

# EPA CO<sub>2</sub> Emissions Rule Modeling and Carbon Emissions Price Forecast for the 2025 IRP

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# List of Acronyms and Terms

- Capacity Factor – Average Output / Max Output for some period
- EPA – Environmental Protection Agency
- BSER – Best System of Emissions Reduction
- CCS – Carbon Capture and Sequestration
- SCCT – Simple-Cycle Combustion Turbine
- CCCT – Combined-Cycle Combustion Turbine
- EGU – Electrical Generating Unit
- MMBtu – Million British Thermal Units

# Agenda

- EPA CO<sub>2</sub> Emissions Rule Operational Impacts
  - Existing Units
  - New Units
  
- Carbon Price Options

# Existing Boiler Units

## Coal-Fired Boilers

**Long-term subcategory:** For units operating on or after January 1, 2039

**BSER:** CCS with 90 percent capture of CO<sub>2</sub> (88.4% reduction in emission rate lb/MWh-gross) by January 1, 2032

**Medium-term subcategory:** For units operating on or after Jan. 1, 2032, and demonstrating that they plan to permanently cease operating before January 1, 2039

**BSER:** co-firing 40% (by heat input) natural gas with emission limitation of a 16% reduction in emission rate (lb CO<sub>2</sub>/MWh-gross basis) by January 1, 2030

For units demonstrating that they plan to permanently cease operating before January 1, 2032

Units are exempt from the rule. Cease operations dates finalized in state plans for exemption purposes are federally enforceable.

<https://www.epa.gov/system/files/documents/2024-04/cps-table-of-all-bser-final-rule-4-24-2024.pdf>

- Bridger 1 & 2
  - As converted gas boilers, not affected by these rules
- Valmy 1 & 2
  - Plans to convert from coal to gas comply with these rules.
- Bridger 3 & 4
  - Without a gas conversion
    - Close by year-end 2031
    - Add carbon capture before 2032
  - With gas conversion (prior to 2030)
    - Complies with these rules

## Natural Gas and Oil-Fired Boilers

**BSER:** routine methods of operation and maintenance with associated degree of emission limitation:

**Base load unit standard:**

(annual capacity factors greater than 45%) 1,400 lb CO<sub>2</sub>/MWh-gross

**Intermediate load unit standard:**

(annual capacity factors greater than 8% and less than or equal to 45%) 1,600 lb CO<sub>2</sub>/MWh-gross.

**Low load units:**

(annual capacity factors less than 8%) a uniform fuels BSER and a presumptive input-based standard of 170 lb CO<sub>2</sub>/MMBtu for oil-fired sources and a presumptive standard of 130 lb CO<sub>2</sub>/MMBtu for natural gas-fired sources.

Compliance date of January 1, 2030

<https://www.epa.gov/system/files/documents/2024-04/cps-table-of-all-bser-final-rule-4-24-2024.pdf>

# Existing Boiler Units

- Bridger 1 & 2
  - Low Load – In compliance
  - Intermediate Load – In compliance with minor adjustments
  - Base Load – Could comply with limited flexibility
- Bridger 3 & 4
  - Without a gas conversion – N/A
  - With gas conversion – Same as Bridger 1 & 2
- Valmy 1 & 2
  - Low Load – In compliance
  - Intermediate Load – In compliance
  - Base Load – Could comply with limited flexibility



# Existing Combustion Turbines

## Existing Combustion Turbines

### Existing SCCT and CCCT Fleet

- No additional compliance from these rule updates

# Existing Unit Modeling Options Summary for 2025 IRP

## Bridger Units 1&2

- Increase minimum output to comply with emissions intensity max

## Bridger Units 3&4

- Exit year-end 2031
- Convert to gas before 2032, increase minimum output
- Add CCS before 2032 and don't convert to gas

## Valmy 1&2

- In compliance with rules, no adjustment

## Current SCCTs and CCCTs

- In compliance with rules, no adjustment

## Low Load (Capacity Factor <20%)

**BSER:** Use of lower emitting fuels (e.g., hydrogen, natural gas and distillate oil)  
**Standard:** less than 160 lb CO<sub>2</sub>/MMBtu

EPA is not finalizing a Phase II BSER for low load units

# New Thermal Units

- Affected units
  - New thermal generation resources that burn diesel or other higher carbon-content fuels (Diesel fuel is 161 lbs CO<sub>2</sub>/MMBtu.)
- Unaffected units
  - Natural gas burning resources (≈117 lbs CO<sub>2</sub>/MMBtu)



## Intermediate Load (Capacity Factor 20% to 40%)

**BSER:** Highly efficient simple cycle technology with best operating and maintenance practices

**Standard:** 1,170 lb CO<sub>2</sub>/MWh-gross

EPA is not finalizing a Phase II BSER for low load units

# New Thermal Units

- Affected units
  - Typical combustion turbine units operated under typical conditions and use cases
- Unaffected units
  - The most efficient combustion turbine available operated to minimize pounds of CO<sub>2</sub> per MWh-gross
  - Typical combined-cycle units operated under typical conditions
  - Typical reciprocating engines operated under typical conditions

## Base Load (Capacity Factor >40%)

**BSER:** Highly efficient combined cycle generation with the best operating and maintenance practices

**Standard:** 800 lb CO<sub>2</sub>/MWh-gross (EGUs with a base load rating of 2,000 MMBtu/h or more)

**Standard:** 800 to 900 lb CO<sub>2</sub>/MWh-gross (EGUs with a base load rating of less than 2,000 MMBtu/h)

**BSER:** Continued highly efficient combined cycle generation with 90% CCS by Jan 1, 2032

**Standard:** 100 lb CO<sub>2</sub>/MWh-gross

EPA's standard of performance is technology neutral, affected sources may comply with it by co-firing hydrogen.

<https://www.epa.gov/system/files/documents/2024-04/cps-table-of-all-bser-final-rule-4-24-2024.pdf>

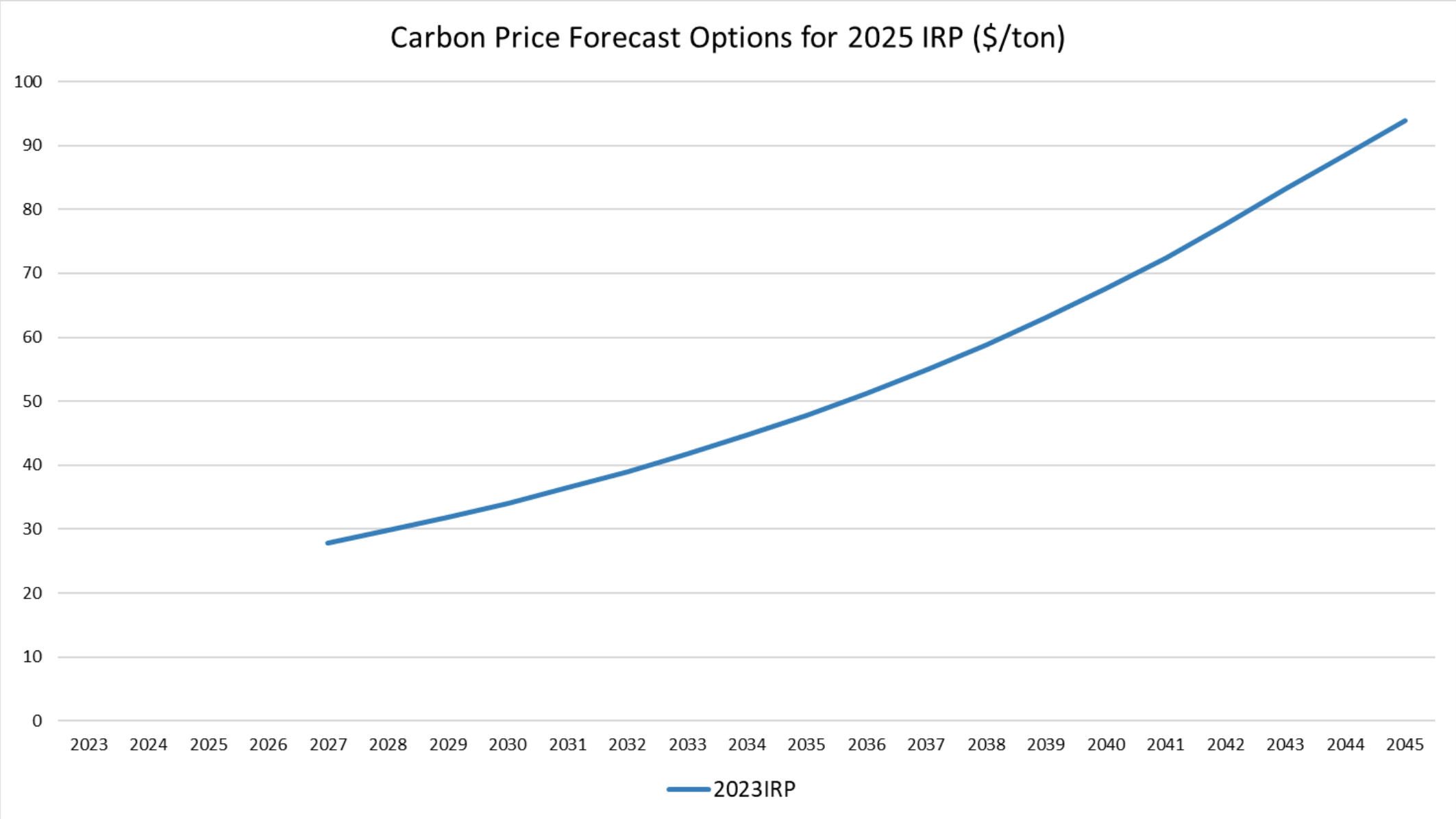
## New Thermal Units

- Affected units prior to 2032
  - Typical combined-cycle units operated under typical conditions are borderline.
  - If covered by rule, reciprocating engines
- Unaffected units prior to 2032
  - Highly efficient combined-cycle units operated to minimize CO<sub>2</sub> emissions
- Unaffected units after to 2032
  - Combined-cycle units with carbon capture technology
  - Combined-cycle units burning hydrogen

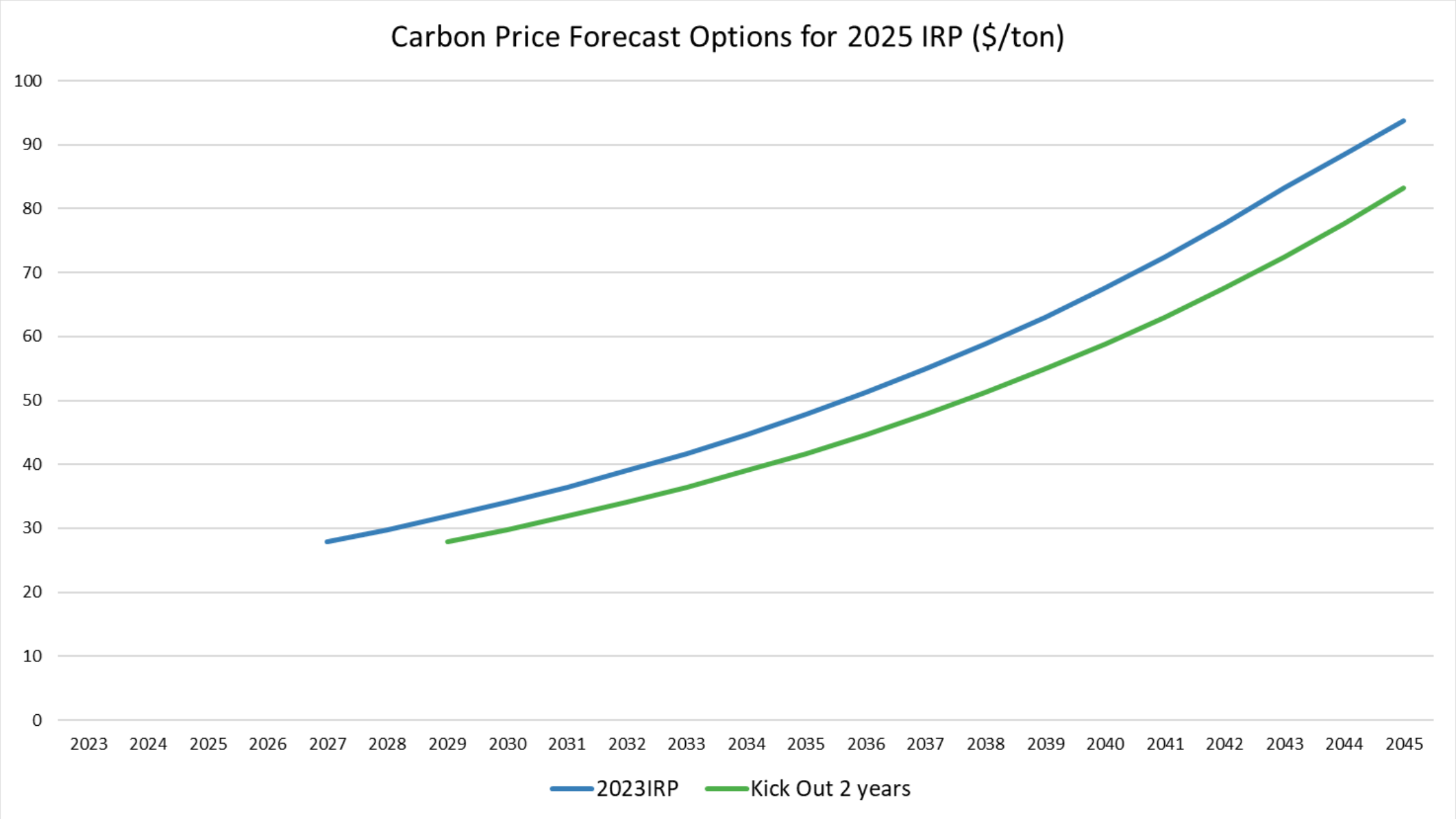
# New Unit Summary

Capacity Factor	Diesel Generators (>25MW)	Typical SCCT Typical Operations	Best SCCT Best Operations	Reciprocating Engine (>25MW)	Typical CCCT Typical Operations	Best CCCT Best Operations	CCCT 90% CCS or H2
Low Load [0%-20%]	Not Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
Intermediate Load [20%-40%]	Not Allowed	Not Allowed	Allowed with no flexibility	Allowed with flexibility	Allowed	Allowed	Allowed
Base Load [40%-100%]	Not Allowed	Not Allowed	Not Allowed	Not Allowed	Borderline pre-2032	Allowed pre-2032	Allowed

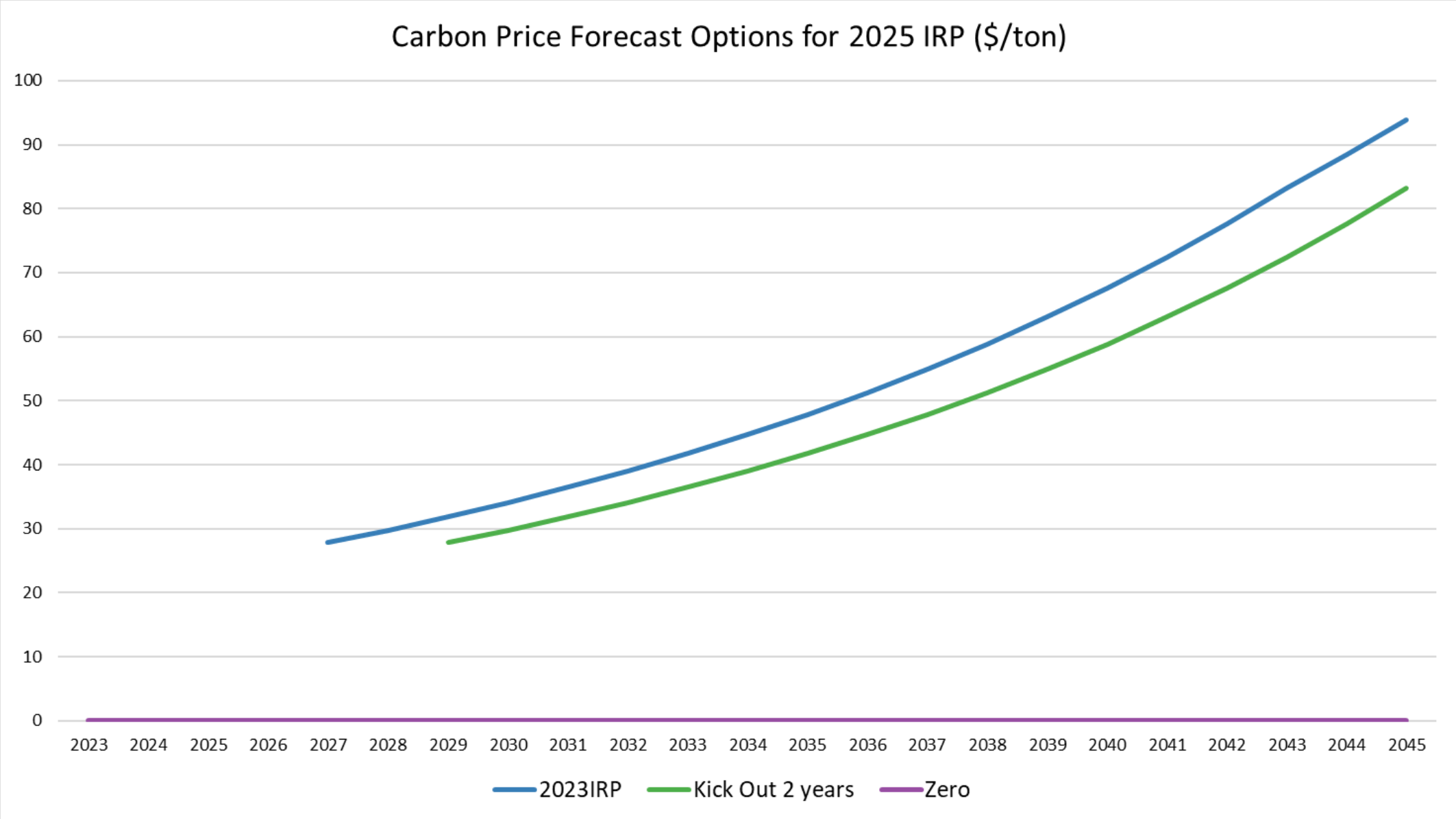
# Carbon Price Forecast Options



# Carbon Price Forecast Options



# Carbon Price Forecast Options





# How to Provide Additional Feedback on EPA Rules and CO2 Price Forecast

[Idahopower.com/IRP](https://idahopower.com/IRP)

Home > Energy and the Environment > Energy > Planning and Electrical Projects > Our 20-Year Plan

- Current Projects
- Oregon Distribution System Plan
- Our 20-Year Plan**
  - IRP Questions and Responses
  - Educational Resources
- Regional Electrical Plans
- Huston to Gem

Idaho Power has begun work on its 2025 *Integrated Resource Plan (IRP)*. The IRP examines the company's projected need for additional electricity over the next 20 years and the resources that will best meet that need while balancing reliability, cost, environmental responsibility, efficiency and risk. The plan is updated every two years and includes a series of public meetings that help guide our planning process.

Idaho Power enlists the assistance of its customers in developing the IRP through an advisory panel – the Integrated Resource Plan Advisory Council (IRPAC).

The IRPAC includes major industrial customers, the environmental community, irrigation representatives, state and local elected officials, public utility commission representatives and other interested parties.

The IRPAC meets with Idaho Power regularly over a period of several months during the development of the company's IRP. These meetings are public. The advisory council's responsibilities include:

- Representing the interests of Idaho Power's more than 630,000 customers
- Participating in open and active discussions of relevant issues, and
- Working with Idaho Power to develop ways to engage the public in the IRP process.

## Public Input

IRPAC meetings are virtual and open to the public. Links to attend meetings via Webex will be posted here.

### Q & A

Submit questions or comments using [the form on this page](#) or [email](#) our IRP team.

