

Lithium capabilities

HATCH

An active player in the Electric Vehicle (EV) and energy storage revolution

Hatch has been active in the design and construction of plants to make lithium products for the EV battery industry since 2003. We designed and built the first modern large converter for spodumene in China for Galaxy Resources, which was commissioned in 2012. At Hatch we take the time to understand not only our clients, but also their business environment. We have been a member of the Chinese Lithium Association for over five years and we became a founding associate member of the International Lithium Association in 2021.

We have a clear understanding of the cost structure of the raw material supply and processing costs and have increased our focus on the quality of product required for both Li-ion battery cathode and electrolyte markets.

Why Hatch?

We have the in-depth technical, project execution expertise and business abilities to deliver successful lithium chemical projects for clients in North America, South America, Europe, Africa, Asia and Australia.

We have delivered constructed plants for our clients globally, with many of our existing offices transitioning from project to support offices. We stay close to support our clients.

Our strength lies in our deep experience in lithium production technology and equipment, mining and mineral processing, hydrometallurgy, pyrometallurgy and extensive global project delivery.

Corporately, we view the lithium business as a growth opportunity for all participants, with strongly increasing demand and consistently high price growth.

Our robust project execution tools, systems and a large pool of resources allow us to successfully manage complex projects in challenging environments. Our one-stop shop approach means that we have all the capabilities in-house to deliver any complex mandate globally.

Capability summary

Lithium processing is an exciting and growing market. Hatch has the demonstrated technical and project delivery expertise to design and construct lithium mines, concentrators and chemicals facilities globally. Our reputation to deliver lithium processing plants on time and on budget has been established, including with global lenders. Our credo is to deliver the best planned, predictable and valued outcomes, something we have every confidence we can do. We achieve our credo by understanding our client's business model, enhancing it where we see opportunities and delivering a safe, functional and cost-effective facility to best suit the operating environment.

Hatch has instigated global strategies to consolidate and elevate our lithium production capability, ensuring that we stay at the forefront of developments in the industry.

Lithium strengths

Chemical Production

Mining and mineral processing

We are currently active in the production and utilization of both brines and hard-rock based concentrates. Moreover, we are also involved in lithium extraction of lithium-bearing clays (e.g. lepidolite) and micas. Hatch has strong links with research and lithium chemical characterization organizations. Our involvement with these organizations is very "hands-on" to ensure that the testwork is kept clearly focused on the business objectives.



Lithium recovery

Lithium hydroxide (battery grade) production	Direct Lithium Extraction (DLE)
Lithium carbonate (battery grade) production	Electrolysis
Lithium sulfate production Lithium metal production	LSM and LHM crystallization
Lithium ore mining and concentrating	Brine concentration and purification (magnesium, calcium, chloride, and fluoride control)
Calcination and roasting	Sulfuric acid regeneration

Project execution

Project management and project services	Construction management
Procurement and supply chain management	Commissioning and start-up support

Specialized engineering capabilities

Our lithium strengths are enhanced by our globally recognized capabilities in:

Hydrometallurgy	Pyrometallurgy
Mine design	Mineral processing
Process simulation	Decarbonization

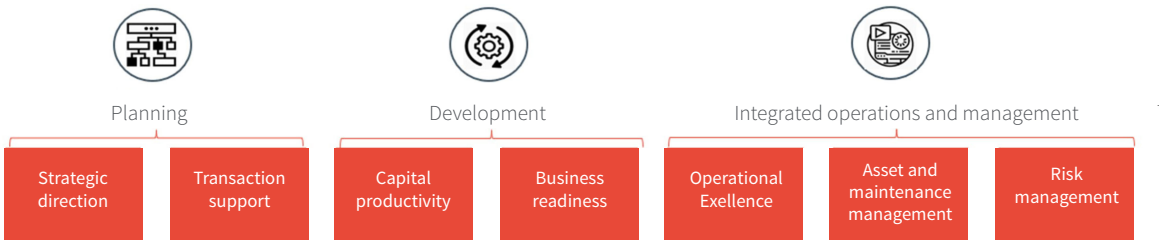
The Hatch Specialized Engineering and Design Group are capable of designing plants with key lithium hydro plant equipment such as crystallizers, rotary kilns, sulfation kiln, dryers and coolers to name a few. We also have a High Pressure Metallurgy Group consisting of a Materials Selection Team who design and manage autoclave construction and as well as review the materials of construction for each process so that they are correctly specified for the process duty and anticipated plant life. We have tested spodumene calcination in flash calciners and fluidized beds and drying of lithium carbonate and sodium sulfate in flash dryers, fluidized beds and heated screws. The Hatch Fluidized Bed Group can undertake the basic and detailed engineering for these units as required or review emerging vendor designs.

We also provide ongoing local support to our client's operating facilities for problem solving, process optimization and minor capital works, ensuring strong ongoing knowledge transfer and support as market conditions change in regard to product price and quality. We have been active in utilizing our process engineering and other discipline capabilities to support operating plants, or pilot plants, based in Canada, USA, Europe, Mexico, South America, China and Australia.

We support, alongside with our clients, the projects in which we are involved by providing access to our global experts (Subject Matter Experts) and using our proven global work sharing processes. These processes allow us to provide the best solutions when and where needed. Work sharing also facilitates the optimization of the overall costs of Hatch services to suit our clients' budgets.

In the meantime, our local presence enables direct communication with the people who use our services. That way, our clients have every confidence that the services provided will meet their needs.

Value-driven advisory solutions

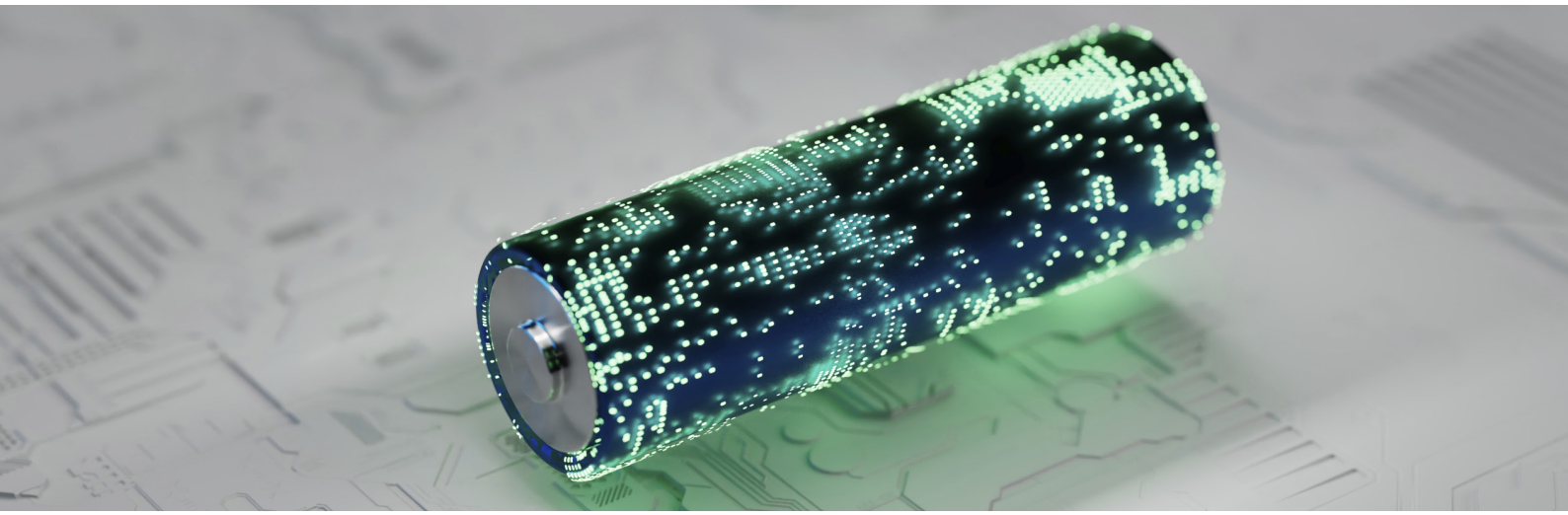


Using our technical know-how, Hatch helps define clients' strategic direction and competitive advantage in the lithium sector, centred around a coherent plan to extract superior shareholder value by optimizing their proprietary suite of assets, with an explicit set of resource allocation decisions. We use analytics and expertise to deliver insights that help clients understand key sector trends and develop market-facing models that extract the maximum value from clients' assets.

In addition, we provide market entry and business location services to clients to identify and prioritize sites to establish lithium operations, and help clients understand the landscape in which they will compete, through conducting market and competitive analyses, assessing synergies, and performing business case valuation. We support mergers and acquisitions, investment, and divestment decisions through comprehensive technical, environmental, and social reviews.

We assist clients from the concept stage to consider critical elements of business readiness in early-stage project planning. We assess business needs, and develop and implement effective and realistic readiness plans that balance effort, accountability, risk, and cost, without compromising business objectives.

To help clients make the right business decisions before committing capital towards lithium projects, we also provide assistance in capital portfolio management, along with a structured approach to improving capital project business cases.



Selected lithium industry experience



About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly.

We respond quickly with solutions that are smarter, more efficient, and innovative. We draw upon our 10,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

hatch.com

20241010

This publication contains information in summary form, current as of the date of publication, and is intended for general guidance only. We make no guarantees, representations, or warranties of any kind, expressed or implied, regarding the information including, but not limited to, warranties of content, accuracy and reliability. Any interested party should undertake their own inquiries as to the accuracy of the information. Hatch Ltd. excludes unequivocally all inferred or implied terms, conditions and warranties arising out of this document and excludes all liability for loss and damages arising therefrom. This publication is the copyrighted property of Hatch Ltd. ©2024 All rights reserved.