DEPARTMENT OF ENERGY

Request for Information on Establishment of Nuclear Lifecycle Innovation Campuses

AGENCY: Department of Energy.

ACTION: Request for information (RFI).

SUMMARY: The United States is undertaking an initiative to reestablish global leadership in nuclear energy, guided by Executive Orders signed on May 23, 2025. The U.S. Department of Energy (DOE, or Department) seeks input from states interested in hosting potential Nuclear Lifecycle Innovation Campuses to anchor integrated, full-cycle nuclear ecosystems that could co-locate and support the entire nuclear value chain while exploring durable pathways for managing used nuclear materials in a safe, secure, and fiscally responsible manner. These campuses must support functions such as fuel fabrication, enrichment, reprocessing used nuclear fuel, and disposition of waste, and could additionally support functions such as advanced reactor deployment, power generation, advanced manufacturing, and co-located data centers, through integrated, forward-looking solutions, consistent with national safety, security, stewardship, long-term and fiscal responsibility goals.

States are invited to indicate their interest and provide constructive feedback on the structure of the Innovation Campuses by submitting a clear articulation of their strategic priorities-- such as workforce development, infrastructure investment, economic diversification, or technology leadership-- along with their proposed appropriate scope of the Innovation Campuses and the specific funding structures, risk-sharing approaches, and other support, incentives, or federal partnerships they would require to successfully host and sustain an Innovation Campus. DOE seeks information on approaches that (1) prioritize private and state capital; (2) rely on targeted, conditional, and time-limited federal support, subject to the availability of appropriations and statutory authority; and (3) include robust financial assurances to protect federal taxpayers from open-ended liabilities. DOE envisions significant workforce development, environmental safeguards, and proliferation-resistant operations. This initiative has the potential to generate significant benefits, improve energy security and enhance international nuclear leadership.

DATES: Responses to the RFI are requested no later than April 1, 2026. States are strongly encouraged to respond as soon as possible, as submissions will be reviewed on a rolling basis.

ADDRESSES: Responses should be submitted electronically to nlic-rfi@nuclear.energy.gov and include ‘‘Nuclear Lifecycle Innovation Campus RFI Response’’ in the subject line of the email. Any information that may be business proprietary and exempt by law from public disclosure should be submitted as described in Section VI of this document.

FOR FURTHER INFORMATION CONTACT: Questions may be addressed to Bryan Kellogg, Deputy Assistant Secretary for Intergovernmental Affairs, through Bryan.Kellogg@hq.doe.gov or by phone at (240) 997–7773.

SUPPLEMENTARY INFORMATION:

I. Background

The United States is exploring the concept of a private sector led initiative to establish comprehensive Nuclear Lifecycle Innovation Campuses (Innovation Campuses). This initiative directly aligns with the Executive Orders signed on May 23, 2025- Reinvigorating the Nuclear Industrial Base (14302), Deploying Advanced Nuclear Reactor Technologies for National Security (14299), Ordering the Reform of the Nuclear Regulatory Commission (14300), and Reforming Nuclear Reactor Testing at the Department of Energy (14301). Collectively, these Executive Orders underscore the urgent national imperative to secure economic resilience, energy independence, national defense, and technological leadership. The creation of modern, secure, sustainable, and fully integrated nuclear campuses could play an important role in this effort.

For more than seventy years, DOE and its National Laboratories have been at the forefront of nuclear science and technology, driving innovation in advanced reactor designs, advanced manufacturing, accident-tolerant fuels, proliferation-resistant fuel cycles, and sustainable waste management solutions. This legacy of leadership makes DOE an ideal partner for federal-state collaborations to develop integrated Innovation Campuses that would serve as a model for innovation, safety, and economic growth. The envisioned Innovation Campuses would focus primarily on fuel fabrication, enrichment, used nuclear material reprocessing or recycling, advanced separations, and the management of waste streams, but could also fully integrate, and to the extent possible, co-locate the entire nuclear value chain. This integration could span research and development (R&D), uranium mining and milling, conversion, deconversion, advanced reactor deployment, advanced manufacturing, and data center construction and operations. The Innovation Campuses could also support isotope production for medical, industrial, and national security applications, and ensure proliferation resistance through advanced safeguards, material control, and compliance. These facilities could also serve as testbeds for next-generation reactors, microgrids, and energy storage solutions, further accelerating the deployment of advanced energy technologies.

Workforce development, as articulated in Executive Order 14302, will be central to the success of these Innovation Campuses. Campuses would ideally prioritize training, apprenticeships, and partnerships with universities and technical colleges to cultivate a new generation of nuclear scientists, engineers, operators, and skilled trades all operating in a safe environment. These efforts could create thousands of high-paying jobs and foster a culture of safety, innovation, and excellence.

Environmental stewardship and public trust will be ensured through robust monitoring programs, radiological safety protocols, and strict compliance with streamlined federal and state regulatory frameworks. The private sector's experience in site characterization, permitting, and community engagement, are anticipated to facilitate transparent, science-based decision-making and long-term public support.

The economic impact of these Innovation Campuses is projected to be potentially significant, with investments and economic activity that could reach billions of dollars over the coming decades, subject to market conditions, policy choices, future budget decisions, and availability of appropriations. Host states and communities may benefit from regional development, infrastructure upgrades, and increased recognition in nuclear energy, technology, and security. Innovation Campuses may also enable the export of advanced reactors, nuclear fuels, and related technologies, strengthening international partnerships and U.S. leadership in the global nuclear market.

Through this RFI, the Department of Energy (DOE) seeks information from states interested in hosting Innovation Campuses. Candidate sites would need to offer sufficient land to accommodate enrichment plants, fuel fabrication facilities, advanced reactor demonstration and testing complexes, reprocessing plants, waste storage and disposal capabilities, data centers, and supporting industries, as applicable based on the sites' proposed scope, as well as the infrastructure needed for secure transportation and long-term monitoring. Ideal sites would also provide robust infrastructure and secure physical and cyber systems and demonstrate strong state and local government support to ensure public acceptance and long-term success, including a willingness to share financial responsibility and provide financial assurances, to the maximum extent permitted by law, for decommissioning, long-term waste management, and site remediation.

II. Innovation Campus Functions and Capabilities

DOE envisions these campuses would be deployed quickly, with initial facilities online in the 2027 timeframe. The following non-exhaustive functions and characteristics of Innovation Campuses are illustrative and are intended to guide respondents in preparing responses. These examples do not represent final design decisions or limitations. DOE encourages bold, innovative, and constructive feedback that spans the full nuclear lifecycle. To foster innovation, DOE envisions minimizing prescriptive constraints allowing states and private-sector partners to tailor responses to regional strengths and national goals. State input is essential to shaping the technical, programmatic, and regulatory framework, ensuring visionary yet feasible configurations.

States should indicate when they believe they could begin construction and commence operations on Innovation Campuses within the scopes of their proposals. Preference will be given to States with more ambitious timelines.

1. **Nuclear Fuel Reprocessing or Recycling**

Scope: Reprocessing facilities could recover uranium, plutonium, and other isotopes from used nuclear fuel for reuse. Recovered uranium can be re-enriched, while plutonium may be fabricated into metal fuel for fast reactors or into mixed-oxide (MOX) fuel for light water reactors. The Innovation Campuses could build on existing research to develop industrially scalable, proliferation-resistant methods that enhance fuel cycle efficiency and deploy the latest safeguard technologies to ensure that separated products can be securely managed and reused to produce fuel for conventional and advanced reactors. The facilities could also separate waste products into a distinct stream, which will require stabilization into engineered waste forms suitable for secure storage and long-term disposal. Resulting high-level waste (HLW), excess used nuclear fuel (UNF), and secondary waste from reprocessing would be treated, stored, and disposed of in accordance with federal, state and local regulations.

Expected Infrastructure: Large commercial complexes incorporating reprocessing plants, waste treatment facilities, isotope separation systems, and fuel fabrication units. Specialized chemical processing facilities, hot cells, and integrated waste handling systems co-located with reprocessing plants. These facilities will require significant power and water resources.

Workforce: Requires many construction jobs as well as more permanent positions including specialized jobs for chemists, nuclear engineers, and process operators.

2. **Disposition of Waste Streams**

Scope: Innovation Campuses could develop and implement safe and compliant disposal solutions for materials requiring long term management, as in interim storage or recycling, and permanent final disposition.

Expected Infrastructure: Geologically stable sites, drilling or excavation equipment, and long-term monitoring systems. Requires extensive regulatory compliance and public engagement.

3. **Fuel Fabrication for Fresh and Reprocessed Material**

Scope: Fuel fabrication facilities could produce fuel assemblies for light water reactors (LWRs), small modular reactors (SMRs), microreactors, and fast reactors. They could use low-enriched uranium (LEU), high-assay low-enriched uranium (HALEU), and potentially MOX fuel for plutonium-based systems. Innovation Campuses could develop advanced fuel forms (e.g., TRISO, metallic, fast reactor fuels) to enhance safety and performance, supporting both civilian power generation and defense applications.

Expected Infrastructure: Precision manufacturing facilities, hot cells for handling radioactive materials, quality control systems and secure storage for fuel assemblies.

Workforce: Manufacturing technicians, nuclear engineers, and quality assurance specialists.

4. Conversion for Fresh and Reprocessed Material

Scope: Conversion transforms yellowcake into uranium hexafluoride (UF6) for enrichment, a critical step in the uranium fuel cycle. Facilities located within Innovation Campuses could use chemical processes to produce high-purity uranium hexafluoride (UF6), suitable for LEU and HALEU. The Campuses could also explore advanced conversion methods to improve efficiency and reduce waste.

Expected Infrastructure: Chemical processing plants, secure storage for UF6 cylinders, and waste treatment systems. Facilities must comply with radiological safety and environmental regulations.

Workforce: Requires chemical engineers, process operators, and safety specialists.

5. Uranium Enrichment for Fresh and Reprocessed Uranium

Scope: Enrichment increases the proportion of uranium-235 to uranium-238 to produce usable nuclear fuel. Concentrations are categorized as follows: LEU, used in most commercial reactors, contains approximately 3–5% U-235; HALEU intended for most advanced reactors, has a U-235 concentration between greater than 10% and less than 20%. Highly enriched uranium (HEU), primarily used for defense applications and specialized reactors, contains 20% or more U-235. Campuses could explore building or expanding uranium enrichment facilities.

Expected Infrastructure: High-security enrichment plants, power-intensive systems (100–300 MW per plant), and robust safeguards to prevent proliferation.

Workforce: Engineers, technicians, and security personnel.

6. Deconversion for Fresh and Reprocessed Material.

Scope: Deconversion transforms UF6 into solid forms suitable for fuel fabrication, often uranium dioxide (UO2). Facilities use chemical processes to convert UF6 into intermediary compounds before reducing and converting them into UO2 powder, which can be fabricated into fuel pellets, TRISO particles, or other fuel forms. This activity would require chemical processing plants, secure UF6 cylinder storage, and other equipment.

Expected Infrastructure: Chemical processing plants, secure UF6 cylinder storage, reduction furnaces, and processing equipment.

Workforce: Requires chemical engineers, process operators, and safety specialists at each facility.

7. **Data Center Construction and Operations**

Scope: Innovation Campuses may host nuclear-powered data centers, classified as critical defense infrastructure, to support high-performance computing for national security, scientific research, and commercial applications. The Campuses' unique combination of nuclear expertise, secure infrastructure, and proximity to advanced reactor deployment may attract leading technology companies to establish data centers within or near the Innovation Campuses.

Expected Infrastructure: High-security data centers will require: advanced cooling systems (e.g., liquid cooling for high-density servers); robust cyber infrastructure (e.g., quantum-resistant encryption, redundant networks); dedicated nuclear power sources (e.g., SMRs or microreactors) capable of servicing load; acres of land, secure perimeters, and high-bandwidth telecommunications access; and supporting infrastructure to ensure uninterrupted operation. Co-location with large nuclear reactors or SMRs necessitates proximity to reactor sites with cooling water access, water rights, and radiological safety systems. The clustering of data centers may drive demand for additional SMRs and large nuclear reactors, requiring multiple reactors per data center to meet power needs, and further integrating nuclear and digital infrastructure.

Workforce: Information technology (IT) specialists, data scientists, cybersecurity experts, nuclear engineers, reactor operators, and construction workers. Each data center could employ a direct workforce, while associated SMRs and large nuclear reactors will add operations and maintenance roles.

8. **Advanced Reactor Deployment**

Scope: Innovation Campuses may serve as testbeds and deployment sites for advanced reactors, in support of the long-term goal of achieving 400 gigawatts (GW) of nuclear capacity in the United States by 2050. Deployment could include electric power generation and process heat production that could support other on-site or nearby energy intensive infrastructure such as nuclear fuel-cycle facilities or AI data centers, national security and defense applications and powering AI data centers.

Expected Infrastructure: Reactor sites with cooling systems, transmission infrastructure, and integrated safety systems.

9. **Uranium Mining and Milling**

Scope: Extraction of uranium ore and processing it into uranium oxide (U_3O_8, or "yellowcake") for conversion, in compliance with environmental and safety standards.

Expected Infrastructure: Access to uranium deposits (if available), heavy equipment, and supporting facilities.

Workforce: Miners, equipment operators, and environmental specialists. Import-focused Innovation Campuses shift jobs to logistics and processing.

10. **Isotope Production for Medical, Industrial, and National Security Applications**

Scope: Innovation Campuses could produce critical isotopes such as molybdenum-99 for medical imaging, cobalt-60 for industrial applications and actinides for national security-using reactors or accelerators-based systems. These capabilities could strengthen U.S. leadership in isotope supply chains, reduce reliance on foreign sources, and support both civilian and defense needs.

Expected Infrastructure: Research and production reactors, hot cells for isotope handling, radiochemistry laboratories, and secure storage and distribution facilities.

Workforce: Radiochemists, nuclear engineers, medical physicists, and production technicians.

11. **Advanced Manufacturing and Other Support Industries**

Scope: Innovation Campuses could catalyze a broad ecosystem of secondary and tertiary support industries, including: manufacturing (e.g., reactor components, cooling systems, construction materials); services (e.g., maintenance, logistics, security, IT support); housing and community development (e.g., residential areas for workers and their families, supported high-quality schools, hospitals, and recreational facilities); and ancillary sectors (e.g., healthcare, education, retail, hospitality). Ecosystems should support the operational needs of the Innovation Campuses and accommodate workforce growth, creating vibrant regional economic clusters.

Infrastructure Requirements: Industrial parks for manufacturing, service centers for logistics and maintenance, residential developments, and community infrastructure (e.g., high-quality schools, hospitals, retail centers). Requires robust utility networks (power, water, telecommunications), transportation systems (roads, rail, airports), and urban planning to support population growth.

Workforce: Manufacturing technicians, construction workers, electricians, IT specialists, security personnel, healthcare providers, educators, and retail workers. Housing development would require construction and real estate roles, while hospitality and retail industries could also expand to support community growth.

12. **Proliferation Resistance through Advanced Safeguards, Material Control, and IAEA Compliance**

    Scope: Reducing proliferation risks across the nuclear fuel cycle is a long-standing U.S. national security objective. Innovation Campuses must implement advanced safeguards, and material protection, control, and accountability systems to prevent unauthorized use of nuclear materials. Measures may include real-time monitoring, secure storage of products and fresh fuel, and compliance with IAEA standards.

    Expected Infrastructure: High-security facilities, advanced monitoring equipment, and cyber-secure data systems to track nuclear materials.

    Workforce: Employs safeguards specialists, security personnel, and cybersecurity experts.

13. **Workforce Development**

    Scope: Innovation Campuses may establish training academies, apprenticeships, and partnerships with universities, technical colleges, and labor organizations to cultivate a skilled workforce in nuclear science, engineering, operations, and cybersecurity.

14. **Safety**

    Scope: Innovation Campuses must implement advanced technologies and protocols to ensure public safety near facilities handling nuclear materials. This includes continuous monitoring, emergency preparedness, and transparent communication with surrounding communities.

    Expected Infrastructure: Radiological safety systems, emergency response facilities, and community outreach centers.

    Workforce: Safety officers, community liaisons, radiological experts, as well as software and hardware developers.

15. **Environmental Stewardship**

    Scope: Innovation Campuses must adopt advanced environmental monitoring systems, radiological safety protocols, and strict compliance with federal and state regulations to protect the environment and public health. Activities will include air and water quality monitoring, radiation detection, and proactive public engagement to build trust and ensure compliance.

    Expected Infrastructure: Environmental monitoring stations, radiological safety systems, and community outreach centers.

    Workforce: Environmental scientists, safety officers, and community liaisons.

16. Secure Transportation Networks

Scope: Secure transportation systems would move nuclear materials (e.g., UF6, fuel assemblies, UNF, isotopes) and waste between Innovation Campus facilities and external sites (e.g., LLW disposal sites, international export ports). Transport could include rail, road, and potentially maritime systems, meeting all DOE, DOT and NRC requirements.

Expected Infrastructure: Dedicated transportation routes, specially designed rail cars, secure vehicles, and tracking/monitoring systems to ensure safety and safeguards compliance.

Workforce: Logistics coordinators, drivers, and security personnel.

17. Decommissioning and Site Remediation

Scope: Innovation Campuses must plan for the eventual decommissioning of reactors, fuel cycle facilities, and other infrastructure, including site remediation to restore land for future use. Activities would include dismantling facilities, managing residual waste, and ensuring long-term environmental protection.

Expected Infrastructure: Decommissioning equipment, waste storage systems, and remediation facilities integrated with disposal facilities.

Workforce: Decommissioning specialists, environmental engineers, and waste managers.

Benefits to the host states:

The establishment of a comprehensive Innovation Campus offers opportunities for host states to advance nuclear innovation, energy security, and long-term economic development while assuming substantial responsibilities for environmental, safety, and fiscal stewardship. By integrating the critical functions described previously, Innovation Campuses could transform host state economies through significant investment, job creation, and infrastructure development, but also require sustained commitment to regulatory compliance, long-term waste management, and decommissioning.

Economic Impact

Innovation Campuses have the potential to deliver substantial economic activity over many decades, driven by direct investments, job creation, and secondary economic activity, recognizing that such outcomes will depend on project specific decisions, market conditions, and the availability of private and state capital.

- Direct investment: The construction and operation of Innovation Campus facilities—including R&D centers, enrichment plants, reprocessing facilities, advanced reactors, advanced manufacturing, data centers, and waste management infrastructure—could require and generate tens of billions of dollars in aggregate investment over time, largely from private and state sources.

- Job creation: Innovation Campuses could create high-quality jobs, both direct and indirect, across diverse sectors. Direct employment may include:
  - R&D: Scientists, engineers, and data analysts for nuclear research and AI development.
  - Fuel Cycle Operations: Workers for mining, milling, conversion, enrichment, and fuel fabrication, including specialized roles for plutonium handling.
  - Reactor Deployment: Reactor designers, construction workers, reactor operators, and maintenance technicians for large reactors, SMRs, microreactors, and fast reactors.
  - Data Centers: IT specialists, data scientists, and cybersecurity experts.
  - Waste Management: Engineers and scientists to design, build, and operate waste management systems.
  - Support Industries: Manufacturing (e.g., reactor components), services (e.g., logistics, maintenance), housing, healthcare, and retail.
- The U.S. nuclear industry currently employs ~80,000 workers. A single Innovation Campus could dramatically increase this figure in the host state, particularly for high-paying, specialized nuclear and other technical roles. Indirect jobs in construction, supply chains, and community services could add another 2–3 jobs per direct job. For example, an Innovation Campus employing 50,000 direct workers might generate 100,000–150,000 indirect jobs, contributing billions annually in wages to the state economy, depending on the proposed scope and size of the Innovation Campus.

- Economic multipliers: Innovation Campuses may stimulate secondary and tertiary industries, potentially creating a multiplier effect on local and regional economies. Constructing industrial parks, residential communities, high quality schools, hospitals, and retail centers could support substantial economic development over the coming decades.

- Fiscal impacts: Innovation Campuses may generate state and local tax revenue through corporate taxes, property taxes, sales taxes, and income taxes from workers, depending on state tax structures and project configurations. States should evaluate how potential tax revenues could fund long-term obligations (for example, decommissioning, environmental monitoring, and community benefit programs), and describe how they could mitigate the need for future state or federal assistance.

Societal and Community Benefits

Beyond economic gains, Innovation Campuses may provide long-term societal benefits to local communities, including high-quality employment opportunities, educational and training programs, and infrastructure improvements. These benefits should be designed and implemented alongside robust community engagement, and clear communication of risks and responsibilities associated with long-term waste management or site remediation.

- Community Development: The influx of workers and families may drive the creation of new or expanded communities, including housing, schools, hospitals, and recreational facilities. For example, 50,000 workers could require 10,000–20,000 housing units, spurring real estate investment. These developments could create vibrant, high-income, sustainable communities with access to modern amenities, improving living standards and attracting further investment. States are encouraged to plan for these developments, as relevant based on the applicable scope of the proposed Campus, using tools such as impact cees, user charges, and other state or locally administered mechanisms.

- Workforce Development and Education: Training academies, apprenticeships, and university partnerships may create a pipeline of skilled workers in nuclear science, engineering, AI, and related fields. States could leverage DOE's National Laboratories to develop world-class educational programs. This could elevate the state's educational infrastructure, attract top talent, and provide lifelong career opportunities for residents- reducing unemployment and boosting social mobility. States should describe how they will fund and sustain these programs over time, including through partnerships with private entities and educational institutions, and how they will leverage but not rely exclusively on federal grants.

- Community Benefit Sharing: States may negotiate community benefit agreements to provide to host communities direct advantages, such as job training programs, infrastructure upgrades, and support for schools and healthcare.

- Energy Access and Affordability: Advanced reactors at the Innovation Campus could provide reliable and affordable energy to the state's grid, supporting AI data centers, industrial parks, and residential communities.

Environmental and Safety Benefits

While nuclear endeavors present challenges, the Innovation Campuses should be proposed and designed to minimize undue risks and deliver significant environmental benefits:

- Robust Public Safety Stewardship: Innovation Campuses may implement advanced radiological safety protocols, environmental monitoring, and promote inherently safe reactor designs, all in compliance with federal and state regulations. Technologies such as real-time radiation monitoring, advanced waste treatment, and secure transportation systems could mitigate risks associated with mining, reprocessing, and waste disposal. Deep geologic disposal facilities (including boreholes) for HLW would ensure safe, long-term isolation of radioactive waste, protecting communities and ecosystems.

- Reliable Energy Leadership: A single Innovation Campus could generate 2–5 gigawatts of power, positioning the state as a leader in energy and attracting energy-intensive industries and associated jobs.

- Sustainable Fuel Cycles: Reprocessing and advanced separations can reduce the volume and radiotoxicity of waste, including HLW, that needs long term management, by recovering uranium and plutonium for reuse, and putting the remaining waste into an engineered waste form designed for permanent disposal.

- Risk Mitigation through Technology: Innovation Campuses could leverage AI-driven predictive maintenance, digital twins, and proliferation-resistant technologies to enhance safety and security.

Strategic and National Benefits

Hosting an Innovation Campus could position the state as a critical player in both national and global arenas:

- National Security Contributions: Innovation Campuses may support defense applications, such as isotope production for national security. This could elevate host states' strategic importance, fostering federal partnerships and sustained funding.

- Global Leadership in Nuclear Innovation: By developing infrastructure for international exports of reactors, fuels, and isotopes, the state could position itself as a global center for nuclear technology. This could generate significant export revenue for private industry, in addition to potential state tax revenue, while strengthening U.S. alliances.

- Technological Innovation Center: The integration of data centers and R&D facilities could make the state an attractive location for technology companies, researchers, and innovators. This synergy between nuclear science, data centers, and clean energy could attract billions in additional investment, driving breakthroughs across multiple sectors.

III. Addressing Challenges and Risks

The primary challenges associated with nuclear development—such as addressing the fuel cycle and waste, proliferation risks, and public concern—are manageable through advanced technology, robust regulation, and proactive engagement. DOE seeks information from states on how they plan to address these challenges.

DOE expects the benefits of economic growth, job creation, clean energy, and global leadership to outweigh challenges, as the Innovation Campuses should be designed with cutting-edge technologies and robust regulatory frameworks to ensure safety, sustainability, and public trust.

DOE-Host State Agreement

Innovation Campuses will require formal agreements between DOE and host states to define roles, responsibilities, and commitments, including clear allocation of financial risk and long-term obligations. The agreement should align the Innovation Campuses' functions with a balanced approach towards economic opportunity, safety, security, and fiscal stewardship.

Purpose

A legally binding agreement between DOE and a host state would establish a framework to support the development, operation, and long-term management of a comprehensive nuclear ecosystem integrating the functions and capabilities described in Section II. The agreement would aim to:

- Facilitate Site Development: Ensure state support for site selection, infrastructure, and regulatory approvals on federal or state-provided lands, including state commitments to provide or facilitate necessary transportation, utility, and security infrastructure.

- Secure Economic Benefits: Enable the state and private sector to capture potential economic benefits through private investment and state and federal funding, as specified in the agreement.

- Address Environmental and Safety Concerns: Balance nuclear innovation with robust environmental stewardship, radiological safety, and long-term management of used fuel and waste, including clear allocation of responsibilities and financial assurances for decommissioning and waste management.

- Align with Executive Orders: Meet timelines and national security objectives identified in Executive Orders and relevant statutes.

Legal Framework and Authorities

The agreement would be grounded in existing and any applicable future federal authorities, ensuring enforceability, including:

- Atomic Energy Act of 1954: Authorizes DOE to manage nuclear energy programs- including fuel cycle activities, reactor deployment, and waste management- and to enter cooperative agreements with states.

- Energy Policy Acts of 1992 and 2005: Enables DOE to provide financial assistance (e.g., cost-sharing, loan guarantees) and enter cooperative agreements for nuclear projects, as demonstrated in the Advanced Reactor Demonstration Program (ARDP).

- Defense Production Act (DPA): Allows DOE to enter voluntary agreements with states and private entities to prioritize critical materials (e.g., HALEU, isotopes) and infrastructure, as referenced in recent Executive Orders.

- Nuclear Waste Policy Act of 1982 (NWPA): Governs the disposal of HLW and UNF, and may allow for allocation of additional funds. The NWPA, along with the Low-Level Radioactive Waste Policy Amendments Act (LLRWPAA) may require targeted amendments to support expanded funding and waste management responsibilities.

Potential Provisions of the Agreement

A legally binding agreement could include the following key provisions, tailored to the Innovation Campus's scope and the state's role:

- Site Selection and Land Use: The agreement should specify whether they intend to use private, state, federal, or mixed land for Innovation Campus facilities, and also identify suitable sites within the state. The agreement should also specify responsibility for zoning and permitting support, as well as ownership and lease agreements for land.

- Infrastructure Development: The agreement should identify sources of private and public funding for facility-specific infrastructure. Further, the agreement should clearly delineate between state responsibility for infrastructure and federal assistance on a case-by-case basis.

- Regulatory and Permitting Support: The agreement should specify specific actions the state will take to streamline state-level environmental and zoning regulations, and the extent to which states intend to align with DOE's NEPA streamlining and NRC licensing reforms.

- Waste Management: The agreement should define responsibilities for managing used nuclear fuel and waste along with secondary waste streams.

- Workforce Development: The agreement should specify whether the state intends to establish training academies and partnerships with universities and labor organizations, and whether the state intends to use private partners to fund apprenticeships.

- Stakeholder Engagement and Community Benefits: The agreement should identify private, state, and federal roles with respect to public engagement, including outreach to local communities, Tribal nations, and environmental groups, to build support for Innovation Campus activities. The agreement should also specify whether and to what extent the state intends to execute benefit agreements to provide funding for high-quality schools, infrastructure, and workforce programs.

- Compliance and Enforcement: The agreement should contain mechanisms for monitoring and enforcement, and the state should explain whether compliance would fall under state, federal, or joint jurisdiction. Nevertheless, the agreement should recognize federal oversight responsibilities for nuclear facilities.

- Termination and Dispute Resolution: The agreement should contain conditions for dispute resolution, including mediation or arbitration, to address conflicts between DOE, the host state, and private partners. These mechanisms would ensure timely resolution of disputes while maintaining project momentum and protecting stakeholder interests.

IV. Funding

Innovation Campuses' integration of all enterprise functions create unique ecosystems, reducing costs through economies of scale and attracting investors seeking diversified revenue streams (e.g., power, fuels, isotopes). However, the development and operation of the Innovation Campuses represent a substantial multi-year undertaking. The funding model prioritizes private investment to leverage industry expertise and capital, with DOE potentially complementing these investments through cost-sharing, loan guarantees, and other mechanisms under existing authorities such as the Atomic Energy Act of 1954, the Energy Policy Act of 2005, and the DPA.

For the long-term management of material, the DOE will negotiate with the state suitable terms and conditions that are acceptable to both parties subject to appropriations and existing DOE authorities.

Private Investment as the Primary Funding Source.

Private investment should serve as the cornerstone of funding for the Innovation Campuses, driven by the significant economic opportunities and long-term revenue potential across the enterprise functions. The private sector's role is critical to achieving the scale and speed envisioned by Executive Orders, particularly for capital-intensive functions such as enrichment, reprocessing, reactor deployment, data centers and HLW disposal.

Key sources of private investment may include:

- Nuclear Industry Leaders: Established and emerging companies may invest in advanced reactor development, fuel fabrication, and reprocessing, waste management facilities, drawn by the Innovation Campuses' potential to supply fuels and reactors for domestic and global markets. For example, each Innovation Campus can host multiple advanced reactors that would generate revenue through electricity sales to grids, AI data centers, and military installations, providing stable, long-term returns for investors. Likewise, enrichment and fuel fabrication facilities could supply LEU, HALEU, and

MOX fuels to both domestic and international markets. Additionally, reprocessing and waste disposal services could generate revenue through contracts and agreements with utilities and federal agencies, including the Department of War (DoW), offsetting operational costs.

- Technology and AI Firms: Leading technology companies—particularly hyperscalers increasingly investing in nuclear-powered data centers—may fund data center construction and operations, leveraging the Innovation Campuses' reliable energy supply. Each Innovation Campus could host multiple data centers.

- Energy and Infrastructure Companies: Private firms may invest in enrichment plants, reprocessing facilities, and associated infrastructure (e.g., manufacturing, transportation), motivated by long-term contracts and export opportunities.

- Financial Institutions and Investment Funds: Private equity firms, venture capital, and infrastructure funds may provide capital for Innovation Campus facilities, attracted by stable returns from power generation, isotope sales, and exports.

- Isotope and Medical Sector: Companies in the medical and industrial isotope markets may invest in isotope production facilities, driven by growing demand. The isotope market is projected to grow from $12 billion in 2024 to $21 billion in 2033.

Financial Provisions

Any DOE financial assistance or credit support under the agreement would be provided only to the extent authorized by statute, subject to the availability of appropriations, and in accordance with applicable federal guidance on credit and budget scoring. Facility-specific infrastructure and associated capital investments should be funded primarily by private partners and, where appropriate, state and local entities, with DOE support limited to specific, authorized assistance mechanisms. The agreement should include provisions requiring:

- Establishment and maintenance of decommissioning and closure funds sized to projected end-of-life costs.

- Financial assurance mechanisms (for example, surety bonds, insurance, escrowed funds, or other instruments) to cover projected long-term costs to the maximum extent permitted by law.

- Cost-sharing and risk-sharing arrangements among private sponsors, the host state, and federal entities consistent with statutory authorities and appropriations.

- For long-term management of material requiring long-duration stewardship, DOE anticipates that any federal role would be defined strictly by existing or future statutory authorities and subject to appropriations.

DOE Financial Assistance Mechanisms

While private investment should dominate, the DOE may provide targeted financial assistance to de-risk projects, attract private capital, and ensure alignment with federal objectives. These mechanisms, authorized under existing legislation, include:

- Cost-Sharing:

  1. <u>Mechanism:</u> DOE may share costs with private partners for high-risk, high-reward functions such as R&D, reprocessing, and advanced reactor demonstrations, leveraging authorities under the Energy Policy Act of 2005. For example, DOE's ARDP has historically provided cost-sharing for reactor projects.

  2. <u>Application:</u> Cost-sharing may support activities such as R&D, reprocessing facility development, and test reactors. This reduces private-sector risk and encourages investment in emerging technologies such as pyro-processing.

  3. <u>Impact:</u> By covering a percentage of costs, DOE can leverage multiple dollars of private investment for every dollar spent, amplifying total capital deployment.

- Loan Guarantees:

  1. <u>Mechanism:</u> DOE's Loan Programs Office (LPO), authorized under Title XVII of the Energy Policy Act, may provide loan guarantees to cover eligible project costs for energy, infrastructure, and advanced technology

projects, subject to applicable restrictions. Eligible nuclear projects alone could access over $100 billion in existing LPO funds.

2. Application: Loan guarantees could support the construction of Innovation Center fuel cycle facilities, power generation, transmission, and component manufacturing facilities, reducing financing costs and improving project bankability.

3. Impact: DOE loan guarantees unlock access to large-scale private financing, accelerating deployment timelines and lowering overall capital costs.

- Voluntary Agreements under the Defense Production Act (DPA):

1. Mechanism: The DPA allows DOE to enter voluntary agreements with private companies to prioritize production of critical materials (e.g., HALEU, HEU, isotopes) for national security. These agreements may include incentives such as advance purchase commitments or price supports.

2. Application: DPA agreements may support activities such as HALEU production, isotope manufacturing, and defense-related fuel fabrication. For example, DOE could commit to purchasing HALEU at fixed prices, ensuring predictable revenue for private operators.

3. Impact: These agreements could de-risk investments in high-security functions such as plutonium reprocessing and HEU production, encouraging private-sector participation in national-security related nuclear activities.

- Grants and Cooperative Agreements:

1. Mechanism: DOE may provide grants and cooperative agreements under the Atomic Energy Act of 1954 and Energy Policy Act of 2005 to support activities such as R&D, workforce development, and environmental stewardship. Cooperative agreements- used for initiatives like the Advanced Reactor Demonstration Program (ARDP) enable shared funding and technical collaboration.

2. Application: Grants may fund activities such as workforce training academies, environmental monitoring systems, and R&D collaborations

with National Laboratories. Cooperative Agreements may support partnerships for activities such as reprocessing, waste disposal and fuel cycle development.

3. Impact: These mechanisms reduce upfront costs for private partners, particularly for non-revenue-generating functions such as workforce development, while leveraging federal expertise and infrastructure.

This RFI does not announce or commit DOE to provide any specific form of financial assistance, incentives, or other funding in connection with Nuclear Lifecycle Innovation Campuses. Instead, DOE expects the private sector and states to lead and finance efforts undertaken in response to this RFI, which could generate substantial benefits to local businesses, communities, and taxpayers.

DOW Financial Assistance Mechanisms

In addition to private investment and DOE support, the DoW may also provide funding for power reactors and compensate for defense-related waste offtake through the Army's Executive Agent program. This funding reinforces the strategic value of the Innovation Campuses and ensures alignment with national defense objectives.

V. RFI Questions to be Answered by Interested States

The following questions seek detailed information regarding each state's interest, capabilities, infrastructure, policies, and strategic vision to support the development and long-term operation of the transformative Innovation Campuses.

1. **State Interest:** What level of interest does your state have in hosting a comprehensive Nuclear Lifecycle Innovation Campus? Provide a detailed description of your state's strategic vision and approach to developing an Innovation Campus that integrates all functions outlined in Section II of this RFI, or, if not all functions are integrated, please specify why. Additionally, please identify what your state requires from the federal government in order to be a host for an Innovation Campus, or what private resources may be required, and what resources the state would plan to contribute.

2. **Proposed Sites Within the State**: What specific sites within your state would you propose for hosting a Nuclear Lifecycle Innovation Campus, and why are they viable and suitable for the necessary functions? Please consider existing nuclear infrastructure, proximity to DOE sites, land availability, zoning, and environmental suitability. Include details on site characteristics, such as maps, geologic stability, access to utilities, and transportation networks.

3. **Potential Private Sector Partners:** Which private sector partners does your state anticipate working with to develop these Nuclear Lifecycle Innovation Campuses? What roles will those partners play? Provide details on the process and timeline for selecting and engaging these partners.

4. **Site Infrastructure Requirements:** What infrastructure and resources can your state provide or support at the proposed site(s) to meet the requirements of all Innovation Campus functions? Detail availability of power (e.g., grid reliability, capacity for enrichment plants, AI data centers), water (e.g., cooling for reactors and reprocessing), waste storage, secure transportation corridors, and physical/cyber security systems. Specify any state investments or upgrades needed (e.g., transmission lines, rail networks, cybersecurity infrastructure).

5. **Regulatory Framework and Licensing Support**: How would your state approach regulatory oversight for the Nuclear Lifecycle Innovation Campus? What regulatory streamlining and expedited permitting can your state offer (e.g., RCRA), while ensuring compliance with federal standards? In areas where DOE assumes ultimate safety responsibility, how would your state partner with DOE to exercise oversight?

6. **Legislative and Policy Requirements:** Are there any federal or state statutes, regulations, or policies that need to be amended or enacted to facilitate the development and operation of a Nuclear Lifecycle Innovation Campus in your state? Provide specific examples of legislative barriers (e.g., restrictions on nuclear waste storage or disposal, reprocessing bans, or zoning laws) and propose strategies to address them, including timelines for legislative changes.

7. **Timeline for State Support:** What is your state's proposed timelines for providing regulatory approvals, infrastructure development, and community agreements to support the Nuclear Lifecycle Innovation Campus? Include key milestones, such as site selection, permit reviews and issuance, infrastructure upgrades, workforce training program launches, and community engagement initiatives.

8. **Anticipated Public and Stakeholder Concerns:** What challenges do you anticipate within your state to any of the Nuclear Lifecycle Innovation Campus functions (e.g., from environmental groups, local communities, Tribal nations, or political entities), particularly for sensitive activities such as reprocessing, plutonium handling, or waste disposal?

9. **Stakeholder Engagement Strategy and Cooperation Mechanisms**: What is your state's plan to engage stakeholders- including political entities, local communities, Tribal nations, environmental groups, industry partners- to ensure timely public acceptance and compliance with regulatory frameworks for all Nuclear Lifecycle Innovation Campus functions? Provide a conceptual strategy, including community outreach programs, public hearings, Tribal consultations, and partnerships with local organizations. Include examples of successful stakeholder engagement from past nuclear, industrial, or infrastructure projects in your state.

10. **HLW Management, Treatment, Storage and Disposal**: How would your state implement the management of material requiring long term management? Describe proposed infrastructure (e.g., interim storage facilities, reprocessing options, deep geologic disposal facilities including boreholes) and compliance with state and federal environmental regulations. Specify any existing capabilities (e.g., licensed storage sites).

11. **State-Specific Limitations:** What state-specific limitations- regulatory, political, environmental, geologic, or community-based- might hinder the development of any of the Nuclear Lifecycle Innovation Campus functions outlined in Section II of this RFI? Provide a general assessment of these barriers and propose strategies to address them, including regulatory reforms, public engagement, or infrastructure investments.

12. **Environmental and Safety Stewardship**: What strategies will your state employ to ensure environmental stewardship and radiological safety across all Nuclear Lifecycle Innovation Campus functions, particularly for activities such as enrichment, reprocessing, and waste disposal? Provide conceptual plans for environmental monitoring systems, safety protocols, emergency response capabilities, and compliance with federal and state regulations.

13. **Transportation Corridors**: What intrastate and interstate transportation corridor challenges exist in your state for the secure movement of nuclear materials (e.g., UF6, fuel assemblies, UNF, isotopes, HLW)? Identify existing infrastructure (e.g., rail lines, highways, ports), regulatory requirements (e.g., state DOT approvals, federal transport regulations), and potential public acceptance challenges. Propose solutions to enhance transportation networks, including infrastructure upgrades or stakeholder engagement plans.

14. **Proposed Agreement Framework:** What type of agreement should be employed to support the development and operation of the Nuclear Lifecycle Innovation Campus- such as cooperative agreements, contracts, financial assistance mechanisms, loan guarantees, or voluntary agreements under the DPA? Limit suggestions to contractual authorities already granted to DOE (e.g., under the Atomic Energy Act of 1954, Energy Policy Act of 2005, or DPA). Describe how these agreement frameworks will facilitate partnerships and align with private funding and operational needs across enterprise functions.

15. **Technology and Industry Partnerships:** What experience, interest, or concern does your state have regarding specific technologies for the Nuclear Lifecycle Innovation Campus- such as advanced reactor designs, reprocessing methods, or AI-driven systems for data centers and operations? Describe existing nuclear industry collaborations, state incentives to attract private-sector partners, and proposed partnerships to support all enterprise functions, including manufacturing, R&D, and isotope production.

16. **Secondary Waste Management**: How would your state assist in managing, storing, and disposing of secondary waste streams generated by Nuclear Lifecycle Innovation Campus activities? Describe compliance with state environmental regulations, access to existing commercial LLW disposal sites, and any proposed state investments in waste management infrastructure.

17. **Government Furnished Data/Technology/Equipment:** What government-furnished data, technology, or equipment (e.g., reactor designs, reprocessing technologies, safeguards systems) would your state require to support the Nuclear Lifecycle Innovation Campus functions? Specify whether your state currently holds rights or licenses for such data or technology, and if not, outline how you would pursue acquiring them through DOE, DoW, or other federal entities.

18. **International Export Capabilities**: How will your state support the development of infrastructure and policies to support international exports of advanced reactors, nuclear fuels, isotopes, and technologies from the Nuclear Lifecycle Innovation Campus? Describe existing or proposed export infrastructure (e.g., ports), state policies to support global partnerships, and strategies to ensure compliance with export control laws and IAEA regulations.

19. **Constraints and Inhibiting Factors**: What potential barriers or impediments could affect the successful siting and operation of a Nuclear Lifecycle

Innovation Campus in your state, considering all nuclear functions? For example, what resources, information, or expert assistance would be necessary to ensure that potentially interested communities have adequate knowledge and support to address concerns related to mining, reprocessing, waste disposal, or supporting industries?

20. **Unaddressed Considerations:** What additional issues should DOE consider in implementing a successful Nuclear Lifecycle Innovation Campus in your state? Provide insights on state capabilities, policies, or prior experience with nuclear, industrial, or large-scale infrastructure projects that reinforce your state's suitability as a host.

21. **Additional State Information:** Please provide any additional information about your state's capabilities, policies, or prior experience with nuclear or related projects (e.g., energy, defense, industrial development) that supports its suitability to host a Nuclear Lifecycle Innovation Campus. Include details on existing infrastructure, economic development programs, or community support initiatives that enhance your state's readiness to support the desired nuclear innovation.

22. **Financial responsibility, Cost Sharing, and Assurances:** Describe how your state would approach cost-sharing and risk allocation for the development, operation, and closure of a Nuclear Lifecycle Innovation Campus. In particular, how would your state expect private entities to fund capital costs, operations, decommissioning, and long-term waste management (for example, decommissioning funds, closure funds, insurance, and other financial assurances)? What state or local contributions, if any, would be contemplated, and how would they be conditioned (for example, performance-based incentives, clawback provisions)?

23. **Revenue Sources and Cost-Recovery Approaches:** What approaches would your state consider to ensure that beneficiaries of the Nuclear Lifecycle Innovation Campus (for example, reactor operators, fuel cycle companies, data center operators, utilities) contribute appropriately to the costs of long-term waste management, decommissioning, and environmental monitoring (for example, user fees, surcharges, host-community agreements)?

VI. Confidential Business Information

DOE aims to protect information that identifies any party's interest in any particular location. Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well-marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose. If your state's response contains confidential, proprietary, or privileged information, you must include a cover sheet marked as follows identifying the specific pages containing confidential, proprietary, or privileged information:

> *"Notice of Restriction on Disclosure and Use of Data*
>
> Pages [list applicable pages] of this response may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for the purposes described in this RFI. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source."

In addition, (1) the header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains, Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure" and (2) every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with [[double brackets]] or highlighting.

Please be aware that DOE may make available for public inspection all other comments, in their entirety, submitted by organizations and businesses (except as provided above for proprietary information) or by individuals identifying themselves as representatives of organizations or businesses.

VII. Disclaimer

This RFI is issued solely for information and planning purposes and does not constitute a solicitation.

Responses to this notice are not offers and cannot be accepted by the Government to form a binding agreement. DOE is not seeking proposals through this RFI and will not accept unsolicited proposals.

Respondents are solely responsible for all expenses associated with responding to this RFI. Not responding to this RFI does not preclude participation in any future agreement, if conducted. No proprietary information should be included in any submittal except via the process outlined in Section VI of this RFI.