Crossing the Innovation Valley of Death

Federal Policy for American Energy Dominance

The United States split the atom, created the solar cell and pioneered hydraulic fracturing, but today China rivals the U.S. in R&D investment and can deploy new energy faster. The country that invents a technology rarely captures its full economic and strategic value if another country is the one that manufactures and deploys it. Policymakers must act now so American innovators can deliver energy that is cheaper, cleaner, more reliable and more competitive.

Why Energy Innovation Matters

Energy innovation is the rare policy lever that does not force a tradeoff. The shale revolution is proof: American breakthroughs in horizontal drilling, hydraulic fracturing and seismic imaging doubled U.S. natural gas production. Without these breakthroughs, electricity prices and power-sector emissions would both be significantly higher today, the economy would be smaller and the U.S. would not be the world's largest energy producer. **One set of innovations, six benefits, no tradeoff.**

The Benefits of Energy Innovation

- Expands supply, lowers costs
- Drives down emissions
- Improves energy reliability
- Accelerates economic growth
- Provides energy security
- Unlocks energy dominance

That same pattern is now playing out in advanced nuclear, enhanced geothermal, long-duration storage and grid-enhancing technologies. Every breakthrough that lowers the cost of producing energy simultaneously strengthens reliability, reduces emissions and makes American industry more competitive abroad. **The countries that lead in commercializing these technologies will set the terms of the global energy market. Those that don't will buy from those that do.**

25%	4.5 yrs	2x+
Projected electricity demand growth by 2030	Average time to permit an energy project	Cost premium for first-of-a-kind energy project vs. a mature one

The Valley of Death: Where Innovations Stall

All new technologies move through a pipeline of research, development and demonstration (RD&D) before reaching commercial scale. For energy, the most consequential failure point—the ***"Valley of Death"***—occurs between a successful demonstration and the first privately financed commercial deployment. **First-of-a-kind energy projects can cost more than twice as much as their mature counterparts, and private capital cannot price the long-duration policy and technology risk on its own.** When American innovations cannot cross this valley at home, they cross it abroad—taking the jobs, supply chains and standard-setting authority with them.

Why This Matters Now

Driven by data centers, advanced manufacturing and electrification, **electricity demand could grow 25% by 2030 and 78% by 2050.** At the same time, global competition is intensifying. China is deploying next-generation reactors, batteries and grid technologies at a pace the U.S. has not matched. Federal policy cannot pick winners, but it can **narrow the Valley of Death by removing structural barriers to deployment and bridge the valley by providing the right kind of capital** to the right stage of risk.

Federal Policy Solutions: What Congress Should Do

To narrow and bridge the valley, Congress should act on three fronts

Unleash Deployment: Reform Permitting, Regulation and Interconnection

Energy projects average **4.5 years to permit** and **over four years to connect to the grid**, and federal policies often regulate specific technologies rather than promote specific outcomes. Predictable timelines and clear standards are prerequisites for projects to cross the Valley of Death. Congress should:

- **Enact comprehensive permitting reform:** Reform judicial review, expand categorical exclusions, set strict timelines and modernize interagency processes via digital tools and concurrent reviews.
- **Simplify regulations to unleash innovation:** Shift from prescriptive, technology-specific mandates to performance-based standards that specify the desired outcome, letting innovators innovate.
- **Reform the interconnection queue:** Evaluate projects in clusters, prioritize by readiness and accelerate the adoption of grid-enhancing technologies that unlock capacity on existing infrastructure.

Fix the Financing Architecture

Energy innovation operates on multi-year timelines, but federal authorizations and appropriations operate on annual ones. Most provisions of the **Energy Act of 2020**—a law signed by President Trump that underpins core innovation programs—**have already expired or will soon.** Congress should:

- **Reauthorize the Energy Act of 2020:** Update and extend the expiring provisions, and explore multi-year appropriations structures for ARPA-E, the Department of Energy's (DOE) national laboratories and applied program offices, with clear milestones to ensure taxpayer accountability.
- **Deploy DOE's Title XVII loan authority at scale:** Use DOE's Office of Energy Dominance Financing to maintain tech-neutrality and accelerate private investment in first-of-a-kind projects.

Fix the Financing Architecture

Artificial intelligence (AI) is compressing innovation timelines—from screening 32 million battery materials to identifying the first new commercially-viable, blind geothermal system in over 30 years. President Trump's **Genesis Mission** established the federal model: targeted investment in shared AI infrastructure that no single private actor would build. Congress should:

- **Invest in shared infrastructure:** Sustain and expand federal investment in AI-enabled research infrastructure throughout the DOE, especially the National Laboratory system and ARPA-E.
- **Modernize compliance pathways:** Ensure technology-neutral regulatory frameworks allow AI-based monitoring and assessment tools to qualify for compliance pathways.

AMERICAN LEADERSHIP IS ON THE LINE

"The question is not whether America will deploy innovative and clean energy systems. The question is whether America will lead that innovation or whether it will cede that ground to competitors who move faster and invest more."

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