Kleinman Center for Energy Policy

CALL FOR RESEARCH PROPOSALS

# 2025-2026 Energy and Climate Policy Grants

## Overview

Each year, the Kleinman Center for Energy Policy awards grants of up to $15,000 to support new research or supplement existing research in energy and climate policy.

This year, we are seeking requests for proposals from University of Pennsylvania faculty, postdocs, and doctoral candidates for research projects in the areas of energy and climate policy that support the advancement of our mission.

Preference will be given to research on the following topics:

- State-Based Policies
- Urban Adaptation
- Clean Manufacturing
- Sourcing and Waste Management
- Grid Resilience and Reliability
- Comparative Approaches to Decarbonization
- Global Energy Security
- Land Management

## Requirements

To apply, applicants must develop a two-page proposal that includes:

1. Problem Statement and Impact
2. Proposed Work and Method
3. Timeline
4. Itemized Budget
5. Policy Digest Proposed Title and Submission Date
6. List of Target Readers (i.e. legislators, senate committee, government, or international agency, etc.)

*Note: Ph.D. students must also include a note of support from their supervisor.*

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## Deadline

Complete and upload your proposal to [this form](this form) by **February 28th, 2025.** If you have any questions or issues uploading your proposal, please contact Arwen Kozak (arwenk@sas.upenn.edu).

## Eligibility

Our grant program is open to Penn faculty, postdocs, and doctoral candidates pursuing research in the areas of energy and climate policy.

Energy science and energy technology development projects are not eligible, unless they have a strong energy or climate policy component. Early-stage projects are also not eligible, unless they can adhere to our policy digest submission deadline of June 30, 2026. We encourage applicants with early-stage projects to instead apply to our 2026–2027 grant cycle.

## Expected Outcomes

Grant money may be used from May 1, 2025 through June 30, 2026. By the end of the grant period, the grantee will deliver a short policy digest tied to grant-supported research.

The policy digest format allows grantees to consider and connect their research to policy outcomes. All digests must be no more than 3,000 words and adhere to our review process and guidelines. Final digests will be published on the Kleinman Center website in HTML and PDF formats.

All future presentations or publications* resulting from this research must include a Kleinman Center funding acknowledgement. Grantees will alert the Kleinman Center to these additional projects, so the center can provide further promotion.

Awards will be issued in two payments: half upon completion of a signed memorandum of understanding (MOU), and half upon delivery of the final policy digest.

** While a policy digest may cover the same topic and findings as a future journal article, it must be a separate work written for policymakers; not for republication.*

## Energy and Climate Topics

Below is an expanded look at this year's topics. As you frame your proposal, we invite you to consider some of these opportunities for inquiry:

### State-Based Policies

Despite federal tax credits, grants, and loan programs for qualifying renewable energy technologies and projects, a substantial portion of energy policy is implemented at the state level. This often leads to a pronounced lack of continuity across the United States. Differences in policy design and distribution allow scholars to investigate best practices that can guide states.

As an example, the siting of renewable energy resources, such as large-scale solar or wind, is typically governed at the state level, but a handful of states have no published siting or permitting guides. Additionally, interconnection standards (i.e., the process for connecting renewable energy sources to the electric grid) are also set on a state-by-state basis.

As the number of states with established interconnection proceedings increases, policy and legal guidance is imperative to assist in determining which approaches have the highest efficacy. As market incentives for renewable energy differ by state, it is important to understand which incentives lead to the greatest action and acceptance of energy policies.

*Example Questions: What policies for renewable energy siting are the most (and least) efficient and effective? Do states with more rigorous policies and regulations outperform others in implementation? What have been the implementation challenges so far, including tensions within and between state governments? How are states navigating challenges and tensions, and what can we learn from these efforts to inform future implementation strategies?*

### Urban Adaptation

Urban environments face unique challenges from climate change and the renewable energy transition. The impact of climate change on the intensity and duration of extreme heat is accentuated in urban "heat islands" where the environmental and human health implications of high density buildings is especially pronounced.

Green buildings are constructed using processes designed to be environmentally responsible and resource-efficient, thus providing economic, public health, and climate benefits. Yet the path to consistent green building policies is hindered by differential zoning regulations and lack of incentives (i.e., tax breaks or rebates). Urban population density also presents unique adaptation challenges and opportunities. For instance, the rollout of electric mobility vehicles (i.e., cars, bikes, scooters, buses, etc.) and their required infrastructure could allow for increased adoption by the public, but scalable ownership and models for accessing these technologies have proven difficult to implement.

The inability of some households to access or afford cooling devices, such as air conditioners, presents yet another challenge under conditions of extreme heat. The development of policies that address challenges specific to urban environments will better allow for continued community resilience and adaptation to renewable energy sources.

*Example Questions: What are the most effective strategies for enhancing urban community resilience to climate change in the face of niche challenges, as well as challenges that disproportionately affect certain segments of the population, such as low-income or otherwise disadvantaged populations? What governance structures, policies, and planning processes are most conducive to addressing urban energy technology and climate resilient challenges? How can current protections and laws be modified to address the increased impacts of climate change?*

## Industrial Policy and Community Resilience

Domestic clean manufacturing has gained significant momentum since the Inflation Reduction Act (IRA) was passed, with over $115 billion invested as of September 2024. Significant funding has gone to the conversion of at-risk or shuttered manufacturing plants, particularly throughout the Midwest and the South.

These efforts aim to reduce reliance on foreign clean energy supply chains, boost domestic production, and stimulate economic growth in historically industrial regions. However, many of these facilities have yet to break ground, highlighting the importance of effective planning and implementation to achieve intended outcomes.

The overall impact of the IRA on clean manufacturing, as well as its tangible benefits for communities, are topics that require current evaluation. The success of these projects depends on how effectively they are implemented and whether they can be scaled and replicated.

Evaluating the entire lifecycle of these facilities—from funding allocation to operational activities to management of byproducts—is crucial for ensuring sustainable outcomes. Critical gaps in knowledge remain on the tangible impacts of these facilities on communities, including the development of job training curricula, the resolution of environmental harms from historical industrial activities, and the role of clean energy jobs in promoting equity.

By addressing these critical issues, clean energy manufacturing has the potential to not only meet climate goals, but also to drive equitable and transformative economic change.

*Example Questions: What are the primary risks associated with scaling up manufacturing as outlined in the IRA? What are the successes and challenges in developing job training curricula tailored for clean manufacturing industries? To what extent has clean manufacturing advanced or undermined equity across different communities? How should lessons from historical industrial production inform the development of modern clean manufacturing facilities? How does one empirically measure the resilience of IRA investments under a new administration?*

## Sourcing and Waste Management

From extraction to disposal, adopting a lifecycle perspective toward the energy transition helps ensure that we minimize the environmental and social impacts of clean energy technologies. Fostering international cooperation along the entire supply chain is critical to meeting global demands for clean energy.

Meeting growing renewable energy needs requires a steady and reliable supply of critical minerals, such as lithium, cobalt, and nickel, that are essential for manufacturing advanced batteries and other clean energy technologies. However, the global supply chain for these minerals is fraught with challenges, including geopolitical dependencies, environmental impacts of extraction, and ethical concerns about labor practices in mining regions.

A comprehensive approach to the energy transition also demands a lifecycle analysis of recycling and waste management. Recovering valuable minerals from spent batteries and other technologies not only reduces the need for new extraction but also addresses the growing environmental burden of e-waste.

Strengthening domestic production and refining capabilities, as outlined in policies like the CHIPS Act, can help reduce reliance on unstable international supply chains while supporting innovation in clean energy technology. In parallel, investing in more efficient and sustainable technologies and advanced recycling practices is critical for scalable, sustainable, and resilient solutions.

*Example Questions: How can lifecycle emissions of emerging technologies be minimized through policy interventions? What policy frameworks can incentivize the adoption of more sustainable mining practices for critical minerals? How can international bodies address disparities in extraction impacts on local communities versus the global benefits of clean energy technologies? How should trade policies be structured to encourage transparency and accountability in the sourcing and distribution of critical minerals?*

## Grid Resilience and Reliability

The aging infrastructure of the U.S. electricity grid is increasingly vulnerable to extreme weather events and growing electricity demand. Policy solutions that reduce these burdens are becoming more critical.

Innovative policy solutions and market models have shown promise during many recent weather-related grid disruptions. Microgrids, community solar, grid-scale storage, dynamic pricing, smart metering, and virtual power plants all have the potential to improve resilience and reliability if implemented carefully, but regulatory support for many of these emerging solutions lags behind available technologies.

Additionally, large electricity users like data centers, EVs, and clean manufacturing technologies require reliable large-scale power to function—further increasing the need for innovation. More radical solutions like hydrogen energy systems and next-generation nuclear power, supported by initiatives such as the ADVANCE Act, offer versatile, low-carbon solutions to meet growing energy demands. Yet, questions remain about the integration of these technologies and the regulatory frameworks that must exist to support them.

NERC has projected major gaps in service over the coming years if these challenges aren't remediated. Increased investment in innovations for transmission and grid technologies and policies can improve energy access and prices, while solving other issues, such as renewable intermittency and resource adequacy. Furthermore, it is vital that these strategies consider the full scope of the energy transition, including broad energy system injustices and the imbalances of power that exist at a global level.

*Example Questions: What are the most effective strategies for integrating diverse and decentralized energy resources into the U.S. electricity grid? How can policy interventions accelerate the adoption of weatherization and transmission innovations to enhance energy access, affordability, and equity? What lessons can be drawn from the implementation of distributed energy systems globally to inform the expansion of such systems in the United States? How can new large-scale demand hubs like data center and manufacturing facilities join the grid without causing widespread reliability concerns. How does the growing demand from energy-intensive sectors, such as data centers and manufacturing, influence the prioritization of grid technology investments?*

## Comparative Approaches to Decarbonization

Energy markets, trade, and policy frameworks play critical roles in shaping global energy transitions and emissions targets. The interconnectedness of energy systems creates opportunities for international cooperation but also presents challenges related to equity, competitiveness, and security. As nations increasingly integrate renewable energy, the dynamics of energy trade and policy are shifting, with implications for emissions reduction and economic stability.

The future of decarbonization hinges on understanding successful strategies from diverse regions and applying them across national and international contexts. International agreements like the Paris Accords offer critical frameworks for aligning global climate action.

Challenges such as rising tariffs in the U.S. and Europe, resource dependencies, and geopolitical instability, including critical mineral supply chains, underscore the need for strategic alignment between policy mechanisms and climate goals.

Carbon offsets and carbon border adjustment measures also prompt debates about fairness and effectiveness in global trade. Understanding successful energy market strategies across different regions can illuminate effective policies and practices that support the transition to cleaner energy globally.

While international collaboration may remain limited by political and economic factors, policy researchers can learn from each other in envisioning innovative mechanisms for addressing shared challenges. Indeed, up to this point, collaboration on climate mitigation has withstood fraught political tensions. By examining comparative international policy approaches and their outcomes, nations can identify opportunities to navigate the complexities of decarbonization—balancing economic growth and a clean energy future.

*Example Questions: How do rising tariffs and resource dependencies between major economies affect the progress of renewable energy transitions and emissions reduction targets? How effective have international agreements been, and what strategies may improve outcomes? How effective are mechanisms like carbon border adjustment measures in balancing emissions reduction efforts with global free trade? What role does international competition in renewable energy innovation play in shaping the cost, accessibility, and deployment of advanced technologies? What are the implications of increased renewable energy production on international trade dynamics and the competitiveness of fossil fuel-dependent economies? Which countries have most successfully navigated a transition to clean energy, and how can this be applied elsewhere? How and why have countries continued collaborating on climate mitigation despite fraught trade politics?*

## Global Energy Security

Energy security remains a cornerstone of global stability, intersecting with geopolitical dynamics, economic policies, and technological advancements. Global conflicts—including military, cyber, and trade warfare—pose a significant threat to energy and grid infrastructure, jeopardizing energy security.

The Russia–Ukraine conflict, for instance, has highlighted Europe's dependence on Russian energy, spurring accelerated investments in renewables and diversified energy imports, but also a return to retired energy resources like coal.

From data breaches to ransomware attacks, energy infrastructure has suffered destabilizing cyberattacks, with catastrophic economic and public health impacts. These attacks can compromise grid infrastructure, disrupting energy distribution and creating cascading effects on other critical systems.

Economic tactics like targeted sanctions and tariffs have the potential to meaningfully disrupt energy and mineral supply chains, destabilize energy systems, and slow progress on decarbonization.

Conversely, the transition to distributed sources of clean energy could, under certain conditions, improve energy security, making the energy system less vulnerable to disruption and sabotage. Policy focus in this area emphasizes supply chain resilience and sovereignty, especially for critical minerals necessary for the energy transition.

Addressing concerns over energy supply chain concentration and resilience will require coordinated efforts by countries, multinational companies, and sectors at large to diversify sourcing, invest in alternative materials, and strengthen international cooperation to secure critical resources.

*Example Questions: What role can energy diversification play in reducing reliance on geopolitically volatile regions for energy imports? How can governments and private entities collaborate to develop resilient cybersecurity frameworks for energy systems? How can nations ensure that sanctions targeting energy exports do not disproportionately affect vulnerable populations? What frameworks can promote equitable access to critical energy resources during geopolitical conflicts? How can countries, companies, and sectors address concerns over energy supply chain concentration and resilience, including of critical minerals?*

## Land Management

Forestry and land management are essential tools in the global fight against climate change, offering opportunities to balance ecological health, carbon sequestration, and renewable energy production. Healthy ecosystems have the potential to act as carbon sinks while supporting sustainable energy and economic development, generating carbon credits for offset programs that encourage conservation, afforestation/reforestation, and improved land management. However, these techniques face significant challenges—from monitoring to greenwashing.

Cutting-edge techniques like enhanced rock weathering (ERW) and gasification of biomass forest residuals can pair carbon sequestration with a host of co-benefits like renewable hydrogen generation, reduced ocean acidification, and wildfire safety. In parallel, biofuels derived from sustainably managed biomass can provide a cleaner alternative to fossil fuels, aligning energy production with ecosystem preservation. However, feasibility, implementation, and monitoring challenges have contributed to considerable uncertainty in determining the true efficacy and long-term impacts of weighing emissions management against long-term ecosystem health.

Balancing the integrity of natural systems while contending with regulatory barriers has left many open questions, and overcoming these hurdles will be critical to realizing the full potential of forests in climate change mitigation and energy system decarbonization.

*Example Questions: How can we improve the measurement of emissions reductions from offset projects? Can ERW be realistically integrated into existing ecosystem management practices? How does the temporal (seasonal and/or diurnal) timing of $CO_2$ release impact ecosystem carbon storage? What is the net climate benefit (i.e., lifecycle assessment) of biomass forest residual gasification or other emerging nature-based sequestration techniques?*