CATL

Together for the Energy Freedom

Battery Recycling Introduction

Public

1 Company Profile

Contemporary Amperex Technology Co., Limited

CATL
Abbreviation

2011
Establishment

Ningde, Fujian
Headquarters

300750
Stock Code

Main Business

Provide EV battery systems & services for green transportation

Cell → Module → Pack

Provide solutions and services for clean energy storage

Rack → Container → Power Station

Global Locations

Headquarters
Ningde, Fujian

5 R&D Centers
China: Ningde, Fujian / Liyang, Jiangsu / Shanghai/ Xiamen, Fujian
Germany: Munich

13 Production Bases
China: Ningde, Fujian / Xining, Qinghai / Liyang, Jiangsu / Yibin, Sichuan / Zhaoqing, Guangdong / Shanghai / Xiamen, Fujian / Yichun, Jiangxi/ Guiyang, Guizhou / Jining, Shandong / Luoyang, Henan
Germany: Erfurt
Hungary: Debrecen







Erfurt Production Base
Erfurt

Xining Production Base
Xining

Luoyang, Henan
Luoyang

Jining Production Base
Jining

Liyang Prodution Base
Liyang, Changzhou

Contemporary Amperex Technology (USA), Inc.
Detroit

Debrecen Production Base
Debrecen

United Auto Battery Co., Ltd.
Liyang, Changzhou

Contemporary Amperex Technology GmbH
Munich

Contemporary Amperex Technology Japan KK
Yokohama

Contemporary Amperex Technology France
Paris

Shanghai R&D Center
Lingang Production Base
Shanghai

Dongfeng Amperex (Wuhan) Battery System Co., Ltd.
Wuhan

CATL-FAW Auto Battery Co., Ltd.
Xiapu, Ningde

Yibin Production Base
Yibin

CATL Headquarters
Ningde Production Base
21C Lab
Ningde

CATL-GEELY EV Battery Co., Ltd.
Yibin

Guiyang Production Base
Guiyang

Yichun Production Base
Yichun

Zhaoqing Production Base
Zhaoqing

Guangdong Brunp Recycling Technology Co., Ltd.
Foshan

CATL-GAC EV Battery Co., Ltd.
Guangzhou

Xiamen R&D Center
Xiamen Production Base
Xiamen

Headquarters
R&D Center
Production Base
Subsidiary

Map source: GS(2016)1663
Supervised by the Ministry of Natural Resources of the PRC

Promote Renewable Energy Transition & Electrification Globally

EV Market

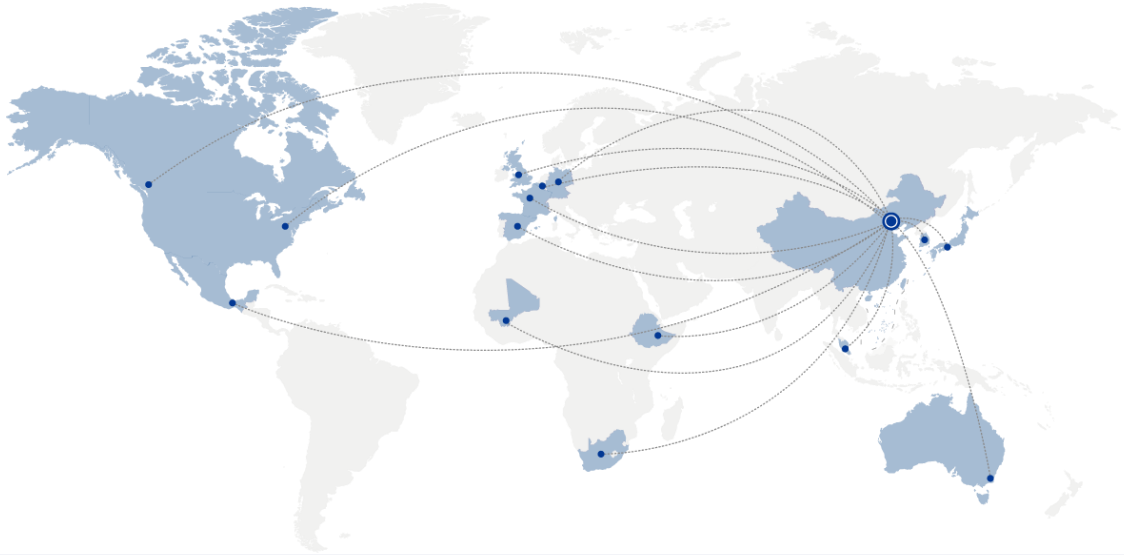
SNE Research:

- CATL ranked No.1 globally in EV battery consumption volume for six consecutive years
- In 2022, CATL held **37%** of global EV battery market share

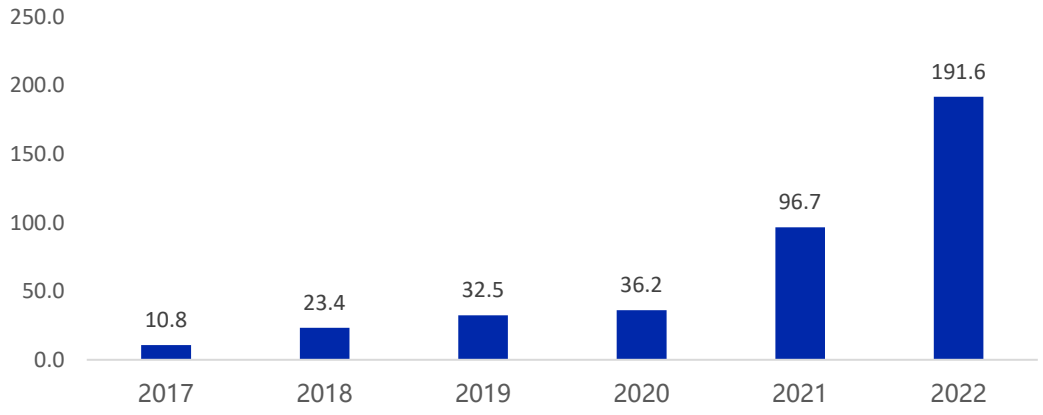
Global: 7.26 million EVs powered by CATL batteries

60 countries and regions

*Data source: SNE Research, data as of December 31, 2022



CATL's Global EV Battery Consumption Volume (GWh)



*Data source: SNE Research

ESS Market

CATL **ranked first** in the world in terms of ESS battery shipment in 2021 and 2022

In 2022, CATL held 43% of global ESS battery market share

CATL's energy storage solutions have been recognized by customers in ESS major markets including the United States, China, Germany, Britain, Australia, and other countries & regions. CATL BESS helps to integrate renewable energy and provide auxiliary services to strengthen the grid.

*Data source: SNE Research, data as of December 31, 2022

Extreme Manufacturing

Committed to building a smart factory: flexible, efficient, low-cost, self-upgrading and of high quality

World Economic Forum
Global Lighthouse Network
Ningde plant (2021), Yibin plant (2022)

The World’ s First
Zero-Carbon Battery Factory
Yibin Plant

Automation

Big Data

Intelligent

2.2M+
System Productivity (PCS/day)

150+
Max Takt Time (unit/ line/minute)

25,000+
Product Number of System-level

340,000+
Data Exchange Volume (per second)

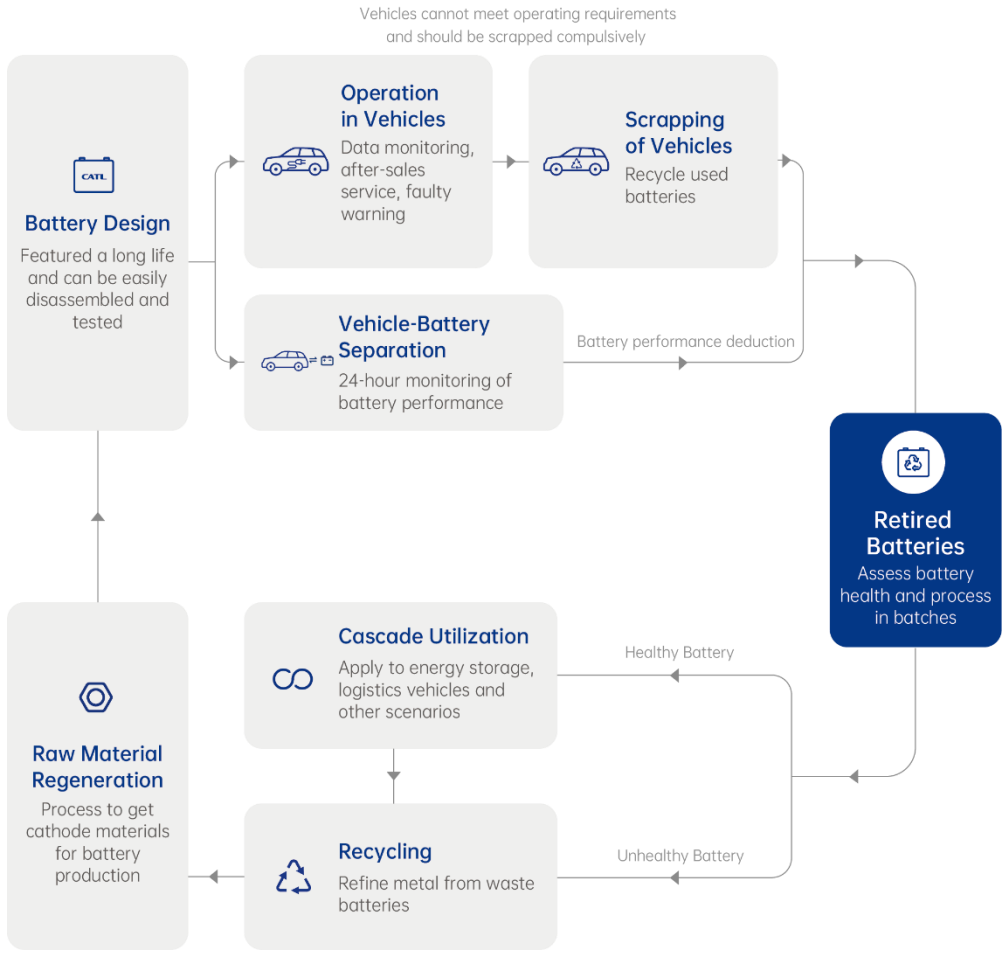
1000B+
Cumulative Data Points

20 Years
Traceability

Intelligent Plant
Adopt advanced technologies

Battery Recycling and Circular Economy

Supported by its subsidiary Brunp, CATL is working with customers to create a closed loop of battery production – application – cascade utilization – battery recycling. At the same time, CATL has reached a strategic cooperation agreement with BASF to focus on cathode active materials and battery recycling, to promote CATL's localization in Europe, which contributes to achieving both companies' global carbon neutrality goals.



Brunp Recycling, Pioneer of Recycling

Overall Network of 7 Bases

Bases located in Guangdong, Hunan, Fujian, East China and Indonesia. Cooperate with top automotive groups, battery and material enterprises as well as academic research institutes.

279 Standards

Participated in setting and revising standards related to waste battery recycling and battery Material regeneration. Among those, 162 standards have been Issued.

1, 407 Innovative Patents

Brunp takes the lead to address the issues of waste recycling through the original "reverse product positioning design" and "directional recycling" technologies.

Large-scale Recycling

120,000 Tons
Waste battery disposal ability

99.3%
Metal recovery rate of nickel, cobalt, manganese

50%
Comprehensive recycling rate of used batteries in China

*The data above are as of June 30, 2021

末端：创新加速资源回收

99.3%

Ni、Co、Mn recycling efficient

90%

Li recycling efficient

2 Global Market Demand

Global Market Demand for Batteries

China

2030 Carbon Peaking

2060 Carbon Neutral

EU

2035

Zero-emission on vehicle

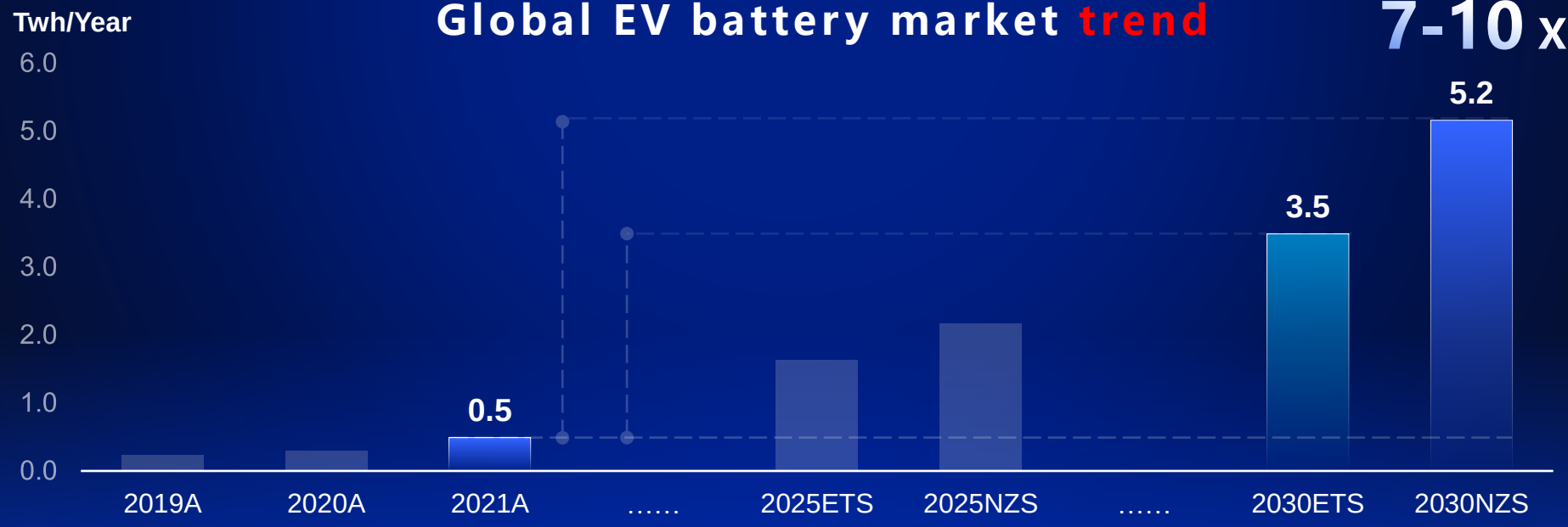
US

2030

EV sales share 50%

Global EV battery market trend

7-10 x



数据来源：BNEF《Electric Vehicle Outlook 2022》（2022年6月）

ETS：经济转型情景（Economic Transition Scenario） NZS：净零情景（Net Zero Scenario）

Mineral Reserves and Demand

Global Reserves (million tons):	**Li 26**	**Ni 100**	**Co 8.3**
Annual Demand of Minerals for EV Batteries : (2030)	**Li 3.8**	**Ni 2.1**	**Co 0.3**

Impossible to establish a sustainable supply chain for EV globally

WITHOUT RECYCLING

Closed-loop Recycling

Image by Argonne National Laboratory

Government actions

- Extended Producer Responsibility Implementation Plan
- EV Battery Recycling and Tracing Management
- EV Battery Recycling Management
- Disposal EV Batteries Secondary and Recycling Industry Regulation

- Battery Regulation：EPR、Recycled Materials Content、Recycling Efficiency
- Critical Materials Act

- Inflation Reduction Act (2022): materials recycled in NA meet the raw material requirement for $3750

3 Challenges & Advice

Major challenges

- Inaccurate tracing system is not able to assure the collection rate of all batteries; (for both EV and secondary use of batteries)
- Difficult to achieve a balance between the battery ownership of consumers and EPR for battery producers;
- Lack of proper regulations and standards for secondary market to assure safety, traceability, etc.
- Need to optimize the recycling capability globally;
- Regulatory barriers make the transportation fee for disposal, waste and used batteries unaffordable.

Advice

- Establish a life-cycle management system, which is critical for the sustainable development of battery industry;
- Develop monitoring tools such as Battery Passport to enhance LCA traceability;
- Introduce proper regulations and standards for secondary market to ensure a safe, environment friendly and traceable operation;
- Facilitate the recycling production capability globally and allow export/import of retired batteries or black mass;
- Develop feasible standards and regulations to distinguish the safety level of retired and waste batteries, to make the transportation fee reasonable and affordable.
- Allow railway to transport batteries and retired batteries in and between major markets like EU, China.
- To comply with some mandatory regulation of the recycled content or materials, such as Co, Ni, Li, relevant regulations should also be implemented to ensure high collection rate of retired and waste batteries for battery producers.

CATL

Together for the Energy Freedom

Rooted in the Chinese culture while embracing the global culture, strive to be a global premier innovative technology corporation, deliver excellent contribution to green energy resolution for mankind!

www.catl.com

Scan to visit our official website