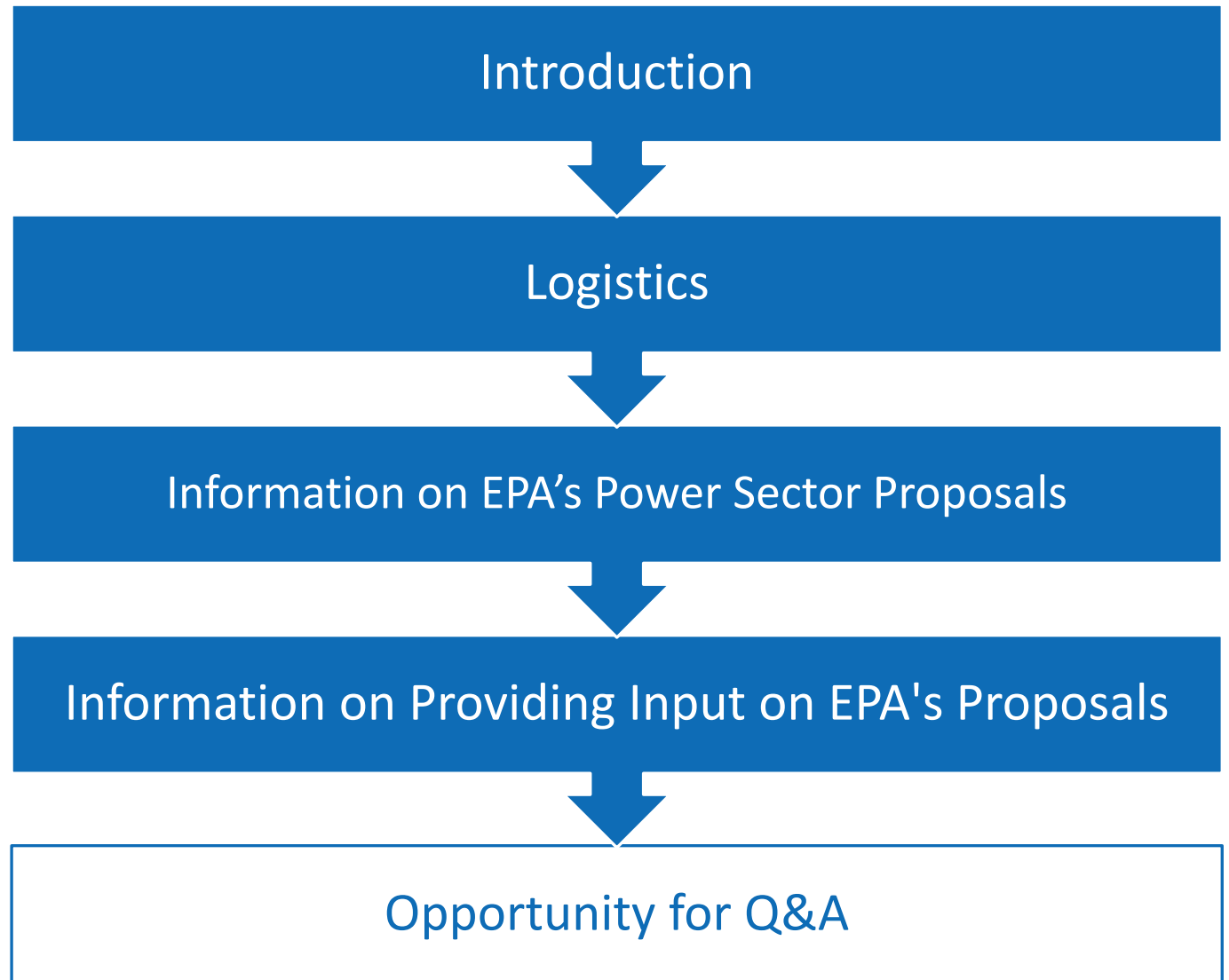


Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants

Webinar for Communities with Environmental Justice Concerns and Members of Tribal Nations

JUNE 2023

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Webinar Instructions and Tips

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 - Raise your hand or type your question in the Q&A
 - EPA staff will call on you when we are at a stopping point, or at the end of the presentation during the Q&A portion of the webinar
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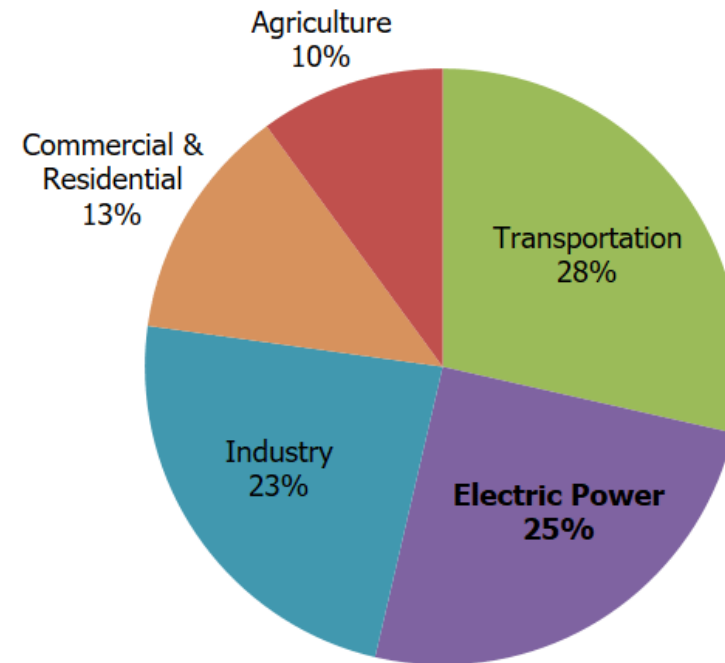
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Overview

On May 11, 2023, EPA issued proposed Clean Air Act emission limits and guidelines for carbon dioxide (CO₂) from **new and existing fossil fuel-fired power plants** based on cost-effective and available control technologies.

In 2021, the power sector was the largest stationary source of greenhouse gases (GHGs), emitting 25 percent of the overall domestic emissions.

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2021



U.S. Environmental Protection Agency (2023). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021

Power Sector Overview

Since the generation of electricity from coal-fired power plants peaked nearly two decades ago, the power sector has changed at a rapid pace

In terms of total share, coal-fired electric generation has **decreased** from ~51% in 2005 to ~20% today

Natural gas-fired electric generation has **increased** its total share by 22% since 2005

- Includes stationary combustion turbines operating as base load electric generating units (EGUs) and as on-demand non-base load EGUs, supporting the grid during peak demand

Electric generation from renewables has **increased its total share by ~11%** since 2005

Electric Power Generation by Fuel Type

Fuel Type	1990	2005	2016	2017	2018	2019	2020
Coal	54.1%	51.1%	31.4%	30.9%	28.4%	24.2%	19.9%
Natural Gas	10.7%	17.5%	32.7%	30.9%	34.0%	37.3%	39.5%
Nuclear	19.9%	20.0%	20.6%	20.8%	20.1%	20.4%	20.5%
Renewables	11.3%	8.3%	14.7%	16.8%	16.8%	17.6%	19.5%
Petroleum	4.1%	3.0%	0.6%	0.5%	0.6%	0.4%	0.4%
Other Gases ^a	+	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
<i>Net Electricity Generation (Billion kWh)^b</i>	2,905	3,902	3,917	3,877	4,017	3,963	3,849

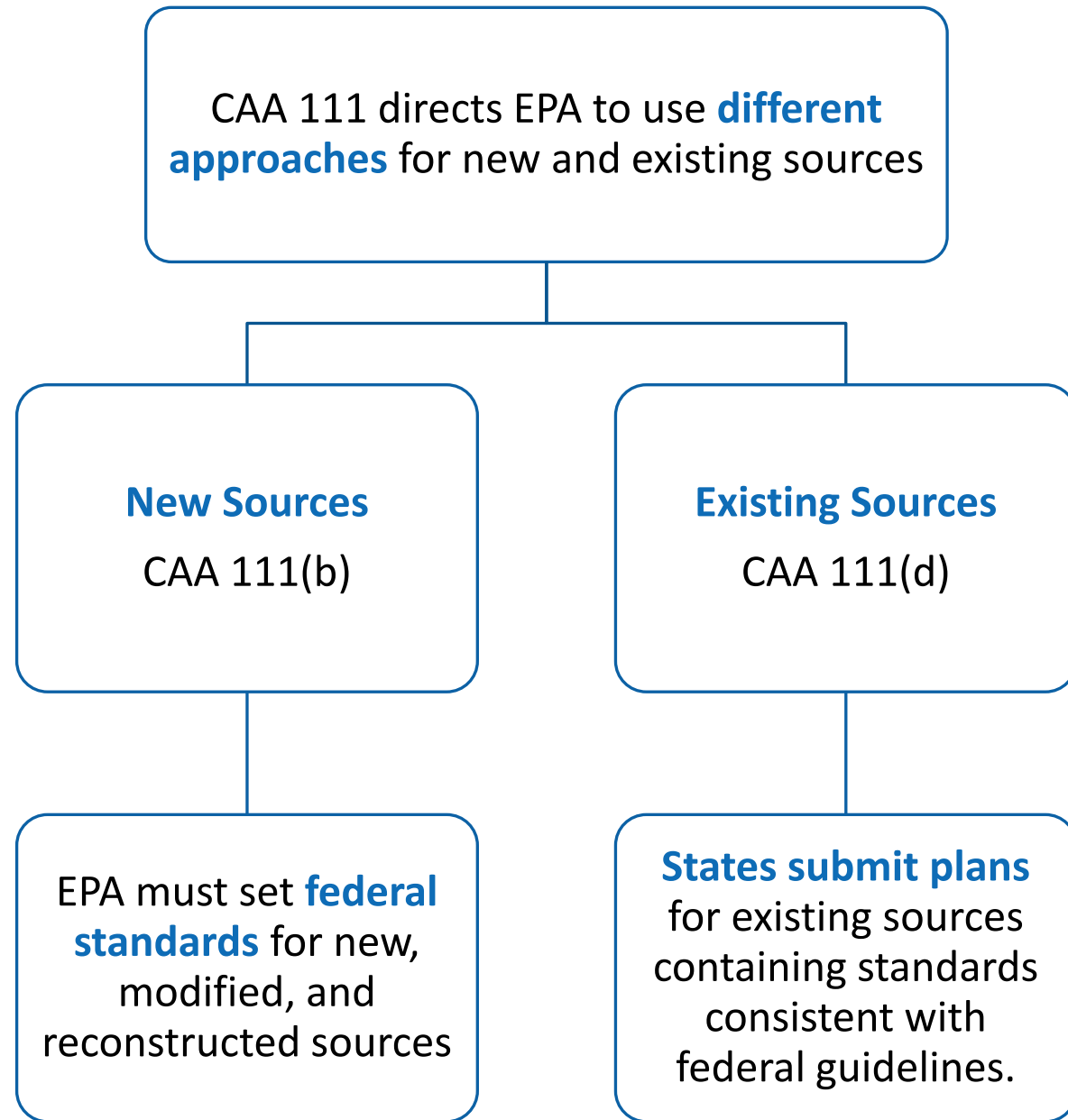
+ Does not exceed 0.05 percent.

(a) Other gases include blast furnace gas, propane, and other manufactured and waste gases derived from fossil fuels.

(b) Represents net electricity generation from the power sector. Excludes commercial and industrial CHP generation.

Clean Air Act Section 111

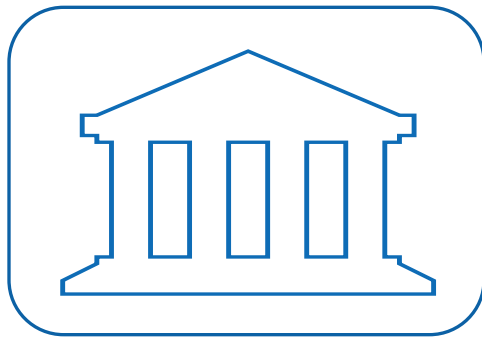
This part of the Clean Air Act (CAA) gives EPA the authority to set GHG pollution standards for the power sector



Reducing Emissions at New, Modified, and Reconstructed Sources

EPA's standards for **new sources** reflect the degree of emission limitation achievable through the application of the **best system of emission reduction**

Standards are **reviewed at least every 8 years** and revised, if appropriate



Congress
Clean Air Act Section
111(b)



EPA
Sets new source
performance
standards



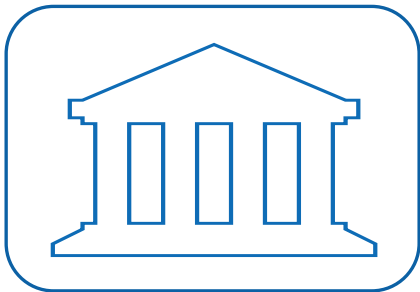
States
Issue state permits
implementing limits



**Emissions
Reductions**

Reducing Emissions at Existing Sources

Congress recognized that **existing sources** do not have as much flexibility as new sources to build emission controls into their design



Congress

Clean Air Act
Section 111(d)



EPA

Issues emission
guidelines, including
identifying the best
system of emission
reduction



States

Develop state plans
detailing how and
when sources
reduce emissions
and submit plans
to EPA



EPA

Reviews and
approves state plans

If a state does not submit an
approvable plan, EPA will issue
a Federal Plan



Emissions Reductions

Overview

Types of fossil fuel-fired power plants covered by this proposal

- New and reconstructed sources – Covered under 111(b)
 - Gas-fired combustion turbines
- Existing sources – Covered under 111(d)
 - Coal-, oil-, and gas-fired steam generating units
 - Large, frequently used gas-fired combustion turbines

Technology-based standards that leverage cost-effective and available technologies

- Proven, cost-effective control technologies that can be applied directly to power plants that use fossil fuels
 - Carbon capture and sequestration/storage (CCS),
 - Low-GHG hydrogen co-firing, and
 - Natural gas co-firing
- Consistent with EPA's traditional approach to establishing pollution standards under Clean Air Act section 111

Reduces climate and other health-harming pollution

- Through 2042, EPA estimates the climate and health net benefits of the standards on new gas and existing coal-fired power plants are **up to \$85 billion**, an annual net benefit of up to roughly \$6 billion
- Proposal for coal and new natural gas is expected to avoid up to 617 million metric tons of carbon dioxide (CO₂) through 2042
- Proposed standard for existing natural gas is expected to avoid up to 407 million metric tons of CO₂

Overview

Builds on decades of technology advancements and momentum from recent changes in the sector driven by the Inflation Reduction Act and the Bipartisan Infrastructure law

- Leverages the clean energy incentives and opportunities provided in the Inflation Reduction Act
- Continues to support a reliable supply of affordable electricity.

Flexible proposal with time and options to plan investments

- Considers how different types of units are used, unit operating horizons and lead times for control technologies
- Existing source standards go into place and CO₂ reductions begin in 2030

Part of a larger, comprehensive suite of regulatory actions for power plants

- The Administrator announced this suite of actions over a year ago to fully address the climate, health, and environmental burdens from power plants, which all too often fall hardest on vulnerable or overburdened communities. Over the last few months, EPA:
 - issued a **final "Good Neighbor Rule"** to reduce smog-forming pollution from power plants and industrial facilities in 23 states;
 - proposed to strengthen **Mercury and Air Toxics Standards (MATS)** for coal-fired power plants;
 - finalized a finding that it is **"appropriate and necessary"** to regulate hazardous air pollutants from power plants under the Clean Air Act, restoring the legal foundation for MATS; and
 - proposed to strengthen **limitations on wastewater discharges** from power plants under the Clean Water Act.

Proposed Standards for New Stationary Combustion Turbines

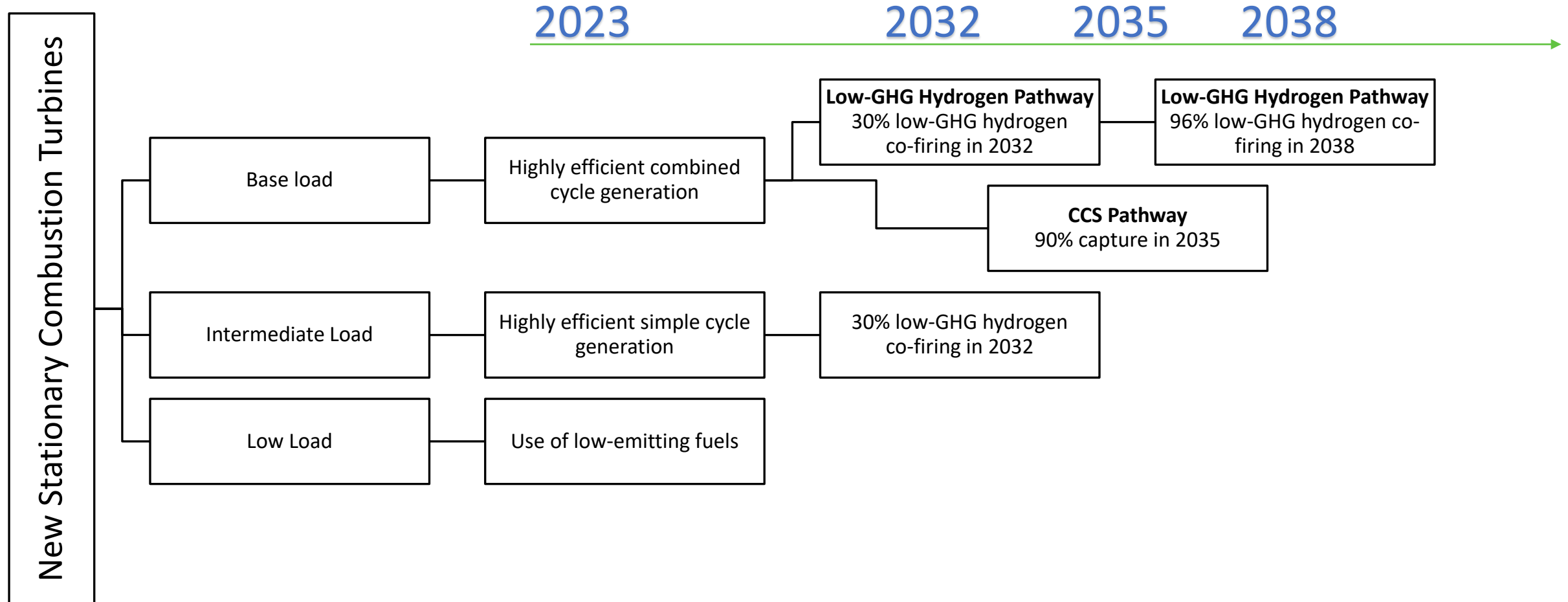
CLEAN AIR ACT SECTION 111(b)

CAA Section 111(b)

- For source categories that **cause or contribute significantly** to air pollution which may reasonably be anticipated to **endanger public health or welfare**, CAA section 111 requires EPA to establish standards of performance for new sources
- Standards must be set based on what is achievable through the application of the **best system of emission reduction (BSER)**
 - Cost (must not be “exorbitant,” “greater than the industry can bear,” or “unreasonable”)
 - Non-air quality health and environmental impacts
 - Energy requirements
 - Control measures that have been adequately demonstrated

Proposal for New Stationary Combustion Turbines

- Standards effective from date of publication (May 23, 2023)
- Three subcategories: base load, intermediate load, low load
- Base load units have two pathways: 90% CCS in 2035 or 96% low-GHG hydrogen in 2038



Proposed Emission Guidelines for Existing Fossil Fuel-Fired Sources

CLEAN AIR ACT SECTION 111(d)

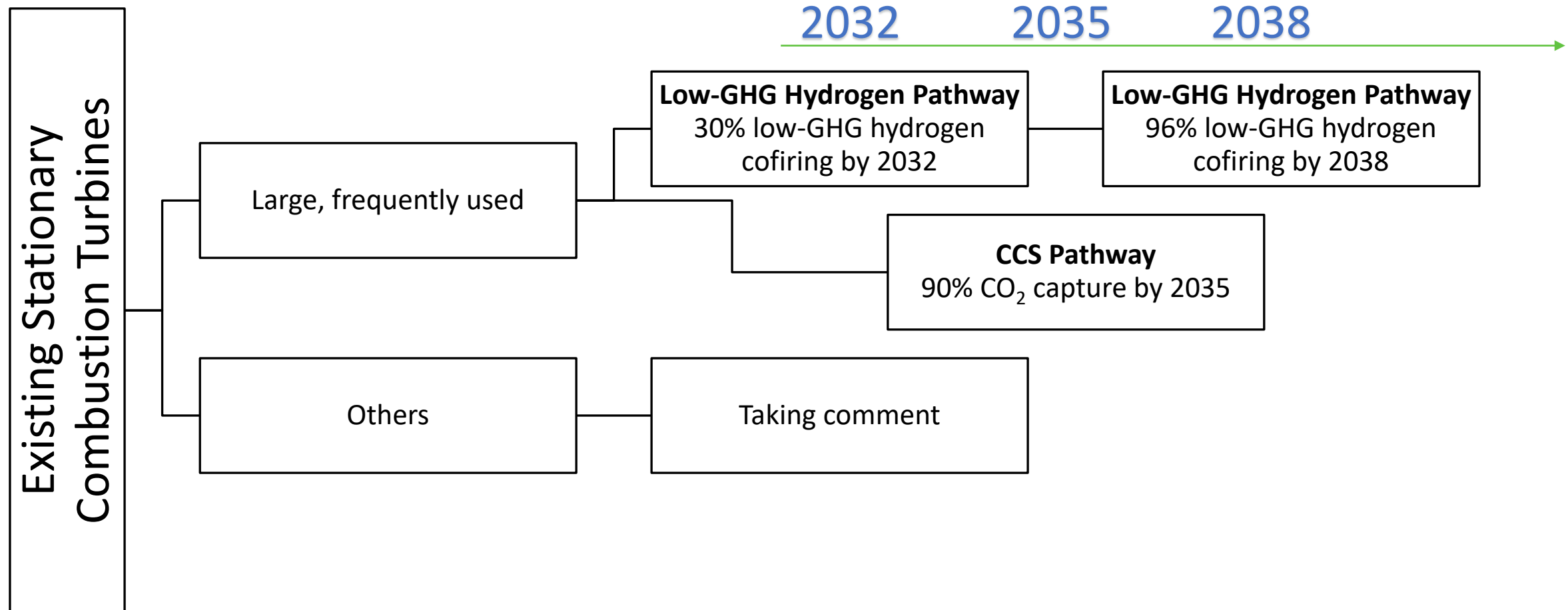
CAA Section 111(d)

Emission Guidelines for States

- Required in certain circumstances once EPA issues New Source Performance Standards for new, modified and reconstructed sources.
- Do not impose requirements directly on sources.
- Inform states as they develop, submit and implement required plans that set standards for existing sources.
- Emission standards must be set based on what is achievable through the application of the **best system of emission reduction (BSER)**

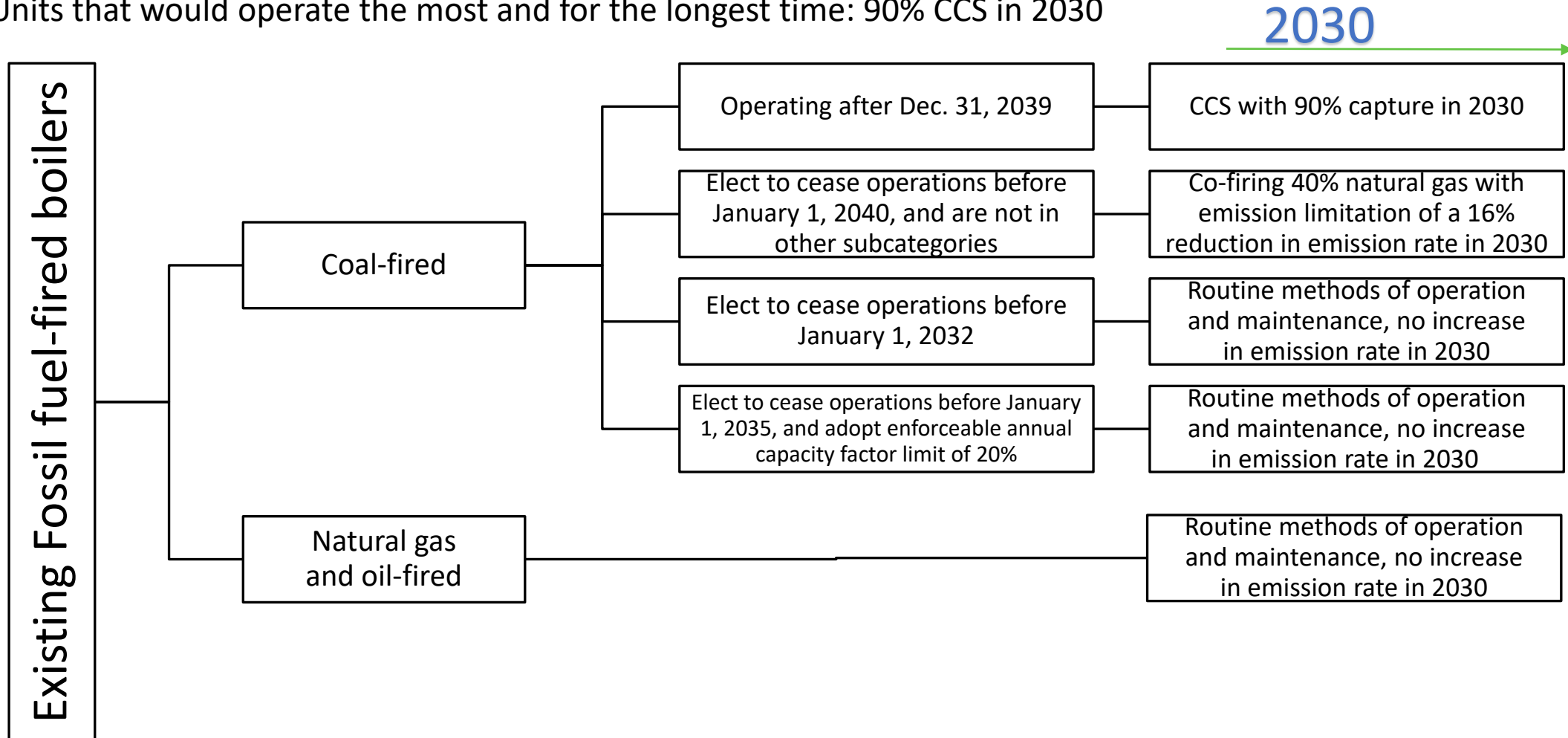
Proposal for Existing Stationary Combustion Turbines

- Proposed emission guidelines for large, frequently used combustion turbines
- Have two pathways: 96% low-GHG hydrogen in 2038 or 90% CCS in 2035
- Taking comment on possibility of covering other stationary combustion turbines



Proposal for Existing Coal-, Gas- and Oil-Fired Boilers

- Proposing four subcategories for coal-fired units, depending on operating horizon
- Limits go into place in 2030
- Units that would operate the most and for the longest time: 90% CCS in 2030



Providing Information on Plans for Existing Sources

State Plans for Proposed Emission Guidelines

Under section 111(d) of the Clean Air Act, states must submit plans to EPA that provide for the establishment, implementation and enforcement of standards of performance for existing sources.

- State plans must generally establish standards of performance that are at least as stringent as EPA's emission guidelines.
- States may take into account remaining useful life and other factors when applying standards of performance to individual existing sources.

General implementing regulations for emission guidelines under CAA section 111

- EPA proposed revisions to the implementation regulations (40 CFR part 60, subpart Ba) in December 2022 that, if finalized, would also apply to these emission guidelines.
- The comment period closed February 27, 2023.
- More information: <https://www.epa.gov/stationary-sources-air-pollution/adoption-and-submittal-state-plans-designated-facilities-40-cfr>

Proposed Standards and Tribes

- EPA is aware of two existing power plants within tribal jurisdictions that are potentially affected by this proposal:
 - Four Corners Steam Electricity Station on the Navajo Indian Reservation
 - Bonanza on the Uintah and Ouray Reservation
- Tribes may seek authority to implement a plan under CAA section 111(d) in a manner similar to a state. Tribes may, but are not required to, develop a Tribal Implementation Plan to implement the emission guidelines.
- EPA is committed to working with eligible tribes to help them seek authorization and develop plans if they choose. Tribes that choose to develop plans will generally have the same flexibilities available to states in this process.
 - If a tribe does not seek and obtain the authority from the EPA to establish a TIP, EPA has the authority to establish a Federal plan for areas of Indian country where designated facilities are located. A Federal plan would apply to all designated facilities located in the areas of Indian country covered by the Federal plan unless and until the EPA approves a TIP applicable to those facilities.

State Plans for Proposed Emission Guidelines

State Plan Submission Deadline

- Proposing submission within 24 months of the effective date of the final emission guidelines

State Plan Components

- Proposing requirements specific to these emission guidelines to ensure transparency, including a website hosted by EGU owners/operators to publish documentation and information related to compliance with the state plan

Compliance Deadlines

- Existing steam generating units: January 1, 2030
- Existing combustion turbine units: January 1, 2032, or January 1, 2035, depending on their subcategory

Meaningful Engagement

- Proposing to require states to undertake meaningful engagement with pertinent stakeholders, including communities that are most affected by and vulnerable to emissions from these EGUs
- Ensures that the priorities, concerns and perspectives of these communities are heard during the planning process.

State Plans for Proposed Emission Guidelines

Establishing Standards of Performance for Affected Existing Steam Generating Units and Combustion Turbines

- Proposing a presumptively approvable methodology (or standard, where applicable) ; states apply EPA's degree of emission limitation to a baseline emission rate for an affected EGU
 - Baseline: lb CO₂/MWh-gross from any continuous 8-quarter period within the 5 years immediately prior to the date the final rule is published in the *Federal Register*
- Proposing increments of progress for certain subcategories, as well as requirements to report milestones related to ceasing operations for units that elect to commit to doing so (medium, near, and imminent-term coal-fired subcategories)

Compliance Flexibilities

- Proposing to allow trading and averaging for state plans under these emission guidelines
 - States would not be required to allow for such compliance mechanisms in their state plans, but could elect to include them
- Taking comment on what limitations or requirements should apply to ensure that trading and averaging mechanisms achieve equivalent stringency to each source individually achieving its standard of performance

Remaining Useful Life and Other Factors (RULOF)

- States would apply EPA's framework for applying less stringent standards based on a particular facility's remaining useful life or other factors. To receive a less stringent standard, a state must demonstrate that a facility cannot reasonably achieve the stringency achievable through application of the BSER.

Emission Changes, Benefits and Costs

- EPA estimated the national emissions changes, benefits and costs in a Regulatory Impact Analysis (RIA). The RIA presents information about the NSPS for new gas turbines and the emission guidelines for existing coal units together.
 - Provides estimates of the emission changes associated with the existing source gas proposal and the third phase of the NSPS for new gas turbines.
- Estimates are presented two ways – as present values (PV) and equivalent annualized values (EAV). The PV is the costs or benefits over the 19-year period of 2024 to 2042. The EAV represents the value for each year of the analysis.

Emission Changes, Benefits and Costs

Emissions Changes

- Aggregate emission cuts from 2028-2042
 - Proposals would cut **617 million metric tons of CO₂** through 2042 along with tens of thousands of tons of PM2.5, SO₂, and NO_x – harmful air pollutants that are known to endanger public health.
 - Estimates do not include the impact of the proposed requirements for existing gas-fired combustion turbines. A separate EPA analysis of these proposed requirements estimates they would reduce between **214 and 407 million metric tons of CO₂** cumulatively between 2028 and 2042.
- Annual emissions changes

For the NSPS for new gas turbines and emission guidelines for existing coal units

 - In 2030, the power sector would emit:
 - 89 million metric tons less CO₂
 - 64,000 tons less annual NO_x
 - 22,000 tons less ozone season NO_x
 - 107,000 tons less SO₂
 - 6,000 tons less direct PM2.5

Emission Changes, Benefits and Costs

Net Benefits

For the NSPS for new gas turbines and emission guidelines for existing coal units

- Present value (2024-2042) – \$64 billion to \$85 billion
- Equivalent annual value (single year) – \$5.4 billion to \$5.9 billion

Health Benefits

For the NSPS for new gas turbines and emission guidelines for existing coal units

- Estimated health benefits in 2030 would be at least \$6.5 billion and could be as much as \$14 billion (2019\$, 3% discount rate).
- In 2030 alone, the health benefits include:
 - Approximately 1,300 avoided premature deaths;
 - More than 800 avoided hospital and emergency room visits;
 - Approximately 2,000 avoided cases of asthma onset and 300,000+ avoided cases of asthma symptoms; and
 - 38,000 avoided school absence days and more than 66,000 lost work days

Environmental Justice Assessment

In conjunction with other policies such as the Inflation Reduction Act, these proposals will play a significant role in reducing GHGs and move us a step closer to avoiding the worst impacts of climate change, which is already having a disproportionate impact on communities with environmental justice concerns.

These proposals include an environmental justice analysis that quantitatively evaluates:

- the proximity of affected facilities to potentially vulnerable and/or overburdened populations for consideration of local pollutants impacted by these proposals and
- the distribution of ozone and PM2.5 concentrations in the baseline and changes due to the proposed rulemakings across different demographic groups on the basis of race, ethnicity, poverty status, employment status, health insurance status, age, sex, educational attainment, and degree of linguistic isolation.

The environmental justice assessment also includes discussions of climate impacts across various demographic groups.

Overall, the environmental justice analysis of ozone and PM2.5 concentration changes due to the proposed rulemakings indicates that the air quality benefits of these proposals in three of the four future years would lead to similar reductions in exposures across all demographic groups.

Meaningful Engagement

- Proposed emission guidelines would require states and/or tribes to undertake meaningful engagement with pertinent stakeholders
 - An affected EGU in a state may be located near tribal boundaries and impact communities in neighboring states or tribal lands. In such cases, it could be reasonable for a state to identify pertinent stakeholders in the neighboring state or tribal land and to work with the relevant air pollution control authority to conduct meaningful engagement that addresses cross-border impacts.
 - EPA is soliciting comments on how meaningful engagement should apply to stakeholders outside a state's borders.
- Deployment of CCS should take place in a manner that is protective of public health, safety, and the environment, and that includes early and meaningful engagement with affected communities and the public.
 - EPA and our fellow federal agencies are committed to responsible and safe deployment of CCS and there is a robust existing regulatory framework to ensure that.

Existing Regulatory Framework Related to Carbon Capture and Sequestration Projects

“The successful widespread deployment of responsible CCUS will require strong and effective permitting, efficient regulatory regimes, meaningful public engagement early in the review and deployment process, and measures to safeguard public health and the environment.”

--Council on Environmental Quality’s (CEQ) February 2022 Carbon Capture, Utilization, and Sequestration Guidance

At the plant

- Proposed Carbon Pollution Standards
 - CO₂ capture
- New Source Review Permitting
 - Range of covered pollutants

In transit

- Pipeline and Hazardous Materials Safety Administration (DOT)

In the ground

- EPA Class VI Underground Injection Program
 - Monitoring and verification
- GHG Reporting Program
 - Suppliers (Subpart PP)
 - Geologic Sequestration (Subpart RR)



Submitting Written Comments

Comment Period

The **comment period** for the proposed rule is from May 23, 2023, through July 24, 2023.

The **preamble** of the proposed rule and the **fact sheets** posted to EPA's website provide specific directions on submitting comments

EPA's preference is to receive comments through the Federal eRulemaking portal at **[regulations.gov](https://www.regulations.gov)**

- We also accept written comments via email, fax, and mail

Submitting Comments to the Public Docket

EPA has opened a **docket** for members of the public to submit input to the Agency in writing

- Visit <https://www.regulations.gov/commenton/EPA-HQ-OAR-2023-0072-0001>
- Search for Docket ID No. EPA-HQ-OAR-2023-0072

For **more information** on submitting information to EPA dockets

- Visit <https://www.epa.gov/dockets/commenting-epa-dockets>



Participating in Public Hearings

What is a Public Hearing?

A public hearing is a **formal meeting** where EPA officials hear the public's view and concerns about an EPA action or proposal

EPA is **required to consider comments**, whether submitted to the docket or provided during a public hearing, when evaluating Agency action

Public hearings **must be held upon request** during the public comment period, but EPA can also choose to hold a public hearing without a request

Tribal Consultation

- In accordance with the EPA Policy on Consultation and Coordination with Indian Tribes, EPA sent letters to all federal recognized tribes inviting them to consult with the Agency prior to issuing the final rule.
- If you would like to initiate government to government consultation with the EPA or would like to request an informal discussion, please contact Amanda Kaufman at 919-541-2388 or Kaufman.Amanda@epa.gov by **July 10, 2023**.

Public Hearing and Comment

- EPA will hold a virtual public hearing for this proposed action on **June 13th**, **June 14th** and **June 15th**.
 - Visit <https://www.epa.gov/stationary-sources-air-pollution/greenhouse-gas-standards-and-guidelines-fossil-fuel-fired-power> for information or to watch a livestream.
- The public comment period closes on **July 24th**. Comments, identified by Docket ID No. EPA-HQ-OAR-2023-0072 may be submitted online.
 - Go to <https://www.regulations.gov/> and follow the online instructions for submitting comments.



Any Questions?

To read the proposed rule and find additional summary resources, visit:

<https://www.epa.gov/stationary-sources-air-pollution/greenhouse-gas-standards-and-guidelines-fossil-fuel-fired-power>



THANK YOU
