DOE Modernization to Unleash American Energy Innovation

Policy Recommendations to Accelerate American Energy Innovation and Secure Industrial Leadership

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America has the most advanced and innovative energy companies and venture capital ecosystem, which are investing billions of dollars to address the challenges of tomorrow's energy supply. Those challenges are expected to be significant, as electricity demand surges due to the growth of artificial intelligence and domestic reshoring. Energy costs and security are at the forefront of concern, with the U.S. in fierce competition with China's investment in energy technology and deployment.

With its world-class laboratories and focus on energy innovation, the Department of Energy has been a vital catalyst and partner for the private sector in driving technological breakthroughs and commercial successes. However, to effectively address current challenges, the Department must operate at the highest level of efficiency and be fully responsive to industry needs.

In December 2024, C3 Solutions partnered with the Emerson Collective to undertake an extensive and unprecedented effort to gather recommendations from over 40 venture-backed energy companies and leading members of the U.S. energy technology investment community. These firms—spanning advanced manufacturing, nuclear innovation, software-driven systems, and grid technologies—shared candid feedback on issues and potential opportunities to improve the Department of Energy's ability to partner effectively with companies at the forefront of energy innovation. The insights from those interviews were provided to the incoming administration in a transition memorandum to help shape their plans and initiatives.

Since then, much of the incoming administration's policy and program priorities have started to take shape. Despite recent efforts to restructure and refocus DOE, much of what was identified in December 2024 remains directly relevant and can guide DOE through the remaining three and a half years. The issues addressed included structural barriers that hinder DOE's ability to move at the speed of the market—outdated timelines, procedural inefficiencies, and misaligned incentives—that transcend partisan politics.

Addressing these challenges will be crucial for the United States to sustain its energy leadership and confront both domestic and global competition directly. The following recommendations, derived from previous interviews and based on the experiences of entrepreneurs and investors, are practical within existing authorities and aim to generate the greatest impact where it is most needed. This is not a call for new mandates or massive increases in spending. Instead, it is a plan to unlock what DOE already oversees—its labs, funding authority, and platform—and to use these resources to foster a more innovative, competitive, and energy-secure United States.

Time Matters: Modernizing DOE Processes to Match the Speed of Innovation

In today's energy landscape, time is not a neutral variable—it is a competitive advantage. The private sector is accustomed to operating in cycles of months, not years. Capital is allocated incrementally. Milestones are hit or missed quickly. Markets shift, technologies mature, and geopolitical shocks demand immediate response. Yet DOE's internal processes—from application intake to funding disbursement—are still governed by timelines and requirements better suited to slow-moving academic institutions than to fast-scaling energy ventures.

This mismatch creates friction at every stage of engagement. Even when companies successfully secure support from DOE, they often face unpredictable negotiations, unclear timelines, and prolonged funding delays that threaten project momentum. Worse still, the inconsistencies across program offices mean that two applicants can have wildly different experiences depending on which team they interact with. Without reform, this procedural drag risks neutralizing the Department's best intentions—and the taxpayer's investment.

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DOE doesn't need more money to fix this. It requires process discipline, smart use of digital tools, and a culture of urgency. Companies that are building the infrastructure of tomorrow cannot afford to wait on outdated review mechanisms or duplicative paperwork. They need a public partner that can move with the velocity of innovation. Our specific recommendations include:

STREAMLINE THE APPLICATION PROCESS

- In line with the principle of "The best process step is no process step," reduce administrative burdens and eliminate duplicative or superfluous requirements (e.g., community benefit or labor agreements before a technology is even commercialized).
- Employ digital tools or AI software to automate parts of the application and review process, reducing human overhead and expediting evaluations.
- Standardize applications across the DOE so that applicants experience a consistent process, regardless of the program or office they approach, and information from prior applications can be repurposed. Reserve a room for application customization to meet the specific needs of the program.
- Create Uniform Contracting Protocols that enforce common milestones, deadlines, and steps to ensure fairness and predictability for all applicants, regardless of the personnel involved.
- Simplify IP agreements to align with venture market standards.

SHORTEN TIMELINES

- Aggressively leverage NEPA categorical exclusions to the greatest extent possible, so that environmental reviews do not hinder technical progress before validating that the technology can economically scale to a degree that creates minimal environmental risks.
- Resolve Extended Negotiations: The negotiation phase for DOE grants has grown unwieldy; timelines vary widely depending on the individual or team.
- Fund Quickly Upon Milestone Completion: Release funding within 30 days of hitting agreed-upon milestones, allowing for standard contingencies.
- Foster Accountability: Build performance metrics and feedback loops so that individual staff are incentivized to keep processes on schedule. Publish progress metrics quarterly.

- Bridge the 'Missing Middle' Funding Gap
- Increase Support for First-of-a-Kind (FOAK) Demonstrations: Expand opportunities between early-stage grants and later-stage commercial-scale programs.
- Expand ARPA-E SCALEUP to other programs: Double down on teams that successfully achieve technical milestones in initial grants to continue scaling.

EMBRACE INNOVATION AND SHARE TECHNOLOGY RISK

- Elevate Software Solutions: Break the antiquated regulatory bias toward hardware by prioritizing software platforms (e.g., virtual power plants, demand-side management, and digital physics engines) that can accelerate deployment and reduce total system costs.
- Take Technology Risk, Not Market Risk: The DOE is mandated by Congress to fund technology development and scale-up. Expect that some innovative projects may fail, and be prepared to share the lessons learned. Leave the underwriting of market risk to the private sector to remove diligence steps and limit political risk. While difficult to execute through contract structures, DOE can embrace cutting-edge projects through LPO, MESC, and other demonstration projects like the Advanced Reactor Demonstration Program. Nobody wants any project to fail, and DOE should not throw good many after bad; however, sticking to its technical core mission helps to fill a technology risk gap rather than a financial one.

Candid Communication for Demonstration and Deployment: Creating a Culture of Clarity, Accountability, and Partnership

One of the most common—and costly—barriers to effective engagement with the Department of Energy is simple miscommunication. Applicants describe a bureaucratic fog: timelines are vague, guidance is inconsistent, and technical feedback is often obscured behind government jargon. In many cases, a fast "no" would be far more valuable than a delayed and indecipherable "maybe." This is particularly true for LPO, but projects selected under other demonstration programs have also suffered from the delayed decision-making required to secure a contract.

Clear, honest communication is not a nicety—it's a cornerstone of functional governance and effective partnerships. For venture-backed energy companies, delayed responses or vague feedback aren't just frustrating—they can be the difference between project acceleration and abandonment. DOE has the opportunity to build trust and credibility not only by improving what it funds, but also in how it communicates with those it engages.

This means setting transparent expectations, publishing performance metrics, offering specific feedback, and treating funded recipients as strategic partners rather than administrative burdens. Communication reform is not merely a procedural issue—it is a cultural one, and it must start at the top. Our specific recommendations include:

IMPROVE COMMUNICATION AND SUPPORT

- Transparency and Accountability: Publicly track and report application processing times to help set expectations, minimize arbitrary delays, and allow the market to assess the efficacy of DOE engagement.
- Dedicate Account Managers who all operate under the same timeline for each applicant/awardee to proactively assist applicants with timely answers to queries, personalized guidance, and clear expectations.
- Provide constructive feedback for unsuccessful applications, offering specific insights to help applicants refine their future submissions.
- Treat Funded Partners as Business Partners to encourage collaboration rather than antagonism.
- Time-Critical Decision Making: Delays undercut the mission to spur domestic industry competitiveness.

ENHANCE NUCLEAR ENERGY STRUCTURES AND COORDINATION

- Fusion Energy Sciences: Develop contract templates and IP frameworks suitable for commercially oriented, late-TRL fusion companies.
- SMR Deployment and HALEU Coordination: Streamline communication and planning between OCED (deployment funding) and NE (HALEU supply) to avoid opaque, disjointed processes.

LOAN PROGRAM OFFICE COMMUNICATION

- Refocus Part 1 on eligibility (i.e., technology innovation, U.S.-based operations, greenhouse gas impact) to alleviate capacity issues and accelerate processing and aim for a maximum 60-day decision on eligibility to avoid “luck of the draw” among Outreach and Business Development (OBD) advisors.
- Efficient Part 2: Once eligibility is confirmed, deeper financial and technical due diligence can be completed efficiently with a narrower pool of applicants.

People First: Attracting Entrepreneurial Talent and Building Smarter Partnerships

The foundation of any institution is its people. For the Department of Energy to effectively collaborate with the innovation economy, it must prioritize a different kind of talent—entrepreneurial, mission-driven individuals who excel in fast-paced, results-focused environments. Currently, DOE's hiring, promotion, and management practices often reward seniority over skill and risk aversion over action. This must change.

Just as great startups are built by high-growth teams—people who develop quickly and add value over time—so too must the Department reconsider how it recruits, empowers, and assesses talent. ARPA-E has shown that short-term, high-impact roles can attract outstanding candidates from industry and academia. The same idea can be applied across the DOE portfolio, especially in programs focused on commercialization and deployment.

However, personnel reform must extend beyond just hiring. DOE also needs to reshape its relationship with industry. Too often, the Department acts as a gatekeeper instead of a facilitator. Venture-backed companies want to see DOE as a strategic partner: to collaborate, co-develop solutions, and scale successful initiatives. This involves valuing industry expertise, recognizing builders, and leveraging the Department's convening power to encourage real collaboration—not just superficial engagement.

Our specific recommendations include:

HIRE FOR SLOPE

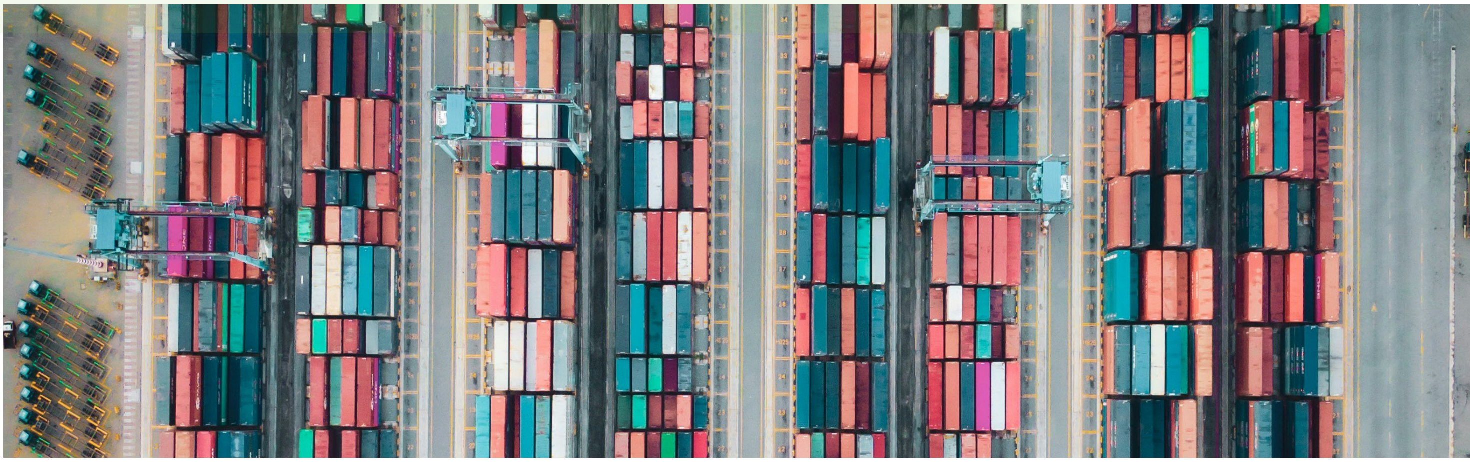
- Expand ARPA-E's limited-tenure program manager hiring approach to more DOE programs to bring in talented Americans with unique knowledge who want to serve, but are not interested in decades of government employment.
- Empower talented young people rather than adhering to the time-served hierarchical approach to promotion.
- Leverage fellowship programs to rotate high-potential personnel from the private sector or other federal agencies through DOE.

FOSTER INDUSTRY PARTNERSHIPS

- Celebrate successful industrialists: Make it cool to build again!
- Build bridges: Leverage DOE's unique convening power to connect innovators, industry stakeholders, and investors.
- Engage the venture community: Appoint venture capitalists to your Secretary of Energy Advisory Board (SEAB) to ensure the long-horizon view is represented alongside corporations and advocates.

Another option would be to establish a separate Innovation Advisory Board that engages with the private sector, DOE, and the Foundation for Energy Security and Innovation (FESI) to maintain and strengthen relationships and address new policy and technological challenges.

- Support incubators and accelerators that work alongside national labs and universities, helping high-potential energy research bridge the gap to venture investment and operate flexibly to pilot new offerings without bureaucratic constraints.
- Regularly visit vibrant venture ecosystems: Startups and venture capitalists have a light footprint in DC, as their primary focus is rightly on technology progress, product development, and customer success. To keep the real-time information flowing, regularly visit the venture hotspots around San Francisco, Boston, Austin, Seattle, Denver, and Chicago.



Beyond DOE: A National Strategy to Compete with China and Lead the Global Energy Future

Fixing the Department of Energy is a critical first step—but it is only one piece of a much larger challenge. As the global energy economy shifts, the United States must adopt a broader industrial strategy that aligns innovation, trade, manufacturing, workforce, and infrastructure toward a single goal: energy leadership in a world increasingly shaped by geopolitical competition.

China's dominance in energy supply chains did not occur by chance. It results from deliberate, coordinated policies—combining government subsidies, export restrictions, forced technology transfer, and economies of scale. The U.S. cannot rely on innovation alone to face this challenge. We need to pair our technological advantages with quicker deployment, smarter purchasing, and strategic collaboration between public and private sectors across agencies and markets.

This section highlights policy priorities that go beyond DOE's immediate authority but are vital for America's ability to turn its innovation edge into lasting global competitiveness. From grid modernization to talent development and international trade, these suggestions reflect the broader market factors that influence whether American innovations are developed and scaled at home. Our recommendations include:

RECLAIM GLOBAL LEADERSHIP

- Lead Internationally. Assert U.S. leadership in shaping fair trade practices, setting global standards, and forging strategic alliances to counter China's influence. By embracing bold commitments and promoting energy exports, the U.S. can strengthen its position in international markets.

- Adopt Strategic Policies and Market Mechanisms. Implement market-based approaches—like carbon pricing or cap-and-trade—to drive emissions reductions and spur innovation. Enact aggressive demand-side policies to bolster U.S. competitiveness and leadership in global environmental initiatives.

REBUILD DOMESTIC ADVANTAGE

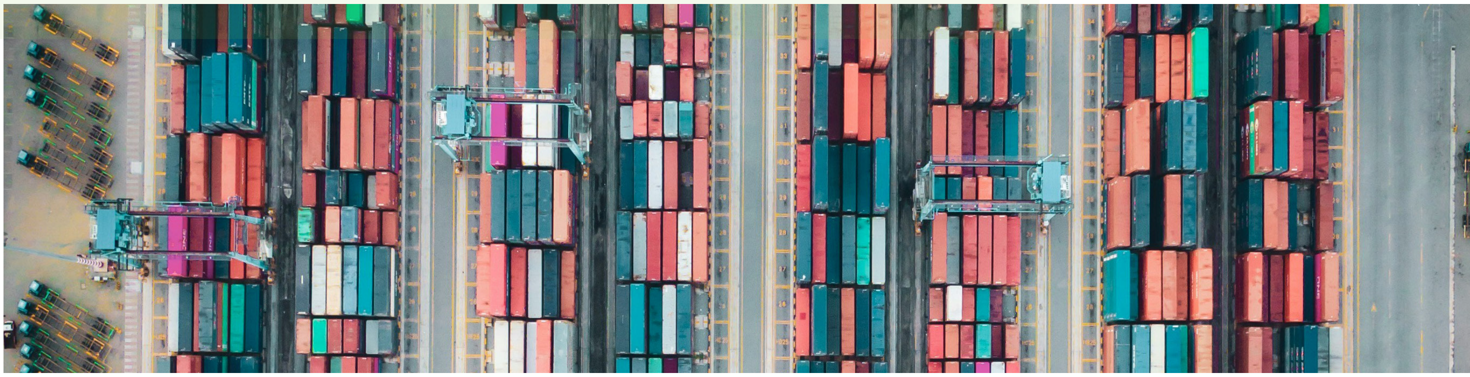
- Accelerate Innovation. Boost federal R&D funding for next-generation technologies such as fusion, advanced batteries, carbon capture, and small modular nuclear reactors. Encourage collaboration among government, private industry, universities, and national labs through expanded programs (e.g., ARPA-E) and regional innovation hubs.

- Invest in Domestic Manufacturing and Supply Chains. Strengthen U.S.-based energy technology manufacturing (for example, solar panels, batteries, nuclear components) and critical minerals recycling and production through permitting reform, tax credits, manufacturing subsidies, and forward purchase agreements.

- Modernize Energy Infrastructure. Upgrade grid integration, transmission systems, monitoring and control, and energy storage to ensure reliability, enable renewable integration, and maintain resilience against disruptions. Support innovative grid technologies that lower capital investment and enhance efficiency and flexibility while accelerating decarbonization.

MOBILIZE THE WORKFORCE AND THE MARKET

- Enhance Public-Private Collaboration. Leverage partnerships to rapidly deploy advanced technologies, ensuring that breakthroughs transition from labs to market. Encourage long-term public and private investments that amplify economic growth while supporting climate goals.
- Develop a Skilled Workforce. Invest in STEM education, apprenticeships, and upskilling programs to equip American workers for cutting-edge energy sectors. Encourage partnerships between industry and educational institutions to align training with the evolving needs of the market.
- Through decisive action—combining industrial policy, innovation, infrastructure upgrades, and robust market incentives—the U.S. can assert global leadership, secure its energy future, and compete with China in the fast-evolving clean energy landscape.



Conclusion: Focus, Speed, and Strategic Alignment

The current policy environment requires the DOE to do more with less—and do it faster. This is not a call for across-the-board expansion; it is a call for disciplined focus on the most strategically important sectors and the most impactful reforms.

By recruiting high-performance talent, streamlining processes, communicating with clarity, and aligning with national priorities in critical minerals and nuclear power, DOE can remain a catalyst for strategic energy leadership. Paired with a targeted national competitiveness strategy, these actions can secure America's industrial and energy future in an era of intense global competition.

The private sector is ready to lead. The question now is whether the federal partner can match its speed, focus, and resolve.