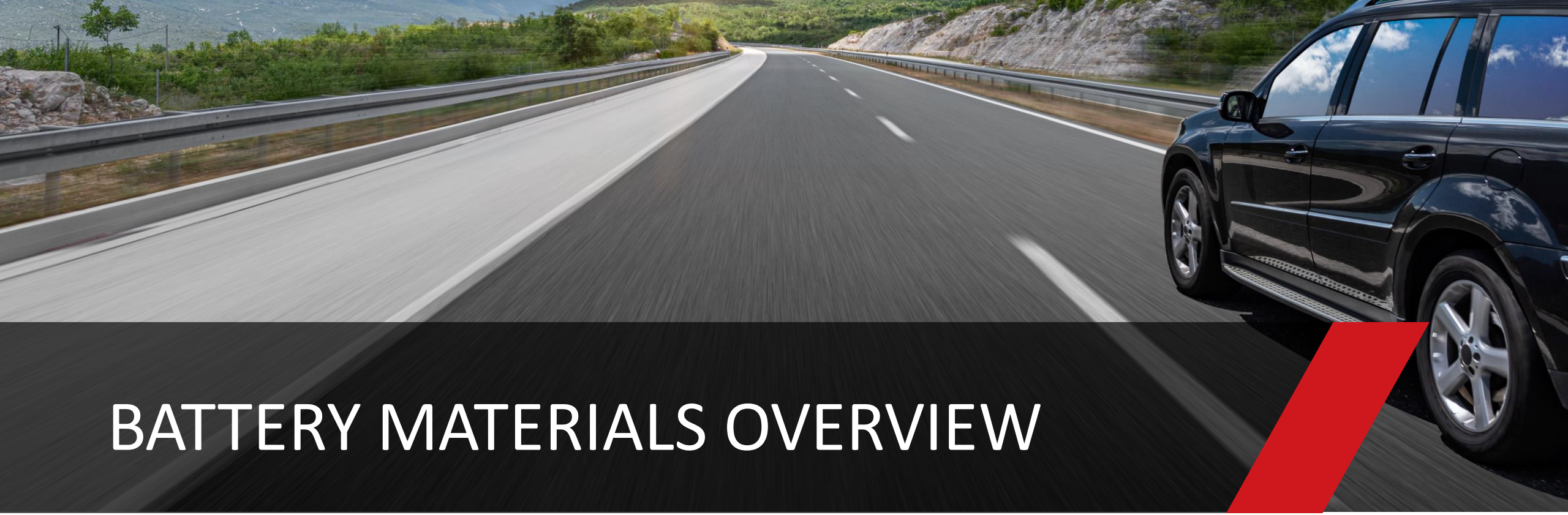


# BATTERY MATERIALS OVERVIEW

SECOND QUARTER – FISCAL 2023

CABOT®

# Cabot Corporation At-A-Glance

## Global specialty chemicals and performance materials company

**140**
years of operation

**~4,300**
Employees

**$4.3B**
Revenue

**37**
Plant Locations

### Industry Leader

- Strong financial performance
  - Investment grade credit rating
  - Track record of year-over-year adjusted EPS growth
- Extensive global footprint with operations in over 20 countries
- Broad portfolio of solutions

### Depth of Capabilities

- Functional materials and technical expertise that enable application innovation
- Strong collaborations with industry leaders and academia

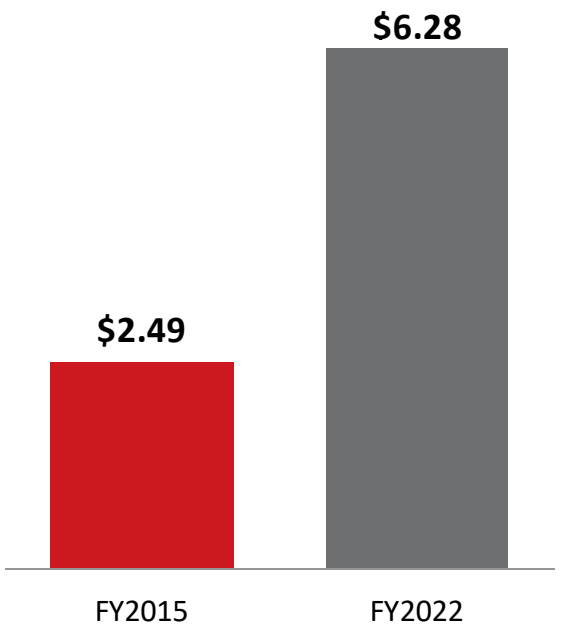
### Sustainable Value Creation

- Materials that enable sustainability benefits in customer applications
- Comprehensive ESG strategy
- Positive societal impact
- Net Zero Ambition

# Strong Earnings Growth with High ROIC

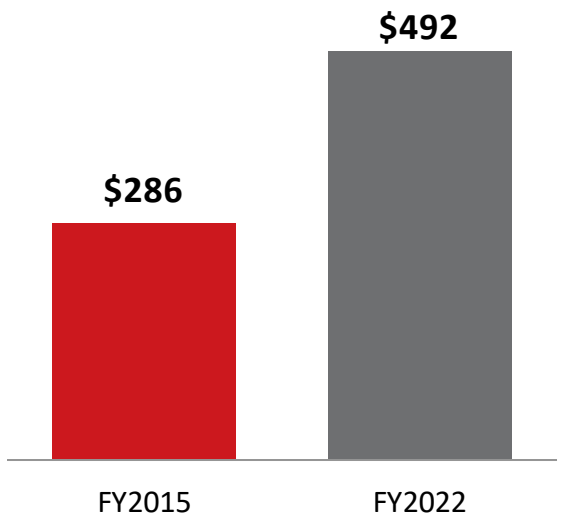
**Adjusted EPS[1]**
($)

+12% CAGR



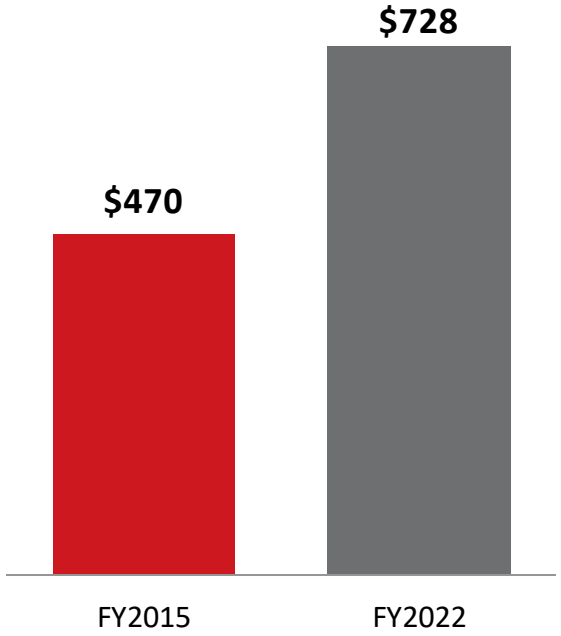

**Adjusted EBIT[1]**
($M)

+10% CAGR

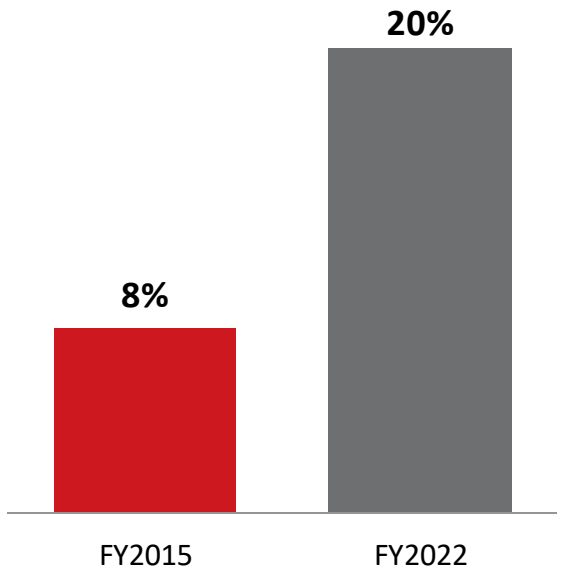



**Adjusted EBITDA[1]**
($M)

+6% CAGR




**Adjusted ROIC[1]**
($M)




**Driven by Successful Execution of Strategy**



1. Non-GAAP measure – See Appendix

# SPOTLIGHT ON BATTERY MATERIALS

CABOT

# Cabot's Battery Materials

## Well-Positioned to Remain a Leader as Growth Accelerates

**58%**
FY22 volume growth

**$132M**
FY22 Revenue; up 74%

**$29M**
FY22 EBITDA; up 81%

### Competitive Advantages

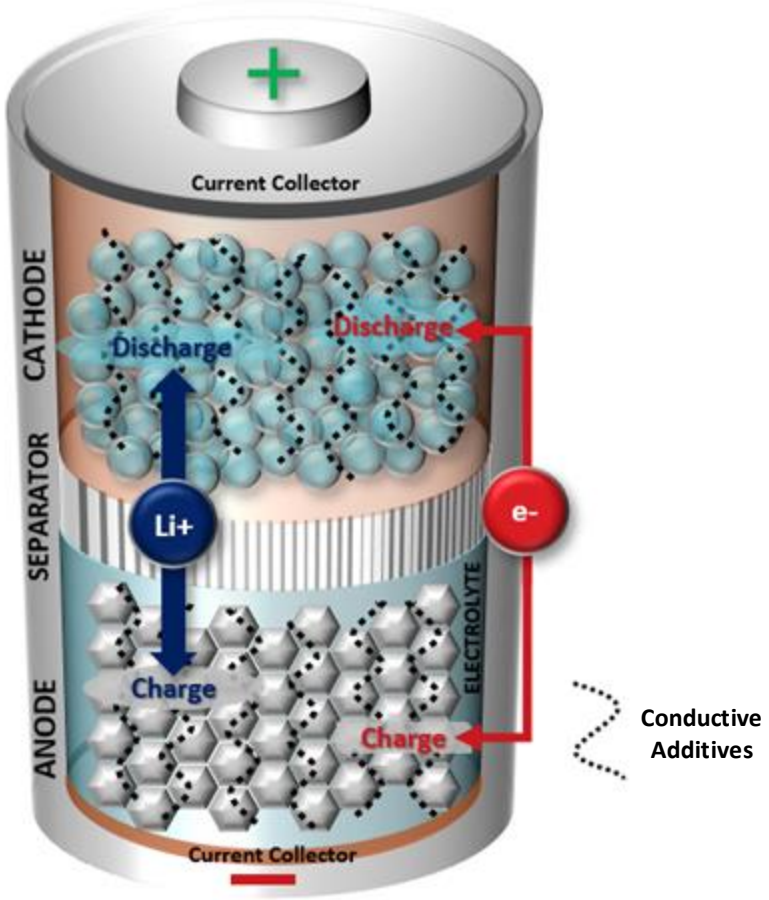
- **Broadest spectrum of Conductive Additive products** & emerging portfolio of new materials
- A leading commercial position with **sales to 9 of top 10 global battery manufacturers**
- **Global manufacturing network** with planned expansions
- Strong customer engagement through **local commercial and technical support**

### Market Environment

- Volume growth driven by **increasing EV demand**
- **Public policy** accelerating e-mobility / renewables
- **Regionalization of supply chains** increasingly valued by OEMs to support EV buildout
- Emerging battery chemistry technologies **all require** some form of conductive additive

# Conductive Additives Role in Li-ion Batteries

## Critical Components to Enable Charge Transfer within the Battery

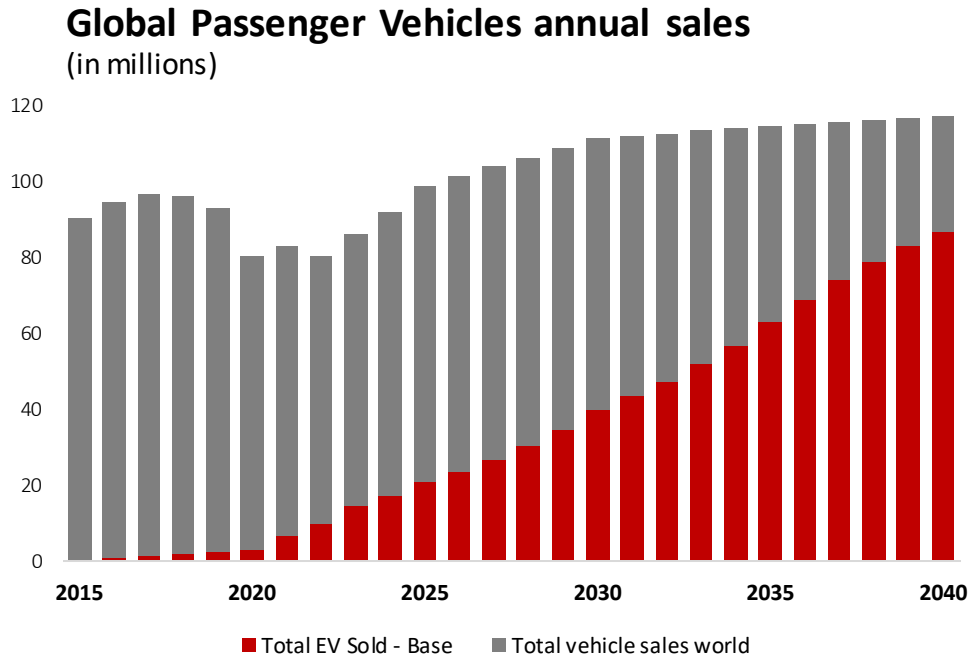



*Illustrative Depiction*

### Why are Conductive Additives Critical?

- Batteries do not perform without conductive additives
- Provide a pathway for electrons to move within the anode and the cathode to the current collector
- Allow lithium-ions to move, and enable charging and discharging
- Next-gen battery technologies such as solid state, dry process, silicon-containing anode, and others will continue to require conductive additives

# Vehicle Electrification Drives Need for Li-ion Batteries




- **EVs with lithium-ion batteries expected to have >50% share of global passenger vehicles sold in 2035**
- **Many countries and companies supporting EV growth[1]**
  - Biden administration's EV goal shoots for half of new car sales in the U.S. to be electric by 2030; Inflation Reduction Act and Infrastructure bill offer incentives to produce EV's in USA
  - In China, goal of ~40% of vehicles sold to be electric by 2030
  - GM aims to end sales of gas and diesel vehicles by 2035
  - VW expects half of its sales from BEVs by 2030; ~100% of new vehicles in major markets expected to be zero-emission by 2040

Source: Benchmark Mineral Intelligence, Q3 2022

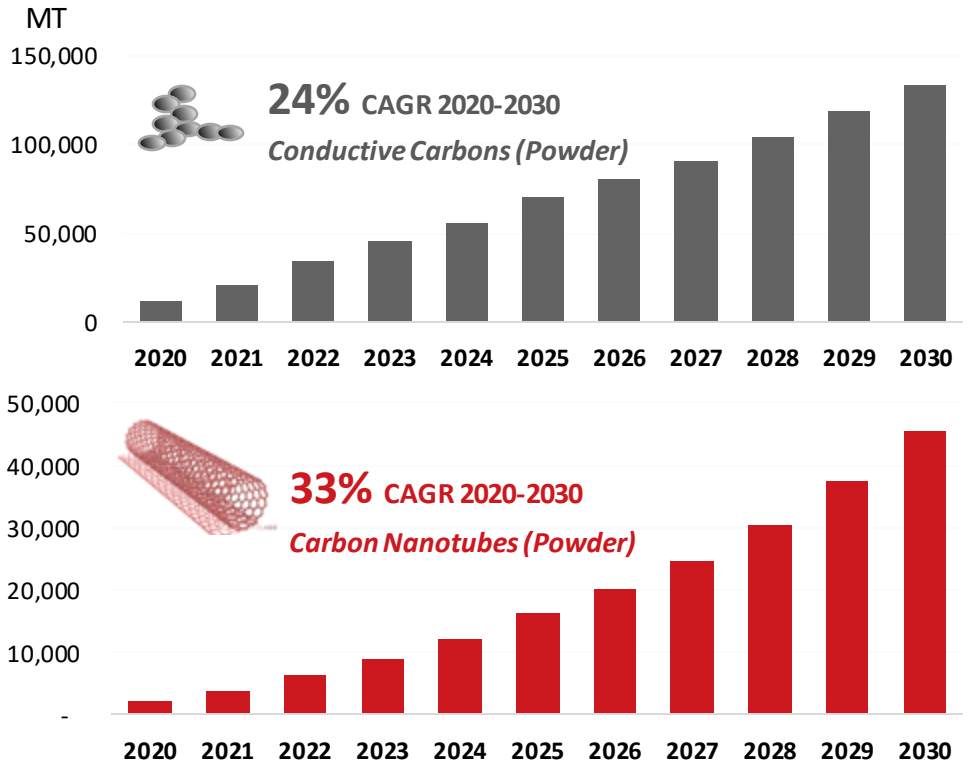
BEV: Battery Electric Vehicle & Plug-in Hybrid
ICE: Internal Combustion Engines & Hybrid

1. Sources: Thomson Reuters; Volkswagen

**Strong EV Market Growth Expect >30% CAGR 2021-2030**

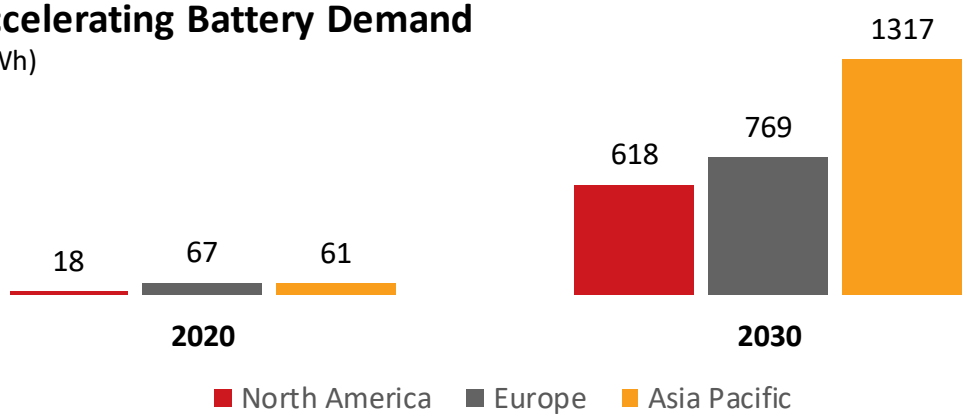
# Conductive Additives Market Expected to Grow ~30% CAGR

**Increasing Global Conductive Additives**
(CCA) Demand




Source: Cabot Internal Assessment

**Accelerating Battery Demand**
(GWh)




- Lithium-ion battery growth expected to translate into significant conductive additive demand
- Battery demand expected to grow across all regions, as battery manufacturers install global capacity

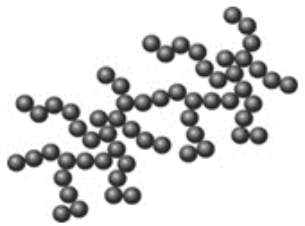
Source: Bloomberg NEF, October 2022

# Broad Product Portfolio for Batteries

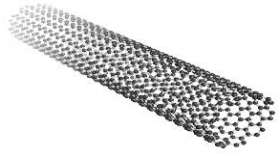
## Cabot has a deep understanding of battery application

### Cathode & Anode Electrodes

**Conductive Additive Powders and Dispersions**

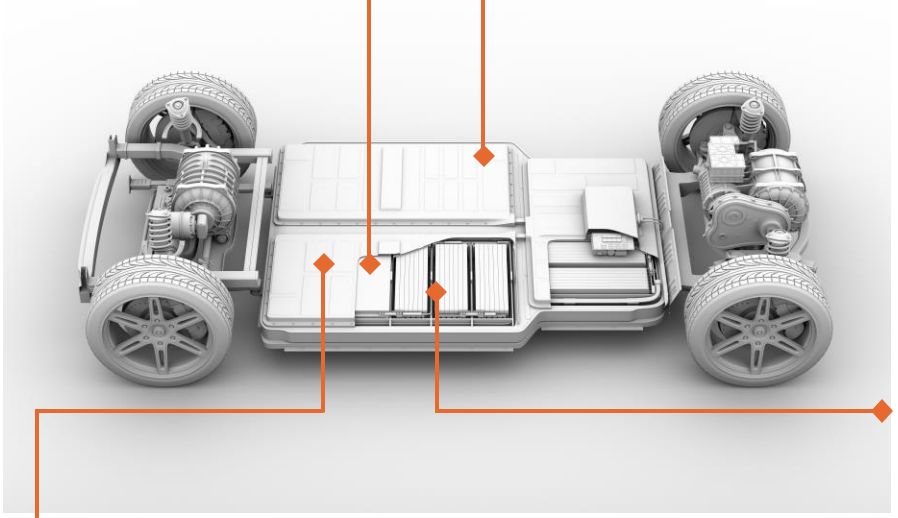


- **LITX® PBX® FCX® Conductive Carbons**
  - Conductivity
  - Wet and dry process in all battery types



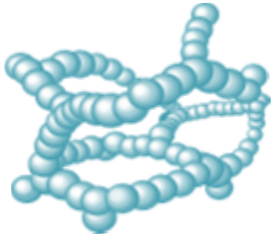
- **ENERMAX™ Carbon Nanotubes (CNTs)**
  - Conductivity
  - Powder and dispersions

- **ENERMAX™ Carbon Nanostructures (CNS)**
  - Cycling performance and conductivity for silicon-containing anode



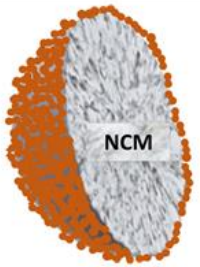
### Thermal Management

- **ENTERA™ Aerogel**
  - Thermal barrier for cells and modules



### Cathode Coating

- **SpectrAl® Fumed Alumina**
  - Cathode surface coating
  - Separator coating




### Adhesive & Sealant

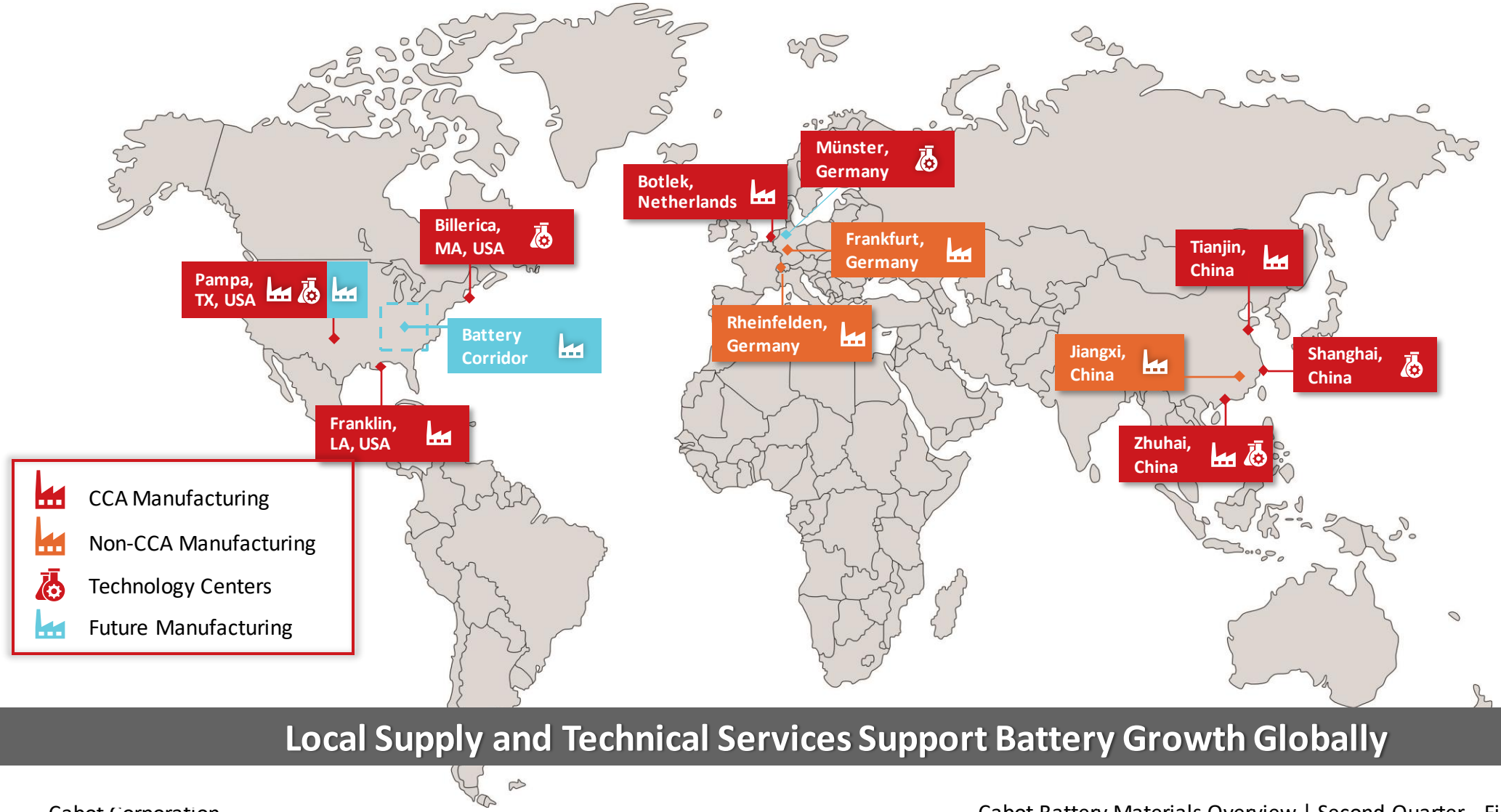
- **CAB-O-SIL® ULTRABOND™ Fumed Silica**
  - Rheology control
  - Mechanical reinforcement

### Electrolyte

- **ENERSIL® Fumed Silica**
  - Rheology control in advanced lead acid batteries

# Conductive Additives Leader with Global Network

## Capacity and Innovation Centers in Every Region




**Local Supply and Technical Services Support Battery Growth Globally**

# We Have "Right to Win" in Battery Materials

### Product Portfolio

- Broad portfolio of conductive additives including conductive carbons, CNTs, carbon nanostructures, and blends that provide enhanced performance
- Emerging portfolio of materials to expand our battery participation

### Global Manufacturing Footprint

- Supports local supply chains
- Customers more focused on regional supply security
- U.S. and EU governments emphasizing local supply chains
- Strong customer engagement through local commercial and technical support

### Strong R&D Commitment

- New material development for next-gen battery developments
  - High Nickel Cathode
  - Dry Process
  - Aqueous Process
  - Silicon Carbon Anode
  - Thermal Barriers

### Performance Track Record/Market Outlook

- Strong demand for conductive additives driven by lithium-ion batteries for EVs
- ~30% 10-year anticipated market demand CAGR
- 50%+ forecasted EBIT CAGR from 2021-2024