

# Quantitative Policy Analysis: Impacts of Mandates and Interconnection Reforms on Energy Storage

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## Did Mandates Lead to Battery Cost Reductions in California?

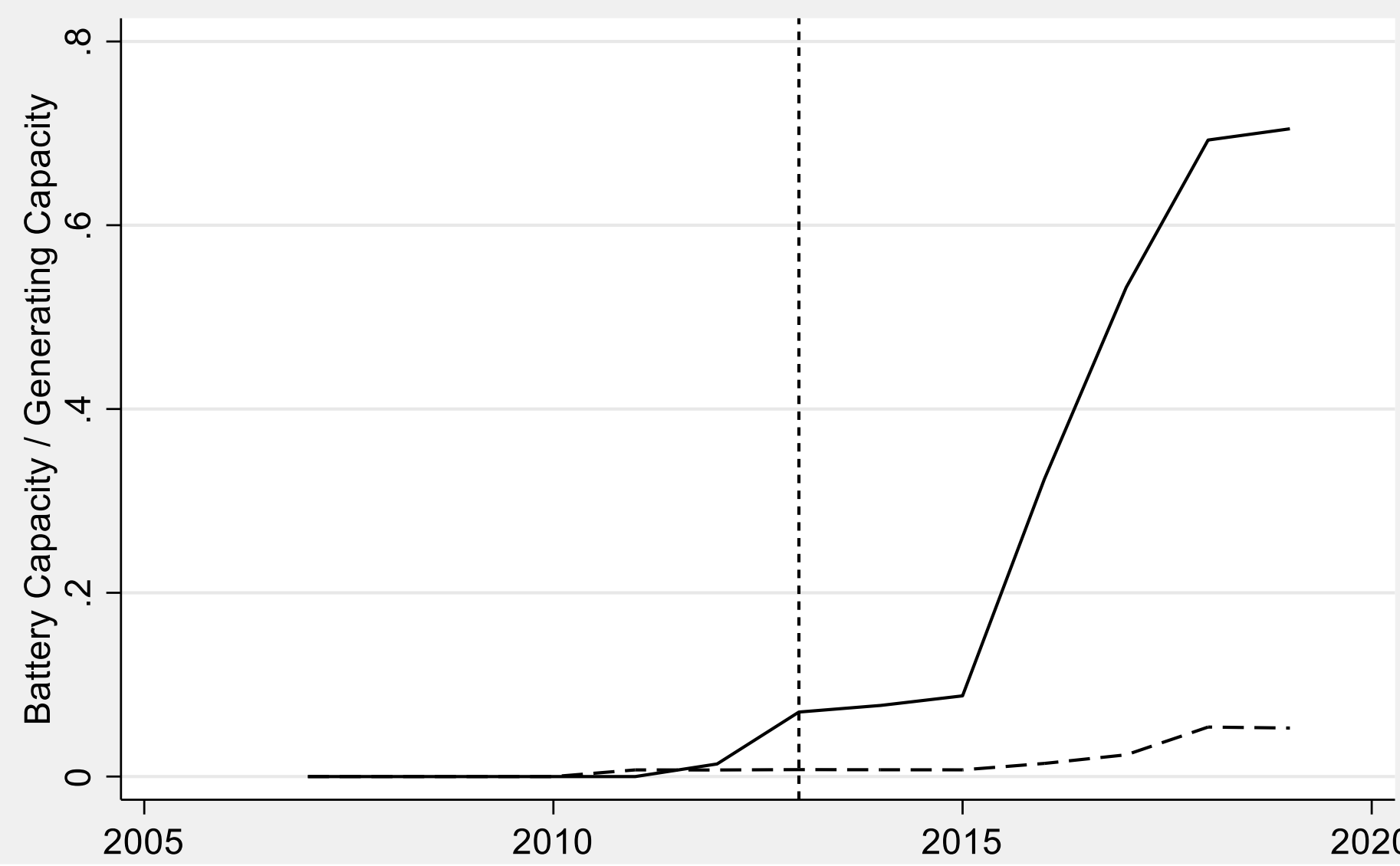
### Research Objective

Evaluate the effectiveness of California's 2013 mandate that utilities procure 1.3 GW of energy storage by 2020

### Methods

- Differences in differences analysis of battery deployment across states
- Synthetic control analysis of deployment in California vs. a "synthetic California"
- Learning curve analysis to tie increases in deployment to decreases in cost

### Synthetic Control Results



### Key Findings for Mandates

- California saw a statistically significant increase in battery deployment
- Effects were robust to policy controls, EV growth and natural gas prices

### Potential Impacts on Battery Prices

- Induced demand can reduce prices through learning by doing
- Lithium-ion batteries have observed learning rates ranging from 14-30%
- Under these assumptions the policy would reduce costs by \$0.76-1.63/kWh
- Savings are likely to be higher if soft cost reductions are considered

## How do Changes to Interconnection Policies Impact Queues?

### Research Objective

Examine how reforms of interconnection policy in New York and Massachusetts impacted project queue times

### Policies

- MA began publishing maps of available hosting capacity
- NY altered cost sharing rules

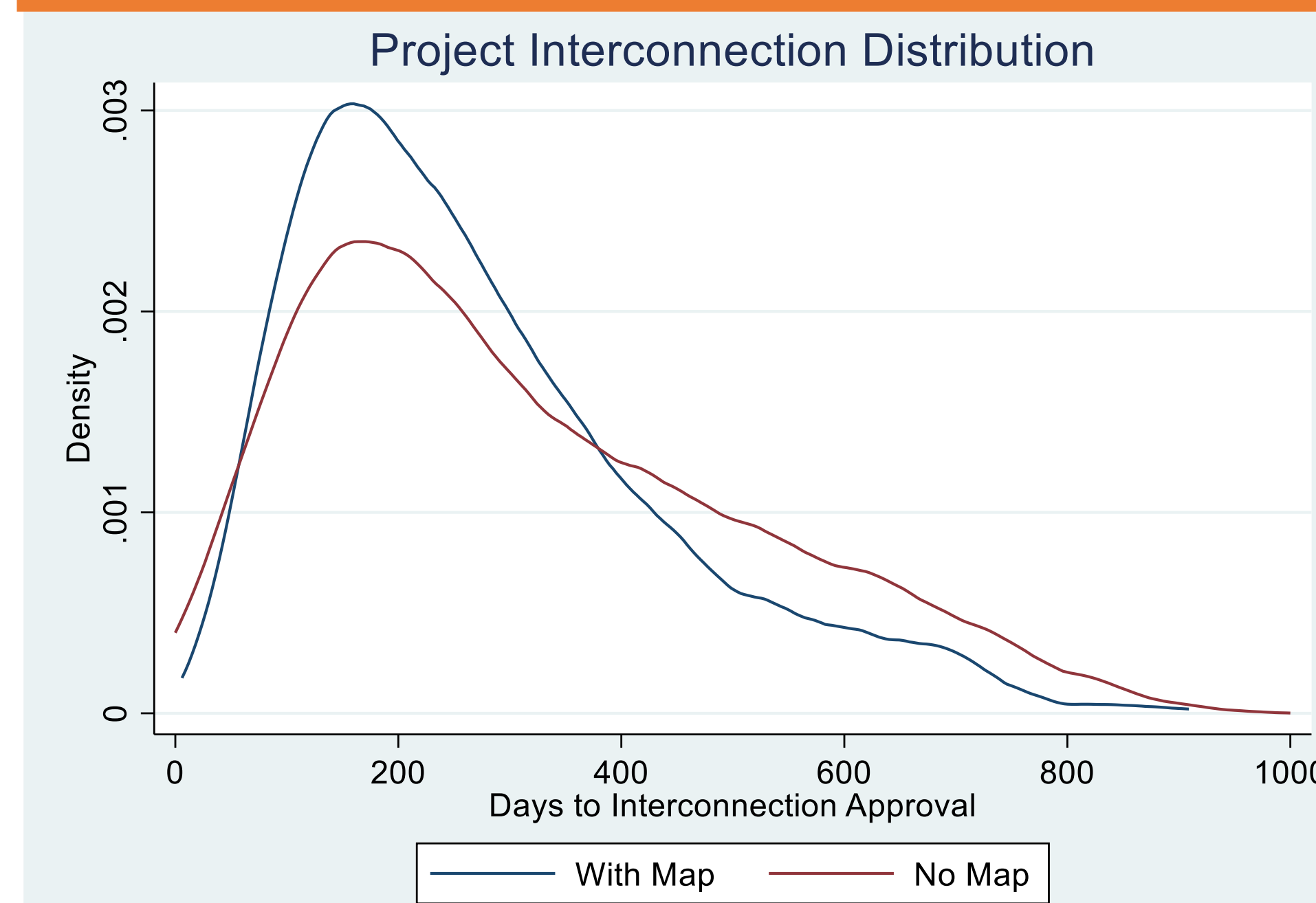
### Methods

Time constrained regression analysis of policies in Massachusetts and New York provides indicators on queue times

### Days to Interconnect

	Before	After
NY	142	122
MA	349	249

### Data Transparency Impact on IC Queues in MA



### Key Findings for IC Reform

- Massachusetts saw queue times reduce by 107 days after providing information on feeder congestion
- Efforts to change cost allocation processes in NY had limited impacts
- Energy storage projects take longer to reach IC than single technology projects, but hybrid projects with storage were approved more quickly than other hybrid projects