U.S. Department of Energy
LITHIUM-ION BATTERY RECYCLING PRIZE

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
VEHICLE TECHNOLOGIES OFFICE
ADVANCED MANUFACTURING OFFICE

2019 NAATBatt INTERNATIONAL ANNUAL MEETING & CONFERENCE
Litchfield Park, AZ. I March 11-14, 2019

Introduction to

Lithium-Ion Battery Recycling Prize

Ahmad Pesaran, National Renewable Energy Laboratory

AMERICAN MADE BATTERY RECYCLING PRIZE
U.S. DEPARTMENT OF ENERGY

The Mission and Goal of the Battery Recycling Prize

Energy Secretary announced the plans for a $5.5M Lithium-Ion Battery Recycling Prize on January 17th
EERE Assistant Secretary launched the Recycling Prize website opening it for registration and submissions on February 15th

- Energize American ingenuity to innovate technologies and processes to collect, store, sort and transport spent lithium ion for eventual recycling and recovery of critical minerals such as cobalt and lithium.

- Empower innovators and private entities with knowledge, resources, and access to rapidly transform ideas into prototypes and pilot demonstration for attracting investment for scale up and commercialization

- The goal of the prize is to develop and demonstrate processes that, when scaled, has the potential to capture 90% of all lithium-ion battery technologies in the U.S. covering consumer electronics, grid, industrial, and transportation applications.

Why Prize? Competitive Procurements vs. Prizes

Call to Solve a Challenging Problem (e.g. FOA, SBIR Grant, Prize)

Financial Award Process

- Write and submit concept papers
- Concept paper review & encouragement to submit
- Applicants write and submit full applications
- Review Applications
- Selections and award negotiations
- Begin performing
- Prepare and submit reimbursement request
- Reviews performance and reimbursement issued

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Prize Award Process

- Begin Performing
- Achieve predefined goal
- Complete submission package
- Review submissions
- Selections of winners
- Winners receive payment

Intellectual property ownership different

Make innovation easy, fast, and agile. Rapid innovation cycles will help boost competitiveness and accelerate the transition of inventions to industry.

About the Battery Recycling Prize

- A $5.5 million phased competition over three years
- Funded by the DOE's Vehicle Technologies Office in Collaboration with DOE's Advanced Manufacturing Office
  - Dave Howell, VTO Acting Office Director
  - Samm Gillard, VTO Technology Development Manager
  - Michael Mckittrick, AMO Technology Development Manager
- The prize will be administered by the National Renewable Energy Laboratory
  - Ahmad Pesaran, Technical Program Manager
- More information on the https://americanmadechallenges.org/batteryrecycling/
- HeroX, a crowdsourcing platform for enterprise and innovators, is the portal for managing the prize information, rules, submissions, judging, scoring, updates, notifications, forum, FAQs, team building, etc. (https://www.herox.com/BatteryRecyclingPrize)

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NREL Transforming ENERGY

Applications and Areas of Interests to the Prize

Consumer Electronics

Transportation

Stationary/ Industrial

Prize Areas of Interest

Collection

Separating & Sorting

Safe Storage and Transportation

Reverse Logistics

Other Ideas

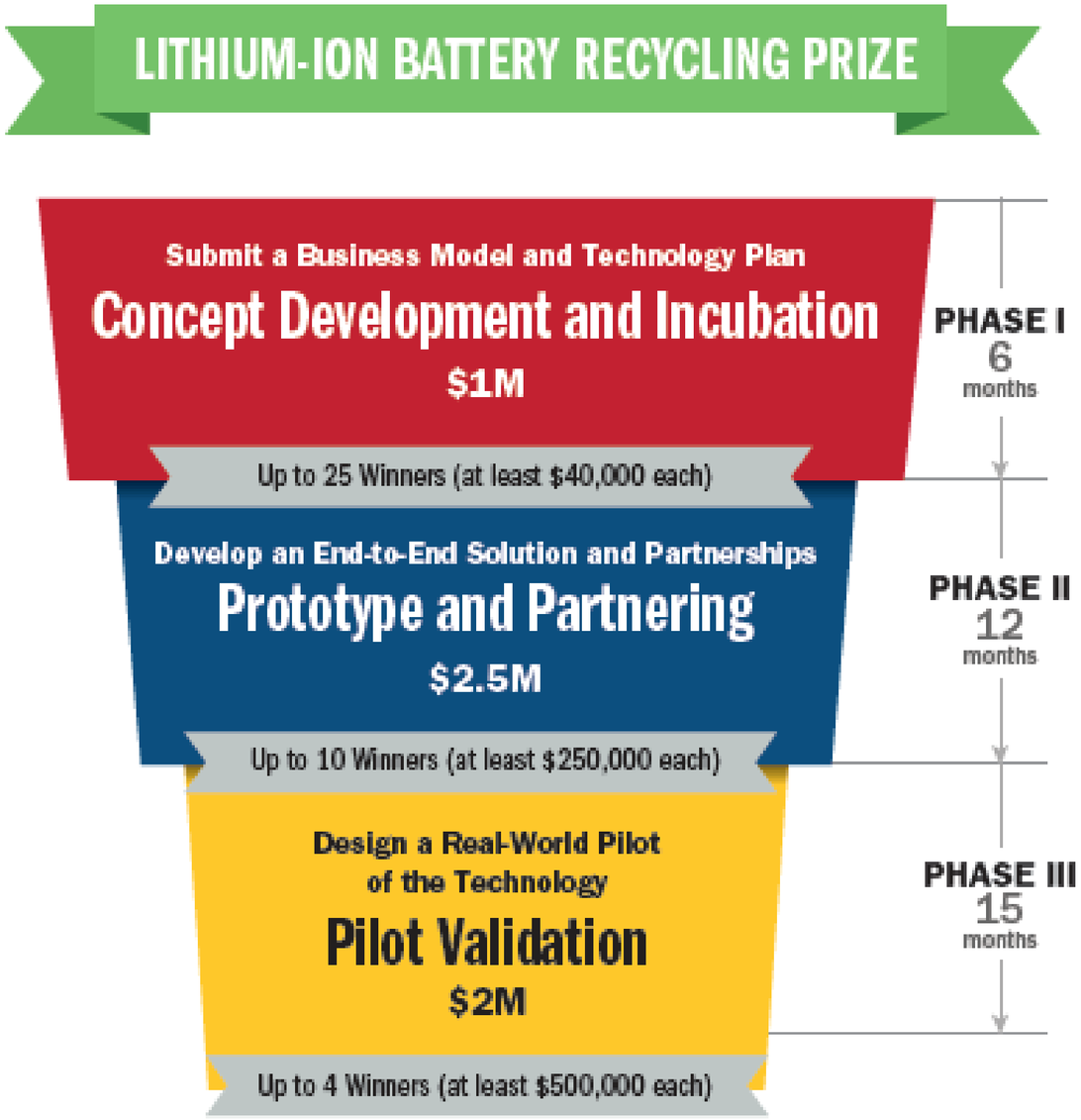
Battery Recycling and Recovery Facilities

Three Phases/Contests To Win Prizes at End of Each

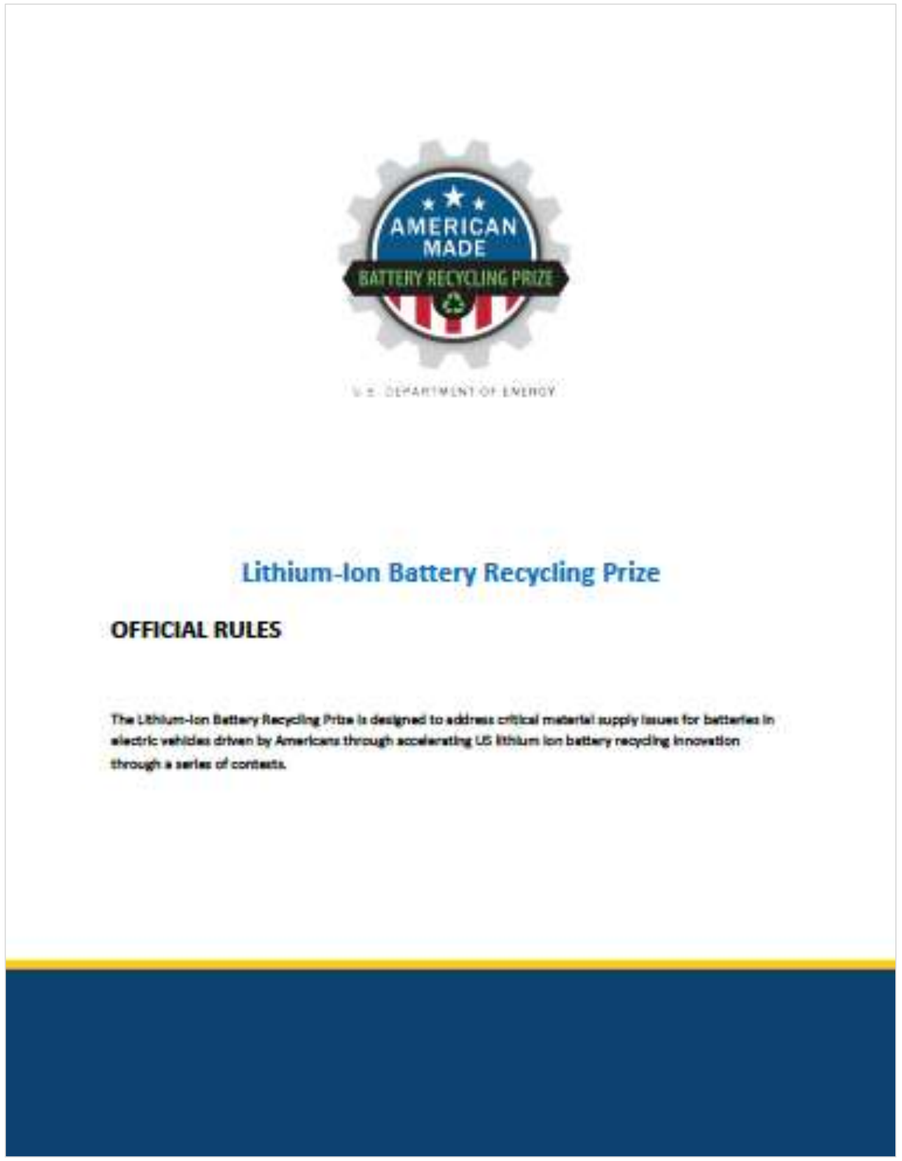
Phase I: Concept Development and Incubation
Applicants can submit concepts related to a single track, multiple tracks, or full end-to-end solutions for one or multiple applications (Consumer, Electric Vehicle, Stationary)

Phase II: Prototyping and Partnering
Applicants must partner and submit a full end-to-end solution for one or multiple applications (Consumer, Electric Vehicle, Stationary)

Phase III: Pilot Validation
Applicant must demonstrate the viability of their full end-to-end solution for one or multiple applications (Consumer, Electric Vehicle, Stationary)



Rules to Read and Follow



Official Rules Document for Phase I Contest is Available Online

https://americanmadechallenges.org/batteryrecycling/battery-recycling-prize-rules-and-scoring-criteria.pdf

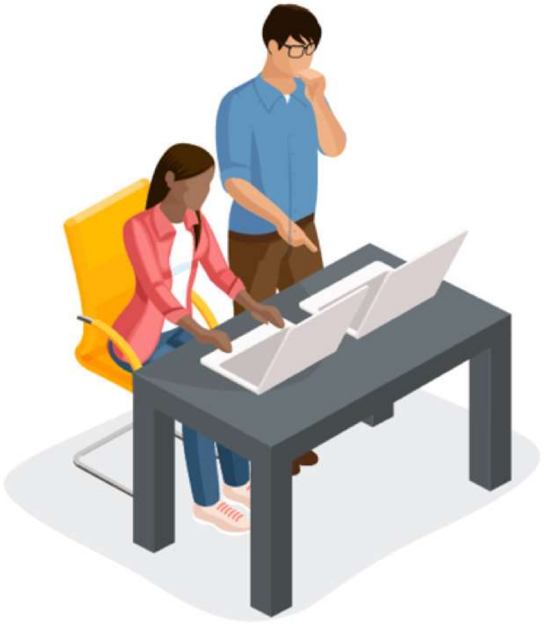
Who Could Win Prizes – Phase I

Any U.S.-based individual, team, or entity (U.S. Citizens or Permanent Residents) with a desire to transform ideas into impactful new solutions is eligible to compete in the Battery Recycling Prize. This includes scientists, researchers, business owners, students, faculty, and more.

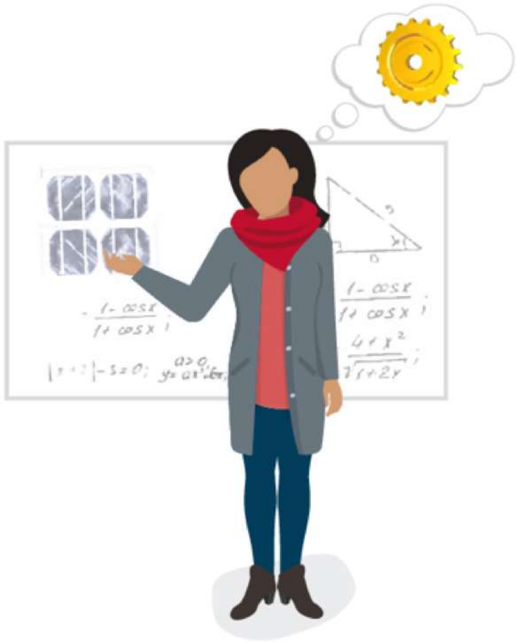
Submissions due August 1, 2019

Scientists

Business Owners



Students and Faculty



Anyone with a Big Idea

Excerpts, the participants must review and follow Official Prize Rules at
https://americanmadechallenges.org/batteryrecycling/battery-recycling-prize-rules-and-scoring-criteria.pdf

What Are the Cash Prizes for Winners?

For Phase I

- A participant can submit only one entry per a particular track
- So one can submit five concepts papers for five different tracks
- One participant may win maximum of $200,000

For Phase II & III

- A participant may win maximum of $500,000 in Phase II and up to $1,000,000 in Phase III

Contest	Winners	Prizes
Phase I: Concept Development & Incubation	Up to 25	Up to **$1,000,000** distributed equally among the winners in cash prizes (minimum of $40,000; maximum of $200,000 per winner)
Phase II: Prototyping and Partnering	Up to 10	Up to **$2,500,000** distributed equally among the winners in cash prizes (minimum of $250,000; maximum of $500,000 per winner)
Phase III: Pilot Validation	Up to 4	Up to **$2,000,000** distributed equally among the winners in cash prizes (minimum of $500,000; maximum of $1,000,000 per winner)

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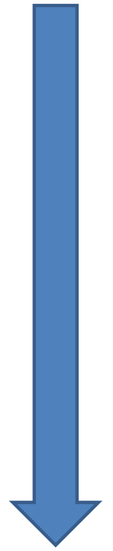
Important Dates in 2019

2.15.2019	Website launched. Rules posted. Registration open
6.30.2019	Registration encouraged
7.31.2019	Last day for registration to enter Phase I
8.1.2019	Last day for submission of Concept Solutions for Phase I
9.15.2019	Evaluations & recommendations for Phase I winners
9.30.2019	Selection and notification of Phase I winners
10.1.2019	Cash awards sent – Phase II contest begins



Interested individuals, teams, and entities develop and incubate concepts and prepare submission packages

What To Submit for Phase I: Concept Development

Public:

- **Video:** A 90-second (maximum) video showcasing the submission
- **Cover Page:** Name, PI, Title, Address, Submission Track, Abstract
- **Summary Slide**

Non-public: (could contain Confidential Business Information)

- **5-10 page Proposal**
  - Executive Summary
  - Team Composition and External Support
  - Solution (intellectual properties are protected and owned by participants)
  - Market Validation and Analysis
  - Planned Execution and Allocation of Funds
  - Detailed Technical Explanation

Next Set of Activities before Submission Date

- Initiating outreach activities to publicize the Prize and get the word out
- Discuss the Prize in Meetings, Conferences, and other Events
- Engage with stakeholders (EPA, DOT, industry, associations, states, cities, municipalities, etc.)
- Will be holding webinars and technical seminars - to be announced soon
  - Informational webinars (2-3 between April and June)
  - Technical seminars (2-3 between April and June)
- Identify and select potential reviewers
  - If interested let us know (NDA and COI)

Questions?

Thank You!

Email: BatteryRecyclingPrize@nrel.gov

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You are invited to submit solutions for Phase I
www.americanmadechallenges.org/batteryrecycling