

Regulating the Transition to a Decarbonized Economy

Steve Cicala
Tufts University

16 October, 2023

Outline

- ① A Whodunnit Mystery
- ② Why This Matters for Decarbonization
- ③ Conclusion

Outline of the Talk

- ① A Whodunnit Mystery
- ② Why This Matters for Decarbonization
- ③ Conclusion

Restructuring and Incidence in the U.S. Electricity Sector

- Power plant divestiture
- Wholesale electricity markets
- Retail prices

A Natural Experiment in Cost of Service Regulation

Cicala (2015):

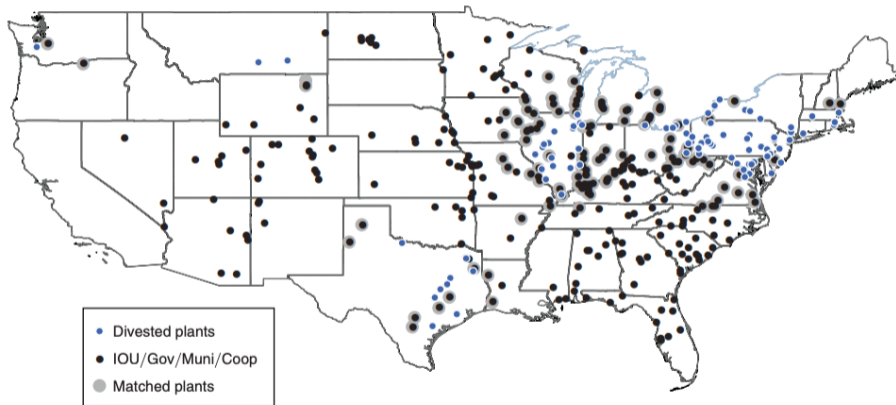
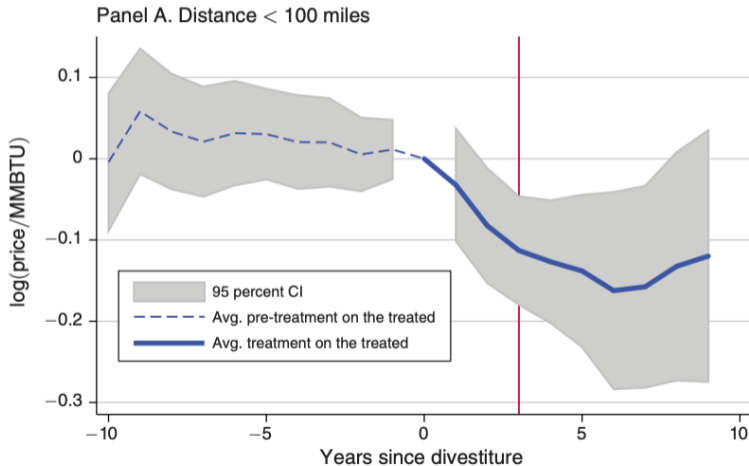


FIGURE 1. COAL-FIRED PLANTS IN THE UNITED STATES, 1990–2009

Power Plant Divestiture Reduced Fuel Costs

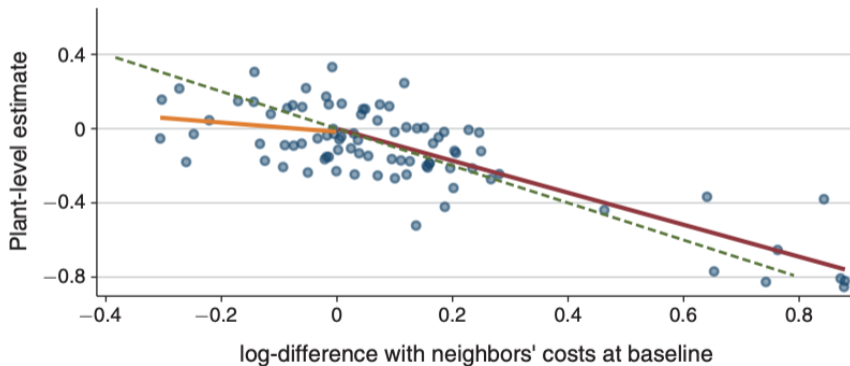
Cicala (2015):



More Fat to Cut, More Savings: Coal

Cicala (2021):

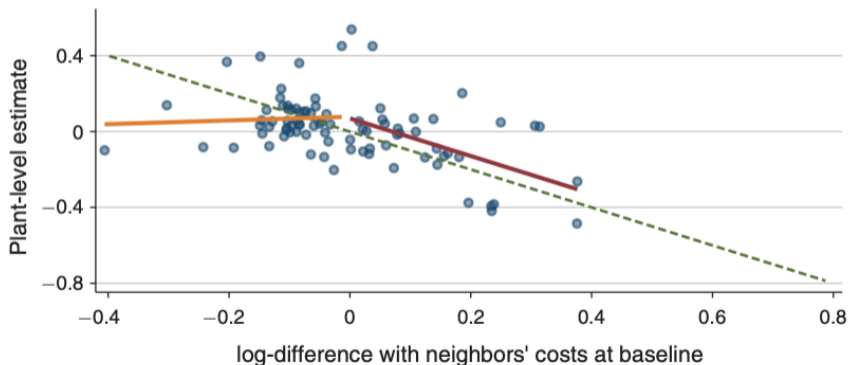
Panel A. Coal



More Fat to Cut, More Savings: Gas

Cicala (2021):

Panel B. Gas



Another Natural Experiment: Wholesale Markets

Cicala (2022):

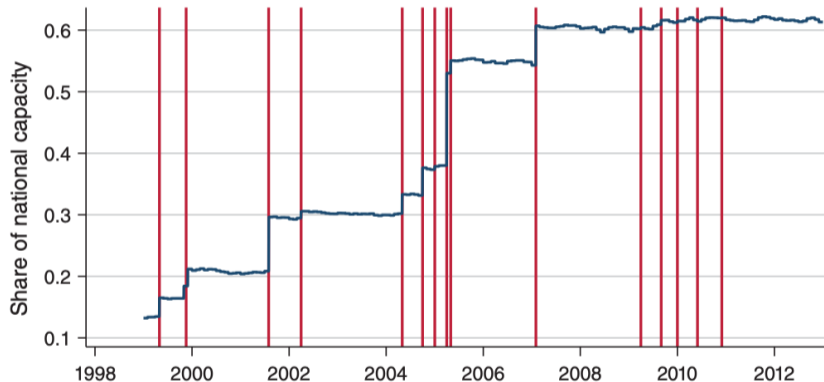
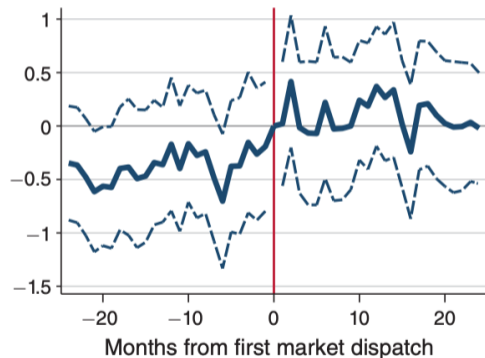


FIGURE 2. SHARE OF US GENERATING CAPACITY DISPATCHED BY MARKETS

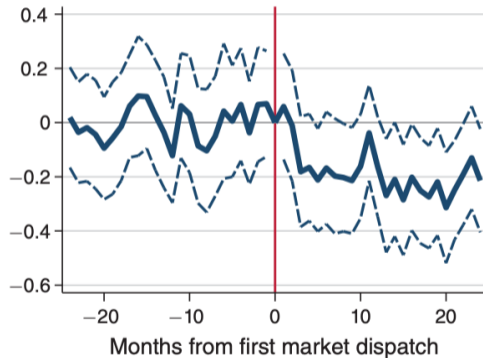
Wholesale Market Dispatch Reduced Generation Costs

Cicala (2022):

Panel A. $\log(\text{gains from trade})$



Panel B. $\log(\text{out-of-merit costs})$

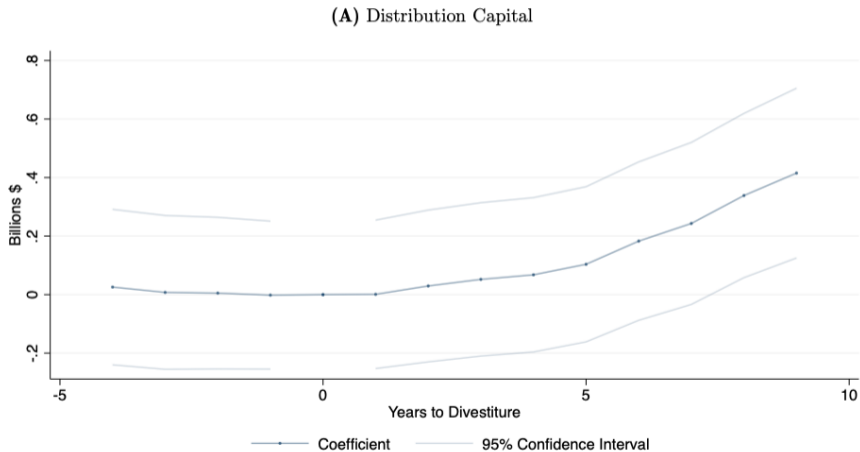


Where Did the Savings Go?

- Consumers: MacKay and Mercadal (2021), Joskow (2005), Kwoka (2008).
- Producers: Borenstein and Bushnell (2015).
- Deregulated Retailers: Kahn-Lang (2023).
- Utilities?
 - Vertically-integrated utilities → T&D utilities.
 - T&D utilities remain rate-regulated, potentially lower input costs.
 - Pass on savings to consumers, or capitalize?

Restructured T&D Utilities have Expanded their Rate Base

Cicala (2021):

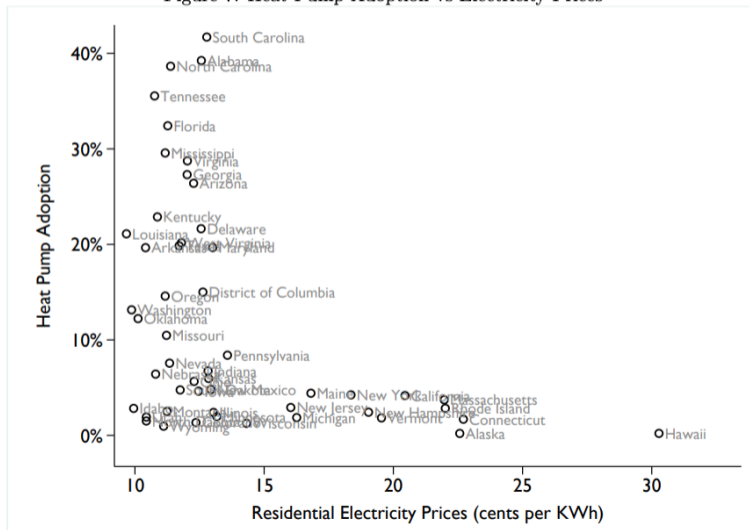


Outline of the Talk

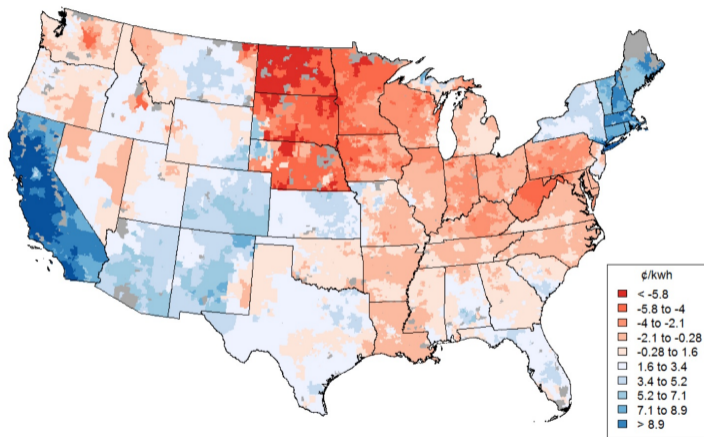
- ① A Whodunnit Mystery
- ② Why This Matters for Decarbonization
- ③ Conclusion

Decarbonization Depends on Retail Prices: Davis (forthcoming)

Figure 7: Heat Pump Adoption vs Electricity Prices



Retail Prices Often Exceed Social Marginal Cost

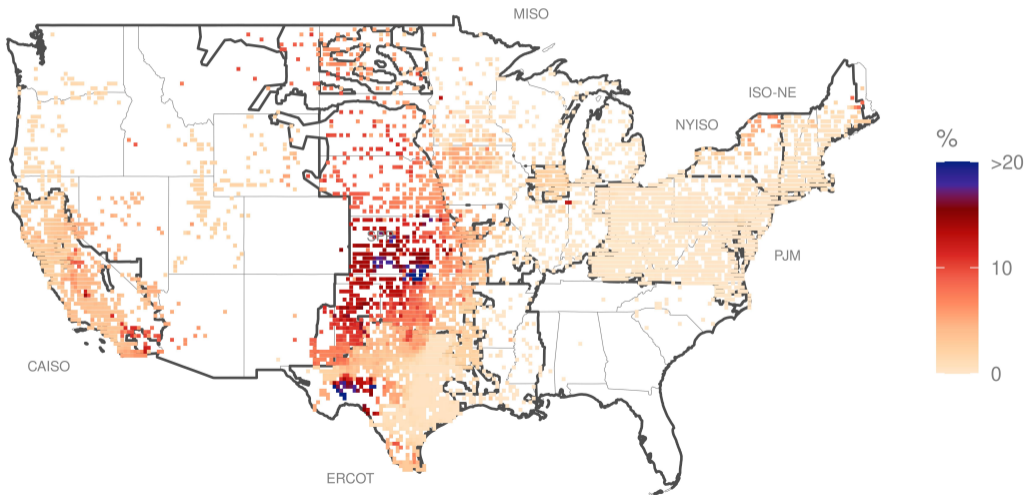


Source: Borenstein & Bushnell (2022).

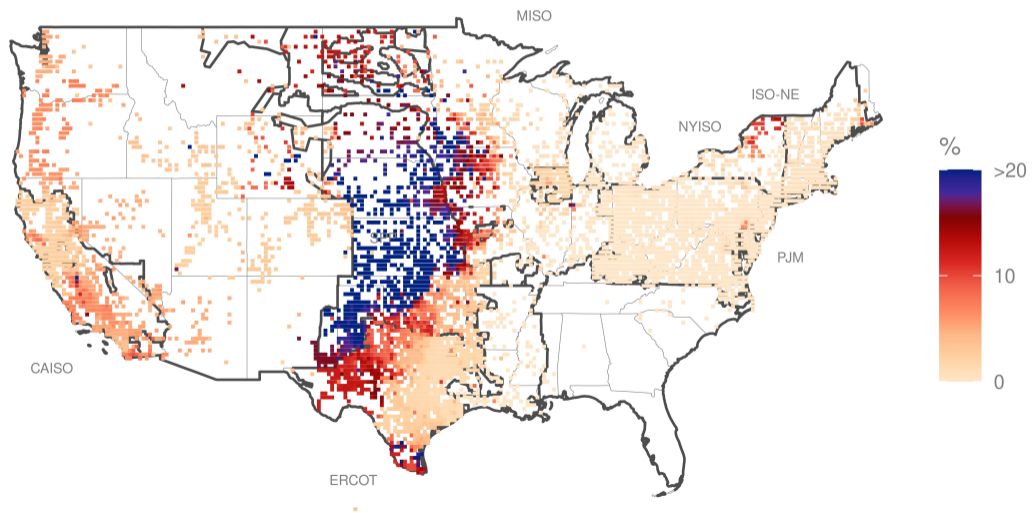
A Disconnect Between Clean Subsidies & Clean Adoption

- U.S. policy leans heavily on generation subsidies.
- Will consumers see lower prices?
- Risk of subsidy treadmill.

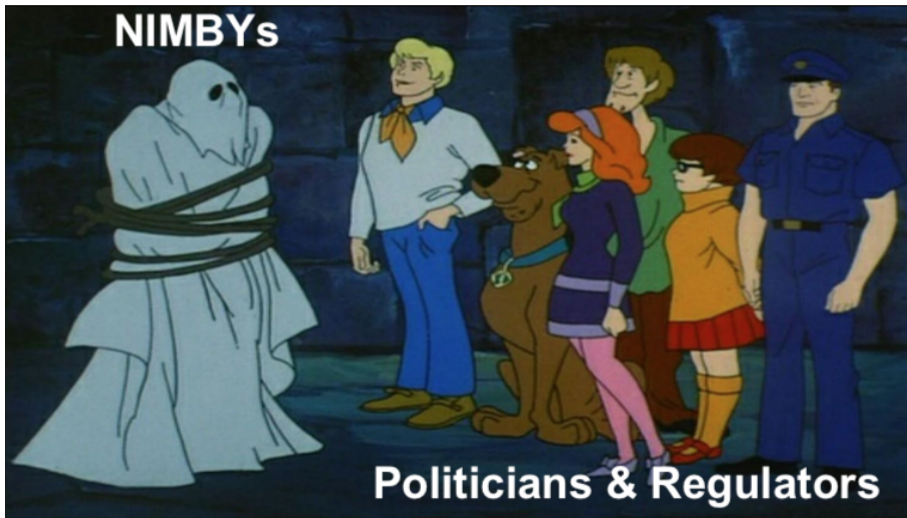
Negative pricing frequency (2019)



Negative pricing frequency (2022)



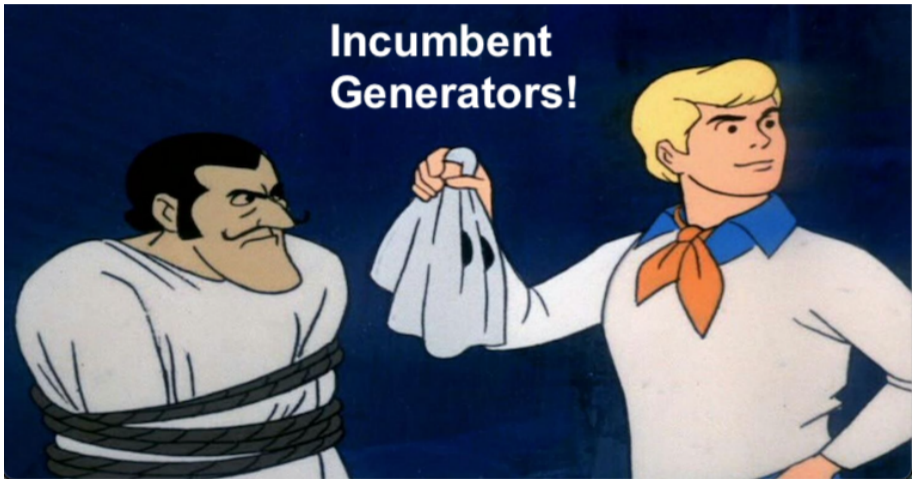
Trying to Build a Transmission Line



15 Years of Attempted Permitting



It was Incumbents All Along!



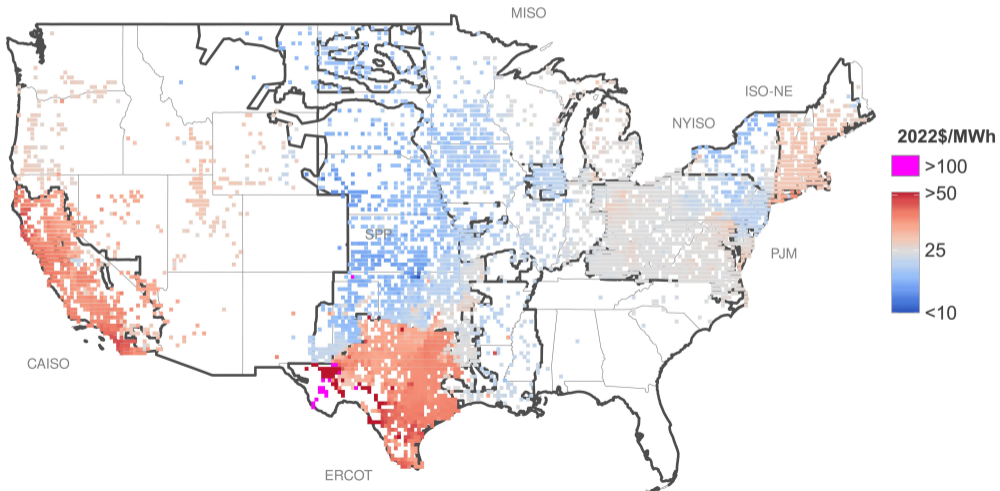
Outline of the Talk

- ① A Whodunnit Mystery
- ② Why This Matters for Decarbonization
- ③ Conclusion**

Conclusion

- To do:
 - Decarbonize the grid
 - Electrify everything
- Scale of change inconsistent with property rights for the status quo.
- Basic supply & demand goes pretty far.
- Careful regulatory design can avoid costly mistakes.

Average wholesale price (2019)



Average wholesale price (2022)

