RESOURCES *for the* FUTURE

Retail Electricity Rates Under the Inflation Reduction Act of 2022

Issue Brief 22-07 by **Nicholas Roy**, **Dallas Burtraw**, and **Kevin Rennert** — August 2022

1. Overview

The Inflation Reduction Act of 2022 (IRA), released on Wednesday, July 27, 2022 by Sen. Schumer (D-NY) and Sen. Manchin (D-WV), contains an extensive set of provisions to promote clean energy technologies, facilitate domestic energy production, and address climate change. The proposed legislation contains many elements that have been considered and discussed in previous RFF analyses,[1] though the details have evolved.

In light of the legislation's title, a key question is how the energy and climate provisions will affect energy prices. To examine effects on the crucial electricity sector, RFF deployed the Haiku Electricity Market Model to project electricity retail rates for a range of potential scenarios that account for variability in future fuel prices, capital and technology costs, and uptake of specific provisions of the legislation.

In this initial analysis, we find that under the legislation:

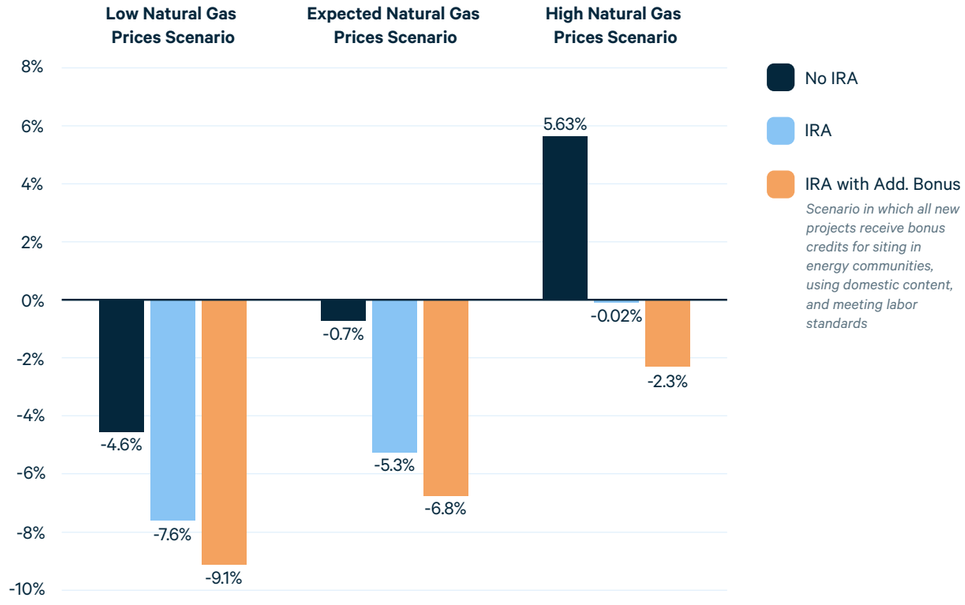
- Retail costs of electricity are expected to decline 5.2-6.7 percent over the next decade, saving electricity consumers $209-278 billion, given expected natural gas prices.
- The average household will experience approximately $170-$220 in annual savings from smaller electricity bills and reductions in the costs of goods and services over the next decade.
- Ratepayers are insulated from volatility in natural gas prices, with electricity rates projected to decrease even under a high natural gas price scenario.
- 2030 electricity sector emissions are projected to drop to 69.8 percent to 74.9 percent below 2005 levels, compared to 48.5 percent below 2005 levels without the policy.

2. Modeled Scenarios

Central to the IRA's power sector provisions is a long-term extension and reformation of clean energy tax credits, including the production tax credit (PTC) and investment tax credits (ITC) for solar, wind, and storage. The PTC for wind is currently expired and the ITC for solar is phasing down. The expiration of these tax credits may be responsible for **the current decline in capacity investment**. The IRA would extend and modify these provisions until 2025 before transitioning them to an analogous new set of technology-neutral production and investment tax credit provisions drawn from the *Clean Energy for America Act*. In addition, the IRA also allows for a set of tax-exempt entities to take advantage of the provisions, and additionally modifies the transferability of tax credits to make them easier to monetize. The IRA increases the amount of the tax credits for carbon capture and storage (which we do not model) and provides a new production tax credit for existing nuclear electricity generating units (modeled as maintaining baseline nuclear generation), among other changes.

1 See: **https://www.rff.org/publications/journal-articles/supply-side-reforms-to-oil-and-gas-production-on-federal-lands-modeling-the-implications-for-co2-emissions-federal-revenues-and-leakage/** ; **https://www.rff.org/publications/issue-briefs/cost-analysis-and-emissions-projections-under-power-sector-proposals-in-reconciliation/** ; **https://www.rff.org/publications/issue-briefs/methane-fees-effects-on-natural-gas-prices-and-methane-leakage/**.

Figure 1. Change in Average Retail Electricity Prices in 2023-2032 with and without the Inflation Reduction Act (IRA)



To enhance the emissions reductions of these policies while also reducing energy costs and addressing long term economic goals, the IRA provides an extensive bonus structure for projects meeting certain criteria. For example, projects meeting wage and apprenticeship requirements are eligible for a 5X multiplier over a base rate, bringing the PTC to a value of 2.5 cents/kWh (adjusted for inflation) and the ITC to 30 percent. Additional, separate bonuses apply to clean energy projects located in energy communities and those using domestic content. The individual bonuses for qualified projects are stackable, and, when taken together, can result in a PTC of 3.0 cents/kWh or an ITC of 50 percent.

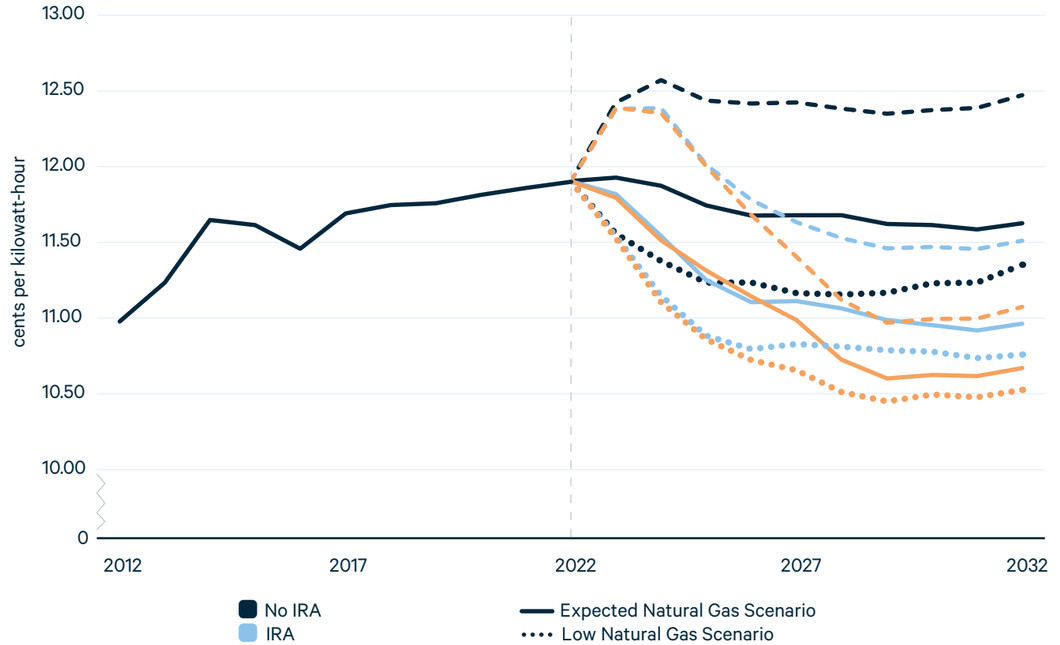
The extent to which clean electricity projects overall will qualify for the varying levels of PTC and ITC values is uncertain. To bracket that uncertainty, we use the Haiku Electricity Market Model to assess the effects of the tax credits for retail electricity rates for two core scenarios: One assuming the PTC is set at an 2.5 cents/kWh and with an ITC of 30 percent, and another assuming the PTC is set at 3.0 cents/kWh and an ITC of 50 percent. For both cases we assume the effects of direct pay provisions ease the ability to monetize the credits. We examine the sensitivity of electricity prices under the IRA to changes in natural gas prices and renewable capital costs.[2]

3. Effects on Electricity Consumers

In Figure 1, we compare the average annual change in retail prices in the no-policy baseline and in the policy scenarios under expected natural gas prices, as well as with alternative natural gas price scenarios from *AEO 2021*. The IRA is projected to have a deflationary effect on retail electricity prices under all of the alternative scenarios we modeled.

2 We account for the effects of the methane fee included in the IRA on natural gas prices by incorporating analysis of a more stringent version of the methane fee from previous legislation, thereby making our estimates of reductions in retail rates conservative compared to the IRA's methane fee provision.

Figure 2. National Average Real Retail Electricity Prices (2022 USD)



Under the expected natural gas price forecast from *AEO 2021*, national retail electricity prices are expected to decline 5.2-6.7 percent on average for the next decade with the implementation of the IRA.[3] Even If natural gas prices are higher than expected, as they have been in recent months due to global shocks in fuel prices, electricity rates are still projected to decline under the legislation. Even under the worst-case scenario examined––in which prices stay near the *AEO 2021* low natural gas supply scenario levels (higher fuel prices), thereby causing retail electricity prices to increase against the no-policy baseline––we project retail rates to be stable and even decline up to 2 percent over the next decade under the policy scenarios. If natural gas supply expands and prices fall, ratepayers could expect even greater savings under the legislation, ranging from 7.5-9 percent on average over the next decade.

The transition to a cleaner electricity mix driven by the legislation is projected to insulate ratepayers from swings in natural gas prices. This result is evident in Figure 1 by comparing the range of retail rates across low and high natural gas prices for the policy scenarios (<7.6 percent) to that of the no-policy case (>10 percent). It is further evident in Figure 2, which shows that the range of retail prices across the policy scenarios converges more quickly than in the no policy cases. By the end of the next 5 years, even the highest natural gas prices modeled still lead to retail prices in the policy cases below what we expect in our no-policy baseline.

The deflationary effects on electricity prices driven by the legislation begin quickly, including a sharp decline as soon as 2023 (Figure 2). The model does not allow for new capacity not already in the planning phase to be built in 2023, so the reductions happening in that year are solely from projects that would qualify for the

3 Our model's baseline has higher retail prices than *AEO 2021*'s baseline, meaning these savings can be taken as *conservative* estimates.

tax credits and bonuses that are already present in our baseline. Ratepayers could be expected to experience the effects of the tax credits as soon as the first qualifying units in their service region are operational. While this generation may be inframarginal (i.e. it doesn't require the tax incentives for it to be built), its receipt of the tax credits begins a path of reductions in expected electricity rates.

In addition to sensitivities to natural gas price fluctuations, we also investigated scenarios with lower renewable costs. As expected, these scenarios resulted in additional increases in renewable capacity. Surprisingly, they did not lead to substantially lower retail prices than the reference case policy scenarios due in part to the lower value of the ITC (because the capital costs are lower) and the associated decrease in price suppressing effects. Under these conditions, more generators in the model opt for the PTC, as it provides a greater economic incentive overall. In general, lower cost renewables leads to more renewable capacity being built, but the decreased benefit of the tax credits per unit balances out to approximately the same effect on retail price.

The modeled reduction in electricity rates under the legislation can be understood as follows: Credits for clean electricity under the IRA function as a payment to qualifying generation. In cost-of-service regions, the value of the payment reduces the revenue requirement for utilities, causing electricity prices to fall. In competitive markets, the payment reduces the bids from generators thus bringing down wholesale power prices. Therefore, electricity rates go down as new generation comes online to address increasing demand, replace old costly retiring plants, and improve grid reliability. For these reasons, the tax credits align the interests of ratepayers and grid operators such that, as major energy investment takes place, ratepayers save money. Household benefits are twofold––both directly from reduced electricity prices, and indirectly from reduced cost of goods and services from businesses and industries that also benefit from reduced electricity prices.

4. Key Assumptions in this Analysis

Tax credits represented here are only for electricity generating capacity. There are several provisions in the IRA subsidizing the domestic manufacturing and production of inputs to electricity generation that also can contribute to a reduction in the capital costs of qualifying generation, and which our modeling does not represent. Additionally, domestic manufacturing can reduce bottlenecks in the energy supply chain that could contribute to inflationary pressures. The only additional provision of the IRA that could raise retail prices would be the methane fee. Previous **RFF analysis** has shown, however, that even a methane fee that is even more stringent than what is provided for in the IRA would have minimal impact on natural gas fuel prices and hence have limited impact on the retail price of electricity.

All scenarios that we model assume electricity demand based on *AEO 2021* reference case assumptions that do not include substantial electrification. The pace at which retail prices decline under the IRA is much greater than what is anticipated in the no-policy baseline embodied in the *AEO 2021* forecast. After concerns of inflation subside, the lower retail prices also provide cushion for potential increases in electricity rates to compensate for rapid electrification that could happen later in the decade. The price impacts of this policy will lower energy rates in the short term, tackling one aspect of inflation, and the new lower electricity rates could serve as a safety net for future volatility. Lower electricity prices under the IRA also can be expected to accelerate electrification of transportation and buildings, which would likely complement the nation's climate policy goals and provide additional savings to households. The IRA provides substantial incentives for energy efficiency and electrification that are **expected** to provide substantial additional savings to consumers.

Other assumptions in the modeling analysis:

- Capacity growth in the model is constrained to no more than double annually, year over year, to represent potential bottlenecks in siting and related issues. If these obstacles were to be removed, the rate of deployment of clean electricity and the reductions in retail electricity prices driven by the legislation could both be expected to increase.
- The results reported here represent endogenous economic investments in offshore wind, onshore wind, solar, and battery storage. The PTC for existing nuclear in the proposed legislation is not represented directly, with generation instead fixed to a baseline to represent the support for existing nuclear assets. The model also does not represent investments in carbon capture and storage at fossil-fueled facilities. Consequently, no retail price benefits from the nuclear PTC or carbon capture and storage are accounted for here.
- The model is calibrated to AEO 2021 for forecasts of electricity demand and fuel costs, and for some technology costs. We rely on the 2020 National Renewable Laboratories Annual Technologies Baseline (NREL-ATB) "Advanced" Scenario for renewable costs. The *AEO 2022* has updated assumptions and expectations for baseline renewable buildout which are not represented in our baseline; consequently, our results may underestimate the magnitude of clean energy to be achieved.
- Natural gas prices in the model are tied to the Energy Information Administration's *Annual Energy Outlook (AEO) 2021*. Natural gas prices do not respond to changes in demand for natural gas. However, we do account for changes in natural gas prices from the methane fee.

Resources for the Future (RFF) is an independent, nonprofit research institution in Washington, DC. Its mission is to improve environmental, energy, and natural resource decisions through impartial economic research and policy engagement. The views expressed here are those of the individual authors and may differ from those of other RFF experts, its officers, or its directors.

Nicholas Roy is a research analyst at RFF working on modeling climate policy impacts in the electricity sector using the Haiku model.

Dallas Burtraw is the Darius Gaskins Senior Fellow at RFF; his work focuses on electricity markets and analyzing the distributional and regional consequences of climate policy.

Kevin Rennert is a fellow and director of the Federal Climate Policy Initiative at RFF; his work focuses on federal climate policy analysis.

The analysis in this Issue Brief is based on **this version of the Inflation Reduction Act**.