UTAH OFFICE OF
ENERGY DEVELOPMENT

UTAH'S STRATEGIC NUCLEAR ENERGY PATHWAY: EFFORTS MOVING FORWARD IN OTHER STATES

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UTAH OFFICE OF ENERGY DEVELOPMENT

Utah's Strategic Nuclear Energy Pathway

Development Considerations: Efforts Moving Forward in Other States

As the second installment of "Utah's Strategic Nuclear Energy Pathway," a series of documents guiding the state through nuclear development, this document reviews the efforts of other states also pursuing the development of nuclear energy. Utah can leverage this document to benefit from the strengths and weaknesses of energy legislation in other states.

Introduction

Utah is not creating a nuclear ecosystem in a vacuum. There are forty-nine other states in various stages of nuclear advancement/avoidance whose experiences provide best practices for Utah to follow, as well as ineffective policies that Utah should avoid. This report presents an in-depth analysis of three state categories (legacy, recent policy and moratoriums) that provide valuable lessons in what Utah should aim to achieve legislatively in preparation for nuclear development.

As Utah shapes its nuclear regulatory framework using other states' experiences as a guide, **the Utah Office of Energy Development (OED) presents five considerations:**

1. Legislation addressing the licensing, permitting, or definitions surrounding nuclear technologies should synchronize with and defer to the authority of the U.S. Nuclear Regulatory Commission, where it has regulatory primacy.

2. Establishing clear rules and a standardized procedure through the Public Service Commission for the siting of nuclear facilities is crucial to reducing political uncertainty and increasing Utah's ability to attract projects and investments.

3. Consistent support for nuclear power projects from legislators, governors, energy offices and local governments has proven to be effective in states such as Michigan, Pennsylvania and Wyoming.

4. While the twelve states that currently restrict nuclear development should not be emulated, understanding the rationale that led to the enacted restrictions is critical in order to address public concerns surrounding nuclear energy.

5. Proactively addressing public education, safety and waste discussions in Utah's initial regulatory framework is critically important to the strength of the coming ecosystem.

These considerations protect Utah's energy priorities as written in Utah Code Section 79-6-301, specifically aligning with our strategic objectives of **adequacy, reliability, dispatchability, affordability, sustainability, security and cleanliness.**[1]

The Nuclear Energy Landscape

While the recent surge of interest surrounding nuclear power generation may give some the impression that it is a new source of energy, nuclear power plants have been providing the United States' power grid with its cleanest and safest energy since 1958.[2] Today, 54 nuclear power plants operate 94 nuclear reactors across 28 states, providing approximately 19% of the nation's electricity.[3] Only three of these reactors (Watts Barr 2, Vogtle 3, and Vogtle 4) are recently deployed, having entered operation since 1990. However, recent design innovations, shifting geopolitical dynamics and upcoming regulatory reforms are returning nuclear power development in the coming decades to a scope and scale not seen since the 1970s and 1980s.

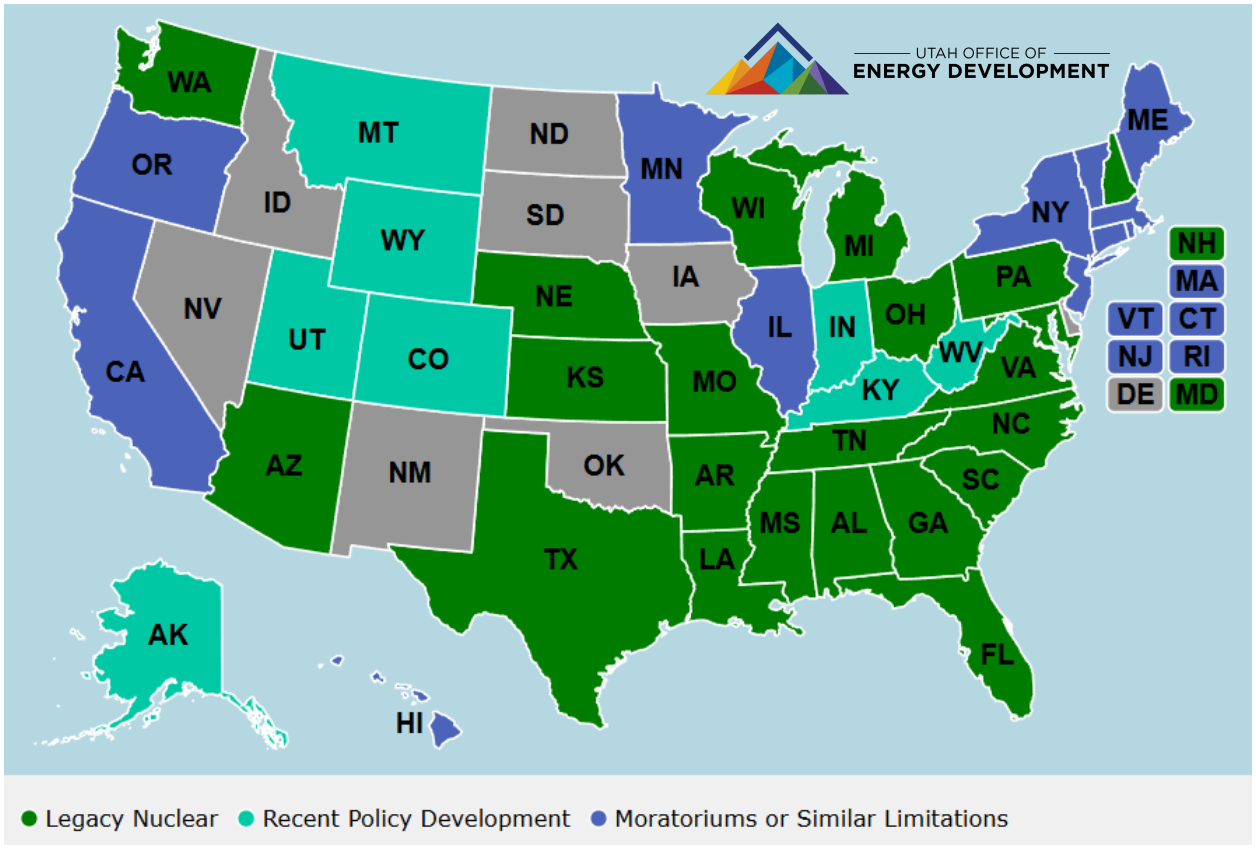

Figure 1. The state of nuclear energy in the United States.

In Figure 1, legacy nuclear states are highlighted in green. These are the twenty-two states that have been operating nuclear reactors for over 30 years and continue to maintain legislative environments favorable for nuclear development. The eight states highlighted in teal, including Utah, are states that do not currently have nuclear power plants in operation but have recently made significant legislative and administrative moves towards promoting nuclear development. States are rapidly joining this category as bills are introduced and passed, and therefore, the list of states in this group will likely be out of date soon after this document is published. Finally, the 12 states highlighted in blue have outright moratoriums on nuclear development or laws that act

as de facto moratoriums. Notably, six of these states would be members of the legacy nuclear group if their restrictive policies were repealed.

While the research underlying this report comprehensively examined the legislative frameworks of all 50 states, OED has selected eight states for analysis to provide insights into the full breadth of policy areas that need consideration and a number of valuable lessons that Utah can learn from.

Within the legacy nuclear group, four states have been selected: Michigan, Pennsylvania, Tennessee and Virginia. In addition to our research, these states were identified through conversations with federal regulators, industry members and other stakeholders. For the recent policy development group, OED again selected a representative sample of four states that provide insights into the full breadth of policy areas that need consideration: Alaska, Indiana, Kentucky and Wyoming. Finally, the moratoriums or similar limitations group is broken into three sub-categories based on the nature of their restrictions, with the rationale that prevailed as they moved away from nuclear energy being summarized.

Legacy States With Long-Standing Nuclear Ecosystems

As outlined above, OED has engaged in a multitude of conversations with federal regulators, industry members and other stakeholders to determine the best states to analyze for this document. The most critical common theme among these states' nuclear energy legislative frameworks is that they do not place additional regulatory burdens on nuclear developers above and beyond the already rigorous requirements of the U.S. Nuclear Regulatory Commission (U.S. NRC). In many cases, the language of their state laws will address an area of regulation by simply stating that the activity is allowed as long as it is compliant with federal regulations, effectively deferring to the U.S. NRC's standards. Where there is state-level regulation, such as through the states' public service commissions, nuclear development is held to the same standard as power plants utilizing any other fuel source.

In addition to not adding additional regulatory burdens, these states actively signal to industry that they are open for business. Their clean energy mandates define nuclear as an acceptable source for contributing to their goals; they form consortia and compacts to advance collaboration and development; and often incentivize nuclear developments financially.

Michigan

Michigan was among the first states to adopt nuclear generation into its energy mix when Big Rock Point became the fifth commercial nuclear power plant built in the United States.[4] Today, its Cook and Fermi Nuclear Power Plants provide 21.8% of the state's electricity, with the repowering of Palisades Nuclear Power Plant and the construction of two small modular reactors (SMR) by 2030 set to push that share above 30%.[5]

Michigan state code does not attempt to increase the regulatory burden on nuclear power development in any way, as the development and licensing of nuclear facilities is left to the U.S. NRC and standard utility planning processes at the Michigan Public Service Commission (MPSC). MCL Section 460 outlines the responsibilities and authority of the Michigan Public Service Commission.[6] When evaluating integrated resource plans and requests to build new generation, it does not place any adverse criteria on nuclear energy that would disadvantage nuclear energy compared to other energy sources. In fact, since 2023, nuclear energy has been legislatively advantaged in the MPSC's processes, recognizing it as a clean resource in the state's clean energy portfolio standard and effectively incentivizing utilities to develop nuclear energy.[7] The MPSC was also directed to examine the feasibility of nuclear power generation in 2022 and published its findings and recommendations in March 2024.[8]

Addressing the question of nuclear waste, Michigan has created a reasonable legislative framework that protects its residents and does not interfere with the operation or development of nuclear energy. MCL Section 3.751[9] codifies Michigan's membership in the Midwest Interstate Low-Level Radioactive Waste Compact, comparable to Utah's membership in the NorthWest Interstate Compact.[10] The Midwest Compact currently disposes of its Class A low-level waste at the EnergySolutions facility in Clive, Utah, and its Class B and C low-level waste at the Waste Control Specialists facility in Andrews, Texas.[11] For High-Level waste, Section 325.491 prohibits the importing of waste generated outside of Michigan and allows spent fuel to be stored at or near nuclear power plants using methods approved by the U.S. NRC.[12] These regulations are paired with frequent resolutions by the Michigan Legislature urging the federal government to fulfill its obligation to establish a permanent geological repository.[13]

Palisades Nuclear Power Plant

While Michigan has a strong foundation for nuclear development in general that Utah can emulate, the state also provides a unique example of recent state support for a nuclear project. The Palisades Nuclear Power Plant has brought Michigan into the spotlight in recent years, as it is expected to be the first nuclear power plant in the United States to restart operation after beginning decommissioning. Additionally, Holtec plans to deploy two SMR-300s at the site by 2030, among the first SMRs that will be deployed in the U.S.[14]

Palisades is located in southwest Michigan on the shoreline of Lake Michigan. Its reactor began operating in 1971 and provided 810 MW of clean baseload energy to its customers for over half a century. In 2022, due to several factors such as the operator's decision to exit the merchant power generation business and the end of its power purchase agreement with Consumers Energy, Entergy transferred its operating license to Holtec International to handle the facility's early decommissioning.[15] After it began decommissioning the plant, what Holtec described as "a groundswell of support from the State of Michigan and the U.S. Department of Energy" led the company to instead announce that it would make the necessary upgrades and repairs to restart the power plant.[16]

Legislatively, Michigan appropriated $150 million in its 2023 state budget to support the repowering, followed by an additional $150 million in 2024 to assist with upgrades to the power plant and U.S. NRC relicensing.[17, 18] This coincided with the addition of nuclear energy as a "clean energy system" in definitions supporting Michigan's clean energy standards and the creation of a bipartisan Nuclear Energy Legislative Caucus.[19, 20] Governor Gretchen Whitmer's office has also been a vocal advocate for the project, touting the jobs and clean energy it will return to the state.[21] Support across all branches of the state government sent a clear message to industry members that Michigan is open for business. These coordinated efforts and support can largely be credited for making repowering a reality.

The U.S. Nuclear Regulatory Commission currently "expects to issue its final decisions on the licensing actions by July 31, 2025." This decision will determine if Holtec's efforts to restart the power plant can move forward. If approved on this timeline, the plant could resume operations before the end of 2025.[22]

What Utah Can Learn From Michigan

Michigan has a legislative framework that can be held as a gold standard that Utah should seek to emulate in all aspects. Its regulations do not interfere or conflict with the U.S. NRC, its public service commission has structured and fair procedures for evaluating nuclear facilities, its waste regulations are tailored to protect its citizens without stifling development and the state has facilitated, incentivized and supported nuclear projects in a cohesive manner. Overall, the success of Michigan's regulatory framework is evident in its nuclear ecosystem, and it is no surprise that Michigan is set to be a leader in modern nuclear development.

Utah can utilize Michigan's experience with the Palisades Nuclear Power Plant as an excellent example of state support for a nuclear project. The project has recently become an even more relevant guide to Utah's efforts, as Utah signed a strategic cooperation agreement with Holtec in May 2025 to collaborate on the deployment of SMR-300s in Utah. According to Holtec, "Palisades will serve as the reference plant for the Mountain West buildout."[23]

Pennsylvania

Pennsylvania became the birthplace of the commercial nuclear power industry when its Shippingport Atomic Power Station became the first full-scale nuclear power plant in 1957.[24] Sixty-eight years later, no other legacy nuclear state produces as much nuclear energy as Pennsylvania.[25] Its four power plants – Beaver Valley, Limerick, Peach Bottom and Susquehanna – generate 32% of the state's electricity needs, enough capacity to satisfy more than double Utah's total electricity consumption.[26]

Like Michigan, Pennsylvania largely leaves development and licensing of nuclear facilities to the U.S. NRC and standard utility planning processes through the Pennsylvania Public Utility Commission. Title 66 § 518 requires anyone planning to construct a nuclear power plant to

receive approval from the Public Service Commission.[27] The commission is required to issue a ruling on the application within six months and is restricted in the scope of its review. However, one item within the review that does create unnecessary burden is that the utility must prove that the nuclear power option in their application is more feasible and cost-effective than a coal-fired power plant at the same site. This provision was implemented more than half a century ago as a measure to protect the state's large coal industry. In today's economic and political climate, it has become an unnecessary hurdle.

In 2014, Pennsylvania updated its Radiation Protection Act, which now includes $1,075,000 in annual fees on any nuclear power plant operator in order to help fund the Pennsylvania Emergency Management Agency for radiological emergency response equipment, planning, training and exercise costs involving nonagency personnel.[28]

State Support for Nuclear Energy

While not as targeted to a specific project as Michigan's efforts, Pennsylvania also expresses broad support for nuclear energy in both its legislative and executive branches. In 2022, their legislature commissioned a study on the benefits of nuclear energy and the potential of SMRs.[29] Legislators have also created a bipartisan Nuclear Energy Caucus, which publishes answers to frequently asked questions and other information on the benefits and advantages of nuclear energy for public consumption.[30] Governor Josh Shapiro joined the effort in March 2025 with the introduction of his Lightning Plan. In a very similar fashion to Governor Cox's Operation Gigawatt in Utah, this plan aims to build more energy projects, speed up permitting, lower costs and create jobs for Pennsylvanians [31]

The success of these efforts can be seen at the Three Mile Island Nuclear Power Plant, where Microsoft has signed a power purchase agreement with Constellation Energy that will restart the power plant by 2028.[32]

What Utah Can Learn From Pennsylvania

Pennsylvania provides another example of an effective legislative framework to emulate. Utah could also adopt similar provisions to those found in Pennsylvania's Radiation Protection Act to bolster the strength of our Division of Waste Management and Radiation Control as it prepares to increase its oversight efforts in a growing nuclear ecosystem.

While the timeline for its repowering of Three Mile Island may be a few years behind that of Palisades in Michigan, it provides another example of how effective policymaking and cohesive support for nuclear energy lead to industry pursuing nuclear development in a state. The 2022 study commissioned by the state legislature, as well as the public education efforts of the legislature's Nuclear Energy Caucus, are also important for Utah to bring forward into the initial regulatory efforts it is undertaking today. Finally, the inclusion of nuclear energy as a key component to Governor Shapiro's Lightning Plan reaffirms the importance of nuclear energy's role in Governor Cox's Operation Gigawatt.

Tennessee

Tennessee has also been a major player in the United States' nuclear industry since the very beginning. This began with the creation of Oak Ridge National Laboratory in 1943, a laboratory that remains critical to nuclear energy research to this day.[33] Tennessee currently has three nuclear power plants – Browns Ferry, Sequoyah and Watts Barr – which generate 48% of the state's electricity needs.[34] In addition to this already large share of nuclear generation, Oak Ridge National Laboratory and the Tennessee Valley Authority are looking to expand their generating capacity with the construction of multiple SMRs at the Clinch River site near the Oak Ridge Lab. This project has successfully acquired an early site permit from the U.S. NRC and is currently navigating the construction permit process under 10 CFR Part 50.[35]

Tennessee has a very simple legislative framework for nuclear development, which can be found in Title 68 Chapter 202.[36] In just a few sections, it outlines that any person engaged in nuclear development or operation must follow all applicable federal rules and regulations, allows the governor to convene groups to conduct studies and obtain guidance on changing laws and regulations, outlines monitoring of nuclear materials transported in the state and gives relevant state agencies the authority to interact with federal nuclear regulators.

Tennessee Nuclear Energy Advisory Council

In May 2023, Tennessee's Governor released Executive Order 101, creating the Tennessee Nuclear Energy Advisory Council.[37] This council was tasked with identifying any regulatory, workforce or education barriers that hinder the expansion of the state's nuclear industry, as well as identifying funding opportunities for the state to harness existing and emerging nuclear technologies.

In addition to the Advisory Council, May 2023's state budget added $50 million to a nonrecurring nuclear energy investment.[38] So far, the fund has distributed awards to four organizations engaged in building a uranium enrichment facility, creating a nuclear engineering minor at the University of Tennessee, purchasing nuclear education equipment and relocating a nuclear company's headquarters.[39]

What Utah Can Learn From Tennessee

Tennessee provides an excellent reminder that state-level regulation of nuclear development does not have to be complex in order to be effective. Additionally, its Nuclear Energy Advisory Council shares many similarities with the responsibilities of the new Utah Nuclear Consortium. Its ability to identify opportunities for the state to make targeted investments in the development of its nuclear ecosystem is a structure Utah should emulate with any targeted funding it may provide through the consortium.

Virginia

While Virginia's commercial nuclear power industry did not emerge until the 1970s, it has hosted U.S. Army and Navy reactors since 1957.[40] Today, Virginia's North Ann and Surry Nuclear Power Plants generate 32% of the state's electricity needs, the largest share of any individual energy resource in the state.[41] In the Governor's 2022 Energy Plan, the state's all-of-the-above energy policy was reaffirmed, with nuclear energy being a critical source of energy for the continuing growth of the state.[42] Virginia, like Utah and other states, has experienced rapid growth in electricity demand, and the northern part of Virginia is home to the country's largest concentration of data centers.[43]

Overall, Virginia's legislative framework for nuclear energy is simple. Title 45.2 Chapter 21 contains all of the state's nuclear energy code — and it is very short.[44] The chapter starts with some definitions, requires the state to have a strategic plan for nuclear energy, sets limits on uranium mining and establishes the Nuclear Energy Consortium. In no way does it outline special rules for the development of nuclear energy facilities, which effectively leaves the state deferring to the U.S. NRC and its rules. This simplicity, combined with the incentives and messaging of the state, has made it an ideal location for nuclear power to thrive.

Virginia Nuclear Energy Consortium

The Virginia Nuclear Energy Consortium was created in 2013, one of the first such bodies to be established during the recent surge in nuclear energy innovation. The consortium was established as a political subdivision of the state, with a board of directors established for oversight. It brings together a number of resources to work with the Virginia Department of Energy, such as universities, nuclear energy companies and suppliers and organizations that support the advancement of the nuclear industry. These partners work together to serve as an "interdisciplinary study, research, and information resource" for Virginia.

Funding and Incentives

Virginia has recently created two funds to incentivize nuclear workforce development, higher education and research, as well as development. In 2023, H.R. 1779 created a fund that supports universities in the state if they create or expand a program leading to degrees that support the nuclear industry.[45] In the same session, H.R. 2386 created a fund to award competitive grants for a wide range of purposes, including nuclear technologies research, site selection for SMR projects and energy workforce development programs.[46] Finally, in 2024, H.R. 1491 authorized the use of a cost recovery method known as construction work in progress.[47] Construction work in progress allows a utility to recover costs from ratepayers while the generating asset is still under construction. This is controversial because it requires ratepayers to incur costs for an asset that has yet to yield a benefit, but proponents argue that it makes capital-intensive nuclear projects less expensive in the long run.

What Utah Can Learn From Virginia

As the final state in OED's legacy nuclear category, Virginia provides another example of an effective legislative framework to emulate. Of particular interest is its nuclear consortium, which convenes similar stakeholders to accomplish similar goals to Utah's new consortium. The state's incentive programs also show Utah that some of the most effective incentives a state can provide for nuclear development are those that target education, workforce development, research and supply chains.

Finally, Virginia presents Utah with an opportunity to discuss the concept of construction work in progress as a method of reducing the overall cost of constructing nuclear power plants. There are benefits and drawbacks to this concept, which Utah should fully understand before making a decision on its use. OED will explore this concept and other financial realities surrounding nuclear energy.

Recent Policy States Developing Legislative Frameworks

Legacy nuclear states certainly provide great examples of long-standing success, but their current efforts also benefit from past nuclear infrastructure, which Utah must create in the present. For that reason, it is also important to evaluate states in similar circumstances to Utah and how they have developed legislative frameworks from the ground up in recent years. Many of these states have made mistakes, such as placing unnecessary requirements on a nuclear power plant's size, location and technologies, creating taxes on nuclear generation that other energy sources are exempted from and a number of other actions that created political uncertainty, stifling development. In many cases, these states have realized these actions were mistakes and repealed or amended their frameworks in a manner more favorable to a nuclear ecosystem.

Alaska

Alaska finds itself in a very unique position when it comes to nuclear viability. The state's main power grid is the smallest interconnect in North America, serving the needs of just 550,000 people with no link to larger interconnected grids in Canada or the contiguous United States.[48] This makes traditional nuclear generation impractical, as a single gigawatt-sized nuclear reactor is capable of producing more electricity than the entire state consumes. Instead, Alaska presents a unique opportunity for deploying microreactors. Over 200 communities across rural Alaska have no economical way to connect with the larger grid, forcing them to operate microgrids that are largely powered by diesel generators. Converting these microgrids to be powered by microreactors provides a number of benefits, from eliminating particulate matter emissions to reducing supply chain vulnerabilities that arise from the constant need for diesel fuel, which is difficult and expensive to transport to such remote communities.[49]

In 2022, Alaska signed S.B. 177 into law, which updated Alaska Statute 18 Chapter 45 to reduce previous regulatory barriers to nuclear development, specifically for microreactors.[50] This

carve-out for microreactors was made by exempting them from a statute requiring the location of any nuclear facility to be designated by the state legislature. That change allows them to instead be sited with the approval of the community that will be utilizing the microreactor through a standardized process at the state's Department of Environmental Conservation. According to Alaska Governor Dunleavy, S.B. 177 gives communities "control over how they meet local energy demands and lays the groundwork for developers to utilize dependable and carbon-free nuclear energy to power work in remote locations."[51]

What Utah Can Learn From Alaska

Alaska provides a strong example of how to develop a legislative framework that facilitates microreactor deployment that Utah should follow. Its statutes streamline federal licensing and permitting oversight by providing clear language that defers authority to the U.S. NRC, and its siting permits have a clear process established through the Department of Environmental Conservation. However, Alaska's approach to the siting of larger nuclear power plants and other nuclear facilities creates political uncertainties that effectively block development through procedural ambiguity.

Utah should not require case-by-case siting approval for nuclear facilities from the legislature, governor, or general public. This approach introduces political uncertainty that would immediately negate Utah's viability for nuclear development, as case-by-case approval effectively functions as a de facto moratorium. Instead, the state should develop a clear and standardized siting approval process under the authority of the Public Service Commission. This eliminates ambiguity and provides a clear understanding of how the process works and what is required of industry members if they wish to develop any kind of nuclear facility in the state.

In regard to nuclear waste regulation, Alaska's legislative framework is underdeveloped. The only issue it addresses, transportation of high-level nuclear waste, restricts any movement of high-level nuclear waste material unless that movement is to move it out of the state. When addressing that specific topic, Utah may wish to regulate the movement of high-level nuclear waste into the state from outside sources, but a full lifecycle nuclear ecosystem will require clear rules and oversight that allow nuclear waste to be moved in a structured manner.

Indiana

Of all eight states used as case examples for this report, Indiana is closest to our current state of nuclear development; however, it also presents a unique learning opportunity: Utah could significantly surpass what Indiana has accomplished by learning from their mistakes. Indiana has no nuclear power plants, but has a single test reactor operated by Purdue University, much like Utah has no nuclear power plants and a single test reactor at the University of Utah. Both Utah and Indiana are actively exploring the early site permitting process, and Utah's engagement with

the Valar Atomics test reactor at the Utah San Rafael Energy Lab (USREL) already positions Utah to surpass Indiana.

Indiana began to build a legislative framework for nuclear energy in its 2022 legislative session when it passed S.B. 271.[52] Although the bill instructed the Utility Regulatory Commission (URC) to adopt rules governing the permitting of SMRs, it only allowed SMRs to replace coal or natural gas generation capacity. This, as well as other restrictions, resembles those Wyoming outlined in its original 2020 framework. Like Wyoming did in 2022, these restrictions will have to be repealed if Indiana wishes to attract any nuclear development.

In 2023, S.B. 176 made a single amendment to the original framework, amending the definition of an SMR to include any reactors with a capacity of up to 470 MW instead of the original 350 MW.[53] While this amendment may seem arbitrary on the surface, it perfectly coincides with Rolls-Royce announcing the development of a new reactor design with a 470 MW capacity. Amending state legislation to stray from established definitions, pick marketplace winners and add unnecessary restrictions will hamper Indiana's efforts to attract wider investment and develop a comprehensive nuclear energy ecosystem.

Utility Regulatory Commission's New Rules

In April 2024, Indiana's URC finalized the new rules it was instructed to create for the permitting of SMR construction, purchasing and leasing.[54] It requires the utility to obtain a certificate of public convenience and necessity (CPCN) before it can begin construction of an SMR. To support the CPCN, the utility must provide the commission with evidence detailing:

- Whether, and to what extent, the proposed SMRs will replace retiring generation capacity that is located in Indiana
- Whether, and to what extent, the proposed SMRs will replace retiring generation capacity that used coal or natural gas as a fuel source
- Whether or not the facility will be located at or near the site of the retiring facility
- How the utility will make use of land, existing infrastructure or other pre-owned facilities
- How the utility will create employment opportunities for workers displaced by the retirement of the previous facility
- Its plan to obtain all the licenses or permits required by the U.S. NRC, Indiana Department of Environmental Management, any other involved federal agencies and the locality
- Its plan for education and community outreach about the proposed SMR

Following SMR approval, the utility must submit all U.S. NRC docket numbers to the commission within 30 days of the number being assigned. This includes any reports, notices of violation or any other notifications sent to or received by the NRC.

What Utah Can Learn From Indiana

Indiana has made several mistakes in its recent legislation that Utah should avoid. This includes straying from established definitions for nuclear technologies, crafting their framework to pick specific winners and adding unnecessary restrictions on top of the already established requirements of the U.S. NRC. That said, Indiana has also made moves in the right direction, namely the creation of a clear and established process for the permitting of SMRs.

Kentucky

Kentucky is a unique state in its nuclear development pathway because nuclear energy was banned in the state for 40 years. During this time, the Kentucky Public Service Commission was only allowed to certify a nuclear power plant if it found that the owner had the technology and means for the permanent and terminal disposal of high-level nuclear waste, a requirement that acted as a de facto moratorium, so long as the federal government fails to establish its geologic repository. This was amended in 2017, when Senate Bill 11 repealed this moratorium by allowing high-level nuclear waste and spent fuel to be stored as long as a plan is submitted to the Public Service Commission in accordance with federal laws and regulations.[55]

Seven years later, in their 2023 legislative session, Kentucky began to build a legislative framework for nuclear energy. Senate Joint Resolution 79 created a Nuclear Energy Working group, whose 23 members were tasked with identifying the barriers to nuclear deployment in the state and providing recommendations to the legislature on how to address those barriers.[56] This was followed in 2024 by two bills. Senate Joint Resolution 140 directed Kentucky's PSC to make all preparations necessary for its role in siting and construction of nuclear energy facilities in the state.[57] Senate Bill 198 created the Kentucky Nuclear Energy Development Authority.[58] The governor initially vetoed the bill due to concerns with the selection of advisory board members, but the veto was overridden by the legislature. The authority serves as the nonregulatory state government agency on nuclear energy issues and development. It is tasked with supporting and facilitating the nuclear energy ecosystem in a collaborative manner that is safe, protects the environment, supports community voices, increases energy education, enhances the economy and prepares the future workforce.

What Utah Can Learn From Kentucky

From its unique position as a previously restrictive state that repealed its de facto moratorium, Kentucky's experience with creating its Nuclear Energy Development Authority highlights important considerations that must be made while operating the board that governs Utah's Nuclear Consortium. Utah should also instruct its Public Service Commission to establish a clear process for permitting nuclear facilities, with an understanding that the process should put nuclear generation on a level playing field with other energy sources.

Wyoming

Wyoming's pathway to nuclear development is of particular interest to Utah's efforts for a number of reasons. Wyoming is a like-minded state with an any-of-the-above energy strategy and an energy portfolio that produces twelve times more power than the state consumes.[59] In addition, our neighbor to the northeast is about 5 years ahead of us on the nuclear energy pathway, and in that time, they have successfully attracted a private reactor, the TerraPower project. David Terry, the president of the National Association of State Energy Offices (NASEO), said in an interview with Utility Dive that "Wyoming has done a terrific job" supporting nuclear deployment.[60]

In a similar fashion to the renewed nuclear discussions nationwide, Wyoming's path to nuclear development originated out of discussions about coal-to-nuclear conversion. In 2020, Wyoming's State Legislature passed H.B. 74, creating its first regulations around nuclear power generation.[61] This bill created a process by which the owners of current coal and natural gas assets could apply for permission to replace their generation capacity with SMRs. The bill also instructed relevant state agencies to adopt rules and regulations, imposed a tax on electricity generated by nuclear reactors, created reporting and financial requirements and reaffirmed that in no way was Wyoming attempting to overstep the authority of the U.S. NRC.

The framework was very specific in only permitting SMRs, which only allowed the construction of reactors with a generating capacity of 300 MW or less. Those projects with capacity needs exceeding 300 MW would need to site multiple SMRs at the same location. Potential sites were restricted to the sites of current coal and natural gas resources, effectively disallowing any greenfield opportunities. Another obstacle created by the framework was that the combined capacity of SMRs on a site was not allowed to exceed the generating capacity of the coal or natural gas power plant it was replacing. Finally, the bill also required the new reactor(s) to be built on the site of the current power plant that it was replacing, an oversight which does not align with the best practice of building adjacent to or near the retiring asset so that the project can be completed as the previous asset is retired.

Shortly after this original framework was implemented, 2022's H.B. 131 would repeal and amend most of the framework's language.[62] All of these elements of the original framework, if they had not been repealed, would have quashed the viability of the TerraPower project before it even began. The TerraPower project plans to construct a 345 MW reactor several miles south of the Naughton Power Plant, with timelines aligning to have the reactor begin generating as the coal plant reaches its decommissioning date. It is also worth noting that TerraPower announced its site selection and set in motion the permitting process as H.B. 131's amendments were making their way through the Wyoming Legislature.

High-Level Waste Regulation

Wyoming's rules for high-level nuclear waste offer a sensible approach that balances the need for temporary storage as a nuclear power ecosystem is developed, while also protecting the state from accepting waste generated outside state boundaries. In 2022, H.B. 131 also amended Wyoming Code 35-11-1506 to expand permissions to store high-level waste.[63] The new legislation allows for on-site storage of high-level radioactive waste and spent fuel produced by a nuclear power generation facility operating within the state.

Beyond these fundamental protections, the bill also requires the operator of a high-level waste facility to submit several reports. It outlines a report on jobs, tax revenues and economic impacts the operator must submit to the Department of Health at least 30 days before the facility begins construction. This is followed by an ongoing commitment to send all publicly available reports to the Department of Health and the emergency management departments of local governments near the facility within 5 days of release, as well as making the reports available to the public online. These or similar reports, while not necessary for the protection of the state, create value by informing public education and sentiments.

What Utah Can Learn From Wyoming

As it stands today, Wyoming's regulatory framework for nuclear energy serves as an exemplary template for Utah. Utah can also learn from the mistakes in Wyoming's original framework, which it had to repeal a year later. Greatly restricting and overburdening nuclear projects with unnecessary requirements is a mistake that Utah should seek to avoid. What Utah should consider adopting is Wyoming's approach to transparency, which requires nuclear facilities to make their regular public reports to the U.S. NRC easily accessible. This level of transparency would strengthen public education and awareness efforts. And in regard to high-level nuclear waste, Utah's legislative framework should follow a similar approach, with exceptions outlined that allow waste to be imported for spent fuel recovery and recycling, should the U.S. NRC establish rules for such a process that Utah would be interested in exploring.

States With Moratoriums

States interested in developing a nuclear energy ecosystem can and should do more than avoid outright legislative bans: They must avoid extremely burdensome regulations or legislation that disincentivize investment. This section does not seek to prove that point, but rather to highlight the rationale that prevailed in other states as they moved away from nuclear energy. Understanding these concerns and how to address them is crucial to our own efforts.

There are currently twelve states that have some form of moratorium on nuclear development.[64] Additionally, there are notable omissions from this section of the paper, namely Kentucky, Montana, Wisconsin and West Virginia, which have all repealed their nuclear energy bans in the

last 5 years. Below, we divide these states into three groups: Outright Bans, Waiting for Waste Solutions and Legislature/Voter Approval States.

The outright ban states of Minnesota and New York both have nuclear reactors that have provided electricity for half a century. However, both states have banned further construction of nuclear facilities. These bans have no timelines, qualifications, or requirements that outline scenarios in which the ban can be lifted or loosened.

California, Connecticut, Illinois, Maine, New Jersey and Oregon all have nuclear construction moratoriums in place until a solution for radioactive waste disposal is identified. The language of these bans generally outlines that the ban will be lifted when a permanent waste repository owned by the federal government receives its operating license from the U.S. NRC.

Hawaii, Illinois, Maine, Massachusetts, Rhode Island, Vermont and Oregon all create an uncertain situation for nuclear developers by requiring the approval of the state's legislature and/or a vote by the general public before any nuclear project can be approved. While these states may technically permit the construction of nuclear projects, the heightened level of political uncertainty ensures that no potential project can attract the necessary capital and stakeholders required for success.

Regardless of the category each state finds itself in, the rationale for their ban(s) revolves around the same issues: Public sentiment. The 1979 partial meltdown of the Three Mile Island Nuclear Power Plant in Pennsylvania caused a negative shift in public perceptions of nuclear energy. This resulted in a wave of bans in the 1980s, with proponents citing concerns about the accident risk, economic viability and general safety of nuclear power plants as well as the lack of federal solutions for permanent spent fuel storage. Utah is currently undertaking a statewide community education and community outreach effort to inform and engage its citizens on the issue of nuclear energy.

It is worth noting that, over the last half-century, public sentiment has begun shifting back in favor of nuclear energy as technologies and public education have improved, resulting in widespread efforts to repeal or reform many nuclear moratoriums. Connecticut, Hawaii, Illinois, Minnesota, New Jersey and Oregon have all seen such legislative efforts.

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