# Criticality Is Not a Customer

*What stands between new nuclear and its first hyperscaler contract*

By Bijay Alex Mathew. Published October 19, 2026. Data as of October 18, 2026. Not investment advice.

**The finding.** Four privately developed reactors reached criticality in the thirty days to July 4, 2026, all four at zero power, and more than $4.5 billion of venture capital reached the sector by late July. The milestone is not the constraint. No hyperscaler has signed a binding long-term power purchase agreement for a new-build advanced reactor. The only new-build contracts are four, with TVA, PacifiCorp and, twice, the US Army. Hyperscaler money has gone to existing plants, restarts, clean energy attributes, options and equity. Of the seven constraints assessed, offtake is least resolved.

**Why no hyperscaler has signed yet.** Buyers need power this decade, and existing plants deliver it sooner; new reactors arrive around 2030 or later. A first-of-a-kind reactor has no cost history to price a twenty-year contract: Lazard's July 2026 benchmarks put new-build nuclear at $175 to $255 per MWh against $51 to $129 for gas combined cycle, and mark small modular reactors with a single illustrative point of about $214, against about $71 for a restart. Lenders want a signed contract before financing a first plant, and buyers want proven cost and schedule first. Hyperscalers do sign 20-year contracts for new generation that can deliver this decade: Microsoft did in June 2026, for a gas plant whose first power is anticipated in 2028. None of this means the demand is false.

| Constraint | Where it actually stands |
|---|---|
| Fuel | Short of time, not uranium. Russian enrichment waivers end January 2028; replacement capacity at scale arrives 2029 to 2036. |
| Regulatory | Regulatory standing predicts little. Fast-lane demonstrations do not yet count toward a commercial license. |
| Workforce | The shortage is welders, machinists and inspectors, not engineers. |
| Manufacturing | Eleven of 24 developers describe building in factories; three have published both a facility they control and a production rate. |
| Industrial supply chain | Field construction broke the last cycle. No current public count of qualified suppliers exists. |
| Offtake | Least resolved. Zero binding hyperscaler PPAs for a new-build advanced reactor, against about 6.9 GW contracted from existing plants. |
| Permission | Nuclear is near its polling high; local opposition to data centers rose from 42 to 75 percent in a year, with two other pollsters that year at 63 and 71. |

**What would prove this wrong.** A signed, binding, long-term power purchase agreement between a hyperscaler and a new-build advanced reactor. Deals with existing plants or restarts, such as Crane, Duane Arnold and Loviisa, do not count.

**What this report does not claim.** It does not predict that this wave of reactors fails or that the constraints are permanent. It asks how far along each one is.

## Eight companies against the same seven constraints

| | Fuel | Regulatory | Workforce | Mfg | Supply | Offtake | Siting |
|---|---|---|---|---|---|---|---|
| Kairos | HALEU; LEU+ possible | NRC, building | Addressing | Demonstrated | Exposed | **PPA, TVA** | Grid |
| TerraPower | HALEU, at risk | NRC permit | Exposed | Not factory | Exposed | **PPA, PacifiCorp*** | Grid |
| Radiant | HALEU, contracted | Four lanes | Exposed | Building | Exposed | **Army contract** | Base |
| X-energy | HALEU, own plant | NRC pending | Exposed | Supplier | Partial | Option | Grid |
| Oklo | HALEU | Denied 2022; DOE pilot, NRC pre-application | Exposed | Own, operate | Exposed | Non-binding | Mixed |
| Aalo | LEU 5% / LEU+ 8% | DOE pilot | Exposed | Factory | Exposed | Partnership | Behind meter |
| NuScale | LEU | US600 certified; US460 SDA | Exposed | Supplier | Exposed | Framework | Grid |
| Westinghouse | LEU | AP300 stalled | Shared firm | Field | Federal loans | LOIs; **Janus OTA** | Grid |

Bold marks a signed contract, and there are four: two utility PPAs and two Army agreements. None is with a hyperscaler. * The PacifiCorp agreement is executed and becomes effective only once the commission approvals the contract names are in hand, among them approval of a related water use agreement. Oregon, Idaho and Utah granted their approvals between April and June 2026; a California application was still active on October 11, 2026, the last date its docket was checked. Each cell is a one-word label for an assessment the full report sets out in full: fuel in Chapter 3, regulatory in Chapter 4, workforce in Chapter 5, manufacturing in Chapter 6, supply chain in Chapter 6, offtake in Chapter 7, siting in Chapter 8, and all eight companies in Chapter 10. This is not a ranking. Workforce and supply chain read Exposed almost everywhere because they are sector-wide.

**What to watch.** Four dated tests fall in 2028, across three constraints. The Russian waivers expire on January 1 and funded replacement capacity arrives from 2029, and Raven-Flint's conversion services for Aalo are due to begin, which is fuel. Radiant's factory has to deliver, which is manufacturing. The Army's deadline for a first operating reactor falls on September 30, which is offtake.

Condensed from Criticality Is Not a Customer, The Offtake Research Series, Volume I, Edition 1.0, published October 19, 2026, data as of October 18, 2026. The full report runs to 156 pages, where every figure is sourced and tagged by interest and the Disclosures section sets out the author's relationships with companies covered. Companion dataset: The Offtake Nuclear Register, October 2026 edition, revision 3, docs.google.com/spreadsheets/d/1WYGG9aLA39dohvVrg9N7vHeg6g2tnRWe7y9PS3Uq0tI. Latest edition and corrections: sonteno.com/research/criticality-is-not-a-customer. Contact: bijay@sonteno.com. © 2026 Bijay Alex Mathew and SonTeno LLC. Quote with attribution; not for resale.