

American-Made Challenges

Geophone Prize

Phase 1: Concept! Informational Webinar

AMERICAN
MADE
U.S. DEPARTMENT OF ENERGY





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Agenda



American-Made Overview



The Geophone Prize



Submission Elements and Scoring



Support and the American-Made Network



HeroX



Next Steps



Q&A

Housekeeping

This webinar will be recorded.

This webinar is being recorded and will be available on HeroX.

Questions?

- There will be a Q&A session at the end of the presentation.
- To submit a question, please type it into the **Q & A box** on the right hand side of your screen next to the chat box.

Technical Issues:

- If you experience technical issues, **please check your audio settings** under the “Audio” tab.
- If you continue experiencing issues, direct message the host (Jackie Petre) through the chat.

American-Made Challenges



U.S. DEPARTMENT OF ENERGY

\$100M
Cash Prizes and
Team Support

30+
Prizes

Grants vs. Prizes



Financial Award Process

Write and submit
concept papers

Concept paper review

Applicants write and
submit full applications

Full applications review

Selections and
negotiations

Begin performing

Prepare and submit
reimbursement request

Request reviewed and
reimbursement issued

Prize Award Process

Begin Performing

Achieve predefined goal

Complete submission
package

Judges score submissions

Winners receive payment

Phase 1: Concept! Overview

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What is the Geophone Prize?



\$3.65M Prize Competition

Phase 1: Concept
Phase 2: Make
Phase 3: Build

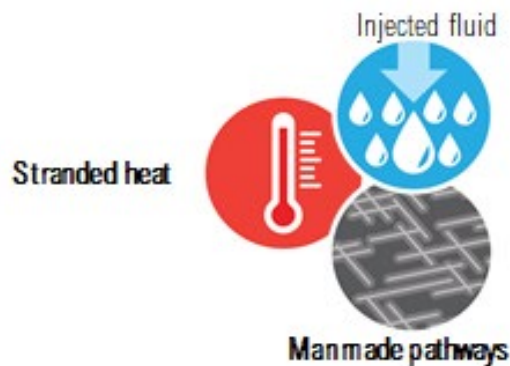


Support from National Network

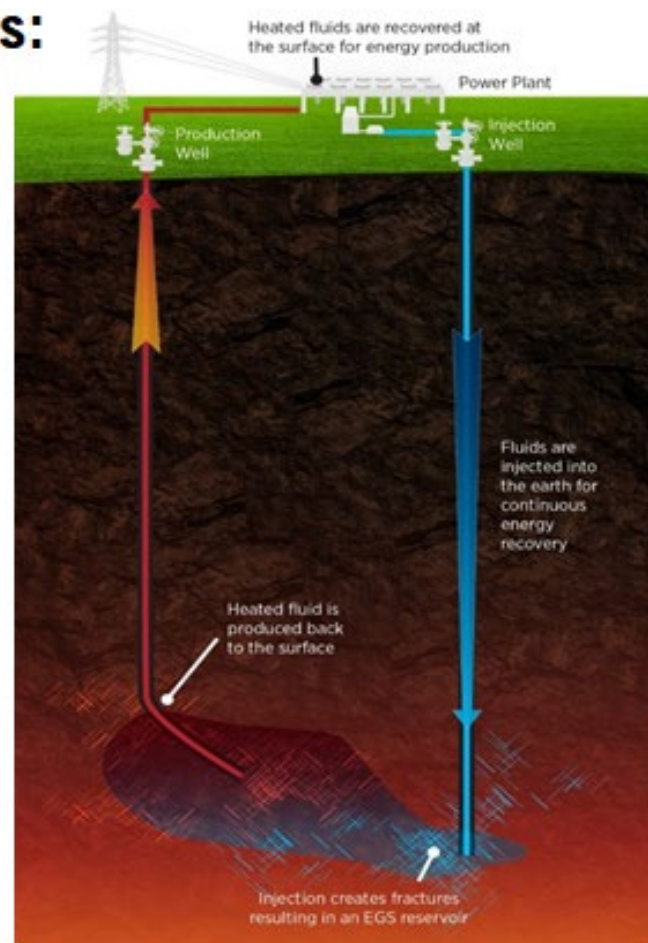
American-Made Network

What are Enhanced Geothermal Systems:

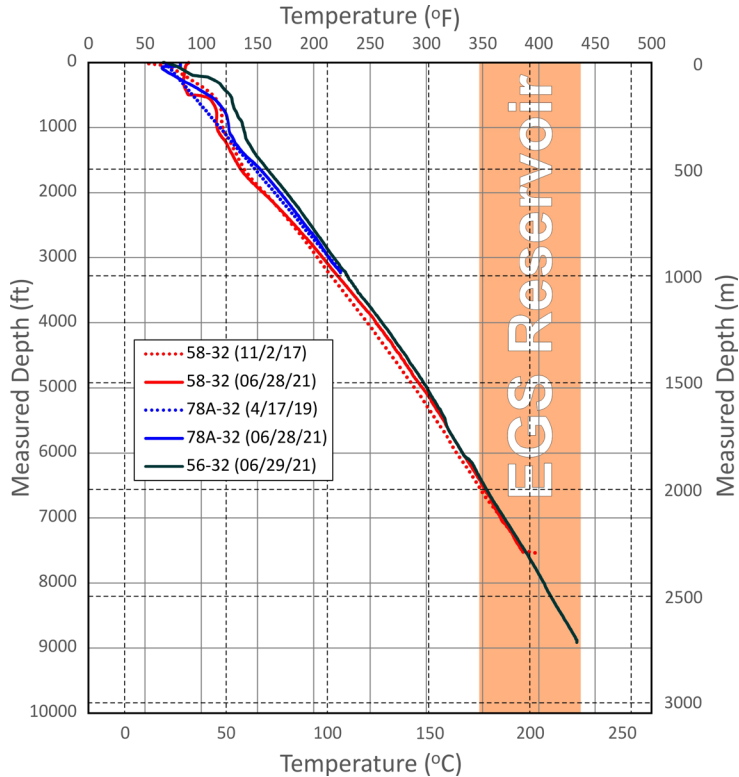
Generating power from hot, impermeable rocks



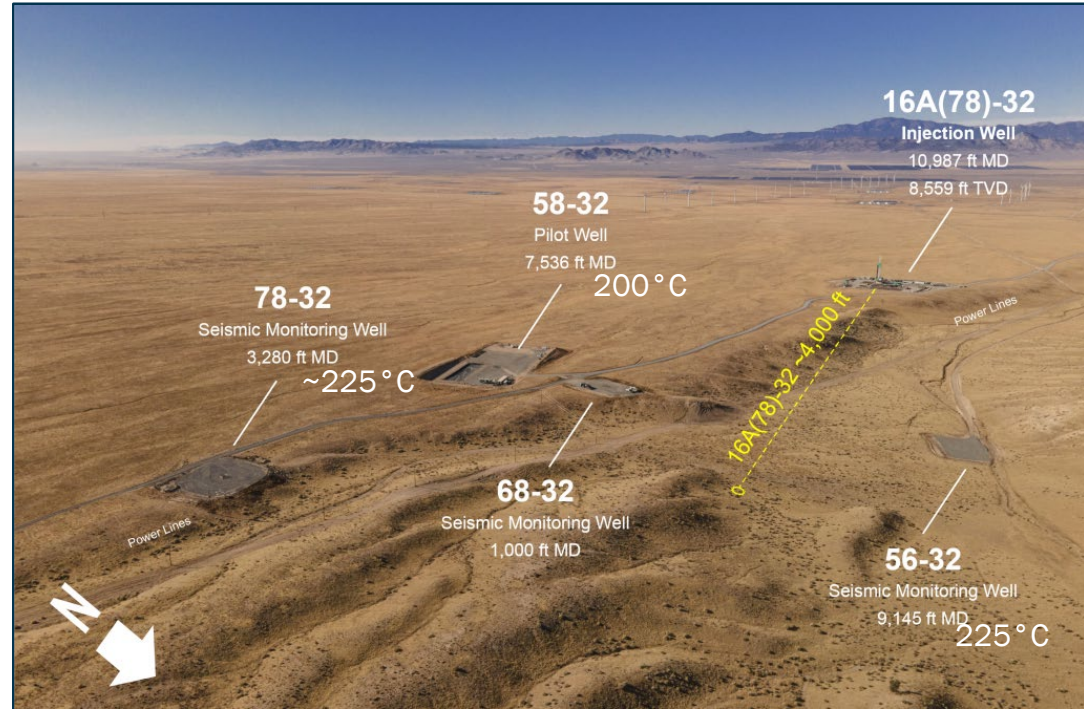
With **technology improvements**, EGS could be engineered wherever **there is hot rock at accessible depths**, enabling economic capture of EGS potential nationwide with a smaller land footprint per MW than other renewables.



Background



<https://gdr.openei.org/submissions/1326>



FORGE Seismic Monitoring: Temperature Limitations

Why Do We Need High-Temperature Sensors?

Seismic event location accuracy is highly dependent on sensor geometry.

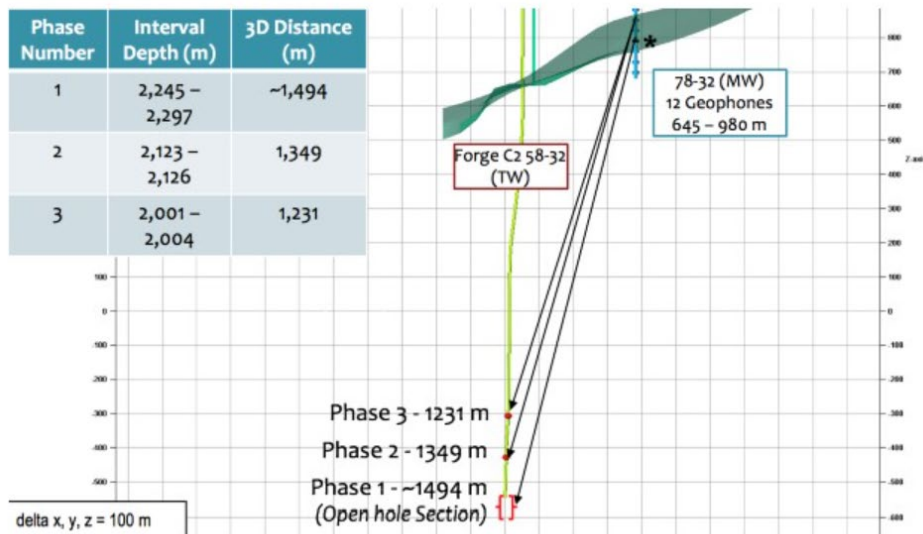
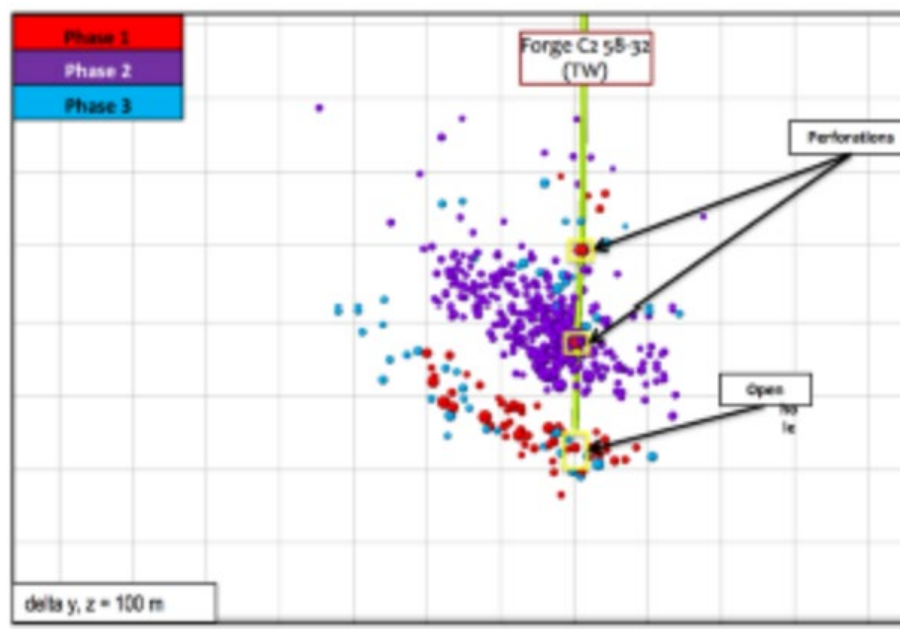


Figure B.III.5. Geometry showing the relative location between well 58-32 and the location of the geophones in borehole 78-32. The DAS extends from the surface (not shown) to bottom hole in 78-32. Location of geophones shown by the blue line. The green surface depicts location of top of granite.



2019 FORGE Topical Report

Performance Goals

GTO has developed the performance goals below for devices developed under the Geophone Prize.

Rank	Designs and prototypes must meet the following performance metrics: Specification	Acceptable	Ideal (Target)
1	Temperature Survivability (duration) *	225 °C for up to 6 months and 250 °C for up to 1 month	225 °C for multiple years and 250 °C for up to 6 months
2	Number of Channels *	3-component sonde, single level	3-component sonde, multilevel array
3	Frequency Range	0.05 – 1,000 Hz	0.005 – 2,000 Hz
4	Dynamic Range	135 dB	165 dB
5	Noise Floor	50 ng/ $\sqrt{\text{Hz}}$ [@ 1Hz]	10 ng/ $\sqrt{\text{Hz}}$ [@ 1Hz]
6	Maximum Pressure Capable	10,000 psi	20,000 psi
7	Clamping Pressure	10x tool/sonde weight	20x tool/sonde weight
8	Length of Data Transmission	3,000 meters	4,000 meters
9	Deployable Behind Casing	No	Yes
10	Tool Diameter	HQ	NQ
11	Clamping	Requires external clamping device	Comes with own borehole clamping system

* Required

Phase 1: Concept



Participants will demonstrate that they have identified and developed an initial concept for a high-temperature, downhole seismic sensor that utilizes currently available components, or a prototype currently under development.

Propose a path to design, prototype, and test a proof of concept.

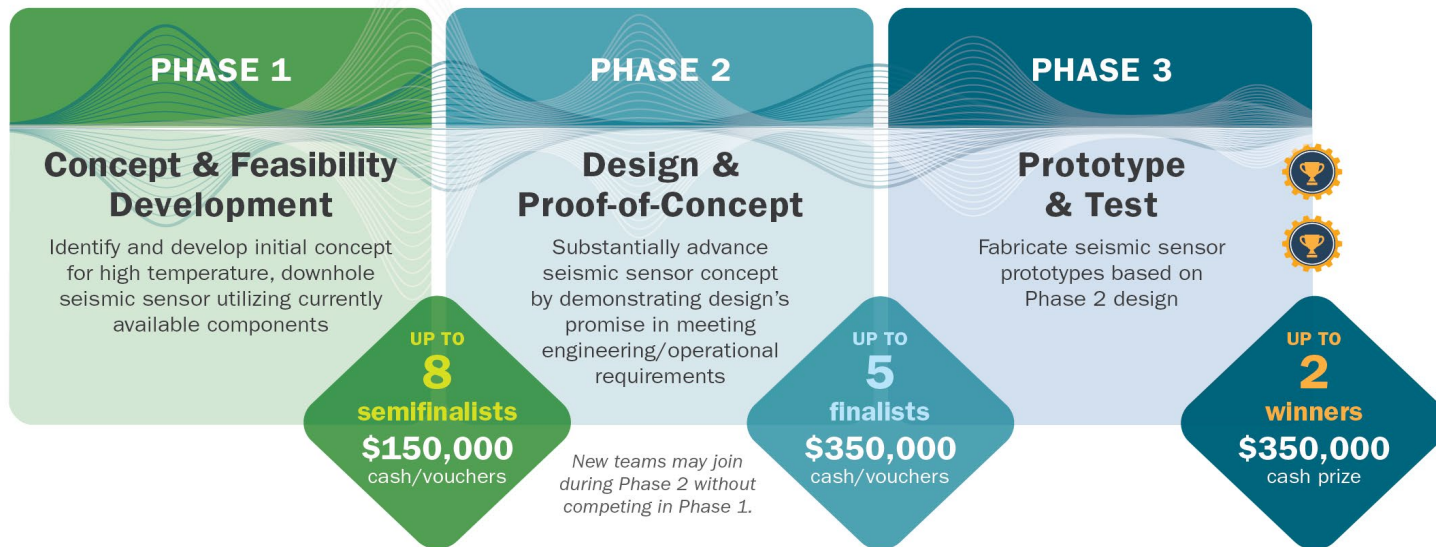
Phases & Prizes



U.S. DEPARTMENT OF ENERGY

GEOTHERMAL GEOPHONE PRIZE

This prize offers a total of \$3.65 million in incentives—
\$2.55 million in cash prizes, \$1.1 million in vouchers.





U.S. DEPARTMENT OF ENERGY

Phase 1: Concept!

Submission Elements Overview

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Read the Rules



Official rules for the
Geophone Prize
are available online.

[Geophone HeroX Page](https://www.herox.com/GeophonePrize) → Resources Tab

<https://www.herox.com/GeophonePrize>

Eligibility

The competition is open to the following entities:

- ✓ **Private entities** (for-profits and nonprofits)
- ✓ **Nonfederal government entities** (such as states, counties, tribes, and municipalities)
- ✓ **Academic institutions** (based in the United States)
- ✓ **Individuals** subject to the following requirements:
 - Individuals can compete alone or as a group. A representative of a private entity can also register the entity to compete by itself or as the lead organization of a group of entities. Teams can also be composed of a mix of individuals and entities or organizations.
 - An individual prize competitor (who is not competing as a member of a group) must be a United States citizen or a legal permanent resident.
 - A group of individuals competing as one team may win, provided the team captain and HeroX account holder for the team submission is a United States citizen or a legal permanent resident.
 - Individuals competing as part of a team may participate if they are legally allowed to work in the United States.
 - Private entities must be incorporated in and maintain a primary place of business in the United States with majority domestic ownership and control. If an entity seeking to compete does not have majority domestic ownership and control, EERE may consider issuing a waiver of that eligibility requirement.

WHO?

Any U.S.-based individual or team
with a desire to transform ideas
into impactful new solutions

CAN COMPETE



Scientists



**Students &
Faculty**



Entrepreneurs



**Anyone with a
BIG! idea**

Important Dates

Phase 1: Concept (5 months)

- April 22, 2022: Phase 1: Concept Launch
- **September 29, 2022: Phase 1: Concept Submission Deadline**
- December 1, 2022: Geophone Prize Quarterfinalists Announced & Phase 2: Make Begins



Submission Package

- Cover page content (to be made public, not scored)
- Up to 90-second video (to be made public, not scored)
- One PowerPoint slide (to be made public, not scored)
- Technical assistance request (to be made public, not scored)
- Technical narrative about the innovation, team, and plan (not public, scored)
- Letters of commitment or support (optional)



Required ☒

Scored ☐

Public ☒

Cover Page

List Basic Information About Your Submission

- Project Name
- Innovation tagline (e.g., your mission in a few words)
- Link to your 90-second video online
- Key project members (names, contacts, and links to their LinkedIn profiles)
- Keywords that best describe your solution (e.g., components, equipment)
- Your city and state
- The Connectors (up to 3) that significantly helped your solution and the major items they helped with (if applicable)
- Other partners (if any).



Required ☒

Scored ☒

Public ☒

Summary Slide

Make your own public-facing one-slide submission summary that contains technically specific details but can be understood by most people.

There is no template, so feel free to present the information as you see fit.

Please make any text readable in a standard printout and conference room projection.



Required 

Scored 

Public 

Voucher Work Slide

Describe how you will use your voucher funds, including the entities you plan to engage and what they will do with the voucher funds.

Provide one slide per entity you plan to engage.

What is a Voucher?

Vouchers allow winners from Phase 1 and Phase 2 to access tools, equipment, and expertise at national laboratories and approved organizations and facilities — which supports the development, testing, and validation of your solutions.

Phase 1: Concept winners will receive a \$75,000 voucher

Phase 2: Make winners, will receive a \$100,000 voucher



Required 

Scored 

Public 

Video

Question: What is your Public Innovation?

Suggested Content:

- How you intend to tackle the seismometer challenge
- How you will incorporate advances in the high-temperature componentry space into your solution and why it is transformational
- Who you are and why you have a competitive edge
- Creative content that conveys your submission in exciting and interesting ways.

Required Submission Format:

- Ensure that your video is posted publicly online (e.g., YouTube, Vimeo.)
- The video should not exceed 90 seconds.

[The America-Made Network may be able to help you with creating your video](#)



TIPS & TRICKS

- ✓ This is your first impression
- ✓ Be creative and focus on content
- ✓ Watch previous winners' videos
- ✓ Get feedback before you post online

Required 

Scored 

Public 

Technical Narrative



TIPS & TRICKS

- ✓ Remember your audience
- ✓ Be specific (this portion isn't public)
- ✓ Pay attention to the word count

Narrative	
<p>Question 1: Innovation— What is your solution? How will you determine whether your solution has achieved success?</p>	
<p>Suggested content you provide</p> <ul style="list-style-type: none"> Describe your innovation's unique value proposition and how it will lead to a device that meets the design metrics listed in Section 3. Define the design approach and specialized components required to manufacture the design. Discuss critical components that may not be commercially available or are hard to acquire. Explain (provide analysis to support) how your solution will lead to reliable indefinite deployment in high-temperature environments while collecting high-resolution seismic data (according to specification in Section 3) using high-temperature seismometers Specify expected performance goals and metrics relevant to your tool for design, prototyping, and testing (see special instructions below). 	<p>Each statement scored on a 1–6 scale</p> <ul style="list-style-type: none"> The competitor identifies a critical failure point of downhole seismometers at temperatures >225 °C. The design represents an innovative approach, built on reasonable assumptions, valid technical foundations, and lessons learned from other notable efforts in this space. The planned design approach is reasonably ambitious and validates critical assumptions needed to advance the proposed solution. The competitor provides compelling analysis that supports the efficacy of their proposed design to overcome critical failure points of seismic sensors deployed indefinitely at high temperature. Performance improvement goals and metrics are verifiable, and aggressive but attainable.

Required

Scored

Public

☒

☒

☐

Technical Narrative

Question 2: Team— Why is this the right team to solve this problem? What expertise is lacking and how will it be addressed?

Suggested content you provide

- Introduce your team, explain how it came together, and highlight the knowledge and skills that make it uniquely capable of achieving success.
- Highlight your team’s experience in high-temperature tool and/or seismic sensor development and how you have applied it to your specific innovation.
- Describe what drives your team to realize this solution.
- Explain why winning the Phase 1 Contest will substantively change the likely outcome for the proposed solution.
- Describe your efforts to advance your solution concept prior to or since the announcement of the prize contest and highlight key milestones achieved.

Each statement scored on a 1–6 scale

- The team’s experience and track record demonstrate notable entrepreneurial qualities such as adaptability, creativity, decisiveness, and resourcefulness.
- The team’s drive, knowledge, and complementary skill sets provide a strong competitive edge toward realizing this solution in the near future.
- Winning the Phase 1 Contest will significantly increase the team’s chances of creating a viable prototype.
- A considerable amount of high-quality effort was put into defining and advancing the proposed concept.



Required ✓

Scored ✓

Public ✗

Technical Narrative

Question 3: *Plan*—What is your plan to achieve your goals?

Suggested content you provide

- Describe where you stand in your solution's development cycle and define goals for Phases 1 and 2 (based on the schedule listed in Section 1.5; **see special instructions below**).
- Describe your team's readiness to meet your goals; what resources provided by the contest will help meet your goals?
- Provide a high-level budget and project management plan to meet your goals between the conclusions of the Phase 1 and 2 Contests, including how you will leverage program resources or other entities (include references to letters of support/commitment if applicable).

Each statement scored on a 1–6 scale

- The stated goals are ambitious, reduce risks, and show a commitment to an accelerated development cycle.
- Meeting the stated goals will demonstrate critical progress toward designing, fabricating, testing, and validating the functionality of this innovation.
- The proposed plan is appropriate and logical in order to achieve the stated goals.
- The proposed plan effectively uses resources available in-house or through this program to advance the innovation.

Special Instructions for Questions 1 & 3

Use only specific, measurable, achievable, relevant, and timely (SMART) outcome-based goals.

- For example: Demonstrate a definitive achievement of progress (e.g., achieve X% efficiency or X letters of interest signed); do not describe how you spent your time. (E.g., provide a report, talk to costumers, or perform experiments.)
- Please see Rules for the rest of the guidelines for your SMART goals.

The American-Made Network may be able to help you to formulate your SMART goals.



Required 

Scored 

Public 

Letter of Support (optional)

- Attach one-page letters (of support, intent, or commitment) from other relevant entities (e.g., potential users of the proposed innovation) to provide context.
- Letters of support from partners or others that are critical to the success of your proposed solution will likely increase your score.
- General letters of support from parties that are not critical to the execution of your solution will likely not factor into your score.
- Please limit letters of support to one page each.

Phase 1: Concept

How We Score

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Expert Reviewers and Scoring

Reviewers

- The Prize Administrator screens all completed submissions, and in consultation with DOE, will assign completed submissions to a qualified panel of expert reviewers composed of subject matter experts.
- Expert Reviewers will sign a Non-Disclosure Agreement.

Scoring

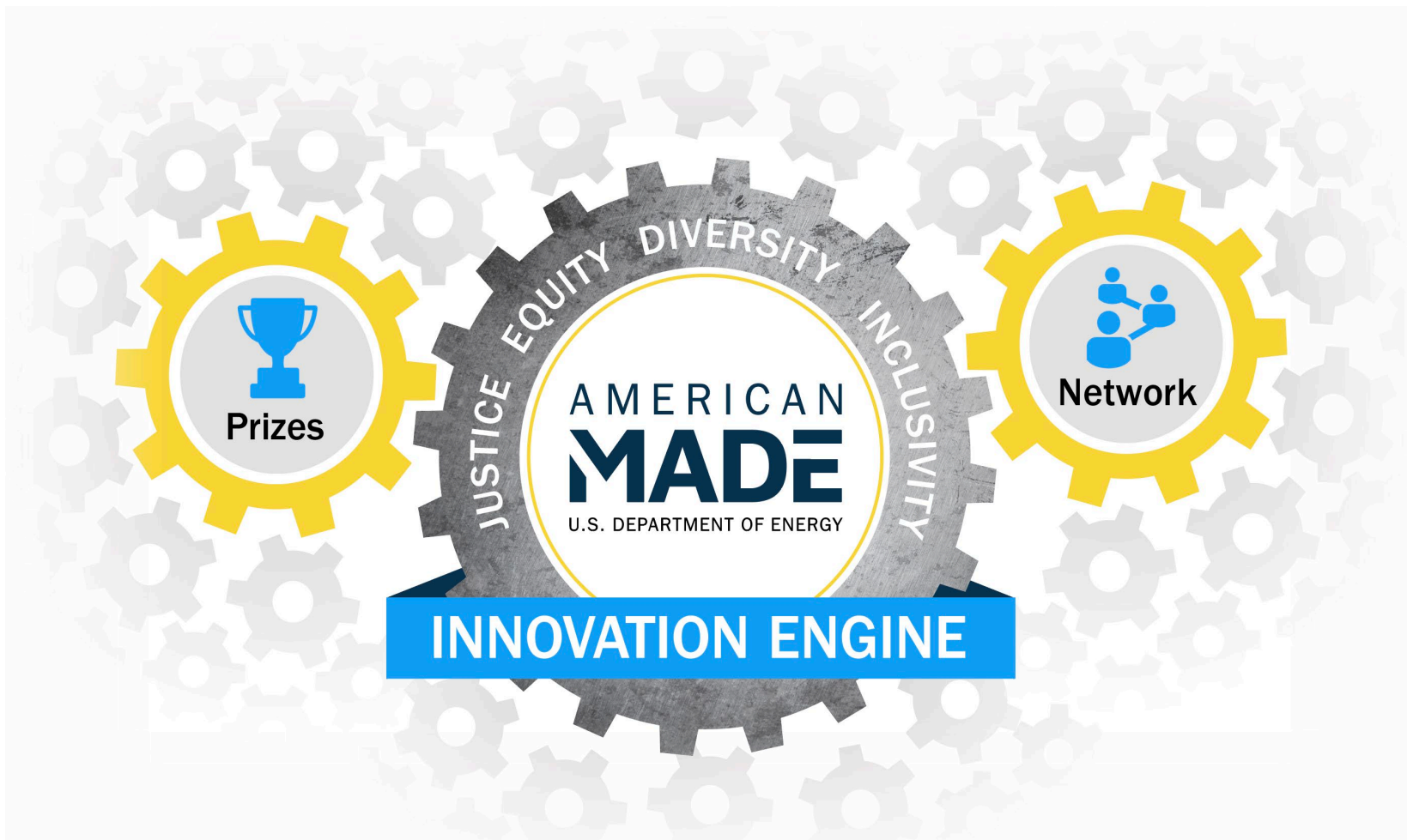
- **Weighting:** Each review criteria bullet for the Technical Narrative submission questions has equal weight. The score from an individual reviewer for the Technical Narrative will be the total sum of the scores for all bullets. All reviewers' scores will then be averaged for a final score for the submission package.
- **Final Determination of Winners:** The Director of GTO is the judge of the competition and will make the final determination of winners. This determination will take into account reviewer scores, any interview findings, and program policy factors.

Phase 1: Concept

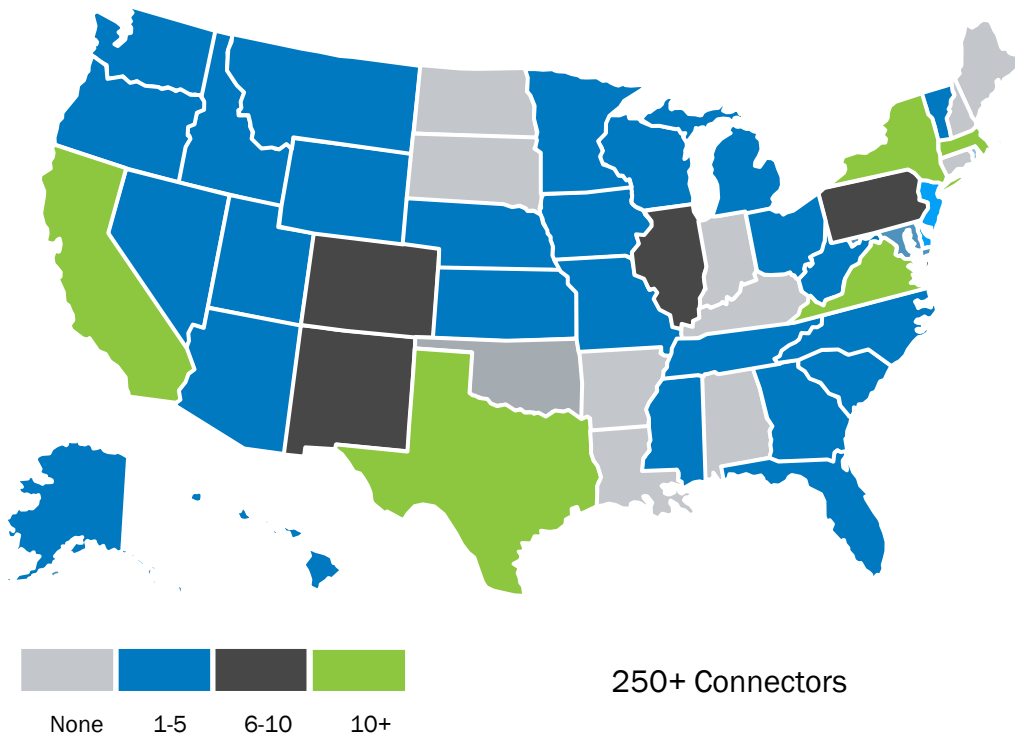
Find Support

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American-Made NETWORK



- Outreach
- Recruiting innovators and Connectors
- Mentoring
- Technical support
- Business support
- Financial support

Connectors



Connectors help innovators to succeed in prize challenges and in the real world, providing them resources needed at any stage of competition.

Connectors help competitors with activities such as:

- Facilitating connections to design and prototyping experts or facilities, as well as mentors and relevant industry partners
- Providing in-kind resources, tools, and facilities to fabricate, test, and prototype high-temperature seismometer solutions.



Network Matching Tool

- Help innovators:
 - Increase the quality and speed of matches with Network members
 - Bridge the gap between what innovators need and what Connector's offer
- Help Network members:
 - Access new clients and business development opportunities
 - Understand the needs and challenges of innovators
- Help all parties improve the utilization of program incentives and other benefits.

How Do I Find and Connect with a Connector?

Through the Network Matching Tool

- <https://network.americanmadechallenges.org/>

The screenshot displays the 'American-Made Challenges' network matching tool interface. On the left, a 'Setup your profile' sidebar shows a progress bar at step 1 and a form for entering personal details: Name (kimberlee.ott), Nickname, and a short biography. Below the form, a note states: 'Your exact address is never shared with anyone nearby. If you do not wish to have geotagging enabled, you can turn it off in your settings.' The main area is titled 'Network' and includes tabs for 'Browse the Network', 'Matches', 'Followers [0]', and 'Following [0]'. A sign-in prompt reads: 'Sign In to start building your American-Made Network.' Below this, three connector profiles are listed: Jay Murray (Idea Foundry), Jackson May (Positive Deviancy), and Faith Kelnhofer (Greentown Labs). Each profile includes a circular avatar, a 'Connector' badge, and a list of capabilities. On the right, a 'Challenges' section features a sign-in prompt and a featured challenge titled 'Solar Prize Round 5 - Hardware Track' with a 'View Challenge' button. The challenge image shows a woman working on a complex mechanical device.

Setup your profile

1

You are editing your own personal account individual.

Name *

kimberlee.ott

Nickname

Please share a short biography.

Your exact address is never shared with anyone nearby. If you do not wish to have geotagging enabled, you can turn it off in your settings.

Network

Browse the Network Matches Followers [0] Following [0]

Sign In to start building your American-Made Network.

Jay Murray Connector Idea Foundry

Capabilities: Business Development & Commercialization, Strategy, Science, Research and Investments, Product Development, System Design, Technical Analysis, Legal, Insurance, and Development, Manufacturing, Fabrication & Prototyping, Robotics, Software Development, F Raw Materials, Utility Scale, Marketing & Promotion, Testing and Validation

Jackson May Connector Positive Deviancy

Capabilities: Business Development & Commercialization, Marketing & Promotion, Product Insurance, and Public Policy, Technical Analysis, System Design

Faith Kelnhofer Connector Greentown Labs

Capabilities: Marketing & Promotion, Strategy, Hardware Development, Manufacturing, Leg Business Development & Commercialization, Product Development, Fabrication & Prototyp Science, Research and Development, Funding & Investments, System Design, Software Dev Technical Analysis, Procurement of Raw Materials, Testing and Validation

Challenges

Sign In to see your Challenges.

Solar Prize Round 5 - Hardware Track ★ Featured Challenge

Enter by 8/31/2021

View Challenge

Connectors Are Rewarded



TIPS & TRICKS

- ✓ Include connectors you worked with on your application

Recognition Reward Name	Anticipated Number of Awards	Dollar Amounts	Details
Mobilize	Up to 1 per winning Phase 1 competitor (8 competitors)	\$40,000 pool; \$5,000 per competitor	Distributed to Connectors for recruiting or mentoring a winning competitor in the Phase 1 Contest.
Phase 2 Mentor	Up to 1 per winning Phase 2 competitor (5 competitors)	\$37,500 pool; \$7,500 per competitor	Distributed to Connectors for mentoring a winning competitor in Phase 3 of the prize.
Phase 3 Mentor	Up to 1 per non-winning Phase 3 competitor (3 competitors)	\$22,500 pool; \$7,500 per competitor	Distributed to Connectors for mentoring a team who competed in but did not win Phase 3.
	Up to 1 per winning Phase 3 competitor (2 competitors)	\$25,000 pool; \$12,500 per competitor	Distributed to Connectors for mentoring a winning competitor in Phase 3 of the prize.



Looking for More Support?

Connect with the Geophone Prize
Power Connector



www.cebn.org

Email: cebn@cebn.org



Annabelle Swift, Lynn Abramson, Allie Judge, Andy Barnes

Phase 1: Concept

Apply on HeroX

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The screenshot shows the HeroX website interface for the 'Geothermal Geophone Prize'. At the top, there's a navigation bar with 'Edit', '991', 'Share', and 'Follow (24)' buttons. The main header reads 'American-Made Challenges'. Below this, a large banner features the 'U.S. DEPARTMENT OF ENERGY GEOTHERMAL GEOPHONE PRIZE' logo and a graphic of seismic waves. To the right of the banner, the title 'Geothermal Geophone Prize' is displayed, followed by a description: 'The Geophone Prize will catalyze the development of high temperature, downhole seismic monitoring for enhanced geothermal systems (EGS)'. Below the description are tags for 'Energy, Environment & Resources' and 'Government'. A 'Stage: Enter' label is visible. A prominent blue button labeled 'SOLVE THIS CHALLENGE' is at the bottom of the main content area. A navigation menu at the very bottom includes 'Overview' (highlighted), 'Guidelines', 'Timeline', 'Forum', 'Teams' (with a red notification bubble), 'Resources', and 'FAQ'.

<https://www.herox.com/GeophonePrize>



Challenge Overview

The Geothermal Geophone Prize

Spearheaded by the Geothermal Technologies Office (GTO) within the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy, and in partnership with the National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory (LBNL), the Geophone Prize spurs creativity and addresses the challenges of operating seismic sensors in geothermal environments.

The American-Made High Temperature Geothermal Geophone Prize is designed to catalyze the development of high temperature, downhole capable seismic monitoring for enhanced geothermal systems (EGS) in the American instrumentation community. This is accomplished through a series of prize competitions and the development of a diverse and powerful support network that leverages national laboratories, energy incubators, and other resources from across the United States.

60 Gigawatts by 2050:

The Geothermal Technologies Office (GTO) is focused on advancing EGS technology because it has the potential to enable the development 60 gigawatts of projected geothermal electricity capacity by 2050 (as highlighted in the [GeoVision: Harnessing the Heat Beneath Our Feet report](#)). Achieving this level of deployment require technical innovations in EGS, however. One of the critical areas centers around advances in subsurface sensing, which requires the expertise of the high temperature electronics (HTE) community. Growth in HTE applications across multiple sectors has been significant in the last decade and

< Geothermal Geophone Prize Competitor Agreement

As a competitor, it is expected that you read, and comply with, the rules for the specific prize challenge you are participating in. Please read the [Official Rules Document](#) for this prize competition. By accepting this agreement on the HeroX platform, you are also accepting the terms and conditions of the Official Rules Document.

When you reach the bottom of the document, Accept Button will be enabled.

Accept

< Competitor registration

Would you like to compete as a team? *


Yes, I want to create my own team


Yes, I want to join a team


No, I want to compete individually

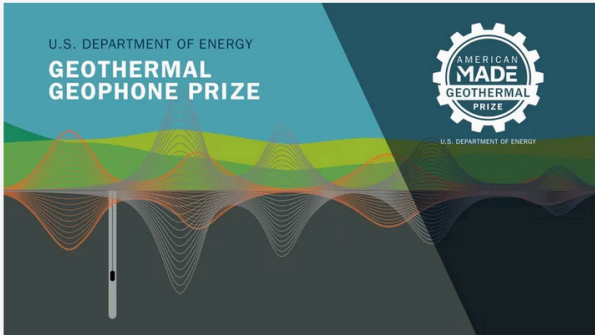
You still will be able to create or join other teams later.

Powered By heroX © 2022

 Edit

 American-Made Challenges

991  Share Following (25)



U.S. DEPARTMENT OF ENERGY
**GEOTHERMAL
GEOPHONE PRIZE**

AMERICAN
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PRIZE


U.S. DEPARTMENT OF ENERGY

Geothermal Geophone Prize

The Geophone Prize will catalyze the development of high temperature, downhole seismic monitoring for enhanced geothermal systems (EGS)

Energy, Environment & Resources Government

Stage:
Enter



BEGIN ENTRY JOIN A TEAM

Overview Guidelines Timeline Forum Teams 25 Resources FAQ

Challenge Overview

The Geothermal Geophone Prize

Spearheaded by the Geothermal Technologies Office (GTO) within the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy, and in partnership with the National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory (LBNL), the Geophone Prize spurs creativity and addresses the challenges of operating seismic sensors in geothermal environments

What's Next?

1. Follow the challenges on HeroX

<https://www.herox.com/GeophonePrize>

2. Read the rules:

Geophone HeroX → Resources Tab

3. Sign up in the Matching Tool and connect

<https://network.americanmadechallenges.org/>

4. Start innovating!

5. Apply by **September 29, 2022.**



Thank you!

Questions?

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Email: GeophonePrize@nrel.gov