



TECH 2018S11: Lithium Extraction Technologies

Lithium Extraction Technologies is one in a series of reports published as part of Nexant’s 2018 Technoeconomics – Energy & Chemicals (TECH) program.

Overview

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.

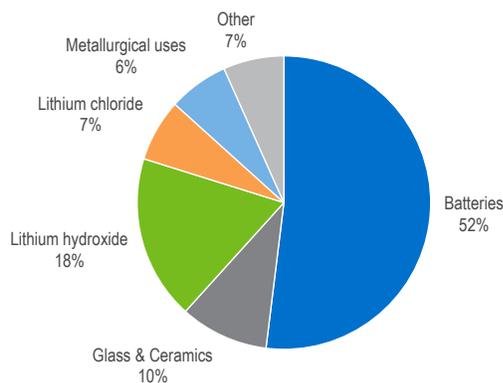
On the supply side, major investment in Australian downstream processing and a shift to lithium hydroxide production are the major trends currently. Within the context of new emerging technologies, expansion of existing operations and more complex routes becoming technically and economically feasible, the lithium industry will continue to evolve.

Report Overview

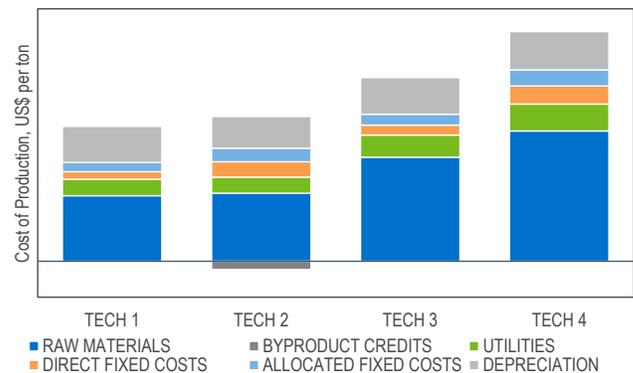
This report provides an overview of technological, economic and market aspects of lithium extraction from mineral ores and brines. The following issues are addressed in the report:

- What are the major technologies used for lithium extraction and how do they differ?
- How do emerging 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 Carbonate Demand by End-Use, 2018



Lithium Hydroxide Cost of Production, 2018



Commercial and Emerging Technologies

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

- Lithium carbonate production via sulfuric acid roasting (Galaxy Resources process)
- Lithium hydroxide production via sulfuric acid roasting (Tianqi Lithium process)
- Lithium carbonate production via soda ash carbonation of lithium-rich brine

Nexant has also reviewed the most advanced emerging technologies in the lithium industry. The analysis provides an overview of the stage of development and technology utilized.

Economic Analysis

Detailed cost of production estimates are presented for all the major commercial lithium extraction technologies. As part of the study, we also looked at the sensitivity of cost of production to key variables.

Global Market Analysis

This report provides an overview of the supply and demand of lithium on a global basis. Markets are defined based on the three major lithium compounds (lithium chloride, lithium hydroxide and lithium carbonate). The report highlights the key drivers of demand and major changes in supply to 2023.

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The TECH program (formerly known as PERP) is globally recognized as the industry standard source of process evaluations of existing, new and emerging of interest to the energy and chemical industries.

TECH's comprehensive studies include detailed technology analyses, process economics, as well as commercial overviews and industry trends. Reports typically cover:

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- Chemistry
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- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Overview of product applications and markets for new as well as established products
- Regional supply and demand balances for product, including capacity tables of plants in each region
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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program (formerly known as PERP), the Biorenewable Insights program (BI), the Sector Technology Analysis, and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

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