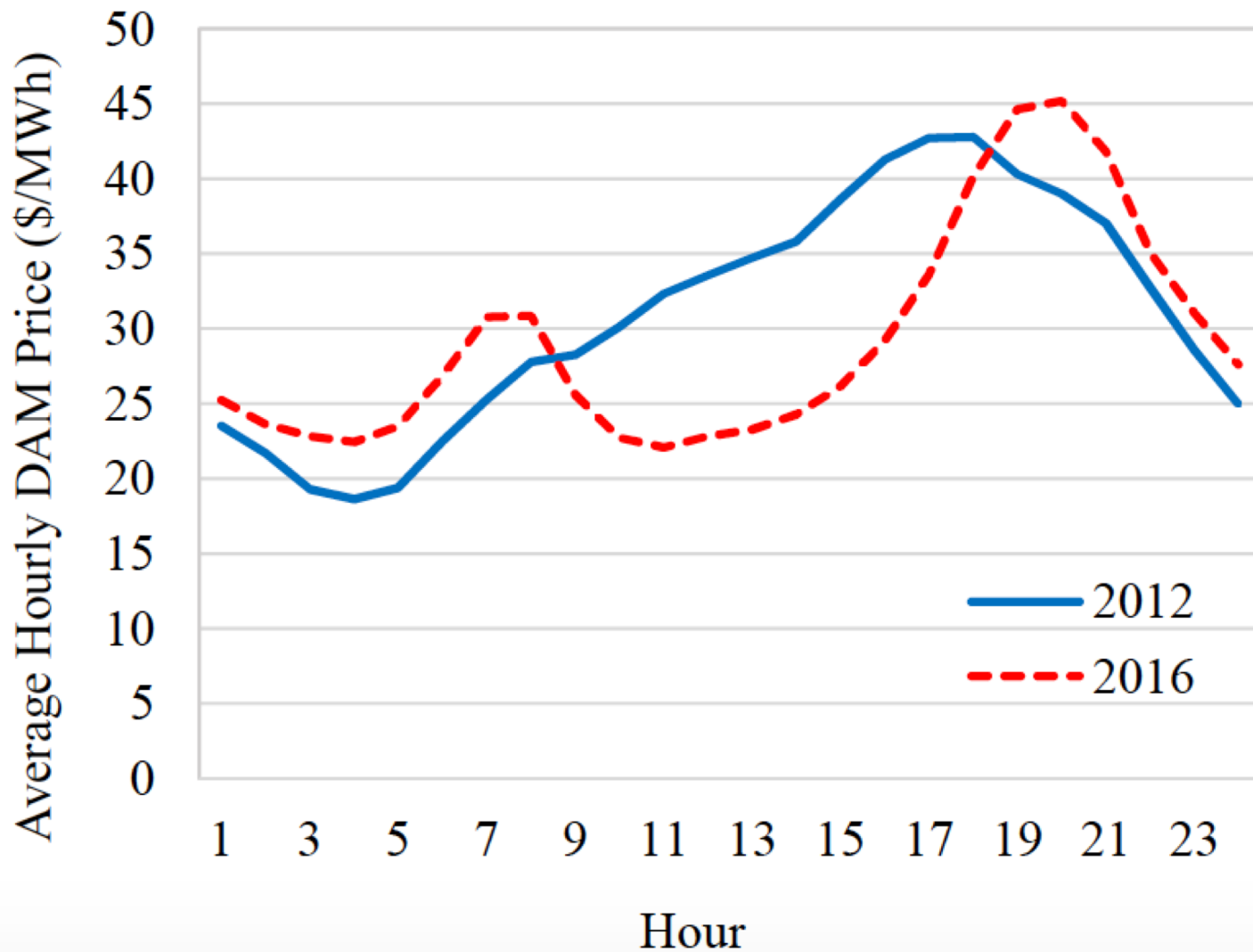
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Hourly Utility Scale Solar Output on CAISO System

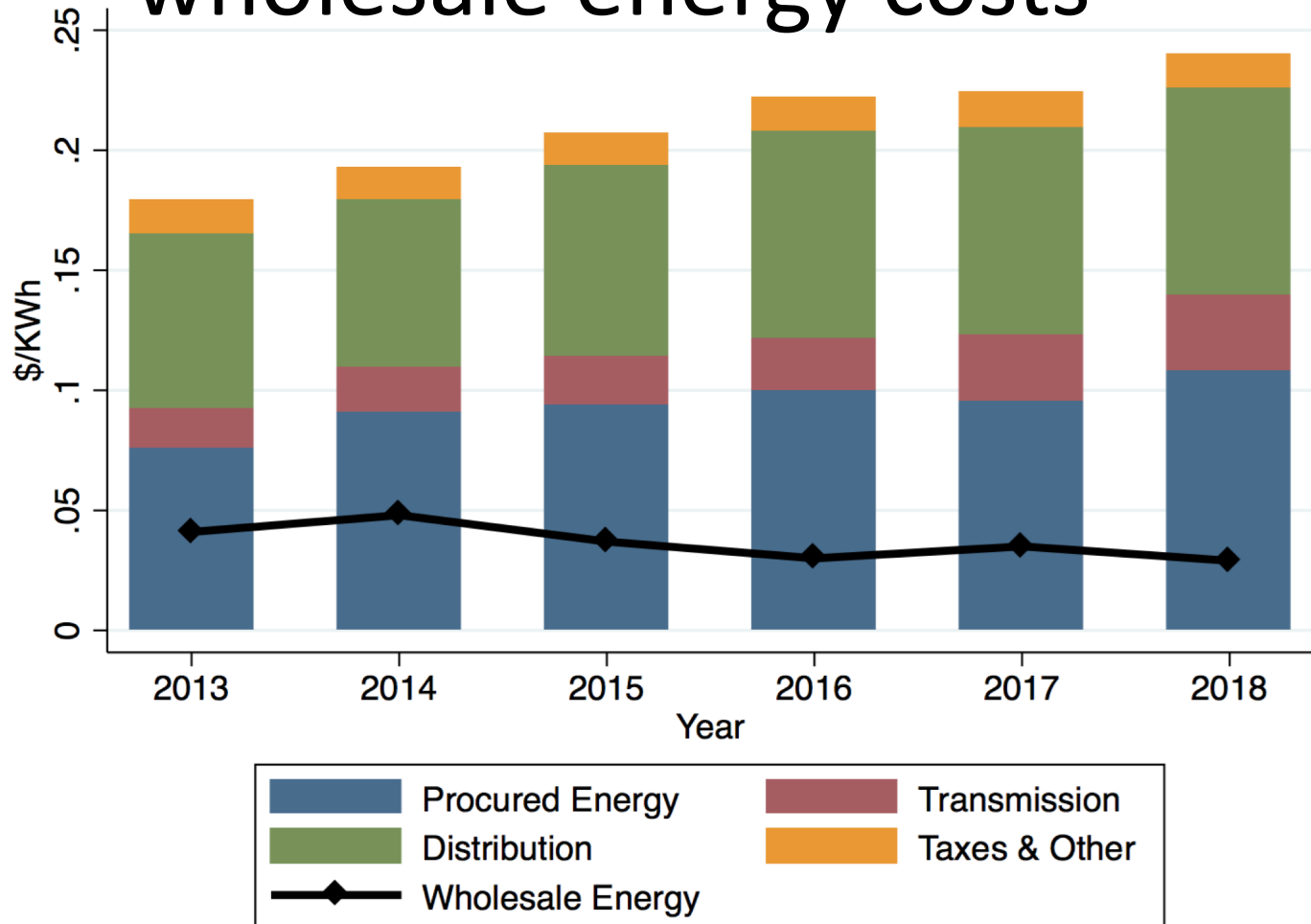
Average Hourly Solar Generation



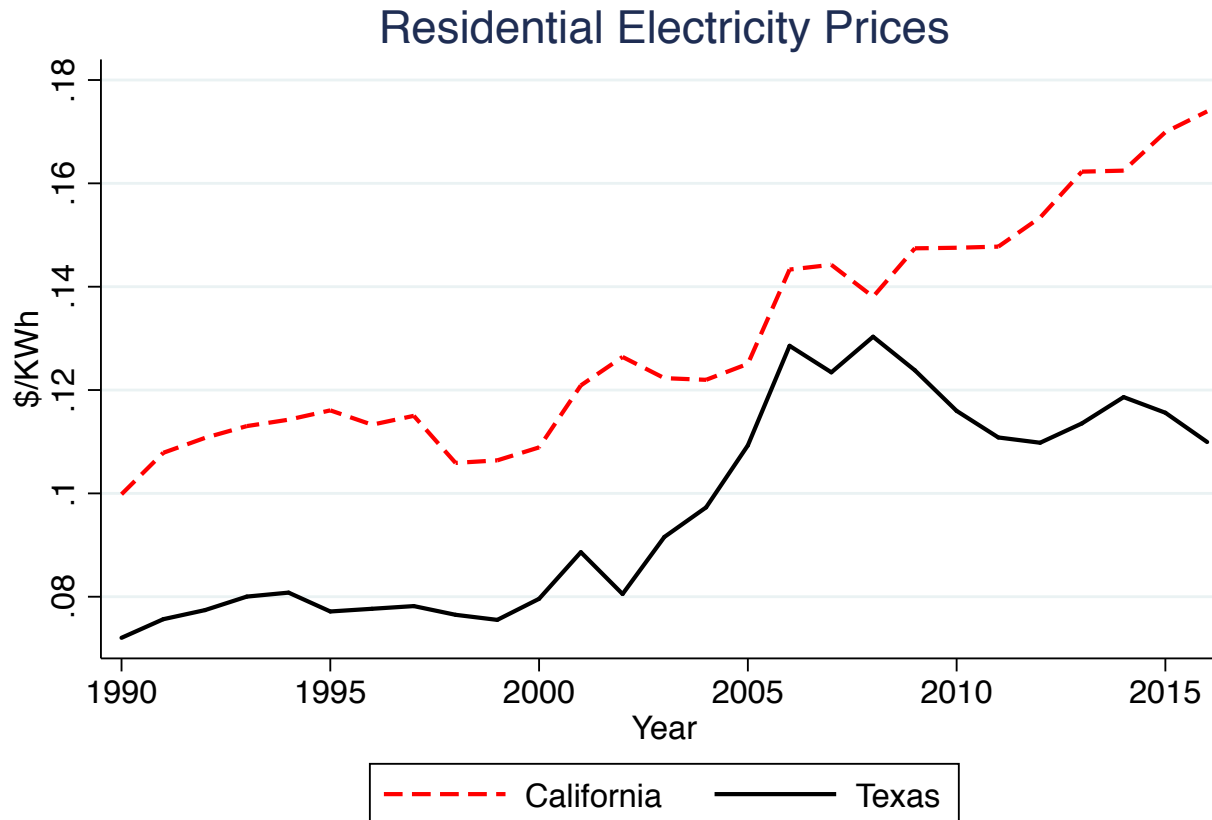
Average Hourly DAM Price



Growing spread between retail and wholesale energy costs



State level policies are (again) creating a wedge between retail prices and wholesale costs



Source: Energy Information Administration Form 861

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 - Carbon pricing

Why motivation matters: FERC and the commerce clause

- **Not acceptable?**
 - Signing above market deals with intent to depress regional capacity or energy prices.
 - Blocking transmission projects because it allows “state X to get our cheap power”
- **Acceptable?**
 - Signing above market deals to promote an environmental goal; to save local jobs?
 - Blocking transmission projects because, ... everyone hates transmission projects

What are the policy options in response?

- Reject/overturn anticompetitive arrangements?
 - Limits of jurisdiction and authority linked to type and form of arrangements
- Mitigation through ISOs?
 - Minimum offers and other mitigation tools
 - Risks of exacerbating original inefficiencies
 - Key question of deterrence effect
- If the process (market) is really leading to the wrong outcomes, *fix the process*
 - Picking solutions through narrow mandates and ad-hoc policies is a slippery slope
 - Once a favorite tool of renewable advocates, now may be used to protect coal
 - How bad do things have to get before we try carbon pricing?

Summary

- Electricity Markets are working largely as we should have expected them to
 - Not always producing the outcomes policy makers *want* them to
- Pressure to interfere (continue to interfere) with market outcomes is reaching a near breaking point
- There is an urgent need to reconcile policy goals (e.g. GHG policy) with market designs
 - Otherwise local policies will continue to stress market prices and customers will continue to seek to bypass them

Time Check?



Thank you

James Bushnell, UC Davis

Comments drawn from:

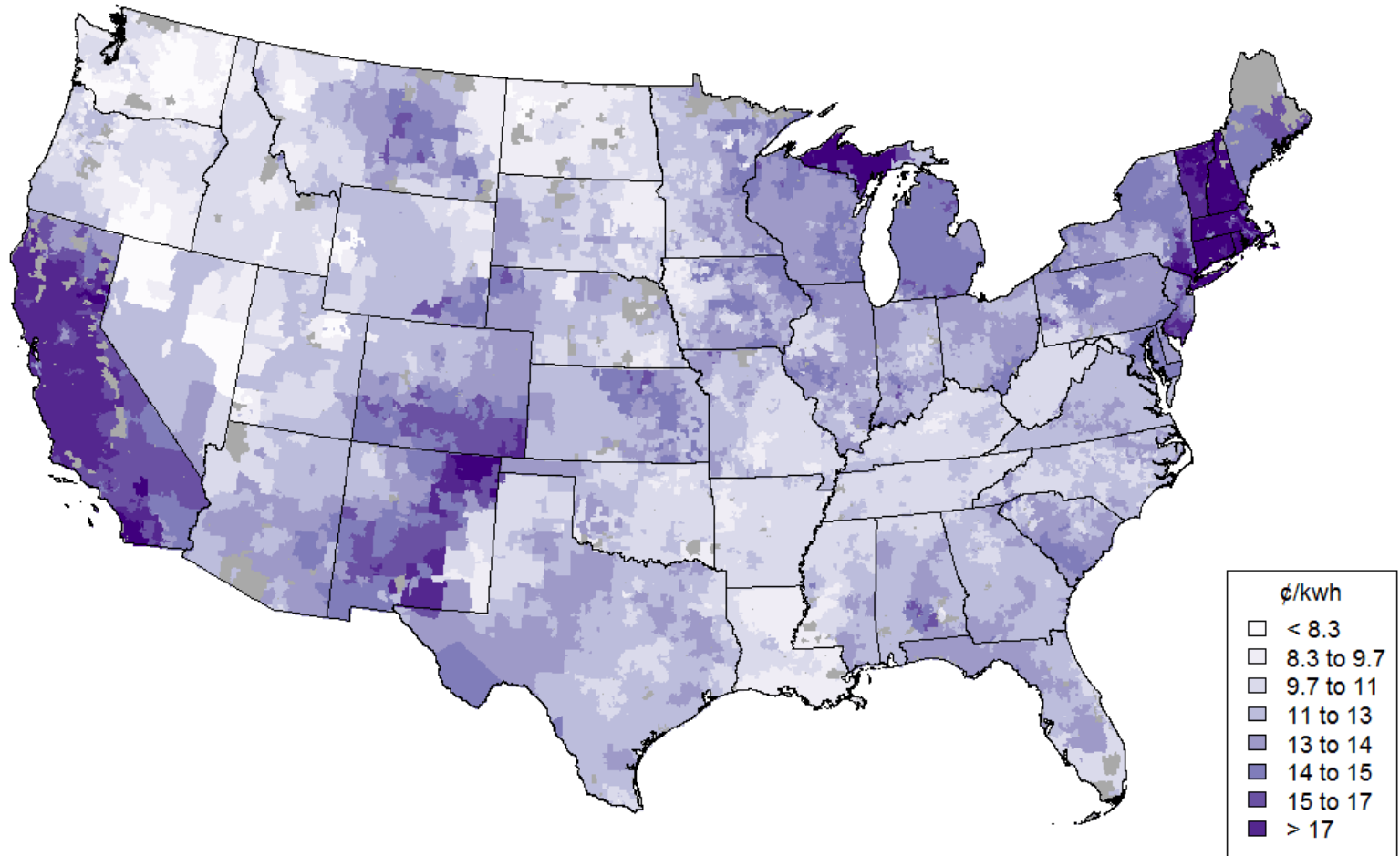
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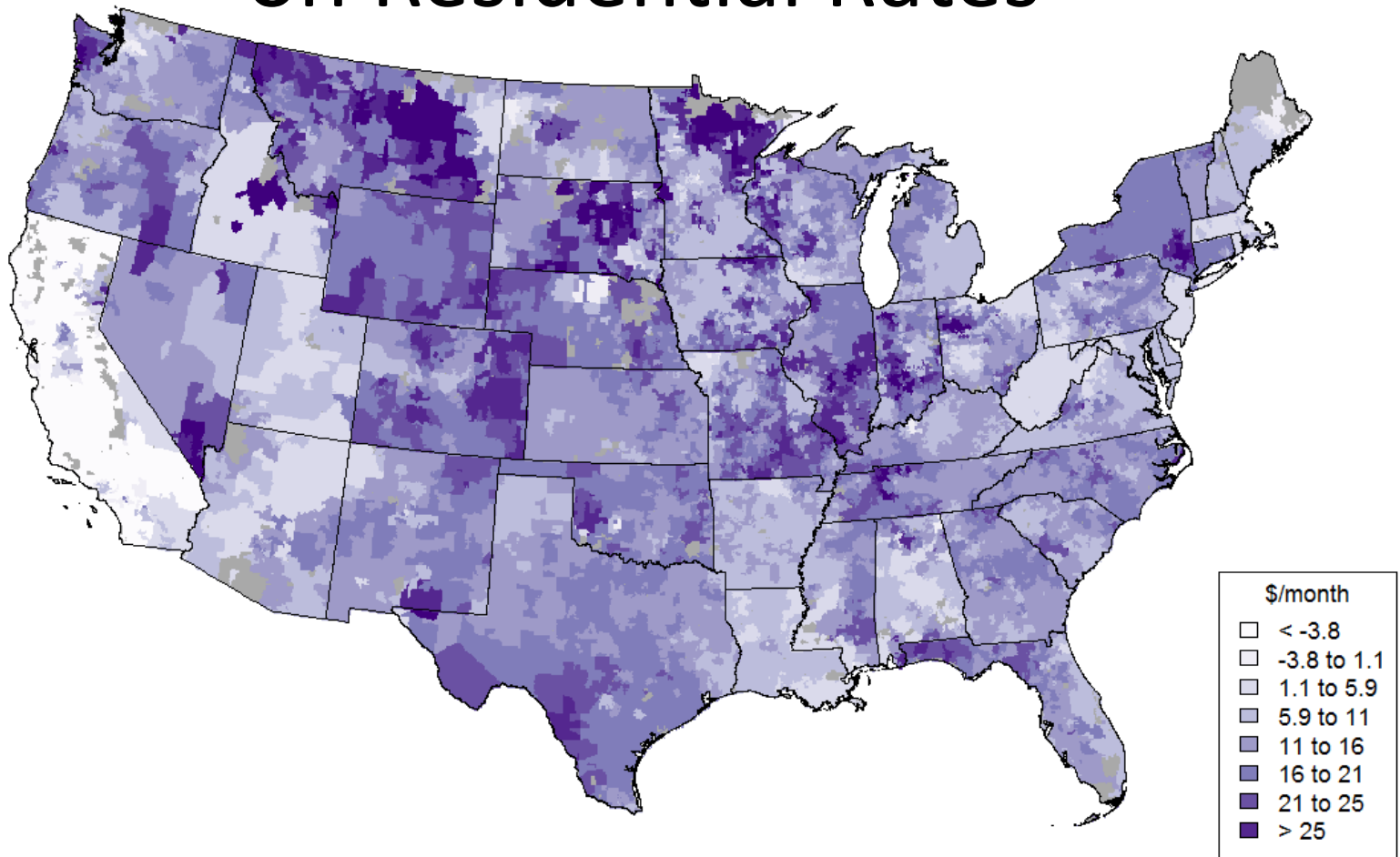
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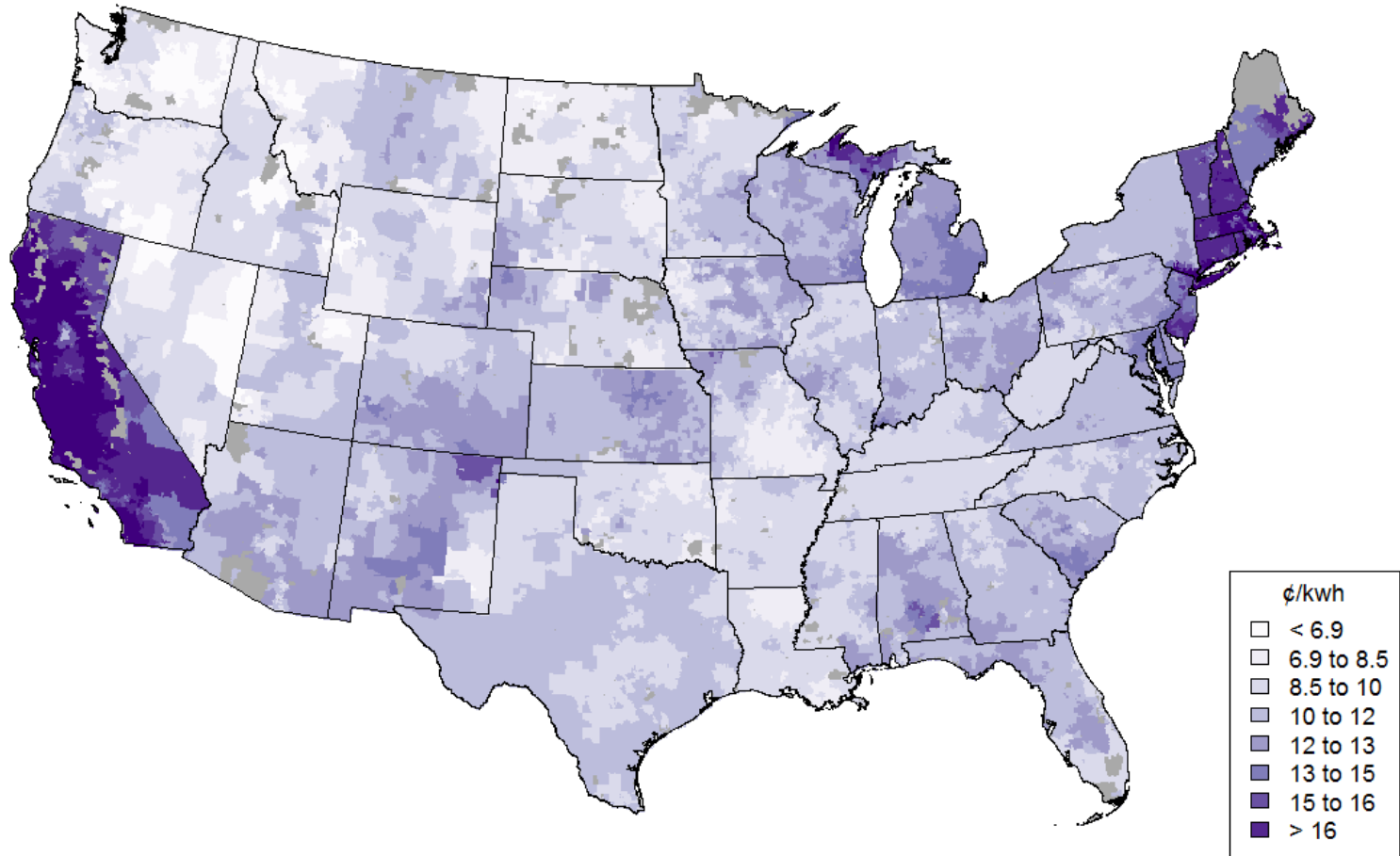
Average Residential Retail Price



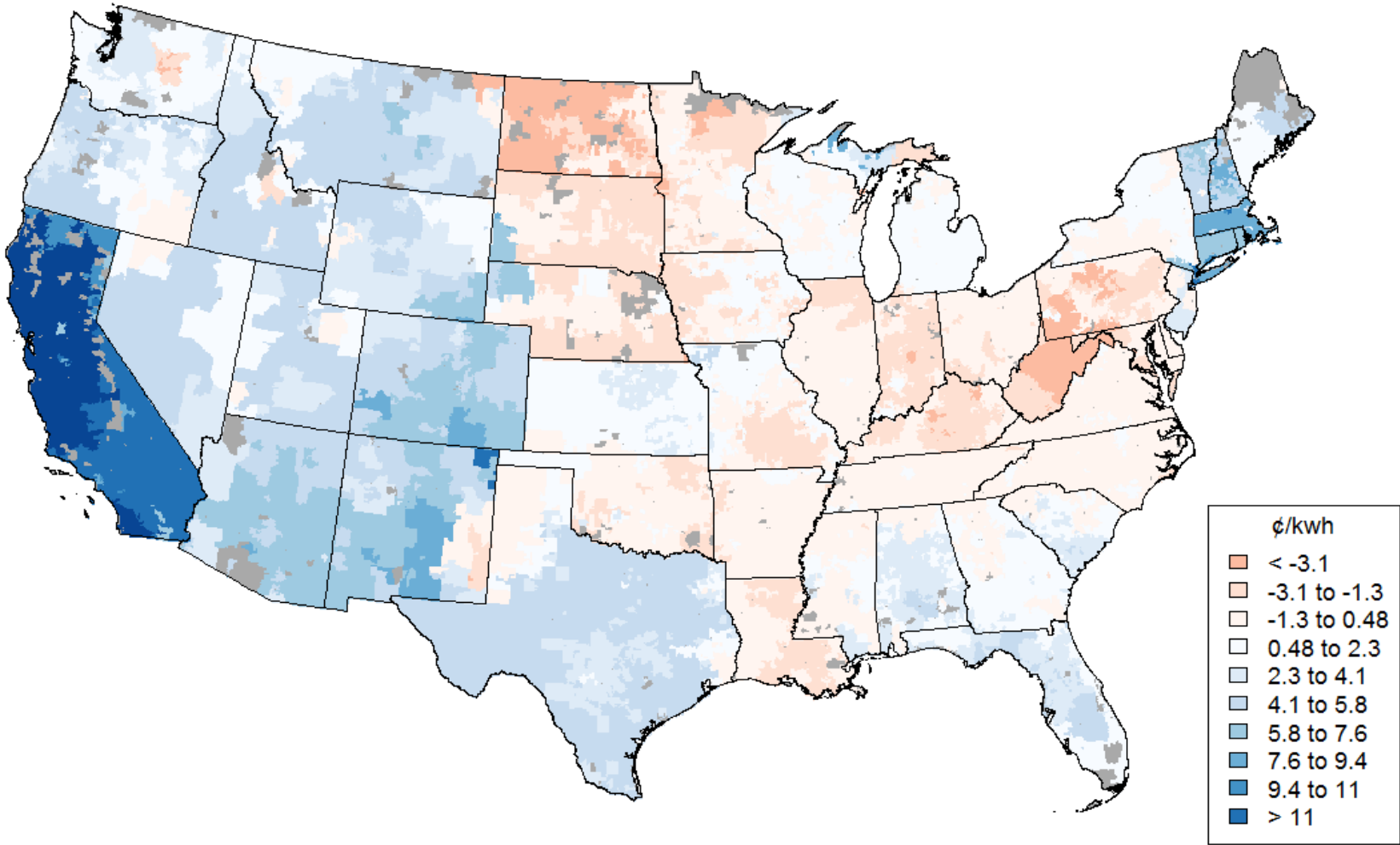
Monthly Fixed Charges on Residential Rates



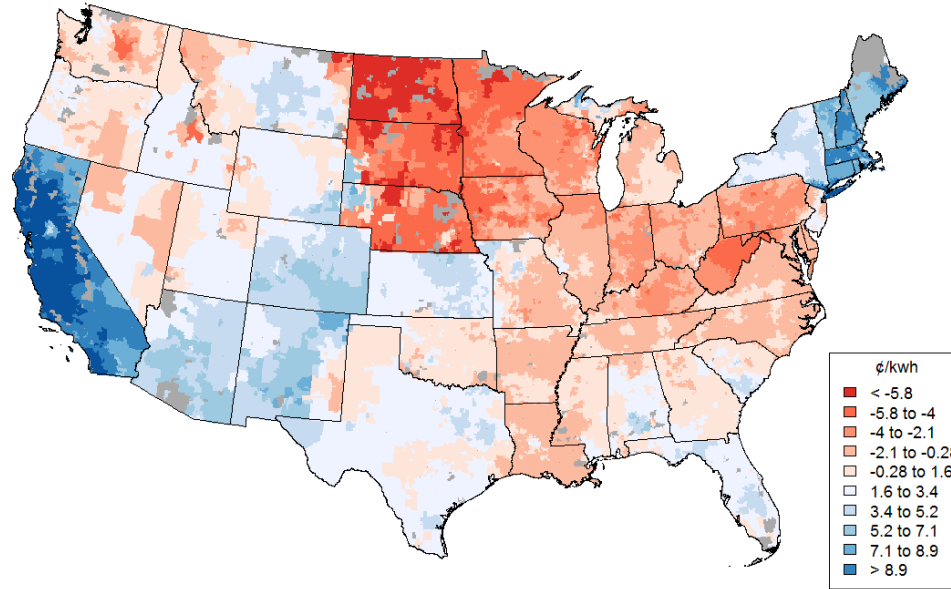
Residential Retail Variable Price



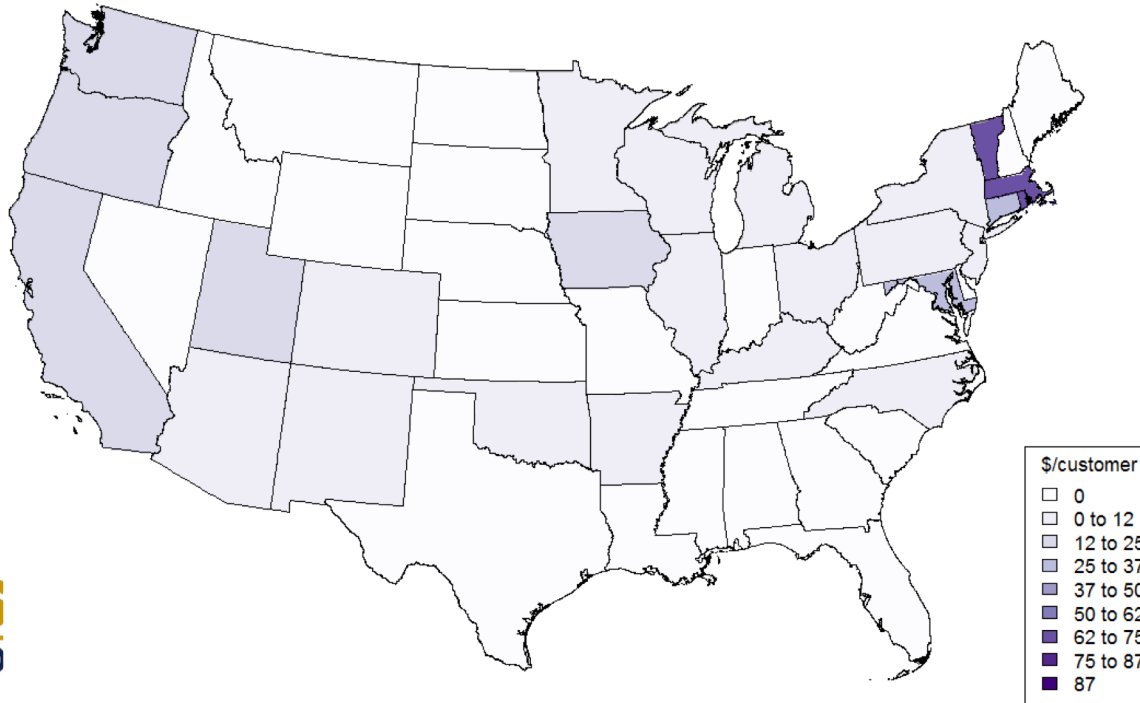
Price Gaps: Retail electricity price - average social marginal cost



Mis-targeted Energy Efficiency

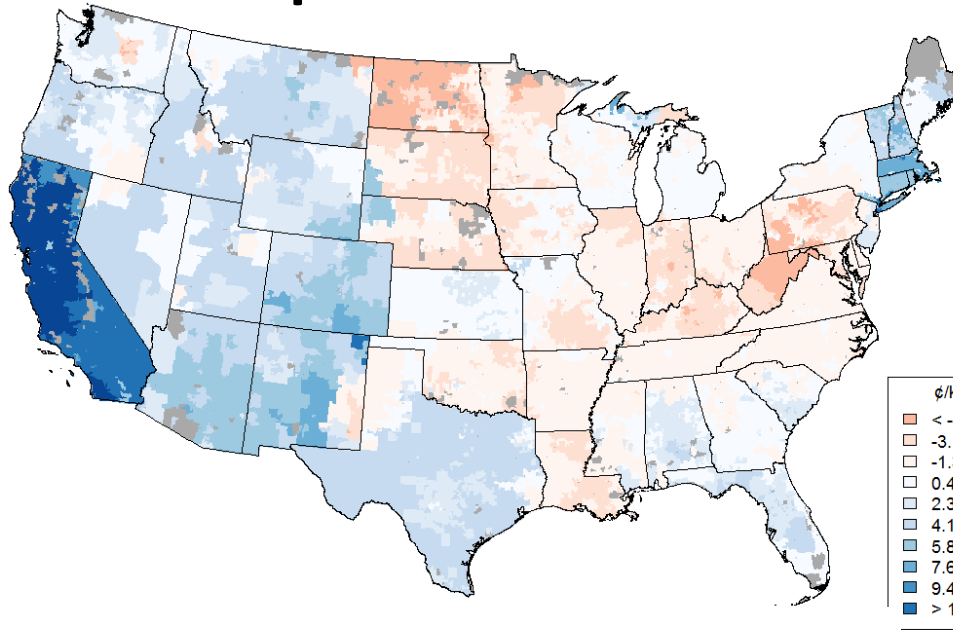


Price-Avg Social MC

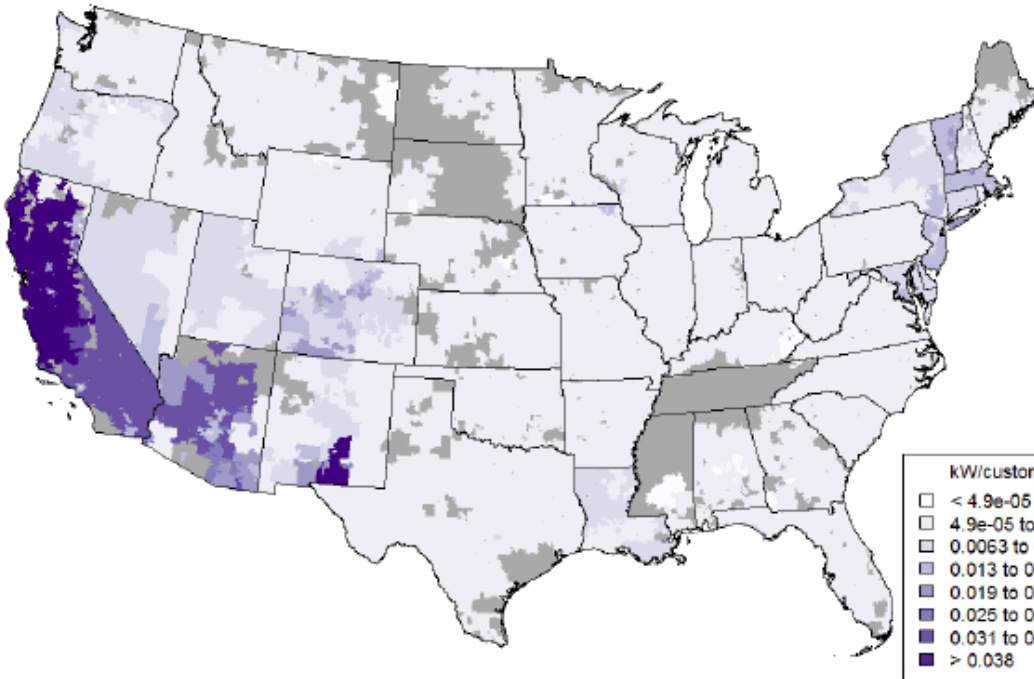


Per-Customer Energy Efficiency Spending

Rooftop solar where $P \gg SMC$



Price-Avg SMC



Net metered res PV capacity
Total res customers