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# Nuclear Energy Resurgence

## Fueled by Rapid Data Center Expansion, Investments and Federal Policy

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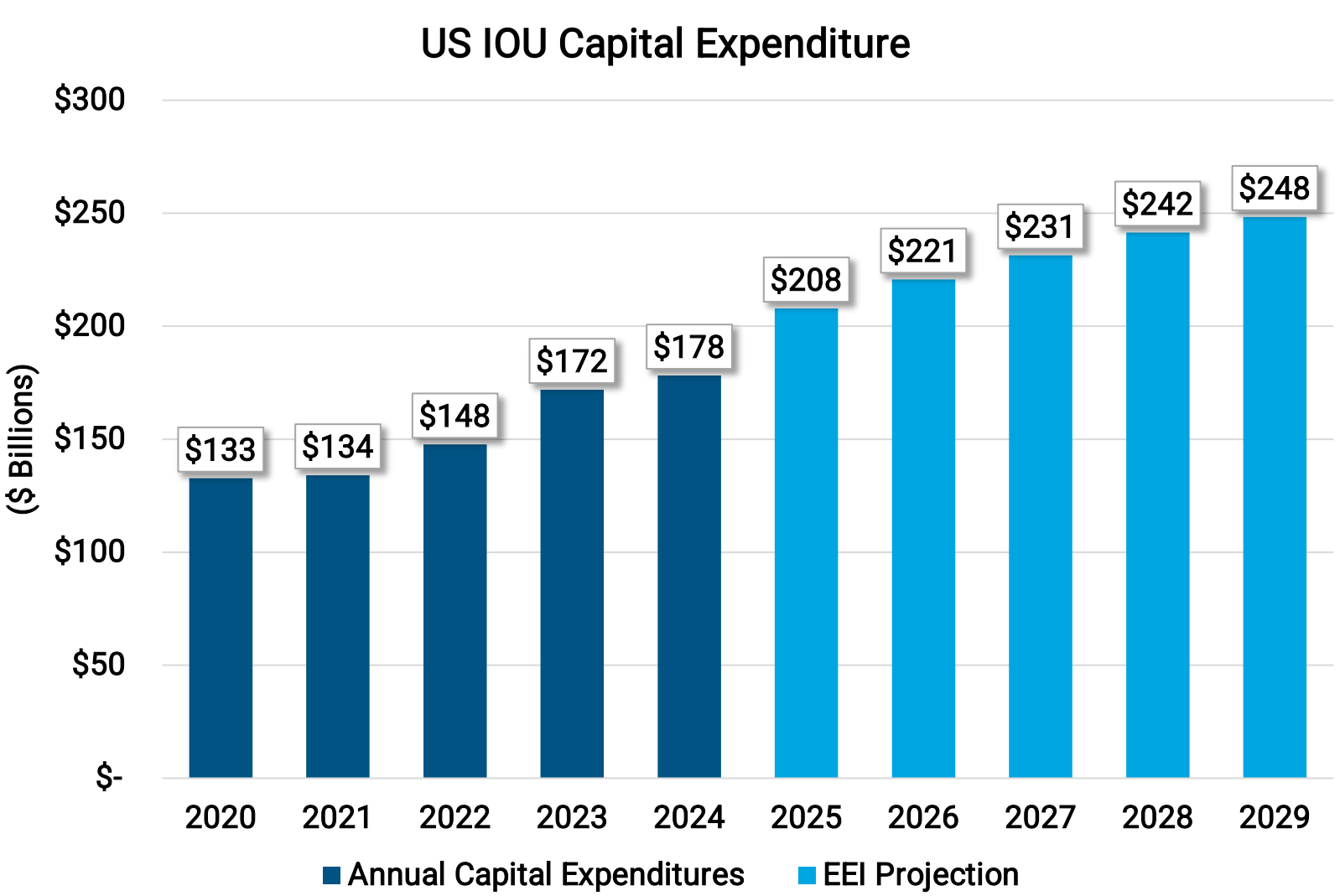
# Utility Capital Expenditure Supercycle Driven By Surging Demand, Upgrades, Replacements




Investor-owned utilities will need **~$1.1 trillion** in capital investment through 2029, comparable with the industry's total capital expenditure over the prior 12 years.

**Investments in generation** as a share of the industry's total capital expenditure have risen over the past four years.

**91 GW** of new capacity is under construction, and 488 GW is planned or proposed over the next five years.

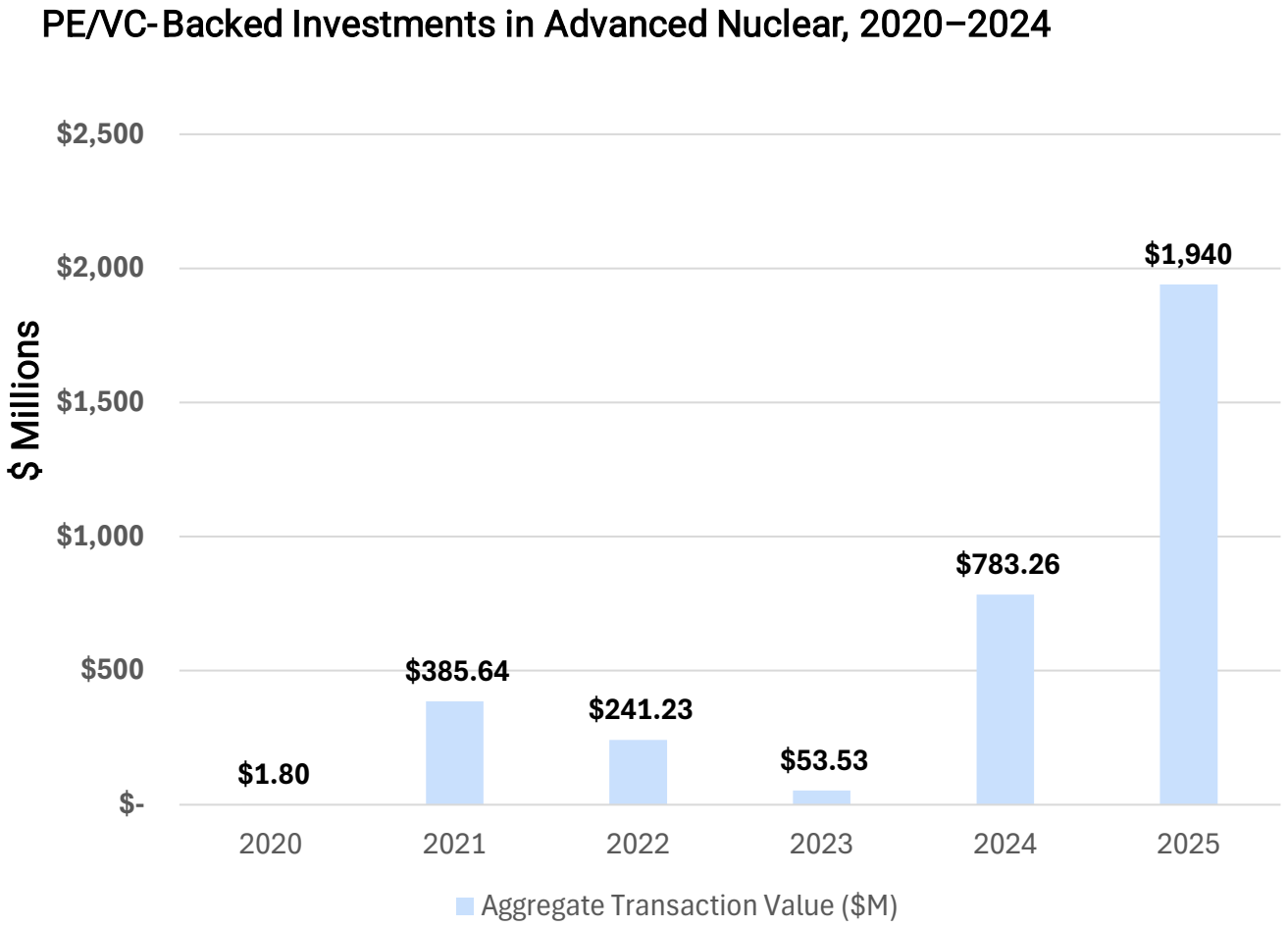
Source: Edison Electric Institute (updated September 2025); Crunchbase, 2025.

# Private Investment in Nuclear Energy Driven by Energy Needs for AI

Nuclear energy is emerging as a clean, reliable and dispatchable solution to meet growing energy demand, especially from data centers.

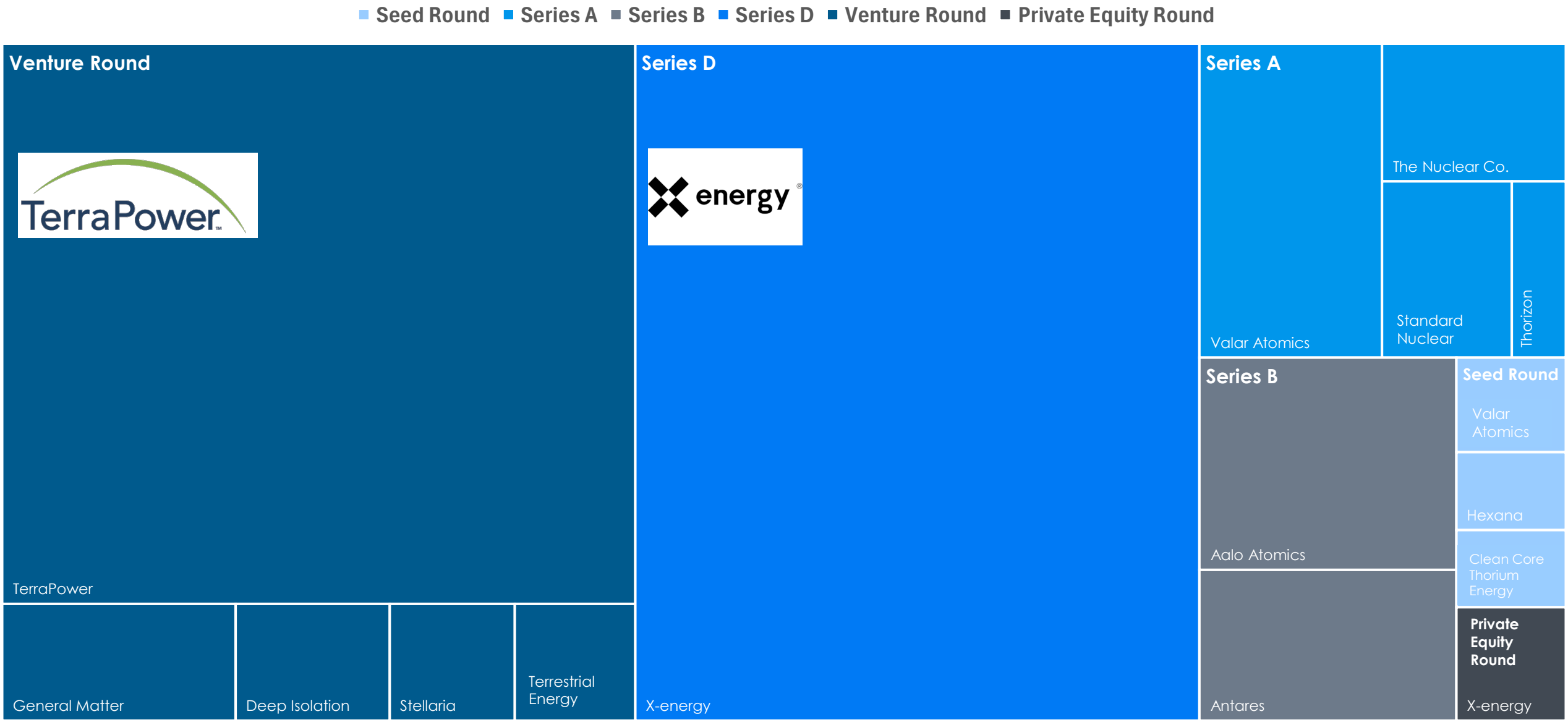
Private equity (PE) and venture capital(VC) investments are entering the advanced nuclear technology space to support small modular reactors, Generation III+ reactors and high-assay low-enriched uranium (HALEU) fuel technologies.

There is a shift occurring from utilities investing in nuclear energy to investment from petrochemicals, manufacturing, Big Tech and AI sectors.



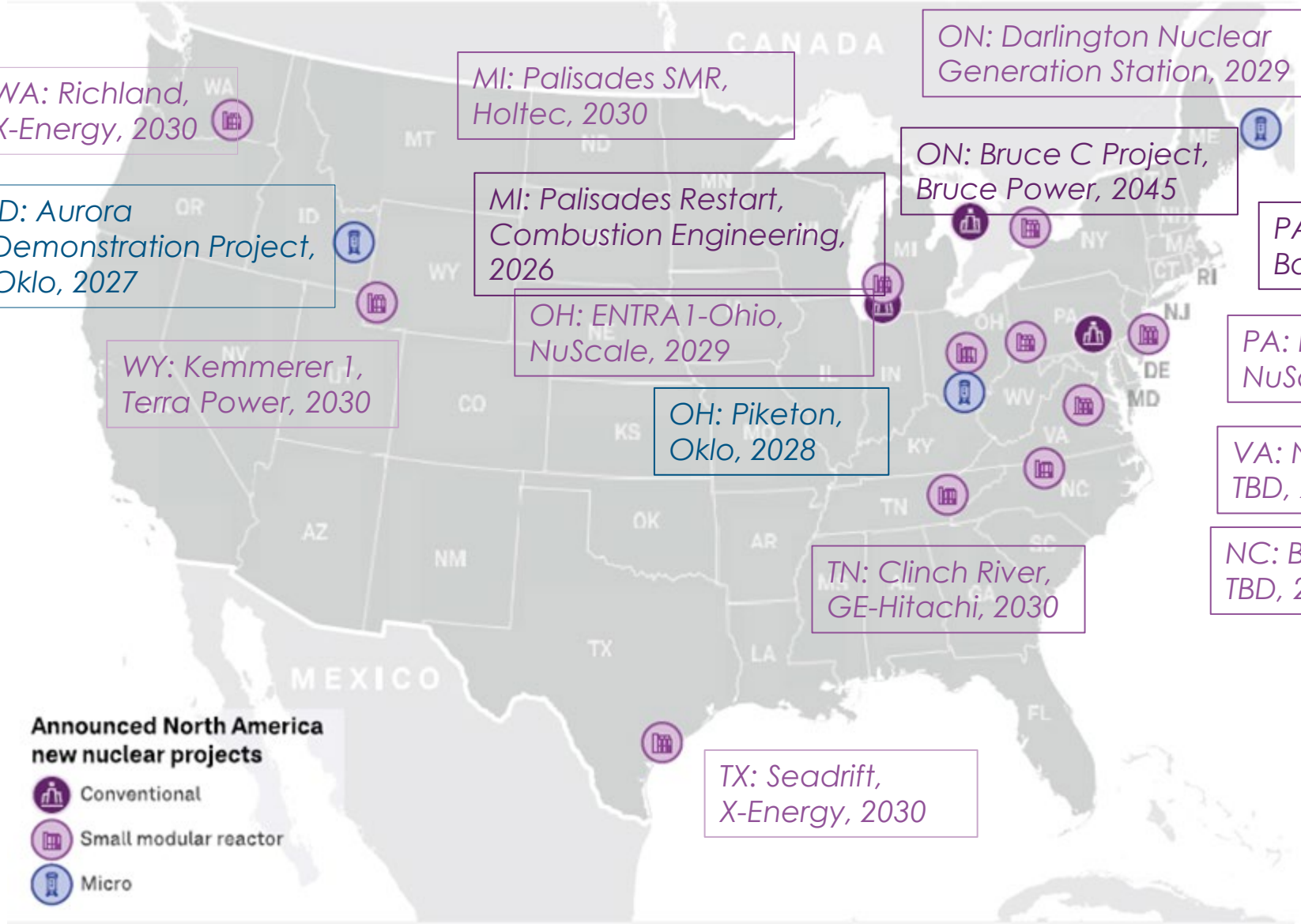

Source: S&P Global Market Intelligence.

# Private Financing for Nuclear Startups in 2025 was $1.9 Billion Across 13 Firms




Source: Crunchbase, 2025.

# Announced Nuclear Reactor Profiles for 2024 in the US




*WA: Richland, X-Energy, 2030*

*ID: Aurora Demonstration Project, Oklo, 2027*

*WY: Kemmerer 1, Terra Power, 2030*

*MI: Palisades SMR, Holtec, 2030*

*MI: Palisades Restart, Combustion Engineering, 2026*

*OH: ENTRA1-Ohio, NuScale, 2029*

*OH: Piketon, Oklo, 2028*

*TN: Clinch River, GE-Hitachi, 2030*

*TX: Seadrift, X-Energy, 2030*

*ON: Darlington Nuclear Generation Station, 2029*

*ON: Bruce C Project, Bruce Power, 2045*

*NB: Point Lepreau SMR, 2030*

*NJ: Oyster Creek, Holtec, 2030s*

*PA: Three Mile Island Restart, Babcock & Wilcox, 2028*

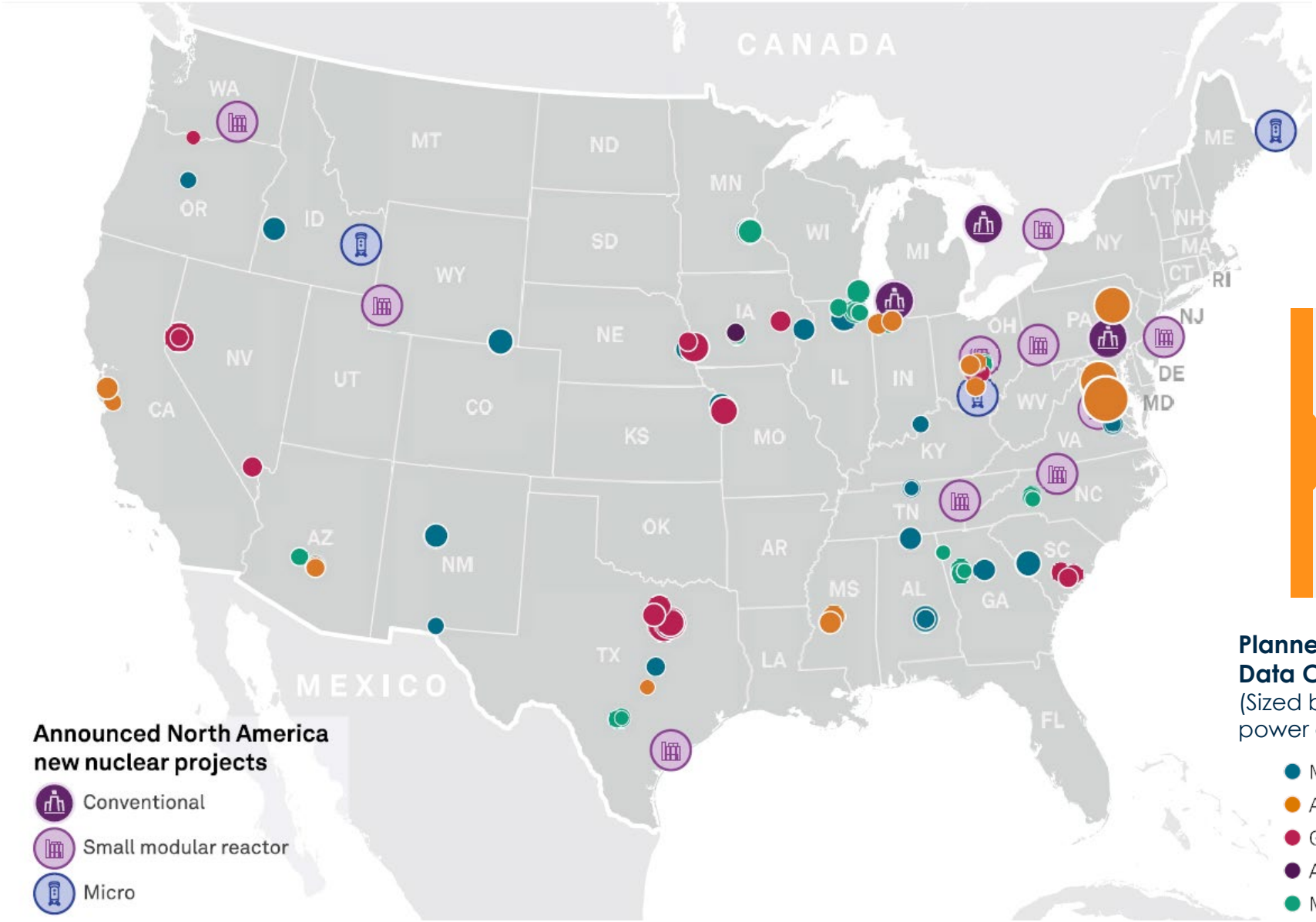
*PA: ENTRA1-PA, NuScale, 2029*

*VA: North Anna SMR, TBD, 2030s*

*NC: Belews Creek, TBD, 2035*

Source: S&P Global Market Intelligence.

# Planned US Hyperscale Data Centers & Announced Nuclear Projects




Tech firms and data center developers see potential for long-term, reliable energy supply from advanced nuclear technology.

Source: S&P Global Market Intelligence.

## Market cap rises for top owners of US nuclear asset on announced data center deals

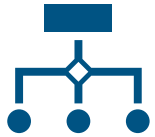

Source: S&P Global Market Intelligence.

# Federal Policy and Incentives for the Nuclear Industry Are Boosting Expansion

## American Nuclear Supply Chain Loans

- Announced June 2026.
- $17.5 billion financing available for five eligible projects.
- Each project site will have two reactors.
- Deployment of 10 total large-scale commercial nuclear reactors.
- Westinghouse's AP1000 design will be used for all the projects, standardizing the expansion.
- Each reactor will generate 1.1 GW of power.

# Federal Policy and Incentives Derisking New Technologies



## DOE Reactor Pilot Program

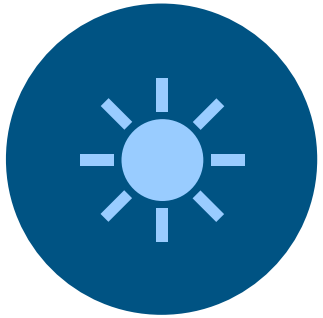
- Launched May 2025.
- Fast-track commercial licensing for advanced reactors.
- Certify and construct advanced reactor designs for demonstrations.
- 11 projects selected in August 2025.
- Antares Nuclear reached criticality in June 2026.

## Gen III & SMRs Pathways to Deployment Program

- Expand nuclear energy capacity to 400 GW by 2050.
- TVA and Holtec to receive $800 million for projects in Tennessee and Michigan.
- Early deployment of advanced light-water SMR: GE-Hitachi BWRX-300.
- Eight companies awarded $94 million in May 2026.

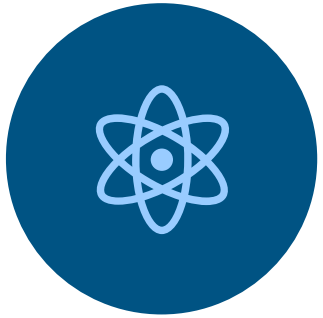
# Nuclear Deployment Faces Timing Challenges

**Data Centers:**
18–24 months



**Hybrid Solar + Storage:**
2 years

**Combined-Cycle Gas:**
3 years



**Nuclear Energy:**
6–15 years

# Historic Nuclear Energy Project Costs Rose Substantially with Delays

## Vogtle Power Plant Units 3 & 4, Georgia
## 2,228 MW:

**2009**

**$14 Billion**

Commercial operations expected by 2017.

**2024**

**$30+ Billion**

Estimated $170–180/MWh. Units 3 & 4 in commercial operation.

## NuScale Power & Utah Associated Municipal Power Systems (UAMPS) Carbon-Free Power Project, Utah:

**2015**

**$3 Billion**

Estimated $55/MWh. Designed capacity of 600 MW with 12 reactors by 2023.

**2018**

**$4.2 Billion**

Designed capacity increased to 720 MW.

**2021**

**$6 Billion**

Estimated $58/MWh. Designed capacity changed to 462 MW.

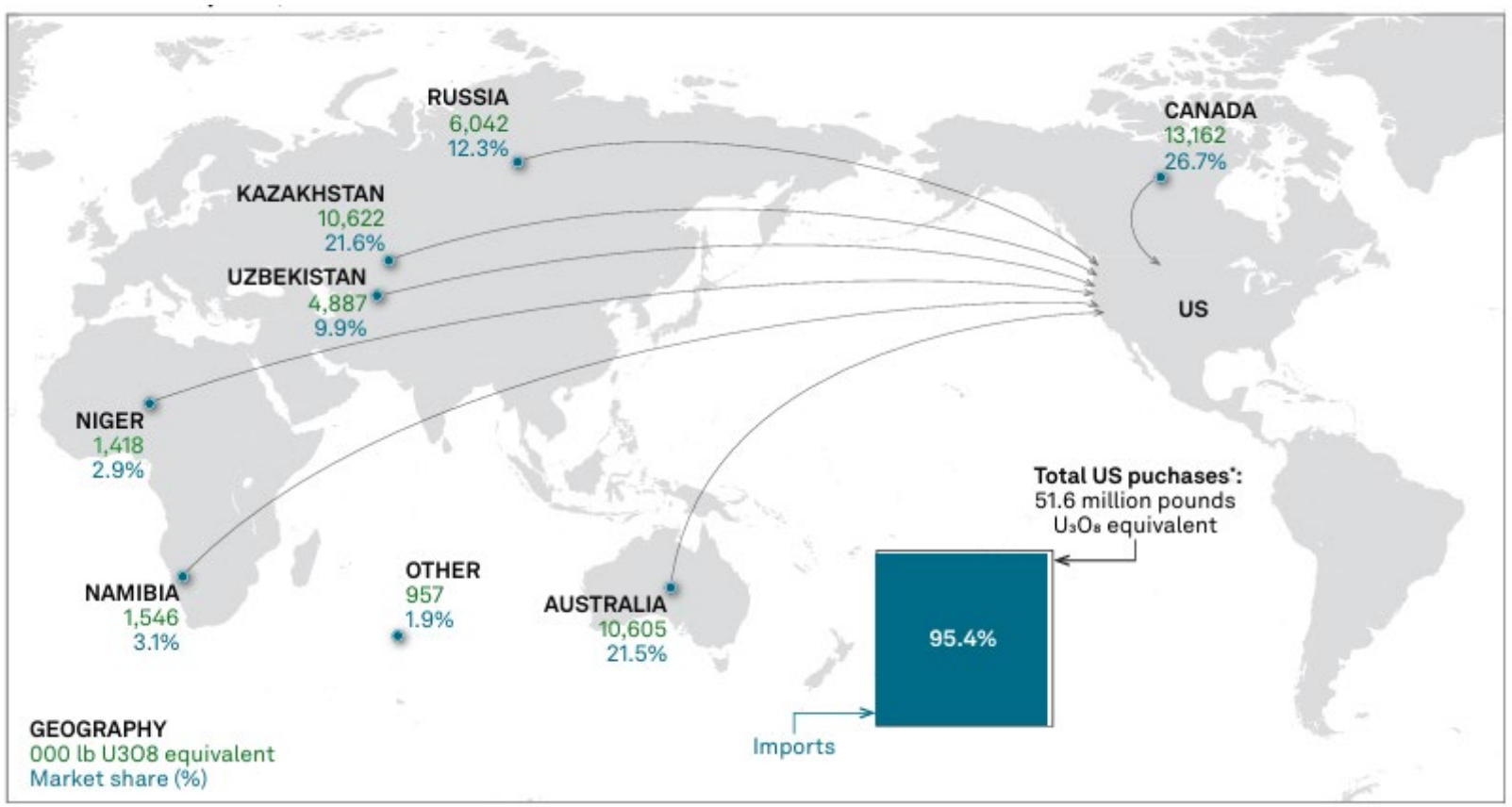
**2023**

**$9.3 Billion**

Estimated $89/MWh. Capacity of 462 MW. **Project canceled.**

# Fuel Supply Bottlenecks Threaten Growth

## US Imports 95.4% of Uranium for Power Plants




U.S. commercial nuclear reactors imported uranium from Canada, Australia, Russia, Kazakhstan and Uzbekistan.

In May 2024, the U.S. banned imports from Russia, although companies could apply for a waiver through January 2028.

High-assay low enriched uranium (HALEU), used for advanced nuclear reactors, is not manufactured in the U.S.

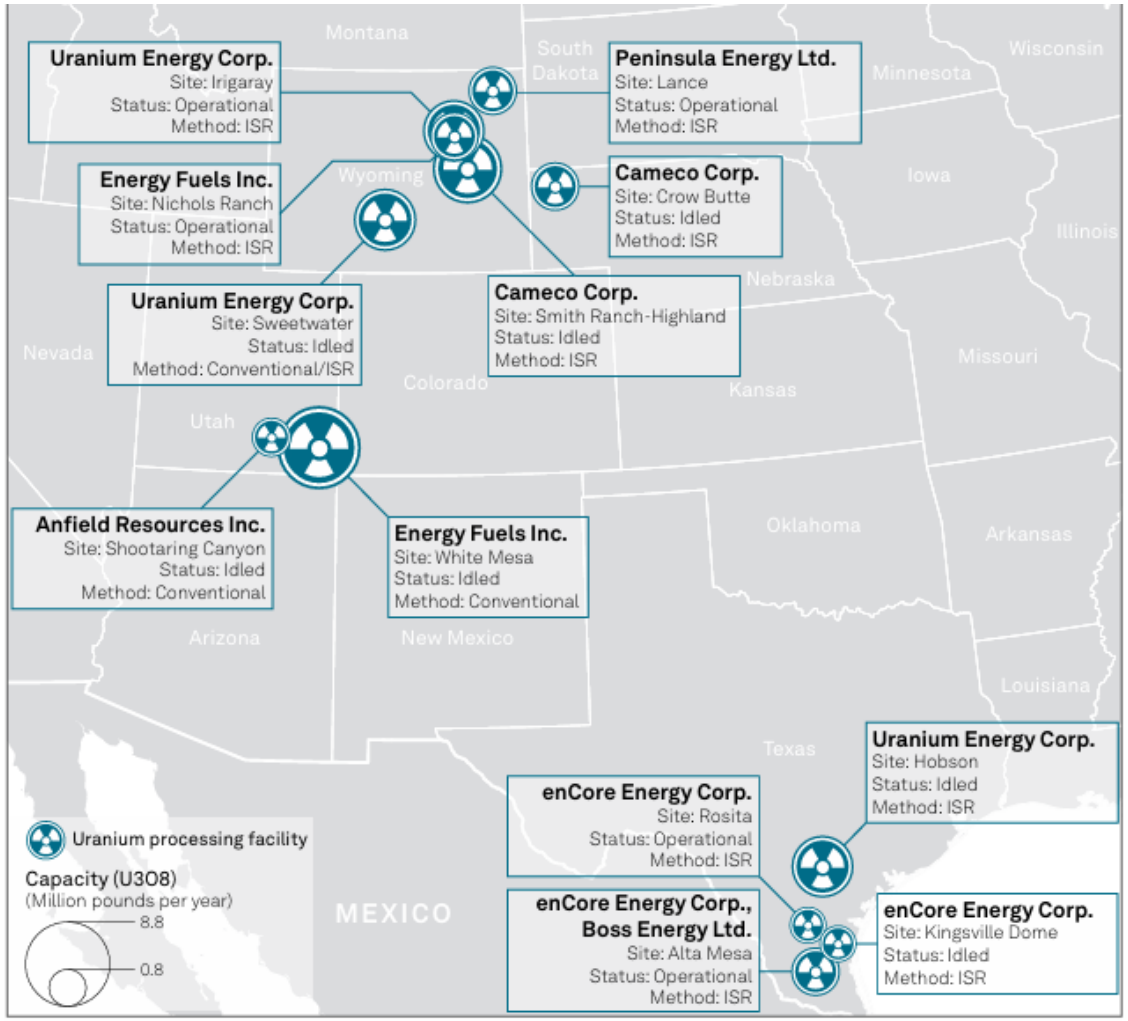
Source: S&P Global Market Intelligence

# Limited Uranium Mining and Processing Across the US with Potential for Expansion

Domestic drilling and exploration of uranium has expanded over the last few years, driven by favorable market conditions and the policy landscape.

Uranium processing facilities are restarting in Wyoming and Texas, with a total of **five active processing facilities** across the U.S.

**U.S. Uranium Processing Centers Expanding**




Source: S&P Global Market Intelligence

# Project Profiles

# TerraPower Natrium, Kemmerer Unit 1

## Status

Most progressed U.S. advanced reactor project in licensing.

NRC issued construction permit (March 2026).

Moved beyond application into active development.

## Technology

Sodium-cooled fast reactor (~345 MW).

Paired with molten-salt energy storage 100–500 MWe+ for 5.5+ hours.

Non-light-water design with first-of-a-kind risk.

## Timeline

Target: ~2030 commercial operation.

~36 months from nuclear concrete pour to fuel load.

Execution risks remain: construction, fuel supply, operating license.

## Estimated Cost

~$4 billion total project cost.

Up to $2B DOE cost-share with private matching funds.

## Why It Matters

Leading advanced reactor in U.S. pipeline.

Coal-to-nuclear transition model (Wyoming site).

Demonstrates grid-flexible nuclear generation.

# Holtec SMR-300, Pioneer Units 1 & 2

## Status

NRC accepted initial construction permit application for review.

Includes limited work authorization request.

Early-stage licensing compared with Natrium.

## Technology

Light-water pressurized-water reactor (~340 MW per unit).

Two-unit project totaling ~680 MW.

More conventional design, but still first-of-a-kind.

## Timeline

Target: ~2030 (Holtec "Mission 2030").

Risk-adjusted estimate: 2030–2032.

Key steps remain: full permit, financing, construction.

## Estimated Cost

$7B–$10B (external estimate, not developer confirmed).

Based on $12M–$15M per MW first-of-a-kind cost range.

## Why It Matters

Located at existing Palisades nuclear site (infrastructure advantage).

Paired with Palisades plant restart strategy.

More familiar technology for regulators and operators.

# X-energy Xe-100 – Dow Long Mott Generating Station (Texas)

## Status

NRC accepted construction permit application (2025).

Environmental review completed with finding of no significant impact (May 2026).

Project led by Dow subsidiary (Long Mott Energy LLC).

## Technology

Four high-temperature gas-cooled reactors (~80 MW each).

Total ~320 MW capacity.

Uses Tristructural-Isotropic (TRISO) fuel for high-temperature operation.

Designed to provide both electricity and industrial steam.

## Timeline

Likely early 2030s in-service.

Final investment decision not expected before ~2028.

Schedule depends on execution pace and project approval.

## Estimated Cost

Multi-billion-dollar project ($3B–$5B+ estimate).

Up to $1.2B DOE cost-share under the Advanced Reactor Demonstration Program.

Final cost not publicly disclosed.

## Why It Matters

Purpose-built for industrial decarbonization (power and process heat).

Differentiated high-temperature, TRISO-fueled design.

Potential template for chemicals, refining, hydrogen and heavy industry.

# ELECTRIC COOPERATIVE CONNECTION: PROJECT PROFILES

# TVA Clinch River BWRX-300 (Tennessee)

## Status

TVA submitted construction permit application (2025).

Currently under NRC review.

First U.S. utility pursuing BWRX-300 deployment.

## Technology

Boiling-water SMR (~300 MW).

Evolutionary light-water design with passive safety features.

Closely aligned with existing nuclear technology base.

## Timeline

Target: early 2030s commercial operation.

Benefits from prior site permitting work at Clinch River.

Backed by experienced federal utility sponsor.

## Estimated Cost

Not publicly disclosed (estimated ~$5.3B for first unit).

Comparable Canadian project is ~$15.1 billion.

Supported by ~$400M DOE funding.

## Why It Matters

Strong sponsor with nuclear operating experience (TVA).

Most conventional SMR pathway in U.S. pipeline.

Potential anchor for broader U.S. and global BWRX-300 deployment.

Momentum in the nuclear energy industry is real, but first-of-a-kind risk makes the technology pathway uncertain in the short term.

Advanced nuclear energy has potential to be a long-term solution for electric cooperatives.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