

3 July 2026

## Key Takeaways:

- AI is turning electricity into a strategic constraint. Data centres need reliable, round-the-clock power, not just cheap power.
- Nuclear is back because its old strength has become newly valuable. It provides firm, low-carbon baseload electricity at scale.
- The best investment opportunities may be sitting outside the reactor. Fuel cycle, equipment, engineering, maintenance and grid infrastructure may offer clearer revenue visibility.
- Small Modular Reactors (SMRs) are exciting but still need proof. They should be treated as long-term optionality, not the whole nuclear thesis.

### Why reliable electricity is becoming the hidden constraint behind the AI boom

For years, nuclear energy was mostly discussed as a climate solution. It could generate large amounts of low-carbon electricity, but the debate often felt slow, technical and policy-heavy.

That is starting to change.

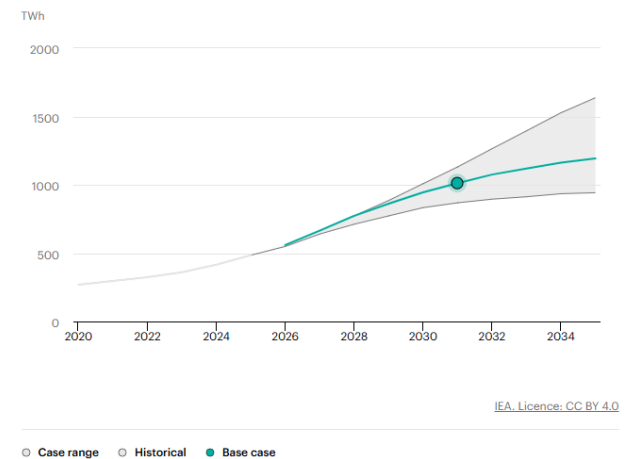
The new question is no longer just whether nuclear can help reduce emissions. The more urgent question is whether the world can produce enough reliable electricity for artificial intelligence (AI), data centres, electrification and industrial reshoring.

This is why nuclear is back in the conversation. Not because the technology is suddenly new, but because the power system is becoming more demanding.

### AI has a power problem

AI may feel digital, but it is built on very physical infrastructure. Behind every AI model sits a chain of chips, servers, cooling systems, transmission lines and power supply. That matters because data centres do not only need cheap electricity. They need electricity that is available all the time.

**Figure 1: Estimated electricity demand by data centres (2020-2035)**



Solar and wind remain essential parts of the energy transition. But their output depends on weather and time of day. Batteries, grids and demand management can help, but large-scale firm power remains valuable.

This is where nuclear becomes interesting again.

Nuclear plants are not flexible growth stories like software companies. They are complex, regulated and capital-intensive assets. But once operating, they can provide stable electricity for decades. That feature becomes more valuable when AI, data centres and electrification increase demand for dependable power.

# Nuclear Energy: Powering the AI boom

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The International Energy Agency (IEA) expects nuclear output to reach a record high, with more than 70 gigawatts (GW) of new nuclear capacity under construction globally. The IEA also noted that technology companies have shown interest in around 30GW of SMRs, mainly to power data centres.

The key point is that large power users are beginning to treat nuclear as a strategic power source.

## From government story to corporate power strategy

Historically, nuclear energy was mostly a government-led story. Policymakers decided whether to build plants. Utilities developed the projects. Investors watched from a distance.

Today, the ecosystem is broader.

Governments still matter enormously. Nuclear needs supportive regulation, financing structures, long-term planning and public acceptance. But large technology companies are increasingly part of the conversation because power availability has become part of their growth strategy. That changes the investment lens.

If data-centre demand keeps rising, nuclear is no longer only about climate policy. It becomes part of the infrastructure required for the AI economy. The World Nuclear Association estimates that around 80 reactors are currently under construction globally, with about 120 more planned. Most reactors under construction or planned are in Asia.

This also means the nuclear revival will be uneven. China, India and selected Asian markets are moving faster on new-build projects. In Western markets, the opportunity may come more from life extensions, restarts, uprates and supply-chain investment than from a rapid wave of brand-new large reactors.

## The opportunity may sit outside the reactor

When investors hear “nuclear energy”, the instinct is often to think about reactor developers. That is understandable, but it may not be the best starting point.

The reactor is only one part of the value chain.

A nuclear revival also needs uranium, conversion, enrichment, fuel fabrication, turbines, pumps, electrical equipment, engineering services, construction capability, grid connections and ongoing maintenance. Some of these areas may offer better revenue visibility than early-stage reactor concepts.

**Figure 2: Example of Uranium and Nuclear ETF that has seen a correction lower**



Source: Bloomberg, UOB Private Bank

In other words, the investment opportunity may be less about predicting the winning reactor design, and more about identifying the bottlenecks that every nuclear project needs to solve.

A simple way to frame it:

- Existing nuclear assets are the cash-flow story.
- Fuel-cycle and equipment suppliers are the bottleneck story.
- SMRs (Small Modular Reactors) are the optionality story.
- Grid and power infrastructure are the enabling layer.

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This is why we continue to prefer a “picks and shovels” approach. Existing operators, fuel-cycle bottlenecks, specialist equipment, grid infrastructure and engineering services may offer more practical exposure than companies whose valuations depend on rapid SMR commercialisation.

### SMRs are promising, but not yet proven

Small Modular Reactors, or SMRs, are a new generation of nuclear reactors designed to be much smaller than traditional nuclear power plants.

That is the appeal. Because SMRs are smaller, they could potentially be built in factories, transported to sites, and installed closer to where power is needed. This could make them useful for data centres, industrial parks, remote communities or regions where a full-scale nuclear plant would be too expensive or difficult to develop.

For AI and data centres, the idea is especially attractive. Data centres need reliable power around the clock. If SMRs can eventually provide dedicated, low-carbon electricity near major computing hubs, they could become an important part of the AI power infrastructure story.

But the key word is “eventually”.

SMRs are promising because the concept is logical. They may be smaller, more repeatable and easier to finance in phases than large nuclear plants. However, today, they are not proven at broad commercial scale. Although the idea is promising, more work needs to be done to show that SMRs can deliver its proposed benefits at scale.

For investors, this means SMRs should be viewed as long-term optionality, not the whole nuclear thesis.

### Bottom line

Nuclear energy is back because the world needs more than clean power. It needs dependable power.

AI has made that reality harder to ignore. As data centres expand and electricity demand rises, nuclear’s round-the-clock generation has become newly relevant.

**Figure 3: Where value can accrue in the nuclear ecosystem**

Different layers. Different roles. Different investment angles.

NUCLEAR LAYER	DESCRIPTION	INVESTMENT ANGLE
 <b>1. Existing Plants</b>	Nuclear power plants that are already operating, including those being extended or updated to produce more power.	 <b>Cash-flow visibility</b> Stable earnings from operating assets.
 <b>2. Fuel Cycle</b>	Companies involved in uranium mining, conversion, enrichment and fuel fabrication.	 <b>Scarcity and bottlenecks</b> Limited supply supports strategic value.
 <b>3. Equipment and Services</b>	Suppliers of critical equipment (turbines, pumps, valves, electrical systems) and providers of engineering, construction and maintenance services.	 <b>Picks-and-shovels exposure</b> Benefit from nuclear build-out regardless of who builds the plant.
 <b>4. SMRs (Small Modular Reactors)</b>	Smaller, standardized reactors that can be built in factories and deployed in more locations, including data centers and industrial sites.	 <b>Long-term optionality</b> High potential, but still early and unproven at scale.
 <b>5. Grid infrastructure</b>	Transmission lines, substations and grid upgrades needed to deliver reliable power from plants to users.	 <b>Enabling layer</b> Essential infrastructure for reliable power delivery.

 **Nuclear is more than just the reactor.** Value can be created across the ecosystem. The key is identifying where fundamentals are strongest and visibility is clearest.

Source: UOB Private Bank

This note builds on the nuclear energy theme introduced in our June 2026 Thematic Investing Series, where we highlighted nuclear as a strategic answer to energy security and rising power demand.

For readers who would like the broader investment framework, the full publication also covers the nuclear value chain, theme maturity score, scenario analysis and key risks across the sector.

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