INCREASE YOUR H_2IQ

The #H2IQ Hour

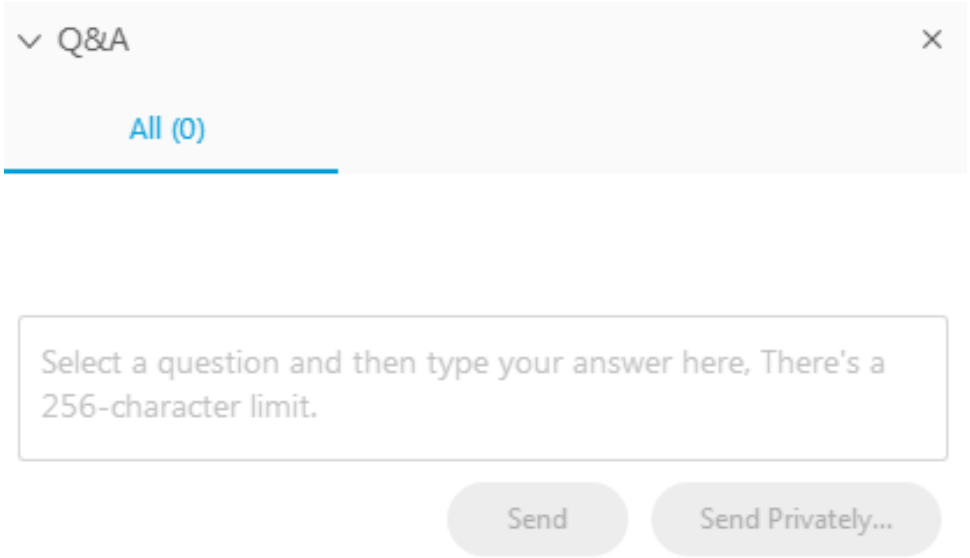
Today's Topic:

DOE Hydrogen Shot Incubator Prize

This presentation is part of the monthly H2IQ hour to highlight research and development activities funded by U.S. Department of Energy's Hydrogen and Fuel Cell Technologies Office (HFTO) within the Office of Energy Efficiency and Renewable Energy (EERE).

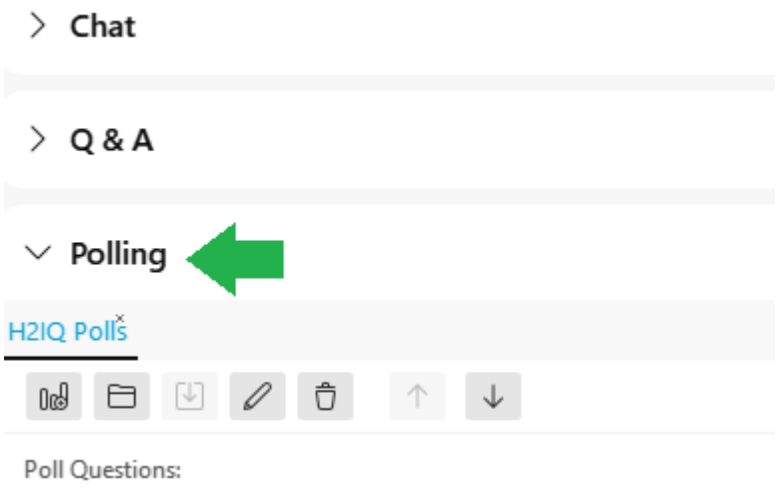
The #H2IQ Hour Q&A

Please type your questions into the **Q&A Box**



#H2IQ Hour Polling Questions

Please submit your answers to our polling questions in the **Polling** Box



American-Made Challenges

H-Prize: Hydrogen Shot Incubator

Phase 1: Propose! Phase Informational Webinar

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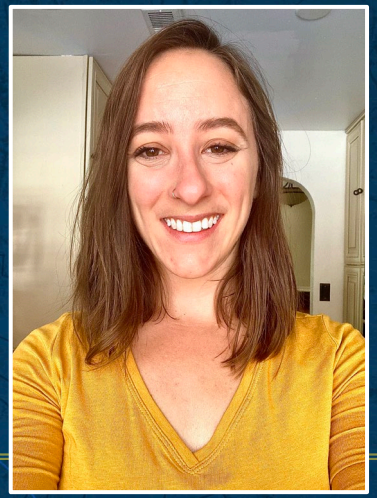

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National Renewable Energy Laboratory
Prize Administrator

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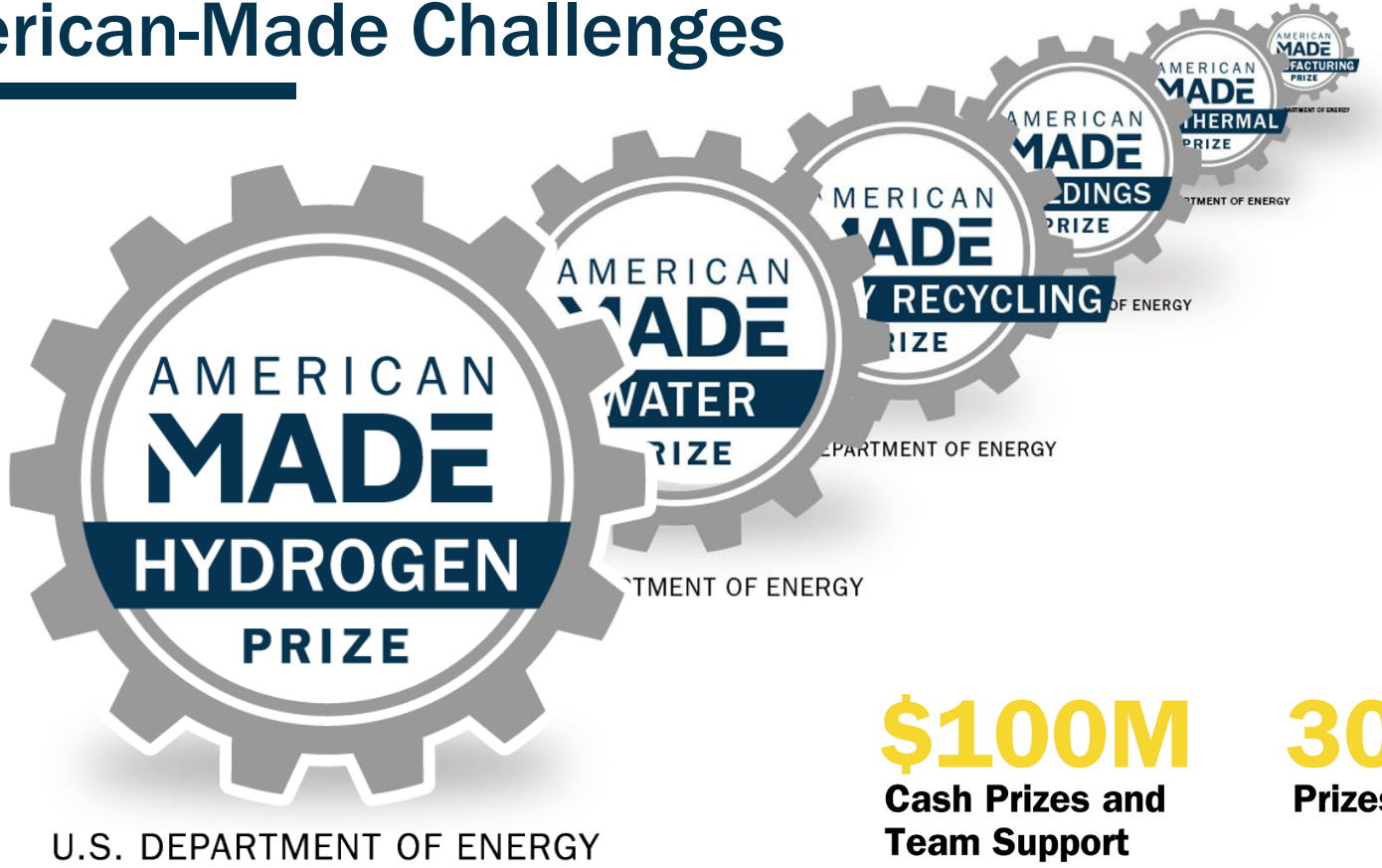
Agenda

- American-Made Overview
- The Hydrogen Shot Incubator Prize
- Submission Elements and Scoring
- HeroX
- Next Steps
- Q & A

American-Made Challenges



$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: Propose! Phase Overview

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What is the Hydrogen Shot Incubator Prize?

$ 2.6M Prize Competition

Phase 1: Propose!

Phase 2: Prove!

Pitch Day

The U.S. DOE Hydrogen Program

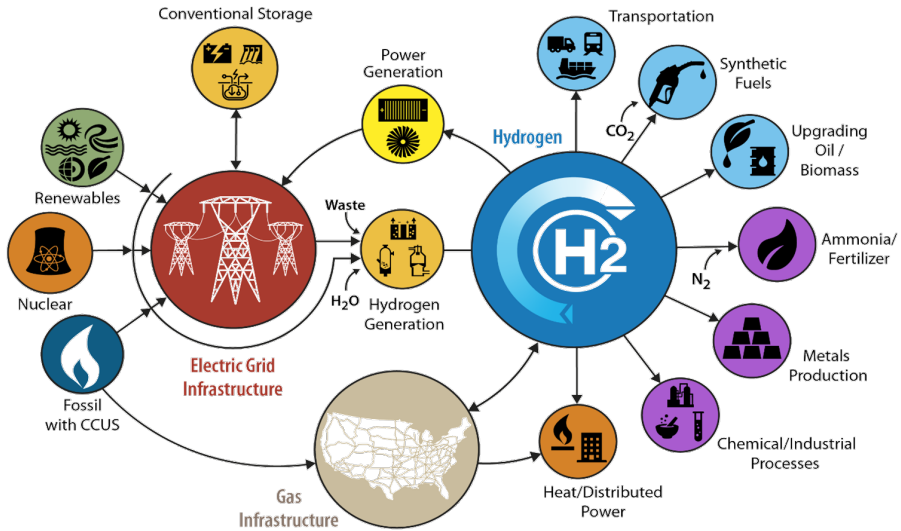
Hydrogen is a key element of a portfolio of solutions to decarbonize the economy.

Hydrogen Program

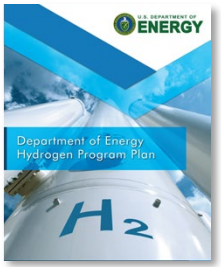
Coordinated across DOE Focuses on **research, development, demonstration, and deployment (RDD&D)** to address:

- **The entire H_2 value chain** from production through end use
- **H_2 production from all resources** (renewables, nuclear, and fossil + CCS)

H2@Scale provides vision to guide how hydrogen can enable clean-energy pathways across applications and sectors



www.hydrogen.energy.gov



DOE Hydrogen Program Plan (2020)

Enabled over 1,200 U.S. patents
>30 commercial technologies

400 projects
200 companies and universities,
15 national labs

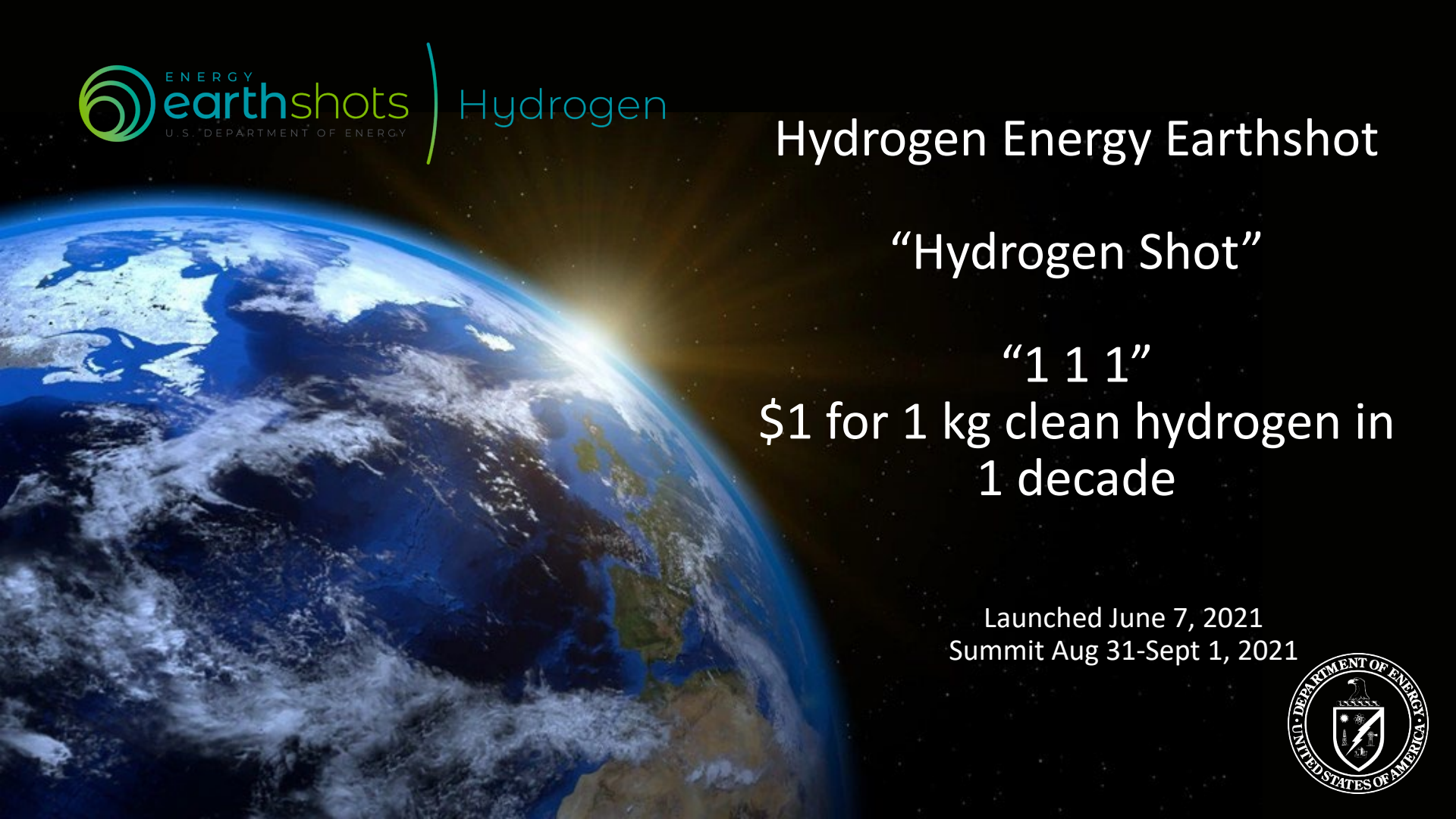
President Biden and Energy Secretary Granholm at Climate Summit

"…I've asked the Secretary of Energy to speed the development of critical technologies to tackle the climate crisis. No single technology is the answer on its own because every sector requires innovation to meet this moment."

President Joseph R. Biden
April 23, 2021

Launch of Hydrogen Energy Earthshot
First of the Energy Earthshots
June 7, 2021
at DOE Hydrogen Program Annual Merit Review

Secretary Jennifer Granholm
June 7, 2021



Hydrogen Energy Earthshot

"Hydrogen Shot"

"1 1 1"
$1 for 1 kg clean hydrogen in 1 decade

Launched June 7, 2021
Summit Aug 31-Sept 1, 2021

Goals: Aligned with DOE's Hydrogen Shot

Incentivize development of innovative "off-roadmap" technologies that have the potential to produce **clean hydrogen at $1/kg**

Break down barriers for inventors and researchers and accelerate progress by complementing traditional FOA process, focusing on stakeholders who haven't engaged with DOE before

H_2

Provide investment opportunities for disruptive concepts and technologies by pitching to investors or pipeline to future FOAs

Please visit the Annual Merit Review Proceedings and Hydrogen Program Plan for currently funded hydrogen production technologies

Phase 1: Propose!

Seeking novel concepts that have the potential to meet the Hydrogen Shot goal of $1/kg clean hydrogen in one decade

Submissions should:

- Describe the work already completed toward defining and/or exploring the novel concept
- Include enough detail for reviewers to be able to rate the concept based upon design and/or experimental work that has already been accomplished
- Detail the assumptions made and address the system boundary conditions, mass and energy balance, preliminary levelized cost of hydrogen, and CO_2 emission estimates, as applicable
- Include quantitative information on all necessary feedstocks, as estimated yield of hydrogen (or conversion rate from feedstock and energy source to hydrogen), identification of any expected byproducts, or waste-products, as well as the expected hydrogen purity.

Phases & Prizes

Phase 1: Propose!

Submission Elements Overview

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Read the Rules

Official rules for the
Hydrogen Shot Incubator Prize
are available online.

Hydrogen Shot HeroX Page → Resources Tab

https://www.herox.com/HydrogenShotPrize

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)

✓ **Private entities and non-federal government entities are subject to the following requirements:**

- Individuals or teams of individuals must be part of or represent a legally formed entity to compete. Only legally formed entities (not individuals) may enter into research agreements with national laboratories to use voucher funds.

  Individuals can form an LLC in the U.S. to fulfill this requirement.

- Individuals competing as part of a team may participate if they are legally authorized to work in the United States, provided that the entity is a U.S.-based company or university.

- Private entities must be incorporated in and maintain a primary place of business in the United States with majority domestic ownership and control. Academic institutions must be based in the United States.

Ineligibility

- Federal entities and federal employees
- Employees of an organization that co-sponsors this program with DOE
- Individuals who worked at DOE (federal employees or support service contractors) within six months prior to the submission deadline. Additionally, members of their immediate families and anyone who lives in their household, regardless of relation
- National laboratory employees.

Please review official rules for all eligibility and ineligibilities.

WHO?

CAN COMPETE

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

Scientists

Students & Faculty

Entrepreneurs

Anyone with a BIG! idea

Important Dates

Phase 1: Propose! (2 months)

- June 6, 2022: Phase 1: Propose! Phase Opens
- **August 17, 2022: Phase 1: Propose! Phase Submission Deadline**
- October 7, 2022: Hydrogen Shot Incubator Prize Phase 1 Winners Announced

Submission Package

- Cover page content
- Up to 90-second video
- Concept narrative that answers four questions about the *innovation, potential, team, and DEI plan*
- One summary PowerPoint slide
- Letters of commitment or support.

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, and nine-digit zip code.

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 ☑

Video

What is your innovation in 90 seconds?

Suggested Content:

- The concept you are developing
- Why your innovation has potential to be transformational and achieve the Hydrogen Shot goal
- Describe your team and facilities and your ability to safely carry out this project.

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

Concept narrative **Max 1,500 Words and Supporting Images or Figures (PDF)**	
Question 1: *Innovation* – What is the innovation and what is its potential to drive down the cost of clean hydrogen production?	
Suggested Content • Describe the innovation, quantifying its significance with metrics. Be specific regarding the potential to drive down the cost of clean hydrogen production (CAPEX, OPEX, etc.).[9] • Describe the innovation in as much detail as possible, including boundary conditions, assumptions made, safety considerations, as well as any cost benefit expected from the sale of co-products or cost penalties in the handing of waste products. • Justify how the innovation could be scaled up to clean hydrogen production volumes relevant to the Hydrogen Shot. • Describe where this work will be completed and where you will source materials for this work. If any work is sourced outside the U.S., you must submit a waiver (Table 7).	**Review Criteria** • The competitor describes an innovation using relevant metrics. • The competitor provides sufficient detail to describe their innovation. • The solution represents an innovative approach built on reasonable assumptions, valid technical foundations, and lessons learned from other notable efforts in this space. • The competitor provides compelling reasoning as to why the innovation has the potential to drive down the cost of clean hydrogen production at relevant scales in a safe manner. • The work and material sourcing will occur entirely in the U.S., or an adequate waiver has been provided.

TIPS & TRICKS

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

Required ☑
Scored ☑
Public ☒

Technical Narrative

Question 2: *Potential* – Why will your innovation be successful?	
Suggested Content • Describe how the innovation has the potential to improve on the state-of-the-art in existing products or provide benefits over other emerging solutions. • Describe the CO_2 produced at the site of hydrogen production and from the feedstock or energy source needed for production (if any). • Describe your plan to reach clean hydrogen production goals (as applicable). • Provide an estimated spend plan showing how you would leverage program resources toward meeting overall goals.	**Review Criteria** • The competitor's assessment of current clean hydrogen production technologies and their pros and cons shows a comprehensive understanding of the space. • The competitor provides sufficient technical detail to justify how this innovation improves upon other technologies. • The competitor either has a credible plan for managing CO_2 produced at the site of production or already produces hydrogen in a manner that meets clean hydrogen goals. • The proposed plan effectively uses resources available in this program to advance the innovation.

Required ☑
Scored ☑
Public ☒

Technical Narrative

Question 3: *Accomplishments and Team* – What have you done to date, and what qualities give you a competitive edge?

Suggested Content	Review Criteria
• Describe your efforts to advance your concept both prior to and since the announcement of the Prize; highlight key milestones achieved. • Explain why winning the ***Propose! Phase*** will substantively change the likely outcome for the proposed innovation. • 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 diversity, experience, and its track record that makes it likely to succeed in the prize competition. What experience do you have trying new things, solving difficult problems, and overcoming barriers to bring ideas to reality? • Describe the facilities available to you and their ability to carry out the work you propose safely.	• The extent to which winning the ***Propose! Phase*** would build on prior efforts and accomplishments; and significantly increase the team's chances of developing a novel concept to a lab-scale demonstration. • The team's track record demonstrates notable qualities such as adaptability, creativity, decisiveness, and resourcefulness. This team is diverse and has the knowledge, experience, and determination to transform their proposed innovation into a demonstration in the near future. • The facilities described are adequate to safely carry out the research proposed.

Required ☑
Scored ☑
Public ☒

Technical Narrative

Question 4: *DEI Plan*	
Suggested Content • Describes the actions the team will take to foster a welcoming and inclusive environment, support people from groups underrepresented in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project. • Describe the impacts of the proposed project on underserved communities, including social and environmental impacts. • Describe how DEI objectives will be incorporated in the project.	**Review Criteria** • The actions the team plans to take to foster their team environment is inclusive. • The proposed technology will have a positive impact on underserved communities. • The DEI plan is sound and executable.

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: Propose!

How We Score

Expert Reviewers

- An expert panel of reviewers organized by DOE and the Prize Administrator will review proposals and provide numeric assessments for each submission element considering the review criteria for that element

- The reviewers cannot have personal or financial interests in, or be an employee, officer, director, or agent of any entity that is a registered competitor in this phase; or have a familial or financial relationship with an individual who is part of a registered team

- Expert Reviewers will sign a Non-Disclosure Agreement.

Scoring

- The reviewers read, score, and comment on the content from each submission. Submissions will be scored on a scale from 1 to 6.
- The final score from an individual reviewer for a submission package equals the total sum of the scores. All reviewers' final scores are then averaged for the final total score for the submission package.
- DOE, in consultation with the Prize Administrator, considers reviewer scores, program policy factors, and interviews (if applicable) when selecting winners. DOE is the judge and final decision maker and may elect to award all, none, or some of the prize funds and vouchers to competitors at each submission deadline.

Phase 1: Propose!

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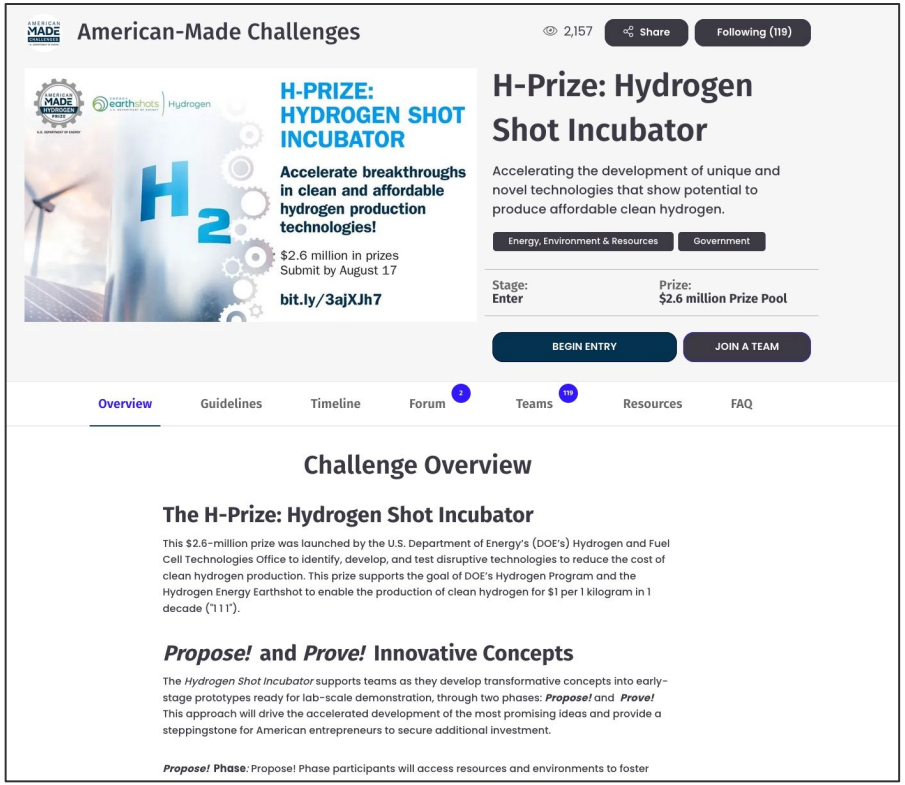
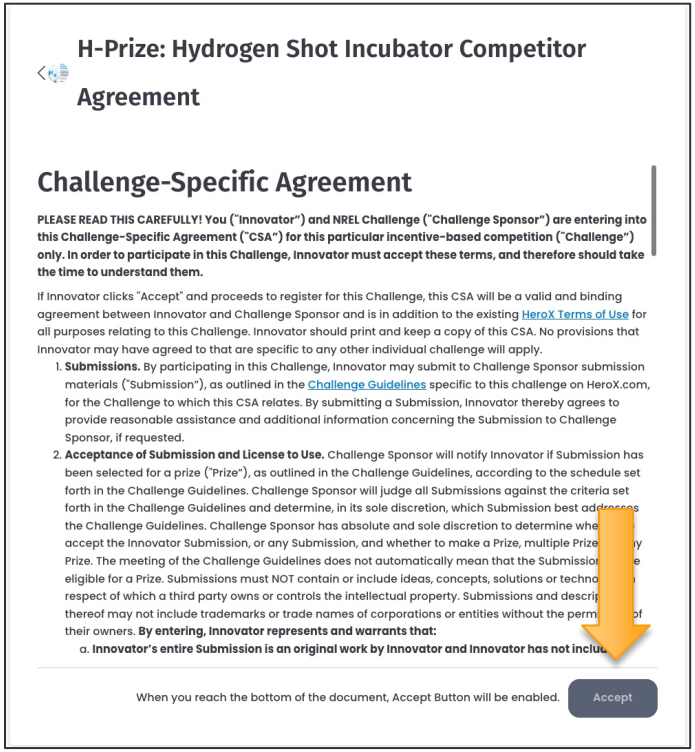
Apply on HeroX

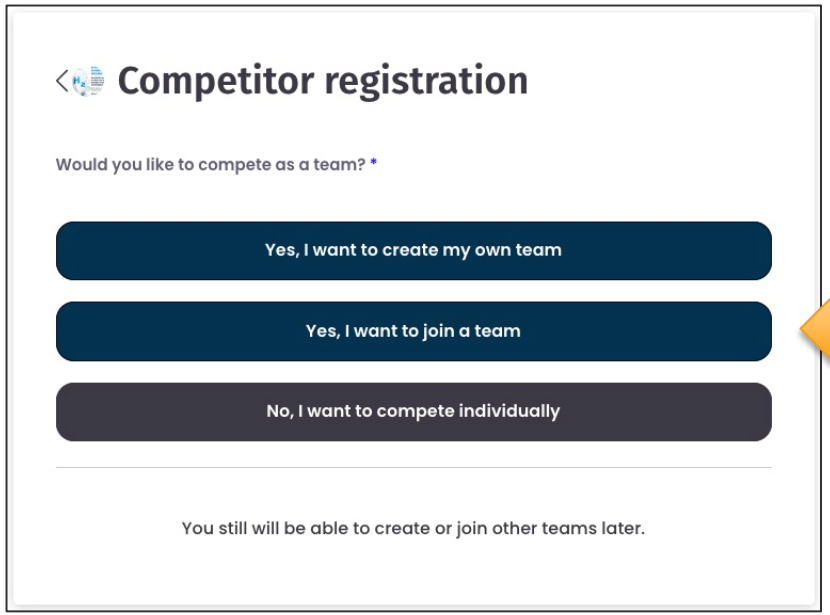
HeroX



https://www.herox.com/HydrogenShotPrize

HeroX


H-Prize: Hydrogen Shot Incubator Competitor Agreement
Challenge-Specific Agreement
PLEASE READ THIS CAREFULLY! You ("Innovator") and NREL Challenge ("Challenge Sponsor") are entering into this Challenge-Specific Agreement ("CSA") for this particular incentive-based competition ("Challenge") only. In order to participate in this Challenge, Innovator must accept these terms, and therefore should take the time to understand them.
If Innovator clicks "Accept" and proceeds to register for this Challenge, this CSA will be a valid and binding agreement between Innovator and Challenge Sponsor and is in addition to the existing HeroX Terms of Use for all purposes relating to this Challenge. Innovator should print and keep a copy of this CSA. No provisions that Innovator may have agreed to that are specific to any other individual challenge will apply.
1. Submissions. By participating in this Challenge, Innovator may submit to Challenge Sponsor submission materials ("Submission"), as outlined in the Challenge Guidelines specific to this challenge on HeroX.com, for the Challenge to which this CSA relates. By submitting a Submission, Innovator thereby agrees to provide reasonable assistance and additional information concerning the Submission to Challenge Sponsor, if requested.
2. Acceptance of Submission and License to Use. Challenge Sponsor will notify Innovator if Submission has been selected for a prize ("Prize"), as outlined in the Challenge Guidelines, according to the schedule set forth in the Challenge Guidelines. Challenge Sponsor will judge all Submissions against the criteria set forth in the Challenge Guidelines and determine, in its sole discretion, which Submission best addresses the Challenge Guidelines. Challenge Sponsor has absolute and sole discretion to determine whe accept the Innovator Submission, or any Submission, and whether to make a Prize, multiple Prize Prize. The meeting of the Challenge Guidelines does not automatically mean that the Submissio eligible for a Prize. Submissions must NOT contain or include ideas, concepts, solutions or techno respect of which a third party owns or controls the intellectual property. Submissions and descri thereof may not include trademarks or trade names of corporations or entities without the perm of their owners. By entering, Innovator represents and warrants that:
a. Innovator's entire Submission is an original work by Innovator and Innovator has not inclu
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.

What's Next?

1. Follow the challenge on HeroX

   https://www.herox.com/HydrogenShotPrize

2. Read the rules:

   Hydrogen Shot HeroX → Resources Tab

3. Start innovating!

4. Apply by August 17, 2022.

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Thank you!

Questions?

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Email: HydrogenShotPrize@nrel.gov

The #H2IQ Hour

Thank you for your participation!

Learn more:

energy.gov/fuelcells
hydrogen.energy.gov