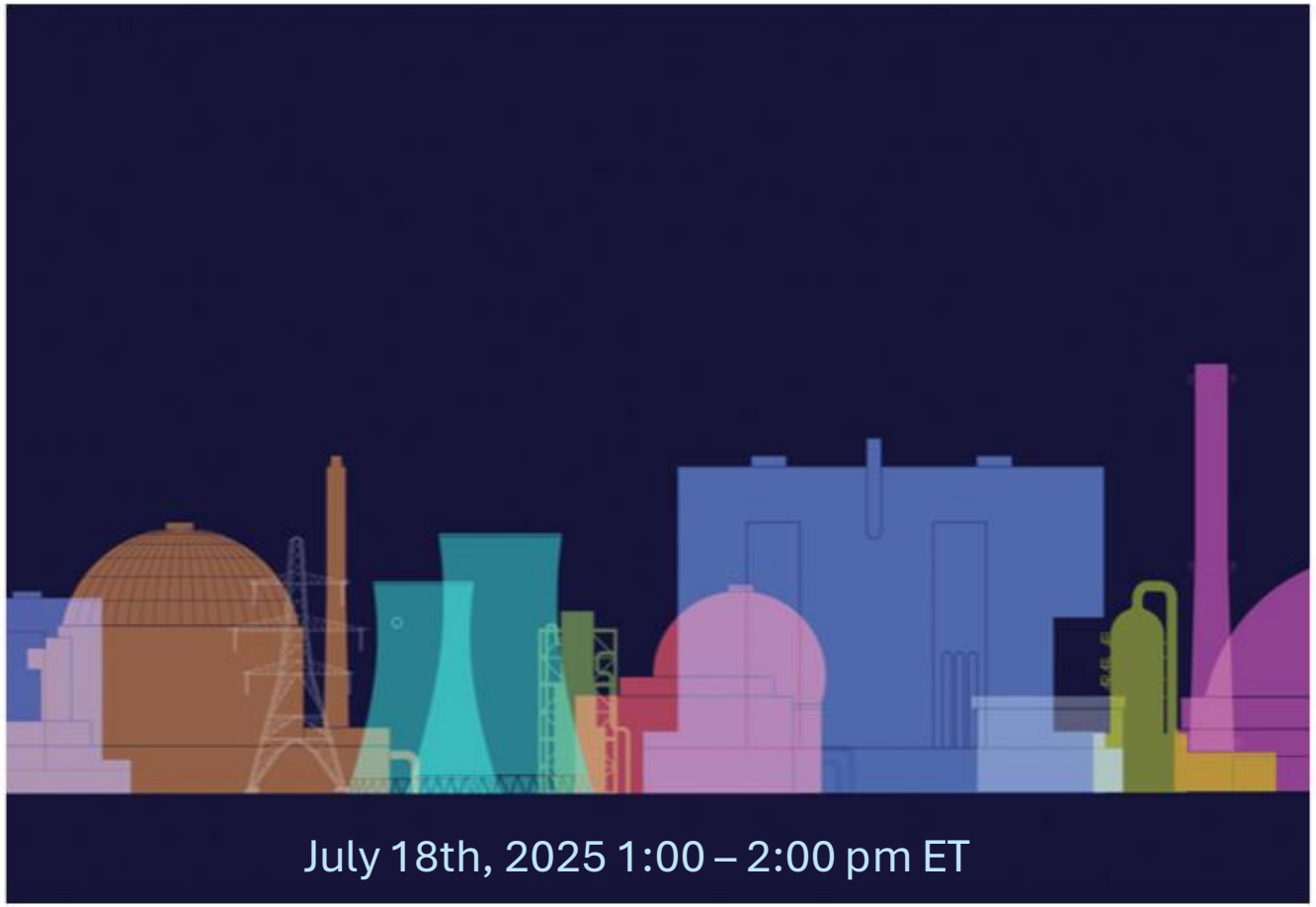
Developing State Advanced Nuclear Energy Strategic Frameworks: Guidance for State Energy Offices and Public Utility Commissions



Moderator: Hon. Lea Márquez Peterson, Arizona Corporation Commission

Panelists:

Kathryn Kline, Senior Technical Advisor, NARUC

Kelsey Jones, Program Director, NASEO

Kiera Zitelman, Technical Director, NARUC

Material based upon work supported by the U.S. Department of Energy under award number DE-NE0009043

Housekeeping

Today's webinar will be recorded

Meeting materials will be distributed after today's call

You can submit questions for our presenters using the Q&A box in the Zoom toolbar

We will reserve time for questions

About Us

NARUC: National Association of Regulatory Utility Commissioners

Founded in 1889, we represent the state public service commissions who regulate the utilities that provide essential services such as energy, telecommunications, power, water, and transportation and who have largely shaped the profile and substance of public utility regulation in America.

NASEO: National Association of State Energy Officials

NASEO is the only national non-profit association for the governor-designated energy officials from each of the 56 states and territories. Formed by the states in 1986, NASEO facilitates peer learning among state energy officials, serves as a resource for and about State Energy Offices, and advocates the interests of the State Energy Offices to Congress and federal agencies.

Advanced Nuclear State Collaborative

- NARUC & NASEO formed the Advanced Nuclear State Collaborative (ANSC) with support from the U.S. Department of Energy in 2023.
- The ANSC convenes state utility regulators and State Energy Officials to enhance collective understanding of the unique regulatory and policy questions surrounding the consideration and deployment of new nuclear generation and support peer learning across states.
- We do this by:
  - Convening webinars and peer-sharing calls;
  - Hosting in-person meetings and site visits; and
  - Developing resources such as briefing papers

Summary & Purpose

- **Policymakers' Interest:** Energy policymakers and regulators are highly interested in advanced nuclear energy due to its environmental, grid reliability, and economic development benefits.
- **Strategic Frameworks:** State Energy Offices and Public Utility Commissions (PUCs) are developing or considering strategic frameworks to examine the role of new nuclear energy, assess development factors, and identify action items for state agencies.
- **Purpose of Document:** To assist State Energy Offices and PUCs in leading or contributing to the development of strategic frameworks for new nuclear energy projects.
- **Key Focus:** Summarizes recommended steps, discusses factors for states to explore, and offers considerations for integrating nuclear energy strategic frameworks with existing state energy planning and regulatory processes.

Advanced Nuclear Energy Level-Setting

- **Growing Demand:** Interest in new electricity generation is increasing sharply due to manufacturing, industrial, and data center growth.
- **Policy Goals:** Many states view advanced nuclear energy as a solution to meet growing power needs while supporting clean power, economic growth, and energy security.
- **Current Fleet:** The existing U.S. nuclear fleet is the largest source of carbon-free electricity, operating at over 90% capacity.
- **Advanced Reactors Defined:** Encompasses Generation III+ (Gen III+) and Generation IV (Gen IV) reactors.
  - **Gen III+:** Rely on low-enriched uranium fuel and water coolant (e.g., Southern Company's Plant Vogtle Units 3 and 4, the first Gen III+ reactors in the U.S. in three decades).
  - **Gen IV:** Use novel fuels and coolants.
- **Size Range:** Advanced reactors vary in size from microreactors (<50 MW), small modular reactors (SMRs, 50–300 MW), to large GW-scale reactors.
- **Deployment Outlook:** As of June 2025, 11 advanced nuclear developers have announced U.S. deployment dates between 2026 and 2031.
- **State Action:** In 2024, 25 states passed pro-nuclear energy legislation, often expanding definitions of clean energy to include nuclear.

What is a Strategic Framework?

Table 2: Contrasting Strategic Frameworks and Other Types of Studies

STRATEGIC FRAMEWORK

- Is written for a broad variety of audiences (e.g., legislators, utilities, power customers)
- Establishes state objectives
- Identifies action items for various stakeholders
- Builds common understanding of opportunities and challenges
- Weighs socioeconomic factors

FEASIBILITY OR SITING STUDY

- Main objective is to recommend an investment
- Is written for one actor or small group of decision-makers
- Typically considers benefits and drawbacks of specific sites and/or reactor designs
- Is technical in nature with limited consideration of socioeconomic factors

POLICY RECOMMENDATIONS

- Is written for state legislators and state policy decision-makers
- Identifies specific policy actions to achieve a goal
- Recommends delegate responsibilities to state agencies

TECHNOLOGY PRIMER

- Summarizes commercially available or near-available technologies
- Is intended to aid decision-makers in selecting an optimal technology to support

Benefits:

- Help achieve state energy policy goals.
- Improve likelihood of advanced reactors being located in the state.
- Address challenges through collaboration among state agencies and stakeholders.
- Unite stakeholders around shared goals and understand the nuclear energy deployment ecosystem.

Why a Strategic Framework?

- **Achieving Goals:** How can advanced nuclear energy generation help achieve state energy policy goals?
- **Improving Likelihood:** What should be done to improve the likelihood of advanced reactors being located in the state?
- **Overcoming Challenges:** What challenges for advanced nuclear energy deployment exist, and how can state agencies and stakeholders collaborate to overcome them?
- **Preparation:** Frameworks help prepare states to navigate complex, costly projects dependent on state and federal approvals, public acceptance, and technical factors.

State Strategic Framework and Similar Resources

State	
Wyoming	Strategic Framework and Roadmap
Utah	Strategic Nuclear Energy Pathway
Louisiana	Advanced Nuclear Strategic Edge Strategic Framework
Tennessee	Nuclear Energy Advisory Council Report
Virginia	Strategic Plan for Nuclear Energy
New York	Blueprint for Considerations of Advanced Nuclear Energy Technologies

Initial Steps & Considerations

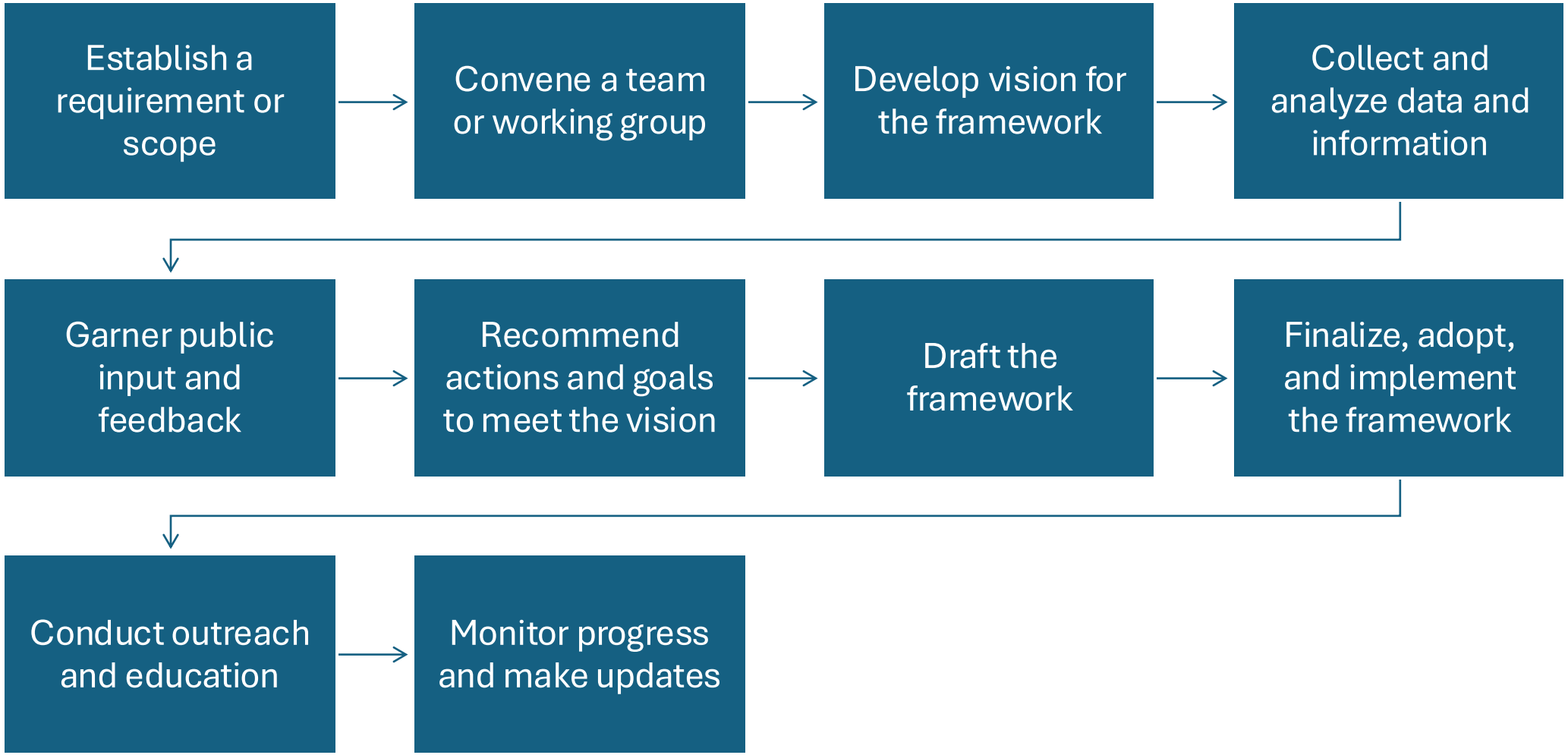
SCOPE POTENTIAL QUESTIONS

EXPLORE TECHNICAL ASSISTANCE NEEDS

CONSIDER WORKING GROUPS AND TASK FORCES

EXPLORE LOCAL ENGAGEMENT OPPORTUNITIES

Strategic Framework Development Pathway



Suggested Categories for Advanced Nuclear Energy Framework Exploration

Highlighted framework topics were identified during ANSC workshops and represent topics that might be useful for states to explore during a framework development process

Framework Category Spotlight: **Cost/Funding**

Key Questions

- Are available funds for supporting early advanced nuclear power deployment perceived as accessible to developers/utilities?
- What financing models exist to reduce first-mover risk, and is there a role for state support?
- What are the decision points related to state-level approval of nuclear power construction costs, and what policy opportunities exist to support advanced nuclear?

Examples

- Virginia Power Innovation Fund
- Duke Energy Carolina's 2024 Carbon Plan Integrated Resource Plan (CPIRP)

Opportunities	Challenges
• Knowledge-sharing collaborations between first movers and utilities considering advanced reactors allow utilities to collect valuable lessons learned from the construction process to reduce costs on future builds.	• Cost overrun risks can have a significant impact to ratepayers. • Project delays may create a risk that incentives are no longer available if project timelines are extended, or projects are abandoned.

Framework Category Spotlight: **Economic Development & Community Impacts**

Key Questions:

- How will different advanced nuclear reactor technologies impact state economic development and workforce considerations?
- What relationship do state economic development agencies currently have with State Energy Offices and PUCs?
- What information can State Energy Offices and PUCs share with communities interested in nuclear?
- What challenges will communities interested in attracting and supporting new nuclear power development face, and how can State Energy Offices and PUCs help communities to overcome them?

Examples

- Texas Advanced Nuclear Reactor Working Group
- KY SB 198: "Nuclear Ready Communities Designation"

Opportunities	Challenges
• Public support for nuclear energy is at a record high. • Nuclear power plants significantly contribute to local employment and tax revenue.	• Matching—how do nuclear power plant developers identify and connect with interested communities Communicating the benefits of nuclear power effectively • For potential coal-to-nuclear, how can the local workforce be retained and re-trained?

Framework Category Spotlight: **Spent Fuel / Safety / Risk Mitigation**

Key Questions

- How can states best interact with the NRC? (e.g., Agreement State program, State Liaison Officer program, memorandums of understanding)
- Are there opportunities (and local communities interested) in participating in the U.S. DOE's collaboration-based siting process?

Examples:

- Connecticut Nuclear Energy Advisory Council
- U.S. DOE's Spent Nuclear Fuel Package Performance Demonstration

Opportunities	Challenges
• Progress on long-term waste siting in other countries • U.S. DOE laboratories have conducted valuable materials research to identify designs for safe long-term storage. • Fuel reprocessing presents the opportunity to reduce the volume of nuclear spent fuel that requires long-term storage if the United States decides to pursue this strategy.	• Previous efforts to establish a permanent nuclear spent fuel repository at Yucca Mountain have stalled, and an alternative facility has not been identified • Public perception of nuclear spent fuel is colored by negative portrayals in media and existing legacy sites.

Incorporating Advanced Nuclear Energy into Existing Plans

NASEO
National Association of State Energy Officials

Load Growth Forecasts

- Help determine need for new generation, especially with rising demand from manufacturing, industrial, and data center facilities
- Amazon's data center near Susquehanna Nuclear Station and Microsoft's PPA for Crane Clean Energy Center (formerly Three Mile Island Unit 1) illustrate high demand for reliable, zero-carbon power

State Energy Plans

- Guide and build consensus for meeting future energy needs
- Virginia's 2022 State Energy Plan outlines nuclear opportunities
- Utah's Operation Gigawatt aims to tackle energy supply/demand gap, including aligning policies with NRC and forming a nuclear program authority

Integrated Resource Plans (IRPs)

- Utilities' long-term plans to procure generation, overseen by PUCs
- IRPs provide one opportunity for utilities to communicate early interest in advanced and explore how advanced nuclear might fit into different energy portfolio scenarios

Conclusions

Key Role: Advanced nuclear energy will be an important tool for decarbonization, economic development, and reliability for states.

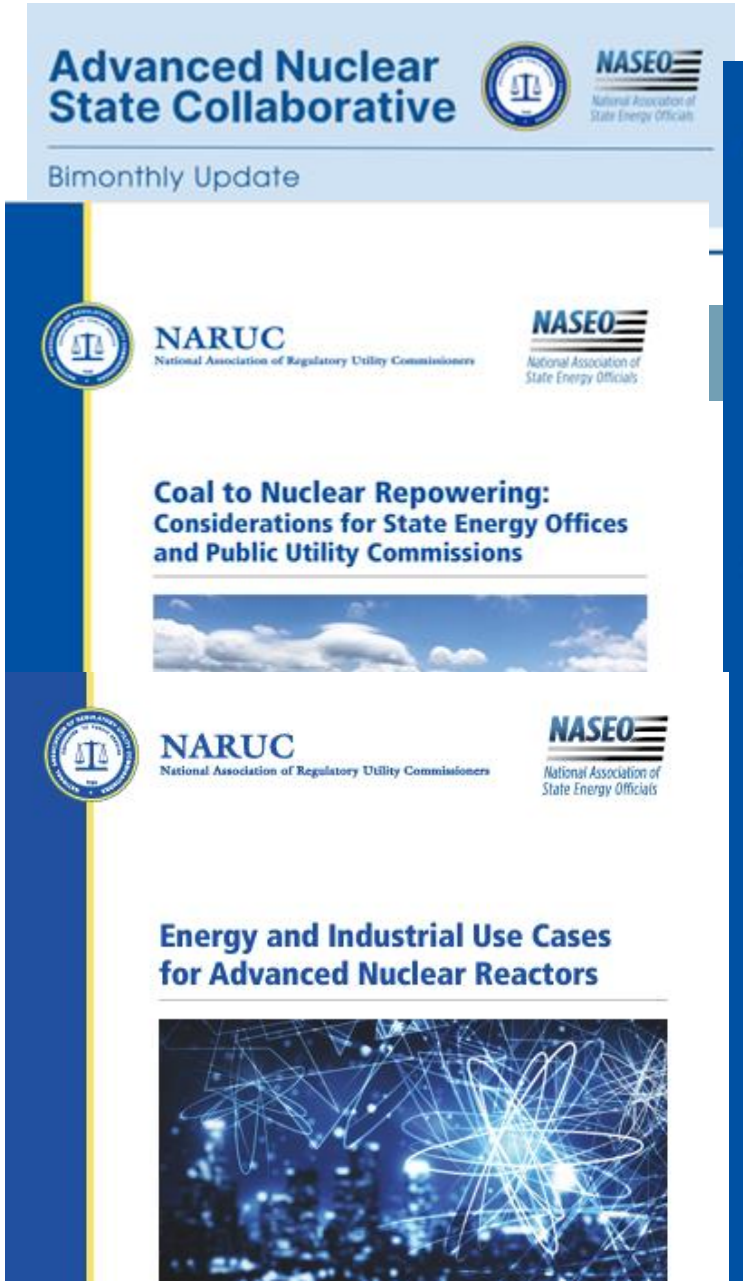
Framework Value: Strategic frameworks help understand challenges and opportunities, and how nuclear fits within state plans, goals, and needs.

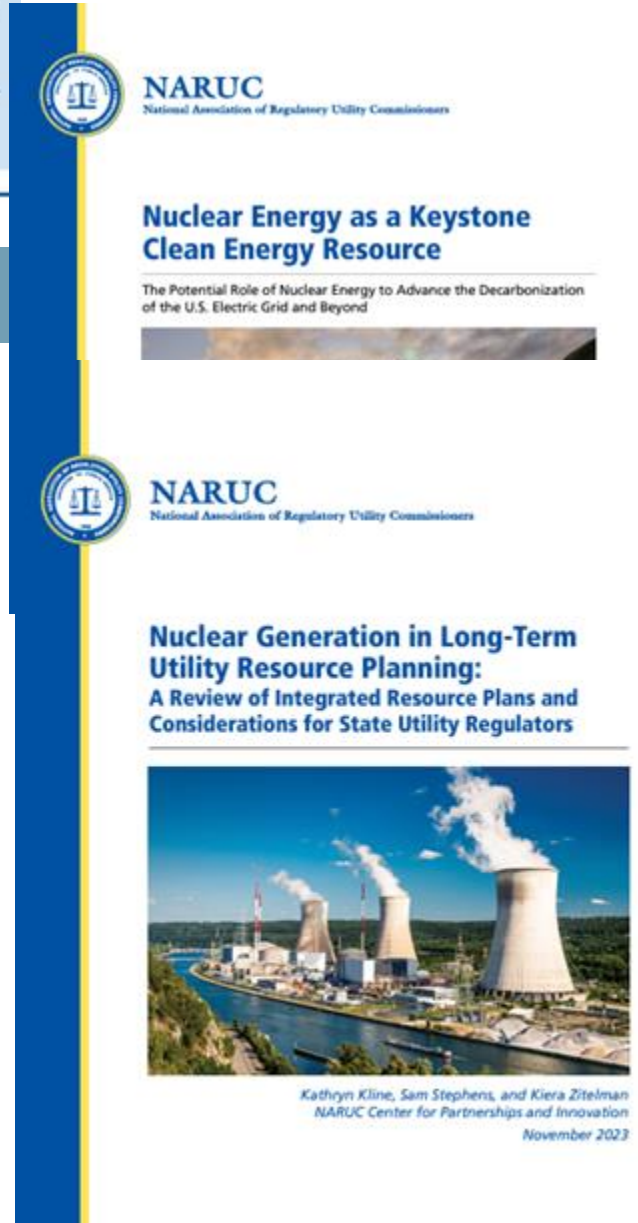
Ongoing Process: States should monitor progress, assess accomplishments, and make modifications as new data or policy/regulatory changes arise.

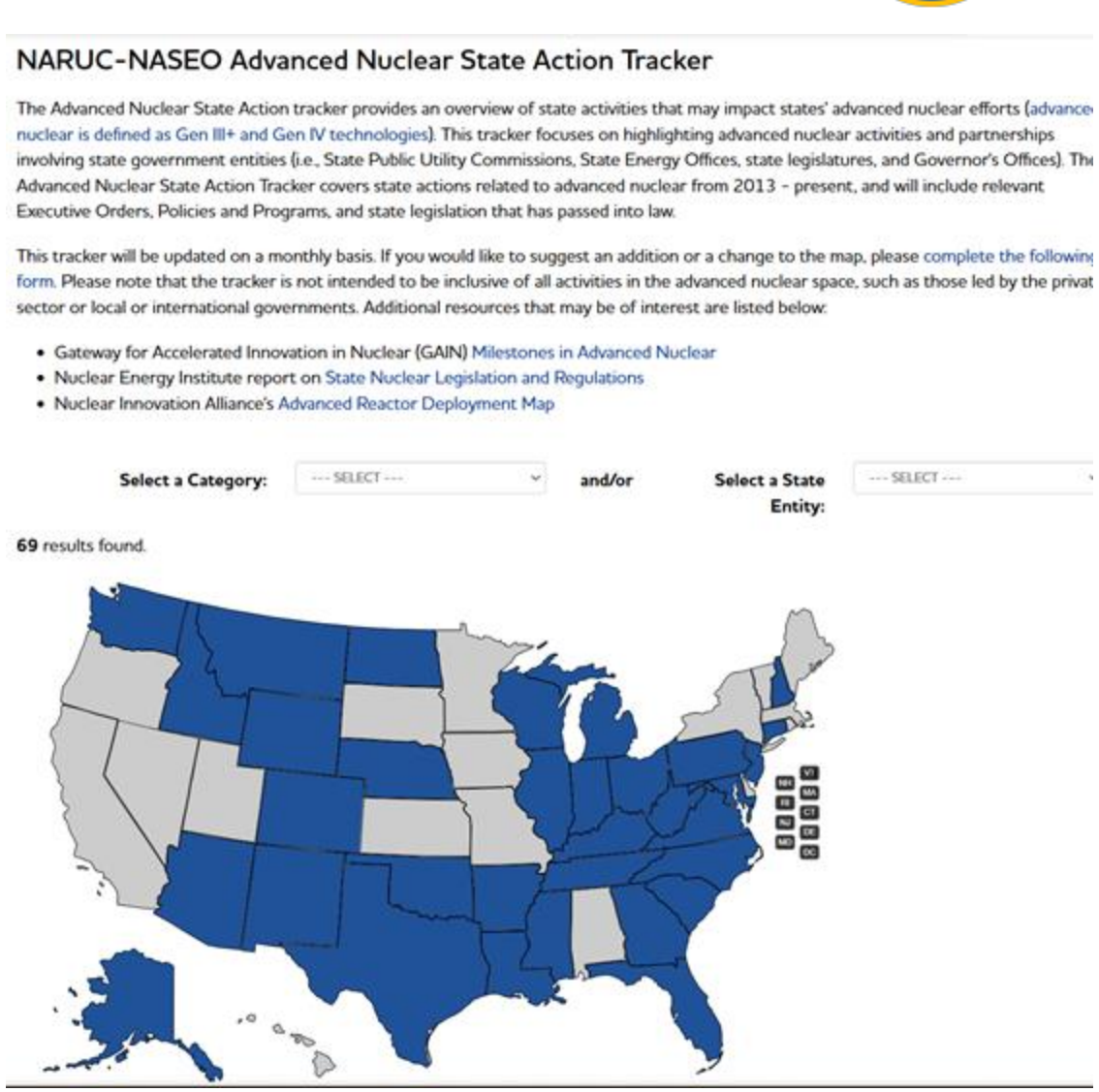
Technical Resources

Program	Resources Available
Gateway to Accelerated Innovation in Nuclear (GAIN)	GAIN is a single point of access to nuclear energy expertise and state-of-the-art research facilities across the U.S. DOE's national lab complex. Whether you are a developer requiring support to accelerate your technology toward market readiness or a leader who is in need of counsel on the applications and benefits of nuclear, GAIN can help you.
The Frontiers Initiative	Idaho National Laboratory (INL) organized the Frontiers Initiative to help first movers in advanced nuclear energy deployment leverage their early adoption of strategic advantage for economic development. The initiative works to catalyze powerful partnerships and to help develop leadership-class capacity to deploy and lead in the new frontier of economic competition.
U.S. DOE, Office of Nuclear Energy Technical Assistance (NE)	NE supports the advancement of nuclear power as a resource capable of making major contributions in meeting our nation's energy supply, environmental, and energy security needs. Additionally, NE provides technical assistance to states and communities as they develop strategic energy plans.
Oak Ridge Siting Analysis for Power Generation Expansion (OR-SAGE)	The OR-SAGE tool provides a methodology to evaluate power plant siting. Based on selected input parameters, the OR-SAGE tool employs a wide array of GIS data sources to identify candidate areas for SMR technology application. Specific sites, such as retired coal plants with significant electrical infrastructure, are also evaluated.
Siting Tool for Advanced Nuclear Development (STAND)	Use STAND to identify and examine potentially feasible sites where advanced nuclear facilities might be welcomed by host communities. STAND is designed to explore and provide insight on socioeconomic, proximity, and safety data; generate county reports; review regulatory data; and complete a comparative analysis across multiple sites.

NARUC-NASEO ANSC Resources





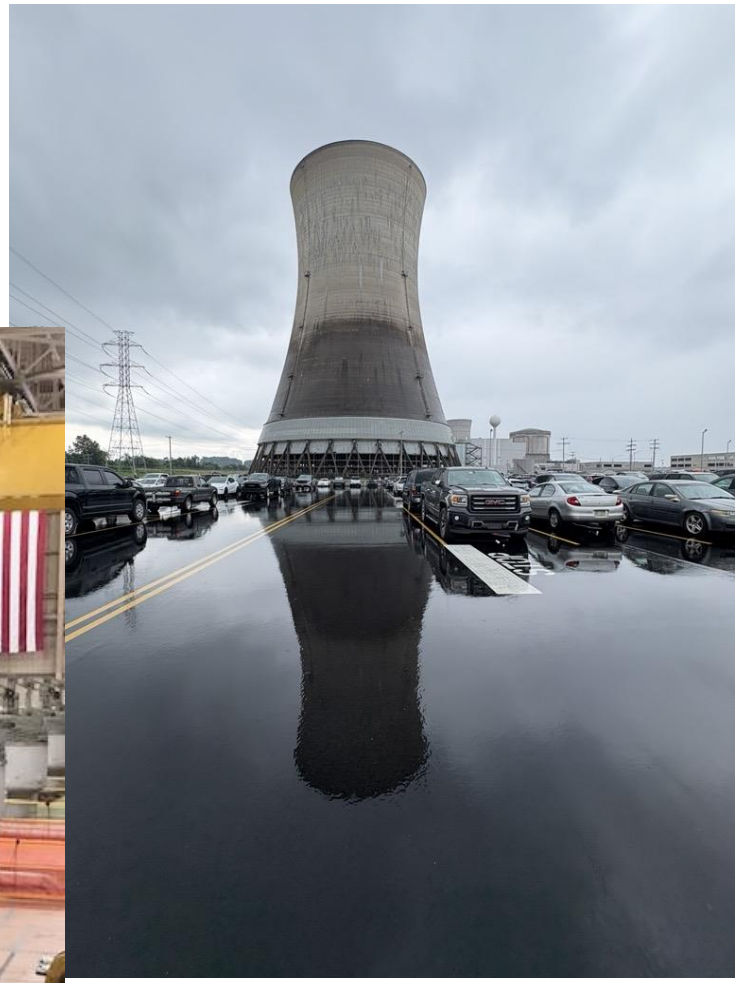


Questions?

Question

For more information, visit the Advanced Nuclear State Collaborative page on the NARUC website

Recap of Crane Clean Energy Center tour



DOE Pilot Program to Build Advanced U.S. Nuclear Fuel Lines

- New pilot program to accelerate the development of advanced nuclear reactors and strengthen domestic supply chains for nuclear fuel.
- The Department issued a Request for Application (RFA) and is seeking qualified U.S. companies to build and operate nuclear fuel production lines using the DOE authorization process.
- Initial applications are **due by August 15, 2025**, with subsequent applications allowed on a rolling basis.
- More information at www.Fedconnect.net, Ref. #DE-FOA-0003572