

Current Climate Policies: United States

Gilbert Metcalf
MIT and Tufts University

MIT Global Forum
March 28, 2024



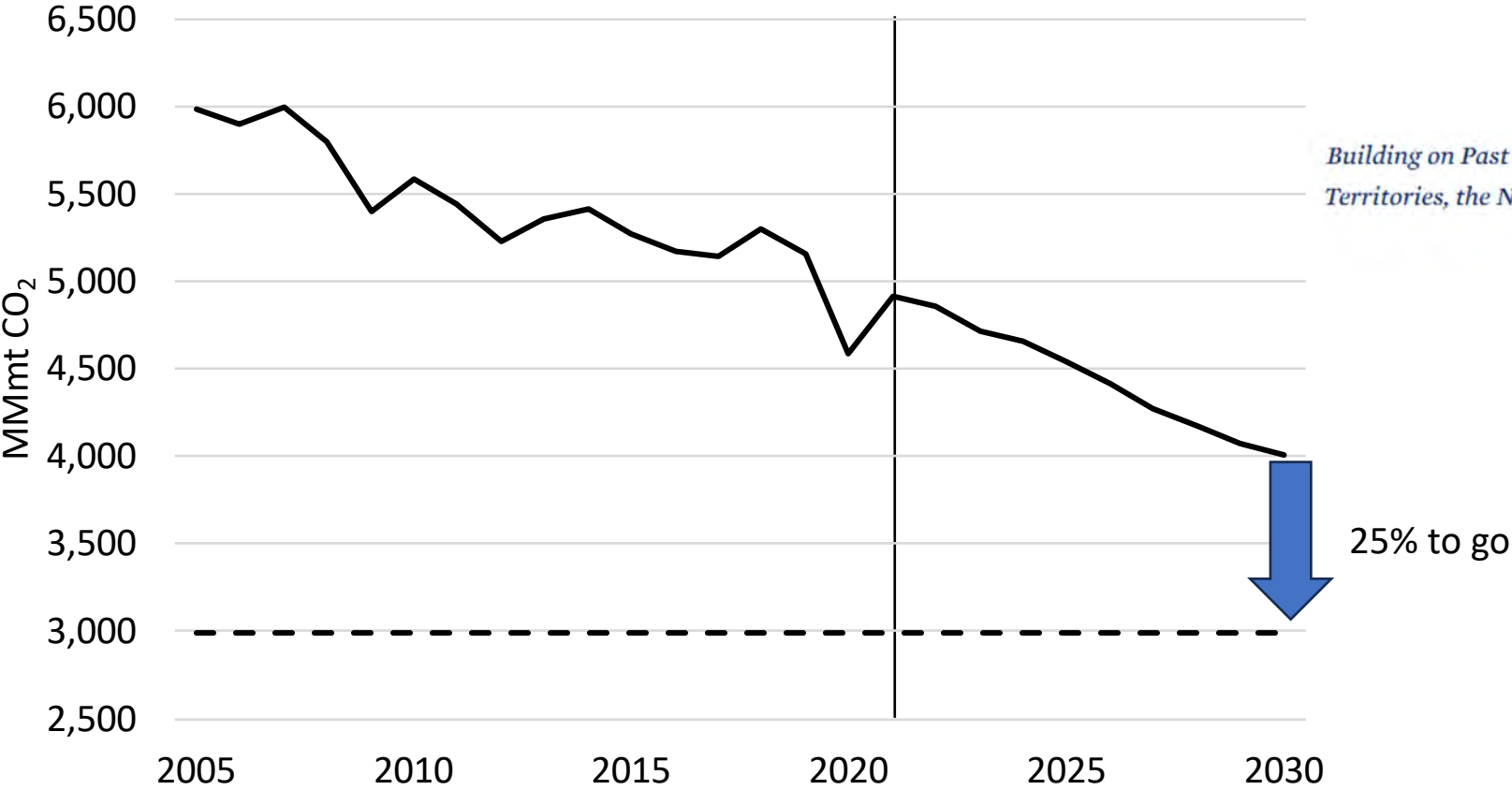
Outline

- Background on emissions reductions since 2005
- Overview of policies
- Assessment of policies

Biden Climate Targets



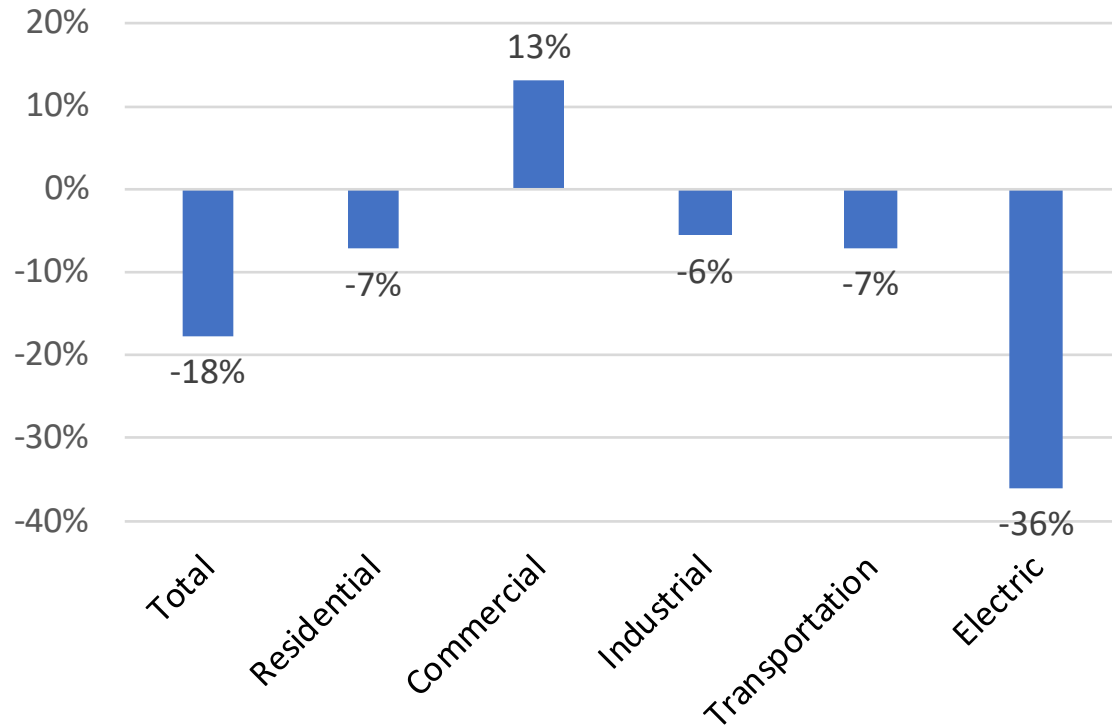
Building on Past U.S. Leadership, including Efforts by States, Cities, Tribes, and Territories, the New Target Aims at 50-52 Percent Reduction in U.S. Greenhouse Gas Pollution from 2005 Levels in 2030



“net zero emissions economy-wide by no later than 2050.”

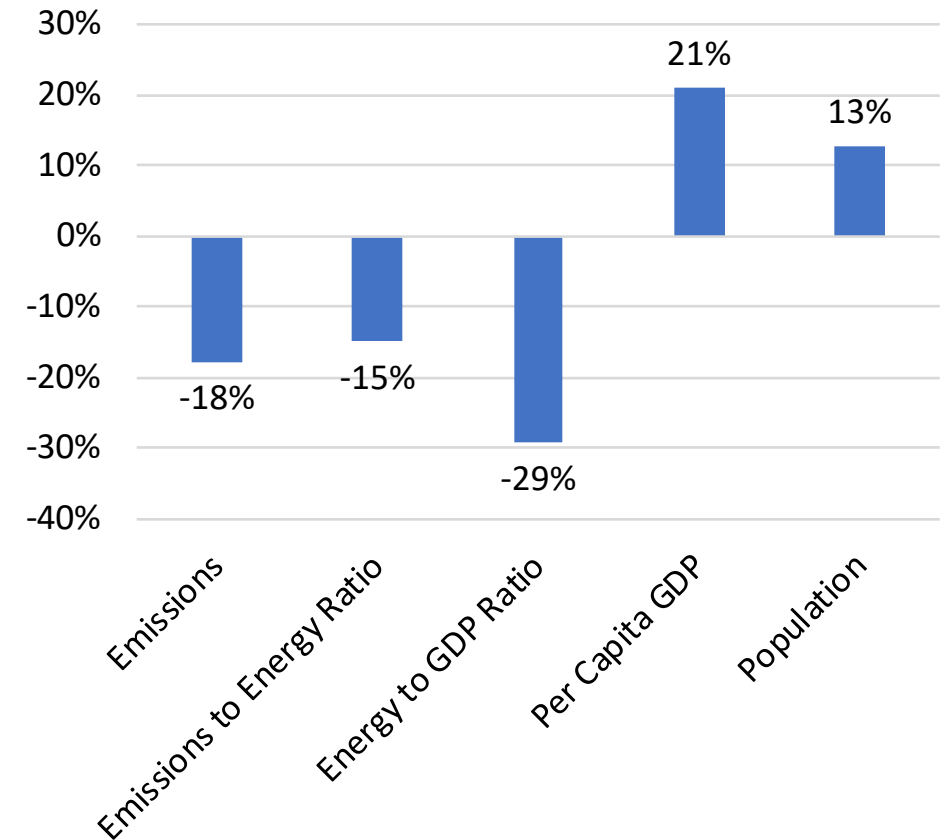
Emission Reductions Since 2005

Emissions



Kaya Decomposition

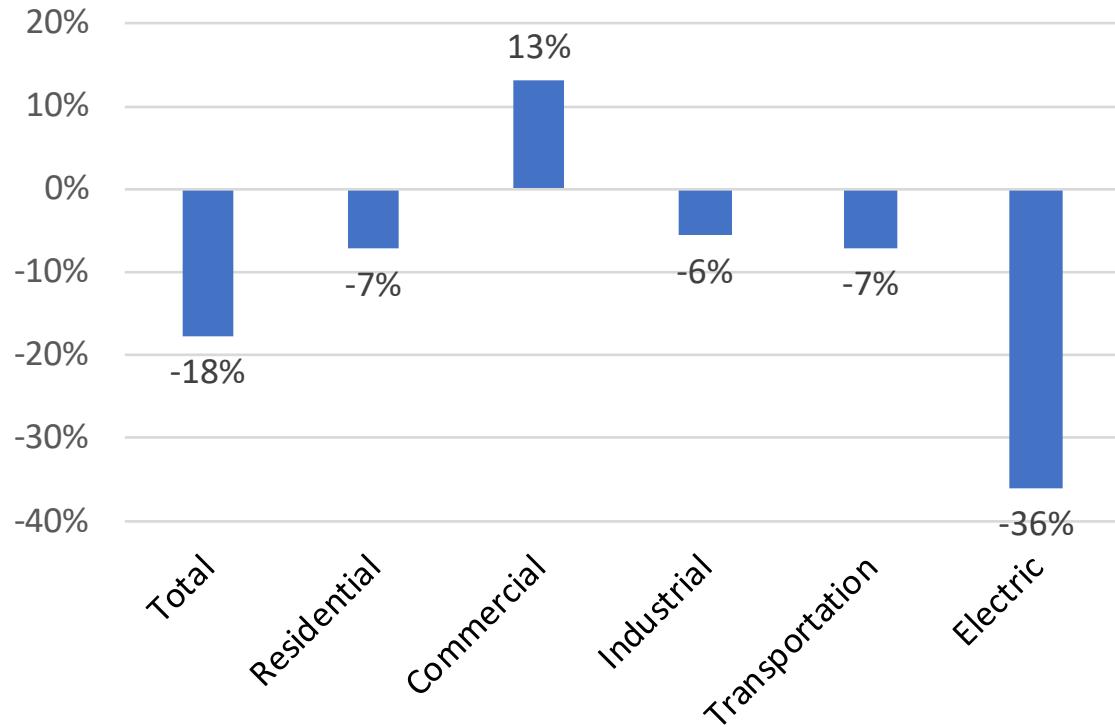
$$CO_2 = \left(\frac{CO_2}{E}\right) \left(\frac{E}{GDP}\right) \left(\frac{GDP}{N}\right) N$$



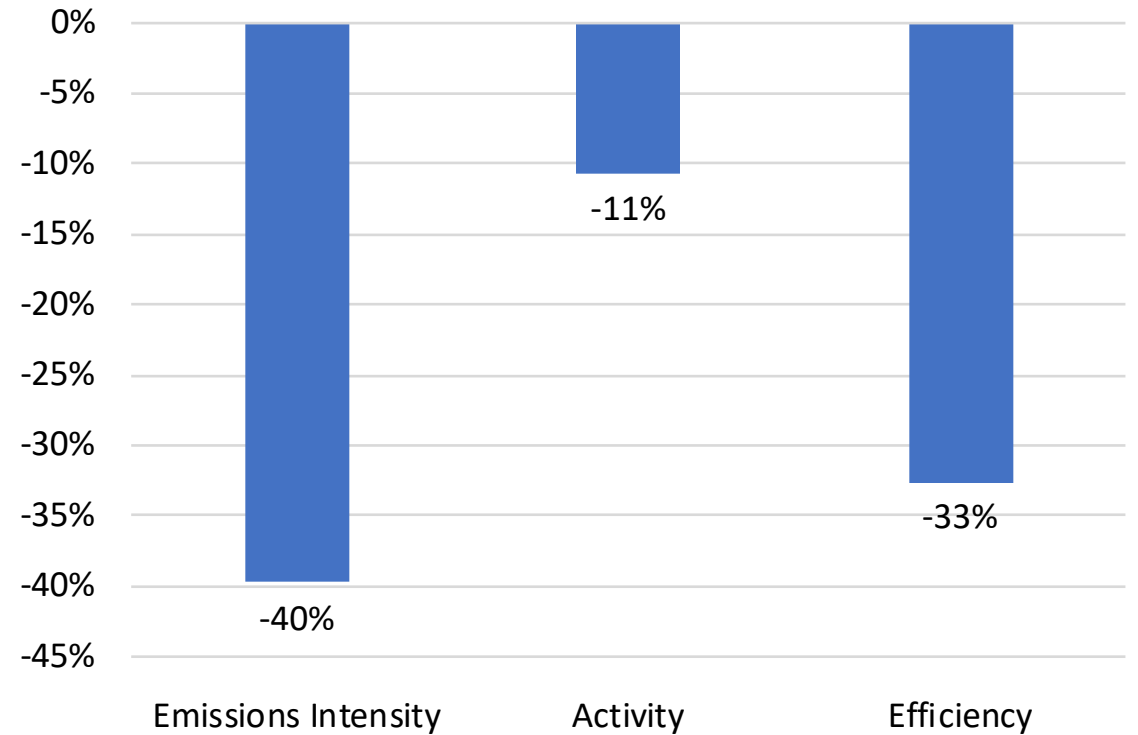
EIA data: 2005 - 2022

Emission Reductions Since 2005

Emissions



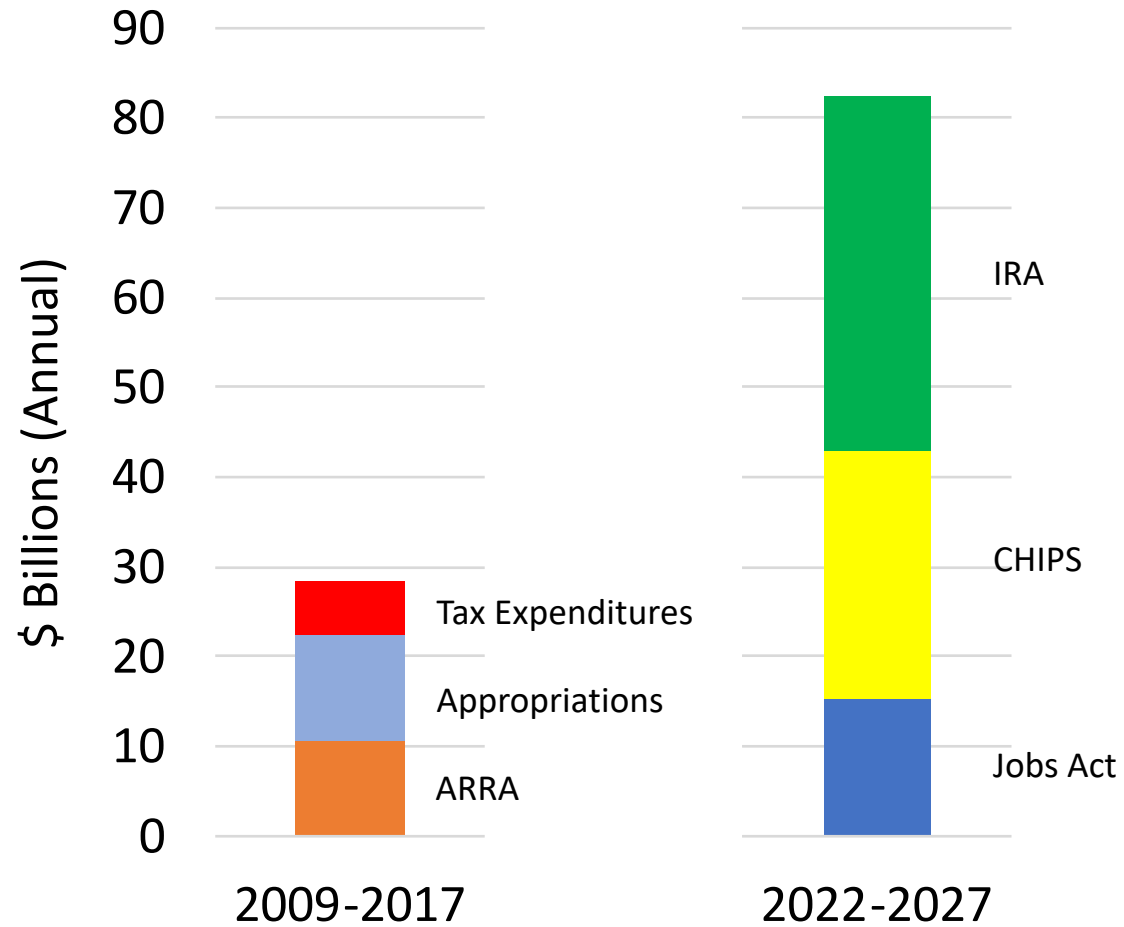
Emissions to GDP Share



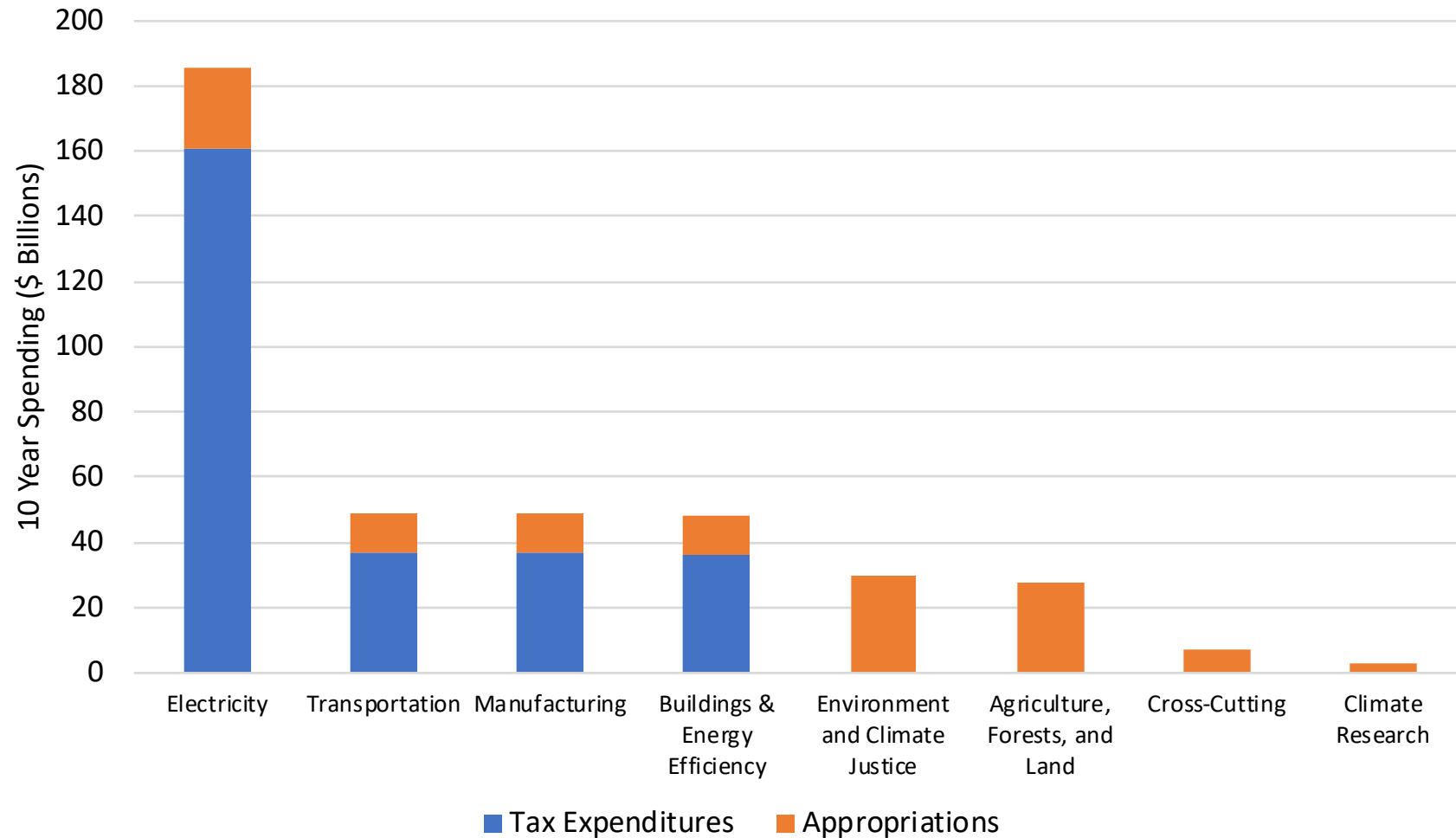
Overview of US Policies

- Federal and state policy survey
- Impacts of federal policy
- Headwinds

Federal Funding Increasing



Inflation Reduction Act (IRA)



Electrify Everything!



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Biden Regulatory Push

Biden administration announces rule aimed at expanding electric vehicles

By Coral Davenport New York Times, Updated March 21, 2024, 12:56 a.m.

Biden Administration Announces Rule to Cut Millions of Tons of Methane Emissions

Dec. 2, 2023

E.P.A. Proposes First Limits on Climate Pollution From Existing Power Plants

May 11, 2023

E.P.A. Lays Out Rules to Turbocharge Sales of Electric Cars and Trucks

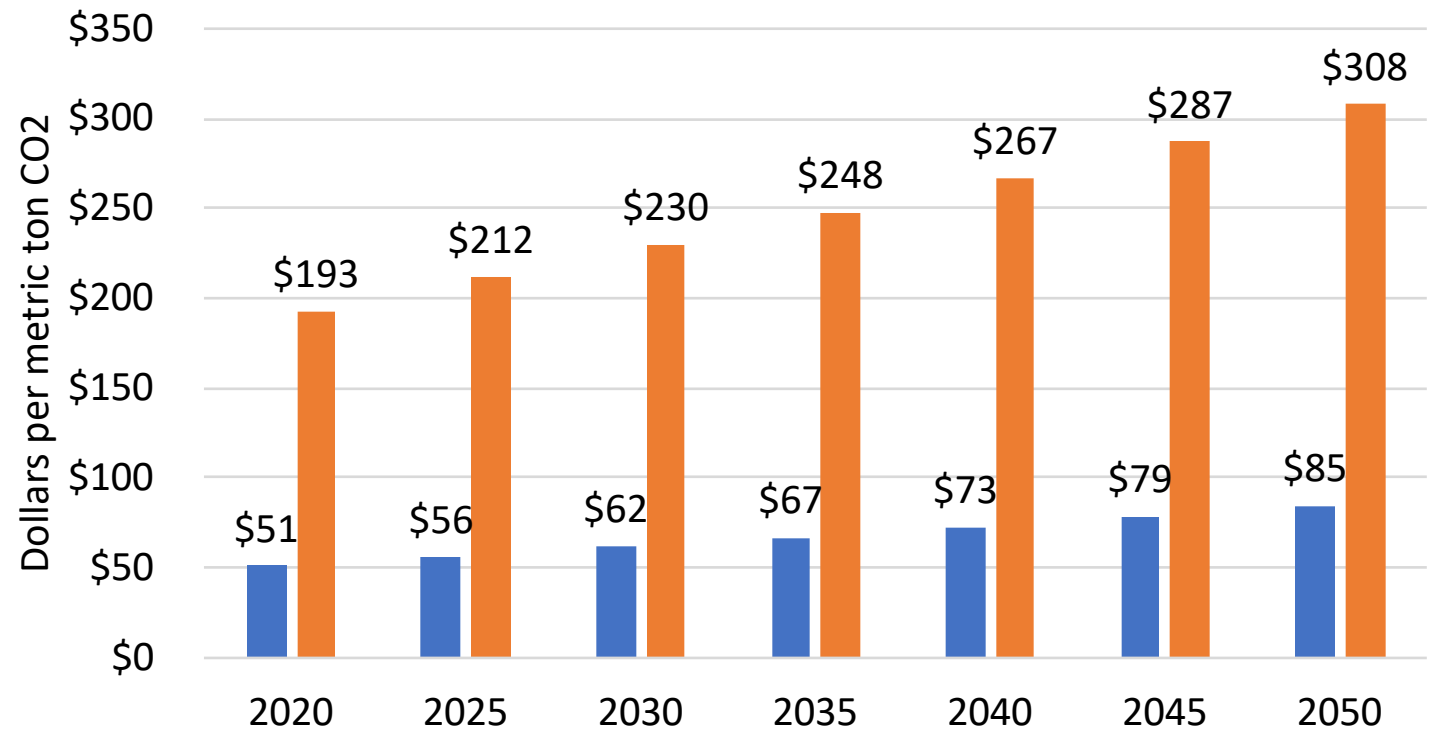
The Biden administration is proposing rules to ensure that two-thirds of new cars and a quarter of new heavy trucks sold in the United States by 2032 are all-electric.

April 12, 2023



Social Cost of Carbon

- Initially used in analysis for approving new federal regulations
 - US fuel economy standards
- Some states using SCC to price zero-carbon subsidies
- Many companies use SCC for internal carbon pricing



CLIMATEWIRE



Biden broadens use of social cost of carbon

Calculations determining the climate damage of greenhouse gas emissions will be considered in federal agencies' budgets, permitting decisions, foreign assistance programs and, eventually, government procurement.



BY: JEAN CHEMNICK | 09/22/2023 06:35 AM EDT



MARCH 14, 2023

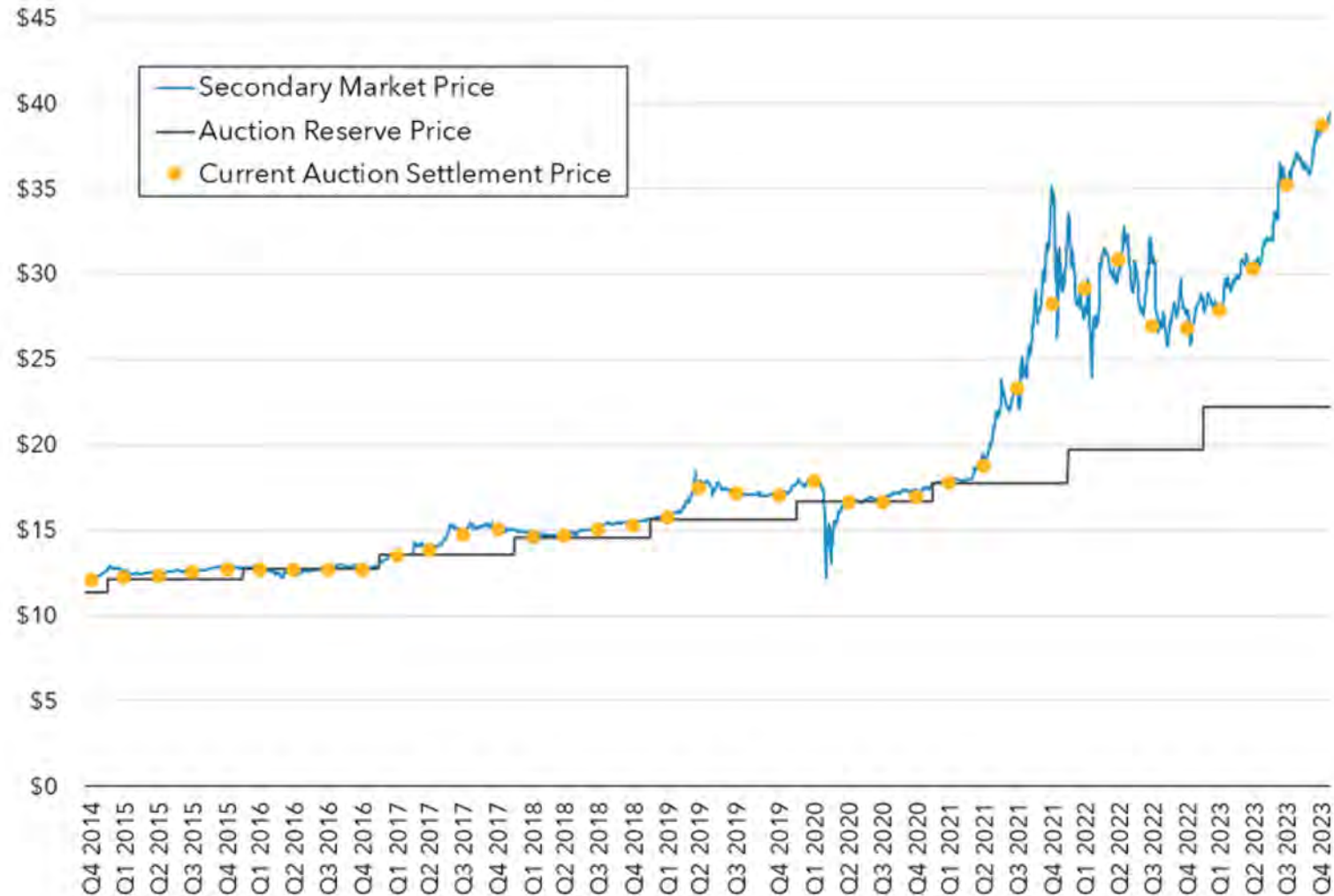
The Importance of Measuring the Fiscal and Economic Costs of Climate Change

- [\\$134 billion in annual expenditure impacts](#) for just six types of disasters – and as much as \$2 trillion in lost revenue annually by the end of the century.
- Existing quantitative assessments of the fiscal cost of climate change have already resulted in new Fiscal Year (FY) 2024 Budget proposals that will decrease the Federal government's short- and long-term climate fiscal risk.
- Existing climate-related financial risk data, analytical tools, and methodologies require further refinement to more accurately quantify specific risks from climate change and inform our policies to combat these risks.

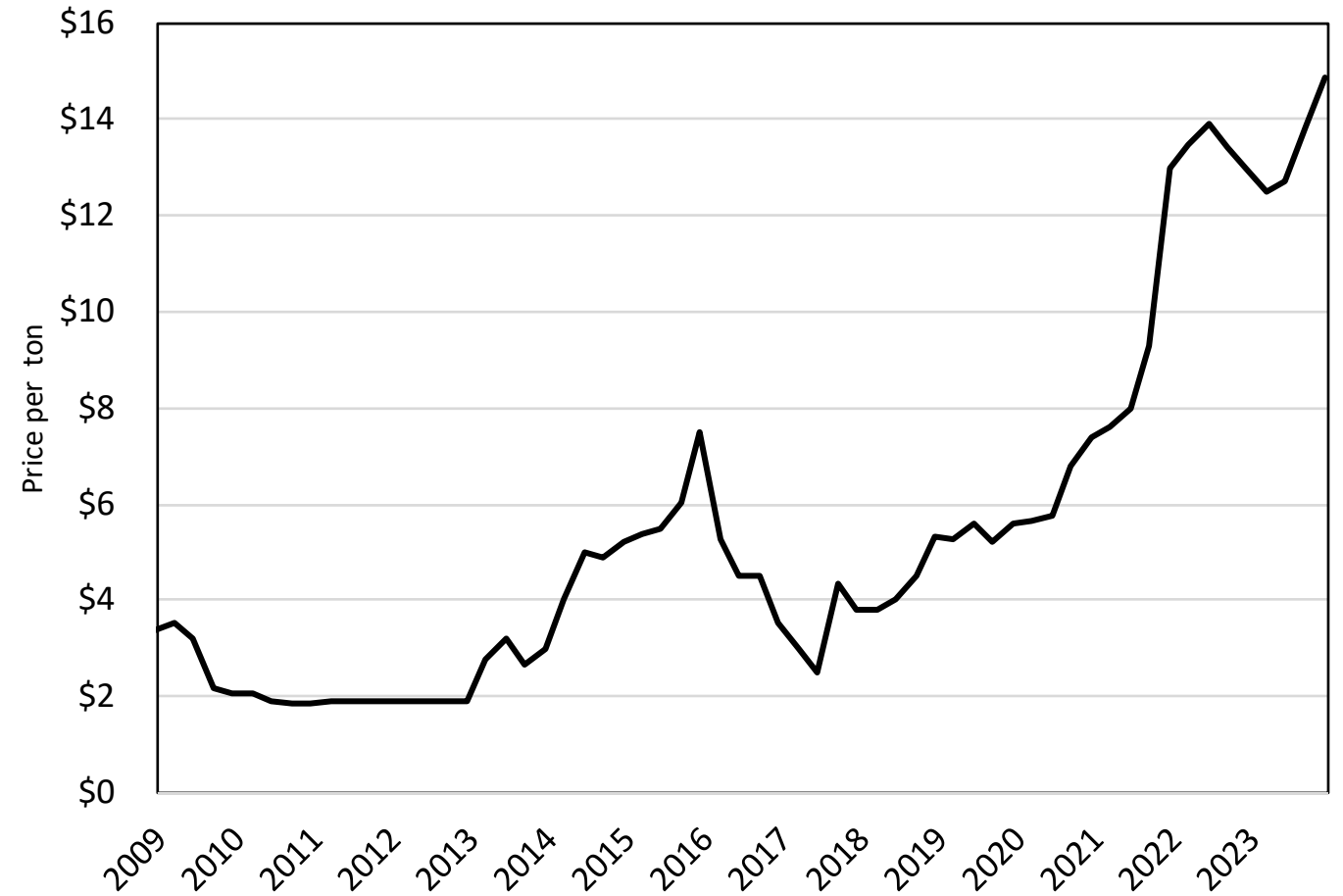
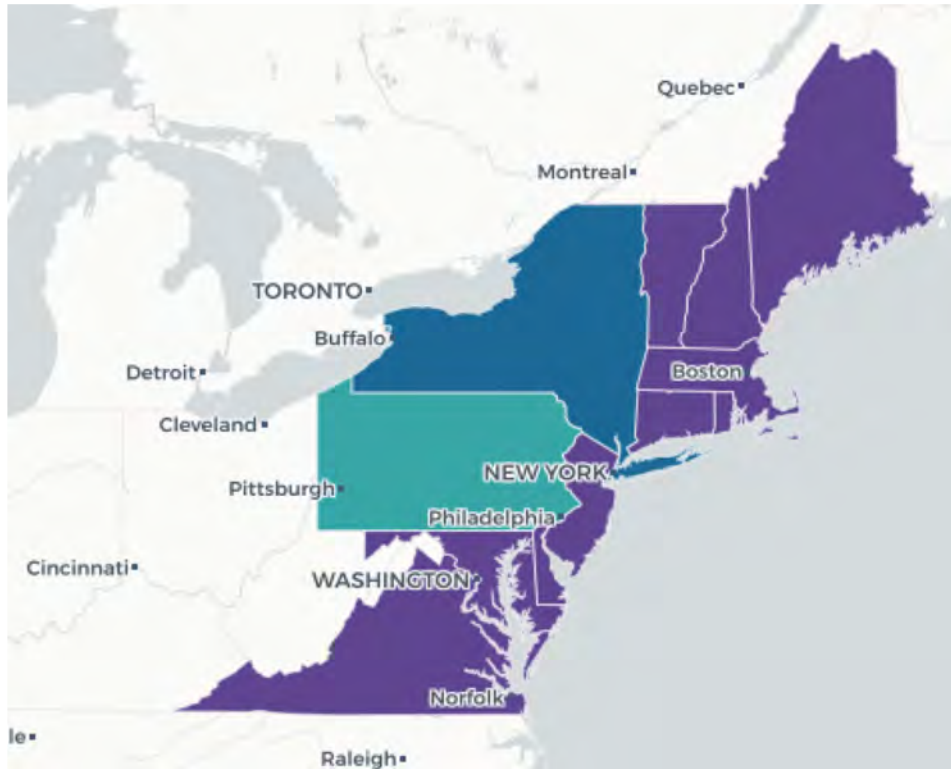
Sub-Federal Policies

- Carbon pricing in California and RGGI
- Other policies

California Allowance Prices

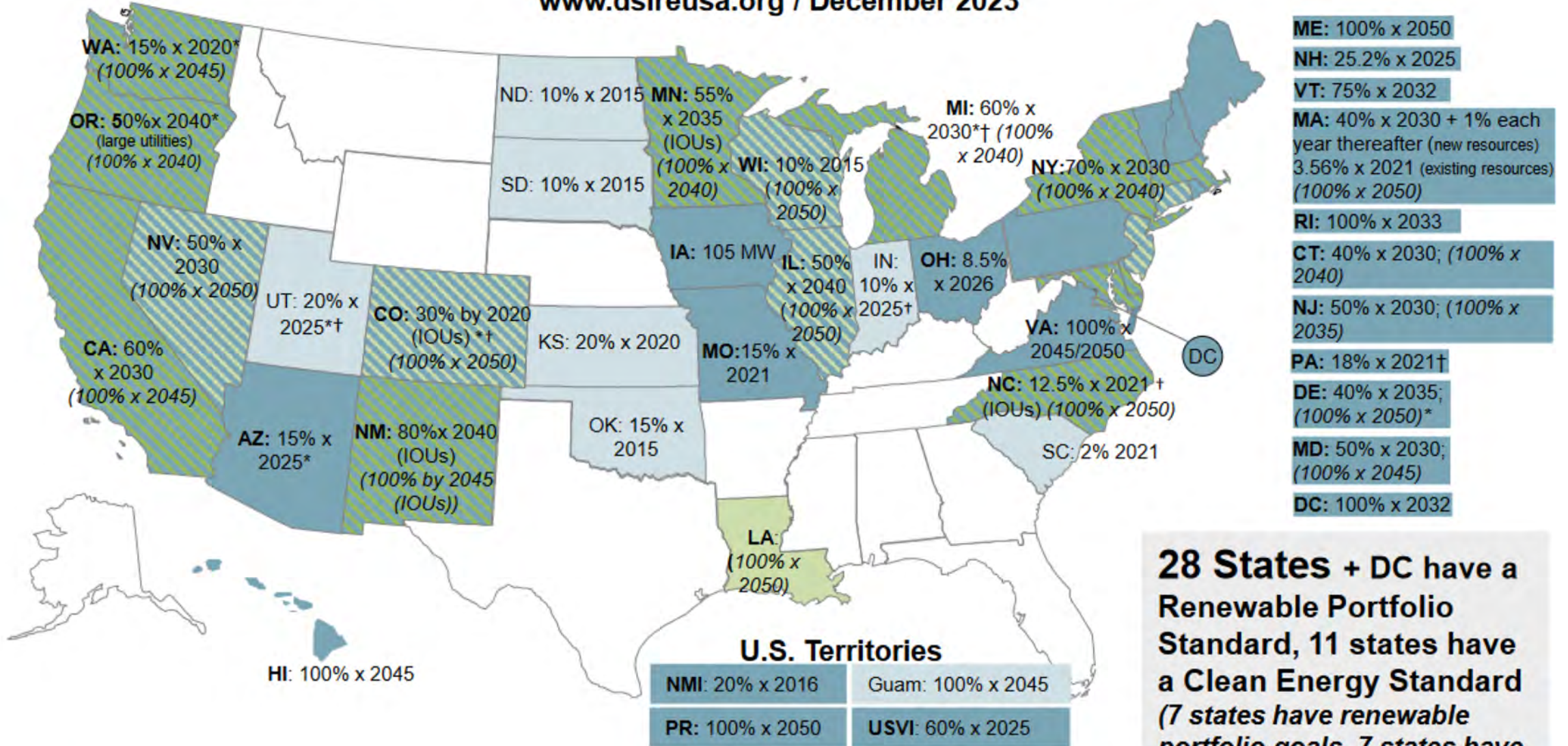


Regional Greenhouse Gas Inventory Prices



Renewable & Clean Energy Standards

www.dsireusa.org / December 2023



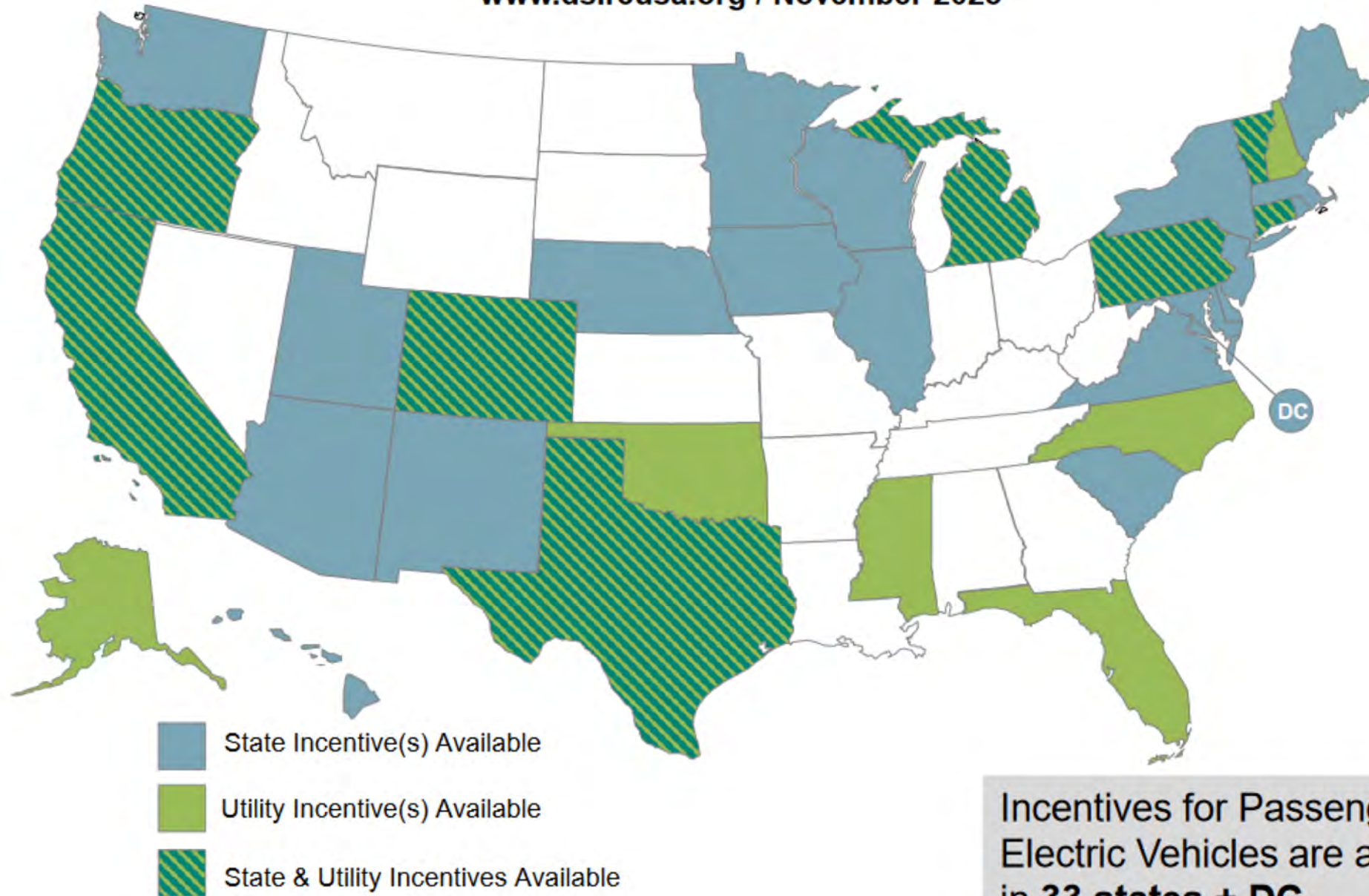
- ME: 100% x 2050
- NH: 25.2% x 2025
- VT: 75% x 2032
- MA: 40% x 2030 + 1% each year thereafter (new resources) 3.56% x 2021 (existing resources) (100% x 2050)
- RI: 100% x 2033
- CT: 40% x 2030; (100% x 2040)
- NJ: 50% x 2030; (100% x 2035)
- PA: 18% x 2021†
- DE: 40% x 2035; (100% x 2050)*
- MD: 50% x 2030; (100% x 2045)
- DC: 100% x 2032

28 States + DC have a Renewable Portfolio Standard, 11 states have a Clean Energy Standard (7 states have renewable portfolio goals, 7 states have clean energy goals)

 Renewable portfolio standard	 Clean energy standard	* Extra credit for solar or customer-sited renewables
 Renewable portfolio goal	 Clean energy goal	† Includes non-renewable alternative resources

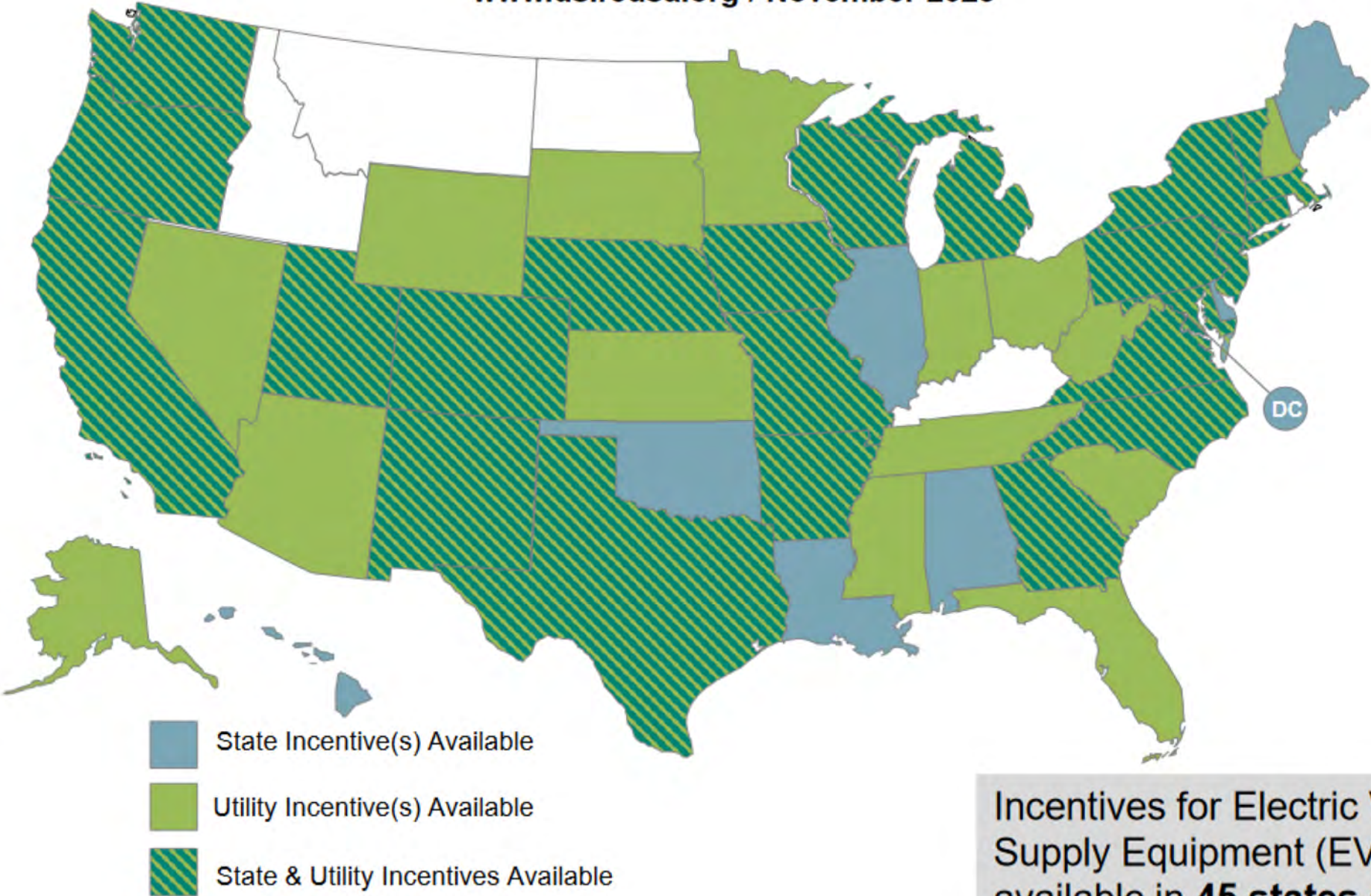
Passenger Electric Vehicle Incentives

www.dsireusa.org / November 2023



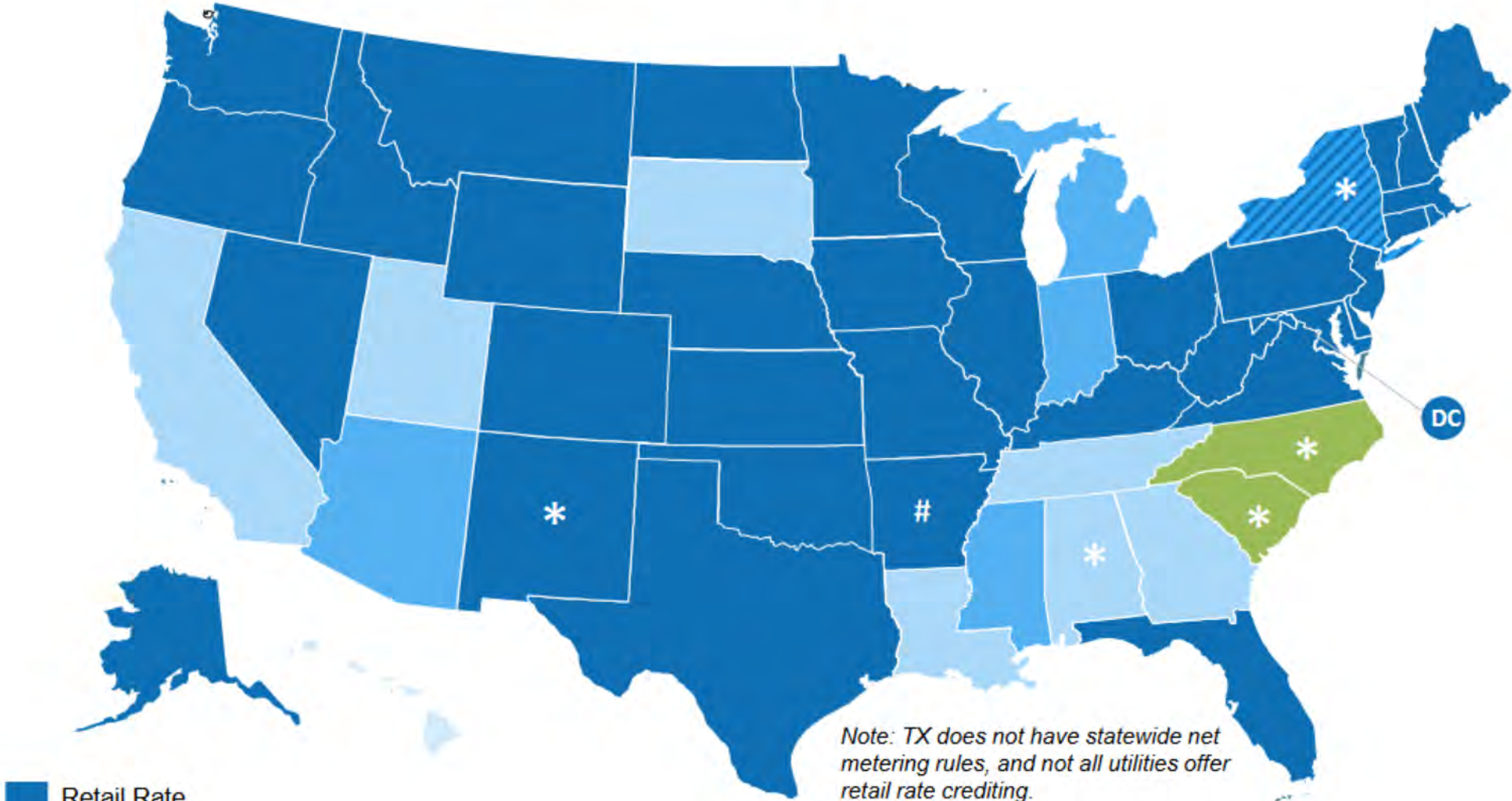
Electric Vehicle Supply Equipment Incentives

www.dsireusa.org / November 2023



Distributed Generation Customer Credit Rates for Excess Generation

www.dsireusa.org / November 2023



- Retail Rate
- TOU Retail Rate
- Between Retail Rate and Avoided Cost/Wholesale Rate
- Avoided Cost or Wholesale Rate

- *** Additional Fees for Small DG Customers are Applicable, at Least for Certain IOUs or Customers
- #** In transition to a lower credit rate

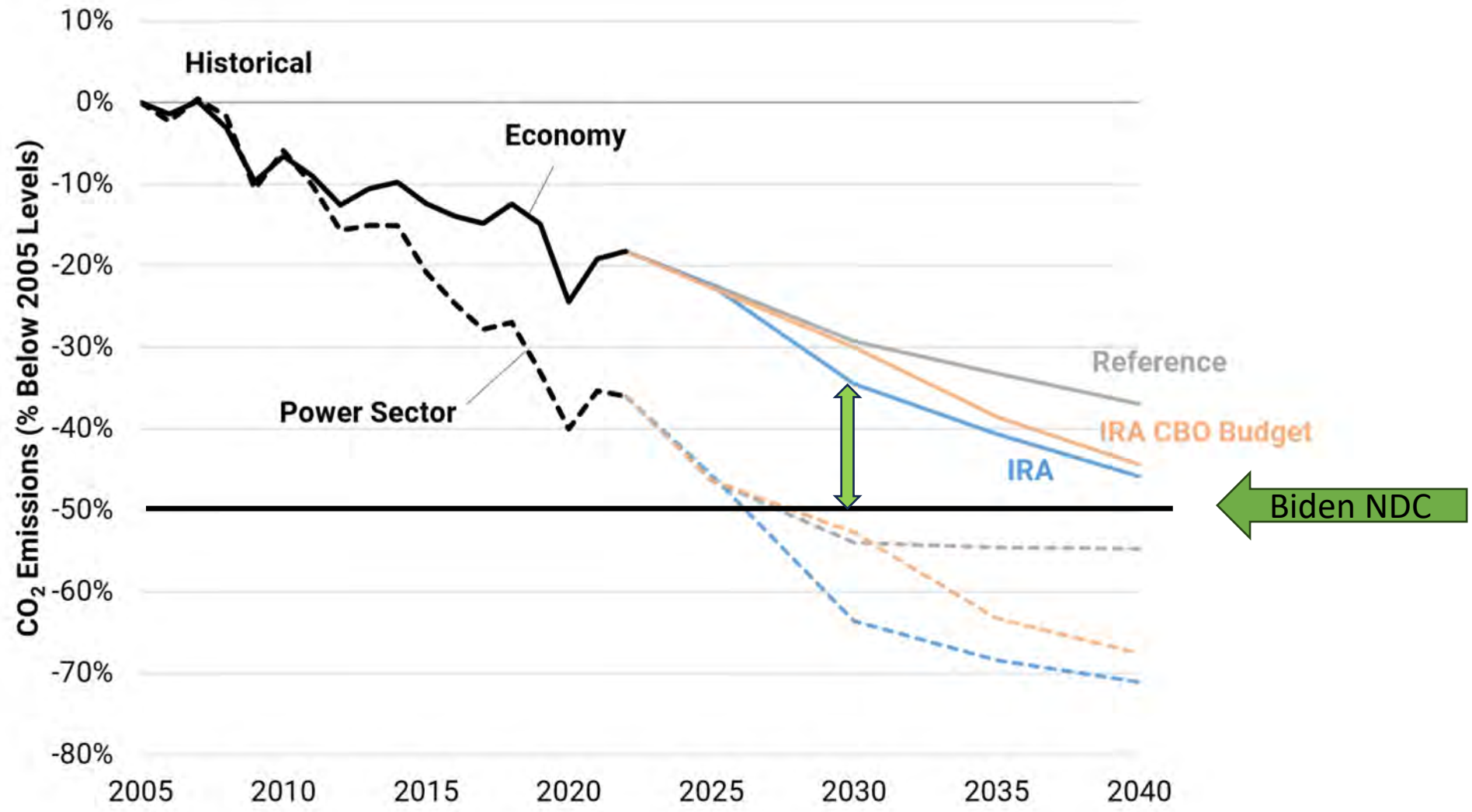
Note: TX does not have statewide net metering rules, and not all utilities offer retail rate crediting.

Assessing Federal Policy

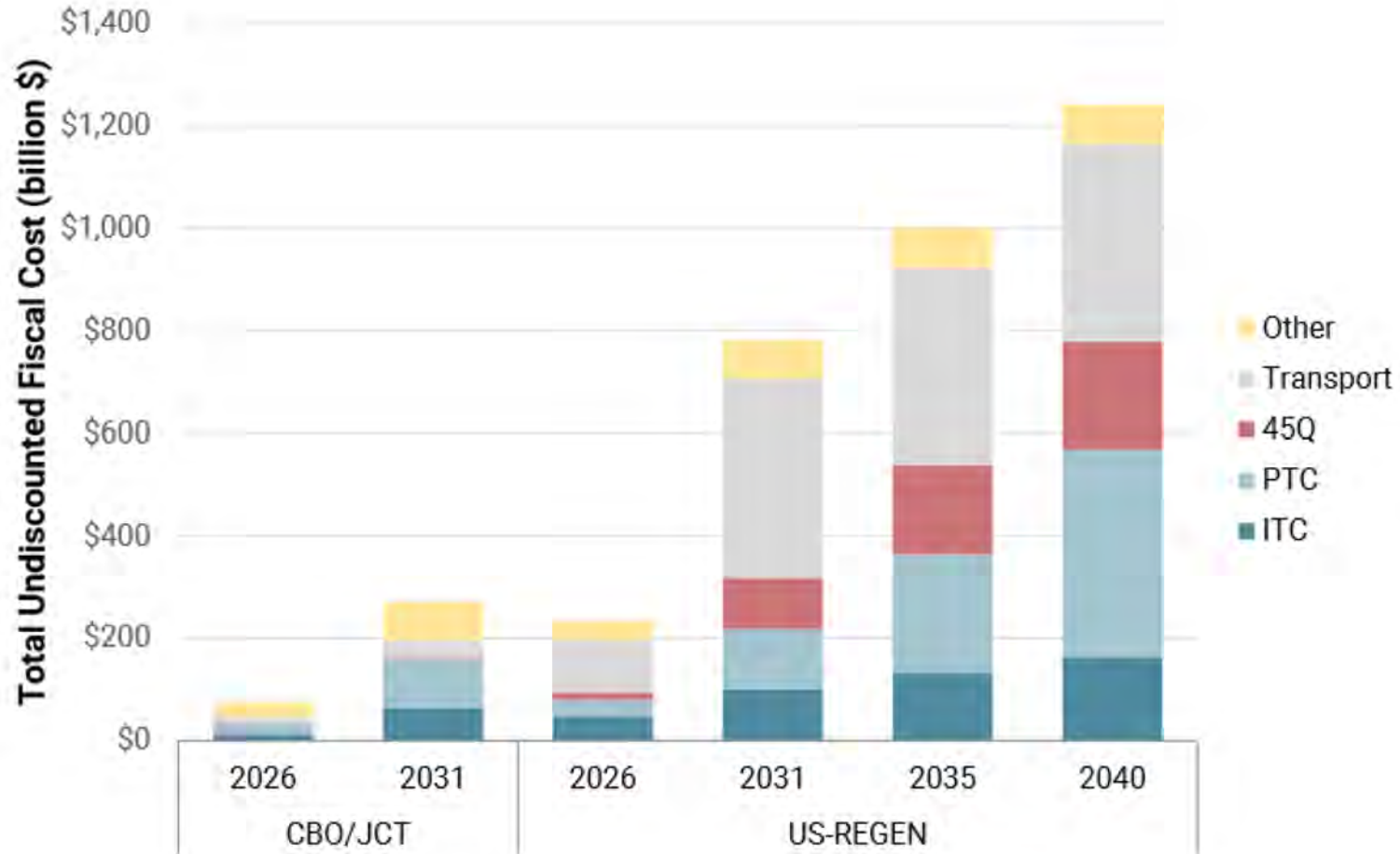
- Will current policies achieve Biden's NDC?
- What will IRA cost?
- Will it create jobs to offset lost jobs in fossil-fuel sector?

- What are the headwinds?

IRA Emissions Impact



IRA Costs Are Highly Uncertain



Policy Choices

- Raise the cost of carbon-polluting energy sources?
 - Carbon tax
- Lower the cost of carbon-free energy sources?
 - Clean energy subsidies
- Direct regulation

Policy Choices

- Bistline et al (2023) compare a carbon tax that yields same emission reduction path as the IRA between now and 2035
 - Relies on less coal and wind/solar and more natural gas
 - IRA lowers energy prices while carbon tax raises them
 - Carbon tax achieves same CO₂ emission reduction at much lower cost
 - IRA average abatement cost of \$45 – \$61 per ton CO₂ reduction
 - Carbon Tax average abatement cost of \$10 per ton CO₂ reduction
- Finkelstein Shapiro and Metcalf (2023) find a carbon tax in the \$15 range achieves Biden Administration emission reduction target

2025 Clean Electricity Tax Credits



PTC

0.55¢ per kWh

+2.2¢ per kWh

+10%

+10%

ITC

6% of basis

+24% of basis

+10% of basis

+10% of basis

Other (capped)
ITC adders for
environmental justice

If meeting prevailing wage and
apprenticeship requirements

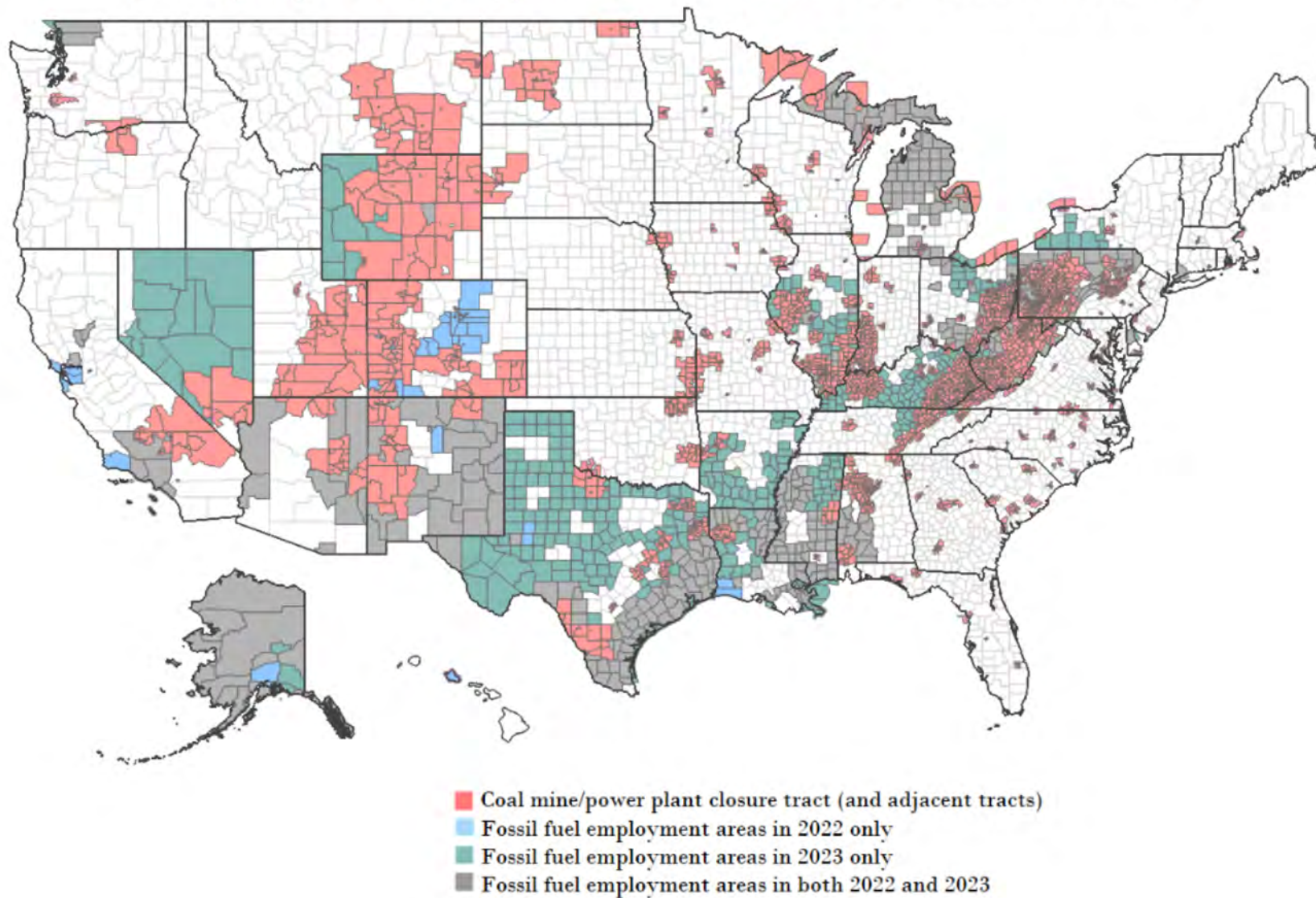
If meeting domestic
content requirements

If located in “energy
communities”

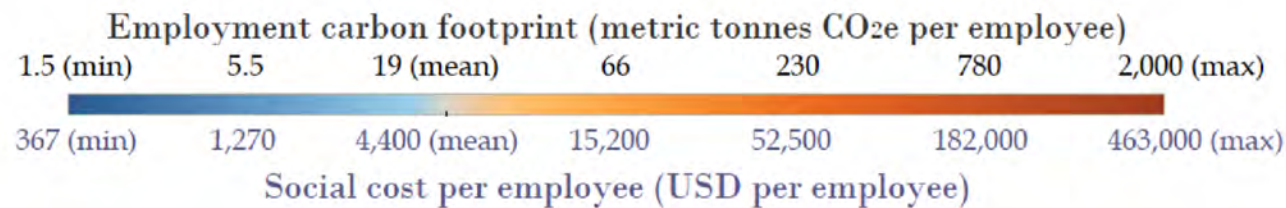
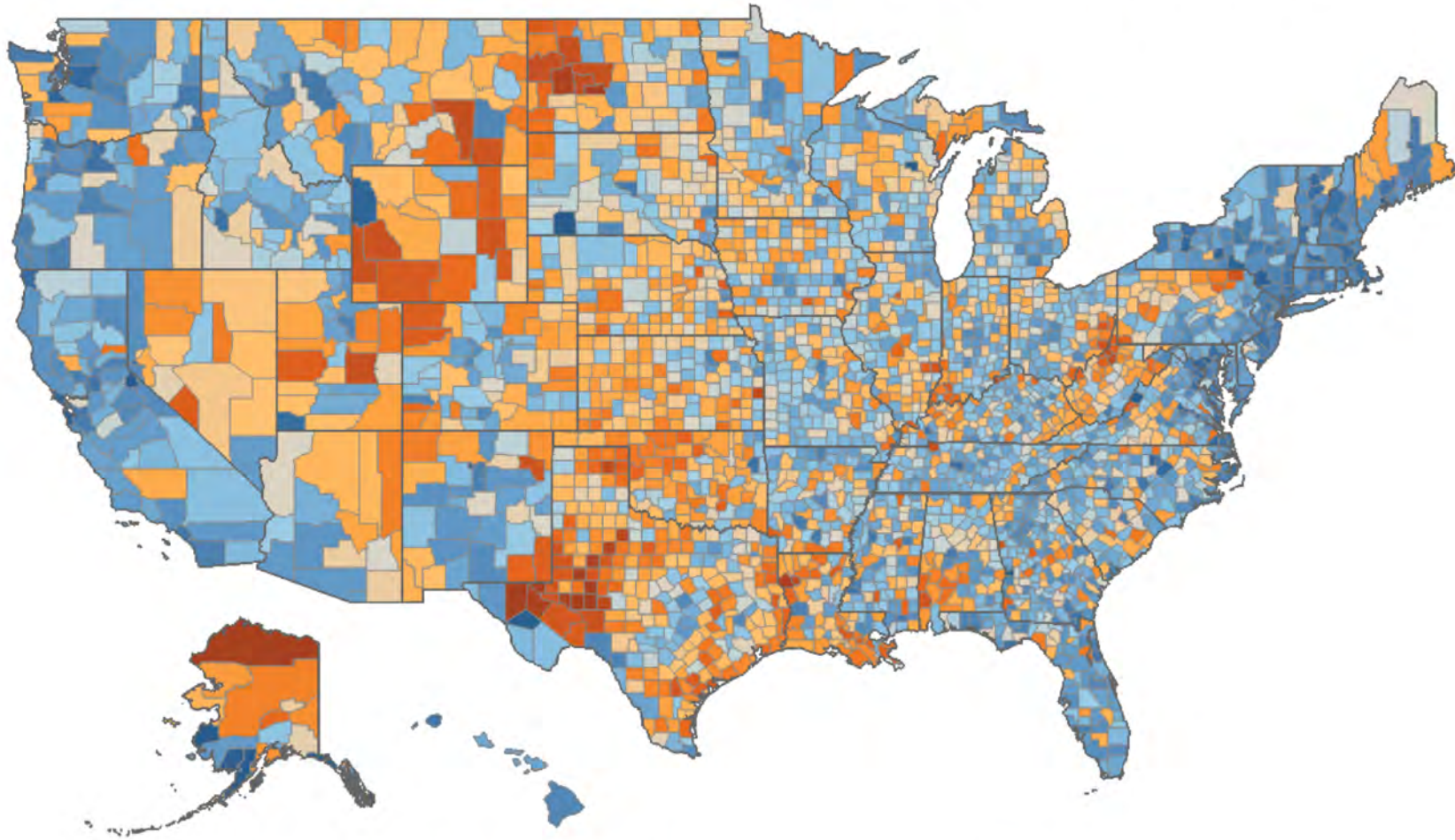
Energy Community under IRA

- Brownfield sites
- High fossil-fuel employment or tax-reliant communities
- Coal communities
 - Coal mine has closed after 1999
 - Coal-fired power plant has closed after 2009

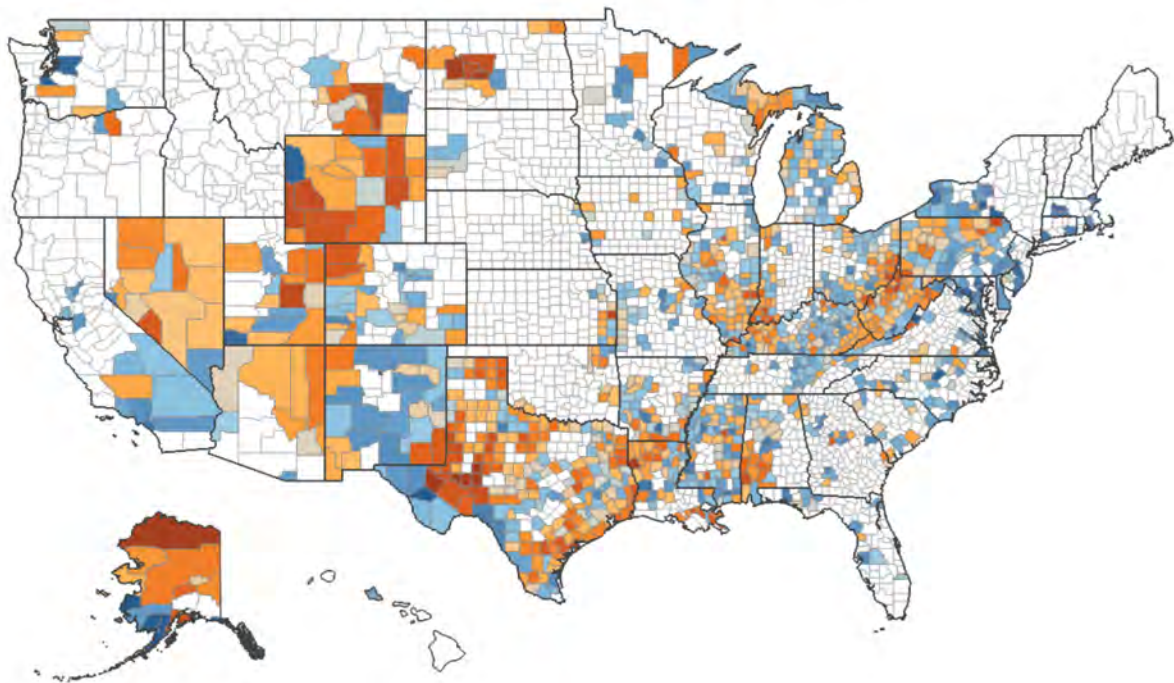
Qualifying IRA energy communities between 2022 and 2023



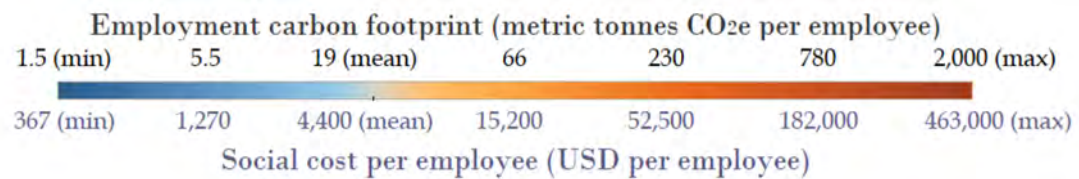
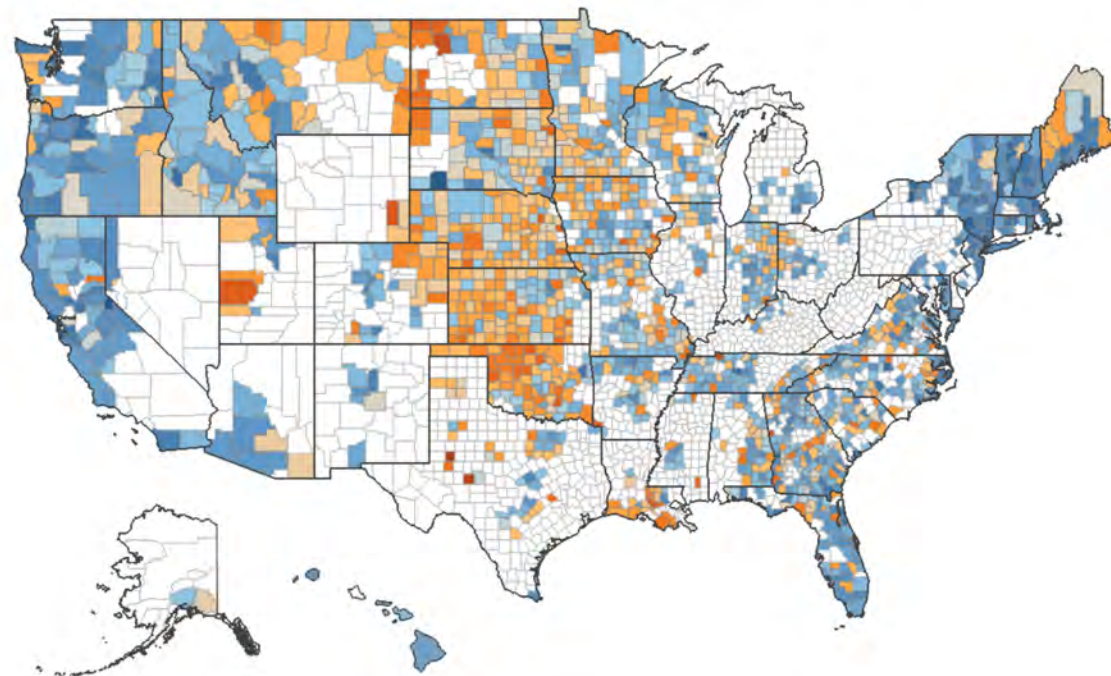
Overall employment carbon footprints, by county



Qualifying counties

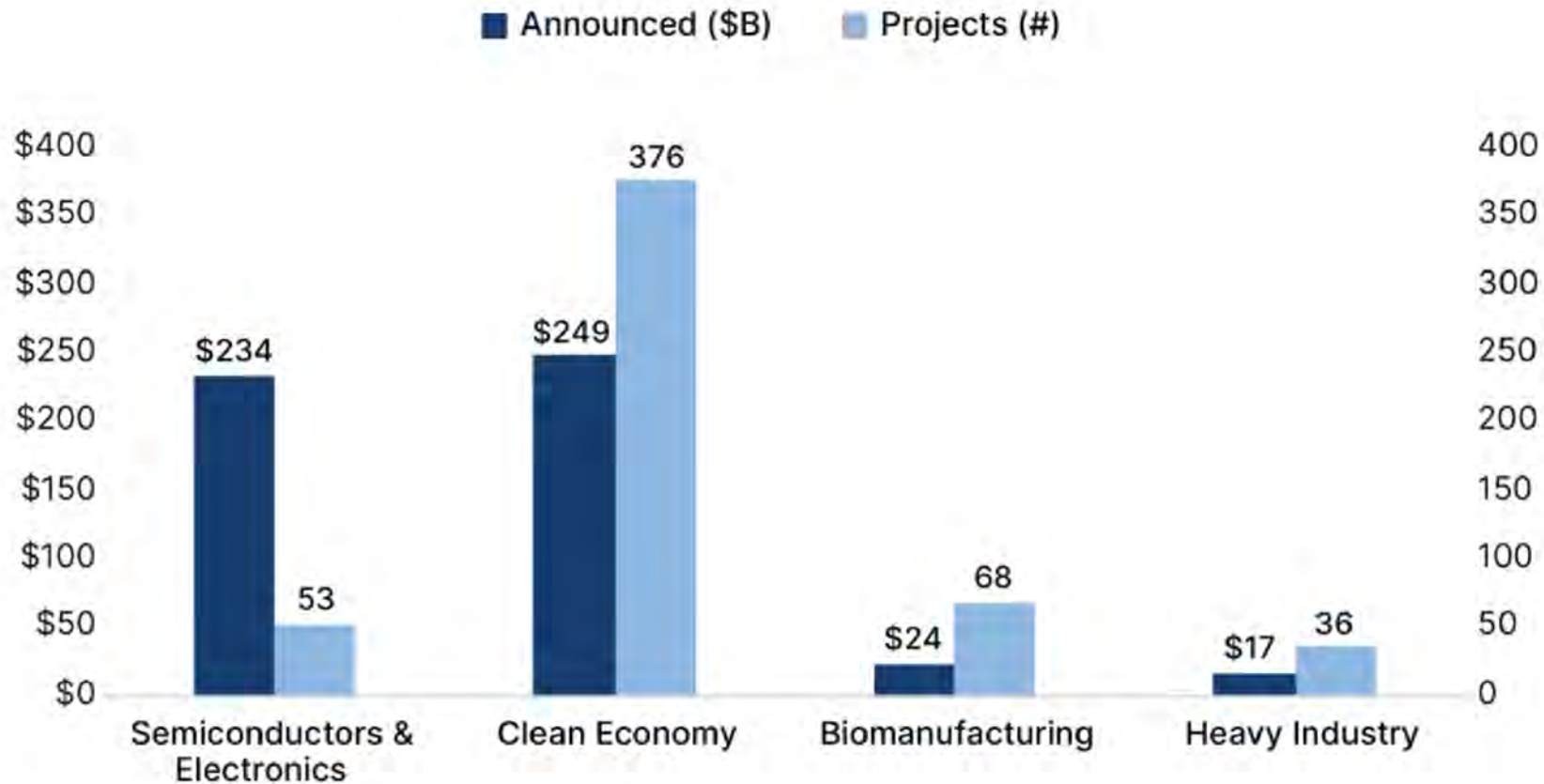


Non-qualifying counties



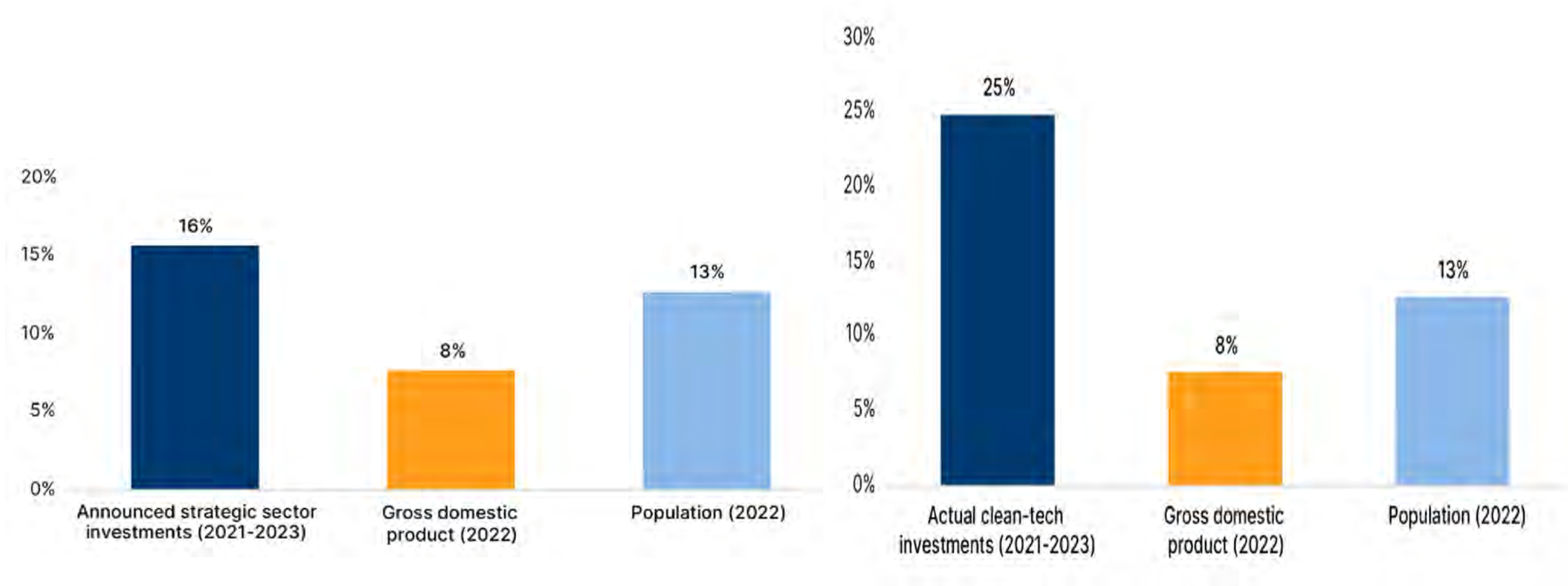
Investments Flowing Into Economically Distressed Areas

Figure 1: The private sector has announced over \$525 billion in strategic sector investments since 2021
Announced investments in industrial-strategy-linked sectors, 2021-2023



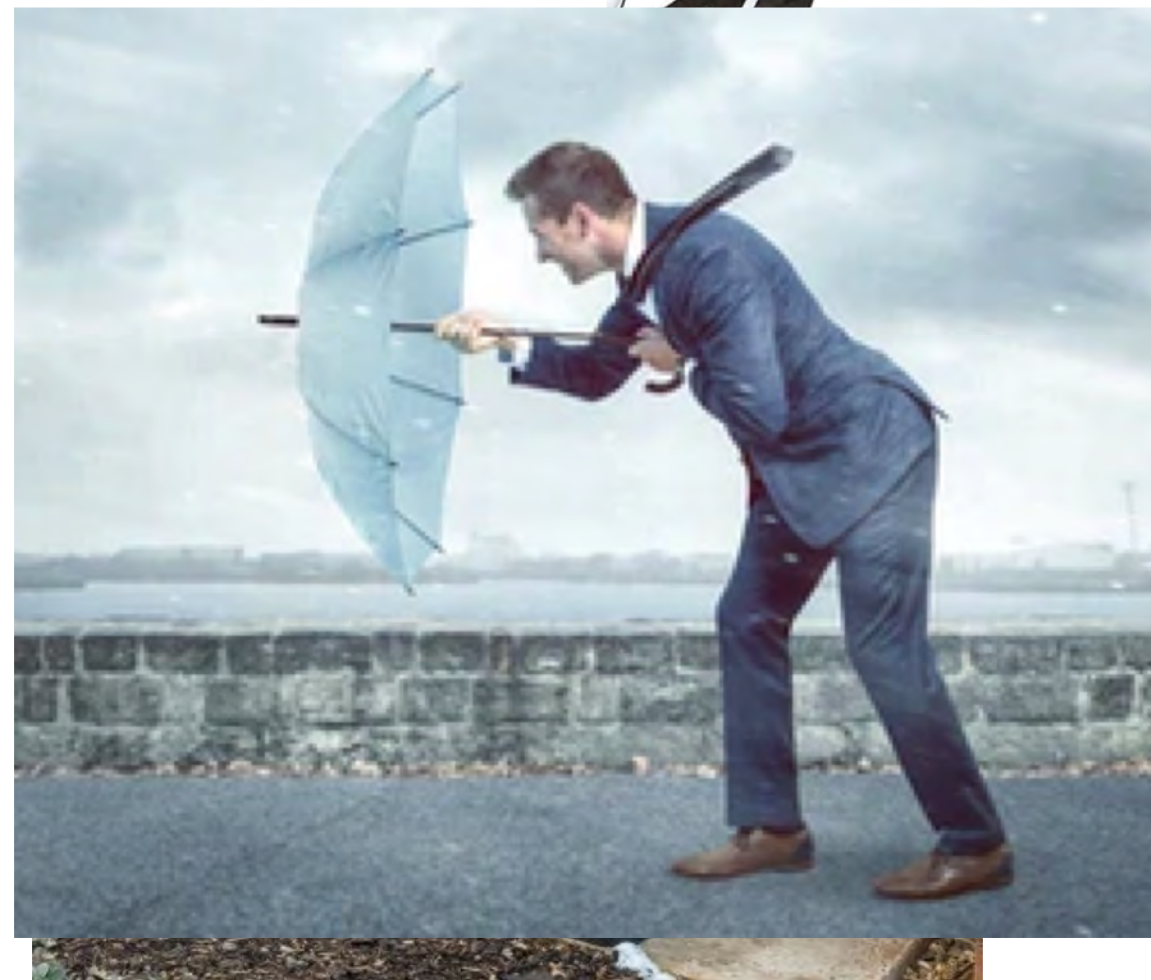
Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor and White House Investing in America database data.

Investments Flowing Into Economically Distressed Areas



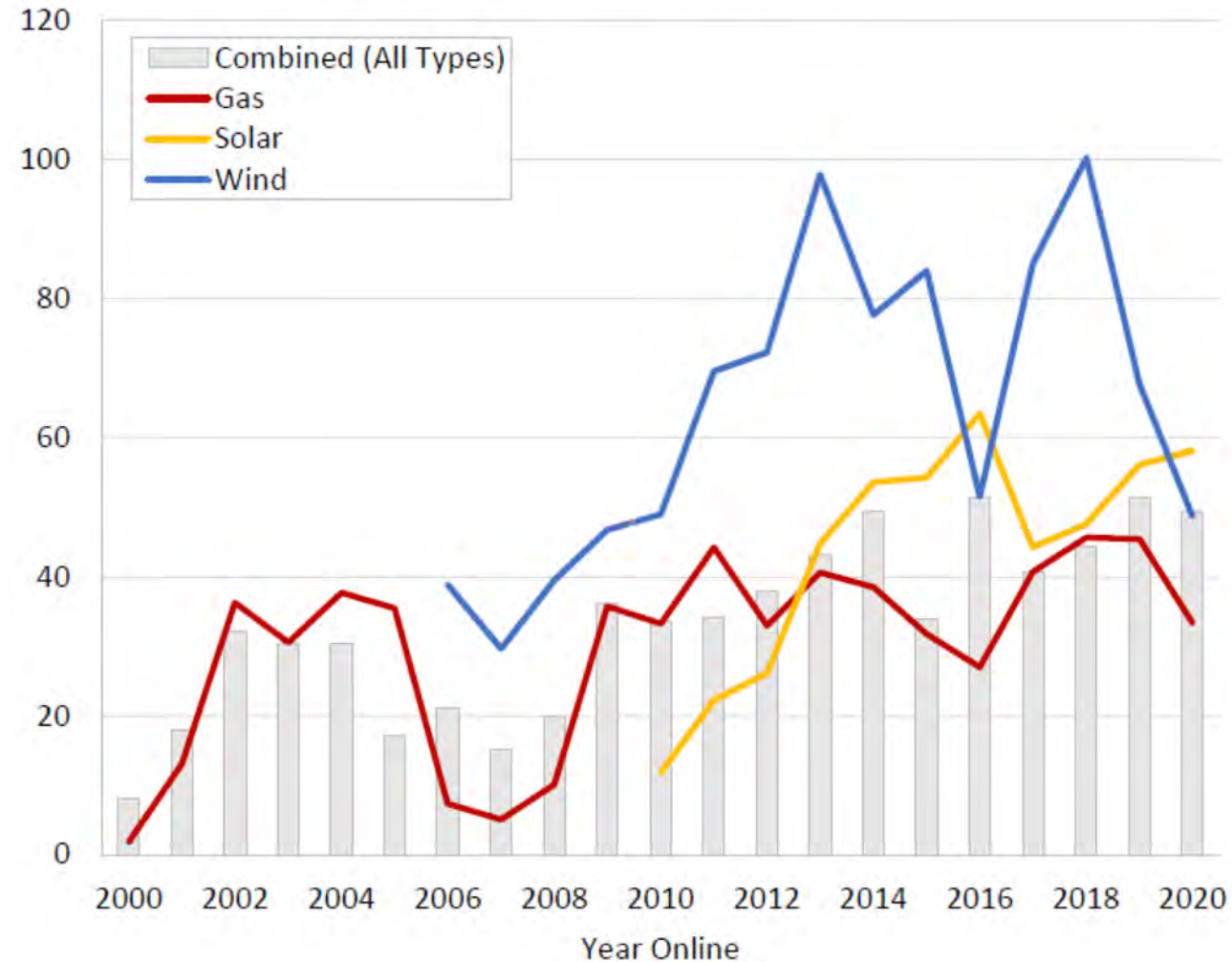
Electrify Everything!

Some Headwinds



Challenges to Electrification: Connecting to the Grid

Median Number of Months from IR to COD



Challenges to Electrification: Building Out the Grid

TransWest Express Transmission Project

- 3,000 MW line
- \$3 billion estimated cost

2005 – Project proposed

2017 – BLM & USFS approve ROW

2020 – State & county permitting completed

2023 – BLM issues Notice to Proceed

2027 – Estimated completion date



Challenges to Electrification: The Last Mile Problem



The New York Times Oct. 28, 2021

Old Power Gear Is Slowing Use of Clean Energy and Electric Cars

Some people and businesses seeking to use solar panels, batteries and electric vehicles find they can't because utility equipment needs an upgrade.



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Additional Headwinds

- Global energy headwinds
 - Ukraine War and NG demand
- Judicial headwinds
 - Major questions doctrine
- Congressional headwinds
- Presidential election

“[T]he next conservative Administration should withdraw the U.S. from the U.N. Framework Convention on Climate Change and the Paris Agreement.

“The next Administration should use Treasury’s tools and authority to promote investment in domestic energy, including oil and gas.”



-- Project 2025

Summing Up

- Biden Administration committed to strong climate goals
 - But achieving the Administration NDC may be challenging
 - Uncertainty about future policy
- IRA is a costly approach to lowering emissions
 - But it's the only game in town