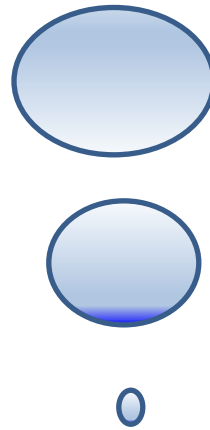


WinterGreen Research, INC.



**Lithium Ion Battery Cathodes:
Market Shares, Strategies, and Forecasts,
Worldwide, 2019 to 2024**



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Lexington, Massachusetts

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CHECK OUT THESE KEY TOPICS

Lithium Ion Battery Cathode Markets: Disruptive Technology that Decreases the Cost of Electric Vehicles

Cathode
Cobalt
Lithium Ion Battery
EV
Electric Vehicle
Electric Vehicles
Drones
UAV

UUV
Power Tools
Smart Phone Equipment
Consumer Electronics
Manganesem
Nickel Cobalt Manganesem
(NMC)

Lithium Iron Phosphate (LFP)
Manganese
Nickel Cobalt Aluminium
(NMA)

Cathode Markets:

Lithium-ion Batteries at \$100/kWh Make EVs Cheaper Than Traditional Gas-Powered Vehicles. As the new cathode technologies are applied to lithium ion batteries, the cost of lithium ion batteries will continue to decrease. Lithium-ion batteries aim to cost \$100/kWh, – a cost that makes EVs cheaper than traditional gas-powered vehicles. Companies are targeting between \$80/kWh and \$100/kWh. Realistically companies will likely approach \$100/kWh.

Figure 1. Lithium Ion Battery Cathodes Market Shares, Dollars, Worldwide, 2018

Cathode Market Shares, Dollars, Worldwide, 2018			
In Millions of Dollars			
	MM\$	%	Tonnes
	2018	2018	
Sumitomo Metal Mining (SMM)	XX	XX	XX
Panasonic	XX	XX	XX
BASF	XX	XX	XX
Umicore	XX	XX	XX
NEI Corporation	XX	XX	XX
LG	XX	XX	XX
Argonne National Labs	XX	XX	XX
Easpring	XX	XX	XX
Mitsubishi Chemical	XX	XX	XX
Reshine	XX	XX	XX
Long Power Systems	XX	XX	XX
Targray	XX	XX	XX
Toda Kogyo	XX	XX	XX
Fujitsu	XX	XX	XX
Pulead	XX	XX	XX
JFE Chemical	XX	XX	XX
Samsung	XX	XX	XX
Hitachi Chemical	XX	XX	XX
Other	XX	XX	XX
Total	XX	XX	XX

Source: WinterGreen Research, Inc.

Figure 2. Lithium Ion Battery Cathodes Market Shares, Dollars, Worldwide, 2017 and 2016

Cathode Market Shares, Dollars, Worldwide, 2017				
In Millions of Dollars				
	MM\$	%	MM\$	%
	2017	2017	2016	2016
Sumitomo Metal Mining (SMM)	XX	XX	XX	XX
Panasonic	XX	XX	XX	XX
BASF	XX	XX	XX	XX
Umicore	XX	XX	XX	XX
NEI Corporation	XX	XX	XX	XX
LG	XX	XX	XX	XX
Argonne National Labs	XX	XX	XX	XX
Easpring	XX	XX	XX	XX
Mitsubishi Chemical	XX	XX	XX	XX
Reshine	XX	XX	XX	XX
Long Power Systems	XX	XX	XX	XX
Targray	XX	XX	XX	XX
Toda Kogyo	XX	XX	XX	XX
Fujitsu	XX	XX	XX	XX
Pulead	XX	XX	XX	XX
JFE Chemical	XX	XX	XX	XX
Samsung	XX	XX	XX	XX
Hitachi Chemical	XX	XX	XX	XX
Other	XX	XX	XX	XX
Total	XX	XX	XX	XX

Source: WinterGreen Research, Inc.

Figure 3. Lithium Ion Battery Cathode Segments, Electric Vehicle, Smart Phones, Stationary Storage / Grid, Power Tools, Laptops, Consumer Electronics, Drones / UAVs, Market Segments, Dollars and Percent, Forecasts, Worldwide, 2017 - 2024 and 2013 to 2017

Cathode Segments, Electric Vehicle, Smart Phones, Stationary Storage / Grid, Power Tools, Laptops, Consumer Electronics, Drones / UAVs, Market Segments,
 Dollars and Percent, Forecasts, Worldwide, 2017 - 2024 and 2013 to 2017
 In Percent
 In Millions of Dollars

	2017 2017	2018 2016	2019 2015	2020 2014	2021 2013	2022	2023	2024
Electric Vehicle								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Smart Phones								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Stationary Storage / Grid								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Power Tools,								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Laptops / Consumer Electronics								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Drones,UUVs, and UAVs								
MM\$	xx	xx	xx	xx	xx	xx	xx	xx
%	xx	xx	xx	xx	xx	xx	xx	xx
Total (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
% Growth	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

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Figure 4. Lithium Ion Battery Cathodes Segments, Military, Transportation, Energy Storage, Consumer Electronics, Dollars, Worldwide, 2018 - 2024 and 2012 to 2017

Cathodes Segments, Military, Transportation, Energy Storage, Consumer Electronics,
Dollars, Worldwide, 2018 - 2024 and 2012 to 2017

In Millions of Dollars

	2017 2012	2018 2013	2019 2014	2020 2015	2021 2016	2022 2017	2023	2024
Military (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
\$ per Tonne	xx	xx	xx	xx	xx	xx	xx	xx
Tonnes	xx	xx	xx	xx	xx	xx	xx	xx
Transportation (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
\$ per Tonne	xx	xx	xx	xx	xx	xx	xx	xx
Tonnes	xx	xx	xx	xx	xx	xx	xx	xx
Utility Energy Storage (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
\$ per Tonne	xx	xx	xx	xx	xx	xx	xx	xx
Tonnes	xx	xx	xx	xx	xx	xx	xx	xx
Consumer	xx	xx	xx	xx	xx	xx	xx	xx
\$ per Tonne	xx	xx	xx	xx	xx	xx	xx	xx
Tonnes	xx	xx	xx	xx	xx	xx	xx	xx
Total (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

Figure 5. Lithium Ion Battery Cathode Segments, NMC 532, NMC 622, NMC 811, Market Segments, Dollars, Worldwide, 2018

In Millions of Dollars		
	MM\$ 2017	% 2017
NMC 532 Cathode	xx	xx
NMC 622 Cathode	xx	xx
NMC 811 Cathode	xx	xx
Other Cathode	xx	xx
Total	xx	xx

Source: WinterGreen Research, Inc.

Figure 6. Lithium Ion Battery Cathode Market Growth Dollars and Percent, Worldwide, 2018 - 2024

Cathode Market Growth Dollars and Percent, Worldwide, 2018 - 2024 In Percent In Millions of Dollars								
	2017 2017	2018 2016	2019 2016	2020 2014	2021 2013	2022	2023	2024
NMC 532 Cathode MM\$, Tonnes	XX	XX	XX	XX	XX	XX	XX	XX
% of Total Market	XX	XX	XX	XX	XX	XX	XX	XX
% Growth	XX	XX	XX	XX	XX	XX	XX	XX
NMC 622 Cathode MM\$, Tonnes	XX	XX	XX	XX	XX	XX	XX	XX
% of Total Market	XX	XX	XX	XX	XX	XX	XX	XX
% Growth	XX	XX	XX	XX	XX	XX	XX	XX
NMC 811 Cathode MM\$, Tonnes	XX	XX	XX	XX	XX	XX	XX	XX
% of Total Market	XX	XX	XX	XX	XX	XX	XX	XX
% Growth	XX	XX	XX	XX	XX	XX	XX	XX
Other Cathode MM\$, Tonnes	XX	XX	XX	XX	XX	XX	XX	XX
% of Total Market	XX	XX	XX	XX	XX	XX	XX	XX
% Growth	XX	XX	XX	XX	XX	XX	XX	XX
Total (MM\$)	XX	XX	XX	XX	XX	XX	XX	XX
% Growth	XX	XX	XX	XX	XX	XX	XX	XX
% Total Market	XX	XX	XX	XX	XX	XX	XX	XX

Source: WinterGreen Research, Inc.

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Figure 7. Electric Vehicle Segment Market Forecasts, Dollars and Units, Worldwide, 2019 - 2025

**Electric Vehicle Segment Market Forecasts,
Dollars, Worldwide, 2019 - 2025**

	2018	2019	2020	2021	2022	2023	2024	2025
Electric Personal Car and Light Truck Truck Vehicle Sales (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
Electric Truck and Bus Vehicle Sales (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx
Total (MM\$)	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

Figure 8. Cars and Light Truck Electric Vehicle Segment Market Forecasts, Small, Mid Size, Luxury. And TaaS, Units, Worldwide, 2019 - 2025

**Cars and Light Truck Electric Vehicle Segment Market Forecasts, Small, Mid Size, Luxury. And TaaS,
Units, Worldwide, 2019 - 2025**

	2018	2019	2020	2021	2022	2023	2024	2025
Personal Electric Vehicle (MM)	xx	xx	xx	xx	xx	xx	xx	xx
# Small Units	xx	xx	xx	xx	xx	xx	xx	xx
# Mid Size Units	xx	xx	xx	xx	xx	xx	xx	xx
# Luxury Units	xx	xx	xx	xx	xx	xx	xx	xx
# TaaS Electric Units	xx	xx	xx	xx	xx	xx	xx	xx
Personal Electric Vehicle (MM)								
% Small Units	xx	xx	xx	xx	xx	xx	xx	xx
% Mid Size Units	xx	xx	xx	xx	xx	xx	xx	xx
% Luxury Units	xx	xx	xx	xx	xx	xx	xx	xx
% TaaS Units	xx	xx	xx	xx	xx	xx	xx	xx
Electric Vehicle Shipped Units (100%)	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

Figure 9. Lithium Ion Battery Cathode Regional, Market Segments, Dollars, Worldwide, 2018

Lithium Ion Battery Cathode Regional Market Segments, Dollars, Worldwide, 2018		
In Millions of Dollars		
	MM\$ 2018	% 2018
US	XX	XX
Germany	XX	XX
Belgium	XX	XX
Rest of Europe	XX	XX
China	XX	XX
Japan	XX	XX
South Korea	XX	XX
Taiwan	XX	XX
Rest of World	XX	XX
Total	XX	XX

Source: WinterGreen Research, Inc.

Lithium-Ion Battery Cathode Material Market by Type (Cobalt, Manganese, Phosphate, Nickel Cobalt Manganese (NCM OR NMC), Lithium Iron Phosphate (LFP), and Others) and End User (Power Tools, Medical Equipment, Consumer Electronics Products, and Others) -

Lithium-ion Battery Cathode Material Market Key Segments:

By Type

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Cobalt

Manganese

Phosphate

Nickel Cobalt Manganese (NCM or NMC)

Lithium Iron Phosphate (LFP)

Others (Nickel Cobalt Aluminum (NCA), Cobalt-based Lithium-Ion (LCO), Lithium Manganese Nickel Oxide (LMNO), and Lithium Manganese Oxide (LMO))

Cobalt

Manganese

Nickel Cobalt Manganese (NMC)

Lithium Iron Phosphate (LFP)

- Power Tools
- Medical Equipment
- Consumer Electronics Products
- Other

Notes:

Production, means the output of Lithium-Ion Battery Cathode Material

Revenue, means the sales value of Lithium-Ion Battery Cathode Material

This report studies Lithium-Ion Battery Cathode Material in Global market, especially in North America, Europe, China, Japan, Southeast Asia and India, focuses on top manufacturers in global market, with capacity, production, price, revenue and market share for each manufacturer, covering

Hunan Shanshan Advanced Materials

Hunan Reshine New Material

Pulead Technology Industry

Beijing Easpring Material Technology

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Tianjin B&M Science and Technology Joint-Stock

Tianjin B&M Science and Technology Joint-Stock

Targray

Market Segment by Regions, this report splits Global into several key Regions, with production, consumption, revenue, market share and growth rate of Lithium-Ion Battery Cathode Material in these regions, from 2011 to 2021 (forecast), like

North America

Europe

China

Japan

Southeast Asia

India

Split by product type, with production, revenue, price, market share and growth rate of each type, can be divided into

Nickel Cobalt Manganate Ternary Material

Nickel Cobalt Aluminum Binary Material

Split by application, this report focuses on consumption, market share and growth rate of Lithium-Ion Battery Cathode Material in each application, can be divided into

Electric Cell Phone Lithium Battery

Electric Car Lithium Battery

Other

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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.

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.

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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, mulitprocessing, 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. Susan Eustis, President, co-founder of WinterGreen Research is a senior analyst. She has done research in communications 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, mulitprocessing, and electronic voting. She is the author of recent studies of the Solar Renewable Energy, Wind Energy, Thin Film Batteries, Business Process Management marketing strategies, Internet equipment, biometrics, a study of Internet Equipment, 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 the same year and successive years 2013,2014,2015, 2016, 2017, and 2018 thereafter. She has been featured twice on the cover of Women of Distinction. 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.

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,

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identification of new technologies and new companies, price performance analysis, product design recommendations, and marketing considerations are typical topics covered.

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