

Opportunities and Challenges for Equity and Decarbonization in the Inflation Reduction Act Home Energy Rebate Programs and Federal Tax Credits

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Abstract

The Inflation Reduction Act of 2022 (IRA) is the most significant federal investment in decarbonization passed to date, introducing extensive grants and programs to accelerate electrification and energy efficiency. This paper examines how the IRA's Home Energy Rebate Programs lower upfront costs of energy efficient upgrades for consumers, particularly low- and moderate-income households. It also examines the expanded and extended clean energy tax credits. Historically, renewable energy received minimal federal support compared to fossil fuels, and the IRA tax credits mark a structural shift, projecting support for renewables to reach \$31.2 billion in 2024, far exceeding the \$1.9 billion for oil and gas. While these mechanisms spur immediate deployment, achieving a durable transition requires parallel investments in infrastructure, including storage and demand-side management (DSM), to ensure stability and equity in the transition to a clean-energy economy.

Keywords: Equity, Decarbonization, Home Energy Rebates, Inflation Reduction Act, Tax Credits

1. Introduction

The IRA is the most significant decarbonization policy in U.S. history, launching a comprehensive suite of programs to support an efficient, renewable-based economy. The Home Energy Rebate Programs (HER and HEAR) and expanded clean-energy tax credits are part of this effort, together forming the largest federal investment in direct consumer energy incentives. These mechanisms reduce costs, stimulate demand, and promote equitable participation. Situating these programs within the longer history of federal energy subsidies reveals how public investment has changed in recent years and shaped technology development.

2. Main Content of Extended Abstract

2.1 Home Energy Rebate Programs (HER and HEAR)

The Home Energy Rebate Programs (Sections 50121 and 50122 of the IRA) comprise two initiatives: the Home Efficiency Rebate (HER) and the Home

Electrification and Appliance Rebate (HEAR). Together, they allocate \$8.8 billion, plus \$200 million in contractor-training grants, to 48 participating states to expand residential energy efficiency and electrification. Their goal is to lower upfront costs for households—particularly those with low incomes—through rebates for whole-home retrofits under HER and targeted upgrades, such as heat pumps or wiring, under HEAR. These programs help transform homes from passive consumers to active energy assets, advancing both decarbonization and distributive equity (Heffron & McCauley, 2017).

Implementation has progressed unevenly (*Fig. 1*). Many states remain in a holding pattern pending Department of Energy (DOE) approval, while others face uncertainty over funding and program design. As of June 2025, most states had not launched either program; a few had begun HEAR or HER individually. Vermont’s HEAR application, for example, was conditionally approved but paused. In contrast, New York, California, Maine, Georgia, and North Carolina report strong participation and consumer demand. Funding is authorized through 2031, allowing sustained expansion of residential decarbonization.

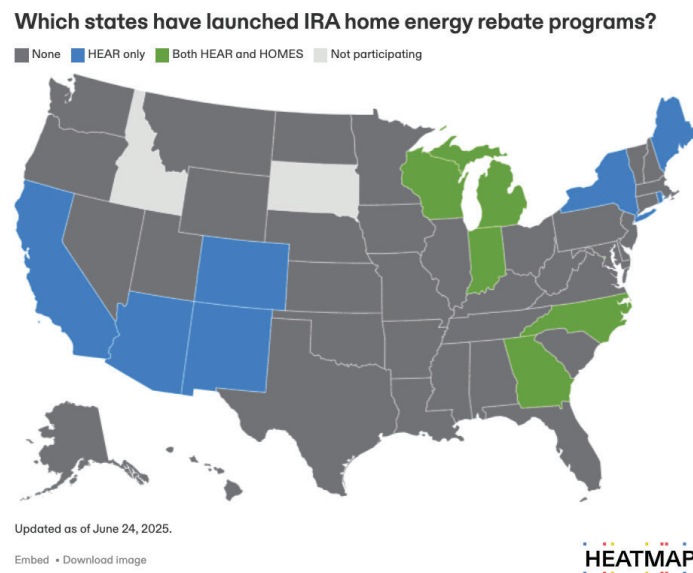


Figure 1. Which states have launched IRA home energy rebate programs?

2.2 Historical Context of Federal Energy Subsidies

Examining federal subsidy history contextualizes the scale of the IRA as a continuation, not departure, from U.S. precedent. Since Congress introduced fossil-fuel tax preferences in 1916, made permanent by 1918, federal policy has consistently shaped national energy systems. For most of the 20th century, renewable energy received comparatively little support. Pfund and Healey (2011)

found that until 2009, renewable subsidies were 'trivial in size.' During their first fifteen years of support, fossil fuels averaged \$1.8 billion per year (inflation-adjusted), nuclear power \$3.3 billion, and renewables only \$400 million. Oil and gas subsidies accounted for 0.5% of the federal budget; renewables represented 0.1%. Renewable Northwest (2025) notes that this pattern reflects the U.S. practice of backing nascent energy industries until they achieve market maturity.

The IRA reverses this asymmetry. In 2024, the Investment Tax Credit (ITC) and Production Tax Credit (PTC), are projected at \$31.2 billion, compared to \$1.9 billion for oil and gas (U.S. Department of the Treasury, 2024) (*Fig. 2*). Analysts at the National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory (LBNL) estimate these credits drive 40–70% of growth in U.S. wind and solar capacity (Bolinger et al., 2023; Feldman et al., 2022). This rebalancing realigns federal investment with innovation and public interest.

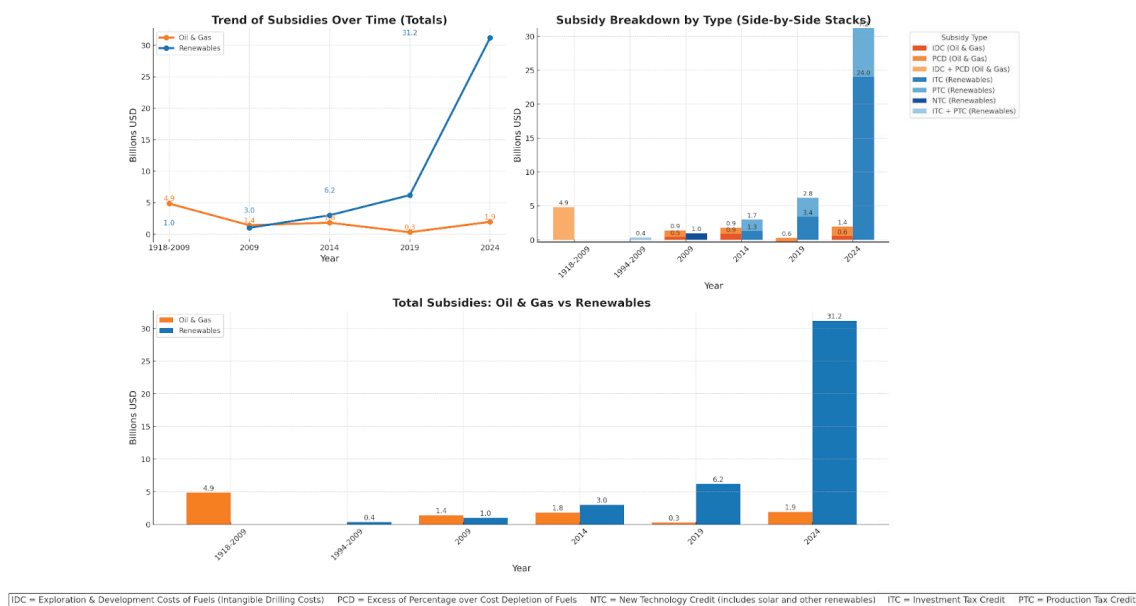


Figure 2. Oil & Gas vs. Renewables Subsidies

2.3 From Fiscal Incentives to Systemic Requirements

While fiscal incentives are helping to ensure greater equity and investment, the IRA's long-term success also depends on addressing infrastructure constraints in storage, transmission, and DSM. Abundant renewables with near-zero marginal generation costs risk curtailment unless supported by flexible load management. DSM programs, including Demand Response (DR), provide a cost-effective bridge for balancing load growth compared to new generation that faces 7–10-year interconnection delays. Norris et al. (2025) estimate that 76 GW of

new flexible load could be added with just 0.25% annual curtailment. The IRA's shift to tech-neutral tax credits post-2024 strengthens this capacity by supporting storage and flexibility-enabling assets vital for grid reliability.

3. Conclusions

Federal policy is reshaping the scale and inclusivity of the U.S. energy transition. The IRA's Home Energy Rebates make upgrades more attainable for low-income households and clean-energy tax credits mark a decisive break from fossil-fuel-favored subsidy patterns. Yet fiscal tools alone cannot sustain transformation. Achieving a durable, just transition requires integrating financial innovation with systemic infrastructure upgrades in storage, transmission, and DSM. Stable, long-term policy design, avoiding the cyclical disruptions that historically undermined clean-energy deployment, will be crucial for ensuring both economic durability and social equity in the transition to a post-carbon energy system.

4. Disclaimer

The views expressed herein do not necessarily reflect those of the U.S. Government or any agency thereof.

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