

**Testimony for the Record
Dr. Michael Laufer, Chief Executive Officer, Kairos Power, LLC**

**Before the United States Senate Committee on Energy and Natural Resources
Full Committee Hearing to Examine the Department of Energy's Implementation of
President Trump's May 2025 Nuclear Energy Executive Orders
March 19, 2026**

Introduction:

Chairman Lee, Ranking Member Heinrich and distinguished Members of the Committee:

Thank you for the invitation and opportunity to appear before this Committee today. My name is Mike Laufer, I am the CEO and co-founder of Kairos Power an advanced nuclear design, engineering, and manufacturing company headquartered in Alameda, California, with manufacturing operations in Albuquerque, New Mexico, and our first demonstration reactor, Hermes, under active nuclear construction in Oak Ridge, Tennessee. I am grateful for this Committee's longstanding commitment to advancing the nuclear energy industry and support for policies that enable innovation, demonstration, and deployment to meet our growing energy demands. I would like to give a special acknowledgement to Senator Heinrich and his office, who have been steadfast supporters of Kairos Power throughout the years and have helped champion our technology.

I welcome the opportunity to offer Kairos Power's unique industry perspective, highlighting the critical role this technology must play in securing our nation's energy future, and sharing our experience moving from advanced reactor concept to active nuclear construction.

"Kairos" is a Greek term meaning the "right or opportune moment", which is where our nation stands today. The need for new power generation is at an all-time high, with projections such as ICF International's *Rising current: America's growing electricity demand* report indicating that electricity demand will rise by as much as 78% in 2050, driven by the electrification of transportation, the rapid expansion of artificial intelligence and data centers, and the reshoring of American manufacturing (Batra et al., 2025). At the same time, we face the challenge of ensuring our grid remains reliable, resilient, and cost-effective. This is our opportune moment, the Kairos moment, for nuclear energy to rise to its full potential to help meet growing demand, maintain grid reliability, ensure energy independence, and strengthen national and economic security. To meet our growing demand, strategic government investments that align with private industry will accelerate our ability to go from demonstration to deployment. This approach will allow government to fully leverage the private sector, by thinking like an investor. Similar to the position the National Aeronautics and Space Administration (NASA) implemented in the Commercial Orbital Transportation Services (COTS) program, it supports companies in development by investing in the outcome rather than the product.

Kairos Power is utilizing the government-provided strategic investment opportunities to deploy



and build out in-house manufacturing and to construct our demonstration reactor within the United States. We are driving towards aligning with the government's strategic investment goals.

Kairos Power's Origins

Kairos Power grew from a broad research effort originating in universities and national laboratories aimed at advancing the technical foundation for designing, developing, and licensing commercially attractive molten salt reactors. In January 2012, the Department of Energy (DOE) launched an Integrated Research Project with the Massachusetts Institute of Technology, the University of California at Berkeley, and the University of Wisconsin at Madison to develop this technical basis. Through this endeavor, Kairos Power was born.

We founded the company in 2016 with a single mission: to enable the world's transition to clean energy while improving people's quality of life and protecting the environment. To fulfill that mission, we are committed to delivering technology that is both safe and cost-effective. Since our founding, we have grown from three engineers to more than 550 full-time employees operating across multiple states, all in pursuit of bringing commercial advanced nuclear reactors to market and deploying them at scale.

Kairos Power Technology

Our technology, the Kairos Power Fluoride Salt-Cooled High-temperature Reactor (KP-FHR), is a high-temperature reactor utilizing molten fluoride salt coolant operating at near-atmospheric pressure. Its passively safe design offers increased safety margins compared to conventional nuclear plants, which are already among the safest energy systems in the world.

The molten salt reactor concept originated at Oak Ridge National Laboratory in Tennessee where researchers were among the first in the world to build and operate a molten salt test reactor. The Molten-Salt Reactor Experiment (MSRE) ran successfully for five years. The technology was eventually set aside in favor of light-water reactor designs that were more advanced at the time; however, its foundational science endured. Kairos Power is building upon that legacy in Oak Ridge through our Hermes Demonstration Reactor, incorporating and advancing the lessons learned from the MSRE program.

Kairos Power reactors use TRISO (Tri-structural Isotropic) particle fuel made with High-Assay Low-Enriched Uranium (HALEU), originally developed by DOE for high-temperature gas-cooled reactors. TRISO fuel has a durable, multi-layered ceramic shell that retains radioactive fission byproducts, serving as the reactor's primary containment. It withstands temperatures up to 1,600°C and has been called "the most robust nuclear fuel on Earth" by DOE.

The reactor coolant is Flibe, a chemically stable mixture of Lithium-Fluoride and Beryllium-Fluoride salts with a strong natural affinity for radioisotopes. The coolant serves as a secondary layer of containment in the highly unlikely event that fission products escape the fuel. To make Flibe, we require Lithium enriched to greater than 99.99% in the Lithium-7 isotope. This requirement has significant implications for domestic supply chain security, which I will address later in my remarks.



Like other Generation IV reactors, the KP-FHR also incorporates inherent safety features that support passive decay-heat removal without requiring electrical power or operator intervention in the event of an emergency. This combination of extremely high-temperature-tolerant fuel, low-pressure, and chemically stable coolant eliminates entire classes of potential fuel-damage scenarios, reducing the number of required safety systems and greatly simplifying the reactor's design. The intrinsic low pressure of the reactor and its associated piping, combined with the containment function of the TRISO fuel, enhances safety and eliminates the need for high-pressure containment structures. This is how the KP-FHR delivers increased safety margins at lower capital costs than conventional light-water reactors.

Kairos Power's Development Approach

Kairos Power's unique approach to commercialization is what truly distinguishes our company in the field of advanced nuclear energy. The conventional nuclear development model is long, slow, and capital-intensive. At Kairos Power, we are disrupting that model by embracing a rapid iterative approach that accelerates innovation and optimization.

Our commercialization pathway is focused on de-risking key aspects of nuclear project delivery, using an iterative design-build-test approach to accelerate learning and mitigate uncertainty before building our first commercial plant. We are validating our technology through a series of non-nuclear Engineering Test Units (ETU) that test the design and integration of reactor systems, demonstrate plant equipment modularization, establish manufacturing infrastructure, build sustainable supply chains, de-risk aspects of civil construction, and provide operational experience with large-scale molten salt systems.

To accelerate this process, Kairos Power has made significant investments in establishing in-house manufacturing, construction, and critical production capabilities to achieve greater control over quality, costs, and schedule. This vertical integration strategy mitigates supply chain risk by relying primarily on raw materials and off-the-shelf components, and leveraging in-house capabilities to produce specialized parts, fuel, and molten salt coolant. At our Manufacturing Development Campus in Albuquerque, New Mexico, our team is machining components from stainless steel and graphite, producing American Society of Mechanical Engineers (ASME) U-stamped pressure vessels, fabricating modular reactor equipment skids, and demonstrating processes for mass-producing TRISO particles and graphite fuel pebbles.

We built our first Engineering Test Unit (ETU 1) at our Albuquerque facility in 2023. It was the world's largest Flibe system, completing more than 2,000 hours of pumped salt operations and testing key systems, including salt loading, reactivity control, pebble handling, and chemistry control. ETU 1 generated hundreds of lessons that are helping to optimize systems in the next iteration. It also illuminated supply chain challenges that have directly influenced our vertical integration strategy, including the decisions to bring graphite machining and vessel manufacturing in-house. ETU 1 was deactivated and decommissioned in 2024.



Engineering Test Units 2 (ETU 2) and 3 (ETU 3) are currently under construction. With ETU 2 in Albuquerque, we are piloting modular reactor construction, packaging systems into over 30 modular equipment skids that are built in a quality-controlled factory environment and then assembled like building blocks. ETU 2 is essentially a non-nuclear template for the Hermes reactor, with skids designed to be transportable by truck or rail. ETU 2 also features the first U-stamped reactor vessel fabricated at our in-house vessel shop.

ETU 3 is under construction in Oak Ridge. Unlike ETU 2, the third iteration will not contain molten salt coolant. Instead, its mission is to demonstrate robotic remote-handling capabilities that will be essential to the operation and maintenance of our commercial fleet, enhancing worker safety and increasing reactor uptime. ETU 3 has already yielded valuable lessons in manufacturing and construction. ETU 3 has been an opportunity for Kairos Power to test electron beam welding – an advanced manufacturing technique with the potential to dramatically reduce the time involved in fabricating high-quality reactor vessels. The building that houses ETU 3 has served as a test bed for installing drilled piers, allowing us to fine-tune our construction process and quality assurance checklists before replicating them 100 yards away for the Hermes reactor building foundation.

Kairos Power’s Demonstration Phase: A Series of Firsts

In 2024, Kairos Power broke ground on the Hermes Low-Power Demonstration Reactor in Oak Ridge, Tennessee. It was the first Generation IV reactor to be approved for construction by the U.S. Nuclear Regulatory Commission (NRC), and the first non-light-water reactor to receive a construction permit in the United States in over 50 years.

This permit was the result of years of rigorous engagement with the NRC beginning in 2018. Kairos Power conducted extensive pre-application engagement with the agency, submitting 15 topical reports, 14 of which have been approved (1 is still under review). These topical reports formalize our approach to key regulatory and safety topics and provide a mechanism for securing NRC alignment on critical issues prior to formal license application submissions. This early and thorough pre-application engagement enabled an accelerated review timeline of just over two years for the Hermes Construction Permit Application, a process that has historically taken far longer.

In November 2024, the NRC approved the construction permit for Hermes 2, an electricity-producing demonstration plant that will be Kairos Power’s first plant to supply power to the U.S. grid. Notably, the NRC completed its review of the Hermes 2 application in just over one year — four months ahead of schedule. This efficiency was enabled by the iterative licensing precedents established through Hermes 1.

In May 2025, Kairos Power completed its first installation of nuclear safety-related concrete for the Hermes Low-Power Demonstration Reactor, marking the official start of nuclear construction on our Oak Ridge project. Since then, our crew successfully installed 52 drilled piers extending 40 feet below grade to anchor the reactor building to bedrock and is now starting on the mat slab that will support the seismic isolation system, further stabilizing the structure. These activities are ongoing today, representing one of the only active advanced nuclear reactor construction



projects in the United States.

In support of our milestones, Kairos Power engages with the various national laboratories to accelerate innovation and conduct meaningful research and development that is utilized in our technology. We are working with Los Alamos National Laboratory to produce TRISO pebbles for our Hermes Low-Power Demonstration Reactor at the Low-Enriched Fuel Fabrication Facility. This partnership reflects the government's strategic investments towards strengthening the domestic nuclear fuel cycle.

In support of our milestones, Kairos Power engages with the various national laboratories to accelerate innovation and conduct meaningful research and development that is utilized in our technology. We are working with Los Alamos National Laboratory to produce TRISO pebbles for our Hermes Low-Power Demonstration Reactor at the Low-Enriched Fuel Fabrication Facility. This partnership reflects the government's strategic investments towards strengthening the domestic nuclear fuel cycle.

Kairos Power also partners with DOE's Manufacturing Demonstration Facility at Oak Ridge National Laboratory to demonstrate advanced manufacturing and construction methods that will create and reshore American manufacturing capabilities. At our Oak Ridge site, we are showcasing the innovative use of 3D-printed polymer composite forms to cast modular concrete shielding structures with complex geometries. The technique allows us to produce shapes that would not be possible with wood or steel forms, achieve the tight tolerances required for nuclear systems, and drive down costs and schedules as we scale up the construction technique for our future commercial fleet.

Kairos Power's Deployment Strategy: A New Model for American Nuclear Energy

In August 2024, Kairos Power announced a landmark tri-party collaboration with the Tennessee Valley Authority (TVA) and Google to address the surging demand for energy while advancing America's leadership in both advanced nuclear and digital technologies. Through a Power Purchase Agreement (PPA) between Kairos Power and TVA, the Hermes 2 Demonstration Plant will deliver up to 50 MW of reliable, clean energy to the TVA grid, which powers Google data centers in Tennessee and Alabama.

This is the first PPA in which a U.S. utility has agreed to purchase electricity from an advanced Generation IV reactor, and the first deployment under Kairos Power's landmark deal with Google to build up to 500 MW of new nuclear generation by 2035. In this initial phase, Google will procure clean energy attributes through the TVA system to support decarbonization of its data center operations in Montgomery County, Tennessee, and Jackson County, Alabama, while supporting future regional growth.

Lessons learned from Hermes 2 will optimize KP-FHR technology, enable subsequent commercial deployments for Google, and help drive down costs for future reactors and customers. This partnership represents an innovative model for how industrial energy users can meet their growing needs responsibly while driving local economic growth and opportunity. The tri-party structure protects electricity customers by limiting development costs to early movers



while helping bring costs down for future customers as additional units are deployed.

Building a Domestic Critical Minerals Supply Chain: Lithium-7 and Flibe

Critical minerals are fundamental to America’s energy independence and national security, and nowhere is this more apparent than in the nuclear sector. In 2023, DOE added lithium to its Critical Materials List, recognizing its importance across energy technologies. This designation has been reinforced by Executive Orders 14154 and 14272, which together direct the elimination of regulatory barriers to domestic mineral production and mandate a national security investigation into America’s dependence on foreign-processed critical minerals. These orders have direct implications for nuclear energy: China currently controls a dominant share of global lithium refining capacity and has demonstrated a willingness to use mineral supply chains as geopolitical leverage. Achieving the nation’s goal of 400 gigawatts of new nuclear capacity by 2050 will require securing a resilient, domestic supply of these materials — and Kairos Power is building that supply chain today.

As described above, Kairos Power reactors require Flibe enriched in lithium-7 to greater than 99.99% purity. The challenge is significant: no domestic supplier currently produces lithium-7 at the volumes required for commercial nuclear deployment, historical U.S. stockpiles are projected to be exhausted in the early 2030s, and the remaining supply can only be imported from Russia. Kairos Power has spent several years developing an environmentally responsible, proprietary chemical process to isolate lithium-7, advancing the technology from bench-scale R&D. Starting in 2019, Kairos completed a series of pilot-scale demonstrations that established the foundation for commercial scale-up.

In 2024, Kairos Power broke ground on our Salt Production Facility (SPF) in Albuquerque, New Mexico, which will produce high-purity Flibe coolant for our advanced reactors, starting with the Hermes series. Demand for enriched lithium extends well beyond Kairos Power’s own reactors. Pressurized water reactors across the existing U.S. fleet use enriched lithium hydroxide to control coolant pH and reduce corrosion, with the World Nuclear Association estimating domestic demand at approximately 400 kilograms annually. As molten salt reactors scale to commercial deployment, demand is expected to grow to tens of tonnes or more of pure lithium-7 (“Current”, 2024). Our Salt Production Facility will have enough capacity to potentially supply enriched lithium to the entire U.S. nuclear industry, making it not merely a Kairos Power asset, but a critical piece of national energy infrastructure.

Aligning with Strategic Government Incentives: The ARDP and Milestone-Based Contracting

In December 2020, under the first Trump Administration, Kairos Power was selected by the DOE to receive funding through the Advanced Reactor Demonstration Program (ARDP) Risk Reduction tier to support the design, construction, and commissioning of the Hermes demonstration reactor. Upon being selected, our team recognized that the structure of the agreement would be as important as the funding itself. We needed a framework that would allow us to move with speed and flexibility, while deploying our resources with maximum effectiveness. We strongly believed that a milestone-based contract, a model previously utilized



by the Department of War and by NASA's COTS program, was the only approach capable of achieving that balance. Milestone-based contracting further supports a good of governance mindset, since private companies are responsible for up-front costs and potential delays, this approach further places government into the role of an investor seeking results not work. After negotiation with DOE, we executed a fixed-support Technology Investment Agreement in February 2024 that provides \$303 million in milestone payments – the first milestone-based contract of its kind under DOE.

This novel approach rewards progress by releasing fixed payments to Kairos Power only upon demonstrated achievement of predetermined, significant project milestones. The principle is straightforward: we are only paid when we deliver. DOE funds results, not work. Since being selected for the ARDP award, Kairos Power has made steady and measurable progress along our pathway to demonstration. Among the major milestones achieved to date are financial milestones, the successful commissioning and decommissioning of our Engineering Test Unit 1, the acquisition of the Hermes site, and our NRC milestones for fuel and material qualification plans as well as the issuance of our construction permits.

We believe milestone-based contracting should become the standard for strategic government incentive programs seeking to bring innovative technologies to commercialization. This model reduces administrative burden for both the recipient and the government, and establishes a fiscally responsible, transparent mechanism for distributing federal funds. It requires companies to carry real skin in the game, bearing the upfront capital risk necessary to achieve each milestone before any federal payment is triggered. That structure incentivizes efficiency, drives performance, and establishes the credibility to deliver. It is a model that serves the American taxpayer, as well as the companies and technologies it is designed to advance.

Advancing Advanced Nuclear: Policy Recommendations

The progress Kairos Power has achieved to date is the result of bold private investment, alignment with strategic government incentives, and a regulatory environment that has been evolving in the right direction. To fully realize the potential of advanced nuclear energy for America's energy leadership, we urge the Committee to consider the following priorities:

- Sustain and expand the Advanced Reactor Demonstration Program (ARDP): The ARDP funding model, which provided Kairos Power with critical early-stage support under the first Trump Administration, has proven its value. Continued investment in this program will de-risk next-generation technologies and accelerate the transition from demonstration to commercial deployment.
- Champion milestone-based contracting as the standard for government investment into the development of capabilities and outcomes: In February 2024, Kairos Power finalized the first milestone-based contract under DOE, a Technology Investment Agreement worth up to \$303 million. The milestone approach pays recipients only upon achievement of predetermined, significant project milestones, ensuring that government funds flow only for results, not work. It requires companies to have real skin in the game, reduces administrative burden for both parties, and drives efficiency and accountability. We



strongly encourage this model to become the standard for federal energy innovation programs.

- Pursue an all-of-government approach to energy innovation: While DOE has been the primary federal partner for advanced nuclear development, there are significant opportunities to leverage other agencies, including the Department of Commerce, the Department of War, and the Export-Import Bank, to accelerate commercialization, support domestic manufacturing, and expand American nuclear exports globally. Furthermore, there is continued opportunity to fully leverage R&D tax incentives as well as expanding the investment and production credits.
- Secure domestic supply chains for critical nuclear materials: HALEU and enriched lithium-7 are both essential to the advanced nuclear sector and both face acute supply chain vulnerabilities. The United States lacks a commercial-scale supply of HALEU therefore continued federal support is needed for the development of domestic enrichment to ensure a reliable fuel supply for advanced reactors and reduce reliance on foreign sources. Similarly, there is no domestic lithium-7 enrichment capacity; existing stockpiles will be exhausted in the early 2030s, and current imports depend on Russia. As a matter of national energy security, Congress and the Administration should prioritize investment in domestic enrichment and processing infrastructure such as Kairos Power's Salt Production Facility.

Closing

The United States is at a pivotal moment in its energy history. The convergence of soaring electricity demand, heightened concerns over cost and reliability, and the urgent need for clean baseload power to support U.S. energy security creates an extraordinary opportunity – and obligation – for advanced nuclear energy. Kairos Power is proud to be building that future, right now, in Oak Ridge, Tennessee, and at our sites around the country.

The progress we have made – from concept to construction in under a decade – demonstrates what is possible when innovative private companies, visionary government partners, and world-class national laboratories work together toward a shared mission. We are grateful for this Committee's leadership, its continued commitment to enabling American nuclear energy, and the critical role it has played in creating the policy environment that makes our work possible.

I look forward to continuing to work with this Committee to advance the policies and investments that will ensure American energy leadership for generations to come.



References

Batra, L., Harris, D., Katsigiannakis, G., Mackovyak, J., Parmar, H., & Scheller, M. (2025, May 20). *Rising current: American's growing electricity demand*. ICF International. https://www.icf.com/-/media/files/icf/reports/2025/energy-demand-report-icf-2025_report.pdf?rev=c87f111ab97f481a8fe3d3148a372f7f

Current and Future Generation - Lithium. World Nuclear Association. (2024, August 23). <https://world-nuclear.org/information-library/current-and-future-generation/lithium#:~:text=In%202013%20the%20US%20Department,a%20different%20pH%20control%20process>).

