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Ending the Era of Energy Favoritism:

*How Technology-Neutral Policy Can Unlock
the US Power Grid*

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**AMERICAN INSTITUTE
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Executive Summary

The United States has exceptionally abundant energy resources and a rich portfolio of energy-producing technologies. Nevertheless, its power sector underdelivers due to institutionally distorted policy design rather than technical constraints. Federal and state rules increasingly pick favored technologies instead of setting clear goals for emissions, reliability, and cost, and then allowing markets to discover the least-cost mix of energy production. As energy demand rapidly increases from AI data centers, electrification, and population growth, this policy misalignment further erodes US economic adaptability while amplifying the likelihood of blackouts and higher prices.

Over time, American energy policy has become a patchwork of technology-specific rules that have distorted energy markets and led to the shortcomings we see today. Early statutes treated nuclear, fossil fuel, and hydropower very differently, assigning each technology a regulatory risk profile that did not match their comparable environmental or reliability characteristics. Programs such as Renewable Portfolio Standards (RPS), Renewable Fuel Standard (RFS), clean energy tax credits, and net metering further entrenched technology categories, often rewarding membership in a favored technology class rather than rewarding measurable reductions in pollution or improvements in reliability. These policy interventions reflect public choice dynamics where organized interests secure concentrated gains while costs are dispersed across ratepayers and taxpayers.

The result is a system that leaves substantial investment untapped and excludes viable, highly efficient technologies. More than 2,000 gigawatts of proposed projects remain stuck in interconnection queues, far more than current installed capacity. Even a partial build-out of this pipeline would significantly expand energy supply and reduce the risks of shortages and higher prices, particularly if complemented by more advanced nuclear, geothermal, and other low-carbon technologies. Research suggests that with technology-neutral incentives and better market design, advanced nuclear capacity alone could grow from roughly 100 gigawatts to several hundred gigawatts by mid-century, while geothermal and other production methods could also scale dramatically.

This paper calls for a course correction in energy policy grounded in economic fundamentals. Environmental harms should be addressed with technology-neutral tools such as emissions pricing and/or Tradable Performance Standards (TPS). Reliability should be procured explicitly through markets for firm capacity, flexibility, and other system attributes. Industrial and re-

gional development goals, where pursued, should be transparent, time-limited, and evaluated on their own terms rather than hidden inside technology and climate agendas. Within this framework, nuclear and other low-carbon technologies can compete on equal footing with renewables and fossil plants, and regulated utilities can be rewarded for outcomes rather than for the size of their capital base.

If policymakers adopt this approach, the US energy system can shift from a hodgepodge of politically favored technologies toward a market-driven portfolio that is cleaner, more reliable, and increasingly affordable. Clear, neutral rules would unlock stalled investment, accelerate deployment of advanced nuclear and other innovative resources, and position the United States to meet surging electricity demand without sacrificing economic growth. The gains are not hypothetical; they are embedded in existing projects waiting for a governance framework that lets them compete.

Key Points

1. The United States possesses abundant energy resources and proven technologies. Policy design, however, constrains energy supply, reliability, and decarbonization.
2. Current US energy production rules frequently pick favored technologies through mandates and subsidies.
3. Such interventions increase costs, misdirect capital, and slow innovation relative to technology-neutral, outcome-based approaches.
4. Policy design deficiencies have resulted in more than 2,000 gigawatts of proposed projects being stalled in interconnection queues. Implementing streamlined, technology-neutral permitting and market rules could unlock a substantial portion of this capacity and make future projects less costly and more efficient.
5. Advanced nuclear, geothermal, and other low-carbon resources can significantly reduce the cost of deep decarbonization if licensing is streamlined and they are allowed to compete fairly for reliability and emissions-focused payments.
6. A coherent reform package would price environmental externalities in neutral terms, procure reliability through explicit markets for system services, and overlay performance-based regulation on local monopolies while limiting opaque industrial policy.
7. If these changes are implemented, Americans can expect lower long-run electricity costs, fewer outages, faster growth in energy-intensive sectors, and meaningful reductions in pollution without sacrificing economic performance.

1. Introduction

The modern US power sector combines resource abundance and technological potential with persistent institutional constraints. The US possesses ample oil and natural gas, a significant existing nuclear fleet, substantial renewable resources, and mature transmission networks; yet concerns over rising system and electricity costs, reliability, and decarbonization persist. The puzzle is not one of technological deficiency but policy design. Energy and environmental rules now constitute one of the largest single clusters of federal regulation resulting in higher prices for Americans and slower economic growth.¹ The United States increasingly governs electricity through instruments that privilege specific technologies and industrial constituencies rather than through neutral, outcome-based rules. As a result, the sector’s core economic question — how to allocate capital to the most reliable, affordable, and efficient projects — is frequently subordinated to policies that favor technology selection and global climate objectives. This approach ultimately undermines all three goals. Given energy’s fundamental role in economic production and long-run prosperity, energy policy decisions play a critical role in shaping the United States’ growth trajectory.²

In 2024, the United States generated the second most energy of any country in the world, 4,391 terawatt-hours (TWh) compared to China’s 10,087 TWh.³ Despite reaching record levels of domestic energy production, growth in US energy demand is increasingly outpacing supply.⁴ The Energy Information Administration projects record electricity demand in 2026, driven largely by power-intensive data centers supporting artificial intelligence and cloud computing, as well as electric vehicles and building electrification.⁵ America’s existing energy grid is already strained and the Department of Energy warns that blackouts could increase 100-fold by 2030 if substantial energy capacity is not added to the grid in the next five years.⁶ Rising demand thus heightens the cost of policy error under a regime where what “counts” as clean or reliable power is increasingly defined by statute and tax code rather than by physics, prices, or performance.

A defining feature of recent US energy policy is the conflation of distinct objectives: advancing specific energy production technologies (notably wind and solar), internalizing environmental externalities (notably greenhouse gases and other pollutants, often at a global level), and advancing industrial or regional goals such as domestic manufacturing or rural income support.⁷ Instead of treating these as analytically separable “ends” with correspondingly distinct instruments, legislation and regulation frequently bundle them

into technology-specific mandates and subsidies. These interventions result in Renewable Portfolio Standards (RPS) that privilege particular resource categories, volumetric biofuel mandates, tax credits restricted to chosen technologies, domestic-content bonuses, and equipment-focused incentives for electric vehicles and storage. These policies embed judgments about “winners” *ex ante*, rather than defining emissions and reliability constraints and allowing decentralized agents to identify least-cost means of compliance.⁸

A transition from technology-picking policies to technology-neutral rules, coupled with reforms to permitting and interconnection processes, would yield significant near-term increases in the United States’ effective energy generation capacity. More than 1,400 gigawatts (GW) of generation capacity and 890 GW of storage are currently stalled in interconnection queues, spanning solar, wind, and natural gas technologies. Together, this is equivalent to approximately 960 Hoover Dams. This total far exceeds existing installed capacity, suggesting that even a partial realization of these projects would materially increase electricity output if interconnection and approval processes were accelerated.⁹ Federal modeling suggests that advanced nuclear capacity could expand from approximately 100 gigawatts today to roughly three times that level by mid-century under conservative assumptions, provided that licensing processes are streamlined and long-term project financing is secured.¹⁰ Comparable opportunities exist within renewable energy. The Department of Energy’s *GeoVision* analysis indicates that geothermal power could expand by an order of magnitude by 2050, contingent on advances in drilling technologies and more streamlined permitting processes.¹¹ For US households and firms, these changes would translate into lower electricity prices as lower-cost resources enter the market; improved reliability through the addition of firm capacity and transmission; accelerated growth in electricity-intensive sectors such as AI data centers and advanced manufacturing; and improved local air quality as higher-emitting generators are displaced.

Insights from economic theory and empirical analysis indicate both the fragility of the current US energy approach and the mechanisms through which its energy potential could be more fully realized. First, the Hayekian knowledge problem implies that regulators lack the information and adaptive capacity needed to select future cost-effective technologies *ex ante*. Price signals and the profit and loss mechanism in competitive markets are much better suited to aggregate dispersed information about the costs, risks, and innovation trajectories of energy technologies.¹² Second, the public choice literature, including Stigler’s (1971) theory of economic regulation and Peltzman (1976) and Buchanan and Tullock’s (1962) work on constitutional political economy, shows that when regulation creates concentrated benefits and diffuse costs, it predictably becomes an object of rent-seeking and capture.¹³

Technology-specific energy and climate policies inherently generate such economic rents. Eligibility for targeted tax credits, carve-outs within regulatory mandates, or guaranteed procurement classifications confers substantial benefits on a narrow set of firms or regions, creating strong incentives to preserve these arrangements even as more efficient alternatives emerge.

Third, work in environmental and energy economics indicates that policies that favor particular technologies are systematically less cost-effective than neutral, performance-based approaches. Fischer and Newell's (2008) comparative analysis of climate policies finds that technology-specific subsidies and portfolio standards generally yield higher marginal abatement costs (the cost of reducing one more unit of emissions) and weaker innovation incentives than emissions pricing or tradable performance standards.¹⁴ Additional research demonstrates how technology-focused climate policies are vulnerable to leakage (where local environmental regulation fails to reduce overall global pollution because the regulated activity shifts location or form) when applied to global pollutants like CO₂.¹⁵ These results are not merely theoretical; they directly map onto the structure of US regulations such as Renewable Portfolio Standards (RPS), the Renewable Fuel Standard (RFS), and multiple overlapping clean energy tax expenditures.¹⁶ Mandates and subsidies tied to particular technologies interact with rate-base incentives and planning requirements, encouraging compliance via eligible categories rather than minimizing total system cost subject to reliability and environmental constraints.

This paper frames US energy policy problems as fundamentally economic: government involvement that selects technologies and bundles objectives produces predictable information and incentive failures. The core analytical argument is that the ends must be separated to achieve each one more effectively. Separating objectives does not eliminate tradeoffs, but it makes them explicit: pursuing reliability, emissions reduction, and economic growth may still involve tensions, yet those tensions are revealed through prices, procurement costs, and performance metrics rather than obscured within technology mandates. Environmental externalities can be addressed through technology-neutral mechanisms, such as an emissions price or tradable performance standard, that apply uniformly to all resources based on measured impacts. Reliability and resource adequacy can be governed by explicit, market-compatible procurement of system attributes (firm capacity, flexibility, and locational deliverability), again on a technology-neutral basis. Distributional and industrial objectives, where pursued, can be made transparent and subject to independent evaluation rather than embedded within nominally environmental or reliability programs. To prevent policymakers from implicitly re-ranking objectives, incentives and rules must be anchored to

observable outcomes, administered through durable institutions, and constrained by clear statutory mandates that limit discretionary technology favoritism. Under such a regime, technologies like nuclear power that can provide low-emission firm capacity would neither be privileged nor penalized by categorical rules; instead, permitting and compensation would be tied to verifiable contributions to system objectives.

2. A Short History of US Energy Policy and the Current Policy Framework

2.1 The Rise of Targeted Intervention

Twentieth-century US electricity markets were built through successive legal regimes that assigned distinct risk-return profiles to different technologies. Over time, these frameworks shaped investment incentives and infrastructure development, channeling capital toward some generation sources while constraining others. These policies led to the current energy mix we have today. Roughly 60 percent of US utility-scale generation comes from fossil fuels, 18 percent from nuclear power, and 21 percent from renewable sources.¹⁷

These aggregate shares rest on institutional choices that predate contemporary climate debates, combined with the priorities of each successive administration.

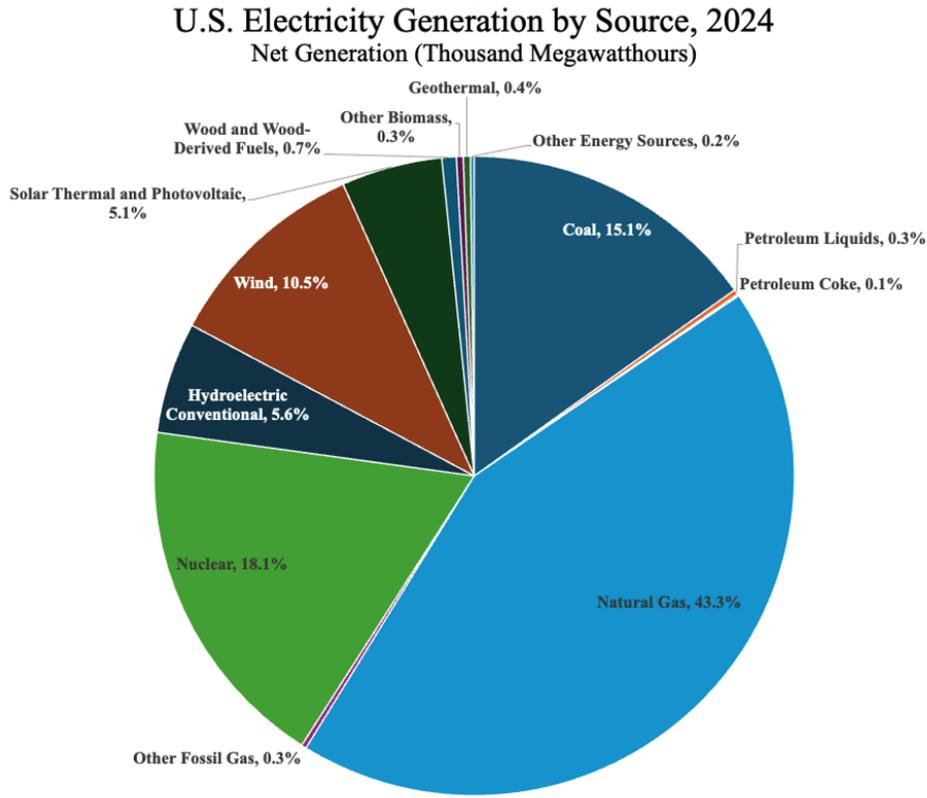


Figure 1. US Energy Information Administration, *Electric Power Annual*

By the early twentieth century, federal and state authorities shifted from a light touch to active management of energy markets. In 1930, the Texas Railroad Commission imposed production reductions to lift crude prices and restrain competitive drilling. Under the New Deal, this framework was expanded through the National Industrial Recovery Act (NIRA) of 1933, which suspended normal competition in favor of industry-administered “fair trade” codes, initially adopted by the oil industry.¹⁸ After the Supreme Court invalidated the NIRA in 1935 in the case *A.L.A. Schechter Poultry Corp. v. United States*, major oil producers supported the Connally Hot Oil Act, which provided federal backing for state programs that restricted output and propped up prices. This approach was favored over proposals for public-utility-style rate regulation of oil companies.¹⁹

The Tennessee Valley Authority Act of 1933 facilitated the expansion of large, federally backed hydropower projects and publicly financed generation and transmission, effectively socializing the investment risks associated with those assets.²⁰ In doing so, the federal government assumed a direct role in shaping the scale and financing of electricity infrastructure. Civil nuclear power was established under a distinct statutory regime called the Atomic Energy Act of 1946 which centralized ownership and control of fissionable

materials in the federal government.²¹ This framework reflected both national security concerns and deep uncertainty about technological and catastrophic risks. The Atomic Energy Act of 1954 subsequently allowed private participation under intensive federal licensing and information controls.²² The Price-Anderson Nuclear Industries Indemnity Act of 1957 then created a capped, pooled liability system for nuclear operators, addressing catastrophic-risk insurability while codifying nuclear energy's exceptional legal treatment relative to other generation.²³ Taken together, these measures embedded technology-specific treatment into US energy governance decades before present climate policy, shaping which investments confronted regulatory scarcity and which operated under more predictable conditions.

Postwar federal policy thus combined public ownership with tight regulatory control for selected emerging technologies. Large hydro and TVA-era projects benefited from direct public financing and statutory mandates, lowering financing and demand risk.²⁴ Nuclear facilities, by contrast, emerged within a framework that required detailed federal approval at each stage: centralized control of materials, security clearances, construction permits, operating licenses, and participation in the Price-Anderson liability pool. Historical work along with official US Nuclear Regulatory Commission histories shows how, from the 1960s through the 1970s, expanding safety requirements, increasingly formalized hearings, and growing public contestation lengthened licensing timelines and increased procedural uncertainty.²⁵ This regime raised the cost of capital for nuclear projects, making their viability unusually sensitive to regulatory and political risk rather than solely to underlying engineering or market fundamentals.

A further complication in the production of nuclear energy was that civilian nuclear policy grew out of a weapons-first bureaucracy. The Atomic Energy Act of 1946 centralized ownership of "fissionable materials" in the federal government, embedding secrecy and defense priorities that hindered early commercial deployment.²⁶ Eisenhower's 1953 "Atoms for Peace" speech opened a diplomatic and legal pathway for power reactors, but institutional funding and expertise continued to tilt toward military priorities, namely naval propulsion and fissile-material production, leaving civilian projects to navigate security restrictions and case-by-case licensing.²⁷ After India's 1974 "Smiling Buddha" nuclear device test, US policy tightened proliferation controls through President Carter's 1977 decision to defer commercial reprocessing and the Nuclear Non-Proliferation Act of 1978, further constraining the civilian fuel cycle even as these moves targeted weapons risks.²⁸ In short, a governance architecture built for weapons shaped civilian nuclear energy, diverting resources and raising regulatory frictions precisely as other generation sources faced more routine permitting.²⁹

Fossil-fuel development followed a different trajectory. Oil and gas producers benefited from comparatively stable and technology-favorable fiscal and legal arrangements. These included percentage depletion allowances and the expensing of intangible drilling costs, which reduced effective tax rates on exploration and extraction.³⁰ Federal and state leasing regimes, most notably the Mineral Leasing Act of 1920 for onshore resources and the Outer Continental Shelf Lands Act of 1953 for offshore tracts, established standardized mechanisms for oil and gas access. These frameworks relied on competitive auctions, fixed primary lease terms, and clearly defined royalty schedules, facilitating exploration and production across large prospective areas.³¹ Although major environmental statutes and spill-driven reforms increased compliance costs, they did not typically subject individual oil and gas projects to the same case-by-case licensing uncertainty or centralized material control seen in the nuclear sector.³² As a result, capital allocation in the oil and gas sector was shaped by these favorable fiscal and legal arrangements, while still operating through market mechanisms such as competitive leasing, price signals, and private risk-bearing.

This asymmetry between the US government’s regulatory approach to different energy sources constitutes an early and important manifestation of technology-differentiated policy. Two carbon-intensive technologies and one low-carbon technology were placed under sharply different regulatory risk profiles that bore little relationship to their respective contributions to long-run climate damages or local health risks. This initial divergence in institutional treatment set the stage for subsequent policy layers – RPS, biofuel mandates, technology-specific tax credits – that amplified rather than corrected distortions in capital allocation across nuclear, fossil, and later renewable resources.³³

2.2 Crisis, Partial Liberalization, and the Foundations of Tech Picking

The 1973 Arab oil embargo and the 1979 Iranian Revolution triggered supply shocks that, amplified by price controls and rising demand, culminated in the oil crises of the 1970s and spurred a wave of federal interventions reshaping electricity and fuel markets.³⁴ Congress enacted the Energy Policy and Conservation Act of 1975, introducing strategic petroleum reserves and efficiency measures, created the Department of Energy through the Department of Energy Organization Act of 1977, and adopted the Public Utility Regulatory Policies Act of 1978 (PURPA).³⁵

PURPA required utilities to purchase power from “qualifying facilities” (QFs), cogeneration plants and small power producers satisfying specified fuel, size, and ownership criteria at administratively determined “avoided cost” rates.³⁶

This mandate was an early attempt to inject competition and diversify the generation base within vertically integrated monopoly systems.³⁷ PURPA's eligibility rules and regulated "avoided cost" calculations allowed regulators to specify *ex ante* which types of projects merited guaranteed offtake and at what price, this framework played a central role in fostering the early development of markets for non-utility generation and renewable energy in the United States.

Paralleling developments in oil markets, the nuclear energy sector confronted multiple crises during the 1970s that significantly influenced subsequent policy. Major nuclear accidents transformed risk perceptions and regulatory responses, most notably following the 1979 Three Mile Island incident and the 1986 Chernobyl disaster.³⁸ Although numerous historical and technical assessments of the accidents – including Samuel Walker's *Three Mile Island*, Nuclear Regulatory Commission reviews, UNSCEAR analyses, and OECD/NEA reports on Chernobyl – found limited or context-specific health impacts of the accidents, the fallout resulted in substantial tightening of licensing procedures and safety reviews of any future nuclear energy projects.³⁹ These developments lengthened regulatory lead times and introduced substantial uncertainty for nuclear projects.

While contemporaneous research examined the impacts and risks of nuclear meltdowns, an expanding environmental health literature quantified the far greater external costs associated with coal and oil combustion, with comparative studies indicating orders-of-magnitude higher mortality per kilowatt-hour relative to nuclear power.⁴⁰ The regulatory response nonetheless focused on nuclear-specific restrictions more than on mitigating the negative externalities generated by any power source. This asymmetry illustrates how translating safety and environmental concerns through non-neutral regulation can invert the social-cost ranking of technologies and misdirect capital from lower-externality options.

After decades of asymmetric risk perception and non-neutral regulation, the next policy wave shifted from safety-driven constraints to market design and fiscal tools that continued to privilege categories over outcomes. The 1990s and early 2000s introduced partial restructuring of electricity markets and a new layer of technology-contingent fiscal incentives. The Federal Energy Regulatory Commission mandated open-access transmission and fostered the creation of independent system operators (ISOs) and regional transmission organizations (RTOs).⁴¹ These reforms introduced wholesale competition while leaving much of the distribution and retail sale of energy under regulation.⁴² Within this framework, Congress enacted targeted tax credits including the Production Tax Credit (PTC) for wind and closed-loop

biomass energy sources, and later the Investment Tax Credit (ITC) for solar and related technologies.⁴³

Several states explicitly mirrored or complemented federal clean-energy tax incentives by adopting their own technology-specific credits and abatements, though the form and generosity varied. For example, New York layered state production- and investment-style incentives onto the federal PTC and ITC through NY-SUN and related tax credits. California combined state investment incentives and rebates with the federal ITC via the California Solar Initiative, and Iowa adopted an early state-level wind energy production tax credit that closely paralleled the federal PTC.⁴⁴ Unsurprisingly, these credits significantly increased wind and solar deployment.⁴⁵ Yet the incentives were categorical by rewarding wind and solar specifically, not delivering verifiable emissions reductions or reliability services relative to alternatives. These tax credits essentially enshrined technology picking into federal fiscal policy.

State Renewable Portfolio Standards (RPS), widely adopted in the late 1990s and 2000s, reinforced technology-differentiated regulation by converting eligibility rules into binding procurement mandates for utilities.⁴⁶ Early and influential examples include Texas's 1999 RPS centered on tradable renewable energy credits, California's 2002 RPS with technology-specific eligibility and escalating targets, and New York's 2004 RPS requiring load-serving entities to procure qualifying renewable generation, each embedding technology selection directly into state electricity markets.⁴⁷ Many RPS programs require retail suppliers to procure a specified share of electricity from resources classified as "renewable," enforced through renewable energy certificates. RPS policies increased renewable energy generation of numerous kinds of projects that exhibited a wide variation in cost, emissions and design quality.⁴⁸

and diesel. Subsequent empirical evaluation, however, raised questions about whether these mandates delivered the environmental benefits originally claimed. A 2008 study found that once indirect land-use change is incorporated, conventional corn ethanol can increase, rather than decrease, net greenhouse-gas emissions relative to gasoline.⁵⁰ The National Research Council's comprehensive review of the RFS reaches similar conclusions about climate benefits while emphasizing distributional gains for specific agricultural producers.⁵¹ Research shows how the mandate transfers surplus toward corn and biofuel producers and contributes to higher food and feed prices.⁵² Together, this literature illustrates how a policy framed as advancing environmental and energy-security objectives can function in practice as a durable, technology-specific transfer to a concentrated constituency. More neutral instruments, such as carbon pricing or performance standards, could achieve larger emissions reductions at lower overall welfare cost.

Net metering, for example, is a billing system that allows consumers with renewable energy sources, like solar panels, to receive credit for the extra electricity they send back to the grid. This program spread from state to state between the late 1980s through the 1990s, first in Minnesota and California, then across most jurisdictions by the mid-2000s.⁵³ Most programs credited a household's excess rooftop energy generation at the full retail rate on a monthly "net" basis, using standardized interconnection rules and bi-directional meters.⁵⁴ As adoption accelerated, state commissions began revising designs. California's "Net Energy Metering (NEM) 2.0" and "NEM 3.0" lowered export credits toward time-varying values and added one-time interconnection fees and successor tariffs.⁵⁵ Hawaii closed retail NEM in 2015 and moved customers to CGS/Smart Export structures.⁵⁶ Massachusetts added the Solar Massachusetts Renewable Target (SMART) program, which provides incentives for solar energy projects that decrease over time and are layered on top of crediting.⁵⁷ Some states piloted "value-of-solar" tariffs that pay a posted rate reflecting avoided energy, losses, capacity, and environmental adders, Austin Energy's being the canonical early example.⁵⁸ The result by the late 2010s was a patchwork of incentives. Some states offered 1:1 retail credit, others linked credit to time-of-use (TOU) or avoided-cost values, and in island grids like Hawaii, regulators replaced retail-rate net metering with sub-retail export credits and companion tariffs that reward pairing rooftop solar with batteries. These policies allowed excess daytime solar to be stored and released during evening peaks instead of overloading the midday grid.⁵⁹

Alongside net metering, other programs promoted renewable energy. State Renewable Portfolio Standards (RPS) set escalating percentages of retail sales to be met with legislatively defined "renewable" resources and enforced compliance through tradable renewable energy certificates (RECs).⁶⁰ At the

federal level, the Production Tax Credit and the Investment Tax Credit reduced capital costs for eligible projects, while the Renewable Fuel Standard set annual biofuel obligations for refiners and importers.⁶¹ Many states introduced community-solar programs to broaden access and adopted revenue decoupling, fixed-charge redesigns, and minimum bills to stabilize utility finances as volumetric sales growth slowed.⁶²

For example, Minnesota and Colorado implemented large community-solar programs, while California and New York adopted revenue-decoupling and revised fixed charges to maintain utility cost recovery. Empirical evaluations suggest these programs had mixed effects on retail electricity prices, often increasing average rates or shifting costs toward nonparticipating customers, while delivering distributional benefits and revenue stability at the expense of higher system and administrative costs.⁶³ By the late 2010s, jurisdictions were updating legacy rules, tightening interconnection timelines, adjusting export credits, and refining REC eligibility, while leaving the core architecture of technology-specific credits, mandates, and retail-rate net energy metering largely intact.⁶⁴

2.4 The Inflation Reduction Act, Nuclear’s Position, and Current Energy Policy Trends

The Biden Administration’s 2022 Inflation Reduction Act (IRA) continues to be the backbone of federal clean-energy incentives and, combined with decades of layered regulations, results in the regulatory mix we have today.⁶⁵ Current US energy regulation is extensive but unevenly structured across fuel types: fossil energy is governed by broad, cross-cutting environmental, leasing, and safety regimes (e.g., the Clean Air Act, Clean Water Act, Mineral Leasing Act, and pipeline-safety rules), while nuclear power is subject to a uniquely dense, technology-specific licensing and safety framework concentrated in Title 10 of the Code of Federal Regulations and administered by the Nuclear Regulatory Commission. Renewable energy, by contrast, faces comparatively fewer stand-alone safety regulations. It is regulated primarily through incentive-based instruments, such as tax credits, renewable portfolio standards, net-metering rules, and siting requirements, and implemented through a fragmented mix of federal tax law and state-level utility and land-use regulation.⁶⁶

In 2025 the law’s new “tech-neutral” credits went live, namely the Clean Electricity Investment Credit and the Clean Electricity Production Credit. These credits do not reward a specific energy source, such as a wind turbine or a solar panel, but are intended to promote any electricity that has very low or zero greenhouse-gas emissions, regardless of the technology that produces it,

including nuclear.⁶⁷ To qualify, projects must meet emission standards and must be placed in service after December 31, 2024. Projects can receive bonus credits for meeting certain wage and apprenticeship requirements and/or being in low-income communities or on Indian land.⁶⁸ Federal tax policy now rewards electricity providers for measured emissions performance. Developers still must deal with ordinary project hurdles such as financing, siting, and building schedules, but the credit rules themselves are marginally clearer and more inclusive than in 2023–24.⁶⁹

The Trump administration has focused oil and gas policy on expanding leasing and development, while curtailing many solar and wind projects. The administration restarted work on a new five-year offshore leasing plan under the Outer Continental Shelf Lands Act that reopens areas for competitive auctions after several years of limited sales.⁷⁰ The One Big Beautiful Bill Act (OBBBA) requires the sale of more oil and gas leases including at least thirty in the Gulf of America by 2040.⁷¹ The Department of the Interior also moved to reopen leasing in Alaska’s Arctic National Wildlife Refuge (ANWR) Coastal Plain and to advance related rights-of-way for oil and gas leasing. Those steps would allow companies to bid for exploration and production in the area, subject to environmental reviews.⁷² The administration plans to offer offshore leases on multiple coasts in 2026, which would increase the number of tracts available for oil drilling bids.⁷³ At the same time, the administration paused or slowed numerous federal wind-energy leasing and permitting while it re-examined costs and local impacts. That pause created uncertainty for new offshore wind areas as oil and gas leasing accelerated.⁷⁴

Nuclear policy has seen the most substantive recent changes. In May 2025 the President signed an executive order that directs the Nuclear Regulatory Commission (NRC) to streamline its processes and to reorganize how it reviews new reactors.⁷⁵ The Department of Energy highlighted related actions to rebuild the nuclear supply chain and to speed up testing and licensing.⁷⁶ The NRC approved an innovative small modular reactor (SMR) design in May 2025.⁷⁷

SMRs are seen as the future of nuclear energy. Compared with today’s large reactors, they are small plants designed to be built in factories and then installed on site, saving time and money.⁷⁸ The NRC also continued work on a proposed rule that would create a risk-informed, technology-inclusive licensing framework for advanced reactors, meaning the rules would focus on measurable safety outcomes rather than a specific reactor type.⁷⁹ For large reactors, the NRC approved key steps that allow Holtec to move forward with restarting the Palisades plant in Michigan. If completed, Palisades would be the first US reactor to return to service after a shutdown.⁸⁰

Taken together, these steps point to a federal tilt toward low-carbon nuclear power while oil and gas leasing expands.⁸¹ Despite these strides, policy inertia from a bygone era persists. The Department of Energy continues to downblend uranium-233 (U-233), a key input for advanced nuclear reactors.⁸² Preserving U-233 would support the development of thorium molten-salt reactors, a technology the US pioneered but later abandoned.⁸³ For decades, weapon-focused policies of the 1940s–60s prioritized uranium and plutonium and sidelined thorium, which is highly efficient for energy production but offers little value for weaponry.⁸⁴

Despite recent modest improvements, US energy policy still routinely conflates ends and means. Much of federal energy policy continues to use technology-specific instruments to pursue environmental, reliability, and industrial objectives simultaneously, thereby aggravating information problems and inviting rent-seeking. A more coherent framework would separate these ends by addressing environmental harms through uniform, technology-neutral constraints on emissions or performance; ensuring reliability and resource adequacy through explicit, competitively procured systems; and eliminating industrial policy objectives. If industrial policy is undertaken, it should be pursued transparently and with explicit evaluation, rather than through opaque cross-subsidies embedded in energy regulation.

Subsequent sections elaborate how such separation can reduce welfare losses, discipline public choice vulnerabilities, and allow markets to discover efficient roles for nuclear and other technologies.

3. Diagnosing the Policy Failure

The central failures of US energy policy that have left roughly 2,000 gigawatts of proposed capacity idle reflect economic and institutional failures, not technological limits. They arise from (i) technology-picking instruments that ignore the variability in the expense of reducing greenhouse gas, (ii) the mixing of environmental and industrial-policy goals with energy policy, and (iii) the interaction of these instruments with monopoly regulation. Public choice and information economics predict exactly the pattern observed: costly decarbonization, misallocated capital, and persistent preference for politically salient technologies over efficient ones.

3.1 Tech Picking vs. Outcomes

A large body of both theoretical and empirical literature finds that, given the government is involved in energy policy, technology-specific mandates and subsidies are second-best relative to technology-neutral price or performance instruments. This distinction matters because the choice of policy instrument

determines whether incentives align with least-cost abatement or become tethered to particular technologies and interest groups. Fischer and Newell (2008) show that targeted subsidies and portfolio standards generally achieve a given emissions reduction at higher welfare cost than uniform emissions pricing or tradable performance standards, and that they distort innovation toward subsidized options rather than least-cost abatement.⁸⁵ Friedrich Hayek's (1945) knowledge problem underscores why this is. Regulators cannot reliably anticipate future relative costs, system-integration needs, or innovation trajectories because they have no reliable feedback mechanism. Market signals emerging from decentralized choice are better at aggregating information.⁸⁶ Feedback like prices, profits, losses, and entry and exit decisions provide continuous feedback about scarcity, performance, and opportunity cost, allowing decentralized markets to coordinate investment and innovation far more effectively than administrative judgment. This theoretical insight is borne out empirically in observed policy outcomes across the US energy sector. Gillingham and Stock's (2018) survey of mitigation costs, likewise, concludes that overlapping, technology-specific policies in the US have raised abatement costs relative to more neutral designs.⁸⁷

Concrete US instruments exhibit these predicted distortions. Renewable Portfolio Standards (RPS) that credit only designated "renewables" while excluding nuclear or existing low-carbon resources reward projects based on category membership, not marginal abatement or reliability contribution. Empirical work by Carley (2009) and by Wiser et al. (2016) shows that RPS policies do increase wind and solar deployment, but also reveal considerable variation in costs and limited alignment with least-cost abatement once exclusions and design details are accounted for.⁸⁸ Ethanol volume mandates under the Renewable Fuel Standard (RFS) represent another form of tech picking. Studies by Searchinger et al. (2008) and the National Research Council find that once land-use change and market responses are incorporated, conventional corn ethanol offers small or negative climate benefits while clearly transferring income to specific agricultural interests.⁸⁹ These category-based programs steer dollars toward labels rather than the cheapest verified tons. This pattern is evident in EV purchase subsidies, whose climate benefits vary widely with grid mix and often come at higher abatement cost, and for storage mandates, whose value depends on when and where services are delivered rather than on installed megawatts alone.⁹⁰

Such technology-specific policies function as constrained optimization problems with arbitrary bounds: regulators pre-select eligible technologies, then let markets optimize only within that subset. This structure predictably produces higher costs than allowing the market to price the full technology set, given the stated outcome constraints. When laws pre-select "eligible"

technologies, investors face regulatory risk on top of normal market risk: rules or relative costs can change, leaving projects unviable even if they were compliant when built. In utility regulation, losses often don't stay with the investor because commissions allow rate-base treatment, meaning the project's undepreciated cost is added to the utility's regulated asset base and recovered from customers over time with an allowed return. Or commissions approve stranded-cost mechanisms, which are special charges on customer bills that compensate utilities for past investments that became uneconomic after policy or market shifts.⁹¹

Regulatory features have direct implications for how firms time and scale irreversible capital investments under uncertainty. Dixit and Pindyck (1994) and Pindyck's (1991) work shows us that investing in long-lived, hard-to-reverse assets has an "option value of waiting." This means that when uncertainty is high, delaying investment can be efficient; technology-specific mandates compress that option value and can trigger premature, welfare-reducing build-outs.⁹² Once such mandates are in place, investment decisions are no longer disciplined solely by market signals but increasingly by regulatory expectations. The work of Stigler (1971), Peltzman (1976), and Kornai, Maskin, and Roland (2003) shows that when the benefits of policy mandates accrue to concentrated groups while costs are widely dispersed, public-choice incentives predict systematic political support for such arrangements. Combined with soft-budget constraints and the expectation that regulators will permit cost recovery even when projects underperform, these dynamics encourage overinvestment in the protected subset.⁹³ The resulting allocation severs the link between project performance and financial accountability. Thus, the upside is privatized while downside risk is shifted to ratepayers and taxpayers.

3.2 Goal Mixing and Public Choice Distortions

A second policy failure that underpins US energy policy is the routine fusion of distinct objectives into single policy instruments. Emissions reduction, technology promotion, regional development, and industrial policy are frequently bundled together through technology-specific mandates and subsidies rather than pursued with separate, purpose-built tools. In their research, Aldy and Stavins (2012) argue that climate policy is more effective when environmental objectives are pursued with dedicated, transparent instruments rather than embedded in overlapping subsidies aimed at co-benefits.⁹⁴ This analytical distinction clarifies why policies designed to accomplish multiple goals simultaneously often perform poorly on each dimension. For example, instead of EV-only purchase rebates and domestic-content bonuses bundled into tax credits, a uniform carbon price or tradable performance standard would directly

reward verified emissions reductions regardless of technology (Aldy & Stavins 2012). Problems compound further when bundled objectives are pursued at subnational scales for pollutants with global damages. Bushnell, Peterman, and Wolfram (2008) show that subnational policies targeting global pollutants via local technology requirements are especially prone to leakage and inefficiency.⁹⁵ Their work illustrates how state renewable or low-carbon fuel mandates can shift high-emissions production to neighboring states or induce credit “reshuffling,” reducing in-state emissions on paper without cutting total emissions economy-wide (Bushnell, Peterman & Wolfram 2008).

Public choice theory explains why mixed-goal, technology-picking instruments persist. Stigler’s (1971) theory of regulation and Peltzman’s (1976) extension of that theory predict that regulation tends to allocate benefits to organized interests when those benefits are concentrated and costs diffuse.⁹⁶ Buchanan and Tullock’s (1962) constitutional political economy, and Olson’s work on collective action, similarly emphasize how small, cohesive groups secure favorable rules, while large groups of consumers face high coordination costs.⁹⁷ These frameworks point to a systematic bias toward policies that bundle distributive benefits with regulatory goals. In practice, this creates “coalition goods” when policies are bundled to satisfy multiple organized constituencies like manufacturers, fuel producers, unions, and regional blocs, making technology-specific designs politically cheaper to pass than outcome-based rules. Moreover, information asymmetries and revolving-door expertise further tilt the process toward insiders who can draft eligibility criteria, measurement rules, and bonus provisions that quietly channel rents. The familiar “bootleggers-and-Baptists” dynamic then sustains the policy: moral or environmental justifications provide cover, while commercial beneficiaries finance the lobbying that preserves the instrument.⁹⁸

Once enacted, RPS categories, RFS mandates, EV-specific credits, and domestic-content bonuses all create concentrated rents for eligible industries and regions. Once in place, these beneficiaries have strong incentives to defend and expand their privileges, even when new evidence reveals that other technologies (e.g., existing nuclear, firm low-carbon resources, or demand-side options) could deliver superior reliability and environmental outcomes. Wisser et al. (2016), Barbose (2024), and Joskow’s (1997), work shows that entrenchment occurs through design choices.⁹⁹ Choices like grandfathering, tradable certificates, multi-year crediting schedules, and stranded-cost recovery lock in asset values and make reform appear to threaten jobs, tax bases, and utility balance sheets. Crucially, because the underlying investments are long-lived and quasi-irreversible, beneficiaries can credibly warn of write-downs and litigation if rules are changed, raising the political price of course correction.¹⁰⁰ The cumulative effect is dynamic rigidity when climate and

reliability policy become vehicles for industrial favoritism, and course corrections toward more neutral instruments face entrenched opposition.¹⁰¹

3.3 Monopoly Incentives

The US electricity sector is organized around hundreds of state-granted local monopolies for distribution, service, and, in many states, vertically integrated utilities that also own generation and transmission. Local electricity provision is typically organized as a government-regulated natural monopoly, characterized by capital-intensive transmission and distribution networks with large fixed and sunk costs. Under cost-of-service regulation, a utility's earnings are determined by applying an authorized rate of return to its regulated "rate base."¹⁰²

The classic Averch-Johnson (1962) result predicts that, under such rules, regulated firms will tilt toward capital-intensive choices because they increase the capital base that earns an authorized return; absent countervailing incentives.¹⁰³ Laffont and Tirole (1993) formalize why regulators have difficulty counteracting this tendency: regulators face an information problem and cannot perfectly observe firms' true costs or effort levels. As a result, contracts designed to limit excess rents can weaken investment incentives, while more generous allowances risk encouraging overcapitalization.¹⁰⁴

These state-granted local monopolies result in a single seller facing the market demand curve and maximizing profit by restricting output below the competitive level and charging a higher price than they would under market competition. Because the monopolist has no direct competitors, it does not need to expand output to meet demand at lower prices and instead chooses the price-quantity combination that maximizes its own profits rather than total surplus. This monopoly pricing creates deadweight loss: the loss of potential economic value that arises when mutually beneficial trades fail to occur because the monopoly price prevents transactions that would make both buyers and sellers better off.¹⁰⁵ Monopolies also exhibit many inefficiencies. With little-to-no competitive pressure, firms let costs creep up through slack operations, excess staffing, or cost-inflated processes.¹⁰⁶ These higher prices, fewer units sold, and more internal waste than we'd see in a competitive market further complicate the provision of energy.

A more coherent regulatory design follows directly from the economics of monopoly regulation. Drawing on Demsetz's (1964) franchise-bidding insight, such a design would replace guaranteed utility ownership with competitive procurement wherever monopoly provision is not technologically necessary, most notably in electricity generation and many ancillary and grid-support

services.¹⁰⁷ Joskow and Tirole (2007) show that reliability can be procured efficiently when scarcity pricing and capacity remuneration are paired with well-designed retail policies; this logic points toward performance-based regulation (PBR), under which utility earnings depend on measurable outcomes, such as reliability indices, interconnection timelines, or verified emissions intensity, rather than on the volume of capital placed into the rate base.¹⁰⁸

In practice, this approach would involve utilities competitively procuring capacity, flexibility, and clean-energy attributes through auctions or standardized contracts, while regulators reward utilities for meeting clearly specified performance benchmarks instead of expanding owned assets. Elements of this model already exist: US wholesale capacity markets (e.g., PJM and ISO-NE) and price-cap or incentive-based regimes such as the United Kingdom's *Revenue = Incentives + Innovation + Outputs* (RIIO) framework that reflect partial implementations of outcome-oriented regulation.¹⁰⁹ Together, these examples demonstrate that technology-neutral environmental instruments and performance-oriented monopoly regulation are not speculative reforms but extensions of tools already in use. When combined, they can mitigate information problems and rent-seeking that otherwise drive excessive, category-driven capital accumulation.¹¹⁰

4. Principles for a Course Correction

Correcting these failures does not require retreating from environmental or energy performance objectives but disentangling them. It requires recasting the state's role along lines consistent with basic market economics and informed by public choice constraints. Four principles follow.

4.1 Separate the Ends: Externality Control, Energy Performance, and Industrial Policy

4.1.1 Externality Control

Environmental harms from energy use, greenhouse gases, local air pollutants, and upstream methane are classic externalities. Abundant research supports pricing these harms directly, either via emissions taxes, cap-and-trade, or functionally equivalent tradable performance standards.¹¹¹ Critics sometimes argue that cap-and-trade systems encourage firms to focus on acquiring allowances rather than innovating, but empirical evidence from the US Sulfur Dioxide (SO₂) trading program shows the opposite: firms responded by developing lower-cost abatement technologies and operational improvements to reduce allowance demand.¹¹² More broadly, by placing a persistent price on emissions, cap-and-trade preserves continuous incentives to innovate because

firms that reduce emissions below the cap capture ongoing gains, whereas technology mandates truncate innovation once compliance is achieved.

Weitzman and Montgomery (1974) show that, for uniformly mixed pollutants, price and quantity instruments can be designed to achieve cost-effective abatement under uncertainty. The key is that the instrument is technology-neutral and tied to emissions outcomes, not equipment categories.¹¹³ Revesz and Stavins (1972) likewise argue that well-designed market-based instruments tend to outperform prescriptive regulation both in static efficiency and dynamic innovation.¹¹⁴ An externality control regime would therefore adopt (i) a uniform price on CO₂ and major co-pollutants across sectors, and/or (ii) a tradable performance standard (e.g., tons CO₂e/MWh, verified methane intensity) with rigorous monitoring, reporting, and verification (MRV). Technology-specific production mandates and fuel-volume requirements would be phased out as redundant.

4.1.2 Energy-Market Performance

Reliability, flexibility, generation capacity, and resource adequacy are conceptually distinct from environmental externalities and should be addressed through the explicit procurement of system attributes. Research shows that well-functioning energy-only and capacity markets depend on scarcity pricing and, where applicable, capacity remuneration mechanisms. These instruments reflect the value of reliability and system adequacy directly, rather than privileging particular technologies.¹¹⁵ An energy-market performance regime would: (i) define products such as firm capacity, ramping capability, inertia, and locational deliverability; (ii) procure them through competitive auctions open to all resources (generation, storage, demand response, interconnection, nuclear life-extension) meeting performance standards; and (iii) allow scarcity pricing to signal when additional investment is valuable. This model will select for verifiable performance, not whether a resource is wind, solar, nuclear, or gas.

4.1.3 Industrial Policy

Industrial policy, as has been discussed, suffers from classic public choice problems. Concentrated beneficiaries lobby for targeted subsidies, local-content rules, and tax credits, while diffuse consumers bear the costs. Over time, these programs become institutionally “sticky” and tend to expand, as beneficiary constituencies mobilize to preserve and extend them, even when accumulating evidence indicates that lower-cost instruments could achieve the same stated objectives.¹¹⁶ By design, this approach involves picking winners. The state selects particular firms, sectors, or technologies de-

spite severe information constraints that make governments systematically weaker investors than decentralized markets.¹¹⁷ In the energy sector, layering industrial policy objectives on top of environmental and reliability goals blurs accountability and raises overall costs. Rather than compensating providers for measurable outcomes, such as emissions reductions or reliability services delivered, these rules reward eligibility categories, thereby inviting rent-seeking behavior. The remedy is disentanglement. Keep industrial experiments, if pursued at all, transparent, time-limited, and evaluated on explicit milestone payments, while returning core objectives to the marketplace.¹¹⁸

This market structure channels competition toward measurable outcomes while constraining opportunities for regulatory capture. Separating these objectives creates a level playing field in which all energy resources face the same carbon price or performance standard and have equal opportunity to be compensated for delivering reliability attributes.

4.2 Keep Metrics Minimal and Auditable

Given knowledge problems and regulatory capture concerns, the metric set should be as transparent as possible: for example, (i) verified tons of CO₂e, (ii) standardized reliability attributes, and (iii) simple consumer-cost indicators. Complex composite indices or opaque “sustainability scores” create scope for manipulation and selective weighting. Independent MRV bodies with open methods and data reduce information asymmetries and limit the ability of regulated entities or agencies to inflate compliance claims.

Public choice analysis suggests institutional safeguards including publishing formulas *ex ante*, minimizing discretionary exemptions, and subjecting metrics to periodic independent review. These measures reduce opportunities for cronyism by making it harder to hide preferential treatment inside bespoke eligibility criteria.

4.3 Technology-Neutral by Law

To discipline winner-picking, core policy instruments should be drafted in technology-neutral terms. Statutes and regulations should specify emissions rates, reliability attributes, or other verifiable performance outcomes, rather than privileging particular fuels, devices, or ownership structures. Conditioning support on outcomes rather than eligibility categories channels innovation and investment toward the lowest-cost means of achieving policy goals, which is the central economic case for neutrality.¹¹⁹

Technology neutrality does not imply ignoring heterogeneous risks of energy production technologies. Nuclear energy, for example, justifiably requires

dedicated safety regulation. Even there, however, rules should be risk-informed and performance-based, not open-ended or discretionary in ways that effectively function as technology bans. Where genuinely technology-specific externalities exist, such as methane leakage from particular equipment, they can be addressed through targeted, measurable performance standards nested within an otherwise neutral policy framework.

4.4 Stable but Sunsetted

Finally, sustained private investment depends on policy stability that is credible over time, while remaining attentive to public choice concerns about entrenching permanent favors. The time-consistency literature and political economy research on regulatory credibility emphasize that effective policy must be predictable *ex ante* yet revisable through well-defined, rule-based processes.¹²⁰ Stability should therefore arise from transparent commitments and procedures, not from open-ended guarantees to particular technologies or constituencies.

A coherent framework would legislate multi-year carbon-pricing and reliability instruments with clearly specified trajectories, paired with automatic, periodic reviews – for example every five years – using transparent metrics such as cost per ton abated, realized reliability outcomes, and evidence of market power or rent extraction. Programs that fail these cost-effectiveness or integrity thresholds would trigger pre-specified sunsets or clawbacks, particularly for technology-specific credits or carve-outs, ensuring capital is redirected toward higher-performing options. At the same time, the regime would limit retroactive rule changes that undermine legitimate investment expectations, permitting exceptions only in cases of fraud or material misrepresentation.

Such a design reduces regulatory risk across technologies while limiting the persistence of rent-seeking arrangements, consistent with Dixit’s insight that predictable, rules-based policy is essential for attracting irreversible investment in capital-intensive sectors.¹²¹ Taken together, these principles address the core policy failures by clarifying the state’s role: to allow markets to price externalities, define reliability and safety requirements, and enforce transparent rules, not to centrally plan the generation mix. A framework that separates objectives, relies on minimal and auditable performance metrics, and applies technology-neutral, rule-based instruments can harness market discovery to deliver lower-cost decarbonization and reliability, while substantially reducing opportunities for cronyism and policy-driven misallocation.

5. Implementation Blueprint: Actionable Policy Levers

5.1 Nuclear-enabling, technology-neutral reforms

One practical avenue for advancing technology-neutral energy regulation is to decouple safety certification from project-by-project siting decisions. A first step in this direction would be a standardized, one-time design approval for technologies such as small modular reactors (SMRs). This approval would be portable across sites, akin to aircraft type certification, so that a vendor that clears a rigorous safety review could deploy the same design without re-litigating core technical issues in each individual licensing docket.¹²² This approach reduces licensing risk and lowers the cost of capital, which empirical research identifies as a primary determinant of nuclear power's leveled cost.¹²³

A complementary reform is the adoption of a reference-plant pathway, in which a technology is built once at full scale and subsequently replicated without fundamental redesign. When paired with modularization and factory fabrication, this approach compresses construction schedules and reduces execution risk. Both modeling and historical evidence indicate that repetition — rather than bespoke one-off projects — is the primary source of efficiency gains in complex capital-intensive systems.¹²⁴ A further requirement is controlled, rules-based access to specialized materials, including uranium-233 (U-233) and medical or industrial isotopes, through transparent allocation mechanisms and robust safeguards. Several advanced reactor concepts, such as molten-salt systems and micro-reactors, depend on testable fuel cycles to validate performance and safety claims.¹²⁵ Taken together, these reforms are intentionally technology-neutral: they alter how technologies are licensed and demonstrated, not which technologies are permitted.

5.2 Externality track

From an economic perspective, the cleanest response to environmental externalities from energy production is a uniform price on emissions or a tradable performance standard that sets an output-based emissions rate and allows firms to trade credits. When paired with rigorous monitoring, reporting, and verification (MRV) that accounts for lifecycle effects, both instruments are technology-neutral in operation.¹²⁶ Moreover, under uncertainty, well-designed price or quantity mechanisms can achieve a given environmental target at least cost, while avoiding the information problems inherent in technology-specific carve-outs.¹²⁷ Once such a neutral framework is established, overlapping subsidies, mandates, and technology-specific quotas should sunset, both to prevent double counting

and to ensure that innovation is guided by least-cost abatement rather than statutory classifications.¹²⁸

5.3 Reliability and market design

Reliability is a bundle of attributes including firm capacity, fast ramping (the ability to change output quickly), inertia (physical resistance to frequency changes), and locational deliverability (the ability to serve load behind congested wires). Energy systems work most reliably when they are compensated explicitly for these attributes and allowed to offer scarcity pricing. This means that retail prices are allowed to rise during peak demand so that investment and demand response are rewarded when reliability is most valuable.¹²⁹

Accreditation of all resources should be explicitly probabilistic, relying on effective load-carrying capability (ELCC) so that a megawatt of solar, wind, storage, gas, or nuclear capacity is credited based on its empirically measured contribution to reducing loss-of-load probability, rather than on nameplate capacity under ideal conditions.^{130, 131} To fully internalize system-integration costs, intermittent generators and large, inflexible loads – such as certain data centers – should carry tradable obligations demonstrating access to firm supply, storage, or demand-side flexibility during scarcity hours.¹³² Finally, pay-for-performance rules with meaningful penalties for non-delivery should apply symmetrically to storage and demand response, ensuring that reliability value is reflected at the meter rather than assumed by category.¹³³

5.4 Working within regulated monopolies

Given that retail electricity service is largely delivered by state-granted monopolies, performance-based regulation (PBR) should overlay traditional cost-of-service rules to tie utility earnings to measurable outcomes rather than capital accumulation. Relevant outcomes include reduced outage duration and frequency, faster interconnection and permitting timelines, verified emissions intensity per megawatt-hour delivered, and the cost per ton of emissions avoided relative to a defined benchmark portfolio.¹³⁴ Where statutes allow, competitive sourcing, including all-source solicitations and third-party power-purchase agreements, should replace guaranteed utility ownership for power generation services.¹³⁵ Transmission and interconnection reform should rely on cluster-based studies paired with binding shot clocks and transparent hosting-capacity maps that indicate how much incremental generation or load each line or feeder can accommodate. Evidence from jurisdictions that have adopted these tools shows faster queue processing and higher conversion rates from interconnection requests to completed projects.¹³⁶

6. The Case for Nuclear Now

Nuclear power, particularly recent advances in small modular reactors (SMRs) and molten-salt reactors (MSRs), offers a uniquely strong case in the current energy landscape. The renewed policy interest in nuclear energy is not accidental but demand-driven. Rapid growth in artificial intelligence and data-intensive computing is sharply increasing electricity requirements, with credible estimates suggesting global data-center demand could roughly double by 2030 on an already constrained power grid.¹³⁷ Nuclear power provides near-zero lifecycle emissions and exceptionally high capacity factors (the share of time a plant operates at full output), while delivering reliable power during scarcity events, precisely when variable renewable resources are most constrained.¹³⁸ System-level modeling consistently shows that portfolios relying exclusively on variable renewables plus storage face sharply rising system costs and residual reliability risk during peak demand windows. Whereas portfolios that incorporate firm low-carbon resources such as nuclear, geothermal, or carbon capture and storage (CCS) achieve deep decarbonization at substantially lower expected cost.¹³⁹

Recent policy developments are moving in the right direction but remain incomplete. The Trump administration's 2025 executive order directing the Nuclear Regulatory Commission toward a risk-informed, technology-inclusive regulatory framework. DOE's Liftoff analyses, along with newly enacted technology-neutral tax credits, help translate political interest into potentially bankable signals. But the investment case for advanced nuclear still hinges on predictable licensing timelines, durable, neutral rules that reduce regulatory risk over multi-decade horizons, and access to the necessary materials for advanced nuclear research.¹⁴⁰ Current Department of Energy policy undermines the US's strategic position by continuing to downblend uranium-233, the critical starter material for next-generation reactor designs. Uranium-233 enables thorium fuel cycles, leveraging thorium's abundance as a byproduct of rare-earth mining to deliver safer, cheaper, and more fuel-efficient nuclear power.

China's molten-salt thorium pilot highlights a growing strategic risk: US policy choices are allowing China to pull ahead in advanced nuclear technologies.¹⁴¹ China's progress in advanced nuclear reflects a deliberate effort to secure uranium-233, the crucial starter fuel for thorium powered nuclear energy, and manufacture this starter fuel, while the United States has moved in the opposite direction by downblending its existing U-233 stockpile rather

than making it available for research and reactor demonstration.¹⁴² This policy choice has slowed domestic innovation and ceded leadership in next-generation nuclear technologies to foreign competitors. Uniquely, the United States possesses both substantial thorium resources and the world's most significant U-233 stockpile, produced during mid-century research programs.¹⁴³ As other nations incur high costs to recreate this capability, current US policy effectively discards a singular strategic advantage by rendering U-233 unusable rather than deploying it for reactor demonstration and fuel-cycle validation.¹⁴⁴

The AI era intensifies this need, as data centers and electrification add large, relatively inflexible loads, and over-reliance on any single intermittent resource increases system costs and outage probability unless paired with firm, long-duration capacity.¹⁴⁵ A genuinely neutral and research-forward framework allows nuclear to compete to supply these reliability attributes on equal terms, without bespoke carve-outs, but also without structural exclusion.

7. Conclusion

The evidence assembled in this paper points toward a straightforward but politically difficult truth: the United States does not lack energy resources or technological options; it lacks a coherent, neutral policy framework for deploying them. Today's system of technology-specific subsidies, eligibility rules, and overlapping mandates constrains investment to politically chosen categories rather than allowing markets to meet clear environmental and reliability requirements at least cost. A shift toward technology-neutral, outcome-based policy would unlock a vast reservoir of stalled projects. More than 2,000 GW are already sitting in interconnection queues, waiting for permission rather than invention. Even partial build-out of this pipeline would transform US electricity supply, lowering consumer costs, increasing resilience, and enabling industries such as AI, manufacturing, and data-center operations to expand without triggering grid instability. Federal modeling similarly shows that advanced nuclear power could scale from about 100 GW-equivalent to several hundred GW if licensing were streamlined and project finance made predictable. These technologies already exist; they pencil out and are waiting on governance to unlock their potential.

To capture this opportunity, the US must legislate and regulate for clear and concise outcomes. That means placing environmental externalities on a single neutral instrument, whether an emissions price or a tradable performance standard with rigorous monitoring and verification. It means procuring reliability as explicit products – specifically firm capacity,

ramping capability, and other reliability attributes – rather than smuggling climate goals into technology-specific mandates. It requires overlaying performance-based regulation onto existing state-granted monopolies so that utility earnings rise or fall with reliability, interconnection speed, and verifiable emissions intensity. And it requires building a standardized, bankable pathway for nuclear power, namely portable design approvals, standardized licensing, reference-plant replication, and safeguarded access to essential materials.

If Congress and the states adopt such a framework and sunset overlapping carve-outs, the market will discover the cleanest, most reliable, and least-cost energy production mix. The result will be an energy system finally aligned with America’s resource strengths, capable of meeting surging demand, and structured to deliver durable economic and environmental gains for decades to come.

Glossary of Abbreviations Used in Text

AI – Artificial Intelligence
ANWR – Arctic National Wildlife Refuge
CCS – Carbon Capture and Storage
CGS – Customer Grid-Supply
CO₂ – Carbon Dioxide
CO₂e – Carbon Dioxide Equivalent
DOE – Department of Energy
ELCC – Effective Load-Carrying Capability
EV – Electric Vehicle
GW – Gigawatt
IRA – Inflation Reduction Act
ISO – Independent System Operator
ISO-NE – ISO New England
ITC – Investment Tax Credit
MSR – Molten-Salt Reactor
MRV – Monitoring, Reporting, and Verification
NEA – Nuclear Energy Agency
NEM – Net Energy Metering
NIRA – National Industrial Recovery Act
NRC – Nuclear Regulatory Commission
OBBBA – One Big Beautiful Bill Act
OECD – Organisation for Economic Co-operation and Development
PBR – Performance-Based Regulation
PTC – Production Tax Credit
PURPA – Public Utility Regulatory Policies Act
QF – Qualifying Facility
REC – Renewable Energy Certificate
RFS – Renewable Fuel Standard
RIIO – Revenue = Incentives + Innovation + Outputs
RPS – Renewable Portfolio Standard
RTO – Regional Transmission Organization
SMR – Small Modular Reactor
SO₂ – Sulfur Dioxide
SMART – Solar Massachusetts Renewable Target
TMI – Three Mile Island
TOU – Time-of-Use
TPS – Tradable Performance Standard
TVA – Tennessee Valley Authority
TWh – Terawatt-hour
U-233 – Uranium-233
US – United States
UNSCEAR – United Nations Scientific Committee on the Effects of Atomic Radiation

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