

LITHIUM RECOVERY AND CONCENTRATION

Achieve your Li-extraction goals

HIGH EXTRACTION YIELD

- **Efficient pre- or post-treatment** to your direct lithium extraction

BATTERY GRADE LITHIUM

- **Cleaner** lithium carbonate and lithium hydroxide

HIGH WATER EFFICIENCY

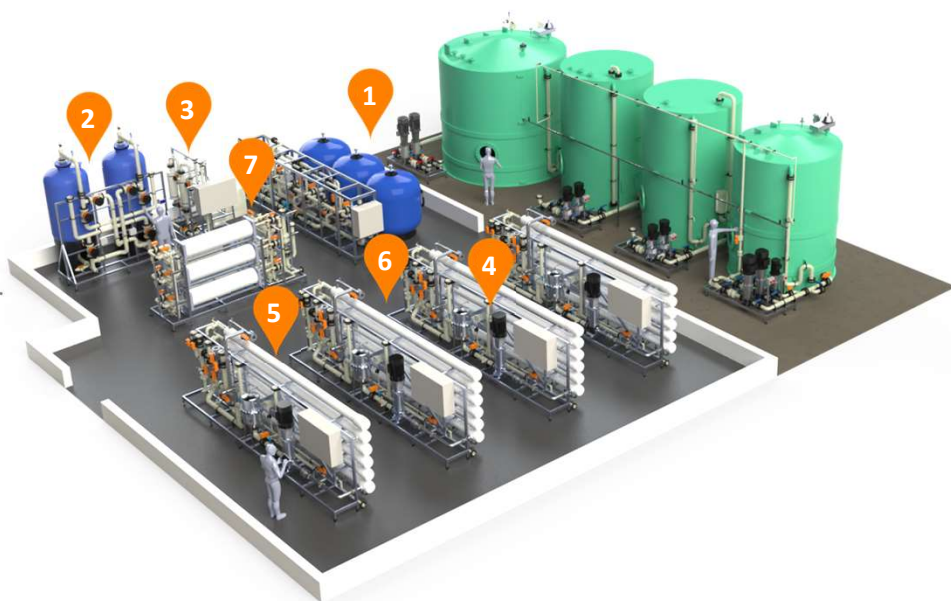
- **Minimized** freshwater intake

DECENTRALIZED SYSTEM

- Suitable to provide solutions **in remote locations**

Our Solution

- 1 ▶ Adsorption
- 2 ▶ Ion exchange
- 3 ▶ Ultrafiltration
- 4 ▶ (High-pressure) nanofiltration
- 5 ▶ Reverse osmosis up to 120 bar
- 6 ▶ Closed Circuit reverse osmosis
- 7 ▶ (Bipolar) electrodialysis



Special features

- ▶ Specific adsorption media or ion-exchange resin for targeting specific substances
- ▶ Containerization to minimize the site works and footprint
- ▶ Pre and/or post treatment: options are available according to the required quality/application needs
- ▶ Wide range of membranes available for specific solutions.



LITHIUM PROCESSES OVERVIEW

Process description

Pre-processing technologies allow to separate Lithium compounds from brines or side-streams, either with separation on membranes (Ultrafiltration, Nanofiltration) or with dedicated absorbers/ion-exchange resin for specific substances. Heavy metals and organic compounds can be separated from the brine.

In the post-processing concentrating technologies are implemented. The waste stream the lithium salt(s) can also be recovered by use of UHP (Ultra-High Pressure) Reverse Osmosis.

Then, purifying technologies are used to produce high-purity lithium products. Bipolar Membrane Electrodialysis or Evaporation / Crystallization can be considered to precipitate and form the required salt.

Lenntech can design and built Lithium separation and recovery unit according to your specifications and requirements.

Applications

- ▶ Reliable pretreatment including precipitation and particle removal
- ▶ Selective removal of divalent ions and remaining metals
- ▶ Selective separation from other monovalent ions
- ▶ Concentration and polishing of Lithium-rich product stream
- ▶ Production of clean water for reuse

WASTE STREAM
LITHIUM RECOVERY

> 90%

REVERSE OSMOSIS
UP TO

120_{BAR}

Process scheme

