Lithium-Ion Battery Breakthrough Contest Information Session

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AMERICAN MADE BATTERY RECYCLING PRIZE

U.S. DEPARTMENT OF ENERGY

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Agenda

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2. Prize Introduction & Continuation
3. Breakthrough Phase Rules & Structure
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    - Track 2: Verified Competitors
    - Industry Collaboration Event
4. Phase IV Introduction
5. Evaluation Entities & Voucher Process
    - Voucher Process Overview
    - Voucher Use Policies
    - Voucher Payments

Lithium-Ion Battery Recycling Prize Introduction

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Your innovative solution to lithium-ion battery recycling could win an up to $200,000 cash prize and advance to Phase IV of the competition for a shot at the $1 million grand prize or a portion of the $3 million runner-up prize pool.

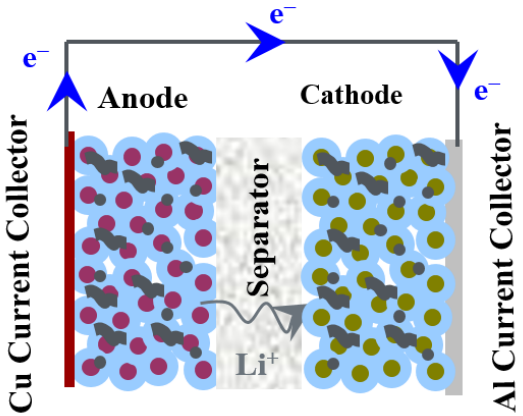
VTO Energy Storage R&D Overview and Strategy

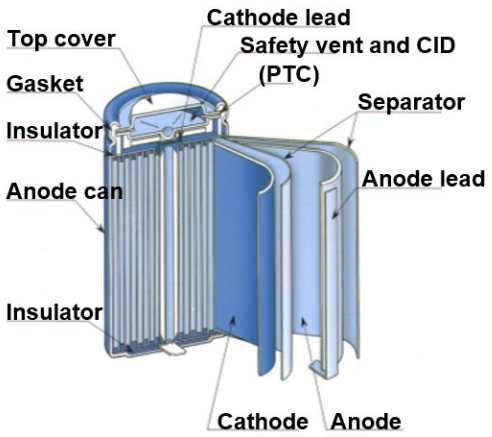
CHARTER: Develop battery technology that will enable large market penetration of electric drive vehicles

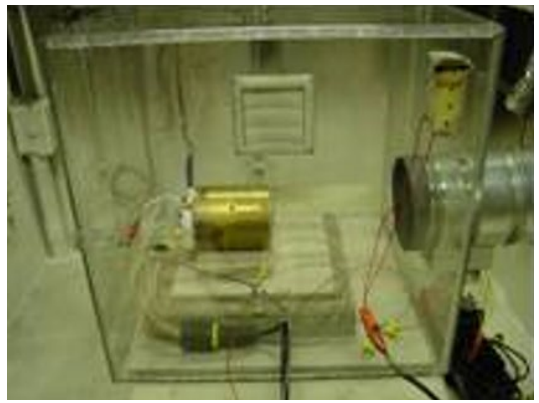
2025 PACK GOAL: $100/kWh
2030 PACK GOAL: $75/kWh
Critical materials-free with recycled materials and capable of fast charge

Energy Storage R&D

- Battery Materials Research (BMR)
- Applied Battery Research (ABR)
- Battery Development
- Battery Testing, Design, & Analysis







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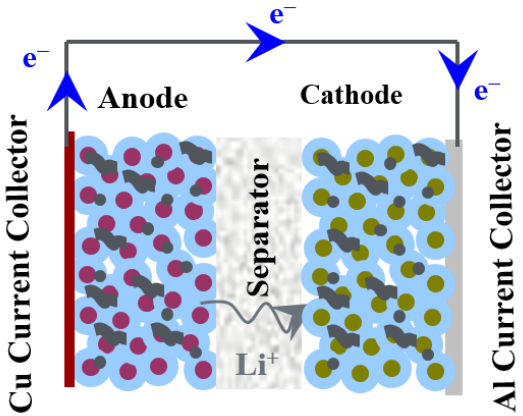
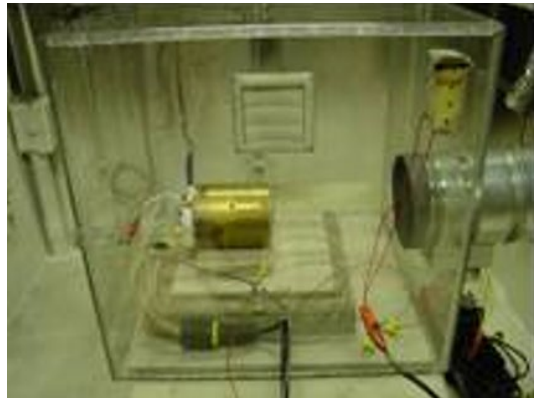


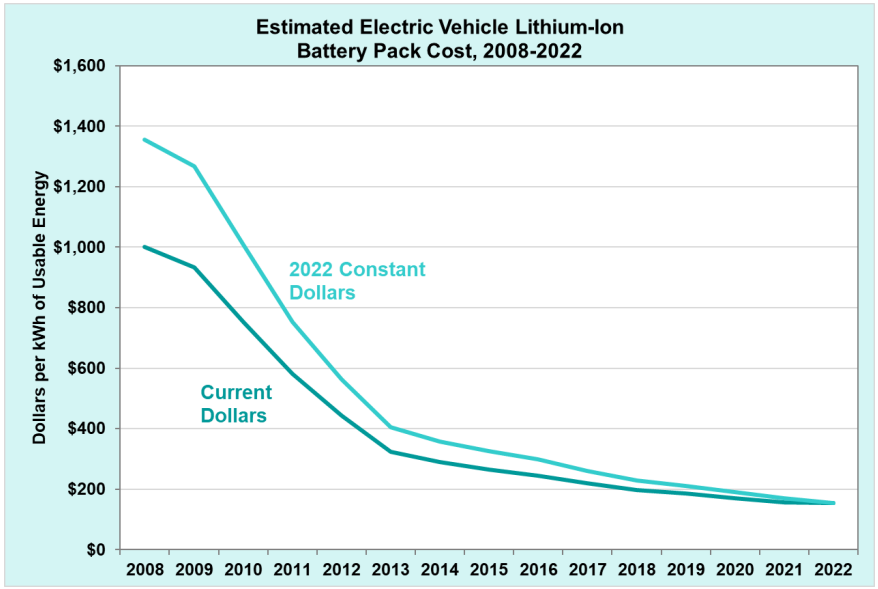
Manufacturing

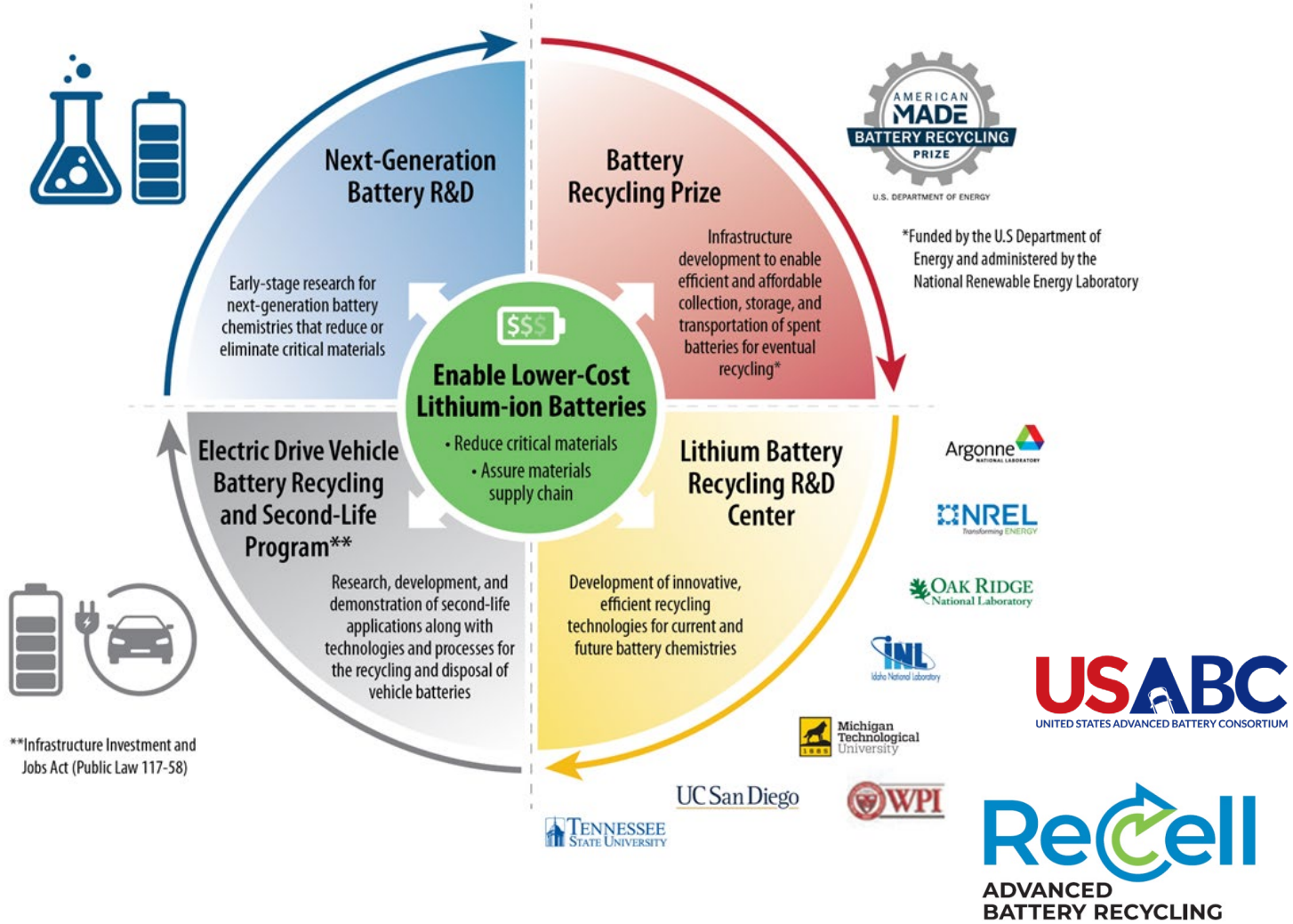
Recycling



VTO's Approach to EV Drive Adoption and Addressing Critical Materials

- **VTO has a target for the cost of an EV battery pack:**
  - $75/kWh by 2030
- **VTO has targeted RD&D to achieve this goal:**
  - Reducing critical materials
  - Establishing domestic supply chain
  - Recycling





Lithium-Ion Battery Recycling Prize

- The Lithium-Ion Battery Recycling Prize was designed to incentivize a diversity of problem solvers **to create end-to-end solutions that help DOE achieve an overall lithium-ion battery (LIB) recovery rate of 90%.**
- Previously, the prize awarded a total of $5.5 million in cash prizes to contestants in three progressive phases over approximately four years.
- Phase III: Pilot Validation, challenged teams to implement pilot validation of their end-to-end solution and gather data to support the solution's projected impact.
- The continuation of the prize aims to **further the goal of contributing to the recovery target** through innovative solutions to current challenges in collecting, sorting, storing, and transporting discarded lithium-ion batteries.

Breakthrough Contest Overview

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Breakthrough Contest Goals

TRACK 1: New Competitors

- *Open to public participation from new and former prize participants!*
- Breakthrough contest incentivizes new submissions from battery industry entrepreneurs that demonstrate innovative solutions that meet the goal of the prize.
- Track 1 encourages legal business entities based in the United States to participate in Breakthrough as new competitors with single process ideas, partial solutions or full concept solutions that enable or meet the prize goal.
- Proposed solutions should address pre-identified challenges in collecting, sorting, storing, and transporting discarded lithium-ion batteries.

TRACK 2: Verified Competitors

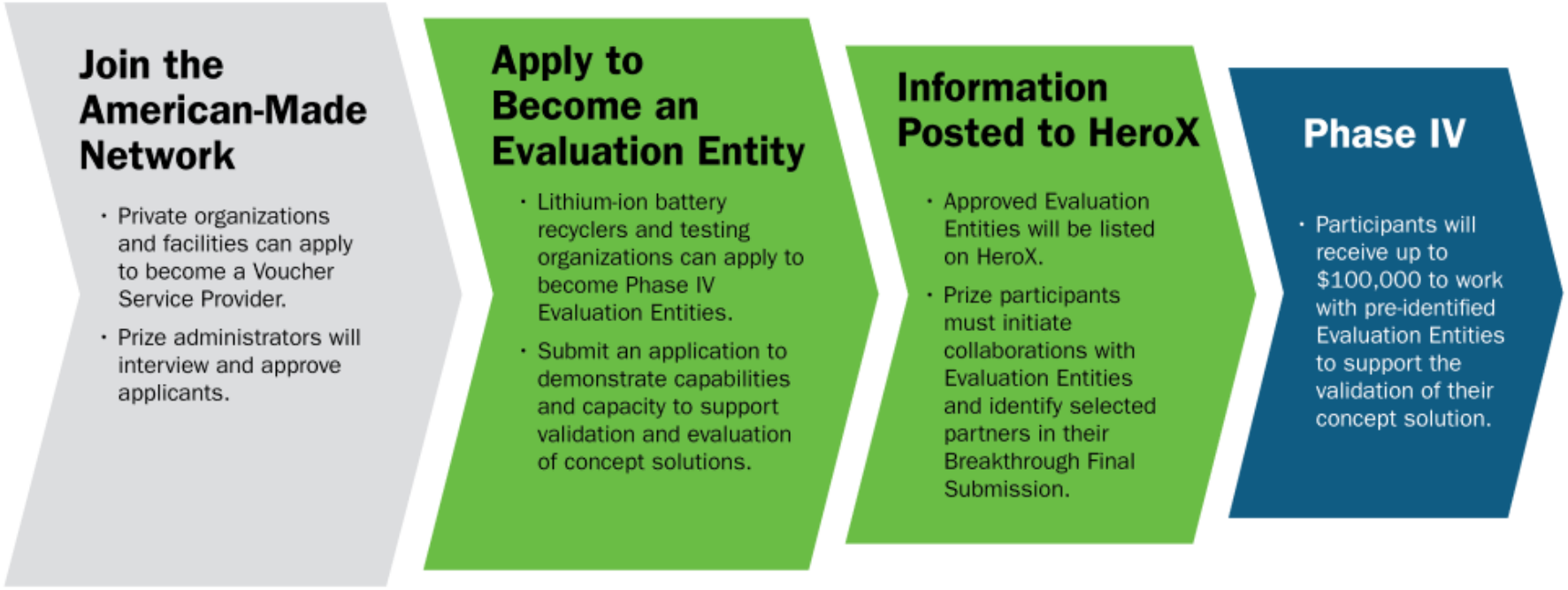
- Phase III winners are invited to further develop their concept solutions with the support of additional $100,000 noncash vouchers to be spent at a Voucher Service Provider (VSP) within the American-Made Network. Voucher work must support the continued validation and demonstration of their Phase III pilot-scale solutions.

Breakthrough Contest Supporting Roles

- **Track 1: New Competitors:** Battery industry entrepreneurs, including nonwinning teams from prior phases of the Lithium-Ion Battery Recycling Prize or eligible innovators entirely new to this prize program.
- **Track 2: Verified Competitors:** Phase III winners will demonstrate the continued implementation of their solution within the marketplace and include market analysis to identify roadblocks and opportunities to future growth.
- **Partners:** External advisors, sponsors, or established partnerships who are committed to supporting the proposed solution and identified as partners in the submission package.
- **Voucher Service Providers (VSPs)**: Approved organizations and facilities, including DOE's 17 national laboratories, within the American-Made Network who use voucher funds to provide tools, equipment, and expertise.
- **Evaluation Entities**: Approved lithium-ion battery recyclers and testing organizations identified in the Breakthrough submission package to support the validation and evaluation of concept solutions in Phase IV.

Evaluation Entities

- The continuation of this prize will also encourage collaboration between participating teams and industry members and recyclers through noncash vouchers.
- In their Breakthrough contest final submission, all participants must identify a pre-approved Evaluation Entity to support the validation and evaluation of their concept solution in Phase IV.
- Eligible organizations can become approved Evaluation Entities by following the steps outlined in the Breakthrough contest rules in section **1.3 Vouchers and Evaluation Entities.**



Evaluation Entities

View the list of approved Evaluation Entities at: https://www.herox.com/BatteryRecyclingPrize/102-evaluation-entities

Recyclers

- American Battery Technology Company

Second-Life Validation

- National Renewable Energy Laboratory
- Oak Ridge National Laboratory
- Argonne National Laboratory
- Idaho National Laboratory

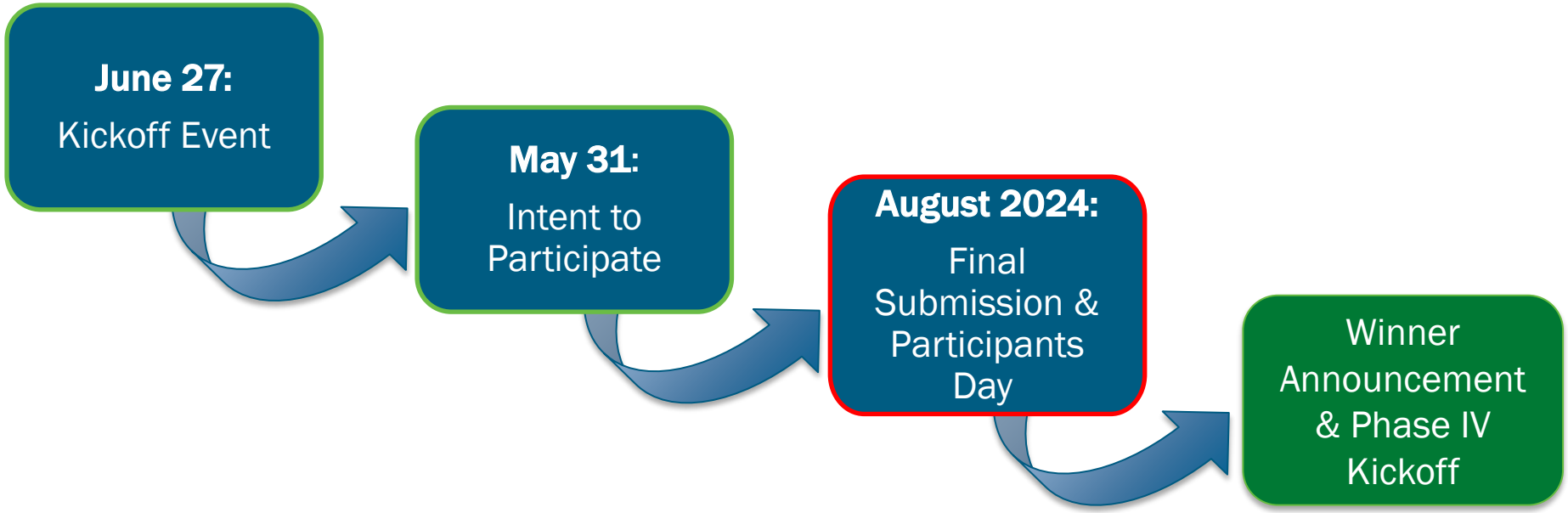
The Lithium-Ion Battery Recycling Prize is **seeking qualified lithium-ion battery recyclers and second-life testing organizations** to support Phase IV as evaluation entities.

Track 1 Prizes

- Track 1 is open to new participants and previous competitors of the Lithium-Ion Battery Recycling Prize. A single business entity may participate as a new competitor, or teams may be comprised of multiple businesses.
- Breakthrough winners will be invited to participate in the Lithium-Ion Battery Recycling Prize **Phase IV: Demonstration of Impact.**

Contest	Cash Prize	Noncash Voucher
Breakthrough	• Up to $1.2M cash prizes distributed equally among up to six teams.	Up to $100k in noncash vouchers to use in Phase IV alongside a pre-identified Evaluation Entity.
Phase IV: Demonstration of Impact	• $1M cash prize awarded to a single “Grand Prize” winner • Up to $3M cash prizes distributed equally among up to four “Runner Up” teams.	N/A

Breakthrough Key Milestones



We encourage all interested competitors to submit their “Intent to Participate” on HeroX by Friday, May 31. Although this step is optional, this allows our judges to prepare for the total number of final submissions.

The “Intent to Participate” form is now open at: https://www.herox.com/BatteryRecyclingPrize/

Final Submission

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What to Submit

Final Submission

- Cover Page: A short introduction to your solution to be shared publicly.
- Executive Summary: A high-level overview of your submission, including a summary of your concept approach and how the end-to-end solution will contribute toward the prize goal.
- Detailed Technical Explanation of Proposal: Describe your solution and approach, including
- Evaluation Entity: Identify an Evaluation Entity and describe plans to scale in Phase IV,
- Team and Resources: Experience and qualifications of team members, advisors, sponsors, and partners.
- Video: 90-second recorded video showcasing your solution.

Participants Day Presentation

Breakthrough participants will have at least one team representative provide a 30-minute virtual presentation to DOE representatives that includes a robust overview of their solution

Full details on what to submit can be found in the Breakthrough Rules, Section 3, on page 12.

The Official Rules can be found here: https://www.herox.com/BatteryRecyclingPrize/

Scoring Criteria

Breakthrough participants' online submissions and presentations will be scored based on the metrics below. Each scoring category will receive a score from 0 to 6. The categories have defined weights. Scores will reflect both the review of the online submission and the in-person presentation.

0	1	2	3	4	5	6
Not Demonstrated	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree

1. Innovativeness (30%):

- Represents a unique, innovative approach to meeting prize goals or significantly advances an existing idea, process, or technology.
- Submission includes documented understanding of current state of the art and demonstrates how the concept furthers LIB recovery rates as a process improvement or end-to-end solution.

2. Feasibility (45%):

- Proposed annual recovery capacity is supported by credible calculations and assumptions via techno-economic analysis or life cycle analysis modeling.
- Likelihood of making a substantial contribution toward the recovery rate for LIBs and degree to which scale-up plan is credible.

3. Evaluation Entity (25%):

- Team has identified and confirmed proposed validation plan with a VSP Evaluation Entity with the appropriate process and capabilities to evaluate the concept impact and contribution to LIB recovery rates.
- Submission outlines an evaluation plan to conduct the validation and provide required feedback documentation in Phase IV, as applicable.

Phase IV Introduction

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Phase IV: Demonstration of Impact

- Track 1 and Track 2 Breakthrough winners will be invited to participate in the **Lithium-Ion Battery Recycling Prize Phase IV: Demonstration of Impact** to demonstrate how effectively their solution contributes to establishing infrastructure to move spent or discarded LIBs from consumers to recyclers across all commercial uses.
- Phase IV will last approximately 1.5 years, kicking off with the announcement of Breakthrough winners.
- Phase IV participants will receive up to $100,000 in noncash vouchers to use in Phase IV alongside a pre-identified Evaluation Entity, for a total of ~$5 million in prizes.
- Phase IV teams will work alongside approved Evaluation Entities to verify the impact of their submission based on the recovered LIBs or validation of second use.
- Phase IV of the prize will award up to $3 million cash prizes distributed equally among up to four "Runner Up" teams, as well as a *Grand Prize award of $1 million to a single team*, for a total of up to $4 million in cash prizes.

Official Phase IV Rules will be released prior to the phase launch.

Evaluation Entities & Voucher Process

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VSPs and Evaluation Entities

- **VSPs:** Approved organizations and facilities within the American-Made Network who use voucher funds to provide tools, equipment, and expertise to participants, including DOE's 17 national laboratories.
  - To be approved as a VSP, including a pre-identified Evaluation Entity, private organizations and facilities must first apply on the American-Made website.
    - The entity is an incorporated U.S. business that has been in existence for at least 12 months at the time the application is submitted
    - The entity has an active website that describes the organization's capabilities
    - The entity offers capabilities, facilities, and services that are broadly available to interested parties
    - The business entity has a history of success in producing, developing, testing, validating, prototyping, and manufacturing products and solutions

- **Evaluation Entities**: Approved LIB recyclers and testing organizations identified in the Breakthrough submission package to support the validation and evaluation of concept solutions in Phase IV.
  - Submit online application

- Breakthrough teams must identify an approved Evaluation Entity in their Final Submission with plans to support should they advance as a Breakthrough winner.
  - Apply as VSP on American-Made website: ASAP
  - Once approved, submit Evaluation Entity Application: Must be approved before final submissions
  - In Phase IV, approved Evaluations Entities may utilize up to $100k noncash voucher to conduct evaluation and report

Voucher Process: Phase IV

- **Breakthrough Winners Announced, Phase IV Begins**
- **Statement of Work:** A draft SOW should be prepared and submitted to the Prize Administrator at BatteryRecyclingPrize@nrel.gov within 30 days of the Breakthrough winner announcement. This statement of work must be finalized (including all negotiations with the Evaluation Entity) within 90 days of the Breakthrough winner announcement.
- **Contract:** Once the approved SOW is in place, teams enter into a formal agreement with the Evaluation Entity. The format of this agreement may be unique to each VSP. Qualified activities relate to work that is directly in alignment with validation and evaluation of the concept solution and must adhere to the policies described in this document.
- **Begin Work:** The period of performance for all voucher work ends on the date that Phase IV submissions are due.

Please Email Questions to:

BatteryRecyclingPrize@nrel.gov

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