Fresh Start — Nuclear Power Poised for Growing Potential

Eyes Turn to Nuclear as Demand for Uninterruptible, Carbon-Free Power Grows

- **Expected surge in power demand has sparked interest in smaller reactors that could be built quicker, cheaper**
- **Nuclear power plants that were shut for economic reasons are being restarted for the first time**
- **The hard lessons learned at Vogtle have provided a better roadmap for how to build a new reactor**
- **As data centers quickly expand electricity demand, nuclear power increasingly seen as critical source**

1. Introduction

There's been no shortage of debate and discussion over the past couple of years about the best way to meet the expected increases in U.S. power demand, driven in part by manufacturing growth, the rapid development of large-scale data centers and the emergence of artificial intelligence (AI) applications. That has spurred a renewed interest among regulators, industry leaders and the general public in nuclear power.

For 70-plus years, the U.S. has had an ever-shifting love/hate relationship with nuclear power. Way back in 1954, Lewis Strauss, chairman of the Atomic Energy Commission, predicted that nuclear power would prove to be "too cheap to meter." From then to the 1980s, there was a nuclear construction spree — by 1990, nuclear reactors supplied nearly one-fifth of the demand for electricity in the U.S. However, the partial meltdown at Three Mile Island Unit 2 in 1979 (followed by the Chernobyl disaster in Ukraine in 1986) deflated public support for nuclear power, and the pace of development in the U.S. slowed to a crawl (see Figure 1 on the following page).

As noted in **Section 2** of this report, the rising cost of nuclear projects didn't help: The most recent U.S. nuclear additions — two new, 1,215-megawatt (MW) units at Plant Vogtle in Georgia — cost nearly $37 billion, or 2.6X their initial $14 billion estimate, and were completed years behind schedule. (**Section 4** focuses on the lessons to be learned from Vogtle.)

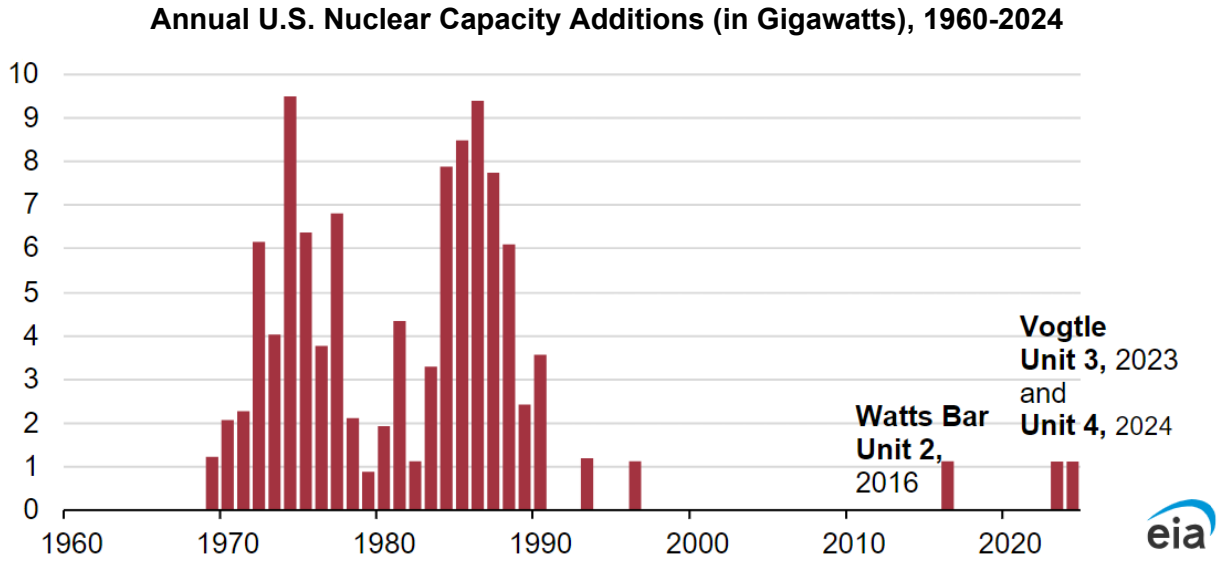

Figure 1. Annual U.S. Nuclear Capacity Additions (in Gigawatts), 1960-2024. Source: EIA

There are at least a few primary drivers behind this new interest in nukes. One is the push to develop low- or no-carbon sources of electricity, particularly those that (unlike wind and solar) can be counted on 24/7. That has led to efforts to bring shuttered reactors back to life, including the 800-MW Palisades nuclear plant in Michigan, which we detail in **Section 3**.

Another driver, detailed in **Section 5**, is the predicted ramp-up in power demand from the large-scale data centers planned to support AI. Estimates suggest an additional 10 billion Bcf/d of natural gas will be needed for power generation by 2030, driven primarily by data center growth and coal plant retirements, potentially reaching 18 Bcf/d if data center construction accelerates rapidly.

There's been much discussion lately about the best way to meet those expected increases in U.S. power demand. But while traditional reactors are known for their cost overruns and construction delays as much as the massive amounts of carbon-free power they produce, some see a better way forward. That has led some to consider adding SMRs to old coal plant sites, the focus of **Section 6**. This would allow companies to reuse existing infrastructure, such as buildings, roads and connections to the grid, potentially reducing construction costs.

The challenge of meeting power demand from data centers is leaving companies and utilities with a limited number of reliable options, which means existing nuclear reactors and new generation are increasingly seen as a viable choice that many companies will likely consider, even though getting a new or refurbished nuclear plant up and running is very much a long-term process.

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