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Bipartisan Policy Center Response to Request for Information on Activation Energy: National Laboratories as Catalysts of Regional Innovation

TO: Office of Science, Office of Technology Transitions, U.S. Department of Energy

DATE: April 26, 2023

RE: DOE-HQ-2023-0010-0001 National Laboratories as Catalysts of Regional Innovation

FROM: Bipartisan Policy Center
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Thank you for the opportunity to respond to a Request for Information on this important topic. This response incorporates the perspectives of startups and incubators across the country through the Bipartisan Policy Center's American Energy Innovators Network (AEIN), a policy-focused network convened by BPC to bring the perspectives of energy startups, incubators, accelerators, investors, and others to the federal policy landscape. This response reflects the experiences of AEIN members in Eastern Tennessee, Iowa, the Chicago area, Houston, TX, northeast Ohio, and Alaska. Some responses are separated by region (South, Midwest, and Pacific) due to the regionally specific nature of the information received – for instance, a region's specific innovation potential or interactions with local partner organizations. Other questions elicited common responses across all regions and are presented without regional separation. Lastly, the six questions found below combine a number of the original RFI questions in a way that allowed us to collect responses from a diverse group of stakeholders. Reference to the original RFI questions can be found at the beginning of each question.

1. **RFI Questions A1 & A3: What makes your region unique for innovation and what untapped potential exists in your region? Please also describe how your work/company/organization leverages this potential.**

Region	Unique Innovation Potential/Opportunity
South – Tennessee, Texas	• Proximity to national laboratory (such as Oak Ridge National Laboratory). • Proximity to and access to trained talent-pool from public universities with well-funded and high-quality research and engineering programs (such as University of Tennessee, Knoxville). • Market access to large national and global public and private industries (such as Tennessee Valley Authority).

	• Access to customers and high business-to-business startup potential due to proximity to well-developed and diverse industries in energy, life sciences, manufacturing, logistics and aerospace (especially in Houston and the Gulf coast). • Access to startup support organizations (particularly organizations like Greentown Labs, The Ion, The Cannon). • Access to venture capital and knowledge (especially in the Huston area). • Proximity to industry subject matter experts. • Access to infrastructure players. • Growing energy transition potential (more prominently in Texas).
Midwest – Ohio, Illinois, Iowa	• Access to natural resources and potential (particularly abundance of water in northeast Ohio, high potential wind in Iowa, and high geologic storage potential in Illinois). • Access to well-developed manufacturing sector and experienced workforce. • High potential for energy transition and growing clean energy sector (including renewables, carbon capture storage, direct air capture and interest in these solutions from existing industrial sectors like ethanol plants). • Access to organizations that work with national and international customers. • Access to high-quality education institutions (specifically the suburbs of Chicago have access to multiple institutions such as University of Chicago, University of Illinois, Loyola University, Northwestern University, DePaul University, University of Illinois Urbana-Champaign). • Access to startup accelerators and supporting and resource programs (particularly organizations like 1871, mHub, TechNexxus, Portal Innovations and programs like World Business Chicago, P33, and the Chain Reaction Innovations Fellowship at Argonne National Laboratory). • Unique central geographic location with access to the rest of the country (especially for Chicago). • Access to research institutions knowledgeable about emerging and cutting-edge technologies (such as Ames Laboratory and Iowa State University).
Pacific – Alaska	• Unique, urgent, and compounding challenge of climate change requiring decarbonized and decentralized energy, community resiliency and remote supply chains, that can result in lower energy costs with equitable access and bolster national security.

	• Unique combination of geography, climate, and resource intensity (can serve as major proving ground for climate tech). • Access to natural resources and potential (including minerals, oil and gas, seafood, and renewable energy sources like wind, tidal, solar and geothermal). • Communities are located distant from industrial activities. • High potential for energy transition sector. • Political willingness and support for energy transition from business leaders, elected officials and academic institutions.

2. **RFI Questions A4, B.1 6, B.2 6: What are the top three barriers to building, expanding, or maximizing your region's innovation ecosystem?**

Region	Barriers to Innovation
South – Tennessee, Texas	• Lack of alignment of all programmatic efforts within a region in order to lower the barriers for startups and innovators. Coordination across separate initiatives and efforts, bringing entrepreneurs from all corners of the ecosystem together, is necessary for success. • Lack of access to laboratory and prototyping space outside the National Laboratory system (especially in Tennessee) makes it challenging to translate a technology from the lab to the marketplace and causes many companies and technologies to migrate towards bigger cities with lab-share programs (for example, companies moving to Houston for Greentown Labs, Boston for The Engine). • Lack of venture funding and investment experience, especially when looking to replicate previous successes in a new region. A local "fund of funds" and government funding or matching would be helpful in this area. • Creating inclusive culture is critical, not only in visible diversity, but also in the ability to bring a broad range of stakeholders to the table like corporate entities, startup, incumbents, disruptive technologies, and a variety of academic institutions.
Midwest – Ohio, Illinois, Iowa	• Brain drain and population loss (especially in Ohio) which leads to insularity and difficulty in attracting the talent necessary for innovation. • A lack of funding mechanisms for pilots and other proof-of-concept opportunities. • Regional disagreement on how the energy transition will take place which has resulted in disagreement over the role of fossil fuels to meet climate goals.

	• Access to capital and cost of building new facilities, like those needed for direct air capture, in the region despite tax incentives from the Inflation Reduction Act. • Pushback from environmental or community organizations that oppose direct air capture and other renewable or low-carbon projects.
Pacific – Alaska	• Geographic isolation • Lack of resources – human capital, capacity (populations are small), policy, and financial. • High cost of energy, manufacturing, and living

3. **RFI Questions B.2 5: What are the potential benefits of new or expanded innovation activity for your region?**

In general, new and expanded innovation activity in regions across the country offer the ability to lead and accelerate development of solutions to key challenges humanity faces in various areas including life sciences, energy transition, supply chain, and climate change. However, benefits must be inextricably tied to access to capital or in order to have an impact. Outside of increased economic opportunities, which have a higher impact in regions outside traditional tech hubs, there is a natural agglomeration of clean technology manufacturing activity and investment happening in many regions of the country. For example, there have been significant investments in battery and electric vehicle manufacturing within a 200-mile radius of Knoxville-Oak Ridge region of Tennessee. Additional economic benefits of expanded innovation activities could also include: increased funds available for community investment for facilities such as schools and hospitals, opportunities for rural prosperity through use of private lands, and reversing trends of "brain drain" from rural areas.

Expanding innovation activity to regions outside traditional tech hubs can help to address decades of underinvestment in rural communities and underinvested cities, including in the Midwest and across the country, to bring these regions to the level of coastal innovation centers. For example, the development of a 1 megaton Direct Air Captor (DAC) facility can generate around 3,500 jobs across the DAC supply chain and hundreds of jobs locally for maintenance, repairs, and operations. New innovation ecosystems can also help to address energy security both for individuals and the nation. The benefits of decarbonizing systems of energy, transportation, and industry in a particular region of the country can provide benefit to all Americans. This will create jobs, reduce the cost of energy, expand transportation options, and improve the health and safety for everyone.

4. **RFI Questions A5, B.2 7. B.2 8: What type of investment or support is needed to realize untapped potential or opportunities in your region?**

Grants and other non-dilutive funding: Financial support is needed across the country to fund proof-of-concept development and as operating capital for new companies or companies expanding into new

energy affiliated businesses. Funding for projects above and beyond venture capital funding is also sorely needed. Many clean tech companies need funding for equipment to move beyond R&D to scale, but leveraging equity financing early in the process hinders a company's ability to raise capital at later stages. However, access to non-dilutive funding, like government grants, is extraordinarily difficult to access and often requires hiring full-time grant writers and administrators to meet the specific needs of granting agencies which is simply not feasible for most startups. Likewise, SBA loans only work for revenue-generating endeavors, which many in this sector aren't attaining yet. Federal, state, and local grants to support climate innovation are critical to developing projects in new regions of the country and current grant offerings are either too high (i.e., hundreds of millions of dollars from programs like DOE OCED) or too low (a few millions of dollars from DOE program offices or DOE SBIR).

Support for existing efforts: Investment targeted at aligning existing programmatic efforts, as opposed to solely investing in new programming, is a need in many regions of the country.

Public-private partnerships and laboratory access: Access to public-private partnership opportunities, especially within the national lab system, is needed to realize the untapped potential of many regions. Additionally, subsidizing the building or retrofitting of laboratory space that is accessible to startups and innovators outside of the national laboratory or university systems would have an outsized impact on any region's innovation ecosystem.

Investment and validation programs: Investment programs that provide matching funds in order to lower the failure rate of startups in new ecosystems, and programs to validate and test claims of startups at low cost or no cost can significantly help accelerate a company's TRL progress.

Permitting support: Local government approval and permitting support for the development of new infrastructure projects.

Knowledge access: Access to institutional knowledge and industry support. Assistance in crafting policy that is favorable to innovation, specifically in the climate tech sphere.

5. **RFI Questions B.1 2, B.1 3, B.1 7: Does your work/organization/company engage with local/regional partners (*e.g.,* national laboratories, industry, academia, financing/investment, community organizations, local and tribal governments, etc.)? If so, please tell us a bit about these partners and your collaborative activities, including how these activities were initiated and funded.**

Region	Local or Regional Partners

South – Tennessee, Texas	• Local and regional partners in Tennessee include the University of Tennessee Knoxville, Oak Ridge National Laboratory, Tennessee Valley Authority, Launch Tennessee, the Knoxville Entrepreneurial Center, and the Knoxville Chamber of Commerce. • A new innovation effort is underway at University of Tennessee Knoxville, with similar leadership to the Innovation Crossroads LEEP node at ORNL, and the university is well-poised to lead an aligned effort across the ecosystem to pull together programmatic efforts rather than continuing to operate in a siloed manner. • Partners in Houston include Greater Houston Partnership, The Ion, Greentown Labs, NREL Chevron Studio, and Rice Alliance at Rice University.
Midwest – Ohio, Illinois, Iowa	• A number of partnership organizations exist in Northern Ohio and typically partnerships occur through philanthropic, state or federal funding. • Argonne National Labs Chain Reaction Institute (Cohort 6) provides support in the Chicagoland area. • Local and regional partners supporting innovation in Iowa include the Iowa Economic Development Agency and the Great Plains Institute.
Pacific – Alaska	• Launch Alaska's Tech Deployment Track is a deployment accelerator program run by Launch Alaska that brings new climate technologies to Alaska. A large component of the program involves working with local stakeholders from a variety of sectors to connect them to new technologies. These partners include experts in the energy, transportation and industry fields, but also include government officials from all over the state (both state and local), Alaska Native corporations, business development experts, academics working the energy and power sector from the University of Alaska, utility executives, and industry experts. This effort is funded primarily by grants from the Office of Naval Research and the U.S. Department of Energy Office of Technology Transitions. • There is also ongoing work in the region with the National Renewable Energy Laboratory, Sandia National Laboratory, the Alaska offices of the Cold Climate Housing Research Center, and DOE's Water Power Technology Office.

6. **RFI Question B.1 5: Does your work/organization/company engage in any activity addressing social or economic barriers or negative impacts in the region? If so, describe those activities.**

Innovation investments that support equitable and sustainable outcomes: Public investment, including investment in innovation, has a poor record of keeping pace with need of many Americans especially communities with history of disinvestment. The BPC and the American Association of Blacks in Energy have developed a framework for investment categories that support equitable and sustainable investments in energy infrastructure. This model can also be utilized as a framework to support regional investment in clean energy innovation. Regional clean energy innovation investments should fall under one or more these three categories:

- *Foundational Investments*: target regions of historic underinvestment with the aim of modernizing energy infrastructure and supporting a communities' full economic participation and well-being.
- *Remedial Investments*: aim to correct for or eliminate existing energy infrastructure deficiencies resulting from past neglect, harm, or obsolescence.
- *Resilience Investments*: enable communities to better withstand the impacts of extreme weather and climate-induced hazards.

Region-specific interventions to address social and economic barriers: Many companies and organizations are involved in taskforces around entrepreneurship, diversity and other identified gaps within their regions and work with local partners to deploy projects in underserved areas. This includes supporting communities that are classified as disadvantaged by the Justice40 Initiative, and bringing high quality, green jobs to areas that have high unemployment and/or high poverty levels and supporting communities that have low education levels with job training and apprenticeship programs. For example:

- Accelerators in the Houston area target founders from underrepresented minority groups in the region.
- The Knoxville HardTech Co-Op physical space is helping to address the lack of commercially accessible lab space and flexible leasing terms for lab space in the area, which is one of the largest barriers impacting early-stage innovators in the region.
- Many of the projects in Launch Alaska's Tech Deployment Track focus on the rural areas of Alaska that have some of the highest energy costs in the nation.

Enabling regional rural innovation and development*:* A 2023 report summarizing a series of stakeholder listening sessions conducted by the Regional Rural Development Centers and funded by the United States Department of Agriculture identified the following recommendations for future investments in rural innovation:

- Build the capacity of rural entrepreneurial ecosystems including creation of rural-focused centers or hubs.
- Identify existing industry clusters and potential for targeted investment in new venture growth based on community assets.
- Identify and provide incentives, structures, and environmental features that are conducive to locating entrepreneurial ventures in rural communities.

- Improve coworking spaces and opportunities in rural communities to leverage expansion of remote and digital commerce.
- Increase broadband access, affordability, and reliability to close the digital skills gap.
- Build capacity of vocational and technical education programs, particularly in secondary and post-secondary institutions serving rural communities
- Provide workforce development opportunities for learners of all ages targeted at skills of the future.
- Develop best practices that integrate research and practitioner knowledge in a rural context.
- Develop a better conceptual framework for rural innovation and metrics for success.
- Leverage regional extension professionals to support the development of local organizations and entrepreneurial ecosystems.