

Institutional Barriers to Decarbonizing the Grid



- Strong, well-planned electricity grid is central to decarbonization
 - Need to interconnect resources faster
 - Need to build stronger regional/interregional ties
 - Need to rationalize & minimize spending to avoid dampening support for the transition

Failing to strengthen the grid could result in up to 80% of the emissions benefits of the Inflation Reduction Act failing to be realized (Princeton REPEAT Project 2024)

What's Going Wrong in Institutional Design?

- **Jurisdictional silos:** division of labor impedes holistic thinking and planning
 - Clean energy & reliability
(states) (NERC)
 - Generation planning & transmission planning/interconnection
(states) (RTOs/FERC)
 - Transmission planning & transmission siting
(RTOs/FERC) (states)
- **Public/private divide:** utilities play a core role in grid planning, entry rules, & reliability governance
 - Their interests sometimes cut against public interest in this space
 - Present outcomes largely reflect utility interests; overspending by billions

Breaking Down Institutional Barriers

- **Jurisdictional Silos:** better alignment of missions and powers; stronger coordination among entities

- E.g., Clean energy & reliability

(states)

(NERC)

Need a reliability organization with ability to regulate beyond technical characteristics of bulk power system, with a mandate to help states meet their energy goals

- **Public/private divide:** stronger governance of “public utilities”; more oversight of planning & its outcomes; Gold standard = Federal Grid Planning Authority

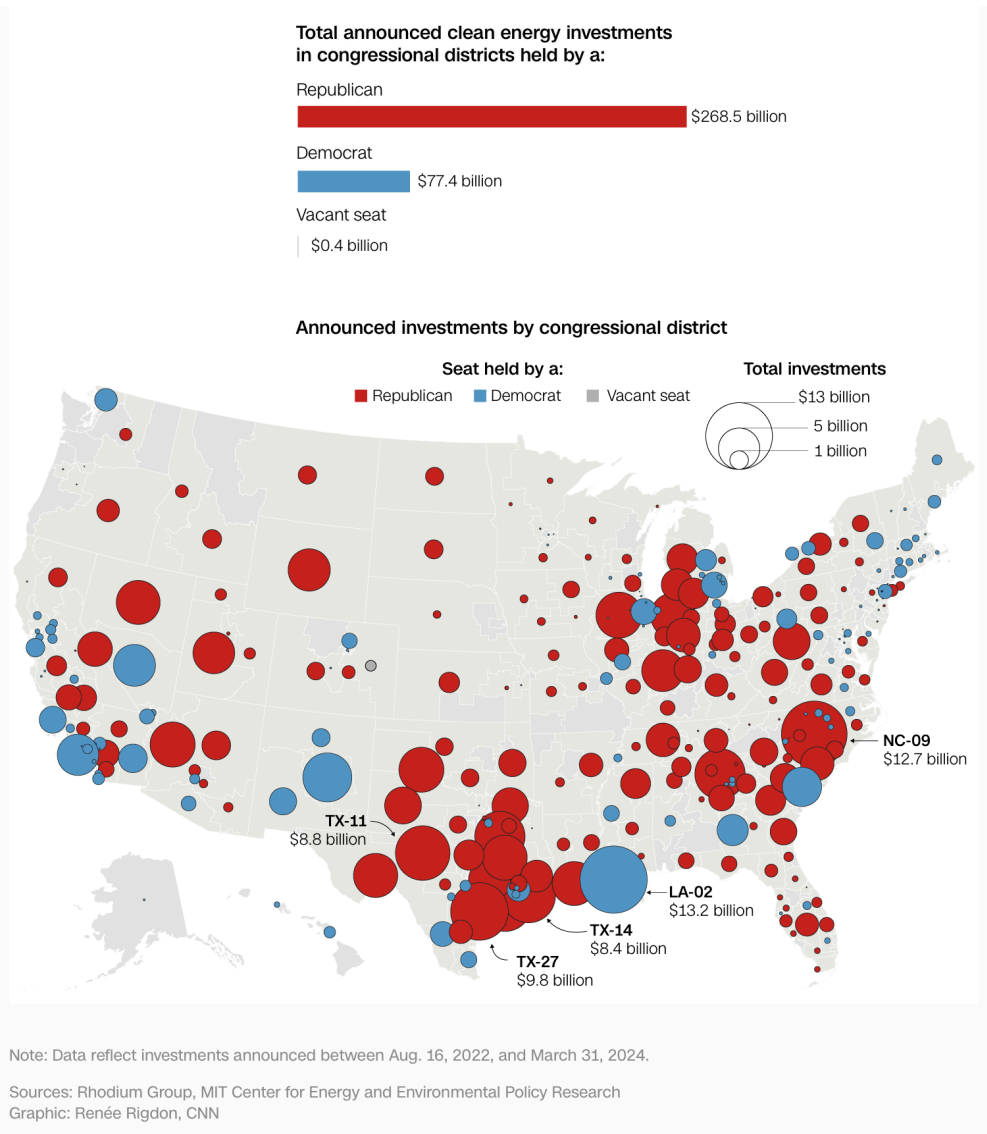
Rationalizing grid buildout serves decarbonization and equity goals simultaneously



Political Barriers to Decarbonization

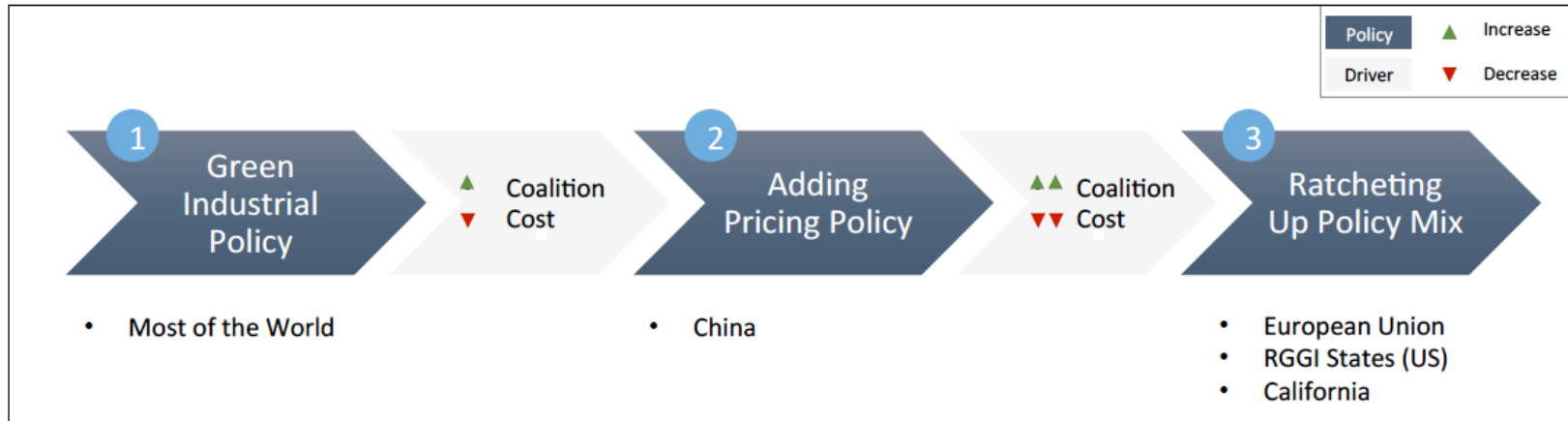
Jonas Meckling
University of California, Berkeley
Harvard Business School

Durability of the Inflation Reduction Act



- IRA driving an **electoral coalition?**
 - Mobilizing voters that benefit from IRA
- IRA creating a **policy coalition?**
 - Mobilizing industry that benefits from IRA
 - Mobilizing politicians in states that benefit from IRA

From policy carrots to policy sticks

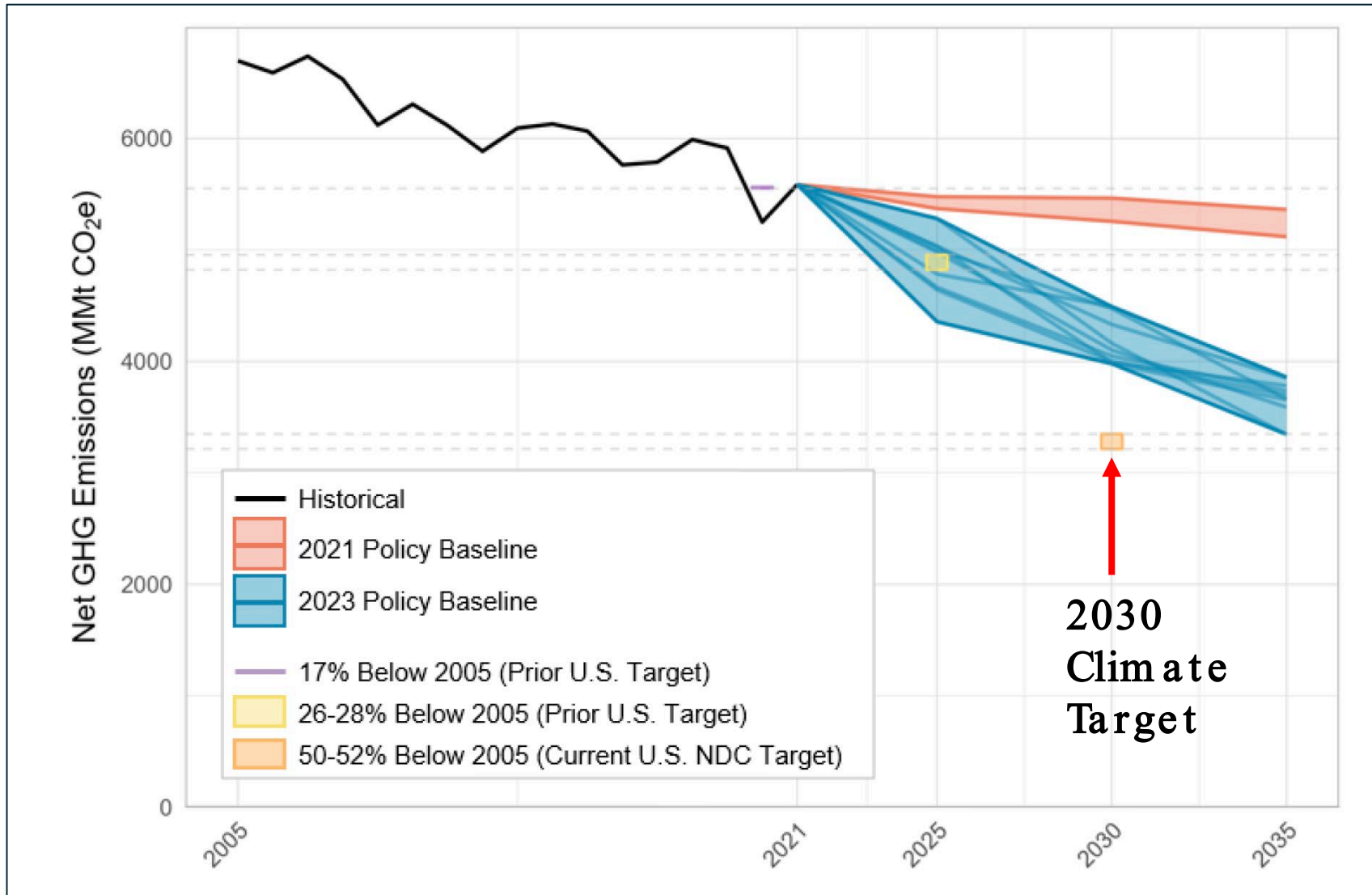


- **IRA reducing political opposition to policy sticks?**
 - Lowering the cost of clean energy technologies
- **IRA building political support for policy sticks?**
 - Growing clean energy coalition
 - Increasing debt pressure and mobilizing politicians for tax reform

Key takeaways

- Political opposition persisting and changing form
- **Near-term outlook:** IRA may be creating **policy coalition** that supports its future, but unlikely driving **electoral coalition**
- **Longer-term outlook:** Path to climate policy sticks uncertain, depends on both reducing opposition and building support

Overcoming Barriers In The Decarbonization Science To Policy To Action To Implementation Ecosystem



Costa Samaras, PhD
Director, Scott Institute for
Energy Innovation

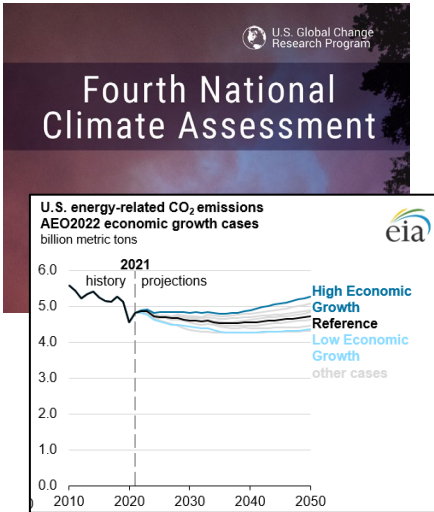
Professor, Civil and
Environmental Engineering

Professor, Engineering and
Public Policy

National Academies
September 12, 2024
csamaras@cmu.edu
CostaSamaras.com
@CostaSamaras

Carnegie Mellon University
Wilton E. Scott Institute
for Energy Innovation

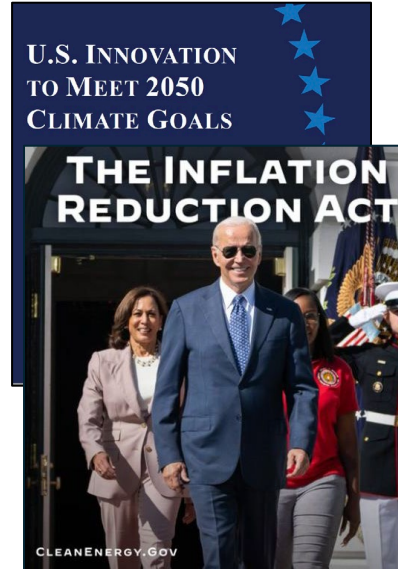
Maintaining Coalitions To Stay on Decarbonization Schedules Under Physical and Transition Risks



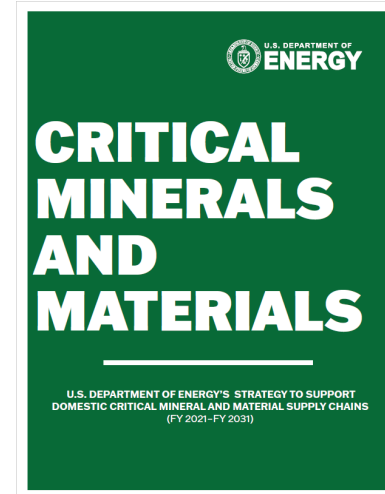
Science, Impacts,
and Solutions
Research
Ecosystem



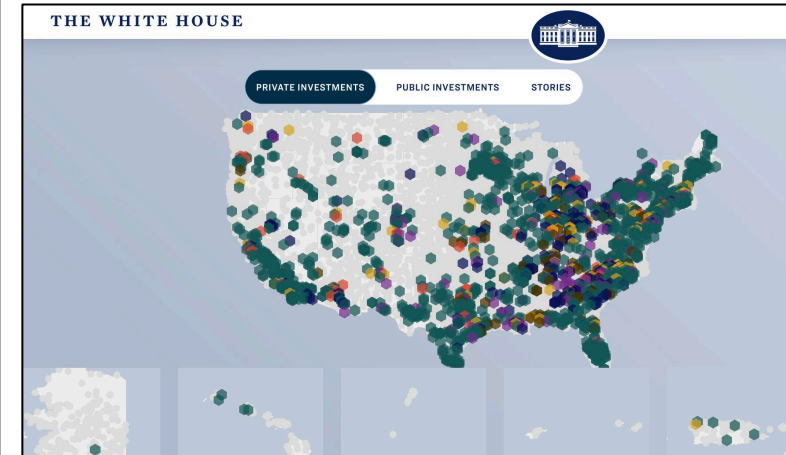
National and Sub-
National Climate
Commitments



Supply Push,
Demand Pull,
and Regulatory
Policies



Materials,
Minerals,
Production,
Capital,
Workforce



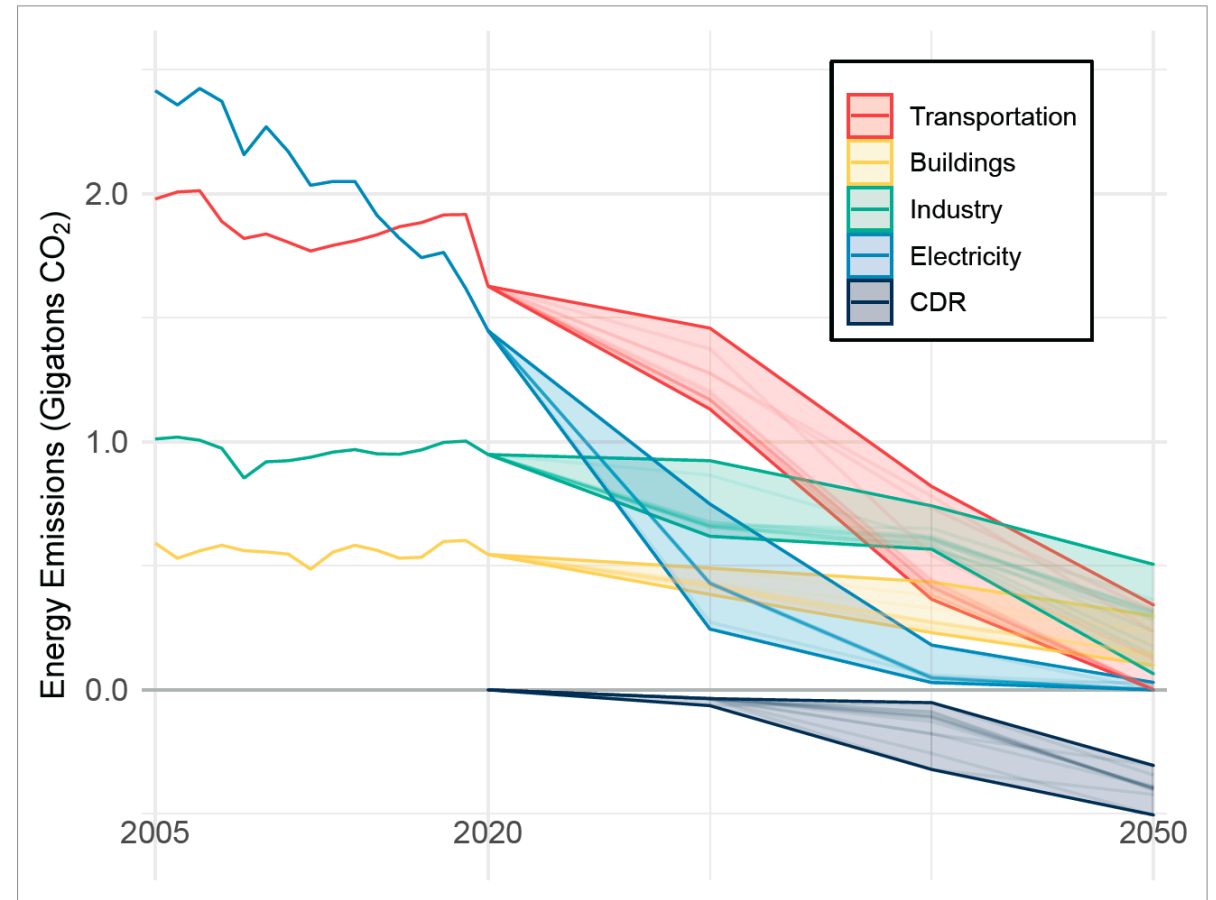
Social
Adoption,
Integration,
Diffusion

Assessment,
Adjustment,
New Efforts



Science Policy Ecosystem Can Help Overcome Barriers

- Technical: assess if we have the scalable solutions, in time
- Physical: assess if we are building what we need, in time
- Social: assess if we are adopting equitable solutions, in time
- Workforce: assess opportunities and gaps, in time
- Finance: assess how to align the capital needed, in time



Source: U.S. Long-Term Strategy (2021)