Beyond Clean Energy: The Financial Incidence and Health Effects of the IRA

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New research from Resources for the Future (RFF) analyzes the Inflation Reduction Act’s effects on electricity generation and investment, emissions of carbon dioxide (CO\textsubscript{2}) and other air pollutants, household electricity prices and costs, household tax burden, and public health. The data show that net benefits of the policy are positive and substantial across income groups. Air quality benefits are most evident in the Midwest and Southeast.

The Inflation Reduction Act of 2022 (IRA), signed into law by President Biden in August 2022, promotes clean energy technologies, facilitates domestic energy production, and addresses global warming through a package of production and investment incentives paid for through the federal budget.

A new RFF report focuses on the IRA’s tax provisions targeted at grid-connected electricity generation. The IRA will affect households through changes in electricity prices and costs, the household tax burden, emissions of CO\textsubscript{2} and other air pollutants, and public health.

The authors use the Haiku electricity market model to estimate changes in investment and generation compared to a no-policy baseline under several future scenarios. They examine changes in electricity expenditures and the tax burden to pay for the IRA using RFF’s Social Welfare Incidence Model. They also examine the health effects of emissions reductions and associated changes in premature mortality.

Key Findings

The modeling finds that the reductions of CO\textsubscript{2} emissions in the electricity sector driven by the IRA are substantial and can be achieved at an average cost that is less than estimates of the social cost of carbon. The IRA’s pocketbook effects, through the cost shift from ratepayers to taxpayers, are progressive across income groups. The legislation’s air quality benefits are most evident in the Midwest and southern parts of the country.

Carbon Emissions

The target of the IRA is reduction of CO\textsubscript{2} emissions from the power sector. Under the no-policy baseline, electricity sector emissions are projected to be 51 percent below 2005 levels in 2030. Under the IRA, across examined scenarios, annual emissions fall to 61–68 percent below 2005 levels in 2030, or by 1,615–1,792 million metric tons. As the IRA is expected to lower electricity prices, thereby incentivizing electrification, emissions reductions beyond those modeled in the report—such as in transportation, buildings, and industry—are likely.

Changes in the Generation Mix

Generation from clean electricity sources will rise to 69–75 percent of the nation’s mix of generation in 2030 across analyzed scenarios, compared to 56 percent in the no-policy baseline, and rising from roughly 38 percent today. The emitting generation displaced by clean sources is about 41 percent natural gas and 59 percent coal.

Air Quality Effects

The shift in the generation mix will result in a decline in emissions of sulfur dioxide (SO\textsubscript{2}) and nitrous oxides (NO\textsubscript{x}), pollutants that contribute to fine particulates, or PM 2.5. SO\textsubscript{2} emissions decline by 37–63 percent from 2022 levels by 2030, resulting in emissions levels that are 3.7–6.2 percent of the electricity sector emissions in 2005. NO\textsubscript{x} emissions fall by 36–53 percent of 2022 levels, to levels that are 12–16 percent of electricity sector emissions in 2005. These changes reduce the effects of pollution from power generation on premature mortality by nearly half. The benefits accrue broadly across racial, ethnic and income groups.
Net Financial Effect on Households

The net financial effect on households involves a decrease in electricity prices, a change in corporate profits, and an increase in taxes. Modeling shows that the effects of this cost shift are progressive overall, with a reduction in net annual household costs among the three lowest income quintiles of $123–$66 and an increase for the top income bracket of $1,014. Because lower income households spend a greater portion of their income on electricity than higher income households, the reduction in electricity prices and the distribution of changes in electricity expenditures across households is likely to be progressive, benefiting low-income households the most in relative terms.

Cost Effectiveness

The shift to clean energy increases capital costs while reducing fuel and other operating costs of the power sector. The annualized net increase in resource cost from the no-policy baseline totals about $13–18 billion in 2030, a year when many clean energy investments will be in place. The authors find that the partial equilibrium cost per ton of CO₂ emissions reduction achieved under the IRA to be $43–54 per metric ton, which is below the current federal estimate for the social cost of carbon ($51/ton in 2020).

Net Benefits

The annual household net benefits across all the analyzed effects total roughly $1,000 in 2030 in our central case analysis for the average household. Figure 3 shows benefits are substantial across all the analyzed scenarios.

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