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KEY INSIGHTS

- **EPA's proposed rules could drive low-emitting capacity and emissions reductions beyond current trends**, though the extent depends on planning uncertainties.

- **Power sector CO_2 reductions in 2040 are 65-86% below 2005** with the rules (compared with 62-76% without the rules).

- **The proposed rules are emissions intensity standards and not technology mandates**, meaning that the technologies on which standards are based may not be the ones deployed.

- **Natural gas capacity could a play role in regional decarbonization efforts**, even as the proposed rules and other trends lower utilization.

This brief is based on the white paper "Analysis of EPA's Proposed New and Existing Source Standards for Power Plants" (2024)

Analysis of EPA's Proposed Standards for Power Plants

by John Bistline, Aranya Venkatesh, Geoff Blanford, and David Young

New analysis examines potential impacts of proposed new and existing source standards on power sector outcomes.

In May 2023, the U.S. Environmental Protection Agency (EPA) released proposed limits for carbon emissions from new and existing fossil fuel-fired power plants under Section 111 of the Clean Air Act. The complex incentives created by these rules require detailing modeling to assess.

Using EPRI's US-REGEN model across a range of scenarios, model results suggest that the **proposed rules may augment CO_2 reductions from the Inflation Reduction Act (IRA)**. 2030 reductions are 54-81% below 2005 levels (compared with 54-62% with IRA alone), and 2040 reductions are 65-86% below 2005 (62-76% with IRA alone), as shown in Figure 1.

The proposed rules are emissions intensity standards and not technology mandates, meaning that the technologies on which standards are based may not be the ones deployed:

- The nascent status of the technologies at the center of the rules—carbon capture and sequestration (CCS) and hydrogen (H_2)—creates uncertainty around timelines, costs, operations, and associated infrastructure.
- The proposed rules could increase deployment of natural gas with CCS, though deployment is sensitive to assumed natural gas prices and technology costs.
- H_2 deployment for power generation is limited in these scenarios. IRA incentives have larger

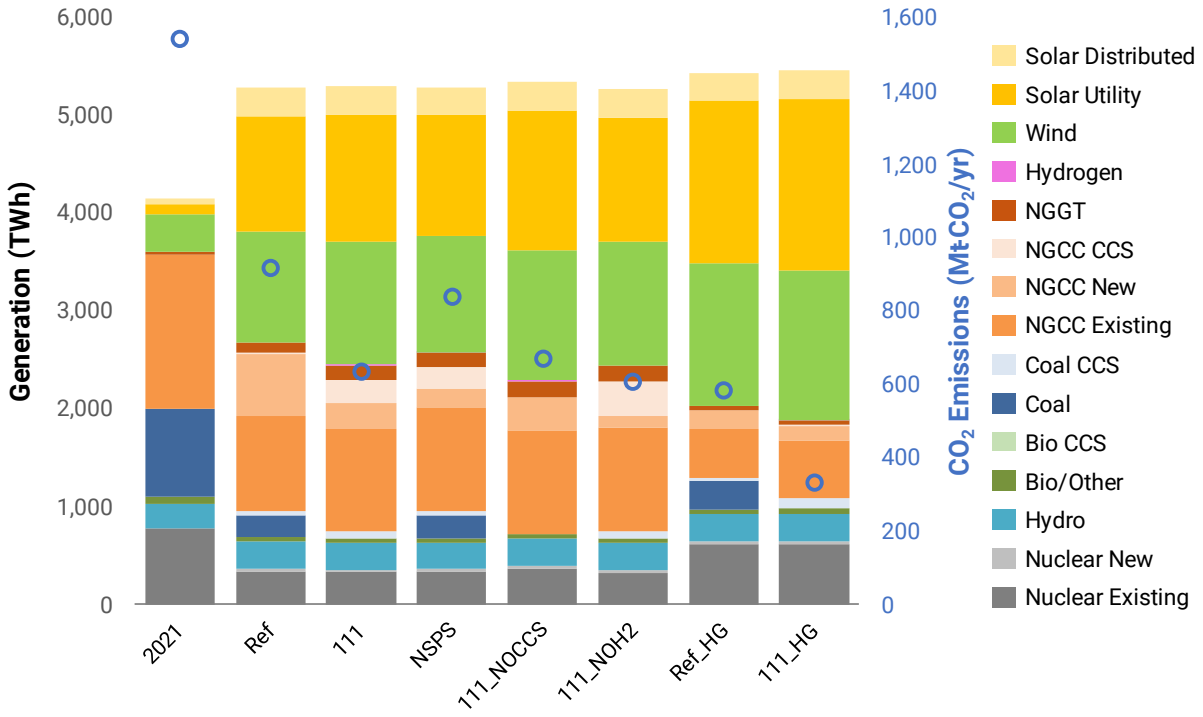

Figure 1. Generation mix by technology (left axis) and CO_2 emissions (right axis) across scenarios in 2040. Based on Bistline, et al. (2024).

impacts in supporting electrolytic H_2, though this is mostly supplying non-electric applications.

Natural gas capacity could a play role in regional decarbonization, even as the proposed rules and other trends lower utilization. Wind and solar are the largest generation resources by 2040 (Figure 1), though gas plays capacity roles in many scenarios as coal retires and load increases.

Size and capacity factor thresholds in the proposed rules could exempt most existing gas-fired plants, and the relative stringency of new source standards increase the value of existing gas capacity. The extent of gas-fired capacity varies regionally and depends on gas price assumptions, which are first-order drivers of the power sector mix and costs.

Uncertainties about impacts of the proposed rules and other drivers on costs, resource adequacy, and distributional outcomes offer opportunities for future research.

- Fiscal costs of IRA's tax credits could increase with 111 rules. Cumulative tax credit expenditures through 2030 increase from $225 billion in the reference to $240 B with 111 (in nominal terms), which increase through 2040 from $1,020 B to $1,170 B.
- Resource adequacy and reliability impacts are affected as much by concurrent trends in the power sector (e.g., retirements of dispatchable capacity, extreme weather events, end-use electrification, supply-side variability) as they are to the proposed rules, and more detailed regional analysis is important to understand these effects.

FOR MORE INFORMATION

Read the full paper: Bistline, et al. (2024), "Analysis of EPA's Proposed New and Existing Source Standards for Power Plants." EPRI Report 300202885.

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