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Nuclear Power – 2026 Outlook

AI, Energy Security, and the Return of Nuclear Power

The global energy landscape is experiencing its most significant transformation in decades. A powerful convergence of megatrends – the rapid expansion of artificial intelligence, accelerating electrification, energy-security priorities, supply-chain geopolitics, and climate commitments – is reshaping how countries and industries define reliable baseload power. Nuclear energy, once viewed as stagnant or even in decline in some regions, is now reemerging as a strategic, long-term, and indispensable pillar of future electricity systems.

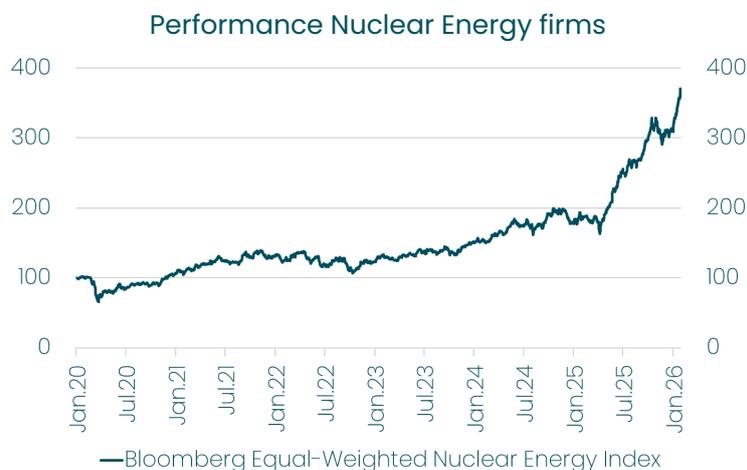
Artificial intelligence is the single most important catalyst behind this resurgence. Large language models, high-intensity inference workloads, and GPU-driven cloud infrastructure are dramatically raising baseline global electricity demand. This shift is not temporary; it reflects a structural realignment of the economy toward continuous, high-density, and high-availability energy consumption –

conditions for which nuclear power is exceptionally well suited.

Generative-AI queries can require up to ten times more energy than traditional computing, and hyperscale data centers increasingly regard 24/7 carbon-free baseload power as a strategic asset rather than a discretionary input.

Against this backdrop, Bloomberg Intelligence forecasts a renewed wave of nuclear construction and investment, with the United States alone expected to require more than \$350 billion in new reactor builds by 2050 under its base-case scenario. Major technology companies – Amazon, Google, Meta, Microsoft, and OpenAI – are shifting from energy purchasers to energy co-developers, marking a fundamental reconfiguration of the relationship between the tech sector and the power sector.

The result is a genuine nuclear renaissance, supported by policy and capital. This momentum was clearly reflected in last year's strong market performance: the Bloomberg Equal-Weighted Nuclear Energy Index delivered impressive returns, rising by +73.86% in 2025.



Source: Bloomberg as of January 2026

AI as the Dominant Driver of New Nuclear Demand

AI is not simply increasing electricity consumption; it is reshaping demand curves altogether. The GPUs that power AI workloads consume orders of magnitude more electricity than traditional CPUs, and data-center operators are rapidly expanding their server footprints. Bloomberg Intelligence estimates that meeting U.S. AI-driven computing needs by 2030 could require an additional 345–815 TWh of electricity — an 11–26% increase compared with 2023 U.S. consumption, depending on model-growth trajectories.

Because renewable generation is intermittent and natural-gas power comes with emissions profiles that conflict with the ESG standards of major technology companies, hyperscalers are increasingly turning to nuclear energy to secure long-term, carbon-free, and highly reliable power. Their willingness to pay substantial price premiums underscores the shift in perception: nuclear is moving from being economically marginal to strategically indispensable.

Data-center operators are now signing long-term power-purchase agreements (PPAs) at premiums of \$15–\$25/MWh above market rates — a remarkable new revenue opportunity for nuclear generators. For example, Constellation’s government-backed Virtual Power Purchase Agreement (VPPA), priced in the mid-\$80/MWh range, implies a premium of roughly \$15–\$25/MWh. If Constellation were to contract half of its nuclear fleet at a \$20/MWh premium, it could add approximately \$1.8 billion to its annual EBITDA. This trend — premium, long-dated

PPAs in a sector with virtually no new supply transform the investment outlook for nuclear operators.

Moreover, interest is growing in behind-the-meter nuclear solutions, where reactors are colocated directly with data centers to bypass interconnection delays and transmission congestion. However, such behind-the-meter configurations require FERC approval, making front-of-the-meter VPPAs the predominant near-term structure due to their more streamlined regulatory pathway. As AI demand curves steepen, colocated nuclear facilities — particularly modular or micro-reactors — may evolve into a mainstream model for next-generation data-center campuses.

U.S. Nuclear Outlook: Policy Support Meets Industrial Bottlenecks

U.S. nuclear capacity is expected to increase from 98 GW in 2024 to 159 GW by 2050 according to Bloomberg Intelligence — a 60% expansion requiring 63 GW of new capacity. This represents a moderate growth trajectory, equivalent to a compound annual growth rate of roughly 1.9% and stands in sharp contrast to President Donald Trump’s aspirational goal of reaching 400 GW by 2050, which would require more than \$3 trillion in investment.

Adding 61 GW of net new capacity would raise nuclear power’s share of U.S. electricity generation to 20%, up from 18% today. Despite improving policy support, the U.S. has yet to advance any of its more than 20 proposed projects to formal planning stages. In the near term, most growth will come from upgrading existing reactors and restarting previously retired plants. Three units — Palisades, Three Mile

Island Unit 1, and Duane Arnold – are currently being brought back online, restoring approximately 2.3 GW of capacity. Other opportunities, such as V.C. Summer, remain uncertain but could provide meaningful supply later in the 2030s.

The bulk of new capacity additions is expected only after 2035, driven largely by progress in small modular reactors (SMRs). However, SMR deployment faces several headwinds, including lengthy permitting processes, first-of-a-kind construction risks, financing challenges, and immature supply chains.

The cost challenge

The nuclear renaissance, however, faces significant constraints: depleted supply chains, a shortage of specialized engineering talent, regulatory bottlenecks, gaps in uranium-enrichment capacity, long development timelines, and emerging technologies – such as small modular reactors (SMRs) – that remain unproven at scale.

Cost predictability continues to be a major challenge for the industry. The Vogtle plant in Waynesboro, Georgia, illustrates the difficulties associated with new nuclear construction. Vogtle Units 3 and 4 were the only new reactors to enter commercial operation in the United States in the past three decades. Their final cost reached \$31 billion – more than double the original estimate – and the construction timeline nearly doubled as well. U.S. “first-of-a-kind” (FOAK) nuclear projects remain 5–10 times more expensive per gigawatt than natural gas or renewable-energy installations.

Small modular reactors offer promise, but the technology is still in an early phase, and initial evidence suggests that SMRs may not be cheaper to build than conventional reactors. In 2023, for example, SMR developer NuScale cancelled its 462-MW Carbon-Free Power Project in Idaho after projected costs tripled to \$9.3 billion, or roughly \$20,130 per kilowatt. While SMR costs are expected to decline as designs mature and supply chains scale, current economics remain challenging.

Construction setbacks are not limited to the United States. Nuclear projects in Finland, France, and the United Kingdom demonstrate that the industry’s challenges are global. Each project deployed new-generation European Pressurized Reactors (EPRs), designed to be simpler to construct and safer to operate than earlier technologies. Yet the same issues seen at Vogtle – cost escalation, delays, and complex regulatory interactions – have also emerged in Europe, further complicated by variations in national policy frameworks and regulatory regimes.

European Nuclear Cost Overruns

Plant	Location	Start Date	Inservice Date		Cost Estimate (\$ in billion)		Cost per KW
			Initial	Latest	Initial	Latest	Latest
Olkiluoto-3	Finland	2005	2010	2023	3.1	11.4	7150
Flamanville 3	France	2007	2012	2024	3.4	15.2	9490
Hinkley Point C	UK	2018	2025	2030	22.5	42.5	13281

Source: Bloomberg Intelligence and World Nuclear Association as of January 2026

Supply chain deterioration

Decades of limited development have left the U.S. nuclear-construction ecosystem significantly weakened. Only a small number of companies retain the capability to forge essential reactor components, and the industry faces an acute shortage of skilled labor, with 93% of employers reporting difficulties in hiring qualified nuclear workers. Uranium-enrichment capacity is also under pressure, a challenge that will intensify

once the U.S. ban on Russian nuclear fuel formally takes effect in 2028. This structural fragility may push back the commercialization timelines for Small Modular Reactors (SMRs), making developer projections appear overly optimistic. Spot uranium prices remain elevated, trading well above much of their historical range:

Uranium spot prices (U308)



Source: Bloomberg as of January 2026

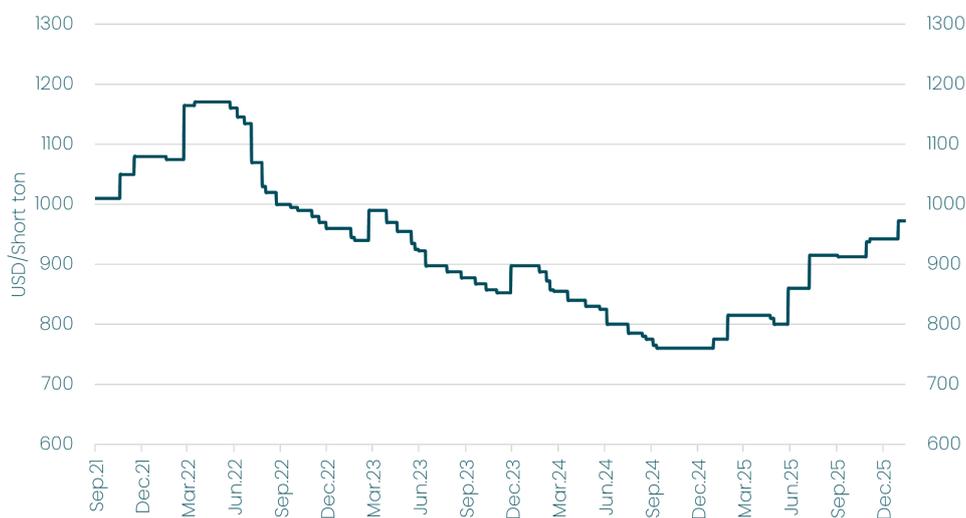
The supply-demand imbalance may become a longer-term challenge as more nuclear plants are restarted and new facilities are built. According to Bloomberg Intelligence, global U₃O₈ uranium supply is projected to rise by 23% between 2024 and 2031, driven by stronger producer pricing, supportive mining policies, and renewed momentum behind nuclear-power deployment. Two-thirds of the world’s uranium production comes from Kazakhstan, Canada, and Australia, according to the World Nuclear Association.

Uranium enrichment could become another structural bottleneck for the U.S. nuclear industry, which has historically relied heavily on Russia for processed nuclear fuel. With this dependency becoming increasingly untenable, the U.S.

Department of Energy (DOE) has issued grants to accelerate domestic nuclear-fuel capabilities, including the production of high-assay low-enriched uranium (HALEU), which may be required to power next-generation Generation IV small modular reactors (SMRs).

In addition, nuclear-power projects are major consumers of steel – a factor that can contribute to cost inflation. Steel prices fell to multi-year lows in 2024 due to slowing global economic conditions and excess supply. However, as new tariffs come into effect, steel prices may rise again. Given the high capital intensity and complexity of nuclear-construction projects, many infrastructure contractors may be reluctant to take on the associated construction and cost-overrun risks.

Steel prices



Source: Bloomberg as of January 2026

Policy support under the Trump administration

The U.S. nuclear build-out enjoys substantial federal support, with up to \$67 billion in potential subsidies available. The Trump administration has set an ambi-

tious goal of quadrupling U.S. nuclear-generation capacity by 2050. However, achieving 400 GW of capacity within this timeframe is highly challenging. At an estimated construction cost of roughly \$10,000 per kilowatt, each

1-GW reactor would cost about four times as much as a comparable natural-gas combined-cycle plant. Expanding capacity by an additional 300 GW over the next 25 years would require approximately \$3 trillion in capital investment.

Given the high costs, construction risks, supply-chain constraints, and long development timelines associated with nuclear projects, additional federal grants and loan guarantees will be essential for mobilizing private-sector investment. At the same time, growing federal deficits may limit the government’s ability to provide subsidies at the scale required.

In an effort to accelerate deployment, the Trump administration has also shortened the regulatory review period for new reactor approvals to 18 months – a significant reduction aimed at streamlining development.

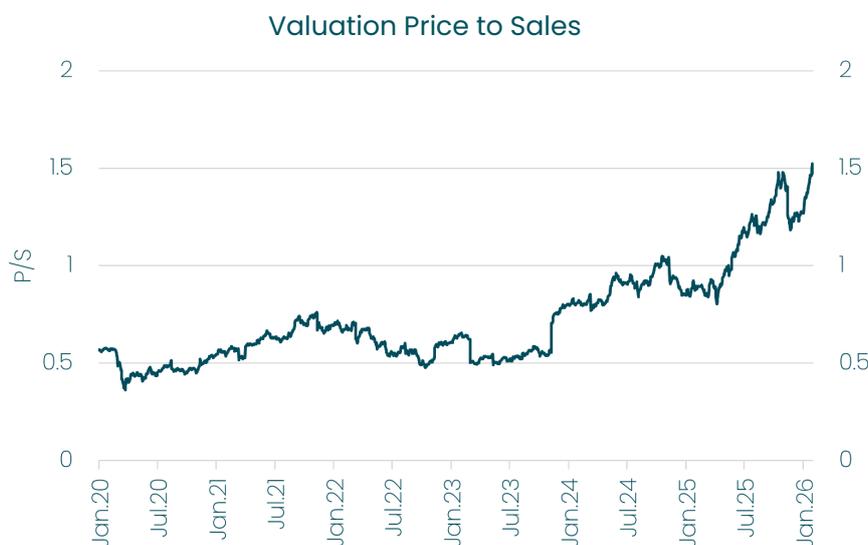
Small Modular Reactors (SMRs): Hype, Promise, and Reality

Small Modular Reactors (SMRs) could play a significant role in the next cycle of

nuclear development, marking a shift away from the full-size reactors that dominated past build-outs. Their greater flexibility and modularity make them particularly attractive for powering data centers, which require reliable, scalable, and potentially colocated baseload electricity. SMRs may help address several of the challenges associated with large conventional nuclear plants, but the technology is likely to remain in development for some time. Utilities are expected to be cautious about adopting SMRs until the designs are proven at commercial scale.

Valuation

The Bloomberg Equal-Weighted Nuclear Energy Index has seen its valuation rise to a price-to-forward-sales ratio of 1.5, placing it above its historical peak. Within the index, uranium producers exhibit the highest valuation multiples; however, these remain closer to their long-term median levels. In contrast, equipment manufacturers and EPC (engineering, procurement, and construction) companies are, on average, trading at their highest premiums relative to historical valuation benchmarks.



Source: Bloomberg as of January 2026

Key takeaways

Investor interest in nuclear power has been fueled by long-term commitments from some of the world's largest technology companies, which are seeking reliable, round-the-clock electricity to support expanding data-center operations. Current valuations across the nuclear sector are heavily influenced by expectations of rising AI-driven power demand; however, significant uncertainties remain regarding technical feasibility and execution. Despite renewed momentum, nuclear power continues to represent only a modest share of global energy investment, and projects remain capital-intensive, time-consuming, and slow to scale. Investors must also recognize that a potential correction in the AI sector could put downward pressure on the valuations of nuclear-energy producers, developers, utilities, and equipment suppliers.

Reactor developers such as NuScale and Oklo are particularly exposed to long development timelines – often up to a decade – before reaching potential profitability. Technical hurdles, cost overruns, and ongoing capital requirements may challenge the elevated expectations currently reflected in their valuations.

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