

Electromobility and Sustainable Energy

SQM's Role in Sustainable Global Lithium Supply



About SQM

- SQM is a global company, producing value-added products such as lithium carbonate (Li_2CO_3) and lithium hydroxide (LiOH) from Chile.
- SQM has commercial offices in 20 countries, reaching clients from 110+ countries. It is one of the first NYSE listed companies in Latin America.
- Its mining operations, which are mainly located in Chile, are heavily and constantly regulated by 15+ different Government Authorities, including Environmental, Health and Safety (EHS) according to high international standards.
- SQM's dedicated team of professionals ensures that the company's operation processes and installations comply with **all environmental standards**.
- SQM can produce up to 70,000 MT/year of lithium carbonate, and is currently working on increasing its lithium carbonate capacity to 120,000 MT/year in the second half of 2021.
- SQM also converts lithium carbonate into lithium hydroxide in Chile. Today, SQM has two production lines to produce a total of 13,500 MT/year of lithium hydroxide, which will be increased to approximately 30,000 MT/year in 2021.



Lithium brine

- For over 25 years, SQM has designed and operated an extraction process for the lithium and potassium ions contained in the **brine from the Salar de Atacama nucleus, a mining resource**.
- **Currently, SQM's brine extraction level is 1,500 l/s.**
- A typical misconception is that the lithium production from brine is water intensive because of the evaporation during the concentration process. However, **brine is not water**; due to its lower density, water is separated from the brine in the Salar de Atacama basin.
- Furthermore, brine cannot be used for human or animal consumption because it has 7-10 times more of total dissolved solids (TDS) than sea water. Fresh water has **5 kg/m³ of TDS**, sea water has **~35 kg/m³ of TDS** and brine has **more than 350 kg/m³ of TDS**, including various elements such as potassium, calcium, magnesium, chloride, etc.



Water Consumption

- In Chile, water usage is regulated by the national water authority "**Dirección General de Aguas**" (**DGA**), which designates water usage allowance considering the estimated fresh water recharge in the basin. The total rights of underground fresh water in the basin amount to **~4,000 l/s**.
- The maximum water usage is authorized by the environmental authorities after a complete evaluation of the Impact Assessment Study elaborated by the company.
- **SQM currently uses ~180 l/s** which is equivalent to **~4.5%** of the total amount of the underground fresh water rights in the basin. The highest consumption comes from **cooper mining companies, which water rights amount to more than 2,800 l/s, almost double the amount of brine extracted by SQM**.
- On its website, SQM publishes the daily consumption of each of its water wells in the Salar de Atacama. In addition, this information is available online for the constant monitoring by the regulatory authorities.
- SQM's lithium hydroxide production consumes **~26 l/kg** of water, of which less than one liter is fresh, and the rest is recycled waste water from Antofagasta city. In comparison, copper consumes **~2X** and beef **~571X** more water than SQM's lithium hydroxide production process.

Note:

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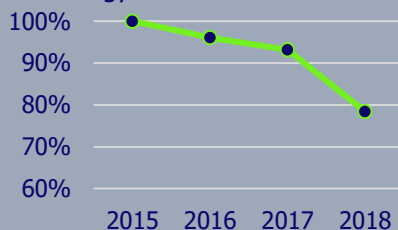
Energy Consumption

- SQM's lithium hydroxide production process requires some physical transformations in the brine. The advantages of the SQM brine-based process is that during the evaporation and purification stages, the use of electric energy is close to zero percent, as almost all the energy used is solar (more than 95%).
- This limits the environmental impact because there is no generation of greenhouse gas emissions. Every year SQM uses, on average, 19,345 GWh of solar energy (that represents ~25% of the total annual electric energy production in Chile)



Carbon Footprint

- SQM's lithium hydroxide production process produces less than **5 kg** of CO₂-eq/kg (including scope 1, 2 and 3) with 50% of the emissions coming from soda ash. In comparison, copper's carbon footprint is similar and cobalt's is **~2.5X** times SQM's lithium hydroxide carbon footprint.
- SQM's carbon footprint is very small because it uses solar energy to concentrate lithium rich brines.
- Since 2015, SQM has reduced its emissions by more than 20%.



Labor Conditions & Communities

- **100%** of SQM's workers have health plan benefits, and SQM scored a Frequency Index (Security Index) of **0.49** in **2018**, which is 1/3 of Chilean mining average of 1.65 accidents per 1 million work hours (the lower the score, the better).
- SQM is engaged in different programs to foster the social welfare of neighboring communities. Since **2011**, SQM has published an annual sustainability report based on **GRI standards**.
- According to Corfo's estimates, **50%** of SQM Salar's cashflow in **2019-2030** will be allocated to the government and communities.



Environmental Responsibility

- According to its Environmental Commitments (RCA), SQM must constantly monitor the aquifer and reservoir levels as well as lagoons level, chemical quality, lagoon surface, gates, etc. Additionally, there is a complete biotic monitoring plan, and all this information is presented to the authorities.
- The RCA also has an early warning plan that regulates brine extractions to prevent an impact on the sensitive environmental areas.

