



# **Beyond Battery Recycling:** Sustainable, Engineered Battery Materials

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# Sustainable Engineered Battery Materials



## BATTERY RECYCLING

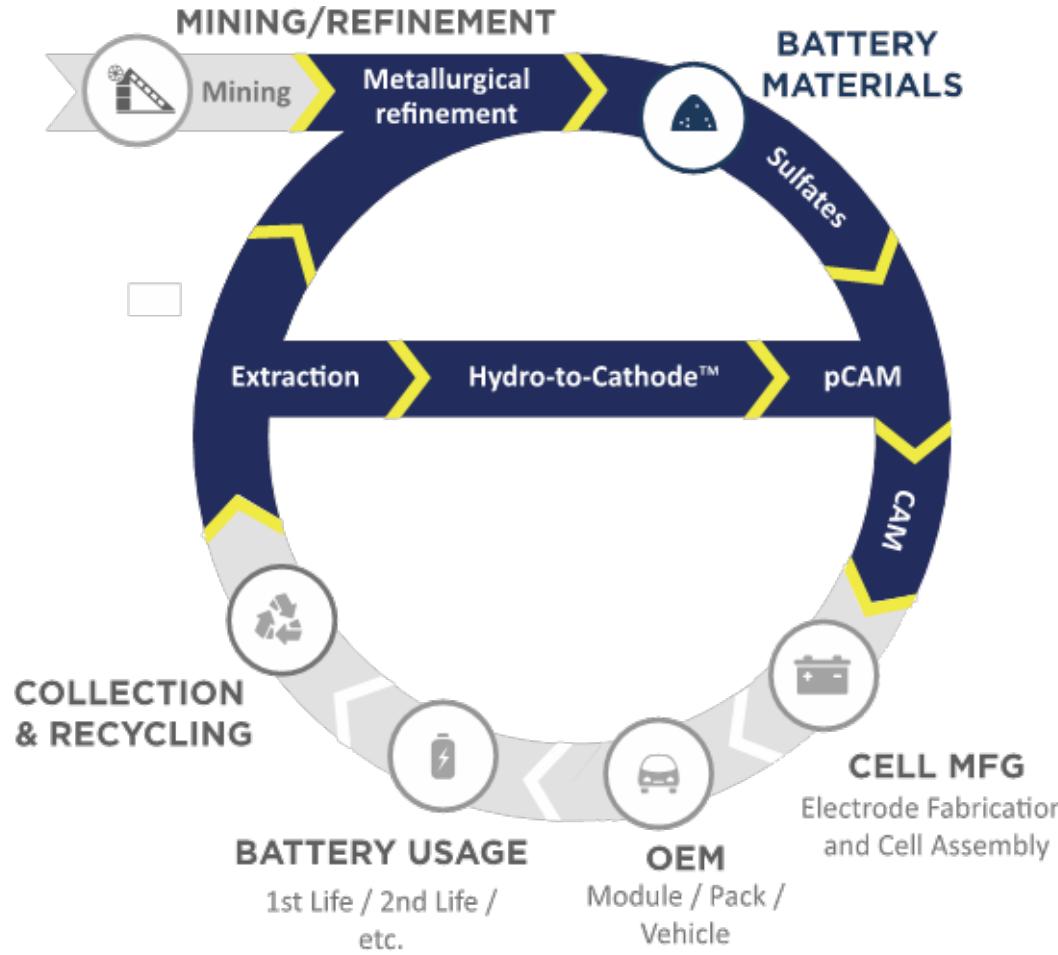
End-of-life lithium-ion batteries  
and manufacturing scrap



## ENGINEERED MATERIALS

Sustainable, high-performance  
cathode active material

# Closed-loop Battery Materials Ecosystem



**Recycled Metal Salts**  
(Li, Ni, Co)



**Sustainable High-Nickel pCAM and CAM**

# Corporate Milestones



2012



First Patents Filed

2016



Founded as Battery  
Resources

2022



Name Change to  
Ascend Elements

2022



Base 1: North America's  
Largest Li-ion Battery  
Recycling Facility

2022



Apex 1: One-of-kind  
Sustainable Cathode  
Manufacturing Plant

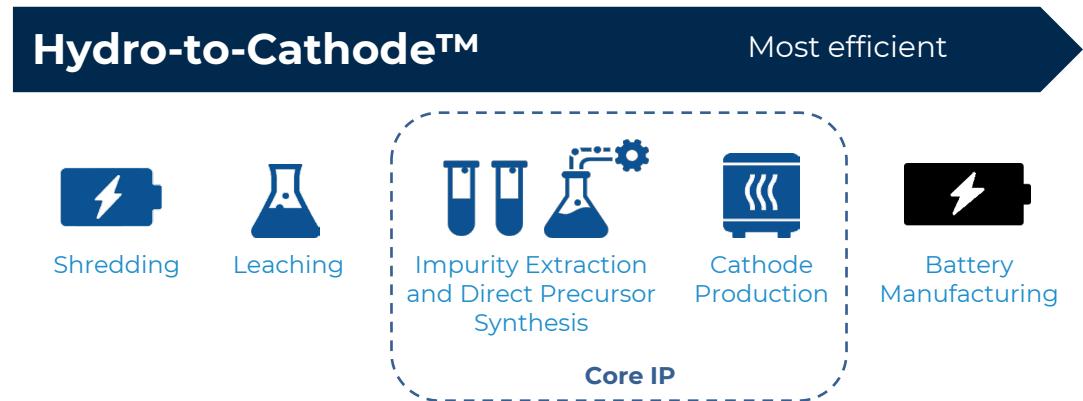


DOE Grants = \$480 Million

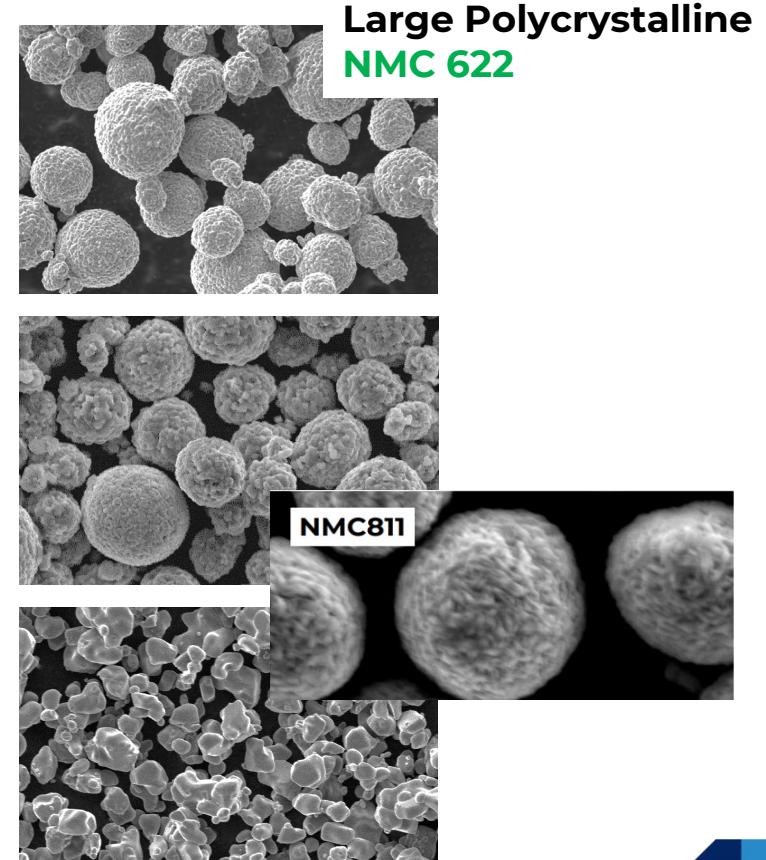


\$300 Million Funding Round

# Hydro-to-Cathode™ direct precursor synthesis



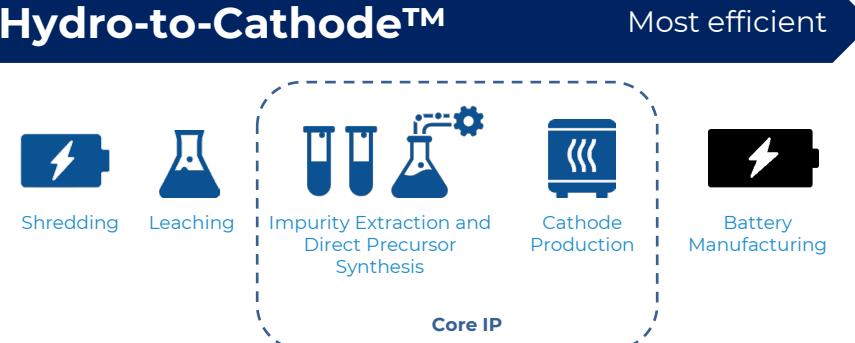
“The most **efficient** and **economical** way to return used Li-ion battery materials to the supply chain.”



# Purpose-Built Li-ion Battery Recycling Technology



## Hydro-to-Cathode™



- Input material agnostic
- Efficient
- Economical
- Cleaner than traditional processes

## Traditional Hydrometallurgy



## Traditional Pyrometallurgy



**57** patents granted or pending

Closing the supply chain loop for battery manufacturers and automotive OEMs

# Commercial-Scale Operations



## Open in 2022

Base 1 Facility (Covington, Georgia)



Shredding batteries and scrap into black mass and extracting lithium, nickel, and cobalt

**Base 1 facility**

- \$50M investment
- Intake capacity: **30,000 tonnes** per/yr.
- 150 high-quality jobs
- Operational **2022**

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Black mass and recycled metal salts

## Open in 2024

Apex 1 Facility (Hopkinsville, Kentucky)



Transforming black mass into high value materials via Hydro-to-Cathode™ direct precursor synthesis

Material for **250,000** EVs per year

**Apex 1 facility**

- Up to \$1.5B investment
- Producing pCAM, CAM, and metal salts
- Up to 400 high-quality jobs
- Operational in **2024**

Sustainable NMC pCAM and CAM

**2024 & Beyond:** Expansion in North America and Europe

Thank  
You!



**ASCEND**  
**ELEMENTS**