POWERLINE NEWS

Coal Plant Retirements Delayed Amid Grid Reliability Concerns

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Coal Retirements and Capacity Loss

In 2024, 23 coal-fired units were permanently retired, representing roughly 3-4 gigawatts (GW) of generation capacity. At the start of the year, coal power provided 80.7 GW of electricity nationwide. At that time, 49 GW of coal-fired power was slated for retirement by 2029.

New Power Additions in 2024

During 2024, FERC confirmed 37.7 GW of additional nameplate power inventory was brought online including:

- Solar: 30.8 GW
- Wind: 3.1 GW
- Nuclear: 1.1 GW
- Natural gas: 2.4 GW
- Other (biomass, hydro, geothermal: 0.3 GW

Why Capacity Factors Matter

Solar and wind cannot produce power continuously. Nameplate power assumes 24 hours of sunshine and windy days every day. Capacity factors are used to determine that actual power that can be expected.

- Solar: Capacity factor 20–25% → 30.8 GW ≈ 6.2–7.7 GW actual
- Wind: Capacity factor ~40% → 3.1 GW ≈ 1.2 GW actual

Adding nuclear, natural gas, and other sources, the actual new power added was about 12 GW, barely covering the 9.7 GW increase in U.S. electricity demand during 2024 (85 billion kWh) after removing 3-4 GW of coal fired power.

Energy Security Concerns

The concern is that the national grid has dangerously low spare capacity in some areas. Also, the expansion of data centers is expected to exponentially increase power demand in coming years. For this reason, the retirement of many coal-fired power plants is being delayed. The planned retirement of 49 GW of coal power by 2029 could lead to power shortages if alternative power is not brought online to replace it.

Dispatchable Power vs. Renewables

Wind and solar cannot produce more power on demand during spikes in electricity consumption. What is known as dispatchable power is power that can be increased on demand when needed. Coal and natural gas power plants are able to do this and can ramp up when there are times of high electricity demand.

Grid Reliability and DOE Emergency Orders

Because of the concern about capacity, starting in May last year, the DOE issued emergency orders to delay retirements at seven coal power plants:

- J.H. Campbell Generating Plant (Michigan)
- Eddystone Generating Station (Pennsylvania)
- Wagner Station (PJM Region)
- F.B. Culley Generating Station (Indiana)
- R.M. Schahfer Generating Station (Indiana)
- Centralia Generating Station Unit 2 (Washington)
- Craig Station Unit 1 (Colorado)

In total, 9 coal-fired units in these seven plants will continue to operate providing 4.5 GW of capacity. This is only 4.5 GW of the planned 49 GW of retirement by 2029.

Environmental Concerns and Solutions

Coal is an abundant and inexpensive fuel source. The reason many are against coal fired power plants is because, unlike other fuel sources, combustion gases from coal require scrubbing to remove sulfur. This generates a wastewater that if not treated properly can pose a danger to the environment. However, this fear is unwarranted. Advancements in wastewater treatment allow for treated water that is ultrapure and can even meet drinking water standards. Advanced RO membrane filtration such as the VSEP vibratory scrubber water treatment system has been used for more than a decade at full-scale in power plants and can remove mercury, arsenic, sulfur, selenium and all of the potential pollutants providing clean water that can be reused or safely discharged.

The VSEP® system, manufactured by New Logic Research in Minden Nevada has been installed at and proposed for dozens of coal-fired power plants in the country. With deployment of these systems, coal could continue to be used safely, cleanly, and inexpensively to supply power to an electricity hungry country.

About New Logic Research

New Logic Research has been a trusted provider of water treatment solutions for the power industry since 1987. To explore how the VSEP RO technology can enhance flue gas desulfurization wastewater treatment operations by recycling water: https://www.vsep.com/industries/power-gen/. To speak directly with an experienced VSEP engineer: info@vsep.com