EPRI

P201 Back Pocket Insights

KEY INSIGHTS

• **Power sector CO_2 emissions could drop 66-87% by 2035 with IRA** from 2005 (compared with 39-68% without IRA).

• **IRA could accelerate clean electricity deployment**, including 1.4-6.2 times current installed wind and solar capacity by 2035.

• **Low-emitting generation shares—including renewables, nuclear, and carbon capture—in 2035 range from 59-89% with IRA**, compared with 46-74% without IRA.

• **Total fiscal costs of IRA's power sector provisions could range from $240-960 billion through 2035**. Energy costs could be $73-370 per household per year lower by 2035 with IRA.

This brief is based on the paper "Power Sector Impacts of the Inflation Reduction Act of 2022" published in *Environmental Research Letters* (2023)

Power Sector Impacts of the Inflation Reduction Act

by Bistline, Brown, Domeshek, Marcy, Roy, Blanford, Burtraw, Farbes, Fawcett, Hamilton, Jenkins, Jones, King, Kolus, Larsen, Levin, Mahajan, Mayfield, McFarland, McJeon, Orvis, Patankar, Rennert, Robson, Roney, Russell, Schivley, Shawhan, Steinberg, Victor, Wenzel, Weyant, Wiser, Yuan, and Zhao

New 11-model comparison examines the power sector impacts of the Inflation Reduction Act of 2022 (IRA).

IRA is regarded as the most prominent federal climate legislation in U.S. history. This paper investigates potential impacts of IRA on the power sector, which is the focus of many core IRA provisions, and assesses robust findings and variation in investments, emissions, and costs.

Electric sector CO_2 reductions from IRA range from 47-83% below 2005 in 2030 and 66-87% in 2035, compared with 39-68% in 2035 without IRA (Fig. 1A). Economy-wide models suggest that power sector decarbonization accounts for 38-80% of 2030 reductions. IRA's technology-neutral tax credits for zero-emitting resources continue until electricity emissions are 25% of 2022 levels, and 3 of 11 models reach this threshold by 2035, which suggests that IRA's effects may take time to be fully realized.

IRA may lower CO_2 emissions by:

- **Increasing solar and wind builds (Fig. 1B), leading to 1.4-6.2 times current installed capacity by 2035**, as well as increasing energy storage and transmission to manage variability
- Deploying carbon capture and storage (CCS) from 0-150 GW (37 GW average) by 2035
- Decreasing unabated coal generation by 44-100% from 2021 levels, compared with a 12-63% decrease without IRA

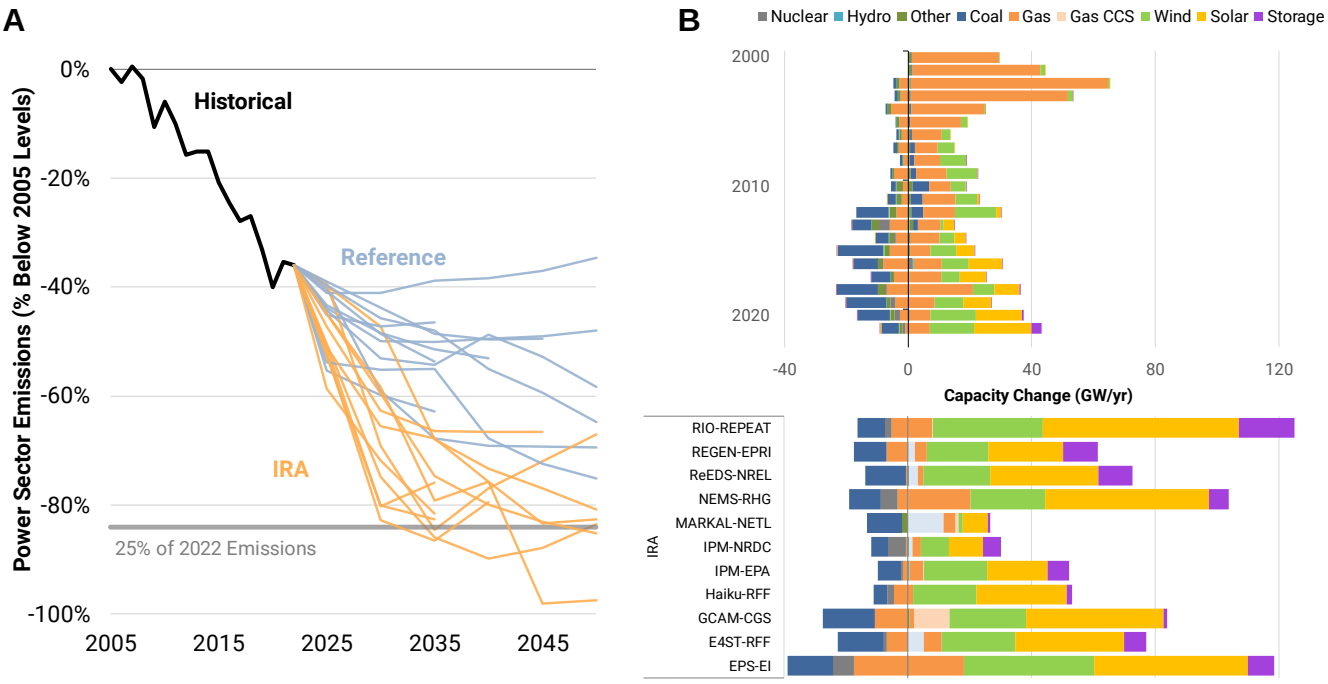

Figure 1. Cross-model comparison of U.S. CO_2 emissions reductions in the power sector under IRA and reference scenarios without IRA (left, A) and average annual investments and retirements through 2035 (right, B). Based on Bistline, et al. (2023).

IRA is projected to increase generation from low-emitting technologies—including renewables, nuclear, and CCS—relative to current trends, though there is cross-model variation in the extent of these changes. **Low-emitting generation shares in 2035 are 59-89% with IRA**, compared with 46-74% without IRA. The analysis shows how differences in IRA-induced investment across models is related to assumptions about capital costs, discounting, and natural gas prices as well as structural features such as a model's temporal resolution.

Wholesale and residential retail electricity prices decline across nearly all models and time periods between the reference and IRA scenarios. Earlier research illustrates how IRA incentives encourage electrification and could **lower total energy expenditures by $10-52 billion per year (about $73-370 per household) by 2035** relative to the reference.

Cumulative **fiscal costs of IRA's power sector provisions range from $240-960 billion to 2035** ($530B average) in the analysis. Although we find higher fiscal costs than initial estimates, IRA's abatement costs are likely far below social cost of carbon estimates, even before accounting for improved air quality.

Our higher clean electricity deployment and lower emissions under IRA, compared with earlier U.S. modeling, change future baselines for policymaking and analysis. Although IRA helps to bring projected U.S. power sector and economy-wide emissions closer to near-term climate targets, no models indicate that these targets will be met with IRA alone, which suggests that additional policies, incentives, and private sector actions are needed.

FOR MORE INFORMATION

Read the full paper: Bistline, et al. (2023), "Power Sector Impacts of the Inflation Reduction Act of 2022." *Environmental Research Letters*.

CONTACT

John Bistline (corresponding author)
jbistline@epri.com