

Article 04/2018

Responsible sourcing of raw materials in the EV battery industry

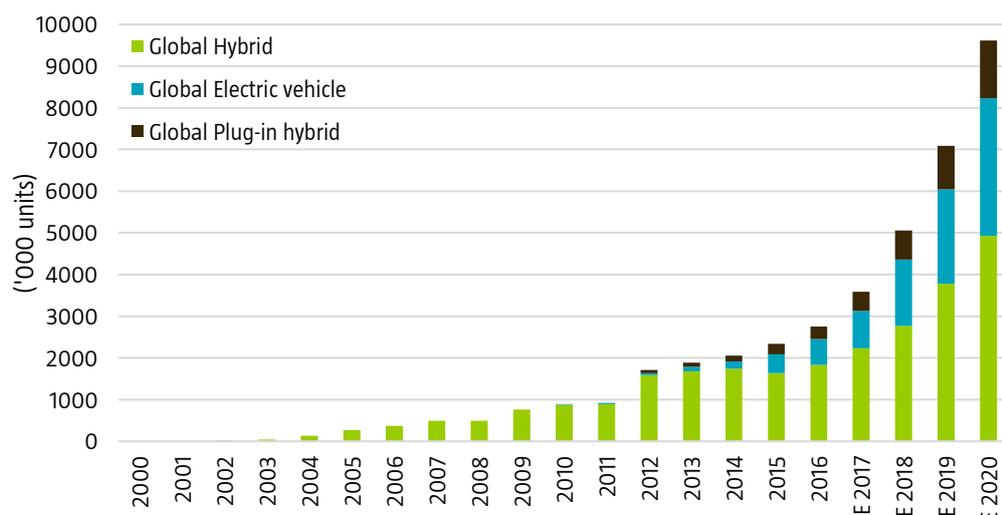
The increasing demand for electric vehicles presents an opportunity for battery manufacturers to profit from the global transition to environmentally friendly modes of road transport. Companies that can source their raw materials in a responsible way will be in a better position to manage their supply chain effectively and to limit their reputational risks in the long term. This will also allow a fledgling industry to continue on its path to sustainable growth.

Growth opportunities in the lithium-ion battery sector

Total unit sales of plug-in electric vehicles (EV) reached 1 million in 2017 and are expected to hit 24.4 million by 2030, according to Bloomberg New Energy Finance.¹ EV sales, including plug-in hybrid vehicles, are forecast to be 30% of all new cars sold in 2030, rising to 54% of global new car sales by 2040.

RobecoSAM considers these forecasts to be rather conservative, as the cost of electric vehicles is expected to already match that of internal combustion engine vehicles in just a few years from now. Furthermore, fleet emission targets as well as the ban on selling new gasoline- and diesel-powered cars in many countries by 2030 or 2040 will help drive the EV growth story.

EV sales to rise significantly in the coming years

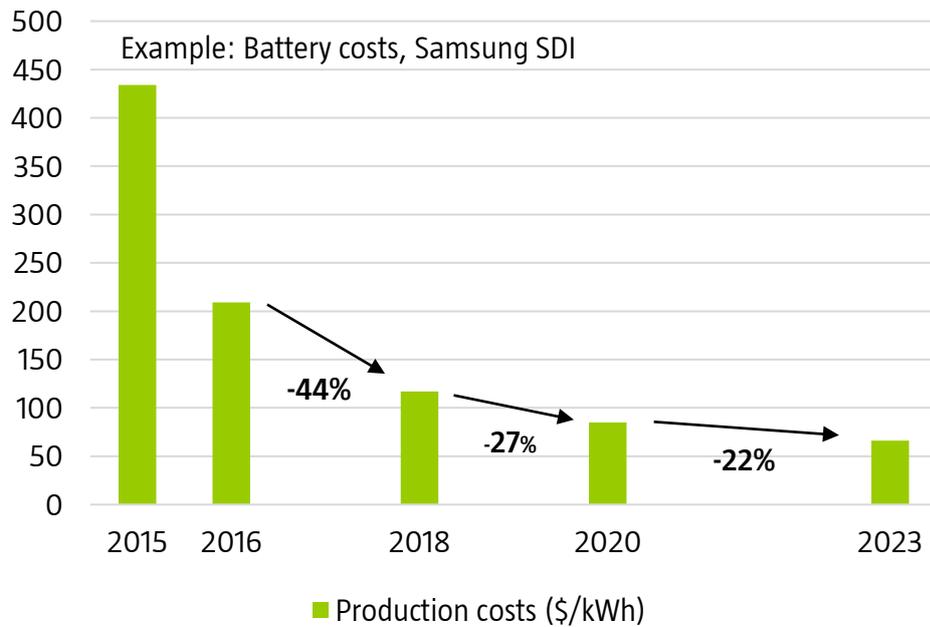


Sources: Fourine, JAMA, MarkLines, EEA, ICCT, Ward's, Autodata, Nomura, 2017

¹ Bloomberg New Energy Finance

EV battery cost is a key determinant of higher EV adoption rates. Forecasts suggest price parity with internal combustion-engine (ICE) vehicles in 2021 as the cost of batteries reaches USD 100/kWh from an average of USD 209/kWh in 2016.²

Battery costs to decline significantly over the next years



Sources: Samsung SDI, BNP Paribas, 2016

Following the significant increase in lithium and cobalt prices over the last few years, the mass adoption of EVs will depend on battery manufacturers' ability to secure the supply of raw materials in order to meet demand. Companies that not only achieve this objective, but also execute responsible sourcing policies will be able to manage their supply chain exposures more effectively and to limit reputational risks.

As such, RobecoSAM recognizes the need to assess the responsible sourcing of raw materials within the supply chain of the EV battery companies that its strategies invests in.

Securing the supply of raw materials

Only a few EV and battery manufacturers have managed to secure long-term supply contracts for lithium and cobalt. Furthermore, lithium is not traded on any exchange, with prices being determined by long-term contracts or spot market prices in China. Therefore, securing the supply of raw materials for EV batteries is a key business risk, and ensuring long-term supply will strengthen companies' ability to meet demand from EV manufacturers. For EV battery manufacturers, it is critical to form partnerships and relationships with upstream companies in order to ensure the sustainable supply of battery components.

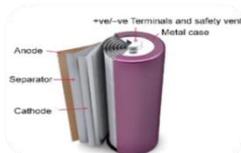
² Bernstein Research

Lithium-ion battery value chain

**Lithium products:
carbonate,
hydroxide**



**Battery
components**



**Battery cells and
packs**



**Car OEMs:
HEV, PHEV, BEV**



Sources: RobecoSAM, Albemarle, 2017

Companies in the EV value chain, as well as countries, are rushing to secure the supply of lithium and cobalt by acquiring mining rights, signing long-term contracts with miners, or purchasing stakes in mining businesses. In the process, implementing responsible sourcing of such raw materials will have a positive impact on the EV growth story.

Responsible sourcing in the EV battery supply chain

Besides ensuring that the business risk of raw materials supply is mitigated, we recognize the need to assess other risks within the supply chain when we invest in companies. For example, both lithium and cobalt have been linked to various environmental and social issues, with the sources of supply principally located in emerging markets. RobecoSAM is committed to integrating ESG considerations into its investment processes, and our approach is consistent with our efforts to maintain these high standards. As part of the investment case, we assess the responsible sourcing of these materials by reviewing the scope and applicability of the company's supplier code of conduct, supplier selection process and conflict mineral policy as well as through media and stakeholder analysis.

Company	Supplier code of conduct	Robust supplier selection process	Conflict mineral policy	Media and Stakeholder Analysis (MSA)
Samsung SDI	✓	✓	✓	No outstanding MSA cases*
LG Chem	✓	✓	✓	No outstanding MSA cases*
Panasonic	✓	✓	✓	No outstanding MSA cases related to supply chain
Umicore	✓	✓	✓	No outstanding MSA cases

*Amnesty International has broadly criticized users of cobalt in the EV value chain for failure to conduct due diligence of their supply chain. However, Samsung SDI and LG Chem have made substantial efforts to manage this risk.

The companies mentioned above – namely Samsung SDI, LG Chem, Panasonic and Umicore – have best-in-class practices. These include the outright prohibition of conflict minerals and materials sourced through any illegal and unethical processes; a requirement for suppliers to conduct due diligence on the origins and distribution processes of minerals; the disclosure of results from the due diligence process; and third-party certification of compliance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.

Companies that include lithium, cobalt and other minerals from high-risk areas in their policies, and perform audits of suppliers and companies in the value chain, provide further comfort over their commitment to responsible sourcing. Given the social risks relating to cobalt from the Democratic Republic of Congo, companies that are actively involved in the Responsible Cobalt Initiative (RCI) – such as LG Chem and Samsung SDI – and those that have a public cobalt policy perform supplier audits involving mine visits. They also use conflict-free smelters and are identified as best-in-class companies, which are classified as investable.

During our assessment, when we find areas that need clarification due to a lack of information on how risks are managed, we engage with the company – along with Robeco's Active Ownership team – and

consider the outcomes in our investment decisions. Only companies that meet all of the engagement objectives qualify for investment.

Conclusion

Sustainability is the core principle of RobecoSAM and we are committed to the integration of ESG considerations in our investment cases. RobecoSAM's integrated investment approach between the Portfolio Manager, Equity Research, Sustainability Investing Research and Robeco's Active Ownership & Engagement team minimizes risks in the value chain of the EV growth story and maximizes the positive contribution of the EV theme by identifying and investing in the most sustainable companies.

The car of the future will be safe, green and connected. New business models will emerge and change our way of life. The electric revolution has just started.



Thimo Lang, PhD
Senior Portfolio Manager



Thomas Guennegues, CFA
Senior Equity Analyst



Roraj Pradhananga
Sustainability Investing Analyst

> For more information, visit:
www.robecosam.com/en/professionals/strategies-services/funds/

About RobecoSAM

Founded in 1995, RobecoSAM is an investment specialist focused exclusively on Sustainability Investing. It offers asset management, indices, impact analysis and investment, sustainability assessments, and benchmarking services. Together with S&P Dow Jones Indices, RobecoSAM publishes the globally recognized Dow Jones Sustainability Indices (DJSI) as well as the S&P ESG Factor Weighted Index Series, the first index family to treat ESG as a standalone performance factor using the RobecoSAM Smart ESG methodology. As of December 31, 2017, RobecoSAM had client assets under management, advice and/or license of approximately USD 20 billion.

References to specific securities are presented to illustrate our investment philosophy and are not to be considered recommendations. The specific securities identified and described do not represent all of the securities purchased, sold or recommended for advisory clients. It should not be assumed that these securities were or will be profitable.

No warranty This publication is derived from sources believed to be accurate and reliable, but neither its accuracy nor completeness is guaranteed. The material and information in this publication are provided "as is" and without warranties of any kind, either expressed or implied. RobecoSAM AG and its related, affiliated and subsidiary companies disclaim all warranties, expressed or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose. Any opinions and views in this publication reflect the current judgment of the authors and may change without notice. It is each reader's responsibility to evaluate the accuracy, completeness and usefulness of any opinions, advice, services or other information provided in this publication.

Limitation of liability All information contained in this publication is distributed with the understanding that the authors, publishers and distributors are not rendering legal, accounting or other professional advice or opinions on specific facts or matters and accordingly assume no liability whatsoever in connection with its use. In no event shall RobecoSAM AG and its related, affiliated and subsidiary companies be liable for any direct, indirect, special, incidental or consequential damages arising out of the use of any opinion or information expressly or implicitly contained in this publication.

Copyright Unless otherwise noted, text, images and layout of this publication are the exclusive property of RobecoSAM AG and/or its related, affiliated and subsidiary companies and may not be copied or distributed, in whole or in part, without the express written consent of RobecoSAM AG or its related, affiliated and subsidiary companies.

No Offer The information and opinions contained in this publication constitutes neither a solicitation, nor a recommendation, nor an offer to buy or sell investment instruments or other services, or to engage in any other kind of transaction. The information described in this publication is not directed to persons in any jurisdiction where the provision of such information would run counter to local laws and regulation.

© 2018 RobecoSAM AG

RobecoSAM | Josefstrasse 218 | 8005 Zurich | Switzerland | T +41 44 653 10 10 | F + 41 44 653 10 80 |
www.robecosam.com | info@robecosam.com