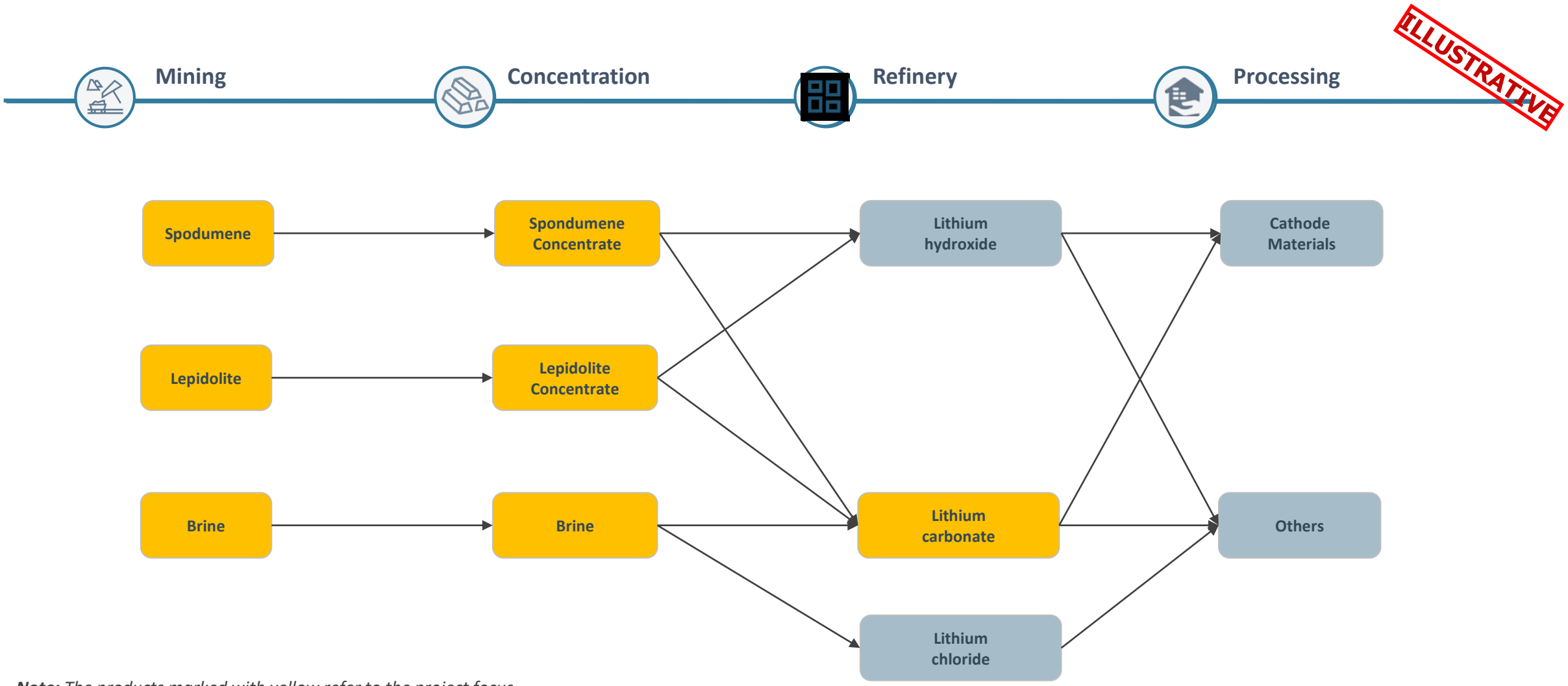
China Lithium Supply Deep-dive

Lithium Mining to Refinery Value Chain



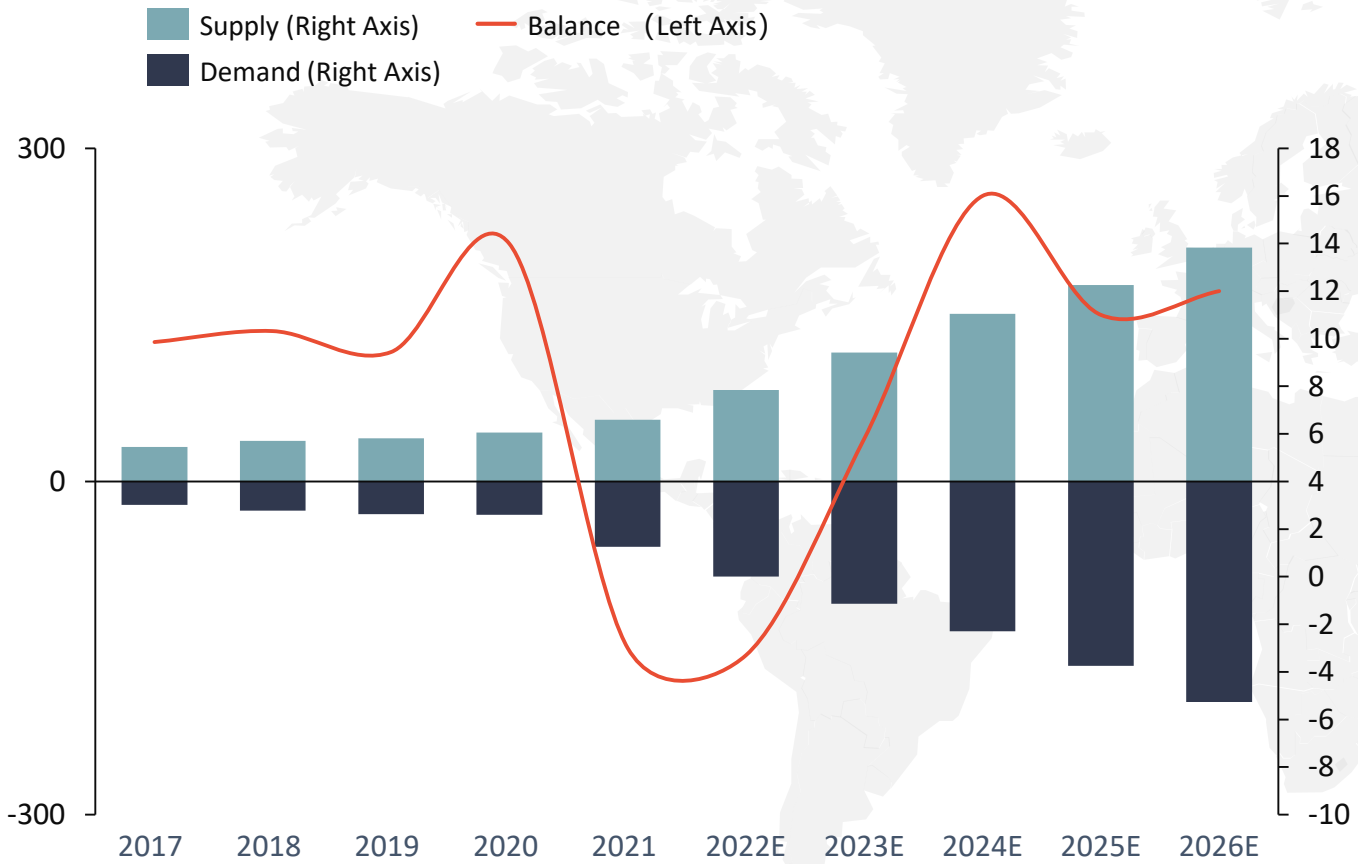
Note: *The products marked with yellow refer to the project focus*

Global Lithium Resource Supply & Demand

On the supply side, the sharp rise in global lithium salt and ore prices will help strengthen resource development at ho me and abroad; In 2023, increased mine production will ease supply tightness.

ILLUSTRATIVE

Global Lithium Resource S&D Balance



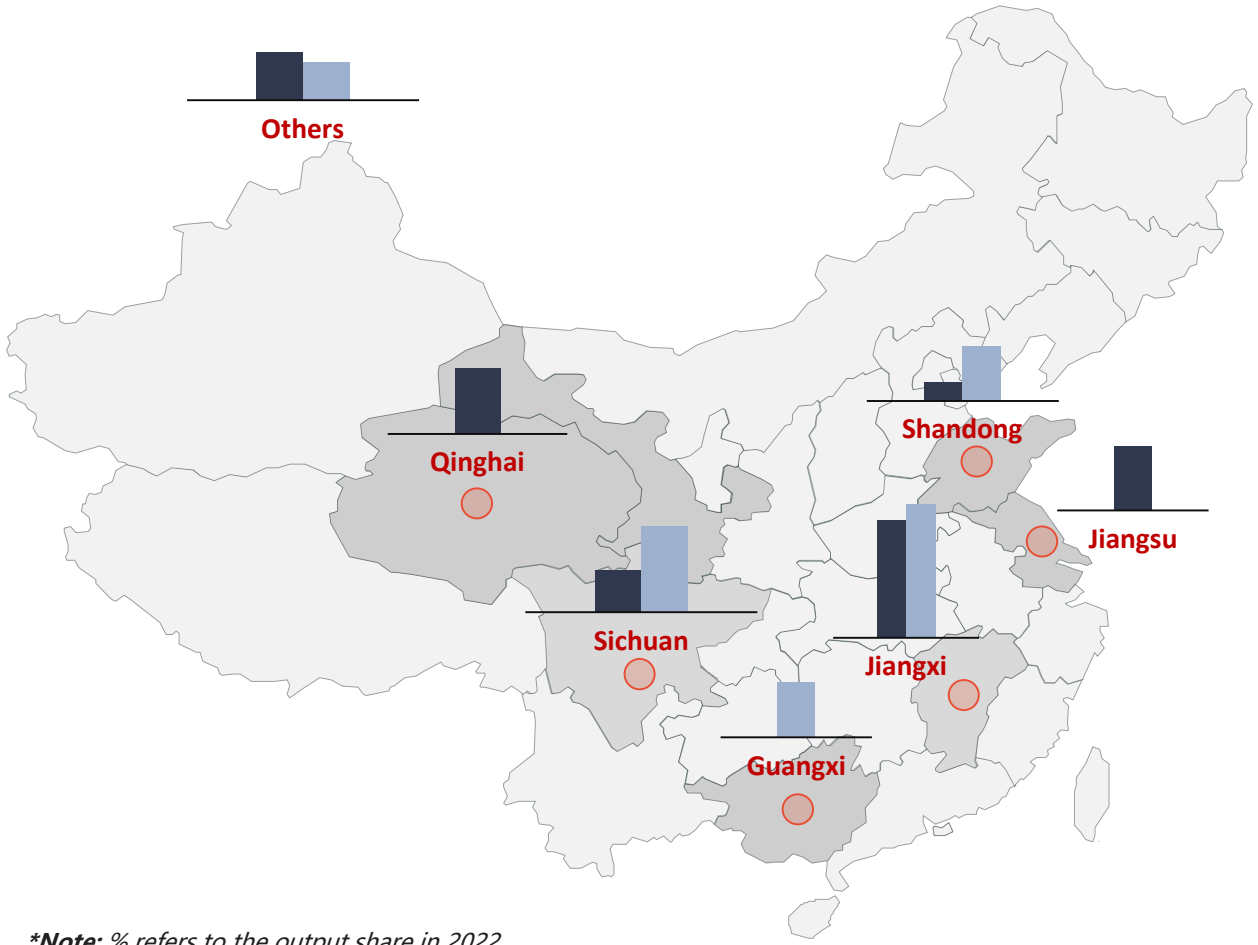
New Project Analysis

Mine Project	SOP	Release Probability
Pilgangoora	2023	L H
Kathleen Valley	2024	L H
Mina da Cachoeira	2025	L H
Cauchari-Olaroz	2023	L H
Greenbushes	2024	L H
Lijiagou	2023	L H

L H : *Probability of on-time production low to high (based on SMM primary research)*

China Lithium Salt Production Base output

China Lithium Salt Production Base output in 2022



***Note:** % refers to the output share in 2022.*

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***Jiangxi:** Li2CO3 Production Base by using lepidolite*

- **Rich resource of lepidolite** ore & suitable for mining
- Relatively **high integration (ore – concentrate - salt) rate**
- New integrated entrants mainly **from downstream LIB / EV players**

***Sichuan:** Li2CO3 & LiOH Production Base by using spodumene*

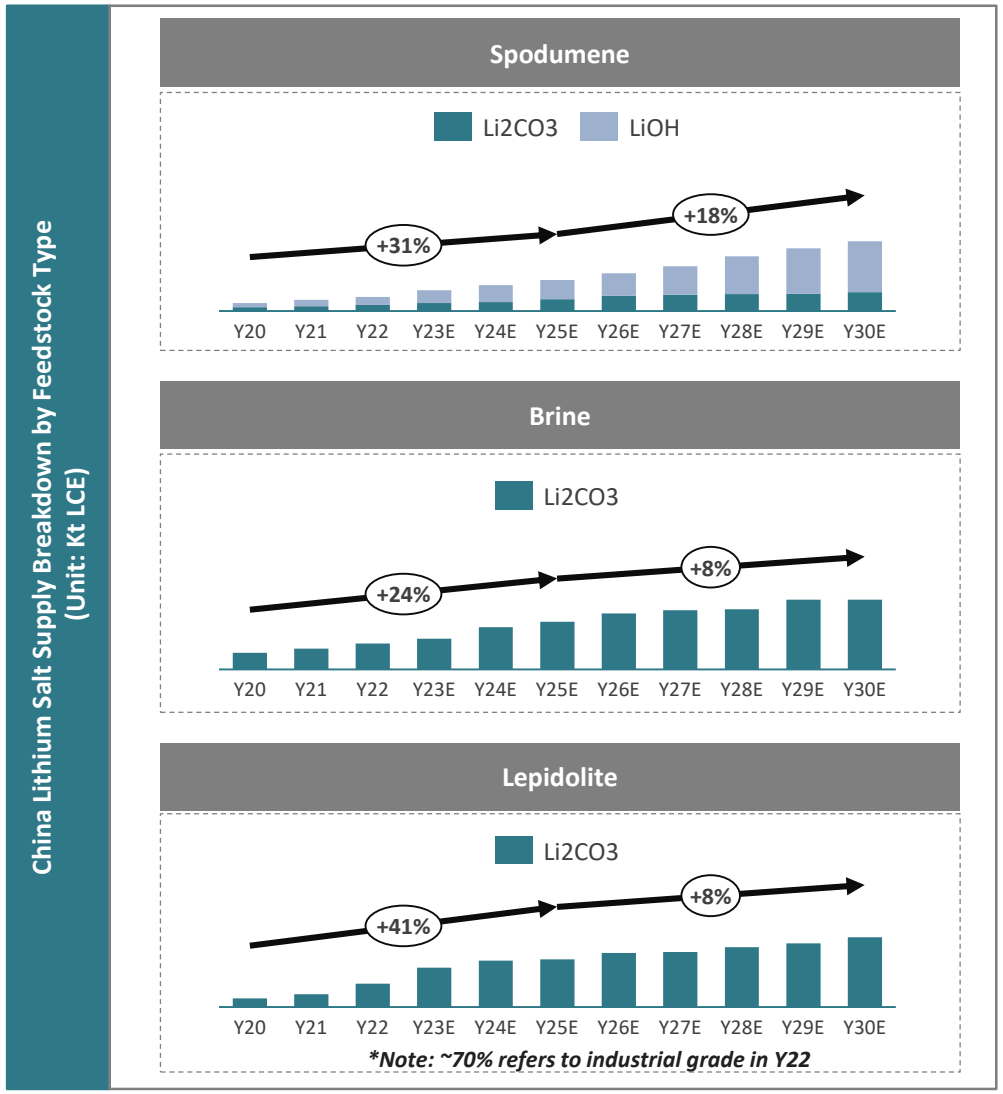
- **Limitation on mining** in Sichuan given the geographical location & religious concern (social protests from local ethnic groups)
- **Depend on importing spodumene concentrate (Australia)** and limited in-house feedstock supply (from Sichuan)
- **Green energy (e.g. hydro power)** for lithium salt production

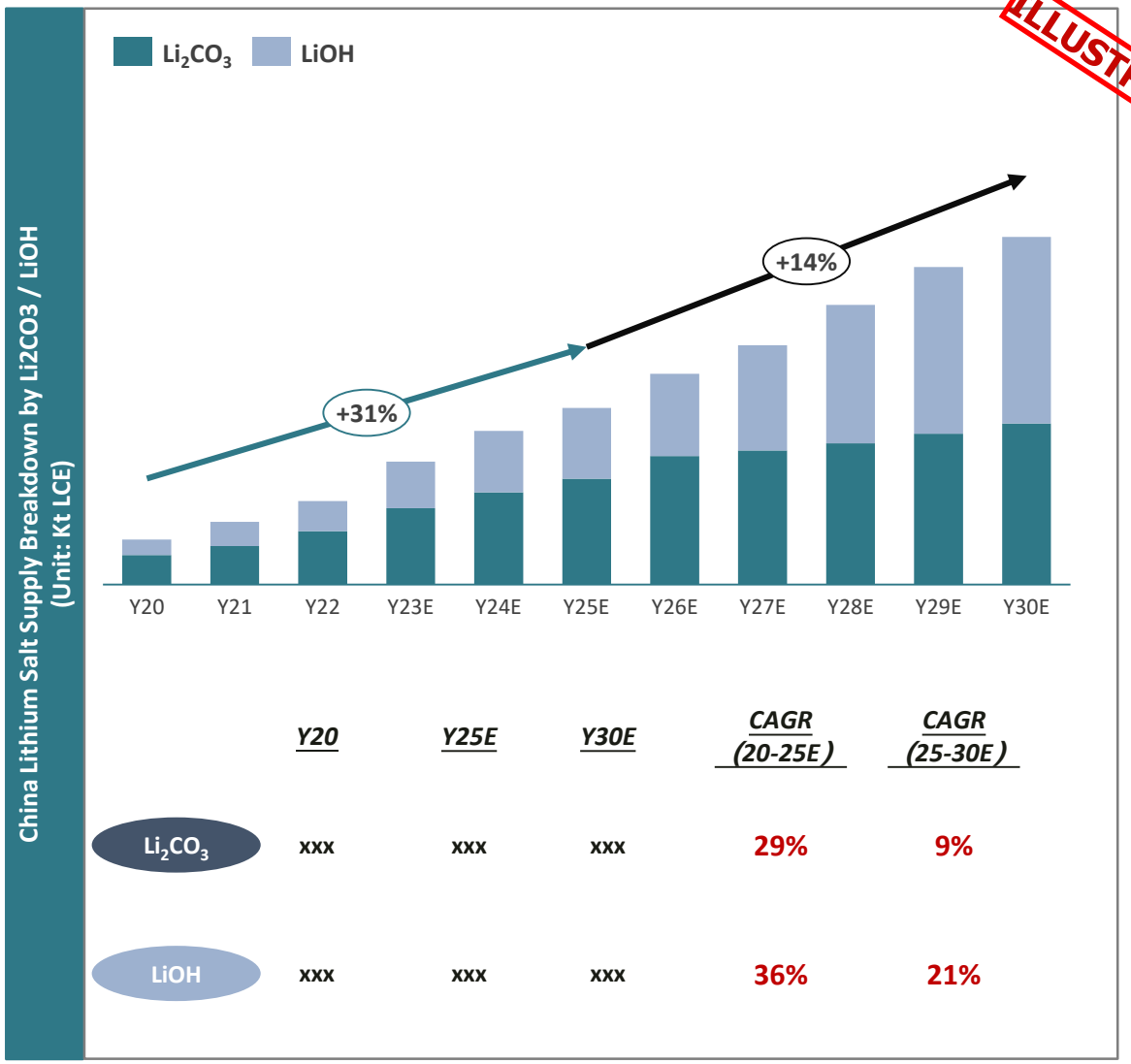
***Qinghai:** Lithium Carbonate Production Base by using lepidolite*

- Lithium product serves as the **by-product of potash fertilizer**
- **More time & higher CAPEX** for expansion
- **Low utilization rate** during the winter season

Lithium Carbonate Lithium Hydroxide

China Lithium Salt Market Size (2020-2030E)



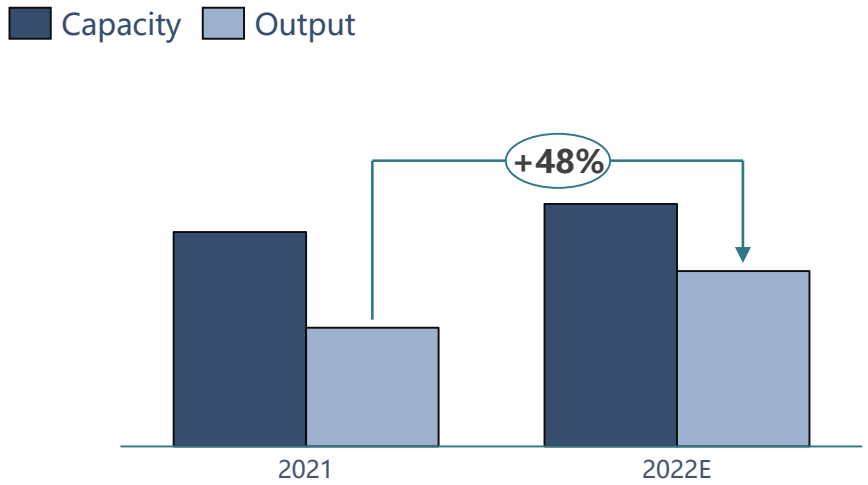


	Y20	Y25E	Y30E	CAGR (20-25E)	CAGR (25-30E)
Li_2CO_3	xxx	xxx	xxx	29%	9%
LiOH	xxx	xxx	xxx	36%	21%

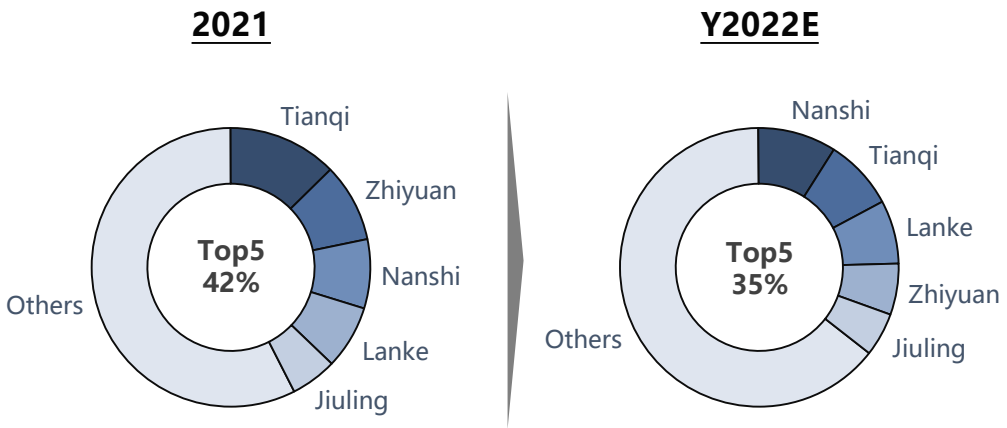
China Lithium Carbonate Market Competitive Landscape

ILLUSTRATIVE

China Lithium Carbonate Market Capacity and Output 2021-2022E (Unit: K Ton LCE)



China Lithium Carbonate Market Competitive Landscape 2021-2022E



The total output of lithium carbonate in China in 2022 will increase by 48% YoY given the downstream robust demand for lithium raw material, and LIB recycling contributes significant increase in lithium carbonate output.

- In 2022, the LFP battery is expected to take larger share than NCM type in China due to its competitiveness in cost-effectiveness and safety performance and drives the demand for lithium carbonate to grow rapidly. Under the expected robust downstream growth, the operating rate of lithium carbonate suppliers has increased. On the supply side, the raw material for production has been further diversified: besides the increase from traditional ore resources, the recycled lithium from waste batteries also grow rapidly driven by the high lithium prices.

In terms of lithium carbonate supply competitive landscape, top 5 supplier's concentration ratio will decrease by 7% YoY because of the more diversified raw material structure, complete value chain layout and the release of expanded capacity.