

ENERGY

It's time to let nuclear energy meet our growing power needs

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MOUNTAIN STATES
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INTRODUCTION

Keeping the lights on in America is already a challenge with an aging energy infrastructure, and advancements in technology such as Artificial Intelligence will need a stable power source to perform. An analysis completed for the National Electrical Manufacturers Association by PA Consulting anticipates a 300% growth in data center energy consumption over the next 10 years.¹ These centers are largely being built for the computational needs of Artificial Intelligence. These data centers have been proposed in states across the nation, including in our region. One consideration, however, is what is going to power them, and the overall expected increase in energy grid demand in America's future.

As noted by the Trump administration's America's AI Action Plan: "The United States must develop a comprehensive strategy to enhance and expand the power grid designed not just to weather these challenges, but to ensure the grid's continued strength and capacity for future growth."

Some suggest that renewable power sources like wind and solar should fill the energy needs of the future. But solar and wind provide intermittent and unreliable power. As great as the intent is, they don't provide baseload energy and don't hold up well under extreme weather events. There are numerous cases of grid outages due to storms disrupting wind and solar. After all, the wind isn't always blowing, and the sun isn't always shining. Plus, the energy needs of a data center are unlike those of a residential home. While homes only demand power intermittently, data centers necessitate continual energy. For the grid to switch to 100% solar and wind, all major cities would need to be windy or sunny or have major battery backups – something that just isn't reality.

Microreactors are an even smaller version of an SMR that usually powers around 10 to 20 MW.

Nuclear can meet our power needs

There is a reliable power solution already available – nuclear energy. Nuclear energy is currently available in 30 countries, with many others considering it. Nuclear powers roughly 19% of America’s grid today.¹ It utilizes what is called inherent rotational inertia.² This refers to its ability to continue to provide electricity to stabilize, even when the power source is inconsistent. It’s similar to the concept of a bicyclist riding up a hill and stopping pedaling. Wind and solar energy do not have this inertia, which makes them incredibly volatile.

Learning from history

When nuclear power is mentioned, disasters like the 1979 Three Mile Island accident in Pennsylvania, the 2011 Fukushima incident in Japan, or the 1986 Chernobyl tragedy in Ukraine are frequently pointed to. These were all events that had massive implications for the image of nuclear energy, but the actual implications of all three of these are misunderstood. At Three Mile Island, no one died in the reactor failure, nor have radiation-related deaths been found. At Fukushima, no one died from the reactor explosion, and only one radiation-related death has been reported. After its cleanup efforts, the background radiation levels were restored to normal. Finally, Chernobyl occurred due to its positive feedback loops, which are no longer used in current reactors. The industry largely shifted to negative feedback loops that possess the ability to shut themselves down in emergencies. Between 4,000 and 16,000 people tragically died in the Chernobyl disaster, but the industry and regulators have learned invaluable lessons from it and how to avoid a repeat tragedy.

Not your parents’ nuclear sector

Nuclear power has made so many leaps and bounds in the last 20 years of development that it’s almost unrecognizable. Specifically, consider the development of small modular reactors or SMR’s.³ These are mainly passive systems and operate on low power and operating pressure. Passive systems mean that no external mechanism or person has to shut them down, but they use natural circulation, convection gravity, and self-pressurization. They can generate up to 300 MW per unit and can be placed almost anywhere due to their size being roughly one-third of a traditional nuclear reactor. This also means that SMRs are less costly because they don’t have to be custom-built to fit a certain terrain, and there isn’t nearly as big a risk for construction delays.

Microreactors are an even smaller version of an SMR that usually powers around 10 to 20 MW. They could be a potential match for data centers found in rural locations that need backup power in cases of an emergency. These nuclear features could be

¹ “Nuclear energy generation by state,” Choose Energy, August 5, 2025, available at <https://www.chooseenergy.com/data-center/nuclear-generation-by-state/>

² “Why Wind and Solar Make Grids More Vulnerable to Blackouts,” Wall Street Journal, June 2, 2025, available at <https://www.wsj.com/video/series/pro-perfected/why-wind-and-solar-make-grids-more-vulnerable-to-blackouts/36798AC3-98C8-49D4-AA3A-1ECF2E089061>

³ “What Are Small Modular Reactors (SMRs)?”, International Atomic Energy Agency, September 13, 2024, available at <https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs>

SMRs can be created off-site and delivered on-site to be assembled, which takes far less time and is more efficient.

the best avenue for these data centers due to their scalability, safety features, and carbon-neutral impact.

There continues to be development within the nuclear sector, as well as fine-tuning certain technologies that have been around for decades. For example, the Terrapower plant that is undergoing construction and final approval in Wyoming plans to use a sodium coolant instead of a water-based coolant. This variation has been around, but this is the first time in 40 years that it is being revisited. The CEO of Terrapower commented, “The industry’s character hasn’t been to innovate. It’s kind of been to repeat past performance, you know, not to move forward with new technology. And that was good for reliability. But the electricity demands we’re seeing in the coming decades, and also to correct the cost issues with today’s nuclear and nuclear energy, we at Terrapower and our founders really felt it’s time to innovate.”⁴

This reactor also consumes high-assay, low-enriched uranium, which is currently only commercially supplied by Russia. The U.S Energy Department is hoping to find a way to produce it within the country. This is just another example of new avenues being explored in the sector.

The cost of traditional nuclear power has historically been expensive. But these smaller SMRs could be more cost-effective. A traditional operation needs to be completely built on-site. These new SMRs can be created off-site and delivered on-site to be assembled, which takes far less time and is more efficient. Fuel needs can also pile on the costs, and SMRs have developed in regard to their needs. It’s estimated that they need to be refueled every three to seven years, compared to a traditional plant that needs refueling every year or two. These fine details in nuclear innovation prove its ability to adapt.

At a time when the political parties can’t agree on much, they do reach a positive consensus on nuclear. For example, in June of 2025, New York Governor Kathy Hochul announced the development of a traditional nuclear reactor in the northern part of the state. She stated, “I’m the first Democratic governor in a generation to say to nuclear, I’m embracing this.” She continued, “to power New York’s future, we need three things: reliability, affordability, and sustainability. And nuclear drives all three.” She also requested that President Trump ease the permitting process saying, “The length of time — 10 years, a decade — of regulatory bureaucracy and red tape that must be gotten through is a reason why it fails, and people don’t even try.”⁵

Permitting reform will aid nuclear advancement

Permitting reforms are needed to streamline the advancement of nuclear energy. There needs to be predictability in the nuclear permitting system. Reforms that work for the government, and also for the investor. China is the most advanced country on

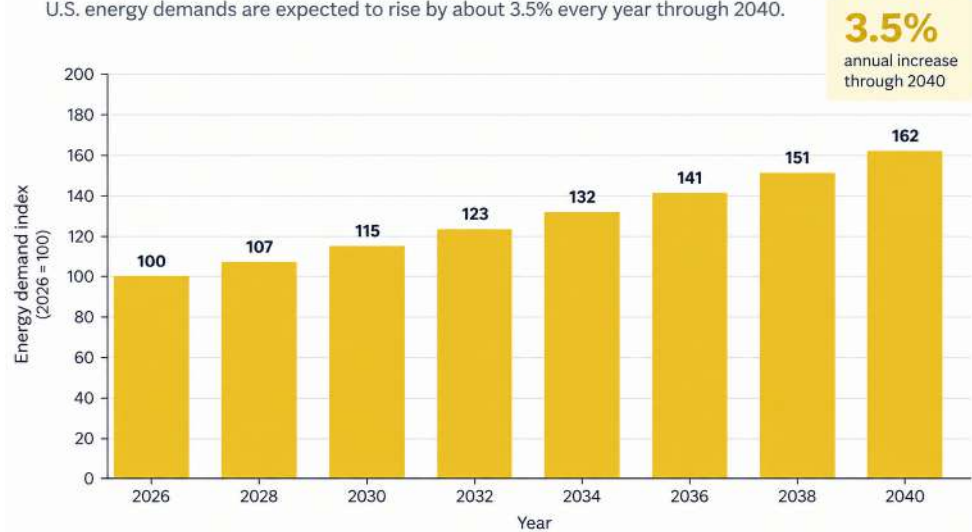
⁴ “Bill Gates is breaking ground on a nuclear power plant in Wyoming,” PBS News, June 10, 2024, available at <https://www.pbs.org/newshour/nation/bill-gates-is-breaking-ground-on-a-nuclear-power-plant-in-wyoming>

⁵ “Governor Hochul Directs New York Power Authority to Develop a Zero-Emission Advanced Nuclear Energy Technology Power Plant,” Governor Kathy Hochul, June 23, 2025, available at <https://www.governor.ny.gov/news/video-audio-photos-rush-transcript-governor-hochul-directs-new-york-power-authority-develop>

the globe in terms of nuclear development, but it still takes around six years to build a traditional plant. As delays happen, the costs continue to increase exponentially. This could be improved with the implementation of the small reactors, but much work is still needed in the meantime.

U.S. Energy Demand Expected to Rise 62% by 2040

U.S. energy demands are expected to rise by about 3.5% every year through 2040.



Note: Indexed projection based on 3.5% annual compound growth, with 2026 = 100.

Source: U.S. Energy Information Administration (EIA), Annual Energy Outlook (assumption of 3.5% annual growth).

In late April of 2025, Idaho, Utah, and Wyoming signed an agreement acknowledging their commitment to collaborate to develop nuclear infrastructure and energy policies.

Our region could lead the way

Responding to the need for regulatory reform, the Trump administration has made multiple moves to enhance and supplement the work of the Idaho National Laboratory (INL), the leading lab in the nation for nuclear developments. INL Director John Wagner commented in his 2025 presentation to the Idaho Legislature’s Interim Committee on Federalism, “I have been a nuclear engineer for over 30 years now, and during the majority of my career, we’ve been shutting down perfectly good operational nuclear power plants for economic reasons... I can’t even ... emphasize properly how significantly different this is than any other action by an administration on nuclear energy in my lifetime.”⁶

INL has also been working with Amazon in deploying AI in an efficient manner to develop nuclear facilities. Amazon Web Services will specifically use AI to help in the use of “designing, licensing, building and operating nuclear facilities.” INL also added that eventually AI could be employed for “autonomous operation” of reactors.

The Northwest Energy Coalition also addressed the Energy and Technology Interim Committee of the Montana Legislature in 2025 about plans to add multiple data centers. It said, “Adding this amount of electric demand in Montana will require massive changes to our energy supply and transmission system. We must consider all the implications for regulated utilities, customer-owned utilities, large

⁶ “Idaho National Laboratory director says Trump is ushering in nuclear renaissance,” Idaho Capital Sun. July 31, 2025, available at <https://idahocapitalsun.com/2025/07/31/idaho-national-laboratory-director-says-trump-is-ushering-in-nuclear-renaissance>

commercial, industrial, and residential electric customers in Montana.”⁷ The committee has three different studies assigned during the session — one on energy transmission (Senate Joint Resolution 12), interstate power grid development (Senate Joint Resolution 21), and artificial intelligence (House Joint Resolution 4).

In late April of 2025, Idaho, Utah, and Wyoming signed an agreement acknowledging their commitment to collaborate to develop nuclear infrastructure and energy policies. A press release announcing the agreement stated the “three states will collaborate in key areas, including:⁸

- Aligning energy policies to support innovation and private investment;
- Coordinating the development of critical energy infrastructure;
- Jointly navigating regulatory and environmental challenges;
- Advocating for federal support of regional energy priorities;
- Enhancing energy resilience and grid reliability;
- Expanding workforce development efforts to support the growing energy sector; and
- Ensuring continued delivery of affordable energy to residents.”

The day before this agreement was signed, Utah and the INL committed to a “formal, long-term collaboration on advanced energy research, workforce development and technology deployment.”⁹ These types of joint state agreements are important to help implement a nuclear energy-fueled future.

Idaho Governor Brad Little on September 18, 2025, also released the Advanced Nuclear Strategic Framework.¹⁰ This is a comprehensive plan to guide Idaho in its pursuit of nuclear energy excellence. This means nuclear energy in Idaho that is safe, reliable, affordable, sustainable, and secure. The plan lays out the role that the Idaho National Laboratory can play, the importance of educational partnerships in research and workforce development, and the need for regional partnerships on a governmental and private level.

Other points from the plan include creating a State Energy Fund to support nuclear development and using the state’s newly established Strategic Permitting, Efficiency, and Economic Development Council to help streamline project approvals. It also highlights the inter-governmental collaboration of the framework that was formed by the Governor’s Office of Energy and Mineral Resources (OEMR) and Idaho Strategic Energy Alliance (ISEA).

Idaho has created an Advanced Nuclear Energy Task force that will recommend strategies for increasing the state’s nuclear energy innovation.

⁷ IBID.

⁸ “Governors of Utah, Idaho, and Wyoming sign tri-state agreement to strengthen regional energy collaboration,” Governor Spencer J. Cox, April 30, 2025, available at <https://governor.utah.gov/press/news-release-governors-of-utah-idaho-and-wyoming-sign-tri-state-agreement-to-strengthen-regional-energy-collaboration/>

⁹ “H.C.R. 9 House Concurrent Resolution to Create Energy Compact with Idaho and Wyoming,” Utah Legislature, Accessed on September 2, 2025, available at <https://le.utah.gov/~2025/bills/static/HCR009.html>

¹⁰ “State of Idaho releases Advanced Nuclear Strategic Framework to strengthen energy leadership and economic growth,” Idaho Governor Little, September 18, 2025, available at <https://gov.idaho.gov/pressrelease/state-of-idaho-releases-advanced-nuclear-strategic-framework-to-strengthen-energy-leadership-and-economic-growth/>

In September 2025, Governor Brad Little also announced the formation of the Advanced Nuclear Energy Task Force.¹¹ This task force’s chief purpose is to “assess, recommend, and support strategies that advance Idaho’s leadership in nuclear energy innovation, deployment, and workforce development.” This includes making recommendations on matters such as “spent nuclear fuel, fuel creation, enhancement, and minimization, opportunities for Idaho to collaborate with other nuclear-advanced states.”

The task force will be composed of no more than 20 members appointed by the Governor, including elected officials, government agencies, INL representatives, private sector stakeholders, and educational representatives. This replaces and improves the existing Leadership in Nuclear Energy Commission, or LINE, which was put into place by Governor Butch Otter in 2012. A lot has changed in the industry since then, and this new group helps to prepare Idaho to lead the way.

At the national level, Idaho Senator Jim Risch introduced in 2025 the *International Nuclear Energy Act*, to support the U.S. domestic nuclear energy industry’s leadership and offset China and Russia’s growing influence on international nuclear energy development. Utah Senator Mike Lee said about this proposal, “With the *International Nuclear Energy Act*, we’re not asking for a seat at the table—we’re setting the agenda on global nuclear development. Achieving American energy dominance will require us to streamline our nuclear exports, foster our relationships abroad, and bring the full weight of American industry to bear in outcompeting our geopolitical adversaries.”¹²

Specifically, this federal act would do three main things: 1) Support the establishment of an office to coordinate civil nuclear exports strategy; 2) require a cabinet-level biennial summit focused on nuclear safety, security, and safeguards; and 3) Establish a Strategic Infrastructure Fund Working Group to determine how to best structure a Fund to finance projects critical to national security.

INL also has some very concrete policy suggestions for a successful, nuclear future. Reforms such as extending NRC and DOE licensing, simplification of the hearing process, and expediting environmental and safety reviews are included. INL states, “In summary, although there have been many recent and ongoing efforts to incorporate efficiency and timeliness into nuclear licensing, much more can be done...If implemented, these reforms have the potential to enhance the United States’ stature as a world leader in nuclear safety to also include leadership in timely and efficient nuclear licensing.”¹³

¹¹ “Gov. Little orders revamp of nuclear energy task force,” Boise State Public Radio, September 23, 2025, available at <https://www.boisestatepublicradio.org/politics-government/2025-09-23/idaho-brad-little-nuclear-energy-task-force>

¹² “S.1801 - International Nuclear Energy Act of 2025,” U.S. Congress, accessed on September 2, 2025, available at <https://www.congress.gov/bills/119th-congress/senate-bill/1801/text/is>

¹³ “Recommendations to Improve the Nuclear Regulatory Commission Reactor Licensing and Approval Process,” Idaho National Laboratory, April 2025, available at <https://inl.gov/content/uploads/2024/11/Recommendations-to-Improve-Nuclear-Licensing.pdf>

Conclusion

U.S. energy demands are expected to rise by about 3.5% every year through 2040. There is already severe stress on our aging energy infrastructure, even before accounting for the power-hungry needs of new technologies. According to McKinsey's GEP power model and many U.S. grid operators, the country could experience shortages of dispatchable power during peak summer demand hours by 2030.¹⁴ Policymakers need to address this issue now, as energy infrastructure takes time and planning to build. We don't want to reach 2040 and be scrambling for energy solutions. Nuclear energy could help meet these power needs, and our region is well-positioned to take the lead. Policymakers should facilitate this opportunity by refining the energy regulatory and permitting system and attracting nuclear investors to help make this dependable and stable power development for our country a reality.

Nothing in this publication shall be construed as an attempt to aid or hinder the passage of any legislation.

¹⁴ "Powering a New Era of US Energy Demand." McKinsey & Company, April 2025, available at www.mckinsey.com/industries/public-sector/our-insights/powering-a-new-era-of-us-energy-demand

SUMMARY & KEY FACTS

The study argues that rapidly growing electricity demand—driven in significant part by AI and data centers—is putting increasing pressure on an aging U.S. power grid, making reliable, around-the-clock generation increasingly important. It presents nuclear energy, particularly emerging technologies such as small modular reactors (SMRs) and microreactors, as a scalable source of dependable, carbon-free power that can complement intermittent renewable sources. The paper highlights recent advances in nuclear safety and technology, while identifying lengthy permitting and regulatory processes as major barriers to deployment. It concludes that Idaho and the broader Mountain West are especially well-positioned to lead a nuclear expansion because of Idaho National Laboratory, new state initiatives, and growing regional cooperation.

Key Facts:

- Energy demand is surging: Data-center electricity use could grow 300% over the next decade
- Nuclear is reliable: It provides continuous, around-the-clock power
- New technology lowers barriers: SMRs are smaller, scalable, and potentially less expensive
- Permitting remains a hurdle: Long approval timelines increase costs and delay projects
- The Mountain West can lead: Idaho and the region already have nuclear expertise and growing state cooperation

ABOUT THE AUTHOR

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Sam has worked on multiple legislative and congressional campaigns across Washington State. He has experience in the governmental sphere as a legislative intern and a session aide at the Washington State Legislature.

Sam is the author of several MSPC studies, including *Adopting a new income tax liability threshold* and *Powering the Mountain States: A snapshot of the region's energy portfolio*.

His work has appeared in many local news publications and was featured on "Hannity" on Fox News Channel.

