

Keliber

Updated Definitive Feasibility Study

Lithium hydroxide production



Press conference Thursday February 28th, 2019



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Updated DFS: Highlights

1

Significantly improved economics in the updated DFS

- Pre-tax IRR 28 %
- Pre-tax NPV (@8%) MEUR 510
- Pre-tax pay back period 3.7 years

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Resources and reserves with good growth potential

- Mineral Resources (Measured and Indicated) 9.47 Mt 1.16 % Li₂O
- Ore Reserves 7.459 Mt 1.04 % Li₂O

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Market growth accelerating

- Rechargeable battery sector forecasted to register 22.7 % pa growth through to 2032
- Driven by global electrification of transportation
- Supported by political and regulative measures

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First European project to produce lithium hydroxide from own ore reserves

- Located near to developing European markets
- Potential for upside through by-products and scalable operations

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Updated Definitive Feasibility Study

Significantly improved economics with lithium
hydroxide production



Key project assumptions

The current life of mines is 13 years, but the project is extended to 20 years by purchasing spodumene concentrates from third parties

Expected mine life (Expected Life of Operations)	13 (20) years
Annual mine production (ktpa)	573 average
Annual concentrate production (ktpa)	113 average
Annual battery grade lithium hydroxide sold (tpa)	12 112 average
Battery grade lithium hydroxide price (US\$/t) between 2019–2032 (in real terms)	12 470 – 15 742
Exchange rate (EUR/US\$)	1.00€ = 1.18 \$

Project economics: key figures

Significantly improved project economics despite higher CAPEX

	Pre-Tax	Post-Tax	CAPEX	MEUR
PAYBACK PERIOD	3.7 yrs *49 % shorter	4.1 yrs	Direct	236
			Indirect	77
IRR	28 % *17 % increase	24 %	Total	313
				*23 % increase
NPV @8%	510 MEUR *76 % increase	384 MEUR		

Total Revenue**

3 060 MEUR

*34 % increase

Total EBITDA**

1 945 MEUR

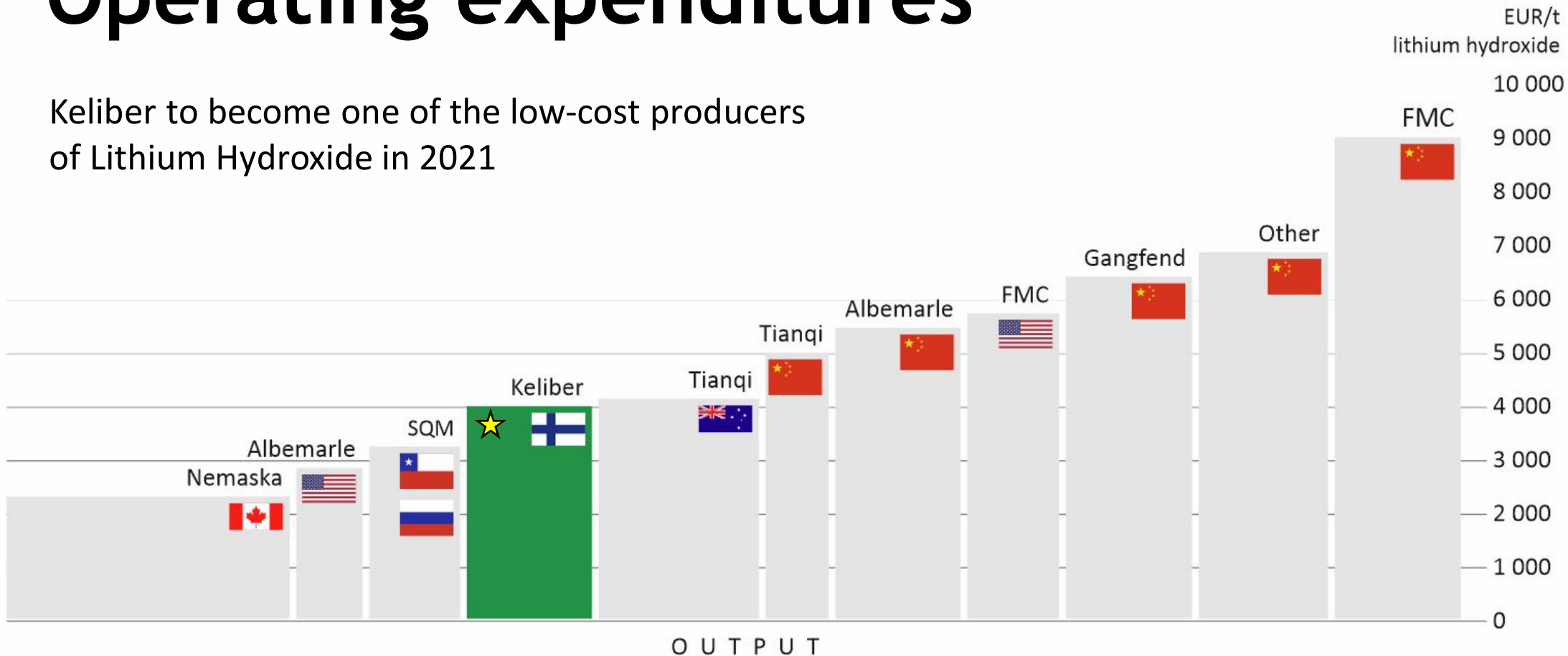
*60 % increase

*Change to lithium carbonate DFS

**Expected Life of Operations

Operating expenditures

Keliber to become one of the low-cost producers of Lithium Hydroxide in 2021



Source: Roskill Keliber Cost analysis, September 2018 and Nemaska Corporate presentation January 2019 (1.00 EUR = 1.18 US\$)

Unit Total OPEX, EUR / t LiOH ★ (produced from Keliber's currently known ore reserves)	4 125
Unit Total OPEX, EUR / t LiOH (incl. purchased spodumene concentrate)	4 541

An aerial photograph of a mining site. The site is a cleared area with a dirt road and several pieces of heavy machinery, including a yellow truck, a red truck, and a drilling rig. A large pile of grey gravel is visible on the right side. The site is surrounded by dense green forest. A small stream or ditch runs along the top edge of the site. The text "Resources and reserves" and "Continuing drilling program" is overlaid in white on the lower half of the image.

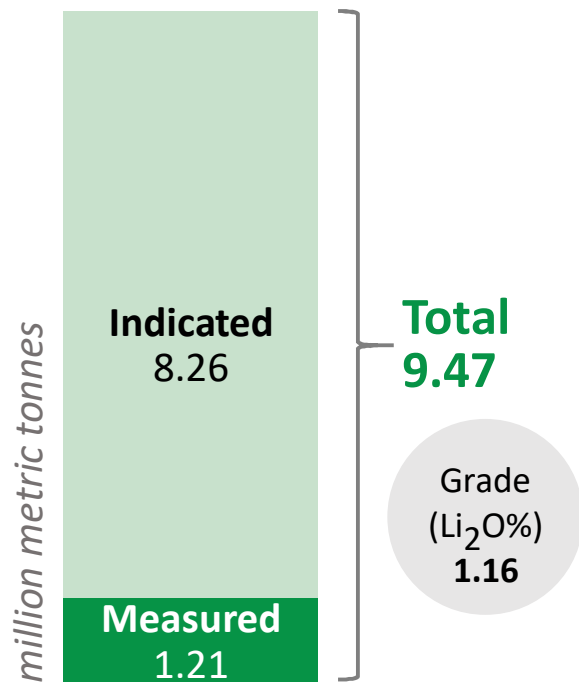
Resources and reserves

Continuing drilling program

Resources and reserves

Latest estimate of mineral resources and ore reserves (million metric tonnes)

RESOURCES (May 2018)



RESERVES (January 31, 2019)

	Open pit (kt)	Underground (kt)	Total (kt)
Proven	903	243	1 146
Probable	3 794	2 520	6 314
Total	4 696	2 763	7 459
Ore grade (Li ₂ O%)	1.07	0.99	1.04

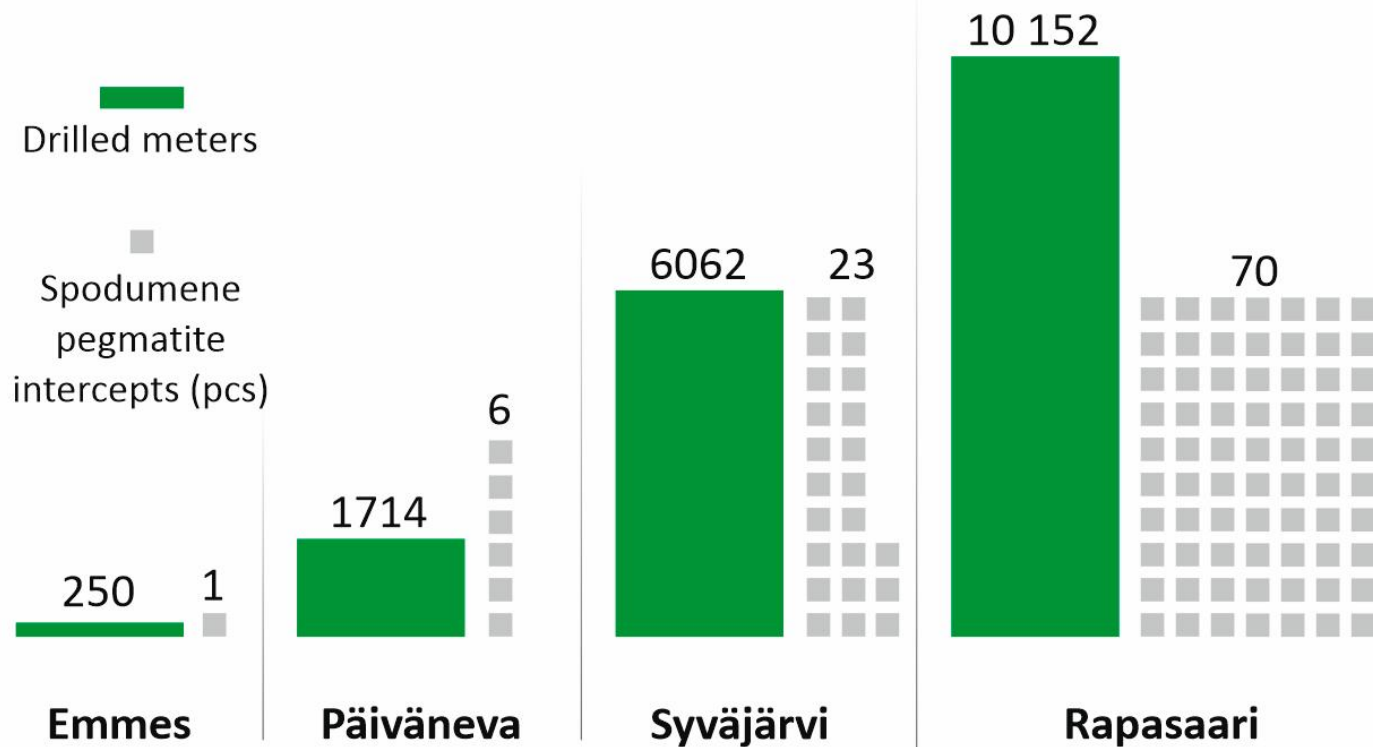
Reserve update is based on recoveries of the lithium hydroxide, tonnes produced, and prices of the final product. These had an impact to cut-off for the open pit (0,45 % Li₂O -> 0.40% Li₂O %). No new drilling results are included.

Ore reserves are included in the Mineral Resources

Estimates prepared by Competent Persons in accordance with 2012 JORC code

Active exploration

Over 18 000 meters drilled after June 2018

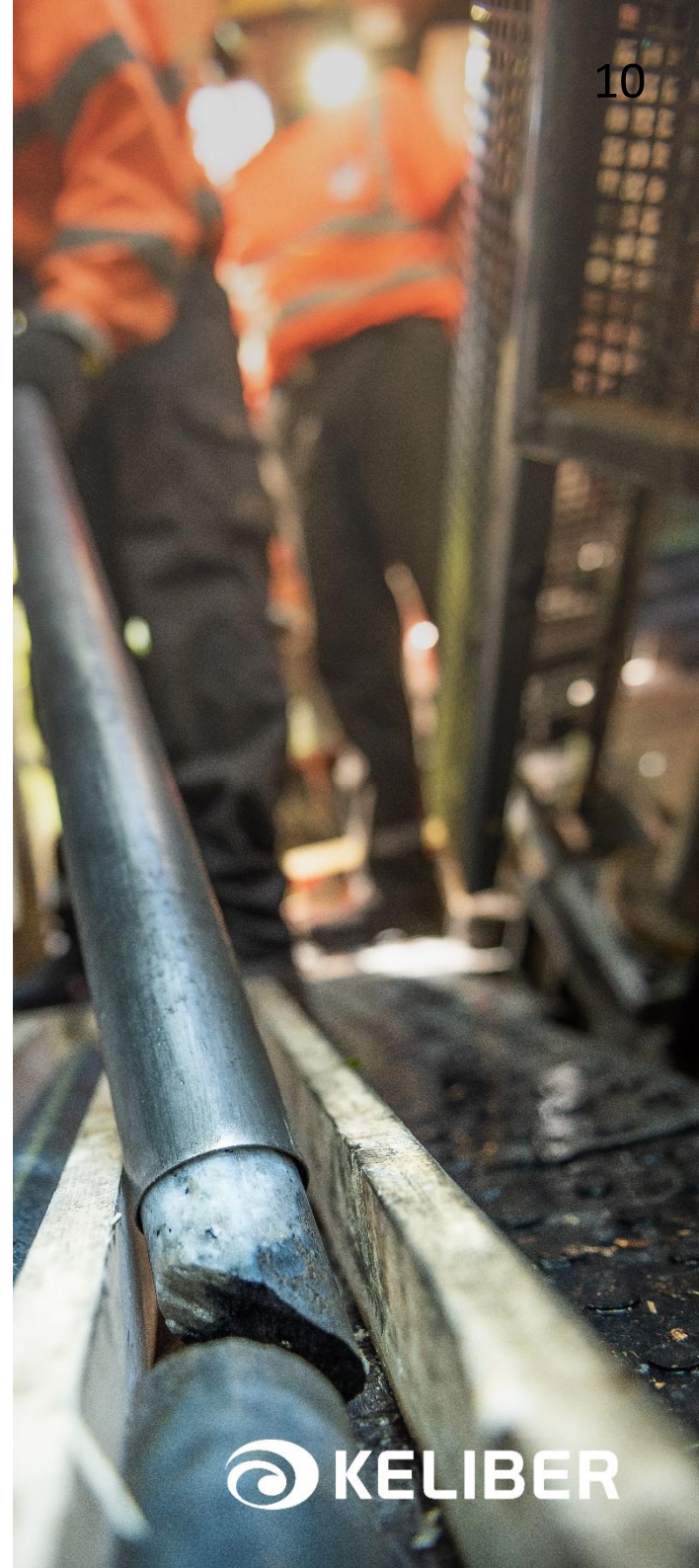


Best intercepts

2.65 m	6 m (tw*)	7.65 m	11 m (tw*)
1.29%	1.57%	1.75%	1.46%
Li ₂ O	Li ₂ O	Li ₂ O	Li ₂ O

* Estimated true width.

Increased mineral resources will be updated later 2019



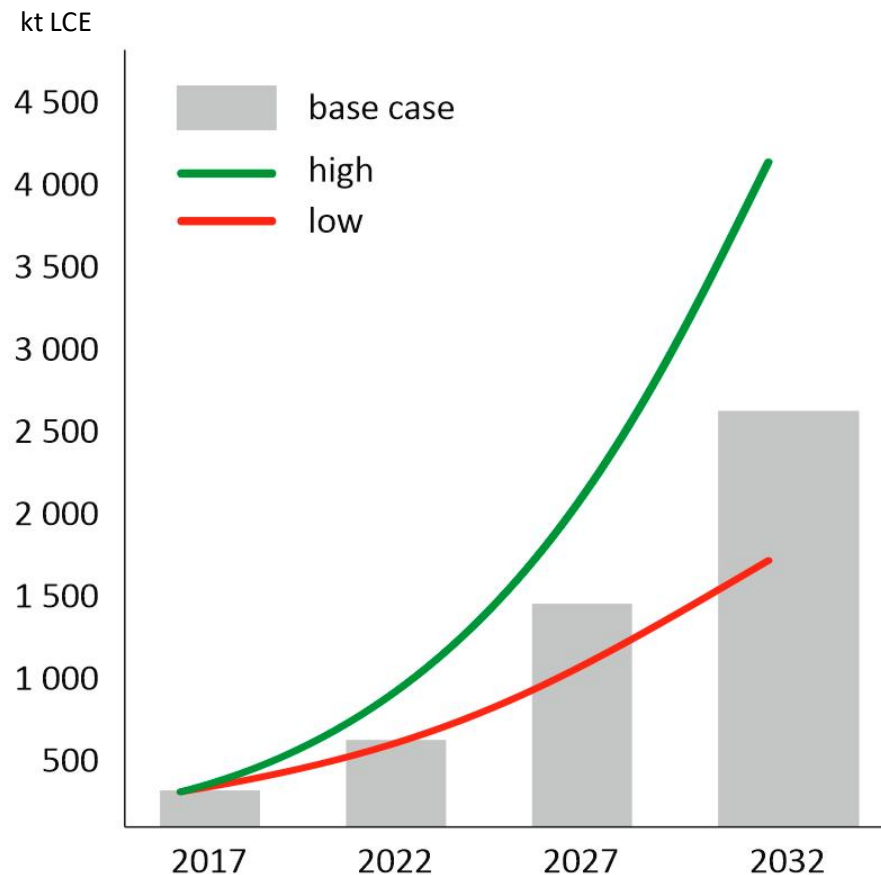
Fast developing market for lithium



Increase in demand for lithium

Rechargeable battery sector driver for growth

Forecasted consumption of lithium



Annual global demand growing
17.9 % per annum to reach
over 2.5 Mt in 2032

22.7 % per annum increase
in the rechargeable
battery sector

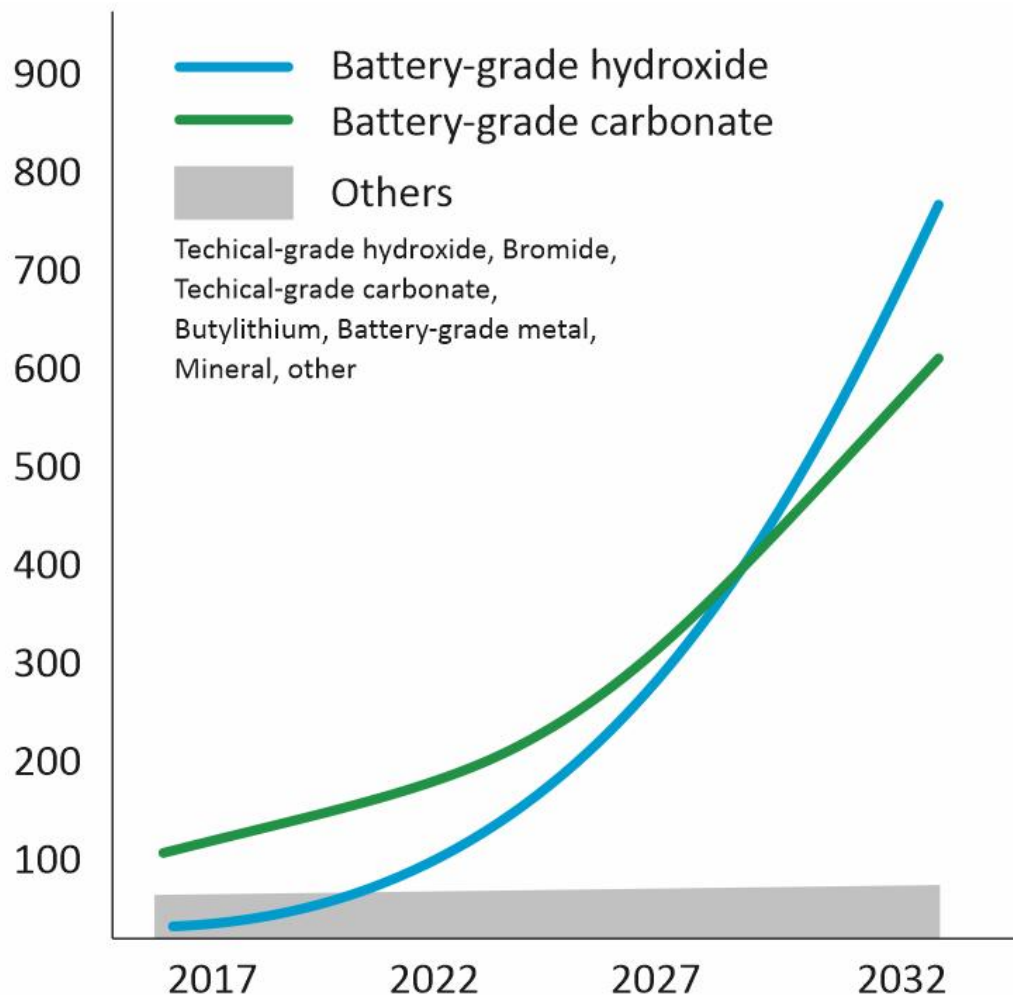
Other markets for lithium (e.g.
glass-ceramics, polymers)
growing in the line with global
economic growth

Growth in demand for lithium-ion batteries will be dominated by the automotive sector

Increase in demand for lithium

Battery-grade lithium hydroxide demand growing fast

Forecast consumption of lithium by product, 2017-2032 (000t LCE)

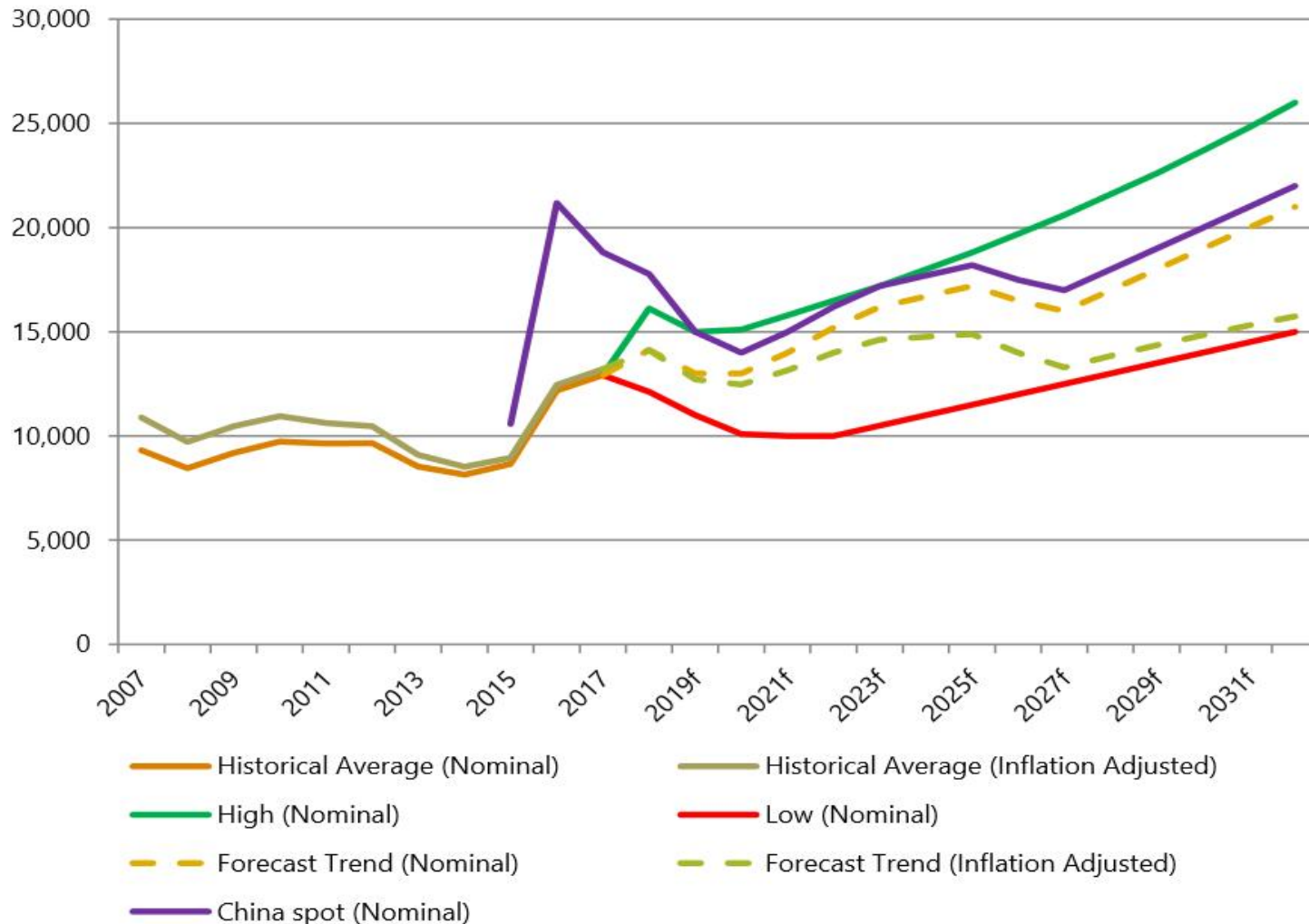


The proportion of lithium carbonate to lithium hydroxide used in Li-ion batteries is dependent upon the cathode mix

In EVs and ESS, the share of high-Ni lithium nickel-manganese-cobalt oxide (NMC), lithium nickel-cobalt-aluminum oxide (NCA) and lithium-iron-phosphate (LFP) will increase

Price forecast for battery-grade lithium hydroxide

Prices expected to stay in good level

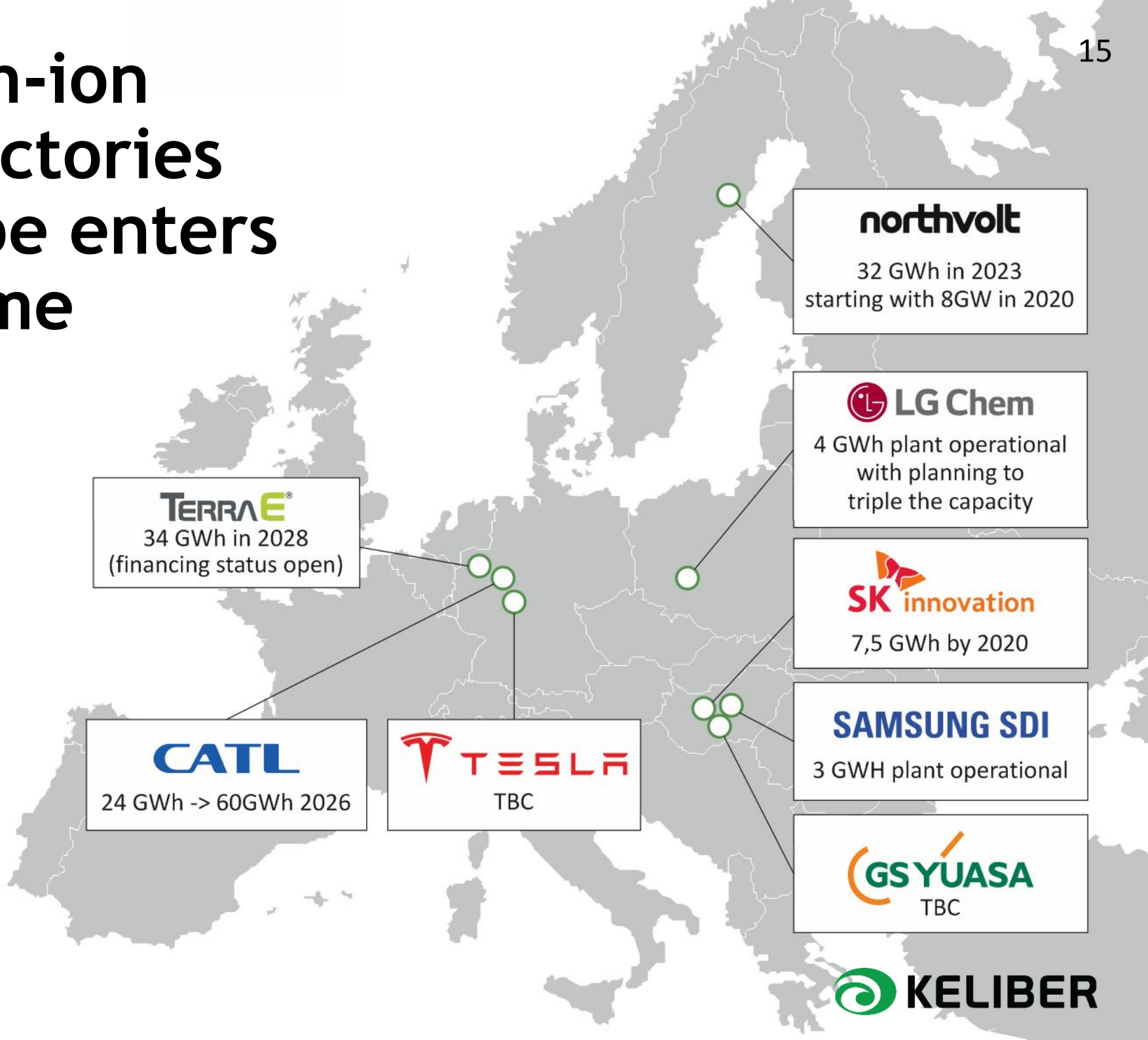


US\$12 470/t
is expected to be the new floor in the base case scenario for battery grade lithium hydroxide

Contract prices expected to be only slightly lower than spot prices in China

Source: Roskill Consulting Group Ltd, 2019. Note: Real prices adjusted to constant 2017 US dollars using World GDP deflator data from the International Monetary Fund's World Economic

Lithium-ion Megafactories - Europe enters the game



northvolt
32 GWh in 2023
starting with 8GW in 2020

LG Chem
4 GWh plant operational
with planning to
triple the capacity

SK innovation
7,5 GWh by 2020

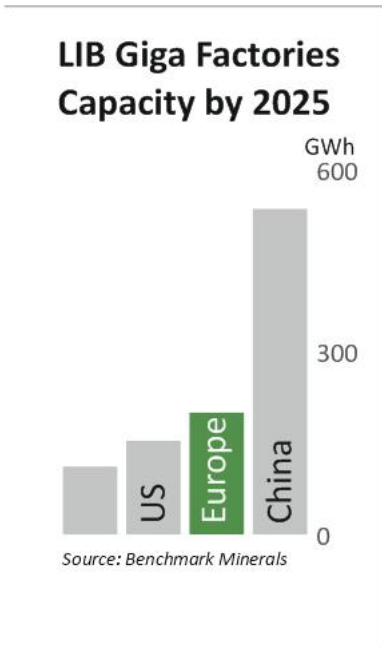
SAMSUNG SDI
3 GWH plant operational

GSYUASA
TBC

TESLA
TBC

TERRAE
34 GWh in 2028
(financing status open)

CATL
24 GWh -> 60GWh 2026



New cathode investments in Europe



Umicore is planning a cathode plant in Poland and targets to start deliveries already in 2020.



BASF intends to invest MEUR 400 in cathode material production plants in Europe.



Johnson Matthey expects to commence battery material production in Europe in 2021 – 2022.



Northvolt plans to build cathodes “in-house” when commencing the battery production in Sweden.

Source: Company data (Umicore, BASF, Johnson Matthey and Northvolt press releases)



The first company to produce lithium hydroxide from its own resources in Europe

Excellent location

Excellent infrastructure in Kokkola Industrial Park

- Significant concentration of chemical industry with 15 industrial operators and more than 70 service companies
- Water, steam, electricity, heat, gas and acids all produced in the area
- **Good availability of skilful workforce**
- **Good support from local community and authorities**

KELIBER KOKKOLA
INDUSTRIAL PARK
CHEMICAL PLANT



KELIBER
KAUSTINEN
KALAVESI
PRODUCTION
PLANT

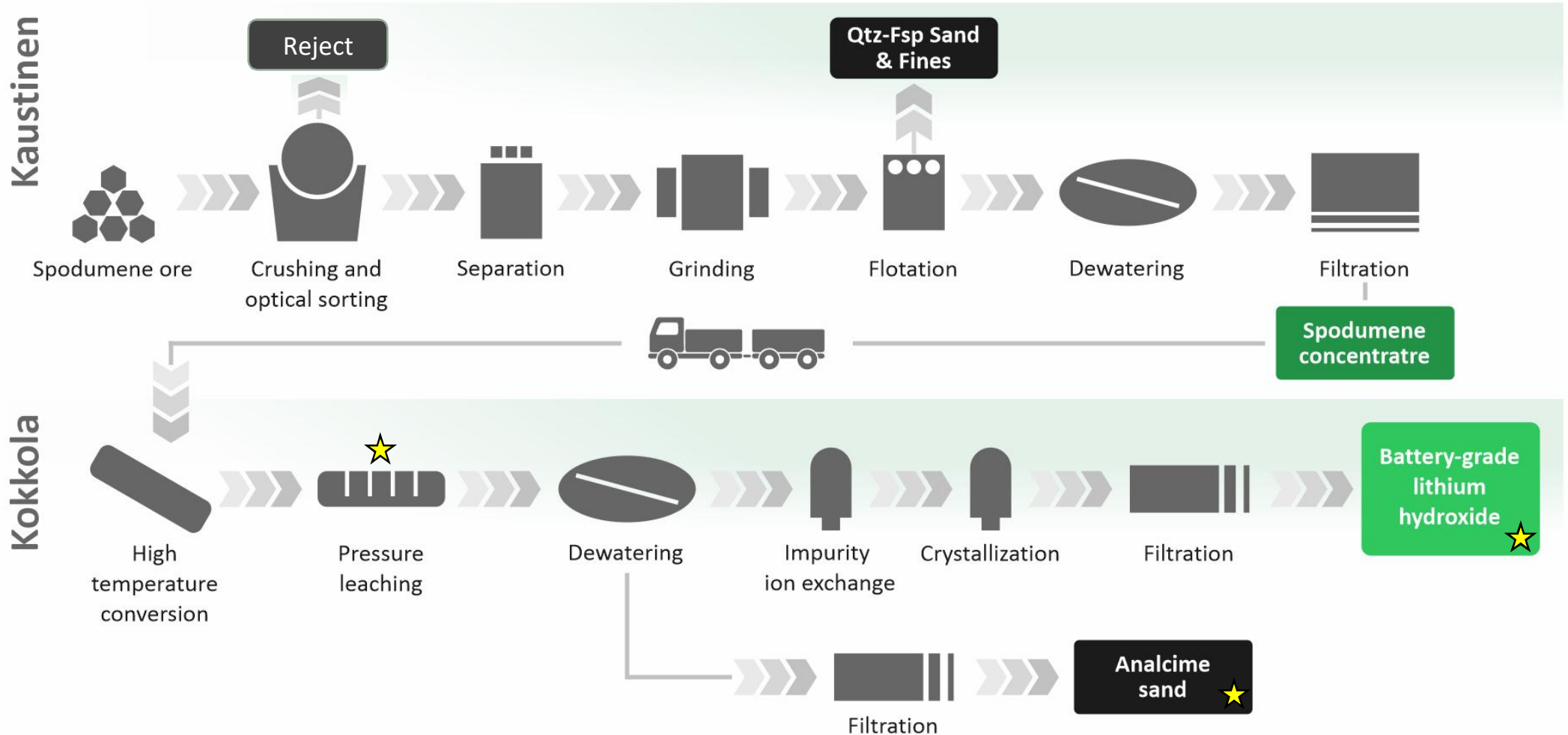
Mines



*Distance from Kalavesi
production plant to
Kokkola Industrial Park is 55 km*

Cleantech process

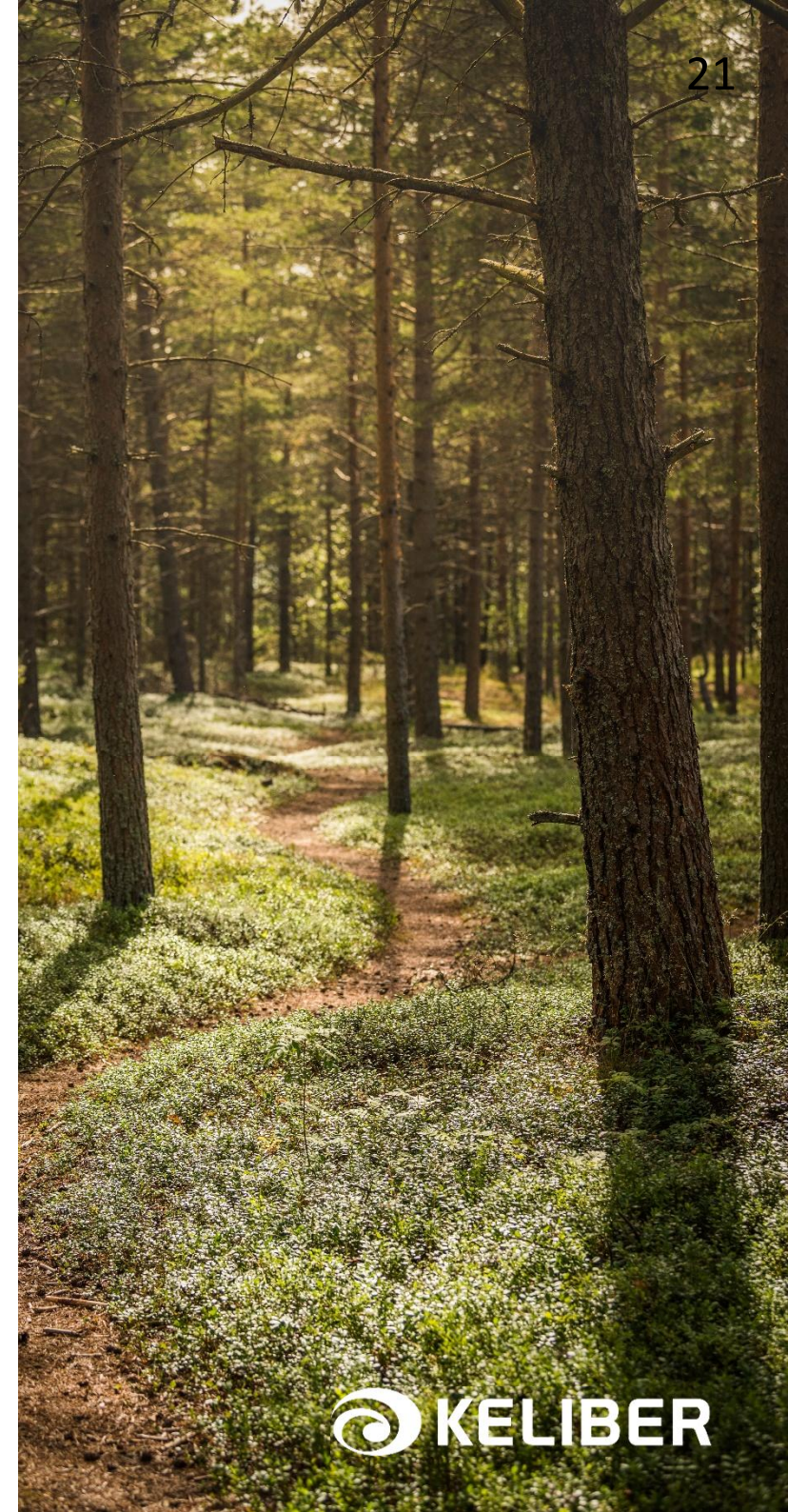
Soda leaching process for lithium hydroxide production developed with Outotec



★ Changes in the lithium hydroxide process compared to lithium carbonate production process are related to the second leaching stage (Ca(OH)_2 will be added instead of CO_2). The composition of analcime sand will change slightly in hydroxide process (analcime will include some CaCO_3).

Project upside

- Excellent growth potential in resources proven by extensive drilling program
- Potential for valuable by-products: Analcime sand and quartz-feldspar sand suitable for circular economy
- Possibility for capacity growth due to excellent location
- In Europe with chemical plant in harbor close to future end product markets





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Lithium Mining for Fast Growing Markets