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Reopening Closed Coal Plants Makes No Economic Sense

- *A plan to restart retired coal-fired power plants ignores serious economic and operational issues.*
- *102 coal-fired units have closed in the last four years; two dozen have already been demolished.*
- *Intact units require large amounts of capital improvements before returning to commercial operation.*
- *Utilities have already turned to cheaper and more efficient forms of electricity generation, such as solar, wind, and battery power.*

Current Coal Facilities Can Barely Compete With Renewables, Battery Storage

Using the justification of its January "energy emergency" declaration the administration released a series of executive orders this week designed to stave off the closure of coal-fired power plants and encourage the restart of recently closed units to help meet projected electricity demand growth. IEEFA research shows that few, if any, of the 102 coal-fired units closed in the past four years are reliable candidates for a restart. Further, the plan to restart coal plants ignores the fact that most of the still-operating facilities are running far below their capacity. Put simply, restarting coal plants makes no economic sense.

IEEFA's analysis of the 102 recently closed/converted units, which have a total generating capacity of 36,566 megawatts (MW) and have not operated since the beginning of 2021, found that few are legitimate candidates to be brought back online. IEEFA narrowed its focus to these recently closed units, which were either retired, converted to run on gas or, in one case, fuel oil, because plants closed more than four years ago would almost certainly have even more maintenance requirements and be even more expensive to restart.

IEEFA's analysis of the 102 units found:

- 24 units have been demolished
- 13 units have been converted to gas
- One unit has been converted to oil
- The units have a median age of 56 years.

To start with, most of the closed plants were old. As coal plants age, maintenance costs rise, pushing up their generation costs. Low generation cost is a key driving factor in the economic competitiveness of coal-fired power plants. Overall, the median age of the 102 closed/converted units as of 2025 is 56 years. U.S. Energy Information Administration (EIA) data shows that the average age of retired coal plants since 2000 has been about 50 years.

At least two dozen units, with 9,230 MW of capacity—more than 25% of the total number of megawatts—have already been completely or partly demolished. As the photos below of the smokestack implosion at the former San Juan coal plant in New Mexico clearly show, restarting this plant, or any other demolished facility, would be impossible. Planning for demolition work at additional units is also already underway.

Figures 1–3: Demolition of the Smokestacks at the San Juan Coal Plant in New Mexico, Aug. 24, 2024

Photo Credits: Ecoflight

One recent example of this disappearing capacity is last month's implosion of the three-unit, 1,895MW Homer City plant. Located east of Pittsburgh in the PJM market, Homer City is an excellent illustration of the economic issues that have prompted the closure of most coal-fired capacity in the past 10 years. The plant went through two bankruptcies in the 2010s, indicating the financial strain already facing the plant. After the second bankruptcy in 2017, the new owners, led by the private equity firm Knighthead Capital Management, predicted that they would be able to operate the plant essentially around the clock in the competitive PJM market. That turned out to be wishful thinking.

Capacity factor is the ratio of how much electricity a plant produces compared to what it could produce if it operated 100 percent of the time. The more competitive a plant is and the more it operates, the higher the capacity factor. The average capacity factor of the coal-fired generation in the U.S. has declined steadily in the past decade, dropping from 61% in 2014 to 42.6% in 2024. This has happened even as the amount of operating capacity also has fallen sharply because of the buildout of cheaper renewable and gas generation.

The Homer City plant owners expected to operate with a capacity factor of 80% even though this key measure of economic competitiveness was only 56.9% in the six years leading up to the 2017 bankruptcy. The Homer City facility performed even worse following the 2017 restructuring, averaging a 17.5% capacity factor in the four years leading up to its 2023 closure.

Ironically, the final straw for the plant was the need for new generation to supply projected artificial intelligence (AI) and data center-driven growth. Knighthead Capital is now planning to build a large new gas-fired power plant at the Homer City site.

Beyond the plants that have been razed, another 14 units, with 5,149 MW of capacity, have been converted to run only on gas, or in one case, fuel oil. The owners of these converted plants have already done the math and found that coal is not economically viable; they are highly unlikely to spend even more money to reverse their decision.

Together, the demolished and converted units represent almost 40% of the total generating capacity at the facilities examined by IEEFA.

At the other closed units, spending on maintenance was likely cut to a minimum, since utilities and independent power producers try to defer plant investments and maintenance expenditures once they have set facility retirement dates. So, there would almost certainly be a sizable, and expensive, backlog of required maintenance that would have to be completed on any unit looking to restart, on top of the normal rise in costs due to aging.

Finally, there will be a set of unknowable but real costs required to ensure that the boilers, turbines, piping, and pollution control equipment at each unit can return to commercial operation after having sat unused for one to four years. It is unlikely that the owners have maintained the units thinking they might be restarted—they were, after all, retired. Given all this, the costs associated with these catch-up maintenance and safety checks likely would be significant. They also would be potentially time-consuming, another strike against restarting.

Another grouping of now-closed units belongs to utilities that have committed to phasing out their use of coal, either as a corporate goal or in response to state directives. Within this category, Xcel Energy is a prominent example. Xcel is a large utility holding company whose subsidiaries provide electricity to 3.7 million customers in eight states. Its largest units are Public Service of Colorado and Northern States Power (which primarily serves Minnesota). Xcel has committed to being coal-free throughout its service territories by 2030 and has a long-standing strategy to accomplish that goal, while still providing reliable and economic service to its customer base while meeting rising electricity demand.

Robert Frenzel, the company's president and CEO explained it this way during Xcel's latest quarterly earnings call in February: "Over the next decade, we expect to invest significantly in our infrastructure to deliver reliable, resilient and cleaner energy for our customers as well as serve significant forecasted customer growth."

Restarting units it has closed since 2021, including one at the large Sherburne County coal plant in Minnesota and one at the Comanche plant in Colorado, as well as converting the three-unit Harrington plant in Texas from coal to gas, is not part of the company's strategy. As Frenzel noted, "Customers don't have to sacrifice cost or reliability to achieve sustainability."

Similar coal-free plans are being followed by DTE and Consumers Energy in Michigan, and AES throughout its U.S. utilities. Each has planned carefully for the transition to ensure that the coal units can be taken offline while still meeting current and future power demand. Restarting one of their retired units is not going to be a top-tier item in future corporate strategy meetings.

The declining economic competitiveness of coal, which cannot be changed via executive order, runs through all these decisions. Utility-scale wind and solar, now increasingly coupled with dispatchable battery storage, and gas are already cheaper than coal, making any decision to restart any coal plant extremely risky. This is particularly true for independent power producers and other non-regulated plant owners that do not have the backstop of captive ratepayers to absorb some of the cost and risk.

Another indication of coal's economic woes is on display at Southern Company's Georgia Power subsidiary. Southern has talked consistently for the past 18 months about the need for new generation resources to meet an expected surge in electricity demand driven largely by new data center and AI infrastructure in its service territory. In Southern's latest quarterly earnings call in February, the company said it has commitments for more than 10,000 MW of new demand in its three-state service territory, with the bulk of that new demand being data center-driven and slated to be located in Georgia.

To meet that expected demand, the utility is planning to add gas-fired generation facilities, as well as significant amounts of solar and battery storage capacity. But there has been no mention of any plan to restart Plant Wansley, a two-unit, 1,744 MW coal-fired facility that the utility retired in 2022.

But the most damning argument against any plan to restart already retired facilities is the low usage rates at the coal-fired plants still operating in the U.S. In 2024, more than 71% of the operating coal-fired capacity ran at less than half of its potential - unmistakable evidence of

coal's economic problems.

EIA data shows that there were 173,905.5 MW of operating coal-fired capacity in the U.S. at the end of 2024. During the year, 176 U.S. coal plants (many of which have more than one coal-fired unit) generated 652,760,000 megawatt-hours (MWh) of electricity, or 15.2% of total U.S. generation. But this output was far from evenly distributed.

Almost one-quarter of the installed coal-fired capacity (51 plants with a capacity of 42,370 MW) produced only 11.4% of the total coal generation. None posted a capacity factor for the year of more than 30%, and 28 had a capacity factor of less than 20%. These numbers show that coal is not economically competitive on a daily basis, but rather is being used seasonally, peaking in the summer and winter when demand is highest and mostly idled in the spring and fall when demand is lower and lower-cost renewables and gas provide most of the power supply.

Another tranche of 36 plants, with a total generating capacity of 39,677 MW, posted capacity factors of between 30%-40% for the year. This group includes six of the largest operating coal plants in the country: Bowen (3,200MW); Gibson (3,132MW); Amos (2,900MW); Scherer (2,580MW); Roxboro (2,439MW); and Jeffrey (2,011.5MW). Just increasing the annual capacity factor of these units by 10% each would produce approximately 12 million MWh more per year—the same as building four brand new 600MW coal-fired power plants operating at a 60% capacity factor.

In other words, spending taxpayer and/or ratepayer dollars to reopen closed coal plants with uncertain maintenance needs and unpredictable future performance makes no sense, economic or otherwise. There is plenty of "extra" generation capacity in the current operating fleet. The problem is, that capacity is not economic.

The only option that makes economic sense and that can bring significant quantities of new generation capacity online quickly is to continue the current buildout of wind, solar and dispatchable battery storage.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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