How Washington Can Lead the Global Energy Race

America built the postwar order on oil. It can build the next one on clean, firm power.

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I. INTRODUCTION

The energy transition has entered a new phase, one where scattered climate pledges have transformed into a global race for industrial-scale power. Beijing has taken the initiative, exporting cheap solar panels that are now the backbone of renewable energy infrastructure across continents. Washington, on the other hand, has focused on its fossil fuel base, delivering oil and gas to trade partners old and new.

Today, the United States has an opportunity to shape international energy markets around firm power. Despite mature competition in solar, wind, and batteries, the U.S. retains advantages in two new technologies, next-generation geothermal and nuclear Small Modular Reactors (SMRs), that could expand its energy portfolio and undergird modern AI infrastructure.

Converting this comparative advantage into global influence, however, will require coordination across three levels: Supply chains, where aggregating supply and demand can incentivize private sector action and ensure national security; foreign nations, where coordinated policy can open up markets for U.S. exports and offer access to power to host governments; and multinational technology companies, which increasingly act as diplomatic partners, and shape the development of global energy infrastructure and its regulatory architecture.

I.I A GLOBAL COMPETITION

Global demand for energy is surging. Electricity needs are expected to increase by three quarters by 2050 as economic development in emerging markets, electric vehicle (EV) proliferation, and data center compute requirements prop up demand (BloombergNEF 2025, ICF 2025).[1] A leader in AI infrastructure investment, the United States offers a window into what the energy future may look like for other countries interested in building out their own AI capabilities: data centers are expected to be the largest source of new power demand through 2035 (BloombergNEF 2025, ICF 2025).

This demand shock is turning the energy transition from a climate imperative into an economic and geopolitical contest–a contest where the U.S. is rapidly ceding ground to China. Over the past decade, China has been the dominant supplier of intermittent energy infrastructure, exporting $28 billion in solar panels and $32 billion in EVs in 2024 (UN COMTRADE). JinkoSolar, one of the largest Chinese solar companies, now has a footprint extending to 20

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[1] While energy demand estimates vary widely across sources, nearly all maintain that energy needs will increase over time (Bloomberg 2025, IEA 2025).

overseas subsidiaries and has pursued manufacturing partnerships abroad, including a $1 billion joint venture in Saudi Arabia (Jinko 2025, Jinko 2024). Such commercial arrangements create opportunities for collaboration, mediated through bilateral bodies like the China-Saudi Arabia High-Level Joint Committee (FMRPC 2025).[2] They also create geoeconomic leverage that has been used repeatedly to shape critical minerals negotiations with the U.S. (Froman 2025, Lv and Munroe 2026, Clayton et al. 2025).

China's dominance in new value chains is the product of targeted industrial policy in strategic value chains.[3] As early as 2005, Beijing deployed an array of industrial policies to support burgeoning clean technology sectors. These policies, enshrined in initiatives like the Renewable Energy Law and the 11th Five-Year Plan for the Development of Science and Technology, include local content requirements, import tax exemptions for key inputs, and funding for innovation and R&D. All helped lay the groundwork for China's modern success across solar, wind, EV, and critical mineral value chains (Zhang et al. 2013). Other countries followed suit, but did not see the same success. The European build out of solar, for instance, had a strong start, with Germany's KfW providing subsidized loans to accelerate solar photovoltaic (PV) development, but failed to effectively coordinate inputs and demand across borders, limiting scale (Hodge et al. 2024).[4]

Although Washington has its own fossil fuel-based export program, it is starting to face structural limits. The postwar order was built in large part on American capacity to guarantee the fossil fuels that it and other industrial economies relied on for both military and economic aims (Painter 2012). Today, however, much of the world's remaining hydrocarbon wealth sits under state-controlled reserves that are closed to American firms, limiting their influence in global markets (S&P 2019, DOS 2025). At the same time, both governments and corporations abroad are committed to alternatives: Nations from Saudi Arabia to the Philippines have made clean energy central to their development strategies, while large tech companies have committed to sourcing clean, firm power for their data centers (SGI 2026, IMF 2026, Google 2020, Microsoft 2020). In this reality, opportunities to shape global markets are tilting towards nations that can supply alternative energy.

While multilateral institutions may have disciplined the shift towards industrial policy in another era, today, such institutions are too slow and constrained to do so. Trade frictions over solar PV panels in the 2000s and 2010s often produced unilateral responses as countries avoided time-consuming, resource-intensive dispute resolution processes through the WTO (Wu and Salzman

[2] Such initiatives also help address Chinese domestic overcapacity and accelerate technological transfer.
[3] In this paper, we define industrial policy as "government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal" per Juhasz et al. 2023. (Juhasz et al. 2023)
[4] China and Germany's decision to capture nascent energy markets with industrial policy follows clear economic logic: In the absence of carbon taxes that internalize the benefits of new energy sources, government support is necessary to spur investment into new sectors. And as the perceived benefits of decarbonization rise due to falling technological costs and perceived increases in demand, states are more willing to deploy more capital to capture those benefits (Meckling et al. 2025). As costs continue to fall, countries are therefore more likely to compete on industrial policy and compete to capture the benefits in new energy markets.

2014). Simultaneously, climate cooperation in the UNFCCC started to move away from enforceable commitments, with the recent U.S. withdrawal further narrowing pathways for formal coordination (Kuyper et al. 2018, White House 2026). Against this backdrop, globalization has plateaued and geoeconomic competition for the benefits of decarbonization has become the norm: The U.S., EU, and China accounted for nearly half of all industrial policy in 2023 (Evenett et al. 2024).

As demand for new energy rises and the influence of multilateral institutions fades, the U.S. has three options to manage China's emergence as an electrostate and its dominance across solar, batteries, and EVs. The first is to compete directly, following the approach of the Biden administration, which provided tax credits to such as solar and EVs through the Inflation Reduction Act (IRA 2022). The second is to ignore the energy transition and double down on fossil fuels, which has been a focus of the Trump administration under its Energy Dominance agenda (White House 2025 - 1). Given China already has a commanding position in the intermittent energy markets, and electricity systems of the future will require both intermittent renewables and clean firm energy, there is one more promising option for the U.S.: complementing modern energy systems with a dominant position in clean firm power. If the U.S. can dominate in clean firm energy, it can balance China's dominance in clean intermittent energy, responding to threats across the critical minerals supply chain by limiting access to key inputs in clean, firm energy.

I.II WHERE AMERICA LEADS

Against intensifying competition, the Trump administration has focused on ensuring energy security–access to affordable, reliable energy–and building out infrastructure to address impending AI-driven load growth. President Trump's executive order, titled "Unleashing American Energy," cemented a policy vision made clear throughout his campaign: an energy system centered on America's "affordable and reliable energy and natural resources." In parallel, the administration has elevated AI and data-center infrastructure into a national priority, streamlining siting and permitting processes and ensuring access to reliable sources of power (White House 2025). Such firm power sources are critical, as even brief power shortfalls trigger protective shutdowns in servers and cooling systems, and have pushed companies like Google to invest in an array of firm energy sources (Kairos 2024, WSJ 2025, Google 2025).[5]

Across the aisle, Democrats are clamoring for clean energy investment. The House Democrats' current position focuses on cheap, American-made clean power, and speeding its deployment to lower costs and meet rising electricity demand (Jeffries 2026). Preferences are also reflected in public sentiment, where renewable energy remains a priority for the majority of Democrats versus a minority of Republican voters (Pew 2025).

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[5] Importantly, while solar PVs from China and other renewable energy sources can contribute to the energy needs of data centers, they cannot reliably supply firm power without expensive investment in battery infrastructure.

Geothermal and nuclear energy stand out as sources of clean, firm power that can help achieve the objectives of both parties. They draw on American strengths to deliver reliable, increasingly affordable energy while advancing two of the Trump administration's priorities: powering data centers, which require energy around the clock, and ensuring energy security (White House 2025 - 1, White House 2025 - 2). They also meet the vision of the Democratic Party by promising to enhance American competitiveness through emission-free energy.[6]

Importantly, America has clear comparative advantages in geothermal and nuclear. The geothermal energy industry leverages technology and expertise from the U.S.-led oil and gas sector while nuclear benefits from the U.S. innovation ecosystem in SMRs. While both sectors currently experience market failures that limit their path to international scale, with the right set of government supports, each presents pathways for the U.S. to establish itself as a credible global leader.

I.II A COORDINATED APPROACH

To build leading global companies in geothermal and nuclear, the United States must coordinate across three levels: supply chains, foreign governments, and multinational tech companies.

First, it should coordinate international supply chains to address vulnerabilities and send clear demand signals. Upstream supply chain vulnerability is a larger challenge in nuclear, where fuel-cycle dependence and chokepoints in specialized manufacturing create security challenges for the U.S.. Downstream, both nuclear and geothermal would benefit from stronger demand signals, which would encourage investment in projects that otherwise struggle to reach bankability and accelerate learning by doing among manufacturers to drive down costs.

Second, it should coordinate across governments to open up markets to American exports. In both sectors, the United States needs agreements with priority partners that reduce cross-border friction by aligning permitting, licensing, project development pathways, and financing. Pre-negotiated frameworks, standardized documentation, and minilateral coordination platforms can create repeatable export channels that would speed deployment abroad.

Third, it should treat multinational technology partners as diplomatic partners. In next-generation energy, states are no longer the only actors shaping cross-border infrastructure outcomes. Multinational tech companies are moving towards vertical integration, and work closely with hyperscalers and utilities to determine where energy infrastructure is built, which regulations are politically feasible, and whether projects become bankable. Creating explicit pathways for commercial diplomacy is critical for anchoring demand and shaping international regulatory pathways, especially as multilateral institutions wane in influence.

This three-level approach offers an opportunity for U.S. collaborators. Among allies, supply chain agreements ensure security at the national and international level, while export arrangements provide continuous access to new, subsidized power in contexts where new energy

[6] This is true from an emissions perspective, but some would rightly note that geothermal can have negative seismological impacts on the communities where it is deployed, while nuclear waste disposal can also have long-term negative environmental consequences (EIA 2026 - 1, EIA 2026 - 2).

infrastructure is sorely needed. Lastly, packaging traditional diplomacy approaches with multinational tech partners reduces friction and facilitates streamlined project development abroad.

To assess the promise of each technology area and identify opportunities for coordinated industrial policy action, the following case studies cover:

1. How geothermal and nuclear provide firm power, and their paths to affordability.
2. The U.S. comparative advantage.
3. Scaling constraints.
4. Opportunities for coordinated industrial policy action.

II. CASE STUDY: GEOTHERMAL

II.I THE PROMISE OF GEOTHERMAL

Geothermal energy is emerging as a credible pillar of American energy security. Historically offering dependable power, it now also draws on advances in new energy system design–Enhanced Geothermal Systems (EGS) and Superhot Rock (SHR)–that promsie to cut costs and increase access to geothermal resources. These developments promise to shift geothermal from a niche resource into a scalable source of power capable of strengthening the reliability and affordability of the U.S. energy system.

Geothermal energy is intrinsically reliable. Made up of primordial and radiogenic heat from the Earth's interior, it is a steady thermal input that can be converted to heat or electricity around the clock. As a result, capacity factors–ratios of energy that is produced against energy that could be produced–are higher for geothermal plants than nearly any other energy source aside from nuclear, averaging 70% for geothermal, against <25% for solar and <35% for wind from 2015-2024 (EIA 2024). Such consistent energy can improve the reliability of American grids, reducing the need for backup generation and long-duration storage, increasing the resilience of electrical grids to spikes in energy demand, and providing independent sources of power in the case of blackouts (DOE 2024, Kolker et al. 2022).

With recent developments, geothermal energy's potential could extend beyond reliability to enable new levels of access. Previously, deployment depended on naturally-occurring permeable rock reservoirs at depths less than 3km, limiting most viable sites to areas near the Pacific Ring of Fire. Over the past decade, however, Enhanced Geothermal Systems (EGS) and Superhot Rock (SHR) have overcome this constraint by creating artificial reservoirs through hydraulic stimulation and reaching depths that would ensure energy access to any country with the means to drill deep (NREL 2026). These technologies are expanding geothermal energy's geographic reach, shifting it from a location-constrained resource to one deployable wherever sufficient subsurface heat exists.

While such geothermal technologies remain expensive, innovations have driven substantial cost reductions: the Department of Energy (DOE) estimates that EGS costs fell by up to 50 percent between 2022 and 2024 (DOE 2024). While SHR remains less mature, it offers a step change in productivity: Most geothermal wells today reach depths of 2–3 kilometers, whereas SHR targets 5–20 kilometers, where heat energy increases by an order of magnitude (Houde et al. 2021). Current geothermal levelized cost of electricity (LCOE) ranges widely from $40-240/MWh depending on quality of geothermal resource, but even the highest costs with next generation geothermal, at ~$250/MWh in 2025, may fall to approximately $50/MWh by 2035 with ongoing deployment and technological developments (EIA 2025, Lazard 2024, DOE 2024).

II.II THE AMERICAN COMPARATIVE ADVANTAGE IN GEOTHERMAL

The United States has a comparative advantage in geothermal energy rooted in its mature oil and gas sector.[7]

Decades of U.S. leadership in the oil and gas sector have generated a base of physical capital, supply chains, and technical capability that is transferable to geothermal energy. Both drilling and hydraulic fracturing scaled up during the American-led shale revolution in the 2000s, opening up access to new resources in the oil and gas sector (Wang et al. 2014). Such technologies are the foundation for modern geothermal systems, and related equipment used in the oil and gas sector–such as oil rigs, directional drilling systems, Polycrystalline Diamond Compact bits, and reservoir simulators–have well-developed U.S.-based supply chains that are widely applicable in the exploration of geothermal resources (Vivas et al. 2020, Visser et al. 2018).[8] The U.S. also benefits from its access to Abandoned Oil and Gas Wells (AOGS), which make up ~80% of global AOGS (Lei et al. 2025). These AOGS can be repurposed for geothermal power generation and offset the cost of drilling, which normally accounts for ~50% of the cost of geothermal production (Higgins et al. 2024).[9]

The American workforce also excels in skills and knowledge relevant to the geothermal power sector. Estimates suggest that approximately 61% of oil and gas employment is transferable to the geothermal power sector (BLS, as cited in CRS 2023). This labor force is supported by technical leadership: U.S. institutions lead in the number of papers and citations in geothermal energy research internationally (Wan et al. 2022). In addition, the U.S. filed more international geothermal patents between 2010-2019 than major competitors like China and Germany (WIPO 2020). Ultimately, the U.S. has both the skilled labor from oil and gas and the intellectual leadership in geothermal technologies necessary to lead in geothermal energy production.

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[7] American geology also ensures a strong foundation for geothermal power as a testing site: Unlike most countries, it sits on a wide band of high-temperature subsurface formations capable of supporting utility-scale geothermal power—resources that are concentrated at tectonic plate boundaries (Rystad 2022).

[8] One of the few areas in the geothermal supply chain where the U.S. does not already hold a significant advantage are in ORC turbines where Japanese turbines (Turboden) account for 82% of the geothermal steam turbine manufacturing market and Israel (ORMAT) account for 74% of the geothermal binary cycle turboexpander manufacturing market (Akar et al. 2018). These gaps could be addressed by domestic industrial policy that co-locates data centers and aggregates demand.

[9] There are opportunities to develop business models that focus on repurposing AOGS in Texas, Pennsylvania, and the Gulf Coast, and other states in areas in close proximity to major demand centers (McCarthy et al. 2024); a bipartisan bill has already been introduced in Pennsylvania to support their transition (Pennsylvania Legislature 2025). Repurposing wells could plausibly mitigate methane leaks if it includes plugging leakage pathways (Professor Talegahi, as quoted in PSU News 2025).

American policymakers are now supporting geothermal investment in new technologies, though support is orders of magnitude lower than in other sectors: The DOE's FORGE initiative provided roughly $90 million to accelerate EGS development in the early 2020s, while recent federal permitting reforms shortened environmental review timelines from years to weeks (DOE 2025, DOI 2025). This year, the DOE announced $171.5 million in funding for next-generation geothermal (DOE 2026). These steps are modest in comparison to nuclear, which has received tens of billions of dollars in support, but they do signal growing recognition that early, targeted public investment should support the American geothermal sector.

II.III BARRIERS TO SCALE

Despite latent advantages in geothermal energy, new geothermal technologies have yet to reach scale. These constraints operate primarily across two levels. At the government-to-government level, fragmented permitting and project approval regimes slow deployment abroad and raise transaction costs for U.S. firms. At the supply chain level, developers still struggle to secure the risk-sharing, financing support, and long-term demand needed to move from demonstration to repeatable delivery. The challenge for geothermal is building the right demand-side and regulatory architecture that allows U.S. geothermal firms to deploy repeatedly in foreign contexts.

Among new pre-commercial, high-potential geothermal technologies, SHR systems have the greatest potential to capitalize on global high temperature geothermal resources, but progress remains slow. Critical technology gaps persist across resource characterization, specialized drilling rigs, bit technology, high-temperature downhole tools, and temperature management equipment (Petty et al. 2020, Pearce and Pink 2025). As a result, only five U.S. SHR projects are planned, under development, or operational at temperatures greater than 300˚C, despite estimates that wide portions of the western U.S. reach 450˚C between 5-10km depths (CATF 2025). Without mechanisms to accelerate learning, investment remains confined to the public sector, slowing the transition to scale.

Even where technologies are closer to commercialization, scaling remains constrained by financing risk. For EGS, subsurface uncertainty, high upfront capital requirements, and long timelines all combine to raise the cost of capital. Roughly 20% of geothermal projects fail to confirm adequate subsurface conditions during exploration, resulting in sunk costs before revenues materialize (Wall et al. 2024). These risks are compounded by the need to finance drilling, fluid handling, and surface infrastructure well in advance of commissioning, and by seven-to-ten-year development timelines that depend on securing long-term power purchase agreements (Compernolle et al. 2019, Levine and Young 2018). Together, these factors make low-cost financing the exception rather than the norm: one EGS-focused U.S. startup, Fervo Energy, drove debt financing across the sector between 2024 and 2025 (Net Zero Insights 2025).

Lastly, geothermal deployment abroad is hampered by regulatory barriers. It often requires approvals from multiple authorities, including central governments, environmental and water regulators, and local governments, resulting in lengthy and uncertain permitting processes that deter investment from international geothermal energy companies (World Bank 2018). These challenges are compounded by the site-specific nature of geothermal projects, which often depend on partnerships with locals and bespoke arrangements with foreign industry players (Abdi et al. 2024, Energy Capital Interview 2023).[10]

II.IV COORDINATING GEOTHERMAL POLICY

RATIONALE

An international geothermal strategy requires coordination with foreign governments to access critical markets and demand aggregation to enable investment further upstream.

Specifically, industrial policy between governments can de-risk learning in SHR and reduce deployment frictions in EGS. Early SHR deployments generate high-value information around resource characterization, drilling performance, and reservoir behavior that firms cannot appropriate on their own. A minilateral approach with trusted partners would accelerate learning across multiple geologies while widening the addressable export market. For EGS, the priority is different: the U.S. government can reduce cross-border transaction costs through standardized project development frameworks. In return for collaboration with the U.S. government, allies and host countries would gain access to cutting-edge geothermal technology and a subsidized source of reliable energy as domestic energy needs soar.

At the supply chain level, a buyers coalition coupled with assistance from multilateral agencies could create an orderbook that makes geothermal projects financeable and replicable at scale. Geothermal projects are capital-intensive, long-duration, and exposed to high exploration risk. Strong demand signals create the incentives for firms to scale in spite of these risks and, for offtakers, they spread prices across a series of early-stage projects, limiting exposure to first of a kind projects.

RECOMMENDATIONS

(I) Government-to-government Coordination: Allied Testbeds and Market Access

Creating an allied geothermal testbed network would accelerate learning in SHR and potentially open up future geologies for export. A network of trusted sites in Iceland, New Zealand, Japan, and other allied countries would expand the number of real-world environments in which U.S. firms and public institutions can test drilling methods, well construction, monitoring, and validation techniques.[11] The network should concentrate on the few improvements that most directly lower failure rates and make projects replicable: early site screening, drilling and well construction in higher-temperature environments, and monitoring and validation. Existing DOE-led technical collaboration models such as DEEPEN (DE-risking Exploration of geothermal Plays in magmatic ENvironments) are a workable template where public leadership convenes universities and firms around field learning (Hjörleifsdóttir et al. 2023).

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[10] The U.S. also has its own set of regulatory barriers, where complex and interconnected permitting regimes often require extended coordination between the state and federal government, occasionally leading to duplicative permits and opaque review processes (DOE 2025).

[11] Based on Pearce et al. 2025, NREL 2024, Petty et al. 2020

Market access for EGS is best accelerated through targeted policies that enable and define deployment pathways. Specifically, targeted bilateral MOUs with partner governments that define how geothermal projects fit into national energy planning would be good starting points for bilateral cooperation, similar to existing LNG agreements (E&E 2025). Also, the U.S. could consider advancing an alternative forum to the International Geothermal Commission for Standards (IGCS), which is chaired by Sinopec, to harmonize international standards in alignment with the needs of EGS and SHR (IGA 2025).

(II) Supply Chain Coordination: Aggregating Demand

Coordinated demand would turn next-generation geothermal into a repeatable export pipeline by enabling entry into export markers. Concessional finance and risk-mitigation packages developed in collaboration with the World Bank's Energy Sector Management Assistant Program (ESMAP) could help accelerate deployment on the ground, providing insurance and guarantees that crowd in private lenders (ESMAP). By taking on partial ownership of these projects through the DFC, the U.S. could further direct geothermal deployment towards the regions that are most interested in geothermal energy buildout. At the same time, structured commitments from utilities and hyperscalars in new regions could aggregate project management expertise, operations, and offtake. This would comprise an orderbook that would bring down the sticker price for the average buyer and address bankability concerns further up the supply chain.

III. CASE STUDY: NUCLEAR SMRs

III.I NUCLEAR RISING

While nuclear has a long history in the U.S., new designs are emerging that could advance energy security by supplying dependable, firm power and offering new paths to cost competitiveness. Small Modular Reactors (SMRs) in particular stand out as promising alternatives to old models.[12]

Nuclear reactors have always promised reliable energy centered in radioactive chemistry. Creating an enabling environment for managed chain reactions, in which uranium is split into its constituent neutrons, they continuously produce heat until the fuel source has been exhausted or maintenance is required.[13] These extended reactions form the basis of nuclear energy's capacity factor, which is the highest of any non-fossil fuel source, exceeding 90% at utility-scale plants from 2015-2024, versus 34% and 23% in wind and solar, respectively (EIA 2024).

Recent developments in modularizing nuclear designs show promise in improving the affordability of nuclear energy projects. SMRs–reactors under 350MW with standardized designs–could improve the commercial performance of existing plants by lowering upfront capital requirements, accelerating learning-by-doing, and expanding potential consumers outside

[12] Fourth-generation nuclear reactor concepts, such as sodium-cooled fast reactors and high-temperature gas reactors, also have potential to accelerate nuclear deployment, and are considered as a subset of SMRs for the purpose of this paper in the context of scalability (MITEI 2018).

[13] This describes fission–nuclear fusion follows a different chemical process, and is outside of the scope of this analysis.

of industrial-scale offtakers (Beck et al. 2025, DOE 2024). While the average LCOE of nuclear reactors remains high, with estimates ranging from $102.67-$222/MWh, overseas success stories suggest that such modular designs could pave the road to success: In China, where industrial policy and local supply chain investments have streamlined deployment of advanced, modular plants, overnight construction costs are less than a third than that of recent American reactors (EIA 2025, Lazard 2024, Liu et al. 2025).[14]

The U.S. government actively supports SMR development, and has paired upstream capital with more recent investments in downstream infrastructure. From 2024-2025, the DOE was the largest global source of funding for SMRs, supporting $2.8 billion in matching grants to startups such as X-energy, TerraPower, and Kairos Power through the DOE's Advanced Reactor Demonstration Program (WNISR 2025). In an MOU signed last year, the Japanese government outlined its commitment to support up to $332 billion in critical energy infrastructure in the U.S., including SMR deployment (White House 2025).

III.II THE AMERICAN COMPARATIVE ADVANTAGE IN NUCLEAR

In recent years, the U.S. has ceded significant ground in advanced nuclear deployment to China and Russia. In China, cheap financing and streamlined regulatory processes are accelerating the commercialization of advanced nuclear technologies. Russia, on the other hand, leads in international nuclear deployment, buoyed by state financing. While there is still an opportunity for the U.S. to lead in SMRs, doing so will require focused support for SMRs.

The U.S. has both the largest nuclear footprint and one of the world's oldest nuclear operations. It operates 94 nuclear power reactors across 28 states, nearly all of which were built in the late twentieth century–the average reactor age is expected to reach 43.7 by mid-2025 (PRIS, Deutch et al. 2025, WNISR 2025). In principle, the U.S. nuclear fleet could be a platform for U.S. energy dominance–an operating base that trains talent, aggregate demand for nuclear supply chains, and support new build designs–however, waning activity has limited its potential. The only new U.S. nuclear power reactors to enter commercial operation in 2023-24 were two new Vogtle units, which entered service after extended delays and cost overruns, exposing weaknesses in U.S. project delivery and supply-chain readiness (Ahmad and Usman 2025).[15]

The U.S. has lost ground to China and Russia in the construction and operation of advanced, large nuclear reactors, with China leading in domestic development and Russia leading in

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[14] Currently, the LCOE of SMRs is even higher than other nuclear reactors: a report from Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO) suggest SMRs remain the most expensive way to generate power in the country, with the LCOE for an SMR estimated at ~USD$210-400/MWh. (CSIRO 2025). The argument remains, however, that scaled deployment of modular reactors can drive down costs faster than larger, bespoke alternatives.

[15] At the same time, the U.S. maintains a meaningful, but tenuous research edge. In nuclear science, it ranked second globally in 2023 in both total publications and in the share of papers in the top 10% by citations, being outpaced only by China (Strategic Policy Institute, as cited by Ezell 2024). Strong academic institutions have also enabled the U.S. to deliver breakthroughs in select nuclear technologies: The U.S. was responsible for the first net-energy-gain fusion experiment in 2022 (National Ignition Facility).

deployment abroad. Domestically, Beijing is set to increase reactor counts by more than 50% in the coming years, with 37 reactors under construction on top of 60 operating today, Russia has 34 in operation with 5 under construction (PRIS). Internationally, Hard MOUs–agreements that span the construction of nuclear power plants, export of components, or services directly related to the operation of nuclear power plants–paint a picture of Russian leadership, with Russian MOUs tripling American equivalents (Energy for Growth 2025).[16] Moreover, many of these reactors incorporate advanced designs: China reported the world's first fourth-generation nuclear reactor in 2023 and led the construction of the first commercial land-based SMR demonstration project, the Linglong One, in 2024; Russia, on the other hand has developed the world's most powerful fast neutron reactor, designed for operation in 2027 (CAEA 2023, CNNC 2025, WNN 2024).

China and Russia both view nuclear as a geostrategic opportunity and subsidize foreign deployment. Russian projects led by state-owned Rosatom include intergovernmental loans, which are often below-market (e.g., Hungary's Paks II), and state credits covering most project costs (e.g., Bangladesh's Rooppur), alongside build-own-operate models that embed long-term revenue support (e.g., Akkuyu's 15-year price structure) (Reuters 2014, WNA 2025, Reuters 2017). In China, nuclear exports are part of the Belt and Road Initiative, and regularly rely on subsidies from state-owned banks (CSIS 2023). The Chinese National Nuclear Corporation, for instance, drew on export support from China's Exim bank, to support nuclear plant development in Pakistan (Aid Data 2025).

While the U.S. cannot unilaterally subsidize exports in the same way as China or Russia, it can leverage extant innovation ecosystems to accelerate and compete in SMRs: the U.S. accounts for more than 30% of global SMR designs versus 12% in Russia and 10% in China (SMR Design Database 2026). By leveraging its startup ecosystem and supporting strategic bets across emerging firms such as X-energy, TerraPower, and NuScale, it could develop and deploy designs that can compete with state-led pipelines abroad.

III.III BARRIERS TO SCALE

To build global leadership, the United States must address several bottlenecks. Cross-border deployment is slowed by fragmented licensing regimes and the added burden of U.S. nuclear cooperation requirements. SMRs also remain exposed to concentrated upstream and midstream inputs across the fuel cycle and reliant on a foreign manufacturing base. Downstream, SMRs lack sufficient government support to prove their bankability.

Cross-border deployment of SMRs is slowed by a two-layer approval stack: every project must clear the host-country regulator's licensing regime and U.S. rules governing nuclear cooperation and technology exports. SMR-specific licensing pathways are still under development, and regulations remain country-specific (IAEA 2025, Alum and Islam 2025). While several groups are working towards the standardization of international regulatory regimes, such as CORDEL, MDEP, and ERDA, SMR regulation remains fragmented by country (ITIF 2025). In cases where the U.S. does not have a 123 agreement with the partner country, a new one must be negotiated

[16] Hard MOU counts for Russia are 63 versus 22 for China and 21 for the U.S.

with that country before deployment, which takes 400 days on average, and even if it does have a 123 agreement in place, approval can still drag (National Academy of Sciences 2023).

Like other reactors, SMR supply chains remain heavily dependent on foreign partners across the full fuel cycle, creating strategic vulnerabilities that will become more acute as they scale. Roughly 95% of uranium delivered to U.S. utilities in 2023 was foreign-origin, with Canada the largest supplier and Russia also playing a large role (EIA 2023). Downstream steps are similarly concentrated: Uranium conversion, from yellowcake to uranium hexafluoride, occurs in just five facilities while nearly half of global enrichment, which occurs after conversion capacity is based in Russia (Carpenter et al. 2025). Specialized manufactured inputs are also concentrated: While SMRs are often hailed as reducing dependence on foreign manufacturing inputs, American manufacturers do not have the capacity to produce SMRs at scale, creating the same dependencies on foreign manufacturing inputs as in large reactors (Wealer 2020).

SMRs also face a financing gap between design and operations. SMR manufacturers need to demonstrate to investors that they can drive down capital costs-per-unit to make up for lower power-per-unit output (MITEI 2018). But with insufficient financing and persistent technological uncertainty, SMRs have not proven their bankability (Mignacca and Locatelli 2020, OECD 2021). As a result, while the U.S. benefits from a healthy startup ecosystem, few are able to bridge the gap between design and operations without significant public risk-sharing. Under the DOE's Advanced Reactor Demonstration Program, only two lead demonstrations have received $3.2B in promised federal support (DOE 2026).

III.IV COORDINATING NUCLEAR POLICY

RATIONALE

An international SMR strategy could facilitate American nuclear exports through coordination with foreign governments on nuclear regulations and supply chains that aggregate inputs and ensure demand for nuclear exports.

Between governments, the priority is to harmonize fragmented licensing regimes while opening up markets for American exports. Today, international SMR deployment must clear both the host-country regulator and U.S. export and cooperation requirements. A coordinated approach could reduce this burden by standardizing documentation, pre-negotiating fast lanes with priority partners, and aligning regulatory and export-control pathways around a small group of allied markets. Working with the U.S. government would provide allies and host countries with access to reliable energy while reducing dependence on Russia and China.

SMR supply chains could importantly benefit from aggregated inputs and clear demand signals. This means securing access to uranium, conversion, enrichment, and specialized nuclear-grade components, while creating enough predictable reactor demand to justify investment in allied capacity. On the demand-side, as in geothermal, SMRs would also benefit from a pooled group of buyers and coordinated financing that could bring down the average price of deployment.

(I) Government-to-Goverment Coordination: Regulatory Fast Lanes

Targeted cooperation frameworks can help simplify regulatory pathways. In particular, the US Nuclear Regulatory Commission, DOE, State, and industry should convene with existing standard-setting organizations, such as the World Nuclear Association's CORDEL, to publish standardized regulatory frameworks that partner regulators can adopt or reference directly when interacting with American SMR exporters (WNA 2026). Establishing fast lanes for priority allies by standardizing 123 packages and bundling them with export-control pathways for technical assistance under the DOE's Part 810 authorization process, could reduce ambiguity on routine SMR support (CRS 2026). These changes can complement the NRC's expedited procedure for new reactor applications to limit regulatory timelines.

(II) Supply Chain Coordination: Resilience and Demand Aggregation

Coordinating nuclear supply chains could ensure economic security upstream. For nuclear, long-term procurement commitments across allied governments would support investment in new capacity while curbing U.S. reliance on specific nations. The Sapporo 5 strategic partnership between the U.S., Japan, the UK, France, and Korea, which pledged $4 billion towards global nuclear value chains in 2024, offers a natural platform to build on, and could expand allied nuclear cooperation beyond uranium sourcing and enrichment to include manufacturing (DOE 2024 - 3).

On the demand side, as in geothermal, a buyers' coalition coupled coordinated financing could create an orderbook that makes nuclear projects financeable and replicable at scale. Host countries would benefit from partnerships with U.S. development agencies like the Development Finance Corporation and multilateral development organizations such as the World Bank, which committed to advancing SMRs with the IAEA last year (DFC 2025, World Bank 2025). This intervention, in combination with an orderbook, would help SMRs reach the industrial scale necessary to prove their viability.

IV. ENLISTING MULTINATIONAL TECHNOLOGY COMPANIES

Multinational technology companies already shape much of the demand for firm power in the United States, and as they expand their data center footprints overseas, they are extending that influence abroad. A small group of tech giants is building billion-dollar data centers that accounted for more than one-fifth of global greenfield investment in 2025 and is planning to invest trillions of dollars into American AI infrastructure alone (UNCTAD 2026, White House 2026). The scale of their investments into offtakers will inevitably give them power to help mold the regulatory and commercial conditions for firm energy investment.

Strategic coordination with multinationals is therefore critical to fast-track the deployment of American energy and shape global energy policy in America's favor, across both geothermal and nuclear. The Stargate Project is a potential blueprint: Announced in 2025, the private consortium builds on the US-UAE AI Acceleration Project, and includes hundreds of billions in global AI infrastructure investment planned over the next three years in the U.S. and abroad (OpenAI 2025). By formalizing diplomatic channels with key tech companies through the Stargate project and other megaprojects, the U.S. could both help define international regulations for nuclear and geothermal deployment, and ensure that demand aggregation across supply chains reflects the needs of large tech companies.

V. CONCLUSION

Today, the U.S. has a choice to define how it wishes to lead in global energy markets. The postwar order was built in large part on American energy primacy and its capacity to guarantee the fossil fuels that it and other industrial economies relied on for both military and economic purposes (Painter 2012). Today, energy markets are more diverse, with China a dominant supplier of solar energy, wind, and batteries, and key gaps emerging in the firm energy infrastructure that will underpin AI.

The United States has strengths that it can build on. It has an oil and gas technology base that transfers directly into next-generation geothermal, an innovation ecosystem that has produced the world's most diverse portfolio of SMR designs, relationships that provide trusted partners for coordinated deployment, and development-finance institutions that can structure deals which private capital cannot close. And while geothermal and advanced nuclear are not the only sectors where American advantages could be converted into strategic leadership, they are among the strongest candidates available today because they provide what the global economy demands: reliable, firm power.

Washington needs a strategy that connects all levels of international coordination into a single push, treating supply chains, state-to-state diplomacy, and corporate partnerships as mutually reinforcing tools to achieve its current objective: energy dominance.