Center on
Global Energy Policy
at COLUMBIA | SIPA

September 2026

How Congress Can Support the NLIC Initiative

By **Matt Bowen** and **Rama T. Ponangi**

- The U.S. Department of Energy (DOE) has issued a request for information (RFI) inviting states to answer questions about hosting what it calls "Nuclear Lifecycle Innovation Campuses" (NLICs), which could include facilities for disposing of spent nuclear fuel (SNF) and therefore represent a new approach to U.S. SNF management.
- The state responses to the RFI provide preliminary evidence that a consent-based approach to siting nuclear waste management facilities might work in the United States and that combining SNF or high-level radioactive waste (HLW) disposal facilities with other infrastructure could help to secure a host.
- However, the NLIC initiative faces significant funding, legislative, and regulatory challenges that could be addressed through congressional action, including authorizing funding for the NLIC initiative, improving access to the Nuclear Waste Fund, partially repealing the 1987 amendments to the Nuclear Waste Policy Act, and directing the Environmental Protection Agency and the Nuclear Regulatory Commission to establish new public health and safety standards that would apply to future SNF and HLW disposal facilities.

The United States has struggled for decades to make progress on managing spent nuclear fuel (SNF) from its commercial power reactors. The Nuclear Waste Policy Act of 1982 established a process for developing so-called "deep geologic repositories" for the disposal of SNF, but Congress later limited site characterization work to the Yucca Mountain site in Nevada. The state of Nevada has opposed the Yucca Mountain project and has successfully blocked congressional funding

This commentary represents the research and views of the authors. It does not necessarily represent the views of the Center on Global Energy Policy. The piece may be subject to further revision.

Contributions to SIPA for the benefit of CGEP are general use gifts, which gives the Center discretion in how it allocates these funds. More information is available at https://energypolicy.columbia.edu/about/partners. Rare cases of sponsored projects are clearly indicated.

for it since 2010.[1] Now, the Trump Administration has initiated an effort to develop new US SNF management facilities.

On January 28, 2026, the US Department of Energy (DOE) issued a request for information (RFI) inviting states to answer questions about potentially hosting what it called "Nuclear Lifecycle Innovation Campuses" (NLICs). The innovation campuses could be made up of many different types of facilities, including data centers, reactors, fuel fabrication facilities, and, most importantly for the purposes of this commentary, consolidated interim storage, reprocessing, and disposal facilities.[2] According to DOE, the agency received 28 responses from 26 states before its April 1, 2026 deadline. On July 28, DOE announced that five states—Utah, Tennessee, Oklahoma, Louisiana, and Idaho—had been down-selected as NLIC host candidates.[3]

This commentary suggests that, based on the state responses received by the DOE, the NLIC initiative represents a constructive start to a dialogue with states on the challenging issue of US SNF and high-level radioactive waste (HLW)[4] management. Moreover, while the dialogue is only in its beginning stages, the responses provide preliminary evidence that a consent-based approach to siting nuclear waste management facilities might work in the United States and that securing a host for SNF/HLW disposal facilities might be facilitated by combining them with other infrastructure. The commentary identifies funding, legal, regulatory, and organizational challenges to establishing SNF management facilities as part of NLICs. It then suggests corresponding actions that Congress could take to address those challenges, which would advance the NLIC initiative and potentially help address SNF management in the United States.

A promising start

The RFI and state responses reflect several features that could support the development of SNF/HLW disposal facilities, including a consent-based approach[5] to siting, formal legal agreements between states and the federal government, and pairing the facilities with other types of nuclear facilities.

It was not clear when the DOE RFI was released whether any state would be willing to publicly consider hosting facilities for consolidated interim storage or disposal of SNF/HLW. The RFI process was completely voluntary—no state was under any obligation to submit anything—and state opposition has long been an obstacle to federal attempts at siting disposal facilities. But all five of the states selected for further discussions with DOE specifically discussed potentially hosting such facilities.[6] The voluntary nature of the 2026 DOE RFI is consistent with the "consent-based" approaches used in other countries, such as Canada and Finland, that have successfully sited repositories for disposal of SNF, and with the Blue Ribbon Commission's 2012 recommendation that nuclear waste management facilities be sited with the consent of the states and local governments involved.[7] The RFI states that "ideal" sites would be able to demonstrate local government

support to ensure public acceptance and long-term success, but does not prescribe measures for establishing such support.

The DOE RFI states that the innovation campuses will require formal agreements between DOE and the host states to "define roles, responsibilities, and commitments, including clear allocation of financial risk and long-term obligations." Legally binding host-state agreements have been an element of successfully operating US nuclear waste management facilities in states such as New Mexico and Idaho.[8] A legally binding agreement also seems to be a measure that states want: for example, the Western Governors' Association published a policy resolution in 2025 that no nuclear waste storage or disposal facility should be located within the boundaries of a Western state without the written consent of the governor.[9] Such an agreement would delineate key aspects of the program, including limitations on disposal inventory, transportation-related requirements, and state inspection and regulatory powers.

The state responses that discuss possibly hosting a disposal facility, such as a mined repository or deep borehole facility, also indicate that those states want to host more than just that facility as part of an NLIC. This preference is consistent with polling results indicating that public support for hosting a disposal facility increases when it would be coupled with other types of facilities, such as nuclear safety research laboratories or reprocessing facilities.[10]

A central challenge: funding

The RFI states that the primary source of funding for NLICs will be the private sector. However, the legal responsibility for disposing of commercial HLW and SNF lies with the federal government, and the Nuclear Waste Fund (NWF), established under the Nuclear Waste Policy Act of 1982 (NWPA) was intended to cover HLW and SNF disposition by imposing fees on reactor owners. The balance of the NWF is currently over $50 billion, although the nuclear waste fee has been set to zero for over a decade because the United States still lacks a functioning disposal facility, a result of stalled development at the Yucca Mountain facility and Congress's failure to approve an alternative disposal plan.[11] But the NWF may not legally be used to pay for all the activities that the NLIC initiative would promote (e.g., deployment of enrichment and reactor facilities). Section 302(d) of the NWPA states that the secretary of energy can only make expenditures from the NWF for radioactive waste disposal activities as defined under Titles I and II of the Act, including:

- activities associated with repositories, storage facilities, and test and evaluation facilities,
- nongeneric research, development, and demonstration activities,
- transportation, treatment, or packaging of SNF or HLW to be disposed of in a repository or either

stored or used at a test and evaluation facility, and

- provision of assistance (as defined in the Act) to states, local government units, or Indian tribes

Two examples of facility types that would be allowable uses of NWF funding are research facilities and testing and evaluation facilities.[12] Both would be logical components of an NLIC with a disposal facility, though neither is mentioned specifically in the RFI. Regarding research facilities, the US Nuclear Waste Technical Review Board (NWTRB) has noted that other countries have been operating underground research laboratories to support the development of deep geologic repositories,[13] and that those with more developed geologic disposal programs have found such laboratories essential to their repository programs. On this basis, the board recommended that DOE pursue one or more of them in the United States to advance the development and demonstration of disposal concepts and provide a platform for training the next generation of US scientists, engineers, and skilled technical workers. A world-class research facility would also draw scientists from around the globe to the host state for tours and meetings.

Regarding testing and evaluation facilities, Title II of the NWPA mentions them as well, stating that they could perform a variety of activities, such as validating scientific models used to design a repository, refining the design and engineering of repository components and systems, and evaluating design concepts for packaging, handling, and emplacement of HLW. This type of work would need to be done as part of any disposal program, and co-location with a repository or borehole facility would be both logical and advantageous.

However, eligibility for funding does not guarantee access to that funding, and accessing NWF funds has been a longstanding challenge for the SNF/HLW management program. The program resides under the same budget cap as other programs at DOE, creating a competition for budget space.[14] It is also subject to annual appropriations from Congress, creating uncertainty over whether the necessary funding will be available from year to year.

Additional challenges

The NLIC initiative also faces a host of other challenges, including the following:

- Based on Congressional amendments to the NWPA made in 1987, site-specific work is directed for the Yucca Mountain project in Nevada, but the Act says Congress would have to approve site-specific work for a second repository. In fact, several key provisions in the amended NWPA are Yucca Mountain- or Nevada-specific. However, a new consent-based approach to siting new nuclear waste management facilities would, by definition, require openness to working with any state that volunteers.

- Some NLIC state responses discuss boreholes as a potential disposal option, as opposed to the more traditional mined repository approach.[15] However, the current EPA public health and safety standards, which were first established in 1985, would be more challenging to apply to this option, as they were developed with mined geologic repositories in mind.[16]
- The NLIC initiative depends on continued support from political leadership at the Office of Nuclear Energy, which tends to change every two to four years, as well as the Senate-confirmed political appointees to whom they report, whose posts also tend to change on similar time cycles. A future federal administration could also simply decide to take the program in another direction or cancel it altogether.[17]

Options for Congress

If Congress opts to support the NLIC initiative, it could consider multiple actions corresponding to these challenges, including:

Authorize funding to support the NLIC initiative in the near term and improve access to the NWF. Authorized funding could help the program take actions, such as negotiating near-term steps with states. Congress could also reinforce to DOE the types of facilities that the NWF can be used to fund under the NWPA (e.g., underground research laboratories and test and evaluation facilities) and their potential value to the US SNF management program. Congress could also revive past legislative efforts to improve access to the NWF, including bills considered in previous Congresses.[18]

Partially repeal the 1987 amendments to the NWPA. This step would involve removing the Yucca- and Nevada-specificity of the 1987 amendments and returning to the more general language in the original 1982 NWPA. Other 1987 amendments to the NWPA, such as extending to local governments most of the rights and benefits initially available only to states, as well as establishing the Nuclear Waste Technical Review Board, could be preserved. In addition to the practical benefit of helping to enable the development of new nuclear disposal sites within larger NLICs, the partial repeal would represent a formal recognition by Congress that the singling out of Yucca Mountain and Nevada for nuclear disposal—a consistent point of contention for the Nevada congressional delegation—has failed and is being abandoned in favor of alternative approaches.

Require the EPA and NRC to develop new public health and safety standards that would apply to future SNF/HLW disposal facilities. These standards would better accommodate newer disposal technologies such as boreholes. This endeavor would not be expensive—on the order of a million dollars per year—but must be started soon for the standards to be available for any future site-specific work related to the NLIC initiative. This timeline would also help avoid any perceptions that standards are being crafted to help a particular site qualify.

Order a joint National Academy of Public Administration and National Academy of Sciences study on the structural elements of a new single-purpose entity to implement the US SNF management program. As many reports over the past few decades have noted, the regular turnover in DOE political leadership is not well-suited to a politically sensitive, multi-decadal program. A dedicated organization with the single mission of implementation (as opposed to DOE, which has many missions) that is also structurally designed for greater continuity over political cycles could better support the US SNF management program.

This idea is not without precedent. Legislation that would create an independent government agency (IGA) has previously been proposed and discussed in congressional hearings. However, the IGA approach appears to have lost some momentum in recent years. The BRC leaned towards a congressionally chartered federal corporation as the implementing entity, and some recent reports have pushed for a private corporation approach.[19] The structural elements of both could be analyzed by the experts at the National Academy of Public Administration and National Academy of Sciences to supply findings and recommendations to Congress.[20] The study of organizational options should also explore how to reform the current funding system to ensure that the fees paid by waste owners are made available in the amounts and on the schedule needed to meet the government's statutory and contractual obligations without competing with funding for other federal programs, in line with Congress's original intent.[21]

Notes

1. For more historical background on the challenge of SNF management, see Matt Bowen, "Forging a Path Forward on Nuclear Waste Management," Center on Global Energy Policy, January 28, 2021, https://www.energypolicy.columbia.edu/publications/forging-path-forward-us-nuclear-waste-management-options-policy-makers/, 11–17.

2. U.S. Department of Energy, "Department of Energy Seeks Hosts for Nuclear Lifecycle Innovation Campuses," January 28, 2026, https://www.energy.gov/articles/department-energy-seeks-hosts-nuclear-lifecycle-innovation-campuses.

3. U.S. Department of Energy, "Nuclear Lifecycle Innovation Campuses Contenders Announced," July 28, 2026, https://www.energy.gov/articles/nuclear-lifecycle-innovation-campuses-contenders-announced.

4. The NRC defines HLW as "the highly radioactive materials produced as byproducts of fuel reprocessing or of the reactions that occur inside nuclear reactors. HLW includes: Irradiated spent nuclear fuel discharged from commercial nuclear power reactors; The highly radioactive liquid and solid materials resulting from the reprocessing of spent nuclear fuel, which contain

fission products in concentration (this includes some reprocessed HLW from defense activities and a small quantity of reprocessed commercial HLW); Other highly radioactive materials that the Commission may determine require permanent isolation." NRC, "High Level Waste," accessed August 4, 2026, https://www.nrc.gov/reading-rm/basic-ref/glossary/high-level-waste.

5. As of 2025, DOE uses the term "collaboration-based siting" instead of "consent-based siting," which was its previously preferred term.

6. Idaho Governor's Office of Energy and Mineral Resources, "State of Idaho: Nuclear Lifecycle Innovation Campus (NLIC) Request for Information (RFI) Response," March 31, 2026, https://nuclear.idaho.gov/wp-content/uploads/2026/03/State-of-Idaho_Nuclear-Lifecycle-Innovation-Campus-RFI-Response_03312026-006.pdf; Office of the Governor of Louisiana, "Opportunities for Nuclear Innovation in Louisiana: State Response to U.S. Department of Energy Request for Information on the Establishment of Nuclear Lifecycle Innovation Campuses," March 31, 2026, https://lailluminator.com/wp-content/uploads/2026/07/Louisiana-Nuclear-RFI-Final.pdf; State of Oklahoma, "Oklahoma Nuclear Innovation Campus Response," accessed September 14, 2026, https://ee.ok.gov/nlic/documents/oklahoma-nlic-rfi-response.pdf; Office of the Governor of Tennessee, "State of Tennessee Response on the Establishment of Nuclear Lifecycle Innovation Campuses – Part B," March 26, 2026, https://www.tn.gov/content/dam/tn/governorsoffice-documents/governorlee-documents/NON-CONFIDENTIAL_DOE_2026_RFI_for_NLIC_Tennessee_Response_Part_B_D5_Redacted.pdf; Utah Office of Energy Development, "Operation Gigawatt: Utah's Nuclear Lifecycle Innovation Campus," March 31, 2026, https://energy.utah.gov/wp-content/uploads/1.-Utah-OED-Establishment-of-Nuclear-Lifecycle-Innovation-Campus-DOE-RFI-Reponse_3.31_FINAL-compressed.pdf.

7. Lake Barrett, Allison MacFarlane, Kara Colton, Fred Dilger, et al., "The Path Forward for Nuclear Waste in the U.S.: A Bipartisan Solution the Nuclear Waste Problem," January 2026, https://sppga.ubc.ca/wp-content/uploads/sites/5/2026/01/Path-Forward.2026.pdf; Blue Ribbon Commission on America's Nuclear Future (BRC), "Report to the Secretary of Energy," US Department of Energy, January 2012, https://www.energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf.

8. Bowen, "Forging a Path Forward on Nuclear Waste Management," 23–25, 39.

9. Western Governors' Association, "Policy Resolution Radioactive Materials Management," July 2025, https://westgov.org/images/files/WGA-PR-2025-07-Radioactive-Materials-Management.pdf.

10. Hank C. Jenkins-Smith, Carol L. Silva, Kerry G. Herron, Kuhika G. Ripberger, et al., "Public

Preferences Related to Consent-Based Siting of Radioactive Waste Management Facilities for Storage and Disposal: Analyzing Variations over Time, Events, and Program Designs," DOE, February 2013, https://www.energy.gov/ne/articles/public-preferences-related-consent-based-siting-radioactive-waste-management-facilities, 45–46.

11. American Nuclear Society, "U.S. Spent Fuel Liability Jumps to $44.5 billion," Nuclear Newswire, November 27, 2024, https://www.ans.org/news/article-6587/us-spent-fuel-liability-jumps-to-445-billion/.

12. Section 174 of the NWPA also states that the Secretary of Energy, in siting federal research projects broadly, such as DOE research initiatives on artificial intelligence or other topics that are not necessarily nuclear related, shall give special consideration to proposals from states where a repository is located. This could help incentivize states to become hosts for such repositories.

13. NWTRB, "Filling the Gaps: The Critical Role of Underground Research Laboratories in the US Department of Energy Geologic Disposal Research and Development Program," January 2020, https://www.nwtrb.gov/search/filling-the-gaps-the-critical-role-of-underground-research-laboratories-in-the-u.s.-department-of-energy-geologic-disposal-research-and-development-program-(january-2020).

14. Bowen 2021. Pages 41-42.

15. E.g., both Oklahoma and Utah mentioned boreholes in their responses.

16. American Nuclear Society, "American Nuclear Society recommends updating EPA repository regs," August 16, 2023, https://www.ans.org/news/article-5265/american-nuclear-society-recommends-updating-epa-repository-regs/.

17. Office of Technology Assessment (OTA), "Managing Commercial High-Level Radioactive Waste: Summary Report," OTA-O-172, April 1982. OTA assessed that "the establishment of a single-purpose waste management organization, independent of other Federal nuclear programs, is needed to avoid the competition for manpower and policy-level attention that has adversely affected the waste management program in the past, to ensure that the staff's primary incentive is the safe and timely accomplishment of the goals of the waste management policy, and to insulate the program from future reorganizations of Federal energy programs." OTA also concluded that "the greatest single obstacle that a successful waste management program must overcome is the severe erosion of public confidence in the Federal Government that past problems have created. Federal credibility is questioned on three main grounds: 1) whether the

Federal Government will stick to any waste policy through changes of administration;"

18. Bowen, "Forging a Path Forward on Nuclear Waste Management," 46–48.
19. Barrett et al., "The Path Forward for Nuclear Waste in the U.S."
20. Matt Bowen, "Nuclear Waste Policy Actions for the 117th Congress and Biden Administration," Center on Global Energy Policy, January 26, 2022, https://www.energypolicy.columbia.edu/publications/nuclear-waste-policy-actions-117th-congress-and-biden-administration/, 12–13.
21. (BRC), "Report to the Secretary of Energy." See Chapter 8, "Funding the Waste Management Program."

About the Authors

Dr. Matt Bowen is a Senior Research Scholar at the Center on Global Energy Policy at Columbia University SIPA, focusing on nuclear energy, waste, and nonproliferation. He is also nonresident senior fellow with the Atlantic Council's Global Energy Center and a senior fellow with Good Energy Collective. He was formerly a Nuclear Policy Fellow at Clean Air Task Force and a Senior Policy Fellow at the Nuclear Innovation Alliance.

Dr. Bowen has written reports on federal and state policies to encourage advanced reactor development, and has also published papers on reforming U.S. nuclear export controls. During the Obama Administration, he was an Associate Deputy Assistant Secretary in the Office of Nuclear Energy and a Senior Advisor in the Office of Nonproliferation and Arms Control at the U.S. Department of Energy (DOE). Previous to working at DOE, he was an AAAS/APS Science Fellow for Senate Majority Leader Harry Reid.

Dr. Bowen received a Bachelor of Science degree in physics from Brown University and a Ph.D. in theoretical physics from the University of Washington, Seattle. He has held positions at the National Academies with the Board on Physics and Astronomy, the Board on Energy and Environmental Studies, and the Division on Engineering and Physical Sciences. Dr. Bowen has also done work outside of Columbia University as an independent consultant for EFI Foundation and Third Way.

Rama T. Ponangi is an India-trained lawyer specializing in nuclear law and policy. Prior to joining to CGEP, Rama worked as a Research Assistant under Professor Donna Attanasio, Director, Energy Laws, The George Washington University Law School, where he organized a 4-day conference titled "Investable Nuclear Energy" covering topics of Environment, Social and Governance aspects of nuclear energy, supply chain for the advanced nuclear reactors, future of the nuclear technology, garnering public support and role of academia in shaping next generation of nuclear law and policy

experts. Rama is also a Policy Fellow at the Nuclear Innovation Alliance.

In the past, Rama interned at the Office of Legal Affairs, International Atomic Energy Agency (IAEA), Vienna, Austria, where he primarily assisted its Legislative Assistance activities such as reviewing the draft nuclear legislation of Member States and assisted in conducting bilateral and multilateral meetings such as Role of a Legal Advisor in a Regulatory Body and International Nuclear Liability Expert (INLEX). Rama also undertook research on the topic of safety, security and liability aspects of Transportable Nuclear Power Plants (TNPPs).

Rama has completed his Bachelors in Law – B.A.,LL.B. (Specializing in Energy Laws) from University of Petroleum & Energy Studies, Dehradun, India. He has completed a diploma in International Nuclear Law from the International School of Nuclear Law (ISNL), University of Montpelier, France organized by Nuclear Energy Agency, OECD. Rama has completed his Masters in Law – LL.M. in Energy and Environmental Laws from The George Washington University Law School as GW Merit Scholar and Randolph C. Shaw Environmental Graduate Environmental Fellow. Rama has completed several other niche certifications in nuclear energy and law.

About the Center on Global Energy Policy

The Center on Global Energy Policy at Columbia University SIPA advances smart, actionable and evidence-based energy and climate solutions through research, education and dialogue. Based at one of the world's top research universities, what sets CGEP apart is our ability to communicate academic research, scholarship and insights in formats and on timescales that are useful to decision makers. We bridge the gap between academic research and policy — complementing and strengthening the world-class research already underway at Columbia University, while providing support, expertise, and policy recommendations to foster stronger, evidence-based policy.

Visit us at www.energypolicy.columbia.edu

@ColumbiaUEnergy

About the School of International and Public Affairs

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools.

For more information, please visit www.sipa.columbia.edu

For a full list of financial supporters of the Center on Global Energy Policy at Columbia University SIPA, please visit our website at www.energypolicy.columbia.edu/partners. See below a list of members that are currently in CGEP's Visionary Annual Circle. This list is updated periodically.

Corporate Partnerships
Occidental Petroleum

Foundations and Individual Donors
Aphorism Foundation
Laura and John Arnold
The bedari collective
Bernard & Anne Spitzer Charitable Trust
Climateworks Foundation
Greg Goff
Blue Horizons Foundation
The William and Flora Hewlett Foundation
David Leuschen
The Rockefeller Foundation
Ray Rothrock
Mike & Sofia Segal
Kimberley and Scott Sheffield
Catherine and Tracy Wolstencroft
Daniel Ziff