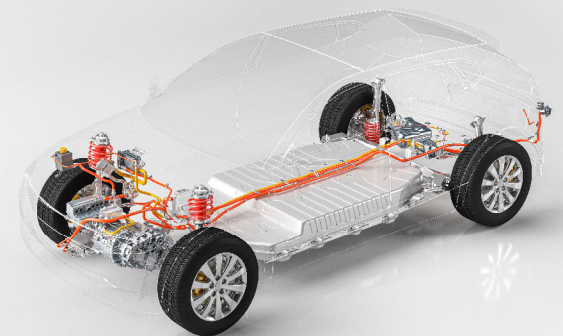




# Drivetrain

## ATC Battery Products & Services arpa-e conf Chicago

June 12, 2023



## VISION

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**Our vision is to be the global partner of choice for remanufacturing solutions.**

## MISSION

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**Positively impact our customers, team members, shareholders and planet through enthusiastic service and responsible stewardship.**

## VALUES

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**Integrity  
Customer Focus  
Service  
Reliability  
Perseverance  
Diversity, Equity & Inclusion**

## Largest global independent remanufacturer of Powertrain and Drivetrain products

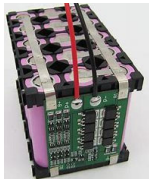
**83+** years of Remanufacturing Experience;  
Founded in 1938

**13** sites in NA, Europe, and Asia

**1.5** million sq. feet of manufacturing space

**1300+** dedicated team members

- Global Supply across North America, Europe and Asia
- Products for Passenger Cars, Light Truck, Commercial Vehicles & Off-Highway
- Battery and Electronics support for all types of propulsion system - ICE, HEV, EV
- Significant environmental benefits from remanufacturing
- Products for complete HV battery lifecycle: Repair, Remanufacture, Re-use, Recycle;  
Chemistry and Form Factors
- Remanufactured products for OES, IAM, Online sales, and end consumers



# Lifecycle Management





First and only industry partner in the pioneering study published by the DOT Mineta Report on repairing, remanufacturing, repurposing and recycling of lithium-ion batteries...<https://transweb.sjsu.edu/sites/default/files/1137-post-vehicle-Li-Ion-recycling.pdf>

## Repair & Reman

- Asset validation, repair, and remanufacturing
- Custom product storage – secured storage options; testing and charge management options (periodic and/or pre-shipment)
- Quick ship FIFO and pre-delivery testing; to dealership locations or direct to customer
- In- and Out-of-Warranty programs
- Dedicated customer service and phone line/help desk options
- Robust KPI definitions and reporting
- Complete recycling services for scrap materials at end of life



Battery repair, remanufacturing, validation, balancing, final testing



Quick Turn Product: Packaged for Pull and Ship



Warehousing and Testing/Maintenance

## Repurposing / 2<sup>nd</sup> Life applications



New ESS Cube  
launching 2023

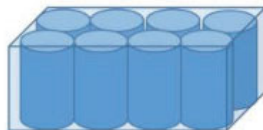


[www.evmarine.co.uk](http://www.evmarine.co.uk)

## Recycling



Cell



Module/Array



Pack

[www.evrecycling.co.uk](http://www.evrecycling.co.uk)



## Battery Reverse Logistics Support

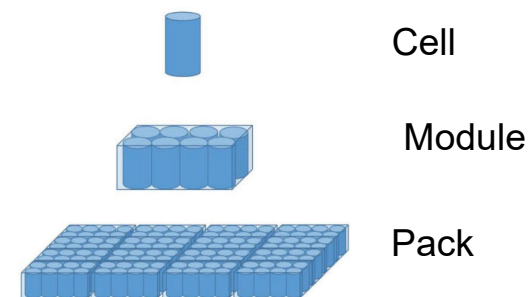
### Fire/Explosion Hazard of Li-ion Batteries

#### Countermeasures

- Technology to Support Battery Reverse Logistics
  - ◆ Smart container/dunnage system to monitor battery cells/module/packs in storage and in transport.
  - ◆ Container/Dunnage to suppress fires during storage and/or transport
  - ◆ Wireless early warning
  - ◆ DOE/NREL Battery Recycle Prize partner



**Dendrites** are tiny, rigid tree-like structures that can grow inside a **lithium battery**; their needle-like projections are called **whiskers**. ... They also **increase** unwanted reactions between the electrolyte and the **lithium**, speeding up **battery failure**. Oct 14, 2019



Advanced Technology



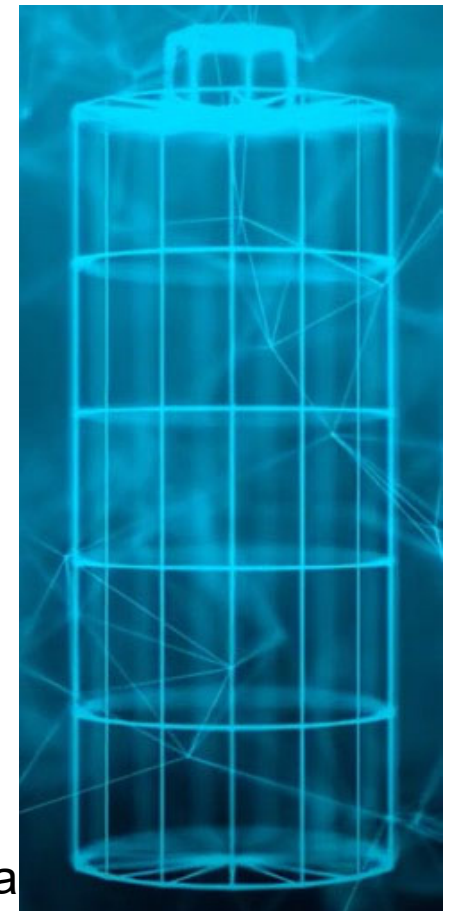
## ❑ Smart Cell Technology for:



- ❑ Wireless data transfer
- ❑ Provides a history of performances, even when removed or stranded from EV through regular transfer of data to the cloud
- ❑ Powerful functionality in an ASIC format at scale for minimized costs
- ❑ Supports IoT connectivity
- ❑ Cell-Level traceability and performance reporting
- ❑ Supports digitization of cell manufacturing

## Future:

- ❑ Opportunity for a global competitive price advantage for battery and automotive OEM adopters
- ❑ Supports a closed-loop for material needed for new battery production



# Battery Lifecycle Management Services & Advanced Technology



Kris Hunter  
Director, Business Development  
Electrification & Advanced Technologies Group

o: (616) 392-6911  
e: [kris.hunter@atcdt.com](mailto:kris.hunter@atcdt.com)