

GEOHERMAL LITHIUM EXTRACTION PRIZE INFORMATIONAL WEBINAR

APRIL 12, 2021



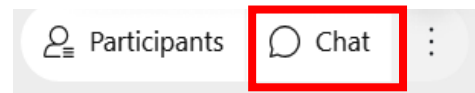
U.S. DEPARTMENT OF ENERGY

Housekeeping

- During the presentation:

- If you have a question:

- Type it in the chat box

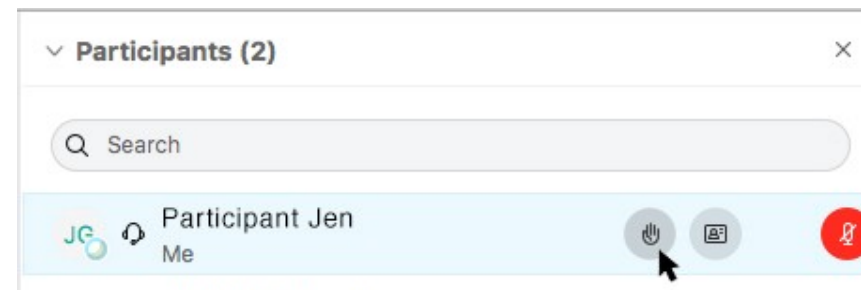


- After the presentation:

- If you have a question:

- Type it in the chat box, or

- Use the Raise Hand feature

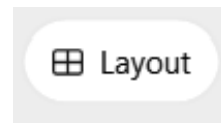


Change layout:

- Grid – All videos shown

- Stage – Speaker highlighted, other videos below

- Focus – Only speaker video shown



Agenda

1 American-Made Challenges and Network Overview

2 Geothermal Lithium Extraction Prize Overview

3 Phase 1 Contest Submission Elements

4 Eligibility

5 Using HeroX

6 Questions



AMERICAN-MADE CHALLENGES AND NETWORK OVERVIEW

American-Made Challenges

PURPOSE



Energize American ingenuity

*in American
innovation and
manufacturing*



Empower innovators

*with knowledge, resources,
and access to rapidly
transform ideas into
prototypes*



Provides Network- powered pathway to disruptive innovation

*so ideas can become
real products in
months, not years*



American-Made Challenges

Accelerator for U.S. Domestic Energy and Global Business Opportunities

The American-Made Challenges incentivize the nation's entrepreneurs to strengthen American leadership in energy innovation and domestic manufacturing. These new challenges seek to lower the barriers U.S.-based innovators face in reaching manufacturing scale by accelerating the cycles of learning from years to weeks, while helping to create partnerships that connect entrepreneurs to the private sector and the network of DOE's National Laboratories across the nation.



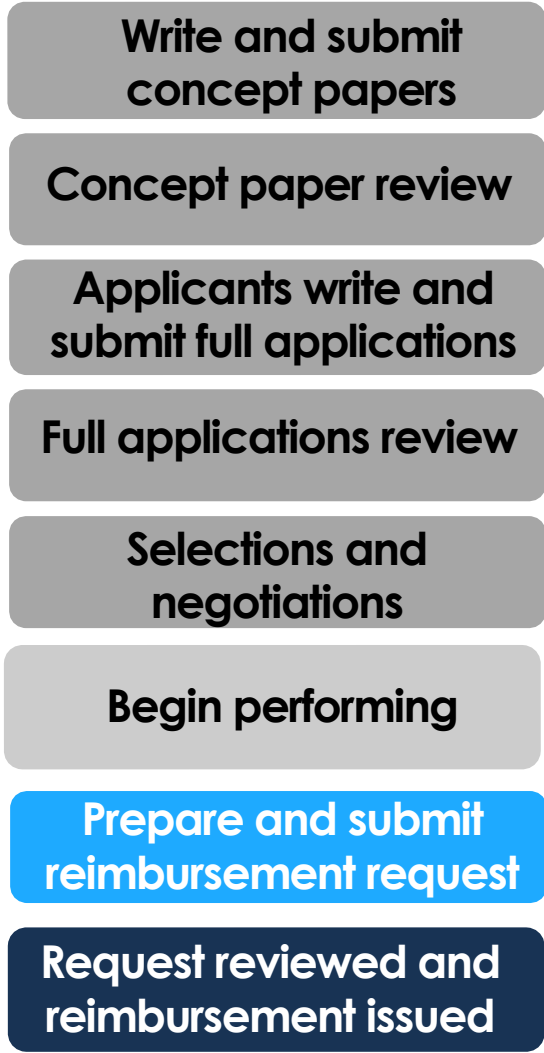
Our Prize Challenges

view prizes by status: *all*

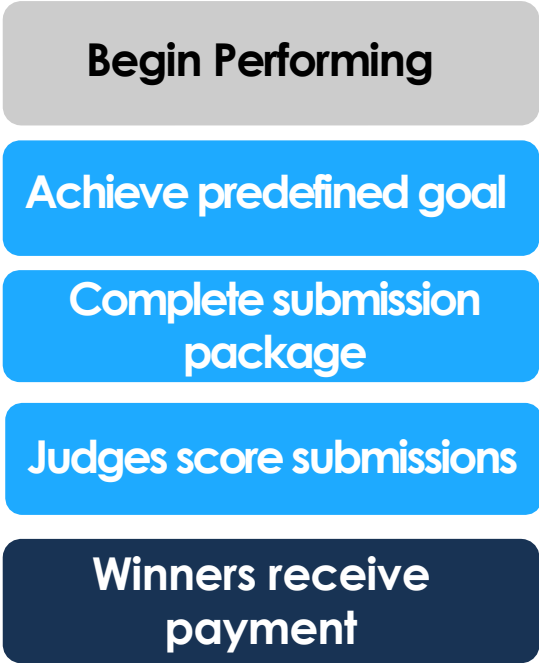
 <p>E-ROBOT Prize</p> <p>up to \$5 million in prizes</p> <p>enter now enter by 05/10/2021</p>	 <p>CABLE Prize</p> <p>up to \$4.5 million in prizes</p> <p>enter now enter by 06/08/2021</p>	 <p>Groundbreaking Hydro Prize</p> <p>up to \$300,000 in prizes</p> <p><i>in progress</i> enter by 01/01/2021</p>
		

Grants vs. Prizes

Financial Award Process



Prize Award Process



★ ★ ★ ★ ★ ★ ★ ★ ★ ★
American-Made

NETWORK

Designed to strengthen and scale critical connections to accelerate and sustain innovation.



National
Labs



Test Facilities



Investors



Universities



Makerspaces



Incubators

Connect with a Network of World-Class Experts

americanmadechallenges.org/network



GEOHERMAL LITHIUM EXTRACTION PRIZE OVERVIEW

What is the Geothermal Lithium Extraction Prize?



**\$4 million prize
competition**

Three Phase Competition



**Geothermal Lithium
Extraction Mentorship**

Industry Advisory Panel

Prize Goal



Incentivize the creation of innovations that improve current state-of-the-art Direct Lithium Extraction (DLE) technology

Why is this Prize Important?



Catalyze

Catalyzes efforts in the U.S. to identify, develop, and test solutions that improve the profitability of DLE from geothermal brines.



Incentivize

Incentivizes the nation's academic community to rapidly discover, research, iterate, and deliver new DLE solutions while developing a safe, domestic, cost-competitive source of lithium to ensure American leadership in the transition to a carbon-free economy.



Transform

Transforms innovative research and ideas into early-stage concepts and then tests proposed designs to demonstrate their ability to improve DLE from geothermal brines.



Enable

Enables the rapid development of technology and builds critical connections for new avenues of technology commercialization.

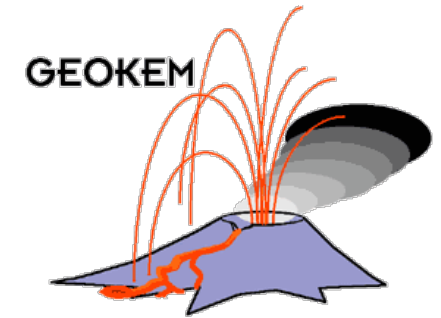
Why Lithium from Geothermal?

- It is expected that global demand for lithium will increase by 500% by 2050 due to widespread adoption of electric vehicles and grid-scale battery storage.
- Lithium supplies will become a crucial element in the clean energy supply chain.
- The U.S. lithium stock is almost entirely imported, with only 1% of U.S. lithium supply being sourced domestically.
- Annual lithium resource potential in the Salton Sea region is estimated at 600,000 tons, which currently exceeds the annual U.S. demand for lithium.
- Could transform the United States from a net lithium importer to a net exporter.



Industry Advisory Panel (IAP)

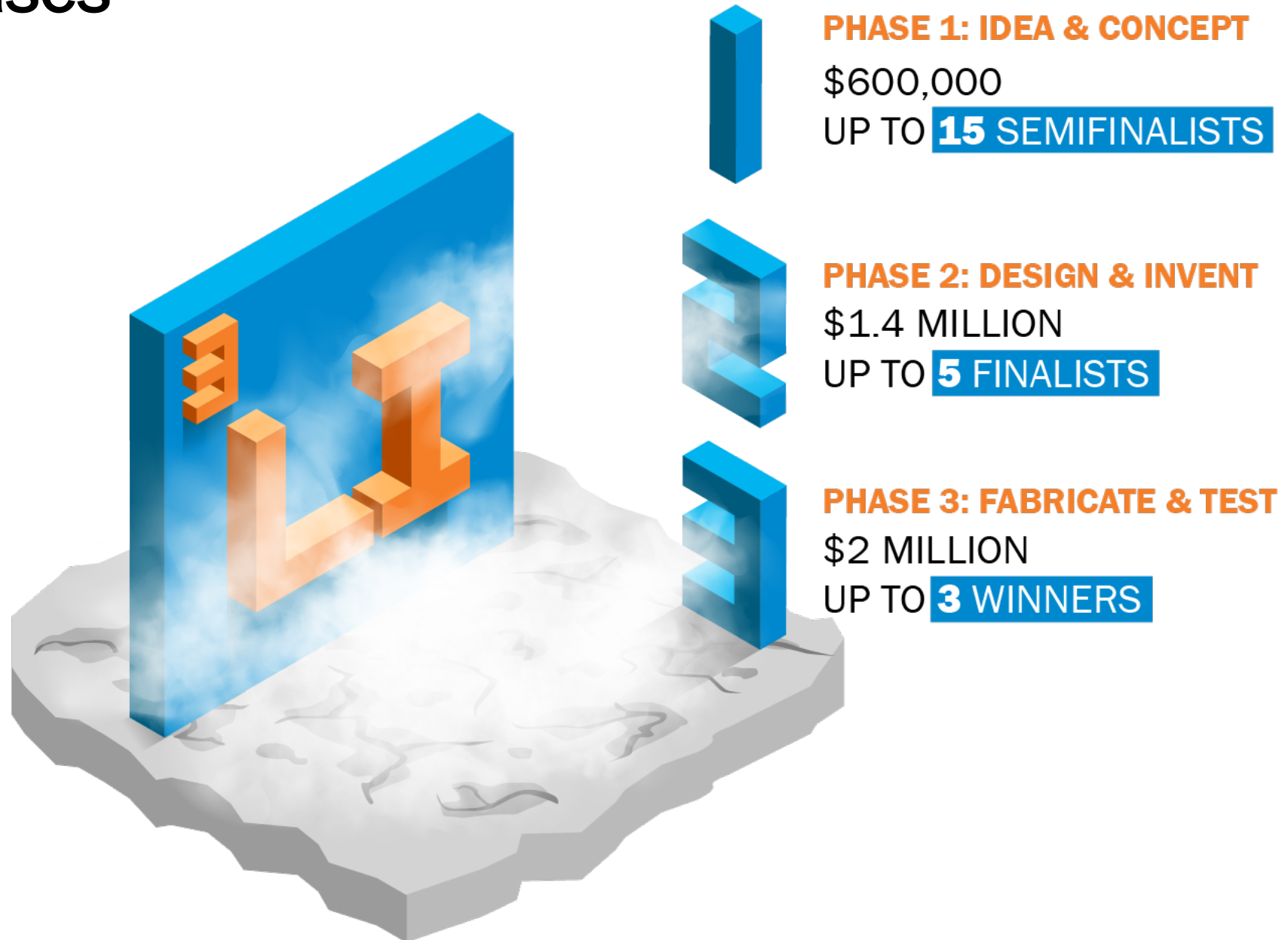
- A team of advisors who are experts in state-of-the-art of lithium extraction technology will serve as mentors during the competition.
- Phase 1 – IAP members will participate in panel discussions about lithium extraction from geothermal brines for competitors to view.
- Competitors will submit a request for IAP assistance with the Phase 1 submission package.
- IAP members and competition teams will meet throughout Phase 2 and Phase 3 to discuss team progress and receive feedback.





PRIZE PHASE OVERVIEW

Prize Phases



Phase Funding

Phase	Winners	Prizes
Phase 1: Idea & Concept	Up to 15	\$600,000 total prize pool distributed equally among semifinalists. Competitors receive a minimum of \$40,000 and maximum of \$600,000.
Phase 2: Design & Invent	Up to 5	\$1.4 million total prize pool distributed equally among finalists. Competitors receive a minimum of \$280,000 and maximum of \$1.4 million.
Phase 3: Fabricate & Test	Up to 3	\$2 million in total prize pool distributed for the first-, second-, and third-place winners.

Phase 1: Idea & Concept

In Phase 1, competitors will:

- Demonstrate that they have identified and developed an impactful idea or solution that addresses one or more of the following technical challenges:
 - Developing electrochemical/electrolysis processes for the direct conversion of a lithium-bearing geothermal brine to a lithium hydroxide product without the intermediate creation of lithium carbonate.
 - Developing new absorbents, precipitants, catalysts, or new processing conditions that can efficiently and selectively extract lithium directly from geothermal brines.
 - Advancements that improve the yield and achievable product purity.
 - Advancements that reduce energy and water consumption rates.
 - Advancements that minimize and/or monetize waste products.
- Propose a path to design, prototype, and test a proof of concept.

Contest dates: March 31—July 2, 2021

Phase 2: Design & Invent

In Phase 2, competitors will:

- Work with IAP member(s) to substantially advance their proposed tool, component, chemical process, or other advancement concept by demonstrating their design's promise in meeting quantitative engineering and operational requirements outlined by the team.
- Develop a plan to test their innovation using a real geothermal brine during Phase 3.
- Present your concept to DOE and IAP members during an innovation pitch meeting.

Anticipated contest dates: September – December 2021

Phase 3: Fabricate & Test

In Phase 3, competitors will:

- Fabricate and test their proposed design to demonstrate its ability to improve DLE from geothermal brines over a 12-month period.

Anticipated contest dates: January 2022 – February 2023



PHASE 1 SUBMISSION ELEMENTS

PHASE 1: IDEA & CONCEPT GOAL

Propose innovative advancement that helps lower the cost per unit weight of geothermally extracted lithium to be cost-competitive with currently common extraction methods (e.g., pegmatite mining and salar brine extraction), and/or can help to reduce energy and water consumption.



Photo: Geothermal Rising, Thomas_Borrmann

Important Dates for Phase 1: Idea & Concept

Phase 1 submission opened:
March 31, 2021

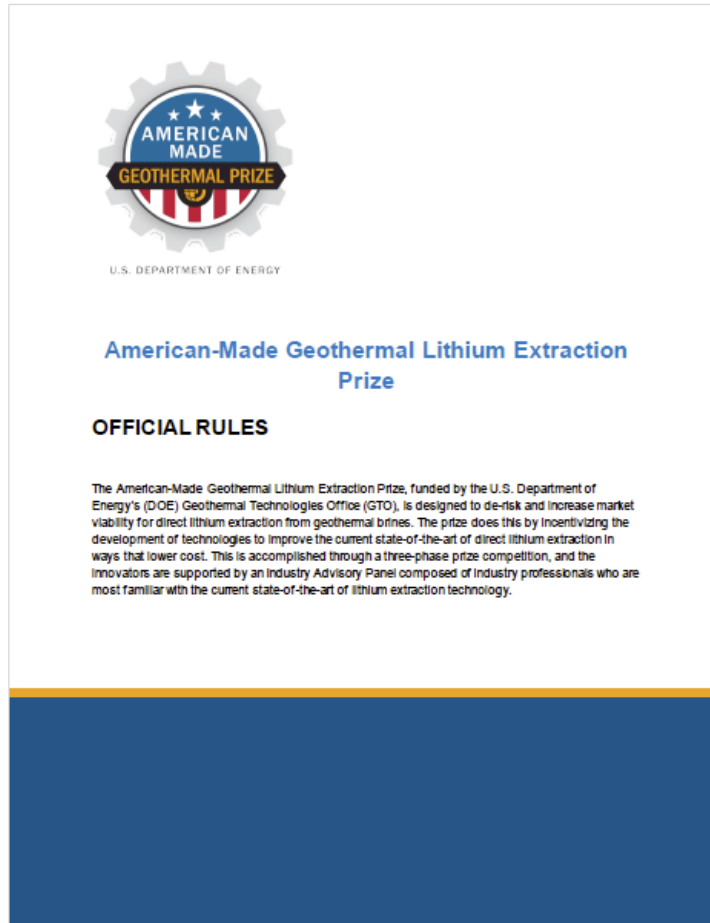
IAP Webinars available to view:
April 26, 2021 (anticipated)

Phase 1 submission deadline:
July 2, 2021 5 p.m. ET

Phase 1 winners announced:
August 31, 2021 (anticipated)



Read the Rules



Official Rules of the
American-Made Geothermal Lithium
Extraction Prize
are available online

https://americanmadechallenges.org/geothermallithiumextraction/docs/Geothermal_Lithium_Extraction_Official_Prize_Rules.pdf

or

[Geothermal Lithium Extraction HeroX Page >](#)
Resources Tab

Phase 1

Submission Elements

- Up to 90-second video (to be made public, not scored)
- Cover page content (to be made public, not scored)
- One Submission Summary slide (to be made public, not scored)
- Industry Advisory Panel Assistance Request (not public, not scored)
- Technical narrative about the problem, innovation, team, and plan (not public, scored)
- Letters of commitment or support (optional)

Innovation in 90 Seconds

Suggested Video Content

- Why the technical challenge you wish to tackle is worthwhile.
- A high-level vision of your proposed solution.
- Who you are and why you have a competitive edge.
- Creative content that conveys your submission in exciting and interesting ways.

Tips

- Be creative and focus on content.
- Ask others for help.
- Get feedback before you post online.
- **Ask others for help – the American Made Network**



Industry Advisory Panel Assistance Request

- Provide a two-page description of where your unique solution would be most aided by the input from an IAP member. Outline open science or engineering questions, facilities/supply needs, and other requests for expertise.
- The Prize Administrator will use this document to connect teams advancing to Phase 2 with an IAP mentor.



Technical Narrative: 4 Questions



1. Problem

What is the problem and why is solving it important?



2. Innovation

What is your solution and why will it be successful?



3. Team

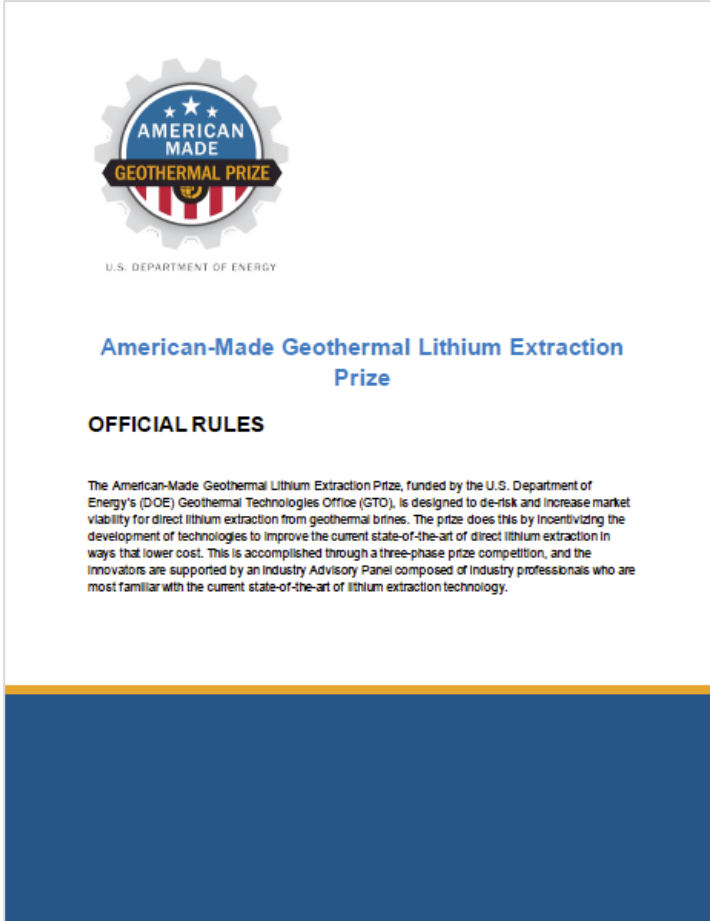
What have you done to date and what qualities give you a competitive edge?



4. Plan

What is your plan to achieve your goals?

Narrative Content & Judging



Each statement for the Technical Narrative is scored based on a 1–6 scale:

1	2	3	4	5	6
strongly disagree	disagree	slightly disagree	slightly agree	agree	strongly agree

Question 1: *Problem*—What is the problem and why is solving it important?

Suggested content you provide

- Describe the barrier within the geothermal lithium extraction supply chain that your innovation will overcome. Use evidence-based validation (e.g., interview with users, case studies, literature) and metrics to support the argument that this barrier is worth addressing.
- Explain how overcoming this barrier will ultimately lower the cost of DLE from geothermal brines.

Each statement scored on a 1–6 scale

- The competitor identifies a critical problem using compelling analysis.
- There is clear linkage and relevance between overcoming the barrier and lowering overall DLE costs.
- The competitor's assessment shows a strong understanding of the broad lithium extraction industry's current state-of-the-art.

Assessment & Announcement

1. Expert Reviewers will score submissions based on the judging criteria (judges will sign an NDA).
2. The final score from an individual Expert Reviewer for a submission package equals the total sum of the scores for all the bullets.
3. All Expert Reviewer's scores will then be averaged for a final score for the submission package.
4. Approximately 60 days after the contest closes, the Prize Administrator notifies and announce winners.





ELIGIBILITY

Eligibility

Individuals can compete alone or as a group.

- Participants must be currently affiliated with an accredited U.S. institution of higher education.
- An individual prize competitor (who is not competing as a member of a group), must be a U.S. citizen or a permanent resident.
- A group of individuals, competing as one competitor, may win, provided that (a) the online account holder of the submission is a U.S. citizen or a permanent resident, and (b) that all group members are currently affiliated with an accredited U.S. institution of higher education. Groups competing as a team do not need all members to be affiliated with the same institution of higher education.

You are strongly encouraged to review the eligibility requirements in the rules document.

All participants must be currently affiliated with an accredited U.S. institution of higher education.



USING HEROX

HeroX



American-Made Challenges

494

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Geothermal Lithium Extraction Prize

This is designed to find solutions that de-risk and increase market viability for direct lithium extraction (DLE) from geothermal brines.

Energy, Environment & Resources

Government

Stage:
Enter

Prize:
\$4 Million Total Prize Pool

[SOLVE THIS CHALLENGE](#)

Overview

Guidelines

Timeline

Forum ¹

Teams ³

Resources

FAQ

QUESTIONS?


EMAIL: GeoLithiumExtraction@nrel.gov



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GET STARTED

Visit our website to learn more and apply!

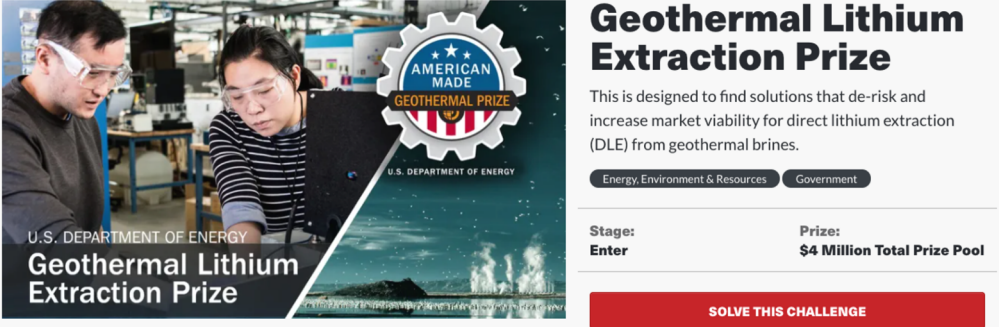


American-Made Challenges
Geothermal Lithium Extraction Prize

The American-Made Geothermal Lithium Extraction Prize is designed to find solutions that de-risk and increase market viability for direct lithium extraction (DLE) from geothermal brines. Advancement of DLE technologies allow for improved methods that lower cost, lessen environmental impact and further the mission to turn the threat of climate change into an opportunity to revitalize the U.S. energy and critical materials supply chain.

[Join the Challenge](#)

AMERICAN MADE
GEOHERMAL PRIZE
U.S. DEPARTMENT OF ENERGY



Geothermal Lithium Extraction Prize

This is designed to find solutions that de-risk and increase market viability for direct lithium extraction (DLE) from geothermal brines.

Energy, Environment & Resources Government

Stage: **Enter** Prize: **\$4 Million Total Prize Pool**

[SOLVE THIS CHALLENGE](#)

U.S. DEPARTMENT OF ENERGY
Geothermal Lithium Extraction Prize

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[Overview](#) [Guidelines](#) [Timeline](#) [Forum](#) ¹ [Teams](#) ⁴ [Resources](#) [FAQ](#)

Challenge Overview

The American-Made Geothermal Lithium Extraction Prize seeks to drive forward the development of economic DLE from geothermal brines found at the Salton Sea by partnering novel geothermal and non-geothermal expertise with experienced DLE industry experts to overcome challenges of geothermal lithium extraction by:

- Developing electrochemical/electrolysis processes for the direct conversion of a lithium-bearing geothermal brine to a lithium hydroxide product without the intermediate creation of lithium carbonate.

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