

J&A Capital Markets Report

Renewable Energy: Lithium Batteries

November 2022

Over \$100 billion has been invested into the lithium batteries sector since 2020. Global trends towards renewable energy have driven the growth of the sector. Forecasts indicate that the sector will grow at a compounded annual growth rate (CAGR) of 13% from 2022 to 2031, making this one of the fastest-growing energy sectors. Chinese companies have received over 50% of capital deployed within the sector showing the appetite for growth and geopolitical importance of the sector.

This report provides a capital market overview of the lithium batteries sector and capital investments according to region or deal types, in addition to how much firms have increased their capital investments as well as announced deals between 2020 and 2022.

AUTHORS



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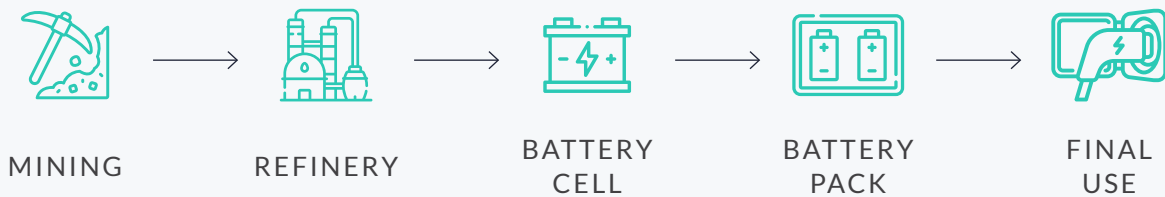
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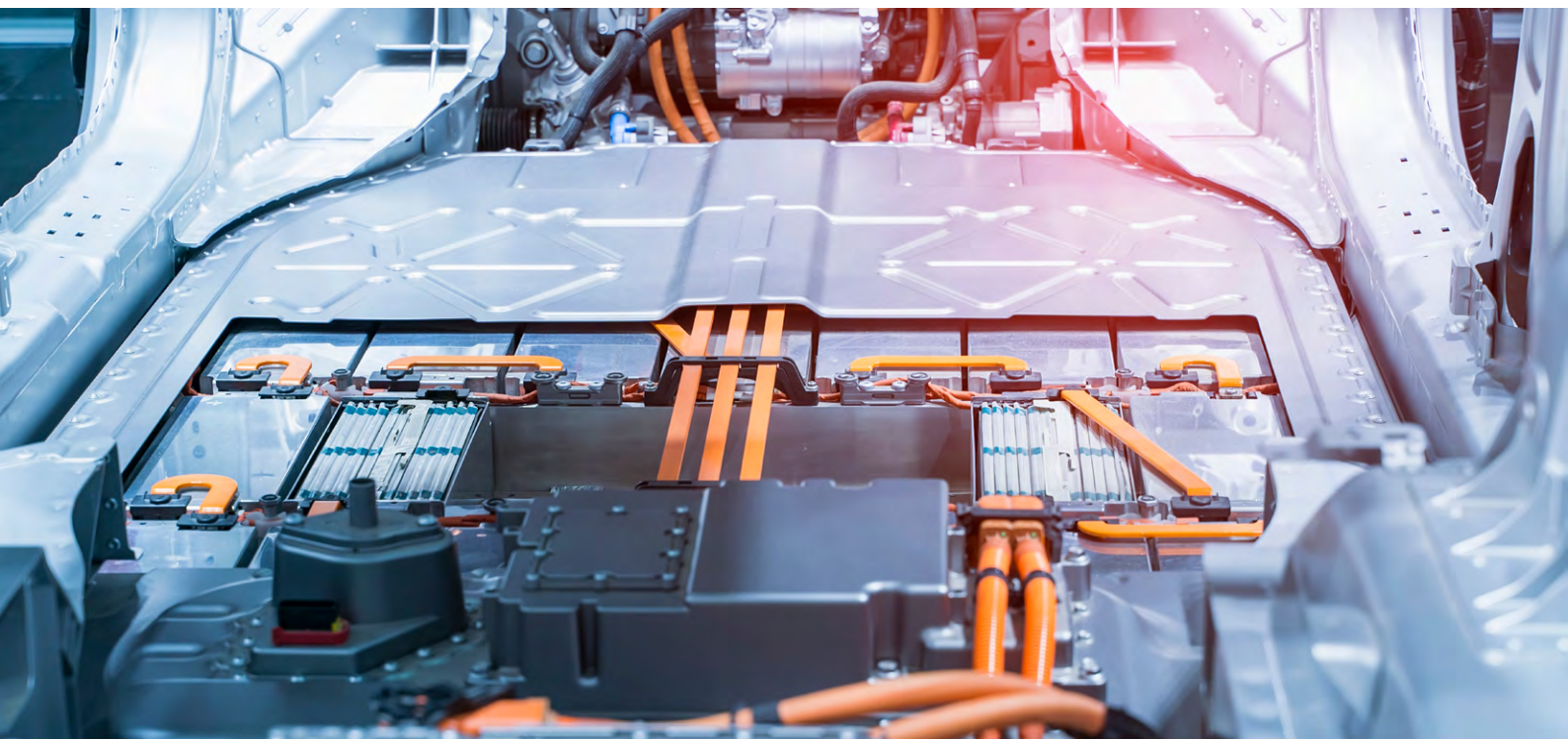
GARETH WALDECK

Gareth Waldeck is a member of the investment banking and global trade team at J&A. He is based in Abu Dhabi. He is originally from South Africa and studied in Economics at Fordham University. He has served as panelist for multiple forums such as the Diversity Dividend: Why Equality Benefits Us All and regularly publishes in the space of cross border capital markets.

Lithium Batteries: Market Breakdown

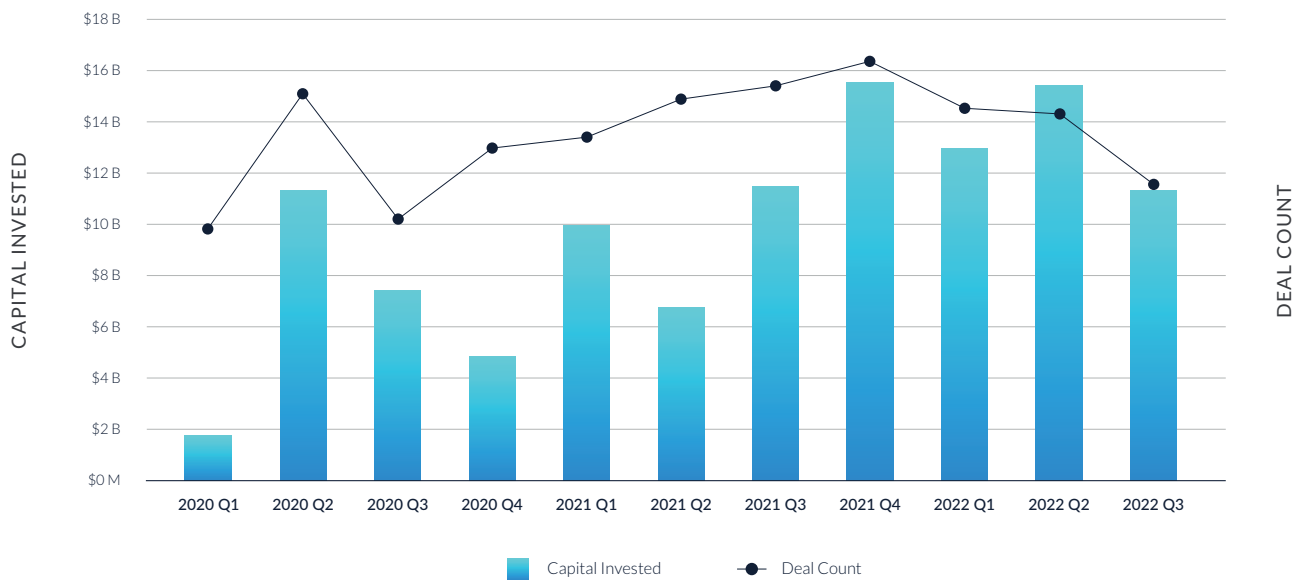


- The lithium battery industry is a \$48 billion industry with a five-year compound annual growth rate of 23%.
 - Lithium batteries can be used to power electric vehicles, households, personal electronics, and as a power backup storage. The technology allows lithium batteries greater energy storage because of the smaller and denser chemical structure.
 - Storage is important in renewable energies because it ensures there is always an availability of electricity. Batteries allow for energy to be stored during peak generation hours and used during off periods.
- Of the energy stored in lithium-ion batteries, 95% is available for use, whereas lead acid batteries have 10% less voltage capacity.



Lithium Batteries: Capital Market Analysis

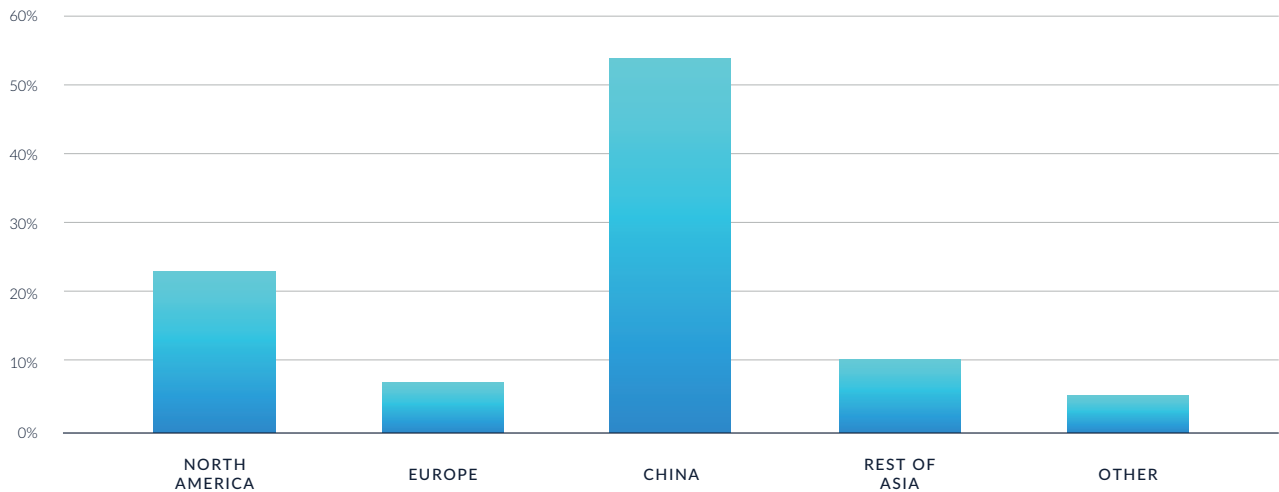
Announced Lithium Battery Deals between 2020 and 2022 Q3



Source: PitchBook Data, Inc.

- Lithium battery companies have received notable capital deployment since 2020, with a total of \$109 billion invested in the sector.
- Capital invested per quarter has been increasing despite lower deal count, indicating that larger transactions are occurring in the market. This shows that the lithium battery sector is maturing and capable of raising large investments.
- In Q2 of 2022, lithium battery companies raised a total of \$15 billion across 127 deals with an average deal size of \$12 million.
- In Q4 of 2021, 145 deals were made with a total of \$15 billion averaging each deal at \$10 million; therefore, it can be assumed that the end of Q4 in 2022 would also have high capital investments.

Capital Invested in Lithium Battery Companies by Region

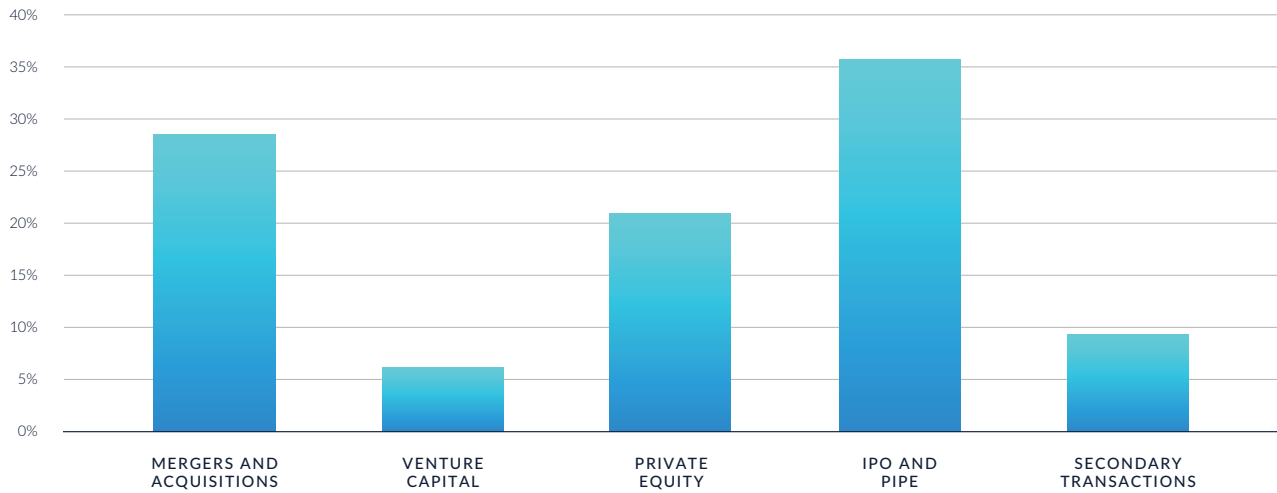


Source: PitchBook Data, Inc.

- Chinese lithium battery companies experienced the largest capital invested within the sector and raised a total of 54%, or \$59 billion, since 2020.
- Lithium battery companies from North America had the second largest capital investment in the sector with 24%, or \$26 billion, since 2020.
- Companies from other Asia companies such as Japan, India, and South Korea have also received notable capital deployment with a total of 11% of all funding in the sector.



Capital Invested in Lithium Battery Companies by Deal Type



Source: PitchBook Data, Inc.

- IPOs (initial public offerings) and PIPEs (private investments into public enterprises) have the largest capital invested in the lithium battery sector at 36%, or \$39 billion, since 2022, which indicates that the sector is maturing and large deals are occurring.
- Private equity at 21%, or \$23 billion, and venture capital at 6% indicates that although deal types are bigger in the private equity sector, venture capitals still consist of deals as well suggesting the vast size of the lithium battery sector.
- Mergers and acquisition deal types have the second largest capital investments with a value of 28%, or \$31 billion, indicating high levels of consolidation in the market.



DEAL SPOTLIGHT: REDWOOD MATERIALS



TOTAL CAPITAL RAISED TO DATE	ROUND	SERIES C	DATE	
\$824 M	CAPITAL RAISED	\$776 MILLION	LEAD INVESTOR	AUG 18, 2021 T. ROWE PRICE

THE COMPANY

Redwood Materials is a USA-based private company that is a developer of sustainable battery recycling technology. Redwood technology specializes in recycling and commercializing batteries and creating a sustainable solution. Redwood's technology facilitates waste to be processed and converted into battery cells. These cells can then be implemented in consumer electronics.

MOST RECENT FINANCING STATUS

- Redwood Materials raised \$776 million based on a pre-money valuation at \$3 billion of Series C venture funding in a deal on August 18, 2021.
- The round was led by T. Rowe Price. Eleven other strategic and financial investors participated in the round including Ford, Amazon, Goldman Sachs Asset Management, and Fidelity Investments.
- The funds will be used to expand the existing operations internationally and throughout North America.

The lithium batteries sector is critical for the future of the renewable energy market. The growth in demand for electric vehicles and household use of renewable energy has resulted in an expansion within the lithium battery sector, and a CAGR of 22%. Lithium batteries will continue to increase in popularity as the world shifts to more renewable energy. J&A forecast that the growth trends and investment in the sector will increase over the next decade making this a pivotal, high-growth industry.