

WinterGreen Research, INC.

Brochure

**Vehicle Company Hybrid Solid-State Batteries, Market Shares,
Market Forecasts, Market Analysis, 2022-2028**

**Vehicle Company Hybrid Solid-State Battery : The Next Generation of
Cars Climbs the Mountain of Solid State Batteries**

Mountains of Opportunity



Picture by Susan Eustis

REPORT # SH29571314

142 PAGES

75 TABLES AND FIGURES

2022

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WinterGreen Research, INC.

WinterGreen Research, Inc.

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CHECK OUT THESE KEY TOPICS

Vehicle Company Hybrid Solid-State Battery
Solid-State Market Driving Forces
Solid-State Market Forecasts
Ford EV
Mercedes EV
Toyota EV
GM EV

VW EV
Tesla EV
Nissan EV
Apple EV
Enovate EV
Solar Energy Storage
Wind Energy Storage
Cities of the Future

Structure of Rechargeable Battery
Solid-State EV Electric Car
EV
Electric Vehicle
Electric Vehicles
Drones
UAV

Solid-State Battery : Next Generation Robot / Human Interaction

Vehicle Company Hybrid Solid-State Battery: The Next Generation Power for Transportation and Energy Storage

LEXINGTON, Massachusetts (March 19, 2022) – WinterGreen Research announces that it has a new study on Vehicle Company Hybrid Solid-State Battery Next Generation Power for Transportation and Energy Storage: Market Shares, Market Forecasts, Market Analysis, 2022-2028. The 2022 study has 142 pages, 75 tables and figures. Solid-State Batteries represent next generation automation of electricity storage, a market in line for significant growth. It is expected to grow at a compound annual growth rate (CAGR) of 147.8% from 2021 to 2028. Rising demand for solid-state batteries among end-use sectors along with the rising research and development activities are focused on commercializing the battery. Lower costs for solid state batteries are expected to propel market growth.

EVs represent a primary market. The electrical solid state battery energy industry will reshape the future. The integrated business model of storage is becoming an application for energy consumption. Amid a greater industry focus on battery technology, automakers with EVs in their lineups are scrambling to position themselves for the arrival of solid-state battery cells soon.

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As EV sales increase driven by tighter regulation of carbon emissions, solid-state battery makers become indispensable for the renewable energy industry. Solid-state battery products are evolving an ability to be mass produced. Toyota has a timeline to achieve mass production of solid-state electric vehicle batteries by 2025. ProLogium said it aims to achieve mass produce solid-state batteries in 2022.

With war between Russia and the Ukraine, the world has embraced EVs as a way to reduce dependence on oil. This is being embraced as a shift to renewable energy. Transforming the economy to run electric vehicles, powered by solid state batteries, means that, no one has to worry about gas prices. With gas prices more than doubling in less than a week, demand of EVs is accelerating at a rapid pace.

Amid a greater industry focus on solid state battery technology, automakers with EVs in their lineups are scrambling to position themselves for the arrival of hybrid solid-state battery cells. Ilika, a materials research firm that has helped Toyota develop solid-state batteries, says the carmaker has been working on solid electrolyte technology for 10 years. Toyota's vision is to replace the flammable liquid electrolyte in a lithium-ion battery with a conductive ceramic material.

In Japan, as is true all over the world, carmakers are rushing to commercialize solid-state batteries. Toyota, Nissan and Honda joined forces with Panasonic to work on solid-state batteries for electric cars. The consortium includes 23 firms in total. They aim to commercialize solid-state batteries in the early 2020ies. The race for the next generation of battery technology is on.

The significant growth of automotive industry in the US, North America, Europe, China, India, Japan, and South Korea is expected to promote the demand for solid state batteries. Amprius Technologies' 100% silicon nanowire batteries are a breakthrough technology that is revolutionizing the battery industry. With the highest energy density, Amprius Technologies batteries improve the performance of electric vehicles, aircraft, drones. Amprius Technologies equipment for high volume manufacturing of 100% silicon nanowire anodes employs inline, continuous, and roll-to-roll production methods.

Worldwide Solid-State Battery markets are poised to achieve remarkable uptake in the market. Next generation Solid-State Batteries promise to bring the biggest change in human labor that has ever occurred. BMW is testing a solid-state battery that can be completely recharged in four minutes. BMW's is teamed with a company Solid Power, dedicated to developing solid-state batteries.

Innovative solid state battery component techniques bring the industry closer to realizing all-solid-state battery, greatly diversifying the battery product lineup. Battery manufacturers and automakers around the globe strive to develop a next-generation electric vehicle battery, called an all-solid-state battery (ASSB), which enables longer mileage and a shorter charging time than current EV batteries due to its higher energy density.

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WinterGreen Research is an independent research organization funded by the sale of market research studies all over the world and by identifying next generation technology. It is next generation technology that drives market growth. The company has 35 distributors worldwide, including Global Information Info Shop, Market Research.com, Research and Markets.

WinterGreen Research is positioned to help customers facing challenges that define the modern enterprises. The increasingly global nature of science, technology and engineering is a reflection of the implementation of the globally integrated enterprise. Customers trust wintergreen research to work alongside them to ensure the success of the participation in a particular market segment.

WinterGreen Research supports various market segment programs; provides trusted technical services to the marketing departments. It carries out accurate market share and forecast analysis services for a range of commercial and government customers globally. These are all vital market research support solutions requiring trust and integrity.

Keywords: Hybrid Solid-State Battery , Solid-State Battery , Solid-State Market Driving Forces, Solid-State Market Forecasts, Solar Energy Storage, Wind Energy Storage, Cities of the Future, Structure of Rechargeable Battery, Solid-State EV Electric Car , Forecast Electric Car Battery, Solid-State Cathode, Ceramics, Cobalt, Lithium Ion Battery, EV, Electric Vehicle, Electric Vehicles, Drones, UAV, UUV, Power Tools, Smart Phone Equipment, Consumer Electronics , Manganesem, Nickel Cobalt Manganese

Companies Profiled

24M

Amperex Technology Ltd. (CATL)

CATL Initial Public Offering in Shenzhen

Amprius Technologies Corporate Headquarters in Fremont, California

Apple

Aurora

Northvolt

Galp

BASF

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**Bettergy
BOAO Navigator Battery Holding
Bolloré
Bolloré Group Revenue
Bolloré BlueCar
Autolib Blue Solutions
Blue Solutions Solid State Battery Development
Solid State Battery Production Capacity
Autolib Red Car Solutions**

Bolloré Energy Storage Ringo Project by RTE

BMW

Bosch

BYD

California Energy Commission

Cymbet

Dyson / Sakti3

Enevate

EV Battery Equivalent of a Gas Tank. Provides the Vehicle Powertrain

Replace Cars That Run on Fossil Fuels with EVs

Extreme Fast Charging Technology Changes Everything

Enovate

Factorial Energy

Factorial's new Solid-State EV Battery

Ford

FREYR Battery

Alussa Energy

FREYR A/S

Alussa Energy Acquisition Corp.

Front Edge Technology

Front Edge Technology Technical Information

General Motors Collaborating with LG Energy Solution on Solid State Batteries

GM Ultium Lithium-Ion Battery

Honda

Hyundai

Ilika

Ion Storage Systems

Ionic

Ionic Materials Liquid Crystal Polymer

Jiawei

Johnson Battery Technologies

LG

Lishen

Mercedes-Benz

MIT

Mitsui Kinzoku

Mobis Energy

Mullen Automotive

Nissan

Northvolt

Northvolt / Cuberg

Panasonic

**Panasonic Leader in Lithium-Ion Battery Market by Virtue of Its Position as A
Supplier to Tesla**

Pellion

PolyPlus

**PolyPlus Battery Company Joint Development Agreements, One with SK Innovation
Co. Ltd.**

ProLogium

**ProLogium and Mercedes-Benz Technology Cooperation Agreement to Develop
Solid-State Battery Cells for Electric Vehicles**

ProLogium and Mercedes-Benz Agreed on Milestones

Softbank Backs ProLogium

ProLogium Major Product Pipelines

ProLogium Production Capacity Able to Meet Demand for Solid-State Batteries

QuantumScape

Riverstone Holdings' Decarbonization Plus Acquisition Corporation III

Sony

Total / Saft

Sakti3

Samsung

SK Innovation

Schneider Electric

Schneider Electric Positions to Implement Electrification of Society At Large

Seeo

Sila Nanotechnologies and Enivate

Sion Power

Sion Power Chemically Stable Ceramic Barriers

SK Innovation

SolidEnergy Systems

Solid Powe

Solid Power Technology

Solid Power Teaming with Ford and BMW

Samsung and Hyundai / Solid Power

Stanford TomKat Center

Sumitomo Electric Industries

SUNY

Tesla

Tesla Canada Industrial Research Chair, Dalhousie University

Thermo Scientific

Thermo Scientific Medical Spectrometers

Total Energies / Saft

Toyota

US Department of Energy

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US Military
LG / University of California at San Diego
LG Silicon Anodes
Silicon As an Anode to Replace Graphite
University of Illinois at Urbana
University of Texas All-Solid-State Lithium-Ion Battery Cell
Volkswagen Group
Wildcat Discovery Technologies

Solid-State Battery : Market Shares, Strategies, and Forecasts, Worldwide, 2022 to 2028

Report Methodology

This is the 957th report in a series of primary market research reports that provide forecasts in communications, telecommunications, the Internet, computer, software, telephone equipment, health equipment, and energy. Automated process and significant growth potential are priorities in topic selection. The project leaders take direct responsibility for writing and preparing each report. They have significant experience preparing industry studies. Forecasts are based on primary research and proprietary data bases.

The primary research is conducted by talking to customers, distributors and companies. The survey data is not enough to make accurate assessment of market size, so WinterGreen Research looks at the value of shipments and the average price to achieve market assessments. Our track record in achieving accuracy is unsurpassed in the industry. We are known for being able to develop accurate market shares and projections. This is our specialty. The analyst process is concentrated on getting good market numbers. This process involves looking at the markets from several different perspectives, including vendor shipments. The interview process is an essential aspect as well. We do have a lot of granular analysis of the different shipments by vendor in the study and addenda prepared after the study was published if that is appropriate.

Forecasts reflect analysis of the market trends in the segment and related segments. Unit and dollar shipments are analyzed through consideration of dollar volume of each market participant in the segment. Installed base analysis and unit analysis is based on interviews and an information search. Market share analysis includes conversations with key customers of products, industry segment leaders, marketing directors, distributors, leading market participants, opinion leaders, and companies seeking to develop measurable market share.

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Over 200 in depth interviews are conducted for each report with a broad range of key participants and industry leaders in the market segment. We establish accurate market forecasts based on economic and market conditions as a base. Use input/output ratios, flow charts, and other economic methods to quantify data. Use in-house analysts who meet stringent quality standards.

Interviewing key industry participants, experts and end-users is a central part of the study. Our research includes access to large proprietary databases. Literature search includes analysis of trade publications, government reports, and corporate literature.

Findings and conclusions of this report are based on information gathered from industry sources, including manufacturers, distributors, partners, opinion leaders, and users. Interview data was combined with information gathered through an extensive review of internet and printed sources such as trade publications, trade associations, company literature, and online databases. The projections contained in this report are checked from top down and bottom up analysis to be sure there is congruence from that perspective.

The base year for analysis and projection is 2021. With 2021 and several years prior to that as a baseline, market projections were developed for 2022 through 2028. These projections are based on a combination of a consensus among the opinion leader contacts interviewed combined with understanding of the key market drivers and their impact from a historical and analytical perspective.

The analytical methodologies used to generate the market estimates are based on penetration analyses, similar market analyses, and delta calculations to supplement independent and dependent variable analysis. All analyses are displaying selected descriptions of products and services.

This research includes referencde to an ROI model that is part of a series that provides IT systems financial planners access to information that supports analysis of all the numbers that impact management of a product launch or large and complex data center. The methodology used in the models relates to having a sophisticated analytical technique for understanding the impact of workload on processor consumption and cost.

WinterGreen Research has looked at the metrics and independent research to develop assumptions that reflect the actual anticipated usage and cost of systems. Comparative analyses reflect the input of these values into models.

The variables and assumptions provided in the market research study and the ROI models are based on extensive experience in providing research to large enterprise organizations and data centers. The ROI models have lists of servers from different manufacturers, Systems z models from IBM, and labor costs by category around the world. This information has been developed from WinterGreen research proprietary data bases constructed as a result of preparing market research studies that address the software, energy, healthcare, telecommunications, and hardware businesses.

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YOU MUST HAVE THIS STUDY

Vehicle Hybrid Company Solid-State Battery: Market Shares, Market

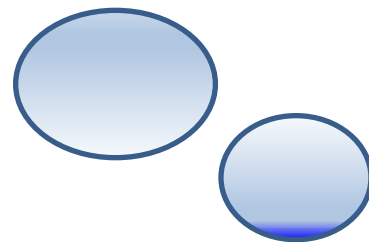
Strategies, and Market Forecasts, 2022 to 2028

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Hybrid Solid-State Battery : Executive Summary

The study is designed to give a comprehensive overview of the Vehicle Hybrid Solid-State Battery market segment. Research represents a selection from the mountains of data available of the most relevant and cogent market materials, with selections made by the most senior analysts. Commentary on every aspect of the market from independent analysts creates an independent perspective in the evaluation of the market. In this manner the study presents a comprehensive overview of what is going on in this market, assisting managers with designing market strategy likely to succeed.

Abstract: EVs Lead Renewable Energy Implementation: Hybrid Solid State Batteries Bring Reliability and Longevity to Energy Supply



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Source: Solid Power.

There is an energy industry consensus that electric vehicles will replace gas powered vehicles in the very near future

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ABOUT THE COMPANY

WinterGreen Research, research strategy relates to identifying market trends through reading and interviewing opinion leaders. By using analysis of published materials, interview material, private research, detailed research, social network materials, blogs, and electronic analytics, the market size, shares, and trends are identified. Analysis of the published materials and interviews permits WinterGreen Research senior analysts to learn a lot more about markets. Discovering, tracking, and thinking about market trends is a high priority at WinterGreen Research. As with all research, the value proposition for competitive analysis comes from intellectual input.

WinterGreen Research, founded in 1985, provides strategic market assessments in telecommunications, communications equipment, health care, Software, Internet, Energy Generation, Energy Storage, Renewable energy, and advanced computer technology.

Industry reports focus on opportunities that expand existing markets or develop major new markets. The reports access new product and service positioning strategies, new and evolving technologies, and technological impact on products, services, and markets. Innovation that drives markets is explored. Market shares are provided. Leading market participants are profiled, and their marketing strategies, acquisitions, and strategic alliances are discussed. The principals of WinterGreen Research have been involved in analysis and forecasting of international business opportunities in telecommunications and advanced computer technology markets for over 30 years.

The studies provide primary analytical insight about the market participants. By publishing material relevant to the positioning of each company, readers can look at the basis for analysis. By providing descriptions of each major participant in the market, the reader is not dependent on analyst assumptions, the information backing the assumptions is provided, permitting readers to examine the basis for the conclusions.

WinterGreen Research is positioned to help customers facing challenges that define the modern enterprises. The increasingly global nature of science, technology and engineering is a reflection of the implementation of the globally integrated enterprise. Customers trust wintergreen research to work alongside them to ensure the success of the participation in a particular market segment.

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About The Principal Authors

Susan Eustis, President, co-founder of WinterGreen Research, is a senior analyst. She has done research in communications, healthcare equipment, and computer markets and applications. She holds several patents in microcomputing and parallel processing. She has the original patents in electronic voting machines. She has new patent applications in format varying, multiprocessing, electronic voting, and oxygen management. She is the author of recent studies of the drone and robot marketing strategies, Internet equipment, biometrics, biomaterials, a study of Internet Equipment, Artificial Intelligence, IoT, Worldwide Telecommunications Equipment, Top Ten Telecommunications, Digital Loop Carrier, Web Hosting, Web Services, and Application Integration markets. Ms. Eustis is a graduate of Barnard College. Ms. Eustis was named Top Woman CEO in 2012 by Who's Who Worldwide. She was named Top Woman Market Research Analyst in 2012, 2013, 2014, 2015, 2016, 2018, 2019, and 2020. She has been twice featured on the cover of the Women of Distinction magazine. She was cited in a recent Time Magazine article and major media articles on Youth Sports market growth. She was also featured in recent Wall Street Journal, New York Times, HBO, and London Times articles. Bloomberg has had several quotes regarding cyber currencies and blockchain recently.

About the WinterGreen Research Team: The WinterGreen Research Team is comprised of senior analysts that prepare the market research and analysis that is offered to the client and developed using an iterative process to achieve a final study. Typical projects include providing market/viability research. The team can look at how drones can be applied to critical infrastructures safety, including: type of market existing, Barriers, Forecast demand and competitors, SWOT and competitive advantages, Price Analysis, product design recommendations (marketing orientation).

Research is typically for many different regions or localities, for example EU countries including Spain, UK, Nordic, Germany, and France. Typical projects profile the United States and areas of Asia. It is common to three representative countries from South America, Brazil, Argentina, Chile, and Mexico. Representative countries from Asia APAC typically include Japan, China, India, and Australia.

Critical infrastructure safety, including: type of market existing, barriers to entry and to faithful execution of product provision, forecast of demand, market share, SWOT, competitive advantage of major competitors, identification of new technologies and new companies, price performance analysis, product design recommendations, and marketing considerations are typical topics covered.

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