



FOR IMMEDIATE RELEASE:

Innovations, new entrants, business opportunities... the battery industry is booming

Extracted from: Status of the Battery Patents report, Knowmade, April 2018 - Li-Ion Battery Packs for Automotive & Stationary Storage Applications report, Yole Développement, April 2018 - Status Of The Rechargeable Li-Ion Battery Industry, Yole Développement, 2017

LYON, France – June 12, 2018: “Battery IP¹ activity is booming along with the industry”, comments **Dr. Fleur Thissandier, Technology & IP Analyst at Knowmade**. Therefore, worldwide demand for energy storage devices has been booming since the 2000s, leading to a very dynamic battery market. The number of battery applications is diversifying and growing to span portable consumer devices, electronic devices, electric vehicles and smart grids.

[Knowmade](#) and [Yole Développement \(Yole\)](#), both part of Yole Group of Companies, investigate the battery industry via two complementary approaches (market and patent analysis) to reveal the latest market issues, technical challenges, solutions and trends, companies’ strategies and identify the related key IP. Both companies propose today a wide collection of technology, market and IP reports focused on industry evolution and technology trends.

The battery industry combines major markets with an increasing and diversifying number of innovations and involved companies. What is the status of the IP ecosystem? Is Li-ion batteries still dominating this industry? What is the status of battery pack market?

Knowmade and Yole offer you today a snapshot of the battery sector.

Under this booming ecosystem with new entrants and numerous moves all along the supply chain, a lot of technologies and products have been developed to answer to the requirement of the modern society and its battery-related applications.

Amongst the numerous existing technologies, Li-ion batteries have become the technology of choice for many applications. The rechargeable Li-ion battery cell market will be worth US\$59.1 billion by 2022. Consumer electronics, the traditional Li-ion battery market segment, has been overtaken by electric mobility, a market segment that will represent 72% of the total rechargeable Li-ion battery cell market’s value in 2022. And according to Yole’s analysis, [Status of the Rechargeable Li-ion Battery Industry](#), the global demand for battery cells in GWh will rise by more than 400% between 2016 and 2022.

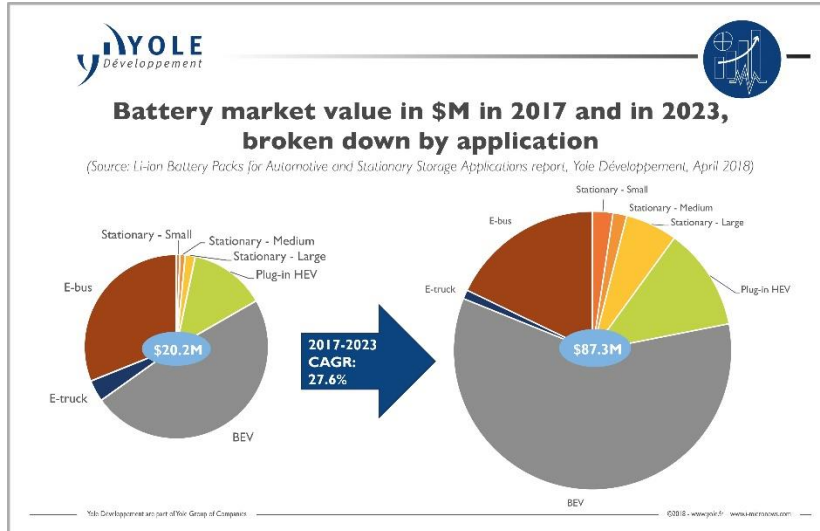
¹ IP: Intellectual Property

“To satisfy such huge demand for Li-ion batteries, large manufacturing facilities have to be built in coming years”, explains **Dr. Milan Rosina**,

Senior Technology & Market Analyst at Yole.

“This provides an opportunity for new players, which can take part in a growing market more easily. This will also result in accelerated implementation of innovations at different levels of the supply chain, in materials, equipment and processes.”

In parallel, the battery pack market segment is also attractive. Yole announces in its [Li-ion Battery Packs for](#)



[Automotive and Stationary Storage Applications](#) report an annual market value of US\$87.3 billion by 2023 with 27.6% CAGR² between 2017 and 2023.

Battery pack is the key element of large-size battery-based systems such as full electric as BEV/PHEV³, electric buses and trucks, and stationary battery energy storage systems. The second largest part of the battery pack market is represented by Battery Management Systems (BMS).

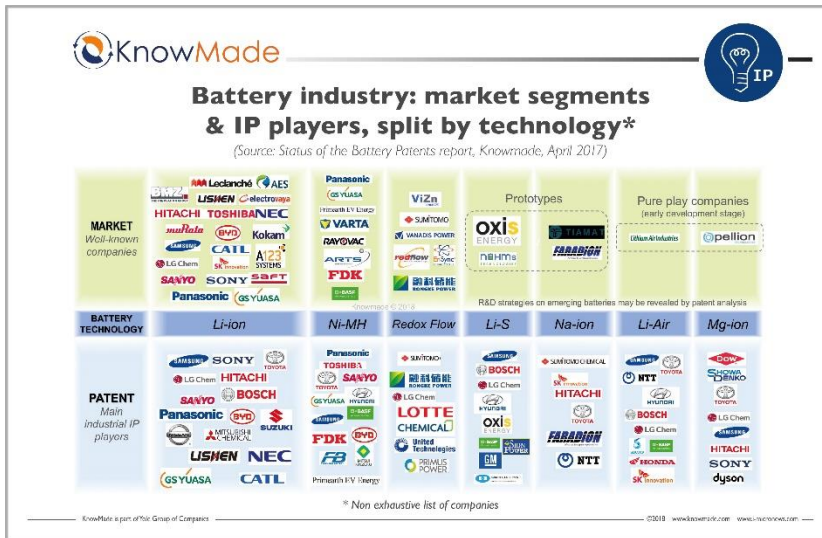
“The differentiation is needed, especially in the e-mobility business”, explains Dr Milan Rosina in this new report. Battery pack makers can increase differentiating added value by carefully designing the battery pack, and choosing components including the BMS, thermal management solutions, safety devices, electrical interconnects, housing and assembly. Therefore, the main trends involve existing technology solutions, which will be further improved and more widely deployed. Technology and cost improvement are from their side, steady. The big changes, such as the transition to 800V battery pack voltage for BEVs, will be realized first by a limited number of car manufacturers and then progressively implemented by other companies.

Dr. Rosina reveals his vision in a battery pack article on i-micronews.com: [“How will the Li-ion battery pack market reach \\$87.3 billion by 2023?”](#)

A lot of R&D effort is currently focused on the development of new Li-ion battery cell materials (electrodes, electrolytes, separators, etc.) as well as on future alternatives to Li-ion technologies, resulting in intensive patenting activity, with a substantial increase in recent years.

² CAGR: Compound Annual Growth Rate

³ BEV/PHEV : plug-in hybrid electric vehicles



More than 300,000 patent families related to batteries have been published worldwide since the early 1990s, announces Knowmade in its report, “[Status of the Battery Patents](#)”. In 2017, more than 30,400 new patent families were published, over 30,900 patents were granted, and over 6,400 patents expired. “It is a critical time to understand the global competitive environment of

batteries from a patent perspective”, comments Dr Fleur Thissandier. “Therefore in-depth patent analyses of key technologies and players can help anticipate changes, quickly detect business opportunities, identify emerging research areas and cutting-edge technology developments, mitigate risks and make strategic decisions to strengthen one’s market position and maximize return on one’s IP portfolio.”

Under its IP report, Knowmade’s analysts reveal the main 2017 trends for battery-related intellectual property (IP). They show an overview of the recent patenting activity (new patent applications, granted patents, expired patents), the main patent applicants, the major patent litigations, and the hot technological topics of the year, for each supply chain segment (electrolyte, separator, electrode, cell, pack/system) and each battery technology (Li-ion, Ni-MH, redox flow, Li-Air, Li-S, Na-ion and Mg-ion batteries). The report includes a special focus on the most interesting patents of the year.

Discover the world of batteries, their technologies and market trends with Yole Group of Companies’ analyses. Stay tuned on micronews.com.

ABOUT THE REPORTS:**STATUS OF THE BATTERY PATENTS**

The battery domain combines major markets with an increasing and diversifying number of innovations and involved companies. What were the main patents, technologies and competitive trends in 2017? – Produced Knowmade, part of Yole Group of Companies.

Companies cited in the report:

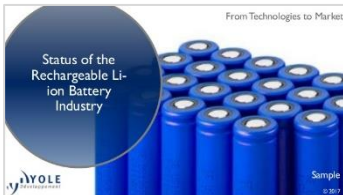
3M, A123 Systems, AGC, Amperex, Automotive Energy Supply, Bak, BASF, BMW, Boston Power, BYD, Chery Automobile, FAW Automobile, Denki Kogyo/Denka, Denso, Donguan Kaixin Battery Material, DuPont, Easpring Material Technology, Ecopro, Envia, General Motors, GS Yuasa, Hitachi, Honda, Huawei, Jinhe New Materials, Johnson Controls Technology... [Full list](#)

Authors:

- **Dr. Fleur Thissandier** works for Knowmade in the field of Materials Chemistry and Energy storage. She holds a PhD in Materials Chemistry and Electrochemistry from CEA/INAC, Grenoble, France. She also holds a Chemistry Engineering Degree from the Superior National School of Chemistry (ENSCM), Montpellier, France.
- **Dr. Nicolas Baron** is CEO and co-founder of Knowmade. He manages the development and strategic orientations of the company and personally leads the Electronics & Telecom department. He holds a PhD in Physics from the University of Nice Sophia-Antipolis, and a Master Degree in Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI Strasbourg), France.

STATUS OF THE RECHARGEABLE LI-ION BATTERY INDUSTRY

How will e-mobility reshape the lithium ion battery supply chain? – Produced Yole Développement (Yole), part of Yole Group of Companies.

**Companies cited in the report:**

3M, A123 Systems, ABB, Akasol, Albermarle, Asahi Kasei, ATL, Aoyu Graphite Group, BASF, Bitrode, BMW, BMZ, Bosch, BTR, BYD, CALB, CATL, China Baoan Group, Daikin, Daimler, Digatron, DNP, Dongguan HONBRO Li-ion Battery Equipment Technology Co., Ltd., E-One Moli Energy, Electrovaya, F&K Delvotec, Dow, Dynapower, FDK, Festo, FMC, Freudenberg, Focus Graphite, Freepport-McMoran, Furukawa Electric, Glencore, GS Yuasa, Henan Kelong New Energy... [Full list](#)

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Dr. Milan Rosina is a Senior Analyst for Power Electronics and Batteries at Yole Développement. Before joining Yole, he worked as a Research Scientist and a Project Manager in the fields of photovoltaics, microelectronics, and LEDs. Dr. Rosina has more than 15 years of scientific and industrial experience with prominent research institutions, an equipment maker, and a utility company. His expertise includes new equipment and process development, due diligence, technology, and market surveys in the fields of renewable energies, energy storage, batteries, power electronics, and innovative materials and devices.

LI-ION BATTERY PACKS FOR AUTOMOTIVE AND STATIONARY STORAGE APPLICATIONS

How to benefit from the ever-growing battery pack market while staying differentiated – Produced Yole Développement (Yole), part of Yole Group of Companies.

Companies cited in the report:

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Elektroelement, Ewert Energy Systems, F&k Delvotec, Fischer Elektronik, Freemans, GE, Gillig, Golden Dragon, GS Yuasa, Furukawa Battery, Hesse Mechatronics, Hitachi, ION, Hyundai, Infineon, Iron Edison, Iveco, JTT, Kokam... [Full list](#)

Author: Dr. Milan Rosina.

ABOUT KNOWMADE



Specializing in patent analysis and scientific information, Knowmade provides technology intelligence and IP strategy consulting services. The company supports R&D organizations, industrial companies, and investors in their business development by offering them a deep understanding of their IP environment and technology trends. Knowmade operates in the following industrial sectors: Compound Semiconductors, Power Electronics, RF & Microwave Technologies, LED/OLED Lighting & Display, Photonics, Memory, MEMS & Sensors, Manufacturing & Advanced Packaging, Batteries & Energy Management, Biotechnology, Pharmaceuticals, Medical Devices, Medical Imaging, and Agri-Food & Environment. Knowmade's experts provide prior art search, patent landscape analysis, scientific literature analysis, patent valuation, IP due diligence, and freedom-to operate analysis. In parallel, the company offers litigation/licensing support, technology scouting, and IP/technology watch services. Knowmade's analysts combine their technical and patent expertise with powerful analytics tools and proprietary methodologies to deliver relevant patent analyses and scientific reviews. More information on www.knowmade.com and follow Knowmade on [LinkedIn](#).

ABOUT YOLE DEVELOPPEMENT



Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide covering MEMS and image sensors, Compound Semiconductors, RF Electronics, Solid-state lighting, Displays, software, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management. The "More than Moore" market research, technology and strategy consulting company Yole Développement, along with its partners System Plus Consulting, PISEO and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to grow their business. . For more information, visit www.yole.fr and follow Yole on [LinkedIn](#) and [Twitter](#).

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