

U.S. DEPARTMENT OF
ENERGY

OFFICE OF
Technology Transitions



Office of Technology Transitions (OTT) Overview: Regional Innovation

Secretary of Energy Advisory Board Meeting
April 25, 2023



AGENDA

- Introductions
- OTT/Office of Science Place-based Project Focused on National Labs
- Liftoff Reports and Rural & Remote Primer
- Example of OTT Place-based Projects
 - TCF Program: MAKEIT Prize
 - TCF Program: C-4 Partnering Model
 - TCF Program: Boost
 - Energy Program for Innovation Clusters

Our Mission

“to expand the commercial impact of the research investments of the Department”

&

to drive private sector uptake of clean energy technologies

**Steward
commercialization
across the DOE**

Joint
Office of Technology
and
Office of Science
Place-Based Initiative



Place-Based Innovation at the National Laboratories

Place-based innovation: An entrepreneurial ecosystem ***anchored with local institutions*** to provide a ***sense of 'place' and supportive culture*** for innovation, workforce development, and economic growth



Facilitates engagement and partnership with communities surrounding labs



Drives sustainable and equitable economic growth in underinvested regions of the US



Creates long-term jobs in new and revitalized industries



Advances new breakthrough technologies and industries of the future



Trains and educates our future diverse, equitable, and inclusive workforce

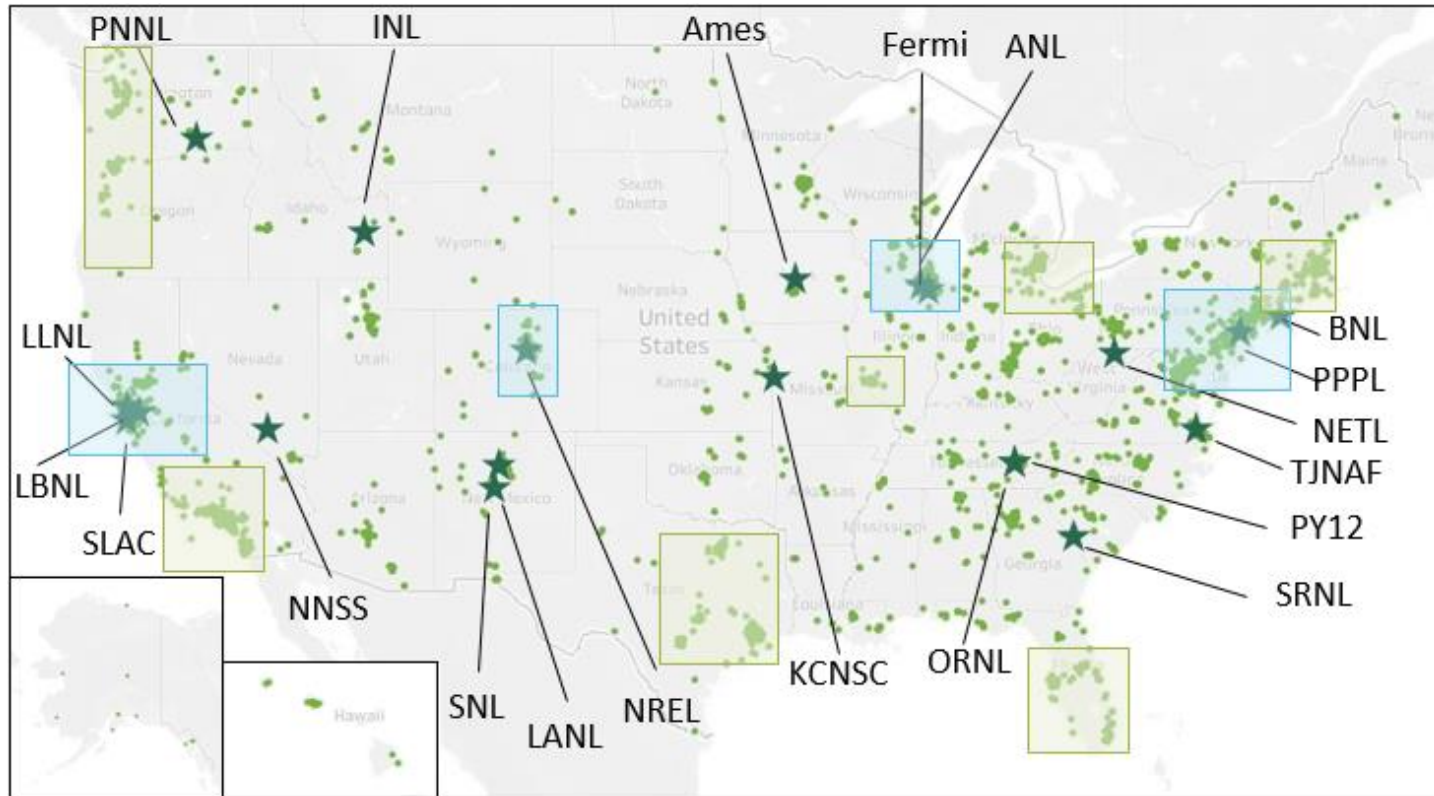
Data driven effects:

- For every high-tech job created, 5 additional jobs are created in skilled and unskilled occupations^[7]
- For every new patent filed by a research university, 15 additional local jobs are created^[16]
- Geographic density of firms and institutions in related fields is correlated with wage growth, job growth, and patent formation^[16]

Our DOE National Labs have an impact across the nation

FY17-FY21 National Lab & Partner Locations

- Area with high density of projects with a national lab (or labs) in close proximity
- Area with high density of projects but no national lab in close proximity

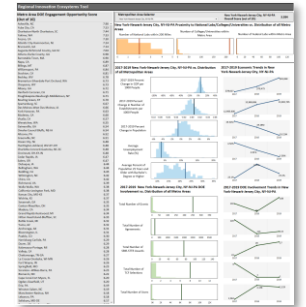


- Each dot represents the location of a NL partner
- 26% of all non-federal partnerships are within a 200-mile radius of a Lab
 - highest # of Agreements, 60% (1,225)
 - 47% (\$343 MM) of Partner Funds

OTT's Regional Ecosystem Analysis Tool assesses facets of innovation ecosystems across the US to assist DOE in creating a data-driven regional engagement strategy

The tool combines indicators from:

- Economic Growth Datasets
- Proximity to Research Institutions
- DOE Involvement Datasets



Interactive & Tailorable to User Priorities

Regional Analyses enable data driven decision making:

- Michigan (Detroit); I-5 & I-15 Corridor
- North Carolina Research Triangle
- Knoxville
- Chicago
- Virginia Beach-Newport News
- Greater New York Region



SC/OTT Place-based Project

Objectives

- Identify **key elements** of successful innovation hubs/districts (industry interviews/literature review)
- Conduct a **landscape analysis** of current place-based innovation activities at the laboratories (lab data call)
- Identify **challenges, best practices, and opportunities** (lab interviews/request for information)
- Develop list of policy recommendations for DOE

Timeline

- Phase 0 – 2020
 - Laboratory of the Future Workshop: The Geography of Innovation
- Phase I – 2021/2022
 - Industry interviews, literature review, lab data call, lab interviews and interim findings
- Phase II – 2023 /2024
 - Request for information
 - Findings and recommendations

Phase 1 findings: Key Building Blocks of Innovation Ecosystems

Talent An educated and skilled workforce, as well as training programs to create and sustain this talent.	Infrastructure For research, commercial, industrial, and residential purposes— inclusive of physical spaces/facilities, utilities, transportation, and other features required for residential, industrial, and commercial purposes.
Technology Accessible scientific and technical knowledge throughout the RDD&D continuum for commercialization and manufacturing.	Capital Access to financial resources (i.e., venture capital, private equity, angel investors, etc.) and technical resources (i.e., scientific and manufacturing equipment).
Social Capital Local networking to incentivize and support the existence, development, and growth of innovation programs and companies.	Policy Local and regional policies and incentives that support innovation- driven enterprises, economic development, and planning within a regional innovation center.
Collaboration with Industry Mutually beneficial partnerships between public and private sectors to facilitate knowledge exchange, accelerate technology commercialization, workforce development, awareness of promising research and needs.	Community Structure that supports the development, accessibility, inclusivity, environmental sustainability, and engagement with the local community in an equitable way.

Phase 1: National Labs have activities that are natural catalysts for regional hubs

Argonne and Fermi

- Both labs working to create “Chicagoland”
- Duality “Quantum” startup accelerator to attract Quantum startups to the region launched in 2021

Pacific Northwest National Lab

- Renewables, grid management and energy storage
- Tech transfer is engaging a Startup Foundry to accelerate the commercialization of technology
- Grid storage launchpad

Lawrence Livermore National Lab

- Carbon capture & sequestration
- Desire to activate the open CA campus to facilitate access
- Desire to activate Central Valley which includes UCMerced (relevance to EJ40)

Oak Ridge National Lab

- Industries of the future (Advanced manufacturing, AI, 5G, quantum, biotech)
- Techstars startup accelerator program aimed at attracting top companies to Knoxville region launched in 2022 with a focus on the Manufacturing Demonstration Facility

Idaho National Lab

- Grid sustainability and EVs
- Mapping out plan to expand Trailhead East accelerator program to accelerate the commercialization of technology

National Energy Technology Lab

- Strategically positioned with facilities in WV and near Pittsburgh
- Relationships with Pittsburgh-based philanthropic capital
- Unique federal status as Government-Owned Government-Operated (GOGO) Lab

.... among others!

OTT is working closely with labs to:

- a) Identify gaps across RDD&D and how they can support lift-off
- b) Fill gaps through:
 - i. Existing OTT funded programs (EIC, EPIC, TCF) pending merit-based reviews
 - ii. New programs (e.g., Business competitions/prizes)
 - iii. Developing better processes/ mechanisms (e.g., PIAs)
- c) Convene & activate regional players (e.g., workforce development)
- d) Identify mechanisms to facilitate hubs (e.g., Small Business Vouchers)

Phase 2: Request for Information (RFI)

Responses due: April 28, 2023

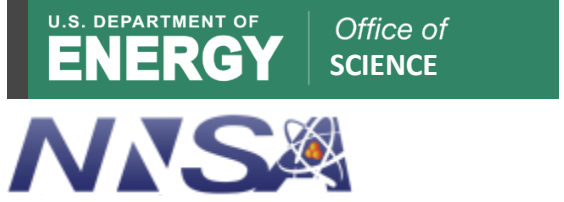
Title: *Activation Energy: DOE's National Laboratories as Catalysts of Regional Innovation*

Summary: The Department of Energy (DOE) Office of Science and the Office of Technology Transitions invite interested parties to provide input on place-based innovation opportunities that support the DOE mission.

Motivation: The Department of Energy (DOE) is exploring opportunities to strengthen place-based innovation activities leveraging the DOE National Laboratories and Sites





Purpose: DOE is seeking input from all stakeholders about opportunities for **place-based innovation activities that leverage research institutions—particularly the National Laboratories and Sites**—to catalyze innovation ecosystems, contribute to DOE's mission in energy, environment, and national security and ensure our nation's vibrant economic future. The information received in response to this RFI will inform, and be considered by, the DOE in program planning and development. This is solely a request for information and not a Funding Opportunity Announcement (FOA), prize, or other solicitation.



Request for Responses: The objective of this RFI is to identify both opportunities and challenges for developing place-based innovation ecosystems anchored by DOE National Laboratories and Sites. DOE is interested in hearing about potential new activities, as well as ongoing activities that would benefit from additional support.



U.S. DEPARTMENT OF **ENERGY** | Office of SCIENCE

NASA

-  Office of FOSSIL ENERGY AND CARBON MANAGEMENT
-  Office of NUCLEAR ENERGY
-  Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
-  Office of ENVIRONMENTAL MANAGEMENT

-  Office of STATE AND COMMUNITY ENERGY PROGRAMS
-  Office of POLICY - Clean Energy Jobs

FESI (Foundation for Energy Security & Innovation)

Office of Technology Transition Place-Based Programs



*Technology
Commercialization
Fund*

EPIC ENERGY PROGRAM *for*
INNOVATION CLUSTERS

Framing for Place-Based Innovation : Lift-off Reports



To meet our ambitious climate goals of

- Carbon-free power sector by 2035
- Net zero emissions economy by 2050

We must commercialize a suite of clean energy technologies with the **private sector**

Pathways to commercial lift-off define

- Milestones
- Cost curves
- Barriers
- Value chain
- Offtake...

Execution is at the **LOCAL** level in physical places

- Hydrogen Hubs
- Manufacturing plants
- Assets (e.g., EV charging)
- Virtual Power Plants

Published reports (liftoff.energy.gov)



Clean Hydrogen



Long Duration Energy Storage (LDES)



Advanced Nuclear



Carbon Management

Next set:

- Industrial decarbonization (chemicals, steel, cement)
- Grid (VPPs, transmission)
- Cross-cutting supply chain challenges
- Energy Improvements in Rural or Remote Areas

Technology Commercialization Fund

- Established by Congress through the EPACT 2005 and reauthorized by the recent EA2020 to “0.9% of RDD&C funding to promote promising energy technologies for commercial purposes.”
- TCF has evolved and plays a critical role in DOE’s RD&D activities:
 - Focus on commercialization
 - Uniquely additive to program office missions creating a support ecosystem around funding programs to enhance their reach and impact
 - Centralized management by OTT enables collaborations that wouldn’t otherwise happen

TCF Base:

Focus on NL Intellectual Property (IP) commercialization

~\$30M/year

TCF BIL:

Enhance and accelerate BIL provision activities

~\$50M/year over 5 years


TCF-BIL: MAKE IT Prize - Manufacture of Advanced Key Energy Infrastructure Technologies

- **Catalyze domestic manufacturing** and commercial liftoff of clean energy demonstration projects:
- Moving manufacturing facilities from planning to shovel-ready.
- Enabling communities to prepare strategies for vibrant manufacturing activity in their area.



\$30M in cash prizes

TCF-Base: C4 Partnering Model - Colocation, Collaboration, Community & Communication

 \$7M (50/50 cost share)

Strong regional clean energy commercialization ecosystem for manufacturing focused on collaboration and rapid technology development using a novel industry-informed partnering approach for RDD&D

Objectives

1. Increase Partnerships through Clean Energy Open Innovation Challenges
2. Implement Facility Partnering Model through new agreements (modeled after ORNL's Manufacturing Demonstration Facility)
3. Achieve Open RDD&D Environment with equipment donation program, agreements in place

Lead Lab:  Sandia National Laboratories

6 Partner Labs:

 KANSAS CITY
National Security Campus

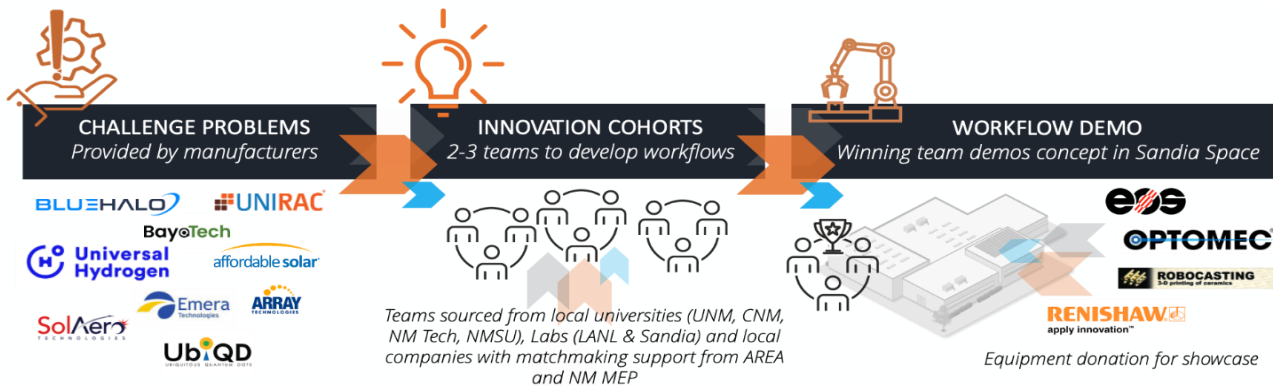
 SLAC NATIONAL ACCELERATOR LABORATORY

 OAK RIDGE
National Laboratory

 Jefferson Lab
Exploring the Nature of Matter

 Los Alamos
NATIONAL LABORATORY

 Fermilab



TCF-Base: Boost Platform – Building Ventures around Actionable Challenges for Underserved Communities

 \$6.5 M (\$1.8M Cost share)

Facilitate interactions with the startup community at a new scale by **building ventures** around actionable challenges identified by underserved communities that is underpinned by a mentorship program

Community Workshops

NEW MEXICO

- Questa
- Santa Ana Pueblo
- Albuquerque
- Socorro

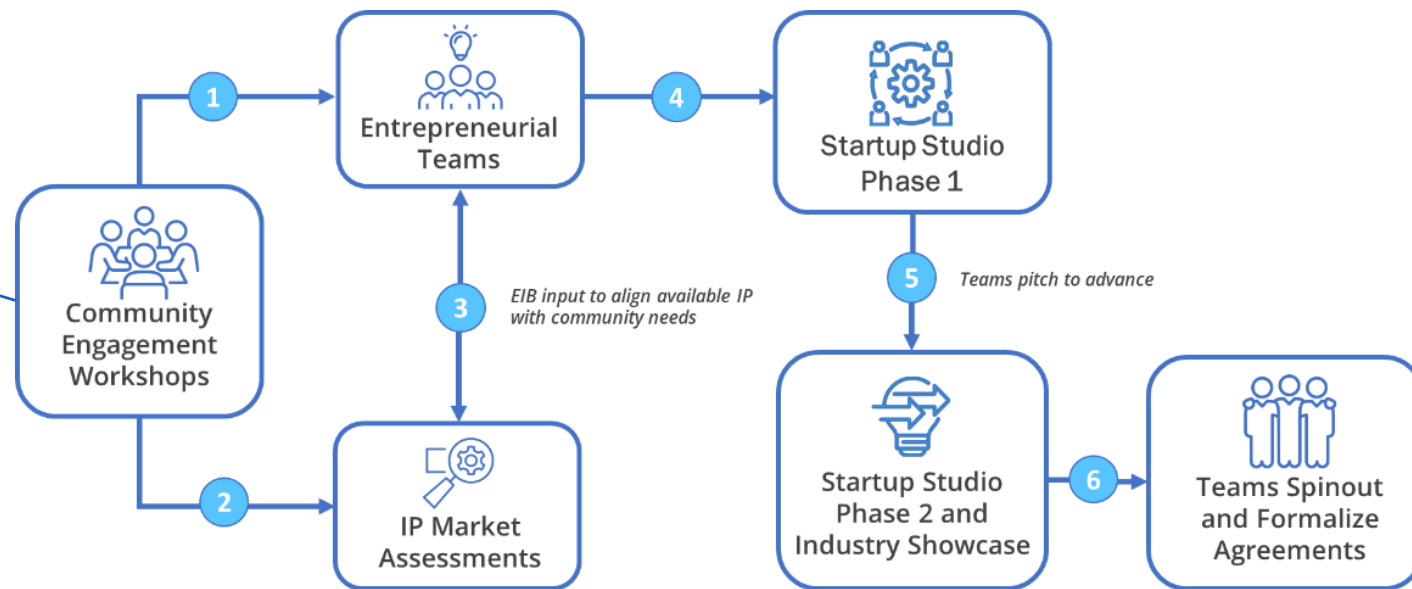
COMMUNITIES IDENTIFIED

- Deliver guidance from outcomes of workshops to FedTech for the upcoming Startup Studio
- Source relevant IP from participating labs to address community challenges

ALASKA

- Fairbanks
- Valdez
- Cordova/Eyak

boost Building Ventures Around Community Energy Challenges



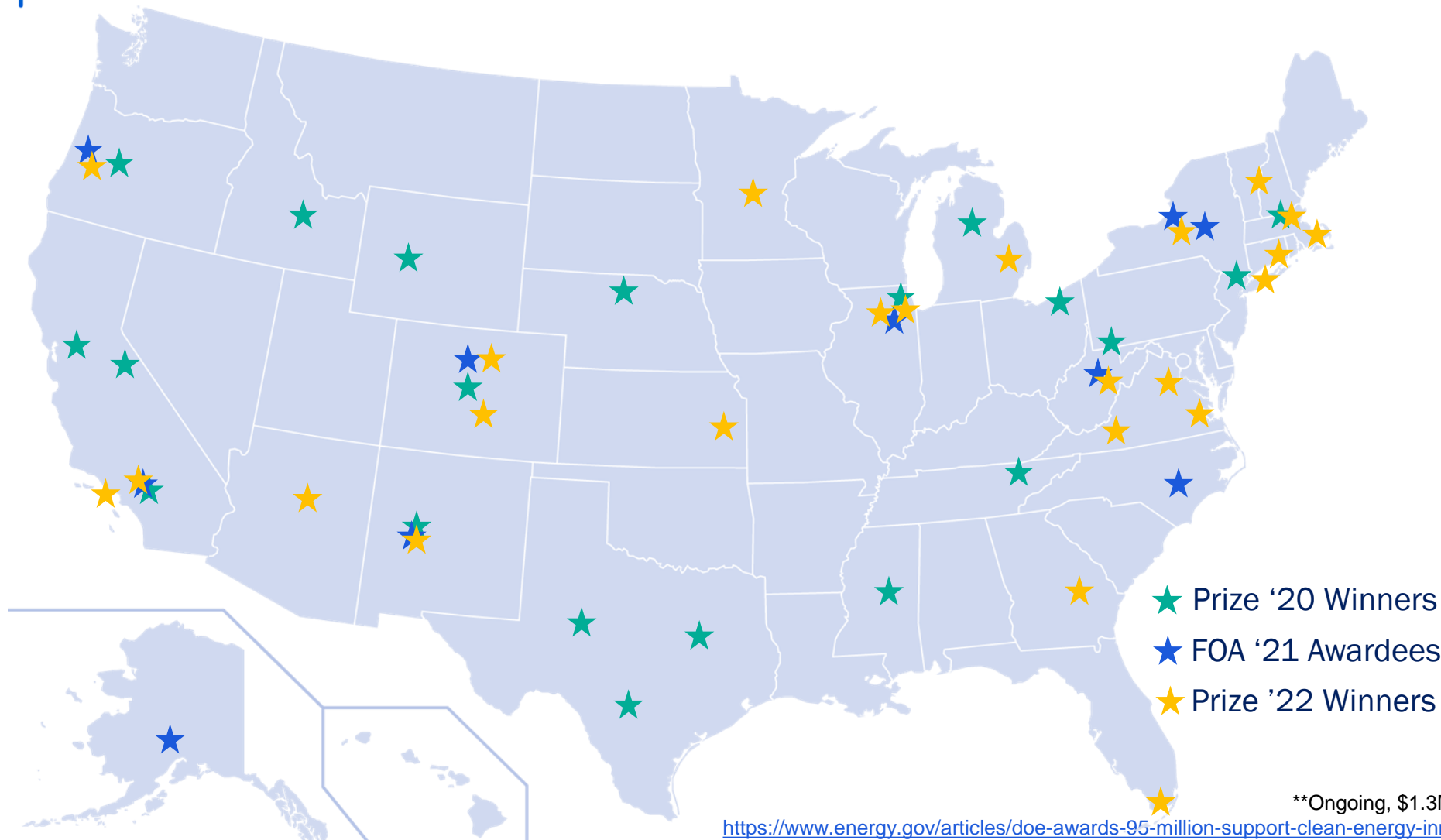
Lead Lab:



13 Partner Labs:



Energy Program for Innovation Clusters (EPIC) – 55 awardees



- \$5M in annual appropriations starting FY20
- Program to boost regional energy innovation & jobs with targeted funding for incubators & accelerators
- Aligns with CHIPS Act Sec. 10713. National clean energy incubator program.

EPIC Prize R1: Oct. 2020

- \$1MM
- 20 winners @ \$50,000

EPIC FOA: June 2021

- \$9.5MM
- 10 awardees

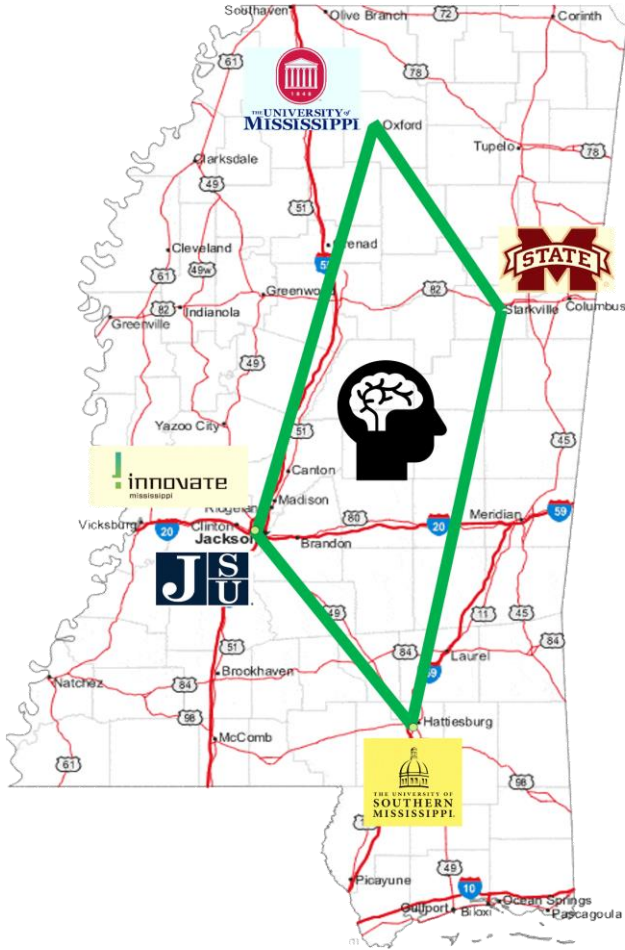
EPIC Prize R2: Oct. 2022

- \$5MM*
- 40+ winners

**Ongoing, \$1.3M awarded to date, does not include PD of staff

<https://www.energy.gov/articles/doe-awards-95-million-support-clean-energy-innovation-and-commercialization-across-america>

Example – Mississippi Virtual-Quad



Mission

V-Quad’s mission is to build an innovative, virtual incubator network to support Mississippi entrepreneurs and innovators launching businesses focused on energy- and agriculture-related technologies.

Need Addressed

This program will help new technology companies seeking to commercialize energy- and agriculture-related technologies find the technical assistance and financial networks that have a specific focus in these areas.

Goal

V-Quad’s goal is to form a public-private partnership that connects Mississippi’s research universities, industry, government and non-profits into a cohesive, tech-based entrepreneurial network.

Key Tenet

The precept of V-Quad is inclusive innovation, and rural areas and a historically Black university are part of the Mississippi V-Quad.

Current Status

- Program open and receiving applications from entrepreneurs – deadline Mar 31
‘Minority and rural entrepreneurs are strongly encouraged to apply’
- Awards of \$5,000 per winner + access to entrepreneurial ecosystem: Mentoring, Market Analysis, Prototyping, Networking, and Funding

\$50K can go a long way!

Questions?

