North Dakota Legislative Council
Prepared for the Advanced Nuclear Energy Committee
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ADVANCED NUCLEAR ENERGY STUDY - BACKGROUND MEMORANDUM

Section 1 of House Bill No. 1025 (2025) (appendix) requires the Legislative Management to establish a committee to study the feasibility, siting, and deployment of advanced nuclear power plants in the state. The committee must consist of two members representing the energy industry, appointed by the Legislative Management, one member appointed by the Public Service Commission, one member appointed by the Industrial Commission, one member appointed by the Director of the Department of Water Resources, and legislative members from the House of Representatives and Senate, appointed by the majority leader of each respective house. The study must include an evaluation of:

- Siting locations, including potential greenfield and brownfield sites, the identification and assessment of undeveloped land suitable for construction, developed land suitable for rehabilitation and reuse, geographical locations, environmental impacts, proximity to infrastructure, and community acceptance;
- Electric grid connectivity, including the capacity of the electrical grid and integration of a nuclear power plant to the state, necessary upgrades and expansions to ensure reliability, and recommendations adhering to national and state electric standards and regulations;
- Land use considerations, including long-term sustainability of proposed sites, environmental and social factors, land use patterns and zoning regulations, potential impacts on local land use, and proposed mitigation strategies;
- Economic impacts, including potential tax revenue, job creation during construction and operation of a nuclear facility, economic impacts on local and state economies, and investor appeal;
- Temporary and permanent nuclear waste storage, including in-state and out-of-state siting locations;
- Small modular and micro nuclear reactors, including the feasibility of constructing and operating small modular and micro reactors to generate power in the state; and
- Provisions of the North Dakota Century Code which place restrictions on advanced nuclear energy development, if any.

The study also must invite participation from an institution of higher education for assistance in evaluating social interests and community acceptance of potential siting locations.

Section 2 of the bill provides for a $300,000 appropriation to the Legislative Council for the purpose of contracting for consulting services for the study and requires the Legislative Council to seek matching funds from the private sector to the extent available to assist with the project.

BACKGROUND

States across the country are actively engaging in policy discussions related to advanced nuclear energy. As technological demands increase, driven by factors such as rapid growth in artificial intelligence and data center infrastructure, legislatures and government agencies are evaluating the role of advanced nuclear energy as a potential power source to meet long-term energy needs. North Dakota recently joined the growing number of states evaluating the feasibility of deploying advanced nuclear power within its borders.

Legislative discussions regarding advanced nuclear energy development in North Dakota predated the 2025 legislative session. Pursuant to House Concurrent Resolution No. 3034 (2023), the 2023-24 interim Energy Development and Transmission Committee was tasked with studying sustainable energy policies to maximize the economic viability of existing energy sources, assessing future demands on electricity in the state, and determining the feasibility of advanced nuclear energy development and transmission in the state. As part of the committee's study, the committee received testimony from representatives of state and federal agencies, national organizations, and the nuclear energy industry. As the study progressed, it became clear to the committee the undertaking of studying advanced nuclear energy development and transmission was larger than anticipated and should be continued in the following interim to evaluate the viability of advanced nuclear energy in the state. As a result, the committee recommended introduction of House Bill No. 1025 (2025) to direct the Legislative Management to form a committee to study advanced nuclear energy.

Testimony provided in support of the bill indicated the need for a continued and more focused study of advanced nuclear energy. These reasons articulated in the testimony included a desire to allocate more focused time and attention to the study of advanced nuclear energy, the rapid increase of baseload energy demands, potential international strategies to reduce reliance on imported oil and natural gas, shifts in the regulatory environment governing nuclear energy, the continued development of nuclear reactors in nearby regions, and President Donald J. Trump's recent endorsement of advanced nuclear reactor development. Additional testimony in support of the study emphasized the importance of nuclear power to the energy system, projected growth of nuclear power in the United States, economic benefits associated with advanced reactor technology, and the importance of energy innovation to address environmental challenges. No written testimony in opposition to the bill was received.

ADVANCED NUCLEAR ENERGY OVERVIEW

History of Nuclear Power

Nuclear energy has a long history in the United States. After decades of nuclear research and development, construction began on the world's first nuclear reactor in Chicago in 1942, which marked the world's entry into the nuclear age.[1] Most early atomic research focused on weapon development for use in World War II. *Id.* After the war, the federal government encouraged nuclear energy development for peaceful civilian purposes and authorized construction of the reactor that generated the first electricity from nuclear energy in late 1951. *Id.*

Nuclear research in the mid-1950s aimed to demonstrate nuclear energy could produce electricity for commercial use. *Id.* In 1957, the first commercial electricity-generating nuclear power plant reached its full design power. *Id.* The industry grew in the 1960s, and electricity generation from nuclear energy was referred to by utility companies at that time as "economical, environmentally clean, and safe." *Id.* However, from the late 1970s to the early 2000s, the nuclear power industry suffered some decline and stagnation.[2] During this time, concerns such as "reactor safety, waste disposal, and other environmental concerns" were identified.[3] Beginning in the 2000s, several factors combined to revive prospects for nuclear power, including the projected increase in electricity demand worldwide, the importance of energy security, a desire to limit carbon emissions, and the availability of a new generation of nuclear power reactors.[4]

[1] U.S. Dept. of Energy, *The History of Nuclear Energy*, https://www.energy.gov/ne/articles/history-nuclear-energy (last visited August 2025).

[2] World Nuclear Association, *Outline History of Nuclear Energy* (July 2025). https://world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.

[3] U.S. Dept. of Energy, *The History of Nuclear Energy*, https://www.energy.gov/ne/articles/history-nuclear-energy (last visited August 2025).

[4] World Nuclear Association, *Outline History of Nuclear Energy* (July 2025). https://world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.

Today, nuclear power remains a notable power source in the United States. As of February 2025, the United States' nuclear fleet consisted of 54 nuclear power plants, with each containing one to four operating units.[5] As of 2024, more than 18 percent of electricity in the United States is generated by 94 reactors in 28 states.[6] In 2024, nuclear power plants in the United States generated nearly 782 billion kilowatt-hours of electricity, which is enough electricity to power more than 72 million homes.[7]

Brief Overview of Advanced Nuclear Technologies

Advanced nuclear technology has emerged as a potential solution for the future of nuclear energy in the United States, and has been described by advocates as clean, reliable, affordable, and safe.[8] Advanced nuclear technology differs from traditional nuclear power in a number of ways. The next-generation reactors, often referred to as "advanced reactors," encompass many designs, models, and technologies with unique features and benefits that differ from reactors used in conventional nuclear plants (i.e., light water reactors). *Id.* The Nuclear Regulatory Commission (NRC) refers to non-light water reactor designs and small modular light water reactors as advanced reactors.[9] Compared to existing operating reactors, advanced reactors incorporate innovative technologies, including passive safety features, alternative fuel or coolant types, or smaller reactor sizes. *Id.* Generally speaking, compared to conventional nuclear plants, advanced nuclear power plants can be built much faster, in part because of the smaller size of the advanced reactors.[10] These advanced reactors differ in size depending on energy needs.[11] Two common sizes of advanced reactors include:

- **Small Modular Reactors (SMRs)**, with an electricity production capacity of up to 300 megawatts electric, which can connect to other reactors. In contrast to a conventional reactor built on site at a nuclear power plant, an SMR can be built in a factory and shipped intact or in pieces, which allows for streamlined construction at a lower cost. *Id.*
- **Microreactors**, which are more compact than SMRs with an electricity production capacity ranging from 1 to 10 megawatts electric. Some microreactor models are highly portable, enabling transport by truck, cargo plane, or helicopter. *Id.*

Currently, there are no operating advanced SMRs or microreactors in the United States. However, there are a number of projects in progress, several of which are in the permitting and development stages. For example, in early 2023, the NRC certified NuScale Power's SMR, representing the first SMR design certified by the NRC.[12] Continued progress in advanced nuclear energy technology is anticipated as overall electricity demand is likely to increase in the coming decade.

Federal Executive Support of Advanced Nuclear Energy

The current federal executive administration has expressed consistent support for advanced nuclear energy development, including multiple executive actions in 2025 encouraging expedited advanced nuclear reactor deployment. On the first day of his second term, President Trump issued Executive Order 14154, titled "Unleashing American Energy," which, in part, encouraged the development of nuclear

[5] Slade Johnson, *The United States Operates the World's Largest Nuclear Power Plant Fleet*, U.S. Energy Info. Admin. (April 24, 2025). https://www.eia.gov/todayinenergy/detail.php?id=65104.
[6] Nuclear Energy Inst., *What Every Legislator Needs to Know About Nuclear Energy* (2024). https://www.nei.org/CorporateSite/media/filefolder/resources/fact-sheets/2024-Legislators-Need.pdf.
[7] U.S. Dept. of Energy, *5 Fast Facts About Nuclear Energy* (May 7, 2025). https://www.energy.gov/ne/articles/5-fast-facts-about-nuclear-energy.
[8] Nuclear Energy Inst., *Advanced Nuclear 101* (2025). https://www.nei.org/advanced-nuclear-energy/advanced-nuclear-101.
[9] U.S. Nuclear Regulatory Comm'n, *Advanced Reactors*, (Mar. 4, 2025). https://www.nrc.gov/reactors/new-reactors/advanced.html.
[10] *See* Nuclear Energy Inst., *Advanced Nuclear FAQ* (2025). https://www.nei.org/advanced-nuclear-energy/advanced-nuclear-faq-(1).
[11] Nuclear Energy Inst., *Advanced Nuclear 101* (2025). https://www.nei.org/advanced-nuclear-energy/advanced-nuclear-101.
[12] U.S. Dept. of Energy, *NRC Certifies First U.S. Small Modular Reactor Design* (Jan. 20, 2023). https://www.energy.gov/ne/articles/nrc-certifies-first-us-small-modular-reactor-design.

energy resources. Shortly after, the Secretary of Energy issued his February 5, 2025, Secretarial Order,[13] titled "Unleashing the Golden Era of American Energy Dominance," which directed the Department of Energy (DOE) to take immediate action to unleash American energy in accordance with the President's executive orders. The Secretarial Order stated, in part:

> The long-awaited American nuclear renaissance must launch during President Trump's administration. As global energy demand continues to grow, America must lead the commercialization of affordable and abundant nuclear energy. As such, the Department will work diligently and creatively to enable the rapid deployment and export of next-generation nuclear technology.

On May 23, 2025, President Trump signed four more executive orders related to nuclear energy, including:

- **Executive Order 14299, titled "Deploying Advanced Nuclear Reactor Technologies for National Security"**, which, in part, directed the federal government to accelerate the development and deployment of advanced nuclear technologies and enable private sector investment, innovation, development, and use of advanced nuclear technologies. The order also addresses deployment and use of advanced nuclear technology at military installations and DOE facilities.
- **Executive Order 14300, titled "Ordering the Reform of the Nuclear Regulatory Commission"**, which aims to reform the NRC to more efficiently promote safe, abundant nuclear energy.
- **Executive Order 14301, titled "Reforming Nuclear Reactor Testing at the Department of Energy"**, which directed the federal government to foster nuclear innovation and bring advanced nuclear technologies into domestic production as soon as possible by improving nuclear reactor testing, streamlining environmental reviews, and establishing a pilot program for reactor construction and operation.
- **Executive Order 14302, titled "Reinvigorating the Nuclear Industrial Base"**, which was aimed at restoring United States leadership in the nuclear energy industry by directing federal efforts toward expediting and promoting the production and deployment of nuclear energy, addressing spent nuclear fuel and high-level waste, expanding nuclear energy workforce capacity, and securing nuclear supply chains.

These orders were issued after the enactment of two significant pieces of federal legislation designed to encourage development of advanced nuclear technologies: the 2019 Nuclear Energy Innovation and Modernization Act (NEIMA) and the 2024 Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act. These pieces of federal legislation are described in further detail below.

FEDERAL LEGAL AND REGULATORY FRAMEWORK

The regulation of nuclear energy in the United States is distinct from other forms of energy regulation. In the United States, nuclear reactors and nuclear power facilities are highly regulated at the federal level. Several key federal statutes and regulations form the legal framework for nuclear energy.

Primary Statutes Governing Non-Military Nuclear Energy

Federal authority over nuclear energy is rooted primarily in the Atomic Energy Act of 1954 (AEA) and the Energy Reorganization Act of 1974.

Atomic Energy Act of 1954

Before 1954, the federal government had exclusive use, control, and ownership of nuclear technology. The AEA[14] encouraged private development of nuclear power subject to a strict federal licensing and regulatory system. The AEA states "the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and

[13] U.S. Dept. of Energy, *Secretary Wright Acts to "Unleash Golden Era of American Energy Dominance"* (Feb. 5, 2025). https://www.energy.gov/articles/secretary-wright-acts-unleash-golden-era-american-energy-dominance.
[14] 42 U.S.C. 2011 et seq.

strengthen free competition in private enterprise."[15] Thus, under the AEA, private entities could own, construct, and operate commercial nuclear power reactors, but would be subject to the regulations of a government agency, originally known as the Atomic Energy Commission (AEC). Pursuant to the AEA, the AEC was entrusted with exclusive jurisdiction over the license, transfer, delivery, receipt, acquisition, possession, and use of all nuclear materials.[16]

Energy Reorganization Act of 1974

Under the AEA, a single agency, the AEC, was responsible for the development and production of nuclear weapons and for the development and safety regulation of civilian use of nuclear materials. In 1974, the AEC was abolished by the federal Energy Reorganization Act of 1974,[17] and the duties of the commission were split among two agencies.[18] The responsibility for development and production of nuclear weapons, promotion of nuclear power, and other energy-related work was assigned to the Energy Research and Development Administration (now part of the DOE), while the regulatory functions were assigned to the NRC. *Id.*

Recent Legislation Supporting or Incentivizing Advanced Nuclear Reactors

Nuclear Energy Innovation and Modernization Act

The NEIMA[19] was a bipartisan bill passed in 2019 with the primary purpose of modernizing the NRC's functions. The legislation primarily accomplished this purpose by directing the NRC to develop a licensing framework for advanced nuclear reactors within 2 years and to complete an optional technology-inclusive licensing framework by 2027. As discussed below, this new technology-inclusive licensing framework is well under way and, according to the NRC, is expected to be issued in 2027 consistent with the timeline provided under NEIMA.

Among its additional provisions, the legislation imposed a cap on the NRC's annual fees for existing reactors, revised the NRC's fee structure, and directed the NRC to establish performance metrics, report specified information to Congress, and examine ways to improve efficiency of uranium recovery licensing.

Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy

The ADVANCE Act[20] was passed as part of the federal Fire Grants and Safety Act and signed into law with bipartisan support in 2024. The ADVANCE Act builds on the successes of NEIMA to further modernize licensing approaches for new reactor technologies, including advanced reactors and microreactors. Among a number of other provisions, the legislation directed the NRC to reduce certain licensing application fees and increase staffing, authorized prize competitions to incentivize innovation and deployment of advanced nuclear technology, and enabled cleanup and reuse of brownfield sites, including retired or retiring coal plants.

Nuclear Regulatory Commission - Title 10, Code of Federal Regulations

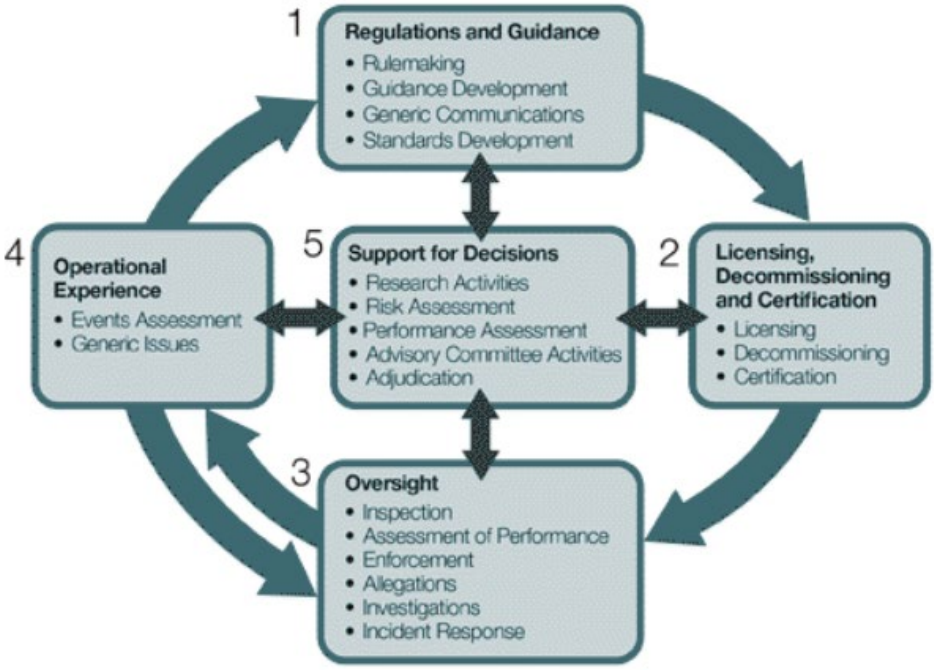
The NRC is an independent regulatory agency consisting of five commissioners appointed by the President and confirmed by the Senate for 5-year terms.[21] The NRC mission statement provides:

> The NRC protects public health and safety and advances the nation's common defense and security by enabling the safe and secure use and deployment of civilian nuclear energy

[15] 42 U.S.C. 2011
[16] Jason O. Heflin, *State Authority to Regulate Nuclear Power: Federal Preemption Under the Atomic Energy Act (AEA)*, Cong. Research Serv., R41984 (Nov. 1, 2023).
[17] 42 U.S.C. 5801
[18] U.S. Nuclear Regulatory Comm'n, *Governing Legislation* (June 24, 2025). https://www.nrc.gov/about-nrc/governing-laws.html#nnpa-1978.
[19] Nuclear Energy Innovation and Modernization Act, Pub. L. No. 115-439, 132 Stat. 5565 (2019).
[20] Fire Grants & Safety, ADVANCE Act, Pub. L. No. 118-67, 138 Stat. 1447 (2024).
[21] U.S. Nuclear Regulatory Comm'n, *The Commission*, (Aug. 4, 2025). https://www.nrc.gov/about-nrc/organization/commfuncdesc.html.

technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment.[22]

Pursuant to the authority under the AEA and the Energy Reorganization Act, the NRC promulgates regulations codified in Title 10, Code of Federal Regulations (10 CFR), which govern various regulatory aspects of nuclear energy. The NRC has regulatory authority over the design, construction, and operation of nuclear reactors and nuclear power facilities, and over the handling, storage, and disposal of nuclear fuel and nuclear waste. The NRC exercises its oversight authority over commercial nuclear reactors through federal regulations regarding licensing, operational oversight, and incident response protocols. The following diagram produced by the NRC provides an overview of the NRC's regulatory process, including the five main components of the process.



1. *Developing regulations and guidance for applicants and licensees.*
2. *Licensing or certifying applicants to use nuclear materials, operate nuclear facilities, and decommission facilities.*
3. *Inspecting and assessing licensee operations and facilities to ensure licensees comply with NRC requirements, responding to incidents, investigating allegations of wrongdoing, and taking appropriate followup or enforcement actions when necessary.*
4. *Evaluating operational experience of licensed facilities and activities.*
5. *Conducting research, holding hearings, and obtaining independent reviews to support regulatory decisions.*

As of June 2017

Source: United States Nuclear Regulatory Commission[23]

A notable regulatory responsibility of the NRC is the licensing of nuclear reactors and power facilities, including the licensing of advanced reactors. Nuclear Regulatory Commission approval is required before a nuclear reactor may be constructed and operated. The NRC currently administers two distinct pathways for nuclear reactor licensing under 10 CFR, part 50 and part 52, and a proposed third pathway is in progress.

[22] U.S. Nuclear Regulatory Comm'n, *NRC Approves Updated Mission Statement,* News Release No. 25-005 (Jan. 24, 2025). https://www.nrc.gov/cdn/doc-collection-news/2025/25-005.pdf.

[23] U.S. Nuclear Regulatory Comm'n, *How We Regulate*, (Oct. 26, 2023). https://www.nrc.gov/about-nrc/regulatory.html.

- **Construction Permit and Operating License (10 CFR part 50)** - Under this traditional two-step licensing framework, applicants must first secure a construction permit based on preliminary safety and environmental reviews. After construction is complete and the design details are submitted, the applicant may apply for a separate operating license.
- **Combined License (10 CFR part 52)** - In 1989, the NRC improved regulatory efficiency using an alternative licensing process under 10 CFR part 52, which allowed the NRC to issue a combined license that encompasses both the construction permit and operating license.
- **Proposed Risk-Informed, Technology-Inclusive Regulatory Framework (10 CFR part 43)** - Following the passage of NEIMA in 2019, the NRC was required to develop a third pathway designed to more specifically accommodate advanced reactors. The proposed rule would establish an optional technology-inclusive regulatory framework for use by new commercial advanced nuclear reactor applicants and would use methods of evaluation that are flexible and practicable for application to a variety of advanced reactor technologies. The proposed rule was published in the Federal Register for public comment, and the public comment period closed on February 28, 2025.[24] The final rule is expected to be issued no later than the end of 2027, in accordance with NEIMA. *Id.*

While there may be nuances depending on the specific regulatory activity or pathway, the NRC licensing process generally follows a consistent set of major steps, which include pre-application processes, application submission, review, docketing, safety review, environmental review, various administrative procedures, and application approval.[25]

RADIOACTIVE NUCLEAR WASTE MANAGEMENT LAWS

Federal Laws

The Nuclear Waste Policy Act of 1982

The Nuclear Waste Policy Act of 1982 (NWPA)[26] is a federal law that established a comprehensive national program for the safe, permanent disposal of highly radioactive wastes. The NWPA defines high-level radioactive waste as the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from that liquid waste which contains fission products in sufficient concentrations; and other highly radioactive material that the NRC, consistent with existing law, determines by rule requires permanent isolation. Among its additional provisions, NWPA established procedures and timelines for evaluation and selection of sites for safe storage or disposal, established federal responsibility for the disposal of high-level radioactive waste and spent fuel, and defined the relationship between the federal government and state governments with regard to disposal of high-level radioactive waste and spent fuel.

Atomic Energy Act of 1954 and the NRC Agreement State Program

The AEA provides authority for NRC regulation of nuclear materials and facilities. In 1959, the AEA was amended to allow the NRC to relinquish certain regulatory authority to states with interest in assuming regulatory authority. Section 274 of the AEA provides a statutory basis under which the NRC relinquishes to the states portions of its regulatory authority to license and regulate byproduct materials, source materials, and certain quantities of special nuclear material. The transfer of regulatory power takes place upon execution of an agreement by the governor of the state and the NRC. North Dakota is 1 of 39 states that have entered agreements with the NRC.[27]

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[24] U.S. Nuclear Regulatory Comm'n, *Part 53 - Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors* (March 4, 2025). https://www.nrc.gov/reactors/new-reactors/advanced/modernizing/rulemaking/part-53.html.

[25] *See* Patrick White & Brittany Lutz, *Nuclear Reactor Licensing 101* (Nuclear Innovation Alliance, Oct. 2024). https://nuclearinnovationalliance.org/sites/default/files/2024-10/Licensing%20101%20-%20October%202024.pdf.

[26] 42 U.S.C. 10101 et seq.

[27] U.S. Nuclear Regulatory Comm'n, *Agreement States* (Aug. 7, 2024). https://www.nrc.gov/agreement-states.html.

Low-Level Radioactive Waste Policy Amendments Act of 1985

The federal Low-Level Radioactive Waste Policy Amendments Act of 1985[28] gave states the responsibility for disposing of low-level radioactive waste within their borders and allowed states to enter compacts to dispose of waste at a common facility. The Act provides for regulation of these facilities by the NRC or by states that have entered into agreements with the NRC under Section 274 of the AEA. The Act also requires the NRC to establish standards to determine when certain waste is deemed below regulatory concern.

State Law Related to High-Level Radioactive Waste

North Dakota Century Code Chapter 38-23 relates to high-level radioactive waste. Section 38-23-01 prohibits the "placement, storage, exploration, testing, or disposal of high-level radioactive waste within the exterior boundaries" of the state. Section 38-23-03 provides the Industrial Commission serves as the point of contact for the DOE on any matter related to the storage or permanent disposal of high-level radioactive waste within the state and authorizes the Industrial Commission to issue a notice of disapproval regarding a proposed high-level radioactive waste facility in accordance with federal law when the Legislative Assembly is not in session. Section 38-23-04 provides for a permitting process and requirements for the testing, exploration, excavation, drilling, boring, or operation of a high-level radioactive waste facility.

Section 38-23-08 created the High-Level Radioactive Waste Advisory Council. Under this provision, the council is required to review site suitability and issue reports to the Legislative Assembly or Industrial Commission for any proposed high-level radioactive waste facilities, review and make recommendations to the Industrial Commission regarding rules and standards relating to high-level radioactive waste, consider any other matter related to Chapter 38-23 deemed appropriate, and report its findings biennially to the Industrial Commission and Legislative Management.

STATE REGULATION OF NUCLEAR ENERGY

Although nuclear reactors and nuclear power facilities are primarily regulated at the federal level, state governments can and have imposed regulations that affect nuclear power plants. North Dakota has not adopted any policies specifically regulating nuclear reactors or nuclear power facilities. Regulations in other states vary substantially, from minimal regulation to outright prohibitions on the construction of new nuclear facilities.

Federal Preemption

At the outset, it is important to note that state regulation should be approached with a high level of caution due to federal preemption issues. The concept of federal preemption is rooted in the Supremacy Clause of the United States Constitution[29] and generally provides that federal law takes precedence over inconsistent state law. The United States Supreme Court has identified two general types of preemption, express and implied. Express preemption occurs when Congress explicitly states its intent to override state authority within a statute.[30] Implied preemption occurs when federal regulation is "so pervasive as to make reasonable the inference that Congress left no room for the States to supplement it" (field preemption) or when "compliance with both federal and state regulations is a physical impossibility" (conflict preemption). *Id.*

In a report[31] containing a detailed analysis of federal preemption under the AEA, the Congressional Research Service summarized the principle of preemption in the context of the AEA as follows:

> As some state governments explore nuclear power's role in a transition away from fossil fuels, state legislatures continue to debate questions of safety and waste storage. Although safety concerns may prompt states to assert authority over nuclear power, federal law severely limits

[28] Pub. L. No. 99-240, 99 Stat. 1842 (1986).
[29] U.S. Const. art. VI, cl. 2.
[30] *See Gade v. Nat'l Solid Wastes Mgmt. Ass'n*, 505 U.S. 88, 98 (1992).
[31] Jason O. Heflin, *State Authority to Regulate Nuclear Power: Federal Preemption Under the Atomic Energy Act (AEA)*, Cong. Research Serv., R41984 (Nov. 1, 2023).

the extent to which states can regulate nuclear power. The Supreme Court has expressly held that, while states retain authority over "questions of need, reliability, cost, and other related State concerns," federal preemption prevents states from regulating radiological safety aspects of nuclear power production.

Whether a state law may regulate a part of the nuclear power lifecycle will depend principally on whether the state law or regulation in question is preempted by the Atomic Energy Act (AEA). Although there is "no one crystal clear distinctly marked formula" for determining whether a state law is preempted by federal law, the Supreme Court has established three general classes of preemption: express preemption, conflict preemption, and field preemption. In each instance, "the question of preemption is one of determining Congressional intent."

Many legal disputes surrounding federal preemption of state regulation of nuclear power have centered on field preemption. Under existing Supreme Court precedent, an analysis of whether a state law is preempted under the AEA requires a consideration of both the purpose and the effect of the state law in question. Thus, any state law that is grounded in radiological safety concerns or has a "direct and substantial" effect on the safety of nuclear plant "construction and operation" falls within the field exclusively occupied by the U.S. Nuclear Regulatory Commission (NRC) and therefore would be preempted.

Accordingly, any state considering policies that specifically regulate nuclear reactors or nuclear power facilities should consider potential federal preemption implications.

Examples of State Nuclear Energy Regulation

Examples of state regulation of commercial nuclear facilities vary across the country. A number of states maintain statutory or constitutional restrictions on new nuclear power facility construction using mechanisms such as waste disposal requirements, voter or legislative approval requirements, or complete bans.[32] Among the most comprehensive state restrictions are the complete bans on new nuclear construction in Minnesota[33] and a specific area of New York[34]. Other states, including Hawaii,[35] Maine,[36] Massachusetts,[37] Oregon,[38] Rhode Island,[39] and Vermont[40] require legislative approval, voter approval, or both, for new nuclear construction. However, these state restrictions are evolving, and in recent years, some states, including Connecticut, Illinois, Kentucky, Montana, West Virginia, and Wisconsin, have modified or repealed their respective restrictions on new nuclear power facility construction.[41]

In 2024, 25 states took "pro-nuclear" action and public utility commissions in 7 states approved orders or took action in support of nuclear energy.[42] Recent policy trends include the formation of task forces, commissions, studies, and state energy plans; creation of financing and tax incentives; programs focused on increasing the value of carbon-free electricity generation; repealing of laws prohibiting nuclear development; and adoption of regulations or regulatory action to increase state regulatory responsibility in support of new or existing nuclear. *Id.*

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[32] Nat'l Conf. of State Legislatures, *States Restrictions on New Nuclear Power Facility Construction* (Sep. 28, 2023). https://www.ncsl.org/environment-and-natural-resources/states-restrictions-on-new-nuclear-power-facility-construction.

[33] Minn. Stat. § 216B.243

[34] N.Y. Pub. Auth. Law § 1020-t (McKinney 2024)

[35] Haw. Const. art. XI, § 8

[36] Me. Rev. Stat. Ann. tit. 35-A, § 4302

[37] Mass. Gen. Laws Ann. 164 App. § 3-3

[38] Or. Rev. Stat. § 469.597

[39] R.I. Gen. Laws § 42-64-14.1

[40] Vt. Stat. Ann. Tit. 30, § 248

[41] Nat'l Conf. of State Legislatures, *States Restrictions on New Nuclear Power Facility Construction* (Sep. 28, 2023). https://www.ncsl.org/environment-and-natural-resources/states-restrictions-on-new-nuclear-power-facility-construction.

[42] Nuclear Energy Inst., *State Legislation and Regulations Supporting Nuclear Energy* (Jan. 2024). https://www.nei.org/resources/reports-briefs/state-legislation-and-regulations

SIGNIFICANT NORTH DAKOTA LEGISLATION

Legislation related to nuclear energy was approved by the 68th and 69th Legislative Assemblies.

2023 Legislation

House Concurrent Resolution No. 3015 (2023) urged the federal government to recognize natural gas and nuclear energy as environmentally sustainable economic activities.

House Concurrent Resolution No. 3034 (2023) recommended the Legislative Management study sustainable energy policies to maximize the economic viability of existing energy sources, assess future demands on electricity in the state, and determine the feasibility of advanced nuclear energy development and transmission in the state.

2025 Legislation

House Bill No. 2159 (2025) allowed the State Energy Research Center to research or pursue projects that will result in the exploration, storage, treatment, or disposal of high-level radioactive waste aboveground in North Dakota if approved by the Industrial Commission and conducted in consultation with the High-Level Radioactive Waste Advisory Council.

SUGGESTED STUDY APPROACH

In conducting the study of advanced nuclear energy, the committee may wish to:

- Solicit the services of a consultant to assist in the study and analysis of advanced nuclear energy.
- Seek supplemental information related to advanced nuclear energy, the nuclear power industry, state energy needs, and nuclear energy legislative efforts in other states from:
  - Representatives of federal, state, or local governments; and
  - Stakeholders, such as representatives of various energy industries, including the nuclear energy industry, electric utilities, transmission authorities, and national nuclear energy organizations.

ATTACH: 1