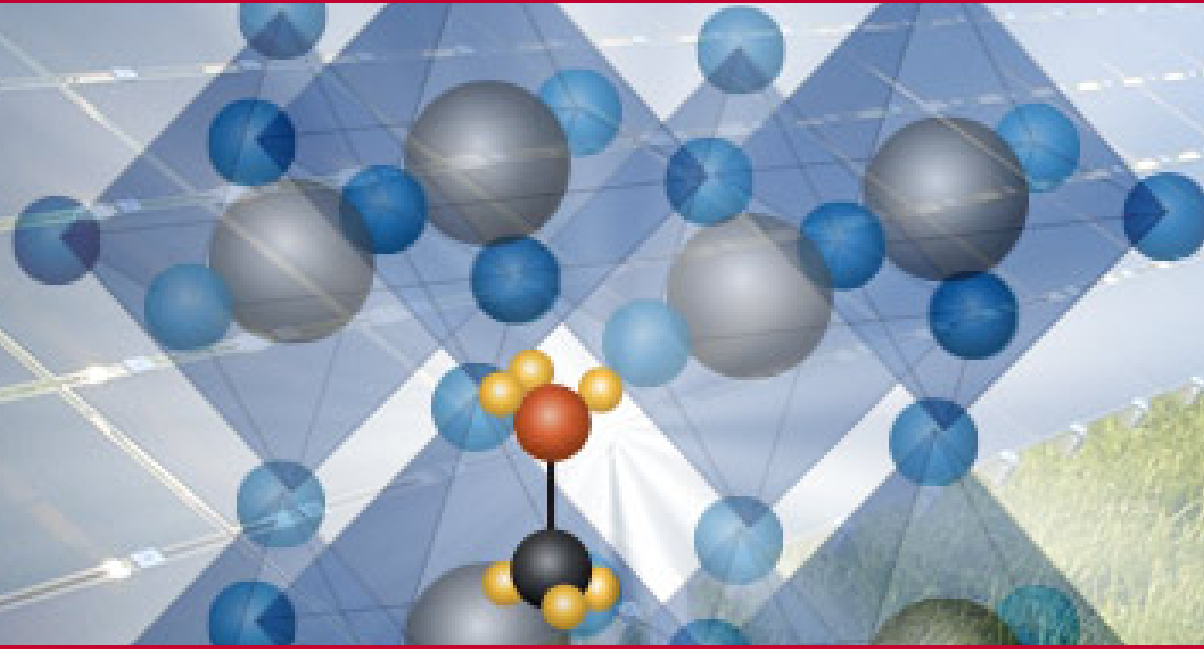


# Perovskite Startup Prize



Kick-Off Webinar April 13<sup>th</sup>, 2021



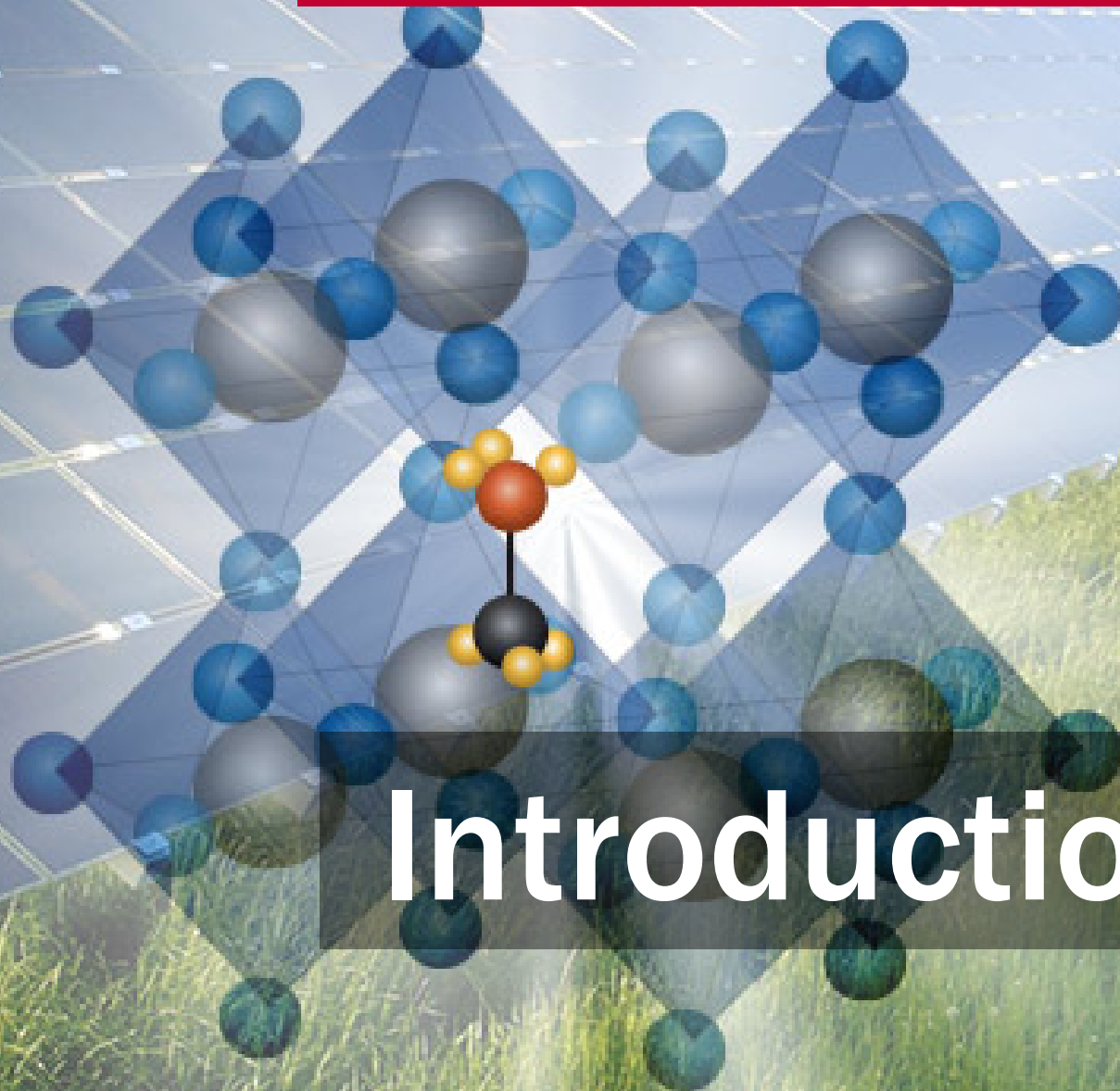
**Disclaimer:** All details necessary to participate in the American Made Solar Prize program are provided in the Official Rules document online. The information provided in this presentation is not intended to amend, modify or substitute details provided in the Official Rules. Information presented should be used in conjunction with the Official Rules. In addition, any reference in presentation to any specific commercial product, process, or service, or the use of any trade, firm or corporation name is for the information and convenience of the public, and does not constitute endorsement, recommendation, or preference by the U.S. Department of Energy. Visit [americanmadechallenges.org](http://americanmadechallenges.org)

U.S. DEPARTMENT OF ENERGY

# Countdown Topics

- Introduction with Peter Lobaccaro
- Overview of the Perovskite Startup Prize
- Important dates and events
- Submitting to Countdown – How to make your submission shine
- Judging criteria and ranking requirement
- Utilizing the Network
- Questions

# Perovskite Startup Prize

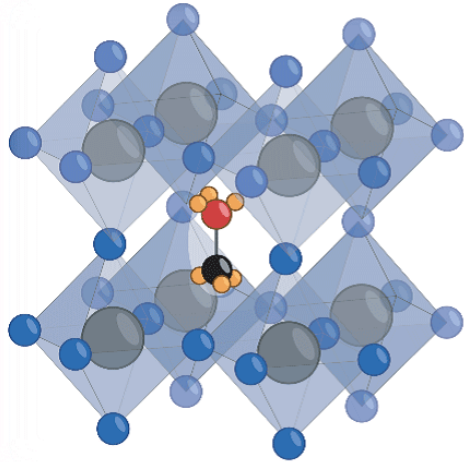


## Introduction

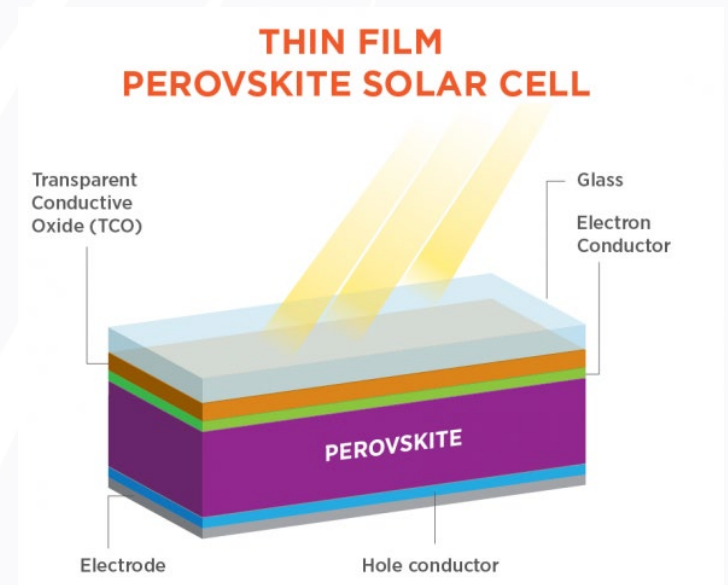


U.S. DEPARTMENT OF ENERGY

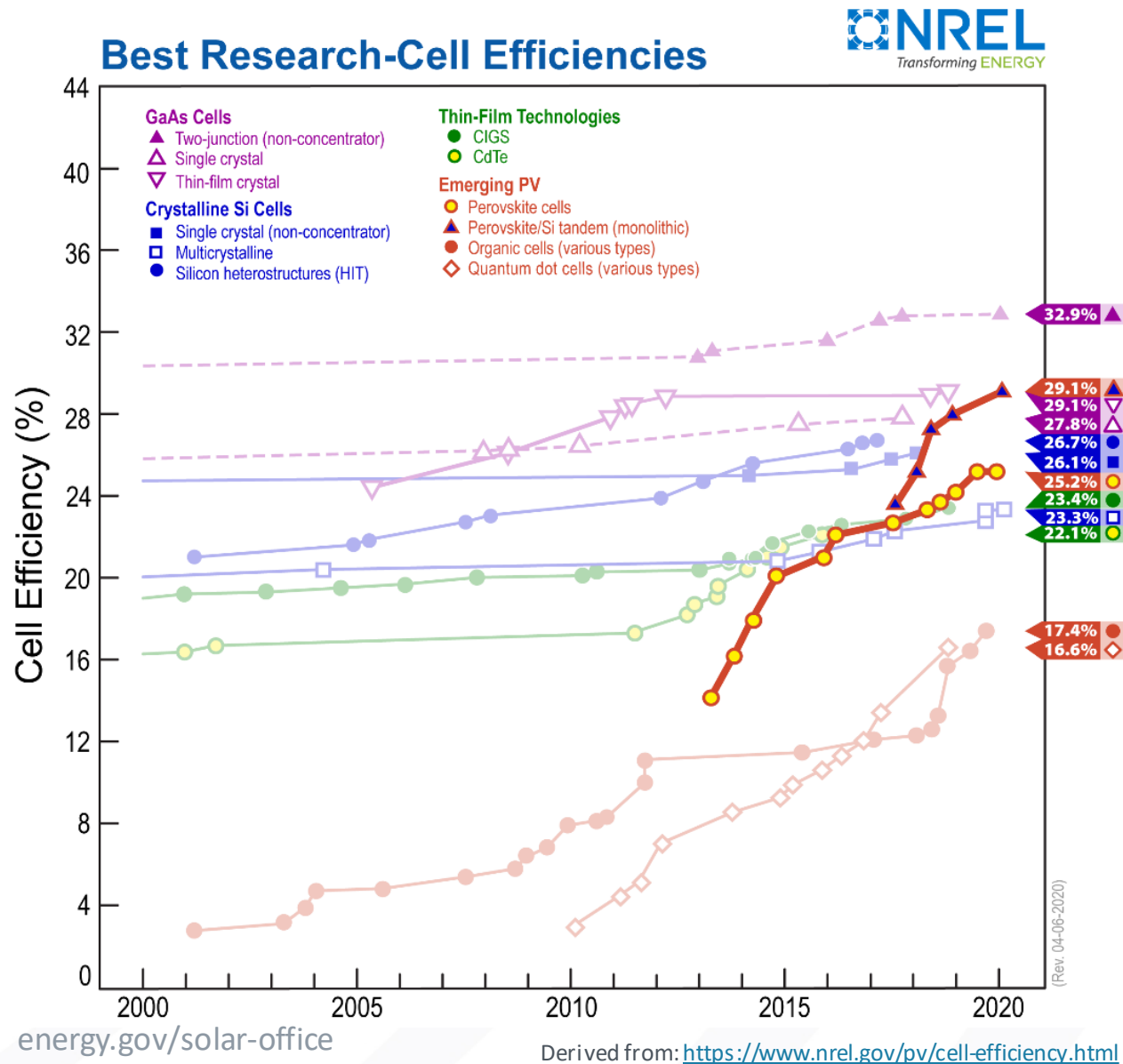
# What are Perovskite Photovoltaics?



- **Class of photovoltaic materials**
  - Named for the crystal structure ( $ABX_3$ )
  - Most basic formulation is methylammonium lead iodide ( $CH_3NH_3PbI_3$ )
  - There are many formulations under investigation
    - Swap  $MA^+$  with  $FA^+$  or  $Cs^+$ , swap  $Pb^{+2}$  for  $Sn^{+2}$ , or swap  $I^-$  with  $Cl^-$  or  $Br^-$
- **Typically fabricated as a thin-film PV technology**
  - Modules produced directly from inks/powders, no intermediate wafers, cells, etc.
  - Fabricated using solution and spray printing techniques, as well as evaporation and vapor deposition
- **Diverse architectures:**
  - Can be stand-alone devices
  - Tandems with other PV technologies (silicon, etc.)

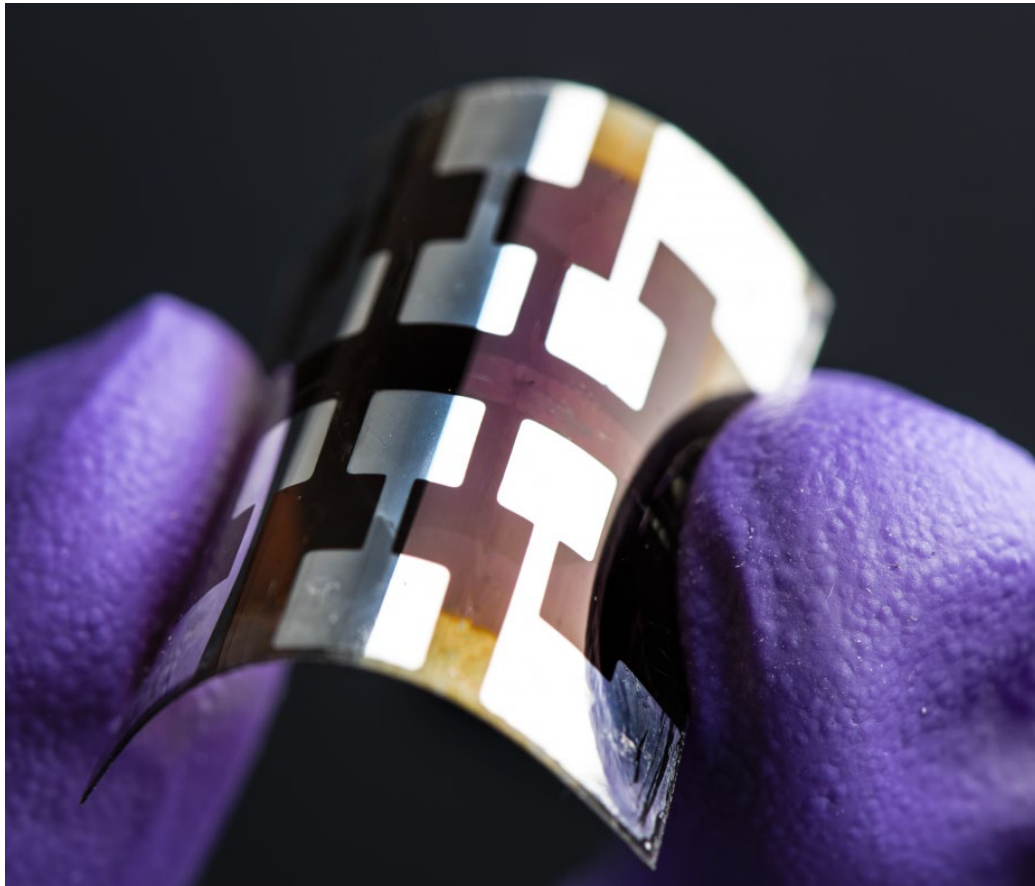


# What makes Perovskite PV so exciting?



- Could be high efficiency as tandems  
→ good for space-constrained applications
- Can be flexible or rigid  
→ wide market and integration options
- Could have very low production costs  
→ cheaper modules
- Could have very low capital intensity  
→ cheaper factories

# What makes Perovskite PV so exciting?



<https://www.energy.gov/eere/solar/perovskite-solar-cells>

- Could be high efficiency as tandems  
→ good for space-constrained applications
- **Can be flexible or rigid**  
→ **wide market and integration options**
- Could have very low production costs  
→ cheaper modules
- Could have very low capital intensity  
→ cheaper factories

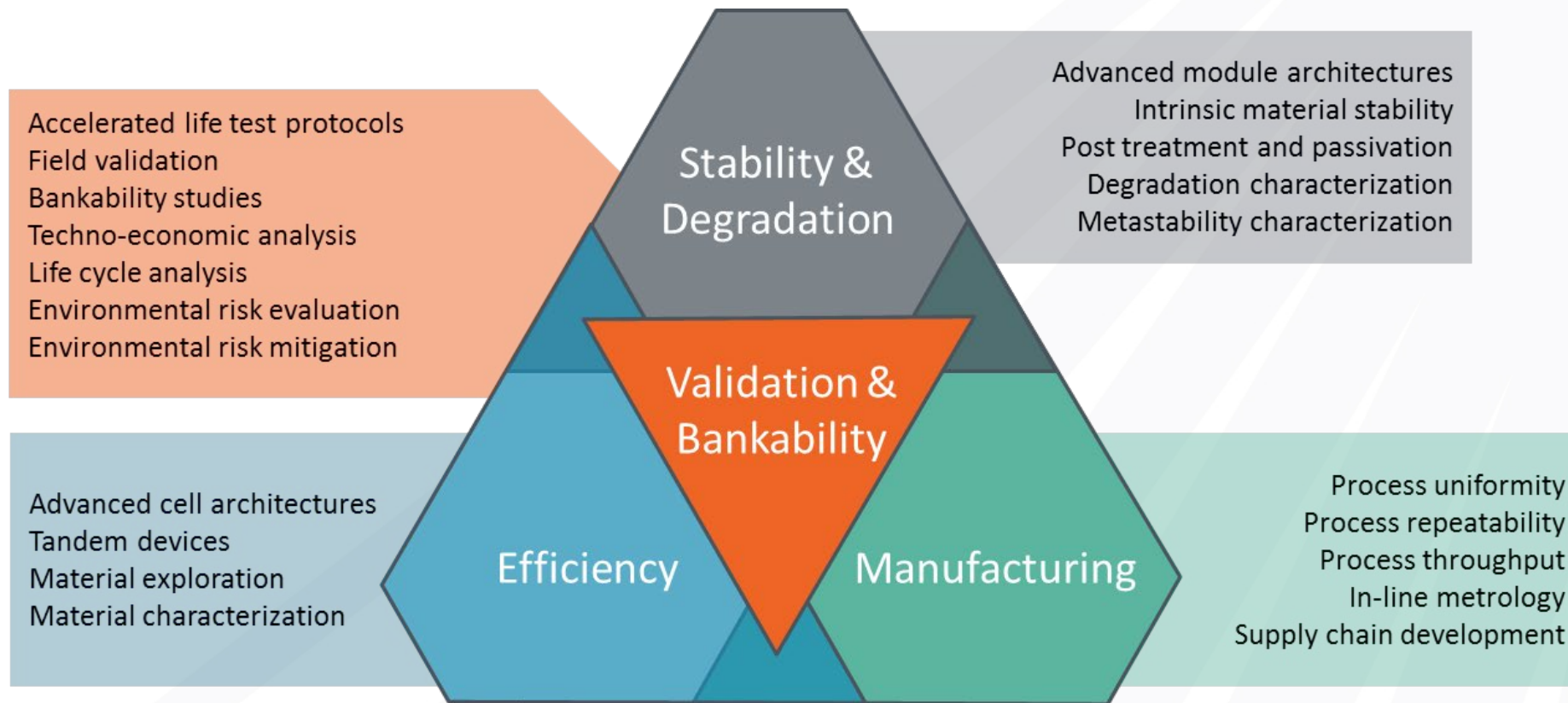
# What makes Perovskite PV so exciting?



<https://www.nytimes.com/2019/03/26/magazine/daily-miracle-times-print-plant-college-point.html>

- Could be high efficiency as tandems  
→ good for space-constrained applications
- Can be flexible or rigid  
→ wide market and integration options
- **Could have very low production costs**  
→ cheaper modules
- **Could have very low capital intensity**  
→ cheaper factories

# What are the Major Challenges?



All challenges must be simultaneously met for commercial competitiveness

More Details: <https://www.energy.gov/eere/solar/perovskite-solar-cells>



# \$40M for Perovskite Funding Program Selections

## US government wants to cut solar costs by 60% in 10 years

The US Energy Department set a goal of achieving 2 cents/kWh by 2030, and announced an initial \$128 million in funding to support technology development.

MARCH 26, 2021 DAVID WAGMAN

Source: PV Magazine



Energy Secretary Jennifer Granholm Image: J. Scott Applewhite

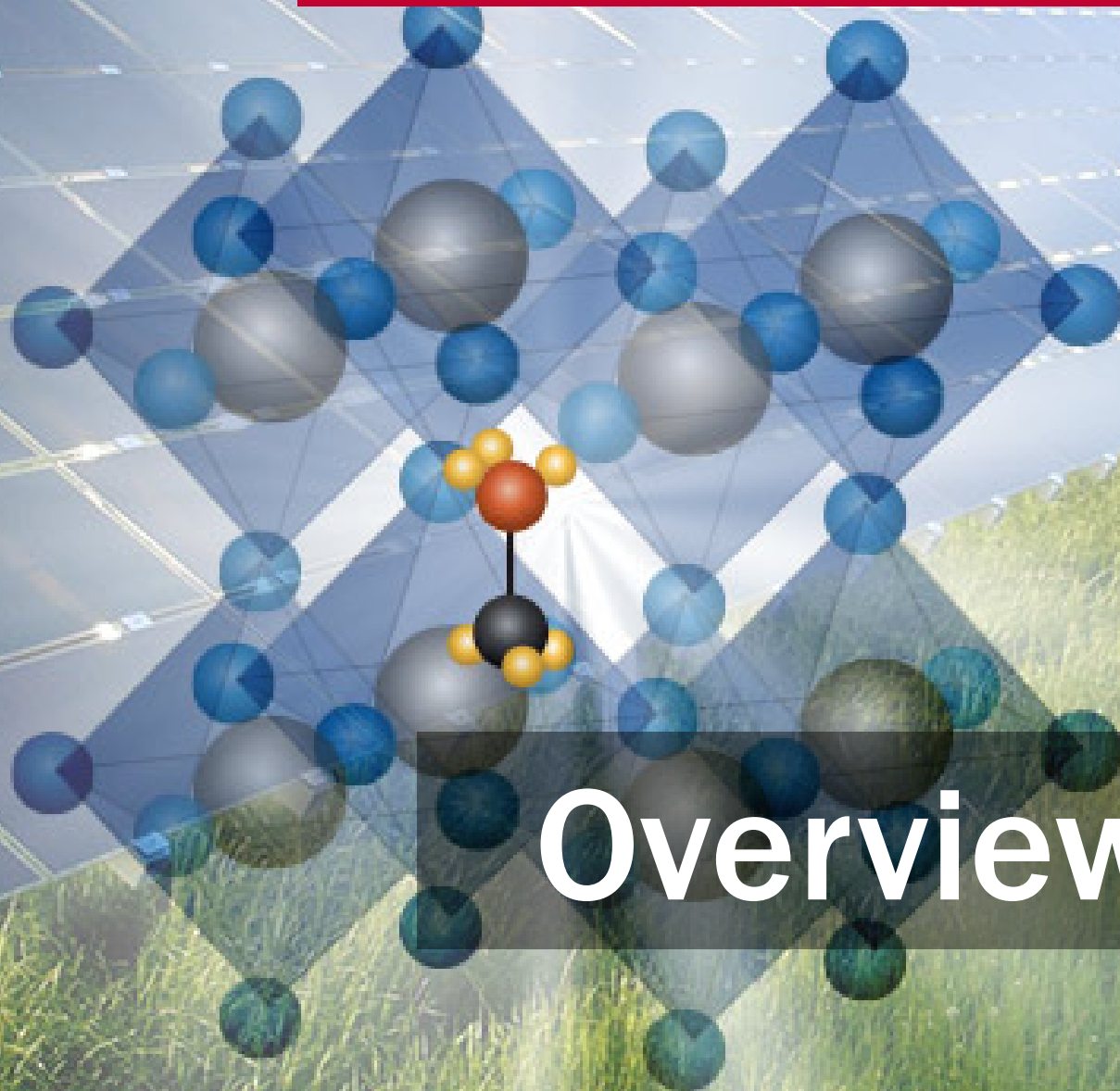
The \$128 million funding initiatives are through DOE's Solar Energy Technologies Office (SETO) and aim to support advancements in perovskites and cadmium telluride (CdTe) thin films. The awards include:

**\$40 million for perovskite R&D:** Perovskites are a family of emerging solar materials that have potential to make highly efficient thin-film solar cells with low production costs. DOE awarded \$40 million to 22 projects that will advance perovskite PV device and manufacturing research and development as well as performance.

Projects that received funding included \$2 million for work to design and prototype 1-meter by 2-meter tandem perovskite modules and investigate encapsulation and backsheets to enhance module durability in the field, and \$500,000 to develop a new low-bandgap perovskite for perovskite-perovskite tandem solar cells. A full list of funded projects is [here](#).

[energy.gov/eere/solar/solar-energy-technologies-office-fiscal-year-2020-perovskite-funding-program](https://energy.gov/eere/solar/solar-energy-technologies-office-fiscal-year-2020-perovskite-funding-program)

# Perovskite Startup Prize



## Overview



U.S. DEPARTMENT OF ENERGY

# PURPOSE



## **Deploy Clean Energy Technologies**

*To advance  
innovative perovskite  
technology and  
industry*



## **Empower innovators**

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



## **Network-powered pathway to disruptive innovation**

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

# What's the Perovskite Startup Prize?



**\$3 million prize  
competition**

Countdown and Liftoff Contests



**National Network of  
support organizations**

American-Made Network



# American-Made PEROVSKITE STARTUP PRIZE



## COUNTDOWN CONTEST

- Build a perovskite-focused team
- Develop technical and business goals
- Secure access to equipment and labs



**6-9**

COMPANIES



**\$200K**

CASH PRIZE



## LIFTOFF CONTEST

- Demonstrate substantial progress
- Undergo technology validation
- Solidify network of mentors and partners



**2-3**

COMPANIES



**\$500K**

CASH PRIZE



**\$100K**

TECH SUPPORT  
VOUCHER

*Winners from Countdown contest*

# 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



# Read the Rules



## American-Made Perovskite Startup Prize

The American-Made Perovskite Startup Prize is designed to accelerate the growth of the domestic perovskite industry, with support from a diverse and powerful support network that leverages national laboratories, energy incubators, and other resources across the United States.

## These rules are effective from March 25, 2021

The U.S. Department of Energy (DOE)'s American-Made Perovskite Startup Prize will be governed by these official rules. The prize administrator and DOE reserve the right to modify the official rules if necessary, will publicly post any such modifications, and will notify prize competitors of any modifications.

1 | American-Made Perovskite Startup Prize Official Rules 3/25/2021

# Official Rules of the American-Made Perovskite Startup Prize are available online

[https://americanmadechallenges.org/perovskiteprize/docs/rules/Perovskite\\_Prize\\_Official\\_Rules.pdf](https://americanmadechallenges.org/perovskiteprize/docs/rules/Perovskite_Prize_Official_Rules.pdf)

# Eligibility Requirements



For-Profit Business Entity - Be formed in and maintains a primary place of business in the US with majority domestic ownership and control

- Companies must be incorporated after October 25<sup>th</sup>, 2020 (within six months prior to the announcement of this competition or any time after the announcement)
- Registered competitor must be an employee or owner of that business
- Individuals or groups of individuals are not eligible to compete



# Perovskite Startup Prize Timelines

  
**6-9**  
COMPANIES

  
**\$200K**  
CASH PRIZE




The first Countdown Submission Period is open!

Date	Deadline
Mar. 2021	Announcement. Countdown Contest open!
June 30, 2021 5:00 PM ET	Countdown Submission Deadline #1
Sept. 30, 2021 5:00 PM ET	Tentative* Countdown Submission Deadline #2
Jan. 7, 2022 5:00 PM ET	Tentative* Countdown Submission Deadline #3
March 31, 2022 5:00 PM ET	Tentative* Countdown Submission Deadline #4
June 30, 2022 5:00 PM ET	Tentative* Countdown Submission Deadline #5

**\*Prize funds must still be available**

- Participants not selected in Countdown will be given feedback and encouraged to resubmit in future open-application periods.
- DOE will announce when the Countdown Contest is over, and The Liftoff Contest will end when the prize pool is exhausted, regardless of whether all Countdown winners have applied to enter the Liftoff Contest.
- The Countdown Contest will have additional submission openings each consecutive quarter if prize funds are still available

# Perovskite Startup Prize Timelines

 **2-3**  
COMPANIES
  **\$500K**  
CASH PRIZE
  **\$100K**  
TECH SUPPORT  
VOUCHER

The first Liftoff Contest Submission Period will open after the first Countdown Winner is selected!

Date	Deadline	Requirements/Notes
Mar. 2021	Announcement	Open for Countdown submissions
June 30, 2021 5:00 PM ET	Countdown Submission Deadline #1	Open for Liftoff submissions
Sept. 30, 2021 5:00 PM ET	Tentative* Liftoff Submission Deadline #1	Liftoff – Must have won Countdown #1
Jan. 7, 2022 5:00 PM ET	Tentative* Liftoff Submission Deadline #2	Liftoff – Must have won Countdown #1 or #2
March 31, 2022 5:00 PM ET	Tentative* Liftoff Submission Deadline #3	Liftoff – Must have won Countdown #1, #2, or #3
June 30, 2022 5:00 PM ET	Tentative* Liftoff Submission Deadline #4	Liftoff – Must have won Countdown #1, #2, #3, or #4
* Must have announced Countdown Winners and Prize funds must still be available		

- As soon as someone wins the Countdown Contest, the Liftoff contest begins.
- Only winners of the Countdown Contest are eligible to apply to the Liftoff Contest within **12** months of winning the Countdown Contest.
- Liftoff Contest competitors who do not win on their first attempt will have one more opportunity to apply to compete in the Liftoff Contest within **15** months of winning the Countdown Prize.
- DOE will announce when the Countdown Contest is over, and The Liftoff Contest will end when the prize pool is exhausted, regardless of whether all Countdown winners have applied to enter the Liftoff Contest.

# Important Dates

## Now!

Sign up to be part of the Challenge to learn about Connectors, Mentors, and see what types of services they offer

## June 30, 2021 3:00 PM ET

Last day to complete a submission for the Countdown Contest Submission Deadline #1



# Perovskite Startup Prize

## What You Need to Know About the Countdown Contest



U.S. DEPARTMENT OF ENERGY

# Countdown Contest Goals

- **Teaming:** Develop a world-class, cross-functional team with credible perovskite and business development expertise that will form a new perovskite PV company.
- **Planning:** Develop well-articulated, aggressive but achievable technical and business goals to be accomplished by the Liftoff Contest that have been vetted by a wide array of stakeholders and industry experts.
- **Facility Access:** Secure access to the necessary equipment and laboratory facilities that enable you to pursue your development plans in the next stage of the competition.

# Countdown Contest Process

## Prove Credibility

- Demonstrate that you are a qualified competitor who has successfully completed world-class perovskite research

## Team Up

- Form and build an exceptional and committed team using the American-Made Network and Mentors

## Activate and Incorporate

- Incorporate a for-profit business

## Develop a Plan and a Deliverable Table

- Develop robust R&D and commercialization plans with goals to be met by the Liftoff Contest deadline



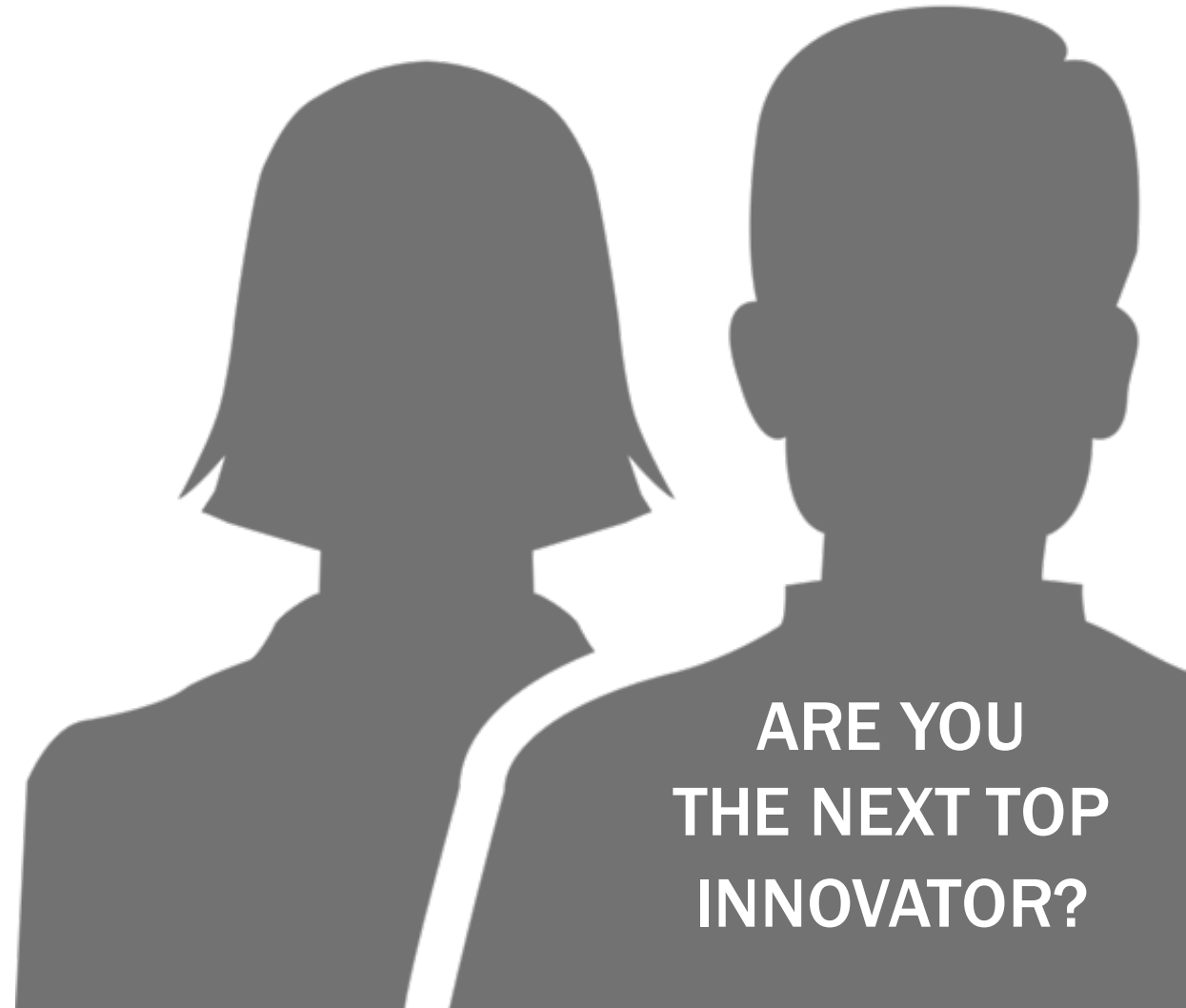
# Countdown Contest Process

## Submit!

- Complete the submission package and submit before the relevant quarterly review cycles for the contest closes

## Assess (Prize Administrator and Expert Reviewers)

- Team Capabilities
- Viability
- IP Protection
- Milestones and Deliverable Table
- Network Engagement



# Countdown Contest Process

## Interview (Prize Administrator)

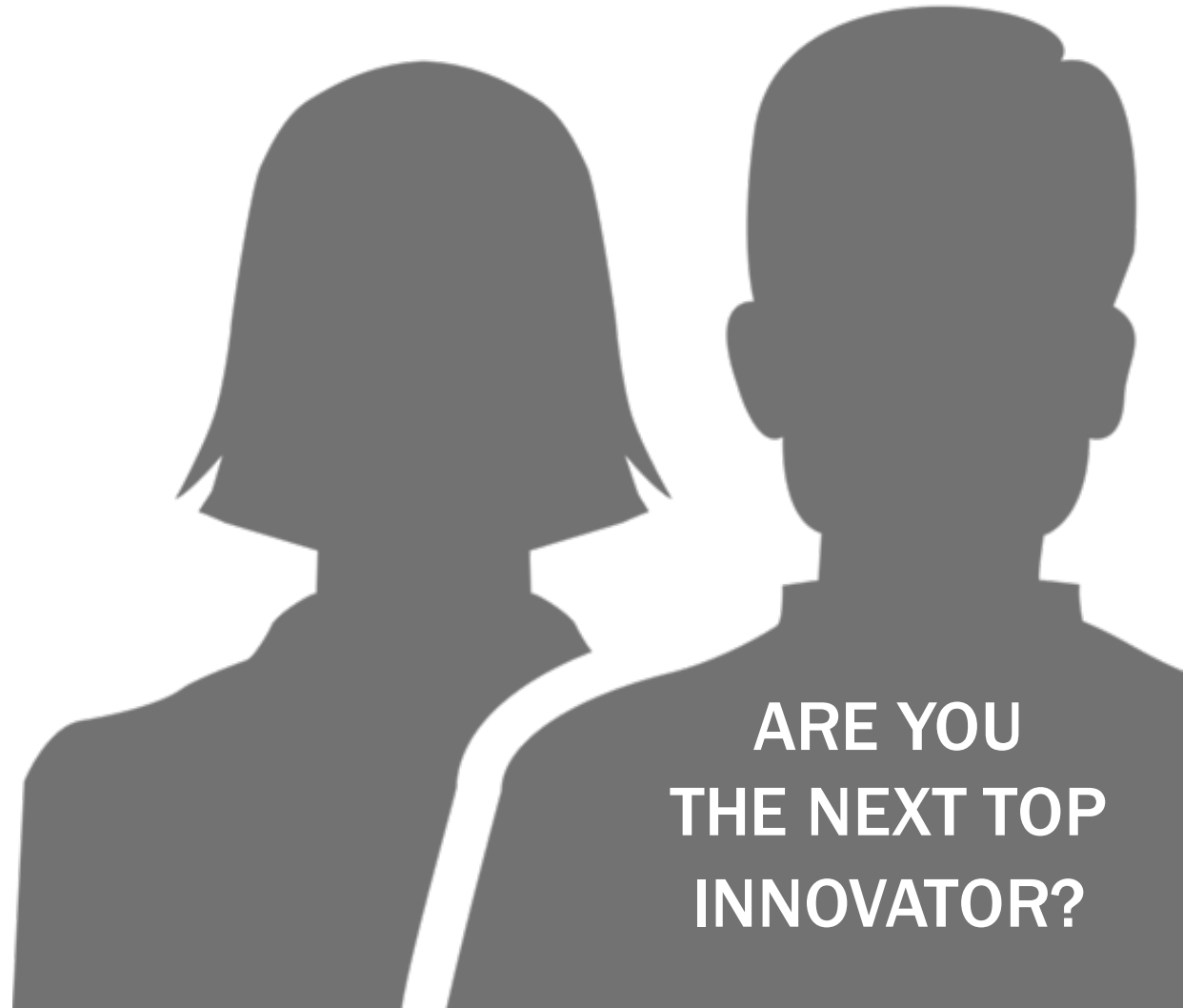
- To help judges answer any questions, we may hold interviews.

## Announcement (Prize Administrator)

- Notify winners and distribute cash prizes, then publicly announce winners

## Resubmission to Countdown or Liftoff!

- If not selected, prepare and resubmit to the Countdown Contest the following quarter
- If selected, prepare and submit to the Liftoff Contest within the next 12 months.





# What to Submit by the first deadline: June 30<sup>th</sup>, 2021

1. 120-second video (public)
2. Cover page content
3. Narrative answers to four questions about the **Team, Technology and Accomplishments, Deliverable Table, and Development Roadmap** (2,500 words)
4. Resumes
5. Technical assistance request (2 pages, public)
6. Summary PowerPoint slide (public)
7. Letters of commitment or support (optional)

# Innovation in 120 Seconds

## Suggested content

- A description of your team, emphasizing perovskite and business expertise.
- An overview of the general operational details about your perovskite innovation and why you have a competitive edge.
- Your current capabilities for perovskite deposition and scale-up, and what have you demonstrated to date.
- Your target market and how you will create a sustainable business with U.S. manufacturing.

## Tips

- Be creative and focus on content
- Ask others for help
- Get feedback before you post online

\*[1 = Strongly Disagree, 2 = Disagree, 3 = Slight Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree]



## Judges will consider these criteria\*

- The competitors are highly qualified.
- The video describes a unique perovskite approach that has a realistic ability to become a successful business in the long term.
- The team has access to state-of-the-art facilities and has demonstrated an ability to produce relevant perovskite devices.
- The video identifies a reasonable target market and a path to making a significant impact on the U.S. solar industry.

# Four Questions

## 1. TEAM

**Why is your team considered “world class” with all of the necessary technical and business expertise?**

## 2. TECHNOLOGY AND ACCOMPLISHMENTS

**What is your technology platform, what have you done to date, and what qualities give you a competitive edge?**

## 3. DELIVERABLE TABLE

**What are your technical and business goals for Liftoff, are they both aggressive and achievable, and will they significantly advance you toward achieving a sustainable business?**

## 4. DEVELOPMENT ROADMAP

**What are the next steps for you technology and business, and do you have access to the necessary resources to achieve them?**

# Narrative Content + Judging

## Question 1: Why is your team considered “world class” with all of the necessary technical and business expertise?

### Suggested content you provide

- An introduction to your team and a description of how it came together, highlighting the knowledge and skills that make it uniquely capable of achieving success.
- An explanation of how the team identified and filled skill gaps, leveraging the American-Made Network where appropriate.
- A statement about why winning the Countdown Contest will substantively change the likelihood of your success.

### Judges score each statement on a 1-6 scale\*

- The team’s drive, knowledge, and complementary skillsets provide a strong competitive edge toward developing a perovskite solar company.
- The team identified skill gaps and brought in the right people or partners to fill those gaps.
- Winning the Countdown Contest significantly increases the team’s chances of creating a viable business based on their solution.

\*[1 = Strongly Disagree, 2 = Disagree, 3 = Slight Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree]

# Technical Assistance Request

## Submit a technical assistance request as part of your Countdown Contest

package to help the American-Made Network understand your needs and assist you.

- Two pages describing the areas where you need assistance
- Network will fill in the gaps and push you towards success



# Submission Form on HeroX & Template in Resources Tab

## American-Made Perovskite Startup Prize SUBMISSION FOR COUNTDOWN



### PROJECT NAME

Innovation tagline (e.g., your mission in a few words)

Keyword tags

### KEY PROJECT MEMBERS

Names, geographic locations, contact info, and LinkedIn profiles

### BUSINESS NAME

Name, city, state, and nine-digit zip code

### PARTNERS AND AMERICAN-MADE NETWORK

Key project partners and organizations (if any)

The Connectors and Mentors (up to 3) that significantly helped you advance your solution and the major items they helped with (if applicable)

[Link to your 120-second video](#)

## Create Submission

[Save & Preview](#)

**Title \***

Give your submission idea a catchy title that describes the idea and gets people interested.

**Short description**

Provide a brief description of your idea. Be clear and concise.

**Image**

[Upload image](#)

Tip: An image boosts your message by illustrating your solution. For best results, ensure your image contains the following items: an actor(ess) (person), artifact (tool they're holding), action (what they're doing), and atmosphere (setting where they are). Ensure your image is at least 650 pixels wide by 366 pixels tall for clarity.

**Link to your 90 second video \***

Post your publicly accessible video online (e.g. YouTube, Vimeo, etc.). Be creative and produce a video that conveys the required information in exciting and interesting ways but do not focus on time consuming activities that only improve production values (i.e. technical elements such as décor, lighting, and cinematic techniques). Assistance from others with experience in this area may be helpful. The American-Made Network may be able to help you with creating your video.

**Cover Page \***

[Choose File](#) no file selected

List basic information about your submission, such as: project name, innovation tagline, URL address from HeroX showing the proposed ideation problem you plan to address (if applicable), and key project members.

A template is provided in the Resources tab (<https://www.herox.com/SolarPrize/resources>).

**Narrative answers to four questions about the problem, solution, team, and plan \***

[Choose File](#) no file selected

You should answer each of the four questions. The content bullets are only suggestions to guide your responses. You decide where to focus your answers. The individual answers to the four questions do not have a word limit, however, the aggregate response to these four questions must not exceed 2,500 words. You may also include up to five supporting images, figures, or graphs. The judges will score the questions based on the content you have provided.

A template is provided in the Resources tab (<https://www.herox.com/SolarPrize/resources>). Use the template pages 3-6 to answer each of the four questions and upload your answers here.

See the full rules document for the questions and suggestions.

**Technical assistance request (public) \***

[Choose File](#) no file selected

Provide a two-page description of the unique challenges and needs a national lab, private facility, and/or member of the American-Made Network could potentially help you resolve. The Prize Administrator will make this request broadly available so members of the American-Made Network can understand your needs and assist you through the voucher program or otherwise.

Edit



## American-Made Challenges

893

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# Perovskite Start Up Prize

The American-Made Perovskite Startup Prize is designed to accelerate the growth of the domestic perovskite industry.

Energy, Environment & Resources

Government

Stage:  
Enter

Prize:  
**\$3 million in total prizes, distributed through 2 contests (see rules)**

SOLVE THIS CHALLENGE

Overview

Guidelines

Timeline

Forum

Teams

17

Entries

Resources

FAQ

## Challenge Overview

Challenge Overview

# Perovskite Startup Prize

Get Support for Your  
Countdown Application



U.S. DEPARTMENT OF ENERGY





# American-Made NETWORK



---

100+ Network  
partners plus  
17 national laboratories

---

-  Connectors
-  Power Connectors

# Connectors and Mentors are Rewarded

Recognition Reward Name	Anticipated Number of Awards	Dollar Amounts	Details*
<b>Recruit</b>	Up to 1 per winning Countdown team	\$1,000 per team	Distributed to Connectors who recruit a perovskite research team that wins the Countdown Contest.
<b>Support**</b>	Up to 1 per winning Countdown team	\$10,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Countdown Contest winners.
	Up to 1 per winning Liftoff team	\$15,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Liftoff Contest winners.
	Up to 1 per non-winning Liftoff team	\$5,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by competitors who competed in but did not win the Liftoff Contest.
<p>* Power Connectors and National Labs are ineligible to receive recognition rewards.</p> <p>** Teams in the Liftoff Contest may only receive up to \$15,000 total in recognition rewards.</p>			

# Introducing the Mentor Network!

Recognition Reward Name	Anticipated Number of Awards	Dollar Amounts	Details*
<b>Recruit</b>	Up to 1 per winning Countdown team	\$1,000 per team	Distributed to Connectors who recruit a perovskite research team that wins the Countdown Contest.
<b>Support**</b>	Up to 1 per winning Countdown team	\$10,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Countdown Contest winners.
	Up to 1 per winning Liftoff team	\$15,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Liftoff Contest winners.
	Up to 1 per non-winning Liftoff team	\$5,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by competitors who competed in but did not win the Liftoff Contest.

\* Power Connectors and National Labs are ineligible to receive recognition rewards.

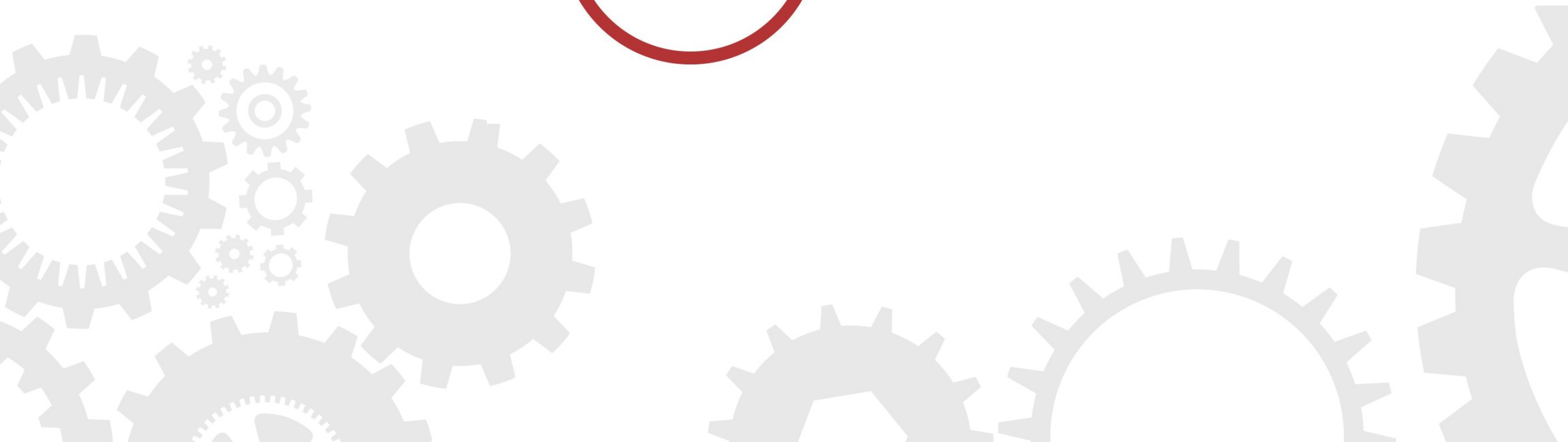
\*\* Teams in the Liftoff Contest may only receive up to \$15,000 total in recognition rewards.

Mentors are individuals with skills, expertise, or past relevant experience who can coach and advise competitors as they build their business. Mentors can help competitors by:

- Bringing deep and relevant prior experience in thin-film solar manufacturing and entrepreneurship, especially in solar, to the team
- Filling an expertise skill gap on the team
- Advising or coaching teams on their technical and business plans and targets
- Mentors who support competitors in the Countdown or Liftoff Contests will be financially rewarded, as shown in the table.

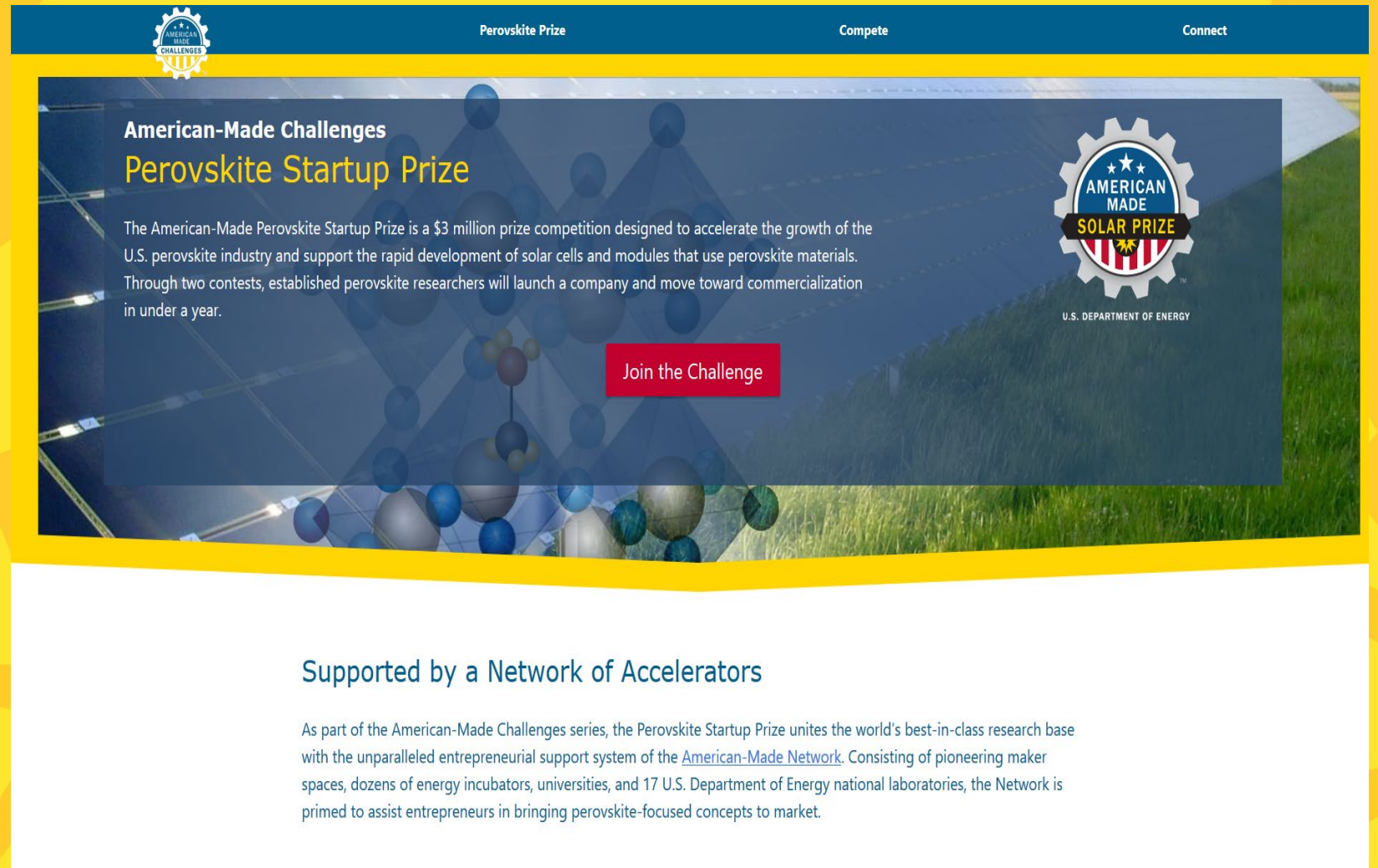
Mentors or Connectors can formally join a team in the Perovskite Startup Prize, but they forego any financial incentive and recognition payment for that round in doing so.

# Power Connector Assistance



# GET STARTED

Visit our website to learn  
more and apply!



**American-Made Challenges**  
**Perovskite Startup Prize**

The American-Made Perovskite Startup Prize is a \$3 million prize competition designed to accelerate the growth of the U.S. perovskite industry and support the rapid development of solar cells and modules that use perovskite materials. Through two contests, established perovskite researchers will launch a company and move toward commercialization in under a year.

[Join the Challenge](#)

**AMERICAN MADE SOLAR PRIZE**  
U.S. DEPARTMENT OF ENERGY

### Supported by a Network of Accelerators

As part of the American-Made Challenges series, the Perovskite Startup Prize unites the world's best-in-class research base with the unparalleled entrepreneurial support system of the [American-Made Network](#). Consisting of pioneering maker spaces, dozens of energy incubators, universities, and 17 U.S. Department of Energy national laboratories, the Network is primed to assist entrepreneurs in bringing perovskite-focused concepts to market.

[americanmadechallenges.org/perovskiteprize/](https://americanmadechallenges.org/perovskiteprize/)

# QUESTIONS?

Email:

[perovskite.prize@nrel.gov](mailto:perovskite.prize@nrel.gov)



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[www.americanmadechallenges.org/perovskiteprize/](http://www.americanmadechallenges.org/perovskiteprize/)