



PERP 2018S11: Lithium Extraction Technologies

“Lithium Extraction Technologies” is one in a series of reports published as part of the 2018 Process Evaluation/ Research Planning (PERP) Program.

Background

The revolution in battery technologies has caused a sharp acceleration in the demand growth for lithium and the trend is expected to continue. With electric vehicle costs falling and infrastructure improving, demand for lithium from battery applications is projected to increase at 15 to 25 percent per year over the next 10 years.

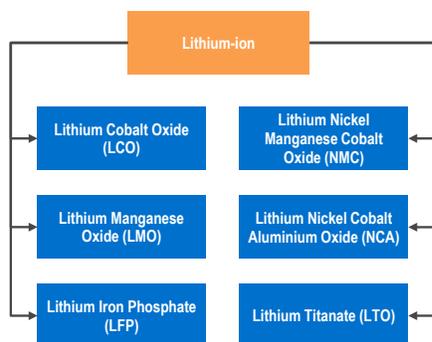
On the supply side, the rise in lithium prices has certainly benefited the suppliers. Within the context of expected supply deficits, new emerging technologies, expansion of existing operations and more complex routes becoming technically and economically feasible, the lithium industry will continue to evolve.

Report Overview

This report will provide an overview of technological, economic and market aspects of lithium extraction from mineral ores and brines. The following issues will be addressed in the report:

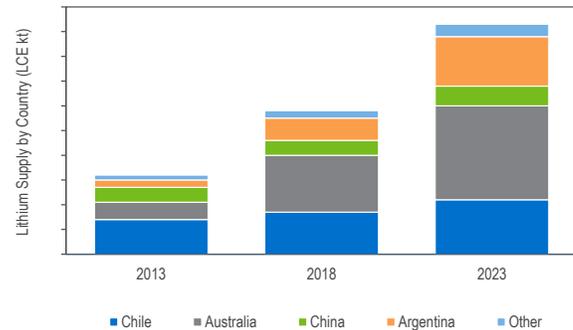
- What are the major technologies used for lithium extraction and how do they differ?
- How do newer technologies compare to existing techniques? Are they feasible?
- How do the process economics compare across different lithium sources and process routes?
- What is the current market environment for lithium?

LITHIUM-ION BATTERIES



Source: Nexant

LITHIUM SUPPLY BY COUNTRY (LCE kt)



Source: Nexant, USGS

Commercial and Emerging Technologies

There are several commercial routes to extract lithium based on mineral ore and brines as the raw material. This report will present the chemistry and process descriptions for the following lithium sources among others:

- Spodumene processing via carbonate leach
- Spodumene processing via acid leach
- Lepidolite processing via roasting
- Brine processing via solar evaporation
- Brine processing via selective recovery methods

Economic Analysis

Detailed cost of production estimates will be presented for all the major commercial lithium extraction technologies. As part of the study, we will look at the importance of mineralogy / brine composition, reagent consumption and other factors on production costs.

Global Market Analysis

This report will provide an overview of the supply, demand, and trade of lithium on both a global and regional basis. As well as an outline of the lithium value chain, the report will highlight the key drivers of demand and the effect of new technologies and minerals on supply.

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