Current Climate Policies: United States

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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**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>-18%</td>
</tr>
<tr>
<td>Residential</td>
<td>-7%</td>
</tr>
<tr>
<td>Commercial</td>
<td>13%</td>
</tr>
<tr>
<td>Industrial</td>
<td>-6%</td>
</tr>
<tr>
<td>Transportation</td>
<td>-7%</td>
</tr>
<tr>
<td>Electric</td>
<td>-36%</td>
</tr>
</tbody>
</table>

**Kaya Decomposition**

\[ CO_2 = \left( \frac{CO_2}{E} \right) \left( \frac{E}{GDP} \right) \left( \frac{GDP}{N} \right)^N \]

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage Change</th>
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<tbody>
<tr>
<td>Emissions</td>
<td>-18%</td>
</tr>
<tr>
<td>Emissions to Energy Ratio</td>
<td>-15%</td>
</tr>
<tr>
<td>Energy to GDP Ratio</td>
<td>-29%</td>
</tr>
<tr>
<td>Per Capita GDP</td>
<td>21%</td>
</tr>
<tr>
<td>Population</td>
<td>13%</td>
</tr>
</tbody>
</table>

EIA data: 2005 - 2022
Emission Reductions Since 2005

Emissions

- Total: -18%
- Residential: -7%
- Commercial: 13%
- Industrial: -6%
- Transportation: -7%
- Electric: -36%

Emissions to GDP Share

- Emissions Intensity: -40%
- Activity: -11%
- Efficiency: -33%
Overview of US Policies

• Federal and state policy survey
• Impacts of federal policy
• Headwinds
Federal Funding Increasing

2009-2017
- ARRA
- Appropriations
- Tax Expenditures

2022-2027
- IRA
- CHIPS
- Jobs Act

Congressional Research Service (2023), RMI (2022)
Inflation Reduction Act (IRA)

10 Year Spending ($ Billions)

- Electricity
- Transportation
- Manufacturing
- Buildings & Energy Efficiency
- Environment and Climate Justice
- Agriculture, Forests, and Land
- Cross-Cutting
- Climate Research

Tax Expenditures
Appropriations

Congressional Research Service (2023)
Electrify Everything!
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

United States Environmental Protection Agency
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

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.
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

Welcome to the Renewable & Clean Energy Standards page. This page provides an overview of the renewable energy standards and clean energy standards in the United States.

The map shows the renewable portfolio standard and clean energy standard for each state. The states are color-coded to indicate whether they have a renewable portfolio standard, a clean energy standard, or both. The map also highlights the states that have a clean energy goal or extra credit for solar or customer-sited renewables.

The states are divided into categories based on their renewable portfolio standards and clean energy standards. The categories include:

- Renewable portfolio standard
- Clean energy standard
- Renewable portfolio goal
- Clean energy goal

The states are also categorized by the year they reach their goals:

- 2015
- 2020
- 2025
- 2030
- 2040
- 2050

The states are further categorized by the type of standard they have:

- Statewide renewable portfolio standard
- IOUs (Independent System Operators)
- Large utilities (larger than 500 MW)
- Existing resources
- New resources

The map also includes a list of states that have renewable portfolio standards and clean energy standards.

- 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 2040)
- 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)
Passenger Electric Vehicle Incentives

www.dsireusa.org / November 2023

State Incentive(s) Available
Utility Incentive(s) Available
State & Utility Incentives Available

Incentives for Passenger Electric Vehicles are available in 33 states + DC.
Incentives for Electric Vehicle Supply Equipment (EVSE) are available in 45 states + DC.
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

Bistline, Mehrotra, and Wolfram (2023)
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%

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
Overall employment carbon footprints, by county

Employment carbon footprint (metric tonnes CO2e per employee)

Social cost per employee (USD per employee)

Graham and Knittel (2024)
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

<table>
<thead>
<tr>
<th>Sector</th>
<th>Announced ($B)</th>
<th>Projects (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiconductors &amp; Electronics</td>
<td>$234</td>
<td>53</td>
</tr>
<tr>
<td>Clean Economy</td>
<td>$249</td>
<td>376</td>
</tr>
<tr>
<td>Biomanufacturing</td>
<td>$24</td>
<td>68</td>
</tr>
<tr>
<td>Heavy Industry</td>
<td>$17</td>
<td>36</td>
</tr>
</tbody>
</table>

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

Parilla et al. (2024)
Investments Flowing Into Economically Distressed Areas

Parilla et al. (2024)
Electrify Everything!

Some Headwinds
Challenges to Electrification: Connecting to the Grid

[Graph showing median number of months from initial request (IR) to completion (COD) for different types of installations (Combined, Gas, Solar, Wind) over years.]
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

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.
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