Mississippi Energy Program for Innovation Clusters

Virtual-QUAD

/kwŏd/: A measure of energy 10e15 Btu

Entrepreneurs Technical Assistance Program (ETAP) Grants

Call for Applications

Application Fee: 0

Application Deadline: June 30, 2022

https://mississippi.org/entrepreneurship/vquad/

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

Executive Summary

The Mississippi Virtual-Quad (Mississippi V-Quad) is a virtual incubator network that links research universities, non-profit organizations, and state and federal government assets in Mississippi to spur entrepreneurial activity in energy and agriculture technologies. The Mississippi V-Quad program will assist new companies with energy- and agriculture-related technologies find technical assistance and financial networks.

Mississippi Development Authority will award a total of $100,000 under the Entrepreneurs Technical Assistance Program (ETAP). Qualified applicants must be developing new products, processes, or services to address current challenges in the energy and agriculture sectors.

Teams are eligible for a maximum award of $25,000 each in the form of a voucher that may be utilized for receiving technology development assistance from a Mississippi Research University (MRU) - Jackson State University, Mississippi State University, University of Mississippi, and University of Southern Mississippi. Student-only teams may qualify for a voucher of up to $10,000. Teams receiving an ETAP grant will be paired with a relevant research university to solve specific technical challenges posed by the applicants. The vouchers have no cash value and may only be redeemed for technical assistance services.

The V-Quad ETAP grant competition is open to teams comprised of high school or college students, university or community college faculty, for-profit businesses, non-profit organizations, public sector employees or any combination of individuals from these entities.

A multitude of resources will be provided to teams participating in the Mississippi V-Quad Program including access commercialization and entrepreneurship mentors, researchers and subject matter experts, laboratory space at Mississippi Research Universities, and connections with local and national energy and agriculture entrepreneurial networks. The ETAP program is supported by the U.S. Department of Energy – State Energy Program under grant number DE-EE0009481 and subject to all terms and conditions associated with the award as well as the related policies and procedures of the MRU cited in the voucher.

The deadline to submit applications for this competitive program is June 30, 2022. Project teams will have up to nine months to complete the proposed tasks and will be required to provide two concise quarterly financial and technical reports and a final report at the conclusion of the project.

Examples of Eligible Technologies

Energy and agriculture sectors encompass an immense array of technologies, processes, products, and services, and the Mississippi V-Quad wants to cast as wide a net as possible. Teams working on any aspect of the energy or agriculture supply chains are invited to apply for the V-Quad program. Advances in other sectors having a significant impact on energy and agriculture include:

- information and communications technologies

- robotics
- artificial intelligence
- virtual reality
- unmanned aerial, terrestrial and marine vehicles
- genomics

New opportunities are emerging rapidly that are enabling the smart infrastructure revolution by introducing digitalization to decades-old platforms. A non-comprehensive list of examples includes:

- energy storage
- transmission and distribution
- distributed generation
- solar
- wind
- geothermal
- hydro
- biomass
- aquaculture
- process safety
- security
- energy efficiency
- crop yields
- crop and animal health
- process monitoring
- personnel training
- farm devices
- geospatial applications
- innovative financing for such technologies

To fully create an environment in which energy and ag startups can succeed, very specific technical assistance is needed.

I. About the V-Quad

In October 2020, the United States Department of Energy (US-DOE) awarded an Energy Program for Innovation Clusters (EPIC) prize to the Mississippi Development Authority to implement Mississippi Virtual-Quad. The EPIC prize recognizes the most innovative and impactful incubators focused on developing strong regional innovation clusters for energy-related technology and entrepreneurship. Continued support for the V-Quad is provide by US-DOE State Energy Program (SEP) under grant number DE-EE0009481 and is subject to all terms and conditions associated with SEP rules and guidelines as well as the related policies and procedures of the MRA cited in the voucher.

Mississippi has a strong research and industrial base in energy and agricultural. There is a tremendous potential to spawn innovative technologies with the right entrepreneurial ecosystem in place. The Mississippi V-Quad is a virtual incubator network that links research universities, non-profit organizations, and state and federal government assets in Mississippi to spur entrepreneurial activity in energy and agriculture technologies.

The Mississippi V-Quad program team consists of individuals from the Mississippi Development Authority, Innovate Mississippi, the Board of Institutions of Higher Learning, Jackson State University, Mississippi State University, University of Southern Mississippi, University of Mississippi and the Mississippi Small Business Development Center. Additional supporters to-date include AMCREF Community Capital, LLC, ASSET Engineering, Chevron ®, Connect Technologies, and ERDCWERX.

In 2021, the Mississippi V-Quad program awarded financial grants totaling $50,000 as Stage I and Stage II Venture Development Grants to support early-stage technology-based entrepreneurship. Ten companies participated in a 10 -week accelerator program and 13 companies participated in the “Pitch in the V-Quad” business plan competition.

The goals of the Mississippi V-Quad program include:

- Increase identification of “commercializable” ideas and research
- Increase the number of commercializable technologies and patentable inventions
- Increase the amount of SBIR/STTR and Angel/VC funding to researchers and new companies working to commercialize their technologies
- Increase the density and engagement of the regional and national ecosystem contact (corporate partners, accelerators, incubators, subject matter experts, mentors, researchers, and local and national entrepreneurial networks.)
- Attract investors to Mississippi companies.

The V-Quad ETAP will foster a strong partnership between the universities and emerging technology businesses. While teams receive access to state-of-the-art facilities and subject-matter experts, the universities broaden their service to private-sector technological development that eventually enhances Mississippi's competitiveness.

II. Call for Applications

The Mississippi V-Quad program is seeking applications from qualified teams who are developing new products, processes, or services to address current challenges that relate to the energy and agriculture sectors. Applications are for the Entrepreneurs Technical Assistance Program (ETAP). Teams selected under the ETAP will receive an award in the form of a voucher that may be utilized for receiving technical assistance from a research university in Mississippi to address specific technical challenges posed by the applicants.

- **Total grant funding available for ETAP: $100,000**
- **Maximum voucher value per team: $25,000**
- **Maximum voucher value per student-only team: $10,000**
- **Applicant cost share requirement: None**

APPLICATION FEE: ZERO ($0)

APPLICATION DEADLINE:
ETAP grant applications must be submitted electronically by JUNE 30, 2022, 11:59 PM CENTRAL DAYLIGHT SAVINGS TIME on the Mississippi V-Quad portal at:
https://mississippi.org/entrepreneurship/vquad/
Acceptable file formats are .pdf or .docx.

All inquiries from potential V-Quad applicants must be emailed to energysmartms@mississippi.org with the subject line "V-Quad Application Inquiry".

III. Eligibility Criteria for Stage I-Venture Development Grants (S1-VDG)

The Mississippi V-Quad Venture Development Grant competition is open to teams composed of entrepreneurs and innovators seeking to solve today's toughest challenges in energy and agriculture. Teams may be comprised of high school students, college-level students, university or community college faculty, for-profit businesses, non-profit organizations, public sector employees or any combination of individuals from these entities. Maximum award for a team comprised of students only is limited to a $10,000 voucher.

Entrepreneurs with ventures that meet the following criteria are encouraged to apply:

- Possess a technically viable concept or product
- Early Stage (Pre-seed – Seed)
- Defined target market for their product or service

The teams must demonstrate a technology readiness level two (TRL 2) or higher as defined below (see Appendix 2 for TRL definitions). The ventures may be pre-revenue or already generating revenue.

TRL 1: Basic principles observed and reported
TRL 2: Technology concept and/or application formulated (*minimum requirement to apply for ETAP*)
TRL 3: Analytical and experimental critical function and/or characteristic proof of concept
TRL 4: Component and/or breadboard validation in a laboratory environment
TRL 5: Component and/or breadboard validation in a relevant environment
TRL 6: System/subsystem model or prototype demonstration in a relevant environment
TRL 7: System prototype demonstration in an operational environment
TRL 8: Actual system completed and qualified through test and demonstrated
TRL 9: Actual system proven through successful mission operations

IV. What do V-Quad ETAP Applicants Get?

Teams are eligible for a maximum award of $25,000 each in the form of a voucher that may be utilized for receiving technical assistance from a research university in Mississippi. MDA will award a total of $100,000 in the Entrepreneurs Technical Assistance Program (ETAP). Teams receiving an ETAP grant will be paired with a relevant research university to solve specific technical challenges posed by the applicants. Teams will have up to nine months to complete the proposed tasks.

The V-Quad ETAP will open up the universities to qualified teams by making the contracting process simple and unique talent accessible and affordable. ETAP will create a greater level of awareness of businesses' technology development needs among the universities and help build capacity that is more responsive to those specific needs.

Through ETAP, eligible teams and companies may access the reserve of Mississippi universities' intellectual and technical assets to overcome critical technology challenges, including, but not limited to:

- Prototyping
- Materials characterization
- High performance computations
- Modeling and simulations
- Intermediate scaling to generate samples for potential customers
- Validation of technology performance
- Designing new ways to satisfy regulatory compliance

The V-Quad ETAP will award vouchers on a competitive basis to qualifying teams operating in the nexus of energy and agricultural sectors. The voucher will act as a coupon allowing the applicant to access a unique skill or facility at a university to bring emerging technologies to market. Members of the V-Quad team (see Appendix 1 for list of members) will support ETAP applicants by aligning with a given university's programmatic strength.

A multitude of resources will be provided to teams participating in the V-Quad Program. These include:

- Access to business and technical mentoring
- Access to researchers and subject matter experts at Mississippi's research universities, and federal research facilities
- Access to laboratory space at Mississippi's research universities (see section VIII for examples of the types of resources available)
- Access to local and national energy and agriculture entrepreneurial networks
- Ability to showcase your technology
- Public recognition of the award

V. V-Quad ETAP Timeline and Deliverables	Schedule
Release Solicitation for ETAP Grants	April 7, 2022
Application Deadline for ETAP Grants (electronic submission at https://mississippi.org/entrepreneurship/vquad/)	**June 30, 2022, 11:59pm (CT)**
Award ETAP Grants *maximum award per team: $25K *maximum award for student-only team; $10K	Late July 2022
First quarterly progress report due (two pages maximum)	October 2022
Second quarterly progress report due (two pages maximum)	January 2023
Final report due (five pages maximum)	April 2023
Oral presentation at the *Mississippi Entrepreneurship Forum*	April 2023

VI. Application Submission Format and Requirements for ETAP

Proposals shall be limited to a ten (10) slide Microsoft PowerPoint presentation. Text font may not be smaller than 12-point. Proposals should incorporate the following components itemized below and submitted to the V-Quad website on or before June 30, 2022, as a PDF or a Microsoft PowerPoint document. Additional documents such as team member resumes (limited to one page per team member), patents, etc. may be provided if deemed necessary by the applicant. Acceptable file formats are Microsoft Word, PowerPoint or PDF.

A PowerPoint template will be provided for all applicants that will include the following sections:

1. A ***Proposal Cover Page*** which shall include the following:
    a) Title of the proposal
    b) Proposer's organization
    c) Technical point of contact ("POC") including telephone/e-mail
    d) Background intellectual property (if any)
    e) Nature of the concept/invention/creative work
    f) Target/intended audience/market

2. An ***Abstract/Overview*** which should provide a concise summary of the proposal that addresses the technical merit and the commercial/market potential. The innovation should be clearly explained and why it is significant compared to existing or alternative technologies. The existing Technology Readiness Level ("TRL") of the technology level should be identified and what next steps of development are needed to make the technology more commercially attractive to its target/intended audience. The TRL should be at Stage 2 or higher (see above for TRL definitions).

3. The proposal shall also include a ***Technical Program/Scope of Work*** that includes the following:
    a) *Objective(s)*: The objectives, significance, and applicability of the proposed development, and a concise description of the advantages gained from the proposed technology.
    b) *Tasks*: A detailed list of each task, who will perform the task, the expected results of each task, and how the task will be accomplished with clearly defined deliverables and milestones. Address how the tasks will close the gap and/or attract potential partners/collaborators/investors to further develop the technology. Identify and describe any special facilities, equipment, or services needed to perform the tasks.
    c) *University Preference*: Indicate if there are existing relationships with one of the four research universities in Mississippi or preference for a particular institution.
    d) *Use of Funds:* Provide a table with use of funds associated with the tasks proposed in the application. (Funds are and subject to all terms and conditions associated with the Award DE-EE0009481 award as well as the related policies and procedures of the Mississippi Research University cited in the voucher.
    e) *Milestones:* A Gantt-style formatted chart addressing the anticipated product performance at major milestones and deliverables schedule that clearly identifies and defines all the tasks and the duration of the performance. All dates should be identified as a time-frame from the award.

4. A section on the ***Commercial Potential*** that address one or more of the following criteria where applicable:

    a) *Business Strategy*: Will the technology be sold to consumers or businesses or licensed?
    b) *Customer Segments*: For which customers will value be created? Provide an estimate of the market potential with evidence to justify the estimated market.
    c) *Value Proposition*: What value is being delivered to the customer and what problems or market needs will be addressed by the technology?
    d) *Channels*: Identify the channels that will be used to reach Customer Segments.
    e) *Revenue Streams*: What are the customers willing to pay for the technology? What are they currently paying? How much would they prefer to pay?
    f) *Key Resources*: What components does the Value Proposition require? What assets are needed? (i.e.: physical, intellectual, financial, human capital, etc.)
    g) *Key Partnerships*: Who are the key suppliers, partners, and alliances needed to execute getting the technology to the Customer Segments?
    h) *Cost Structure*: What are the most important costs in the business model? Which resources and activities create the most expenses?
    i) *Competitors*: Who are the competitors and describe the products/services that are currently being sold or offered?
    j) *Competitive Advantage*: Explain the competitive advantage of the technology. What is the distinct and sustainable advantage that others cannot duplicate?

5. A section on the ***Team Member Qualifications*** shall be included. Proposals should contain and provide biographical information about each team member which demonstrates relevant experience. Resumes for team members may be included as additional attachments. Individual resumes may not exceed one (1) page.

VII. Scoring Criteria for ETAP Grants

ETAP grants will be awarded on a competitive basis. All ETAP applications received will be scored by multiple reviewers based on the five following criteria. Maximum number of points achievable by a team is 50.

1. Technical merit of the product, technology or the proposed service (1 - 10 points)
2. Use of funds and potential match with a Mississippi research university (1 - 10 points)
3. Target market analysis (1 – 10 points)
4. Financial criteria and likelihood of profitability (1 – 10 points)
5. Project team strength (1 – 10 points)

Appendix 1: V-QUAD Program Team Members

Sumesh Arora, PhD (sarora@mississippi.org)

> *V-Quad Program Co-Leader*

> Director, Energy & Natural Resources Division, Mississippi Development Authority

Joe Donovan (jdonovan@mississippi.org)

> *V-Quad Program Co-Leader*

> Director, The Entrepreneur Center, Mississippi Development Authority

Whitney Jackson (whitney.jackson@mississippisbdc.org)

> *V-Quad Program Manager*

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> V-Quad Program Support

> The Entrepreneur Center, Mississippi Development Authority

Allyson Best, MBA

> Director, Office of Technology Commercialization, University of Mississippi

Tasha Bibb, MBA

>Entrepreneurial Development Director, Innovate Mississippi

Almesha Campbell, PhD

> Assistant Vice President for Research and Economic Development, Jackson State University

Jeremy Clay, JD

> Director, Office of Technology Management, Mississippi State University

Brian Cuevas, PhD

> Director, Office of Technology Development, University of Southern Mississippi

Kim Gallaspy

> Assistant Commissioner for Government Relations, MS Institutions of Higher Learning Board

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Supporting Partner: ERDCWERX, Vicksburg

Appendix 2: Definition of Technology Readiness Levels (TRLs)

TRL 1 Basic principles observed and reported: Transition from scientific research to applied research. Essential characteristics and behaviors of systems and architectures. Descriptive tools are mathematical formulations or algorithms.

TRL 2 Technology concept and/or application formulated: Applied research. Theory and scientific principles are focused on specific application area to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.

TRL 3 Analytical and experimental critical function and/or characteristic proof-of-concept: Proof-of-concept validation. Active Research and Development (R&D) is initiated with analytical and laboratory studies. Demonstration of technical feasibility using breadboard or brass board implementations that are exercised with representative data.

TRL 4 Component/subsystem validation in a laboratory environment: Standalone prototyping implementation and test. Integration of technical elements. Experiments with full-scale problems or data sets.

TRL 5 System/subsystem/component validation in a relevant environment: Thorough testing of prototyping in a representative environment. Basic technology elements integrated with reasonably realistic supporting elements. Prototyping implementations conform to target environment and interfaces.

TRL 6 System/subsystem model or prototyping demonstration in a relevant end-to-end environment (ground or space): Prototyping implementations on full-scale realistic problems. Partially integrated with existing systems. Limited documentation available. Engineering feasibility fully demonstrated in the actual system application.

TRL 7 System prototyping demonstration in an operational environment (ground or space): System prototyping demonstration in an operational environment. The system is at or near the scale of the operational system, with most functions available for demonstration and test. Well integrated with collateral and ancillary systems. Limited documentation available.

TRL 8 Actual system completed and "mission qualified" through test and demonstration in an operational environment (ground or space): End of system development. Fully integrated with operational hardware and software systems. Most user documentation, training documentation, and maintenance documentation completed. All functionality tested in simulated and operational scenarios. Verification and Validation (V&V) completed.

TRL 9 Actual system "mission proven" through successful mission operations (ground or space): Fully integrated with operational hardware/software systems. Actual system has been thoroughly demonstrated and tested in its operational environment. All documentation completed. Successful operational experience. Sustaining engineering support in place.