

Coal's Accelerated Burn: Drivers for Coal Plant Closures

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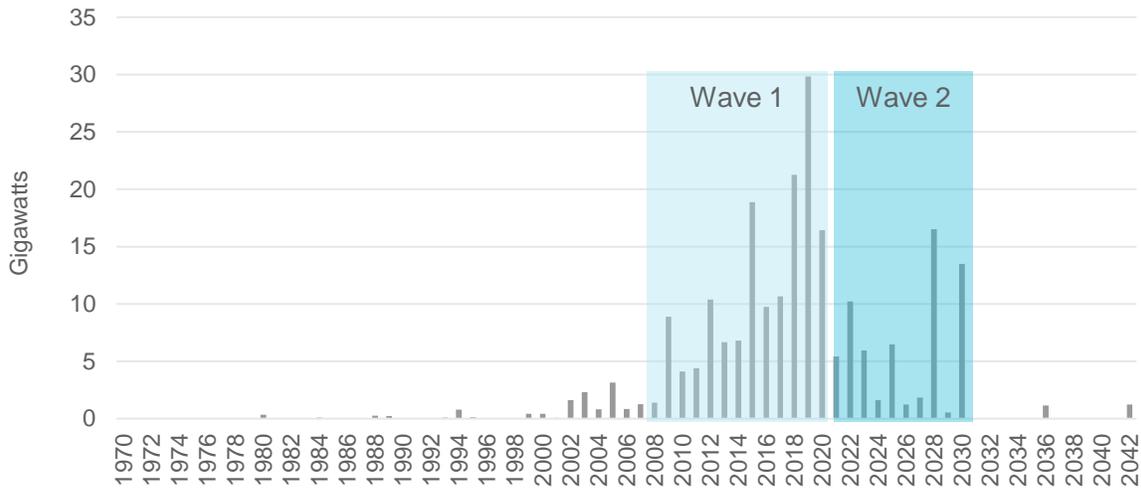
OVERVIEW

A second wave of coal plant closures is projected across the United States in the next five to ten years. The first wave began in the early 2000s and was driven solely by economic considerations. The coming second wave will be driven by similar economic considerations but will be buoyed by socio-political factors. Net-zero, renewable portfolio standards, and other clean energy emission goals and mandates, coupled with a new emphasis on environmental, social, and governance (ESG) initiatives, will accelerate the timing of coal plant retirements. ScottMadden projects the end of coal as an electric generation source in the United States sometime within this century.

Beginning in the early 2000s, one of the most significant trends in U.S. electric generation is the shift away from coal as a primary generation source. Previously, maxims like “coal is king” were unquestioned in generation related decision-making processes, but several factors disrupted the economics of coal generation and drove the closure of coal plants. These included the rise of commercial grade wind and solar renewables, the precipitous drop in natural gas prices brought on by fracking, and the cost of retrofitting existing coal plants to meet more stringent environmental standards. While never an easy decision, closing a coal unit that was losing money, or projected to lose money, was a relatively straightforward strategy to articulate to boards, investors, customers, and other stakeholders.

While economics continue to play a role in today's decisions to retire coal plants, the second wave of coal plant retirements is being ushered in by increasing societal pressure to reduce carbon emissions. This whitepaper explores ScottMadden's view of the six primary drivers of the second wave. Our analysis is based on ScottMadden's experience working with both large and small electric generation companies across North America, as they make strategic decisions about changes to their generation profiles.

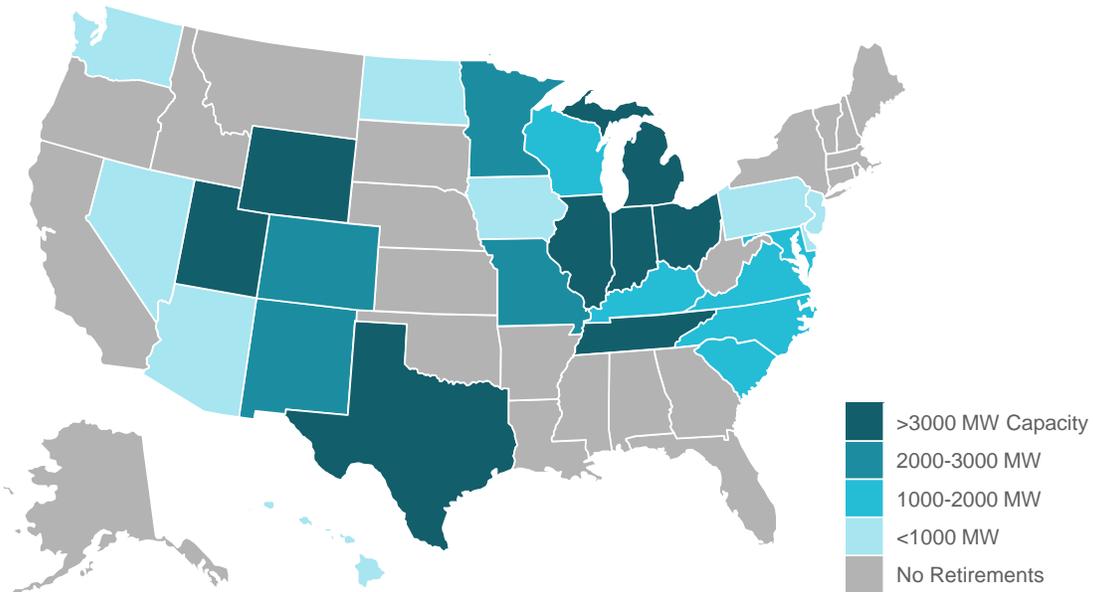
Figure 1: U.S. Coal Plant Retirements, Actual and Projected 1970–2042¹



CURRENT LANDSCAPE OF U.S. COAL GENERATION

The United States has been home to nearly 500 grid-connected coal plants, representing more than 1,200 units. By 2020, however, less than 600 units continued to operate in the United States, representing an approximate capacity of 230 GWs with an average age of 45 years. Today, roughly one-third of that capacity (73 GWs) is set to retire by 2045.²

Figure 2: Planned Coal Generating Plant Retirements by State Between 2022 and 2045³



¹ S&P Global Market Intelligence, ScottMadden analysis

² EIA: Planned U.S. Electric Generating Unit Retirements, https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_6_06

³ EIA: 2020 Form EIA-860 Data - Schedule 3, 'Generator Data' (Proposed Units Only) <https://www.eia.gov/electricity/data/eia860/xls/eia8602020.zip>

While the United States saw a 17% uptick in generation from coal in 2021, the recent surge is attributable to high natural gas prices, as oil and natural gas producers curbed production in response to the ongoing COVID-19 pandemic.⁴ The surge in coal generation is no doubt temporary (see sidebar) as natural gas production returns to pre-pandemic levels, more coal retirements continue to be announced, and renewable generation continues to be built.

Historically, the age of a coal plant has been the best determinant of whether it will continue to operate. Since 2015, however, the emissions rate of a coal plant may have become a better indicator of that plant's remaining life.⁵ Figure 3 provides a comparison of the average unit retired in 2015 versus the average unit retired in 2018.

Figure 3: Comparison of Average U.S. Units Retired in 2015 vs. 2018⁶

	U.S. Units Retired in 2015	U.S. Units Retired in 2018
Average Age (years)	53	46
Average Capacity (MW)	129	350
Average CO ₂ Emissions Rate (million tons/year)	43	83

DRIVERS OF COAL PLANT CLOSURES

There are six primary drivers of this wave of U.S. coal plant closures. The first three relate to economics and financial decisions, while the last three are more socio-political in nature.

- 1. Natural Gas Prices:** The abundant supply of domestic natural gas reserves has reduced the cost of the fuel, making it more attractive for use in electricity generation. By 2050, natural gas-fired generation is projected to remain in favor and comprise approximately 34% of the power generated in the United States, relatively flat from 2021's percent of generation (37%).⁷

...or is it?

Not everyone is abandoning coal quite yet, as natural gas prices have increased, motivating some recent gas-to-coal switching in some markets. While many mining companies were exiting the thermal coal market, some are responding to this recent uptick in demand by maintaining or growing investment in the sector. This is evidenced by Glencore Plc's recent re-commitment to coal, at least through 2050. Glencore has promised to run down its coal assets by then, a plan approved by 94% of its shareholders, rather than divest the coal unit as urged by Bluebell Capital Partners.* This approach helped Glencore post record earnings in 2021, and coal is expected to be an even bigger contributor to Glencore's profitability in 2022.**

This example may suggest that coal will be here longer than many think, driven by near-term investment opportunities and/or near-term energy security. This may be at odds with utilities and jurisdictions that have set net-zero targets.

⁴ Washington Post: U.S. emissions surged in 2021, putting the nation further off track from its climate targets, <https://www.washingtonpost.com/climate-environment/2022/01/10/us-emissions-surged-2021-putting-nation-further-off-track-its-climate-targets/>

⁵ Scientific America: And Now the Really Big Coal Plants Begin to Close, <https://www.scientificamerican.com/article/and-now-the-really-big-coal-plants-begin-to-close/>

⁶ EIA: More U.S. coal-fired power plants are decommissioning as retirements continue, <https://www.eia.gov/todayinenergy/detail.php?id=40212>

* Financial Times: Glencore defends coal rundown strategy as right for the world, <https://www.ft.com/content/81696e63-38c5-4454-8a03-8a92fdc4ca5a>

** Nagle stands behind Glencore coal strategy with fuel set to drive EBITDA in 2022, <https://www.miningmx.com/news/markets/48759-nagle-stands-behind-glencore-coal-strategy-as-fuel-set-to-drive-ebitda-in-2022/>

⁷ EIA: Annual Energy Outlook 2022 with projections to 2050, <http://www.eia.gov/forecasts/aeo/>

2. **Cost Competitiveness of Renewables:** Renewable energy is rapidly becoming a more cost-competitive source of generation, benefiting from technological advances, state renewable portfolio standards and related policies, and (in the case of wind and solar) favorable tax treatment.
3. **Ageing Units:** The majority of U.S. coal capacity was built between 1970 and 1990. The average age of all operating coal units is currently 46 years, and 81% are more than 25 years old.⁸ While they might still carry debt, these units are fully depreciated, facilitating the retirement decision.
4. **Public Perception of Coal:** The public perception of coal-fired generation has become increasingly negative over time. The process of burning coal to generate electricity is targeted by a wide range of groups that argue the practice is one of the primary causes of climate change and other public health problems, particularly respiratory ailments like asthma. The rise of ESG concerns has brought a spotlight to the energy industry, and utilities with coal-generating assets have increasingly been identified as targets of activism.
5. **Renewable Portfolio Standards (RPS):** The term RPS is often used interchangeably with renewable energy/electricity standards (RES). Both describe policies meant to require or encourage suppliers to provide customers a minimum share of electricity from renewable resources. While there is no federal RPS policy, 31 states and DC have enacted their own policies with wide ranging renewable energy targets and timelines, from 8.5–100% and 2021–2050, respectively. No two states have the same requirements, and states frequently make significant revisions to RPS policies. In 2019 alone, eight states created new or raised existing RPS targets. As of early 2021, RPS policies applied to 58% of total U.S. retail electricity sales, but this number is higher today as states continue to update their standards. With more states adopting or increasing RPS targets every year, that influence is expected to grow in the coming years.⁹
6. **Foreign and Domestic Focus on Climate Change:** The recent release of the United Nations Intergovernmental Panel on Climate Change (IPCC) Report, which has been described as a “code red for humanity,” reinforces the international belief that a global shift away from fossil fuels is an urgent imperative.¹⁰

On day one of his presidency, Joe Biden rejoined the Paris Agreement, and since taking office in January 2021, the Biden Administration has made addressing climate change a central element of both foreign and domestic policy. Biden has created two new positions in the Office of the President with John Kerry serving as Special Presidential Envoy for Climate and Gina McCarthy heading the White House Office of Domestic Climate Policy. Kerry is the first-ever principal to sit on the National Security Council entirely dedicated to climate change, and McCarthy, frequently described as the “Climate Czar,” coordinates domestic climate policy across agencies and departments.

⁸ EIA: Detailed generator-specific information about existing and planned generators, <https://www.eia.gov/electricity/data/eia860/>

⁹ Lawrence Berkeley National Laboratory: U.S. Renewables Portfolio Standards 2021 Status Update: Early Release, https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf

¹⁰ Reuters: U.N. Climate Change Report Sounds ‘Code Red for Humanity,’ <https://www.reuters.com/business/environment/un-sounds-clarion-call-over-irreversible-climate-impacts-by-humans-2021-08-09/>

IN CLOSING

The strategic process to build, operate, and retire generation units is complex. These are big decisions that require input and analysis from many stakeholders. To date, the decision to close coal units in the near-term has been driven primarily by economics. While never an easy decision, the process is straightforward for any executive when analyzing an asset that is costing more to operate than it earns.

Going forward, ScottMadden predicts that while closures will continue to include economic drivers, public perception, RPS requirements, and an international focus on climate change will increasingly drive decision making and cause a second wave of coal unit closures, dramatically shifting generation away from coal to natural gas and renewables.

RELATED ARTICLES

This article is part of a series titled [Coal's Accelerated Burn](#) covering coal unit closures.

1. Drivers for Coal Unit Closures
2. [Management Guide to Coal Unit Closures](#)
3. [Stakeholder Analysis: A Case Study](#)
4. After the Closure: What's Next for a Decommissioned Coal Plant?

Additionally, we suggest the following article written by Dorsey & Whitney's Development and Infrastructure Industry Group:

5. [Power Plants Retired as "Uneconomic" May Still Hold Significant Value](#)

HOW SCOTTMADDEN CAN HELP

ScottMadden has assisted many generation companies to effectively analyze, plan, and execute plant decommissioning projects. We approach decommissioning work with a deep respect for the stakeholders and leverage our significant experience to support your initiatives. Our experience includes:

- Decommissioning analysis and strategy
- Decommissioning planning
- Stakeholder communications and employee notifications
- Project management
- Organizational redesign
- Reduction in force analysis and implementation
- Vendor selection for demolition/deconstruction
- Development of coal ash disposal strategy
- Decommissioned plant strategic repurposing analysis

For more information on how ScottMadden can assist you with plant decommissioning and other fossil generation initiatives, please [contact us](#).

ABOUT SCOTTMADDEN, INC.

ScottMadden is the management consulting firm that does what it takes to get it done right. We consult in two main areas—Energy and Corporate & Shared Services. We deliver a broad array of consulting services ranging from strategic planning through implementation across many industries, business units, and functions. To learn more, visit www.scottmadden.com | [Twitter](#) | [Facebook](#) | [LinkedIn](#).

ABOUT SCOTTMADDEN'S ENERGY PRACTICE

We know energy from the ground up. Since 1983, we have served as energy consultants for hundreds of utilities, large and small, including all of the top 20. We focus on Transmission & Distribution, the Grid Edge, Generation, Energy Markets, Rates & Regulation, and Corporate Services. Our broad, deep utility expertise is not theoretical—it is experience based. We have helped our clients develop and implement strategies, improve critical operations, reorganize departments and entire companies, and implement myriad initiatives.

ABOUT THE AUTHORS

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