



Issue 68: January 6, 2021

Lithium ESG. SQM, LG ES & Mt. Holland

I've often said that little lithium punches above its weight as a microcosm for major geopolitical trends affecting the commanding heights of global industry. So too in the ESG dialogue. Industries with far greater carbon, land and water footprints get far less digital ink spilled than the lightest metal.

One of 2020's subplots was the greater acknowledgment and acceptance of the potential for direct lithium extraction (DLE) technologies. **Livent** has begun to equate DLE with "sustainability" and, channeling its promotion of a unique brine process it has honed over decades, DLEvangelists have suggested this innovative field is not "unconventional". The German chemical company **Lanxess'** Smackover project in Arkansas became the most highly valued lithium development project in 2020, at USD 940M, adjusting its partner **Standard Lithium's** USD 280M market cap by its 30% ownership. An ESG investor - **BNP Paribas' Energy Transition Fund**, which has also been a lead PIPE investor in a number of EV-themed SPAC mergers - led a CAD35M SLL investment round in late December.

Company (ownership), Project	Project Value 01/4/21 (\$M)	Type
Standard Lithium (30%)/Lanxess(70%), Smackover*	\$ 913	DLE Brine
Lithium Americas (100%), Thacker Pass^	\$ 579	Clay
Piedmont Lithium (100%), Piedmont Lithium Project	\$ 382	Rock
Ioneer (100%), Rhyolite Ridge	\$ 363	Rock
Bacanora(50%)/Ganfeng(50%), Sonora*	\$ 334	Clay
Vulcan Energy (100%), Upper Rhine Valley	\$ 168	DLE Brine
E3 Metals (100%), Clearwater Lithium	\$ 28	DLE Brine
*adjusted for Bacanora/Standard Lithium respective ownership		
^RK Estimate based on USD677M value of Lithium Americas' Cauchari project		

Like the 80's youngsters New Kids on the Block, **Vulcan Energy Resources** came out of nowhere this time last year steadily moving up the charts of 2020's lithium scoreboard. At USD 168M market cap VUL was the year's top performer despite having raised just ~AUD5M cash and have yet to publish any project economics. **E3 Metals** in Alberta raised ~USD6.5M in 2020 while taking \$1.5M free money and 12 months intellectual property from **Livent**. **ETMC** published a preliminary economic assessment with a \$1B pre-tax NPV late last year #relativevalue.

Breakthrough Energy Ventures invested \$20M in a VC round for **Lilac Solutions**, which has been testing brine from **Lake Resources** in Argentina and **Controlled Thermal Resources** in California's Salton Sea among others. The US **Department of Energy** and **California Energy Commission** provided R&D grants to **Berkshire Hathaway Energy's** Salton Sea geothermal and to **Albemarle** to test new technology to convert lithium chloride directly to hydroxide which if successful could be used on Albemarle's Magnolia bromine project in Arkansas. I expect more corporate welfare checks to flow in 2021 from a **Build Back Better Biden** cabinet already being dubbed as a climate/energy transition "dream team". Will the DOE go beyond R&D grants and make low cost loans to future **Tesla**-like lithium startups and **Solyndra**-like lithium failures? #EmbraceTheSwamp.



Sunlight is the greatest disinfectant, as they say, and a second 2020 subplot is the increased awareness and growing importance of Life Cycle Assessment (LCA) for project valuation. Hat tip to specialized consulting firm **Minviro** for gaining mind share in the battery materials space. **Benchmark Minerals, CRU** and **Roskill** have followed launching their own ESG service late last year. Hat tip as well to **Alex Grant** for digging deep into the question “Is Lithium Brine Water” and for September’s salty FT article with **Alonso Barros** shedding Atacama sunlight into SQM & Albemarle’s briny waters and indigenous people issues. [The drive for greener cars must be matched by cleaner lithium.](#)

A big M&A deal announced late last year was between data analysis firms **S&P Global** and **IHS Markit** from which I took the slide below. ESG, climate and energy transition analysis is BIG business. It is affecting corporate behavior. But, like Moody’s and S&P credit ratings, it is also attracting justifiable criticism as corporates pay their assessors.

Pro forma company has complementary assets and commercial offerings in **ESG**, climate and energy transition

Comprehensive solutions		S&P Global	IHS Markit
Data & Platforms	• ESG scores with time series data	✓	
	• Workflow and reporting platforms		✓
	• Emissions database		✓
Benchmarks	• ESG equity indices	✓	
	• ESG fixed income indices		✓
	• ESG Evaluations	✓	
	• Price benchmarks (carbon, hydrogen)	✓	
Analytics	• Climate and transition scenarios	✓	
	• Plastics circularity		✓
	• Asset valuations		✓

Always on the defensive, SQM has been on a concerted *sustainability* charm offensive. More on that in a moment, but first some words about the oft forgotten “G” in ESG, for which the last two months has served up two meaningful SQM reminders.

In SQM’s Q4 earnings last November I was struck by the dichotomy of SQM paying a \$62.5M penalty...

in connection with a [class action lawsuit](#) in which Plaintiffs allege [SQM] statements in filings from 2010-2014 were “materially false and/or misleading, because they failed to disclose: (i) that money from SQM was illegally channeled to bribe Chilean politicians and political parties, (ii) that SQM had filed fictitious tax receipts in order to conceal these bribe payments, (iii) that SQM lacked adequate internal controls over its financial reporting, and (iv) that, as a result, SQM's financial statements were materially false and misleading and not prepared in accordance with applicable accounting principles.” Some additional color here: [Tyne and Wear pension fund shares in \\$62.5m class action payout.](#)



...while simultaneously highlighting this achievement 'S&P Dow Jones Indices announced the results of its annual **Dow Jones Sustainability Indices** rebalancing and reconstitution based on the participation in the **SAM Corporate Sustainability Assessment**. This year, SQM qualified for both the DJSI Chile Index and DJSI MILA Pacific Alliance Index.'

"This is the **first year** that **we have actively participated** in the **SAM Corporate Sustainability Assessment**...We understand that our efforts do not stop here, and will continue our work related to environmental protection, social responsibility and corporate governance.

[Reuters reported December 30](#) that Chilean Finance Minister Ignacio Briones said in a television interview Wednesday that Julio Ponce, a principal shareholder of SQM, the world's second largest lithium producer, "would be in jail" had a case of illicit trading brought against him in Chile been conducted in the United States. Chile's stock market regulator in 2014 fined Ponce, then chairman of SQM and former son-in-law of late dictator Augusto Pinochet, nearly \$70 million for his role in a market manipulation scandal known locally as the "Caso Cascadas." Ponce appealed that fine - then the largest ever handed down by the Chilean regulator - in a lower court and won. The lower court slashed the penalty to less than \$3 million, a decision upheld by the country's Supreme Court.

Wondering: Does the governance section of S&P Dow Jones SAM Corporate Sustainability Assessment not include questions about insider trading and bribery related to individuals in key decision-making roles in its assessed companies?



SQM. Sustainable Atacama Price Predator
“The Saudi Arabia of China Commodity Carbonate”

“I would be remiss if I didn’t mention the **Sustainable Development Plan** that we announced last month...we have defined concrete **goals to significantly reduce the use of continental water and brine extraction**...we do not believe that the brine extraction reduction will have an impact on our near-or long-term lithium production or expansion plans. In fact, on top of the lithium carbonate and lithium hydroxide capacity expansions we are already working on in Chile...the Board approved **expanding our lithium capacity even further** in order to reach **180,000** and **30,000 metric tons of lithium carbonate** and lithium hydroxide respectively **by 2023**... - Ricardo Ramos, SQM CEO, November 2020

Unlike in years past in which SQM failed repeatedly to meet its increased production targets, it managed to ramp up volumes aggressively throughout 2020, reaching 70kt/63kt capacity/sales up from 48kt. While Tier One battery producers in Korea and Japan continue to pay reasonable prices for their increasingly higher standard carbonate specifications, SQM lost significant share in this premium market while it raced to the bottom to gain lower quality, lower price market share in China.



Casualties of SQM’s undisciplined dumping of commodity carbonate in the low \$3,000s included **Altura**, SQM’s 26% shareholder **Tianqi**, and SQM’s overall profitability. As predicted by **Javier “lithium is a commodity” Martinez at Morgan Stanley**, SQM allowed its lithium gross margins to shrink from more than 50%+ a few years ago to less than 15% in recent quarters to exert its low cost commodity positioning.

While it is nice to see the China carbonate price uptick in recent weeks, it is RK Equity’s view that the longer lasting impact of SQM’s aggressive growth-at-any-cost strategy is likely to put a low ceiling on China carbonate prices. **Medium-term we see a sustainable \$4,000 premium for battery quality hydroxide, ex-China (~\$13-14K) to China “spot” carbonate (\$9-10K).**



In my partner [Rodney Hooper's must-read lithium note](#) over the weekend, he articulated much faster hydroxide to carbonate growth with the latter having much greater latent capacity which is more likely to materialize both from China carbonate converters who have lower return thresholds and can re-enter the market quickly, and SQM's hyper aggressive, low capex, low opex ramp:

*'In 2021 we see lithium demand increasing by 80-90KT LCE, including downstream inventory build: 50-55KT hydroxide (50-55% growth), **30-35KT carbonate** (13-15% growth). Previously my expectation was the carbonate market would take longer to balance. This market has outperformed my expectations. Carbonate demand growth in China has been exceptional, yet Chinese carbonate production capacity is currently operating at around 50%. **SQM targets a 2021 sales growth of 20KT LCE.** Their November net sale price into China was still below \$4k/t, a clear indictment on quality even after adjusting for possible internal inventory transfers. How will battery-grade/quality carbonate supply respond to demand now that prices are above the marginal production cost? – Rodney Hooper, RK Equity*



SQM. Sustainable, Premium-Priced Specialty Hydroxide

Mt. Holland Final Investment Decision Imminent

In December 2018, SQM's JV partner at the time, [Kidman Resources announced an integrated PFS](#) suggesting capex of USD737M for a 45,000 Mt Holland project and operating costs of USD 4,507.

As SQM advanced Mt. Holland to DFS with Wesfarmers in 2019, SQM held an investor day in New York in September in which it let an important cat out of the bag: operating costs at Mt. Holland will be a full 50%+ higher than this USD4,507 figure. SQM showed it expects to earn a \$3,200-8,200 (32-55%) operating margin based on lithium prices ranging from \$10-15,000/t, implying **Mount Holland operating costs of USD 6,800/t.**

LONG TERM OPPORTUNITIES IN ALL BUSINESS LINES

Long Term Strategy 2019 → 2025

Lithium and derivatives		LTM	Target 25	Diff	
Sales Vol Lithium from Chile	TnTone	46.8	> 150	103	65 Mt 2020 / 18% gpy
Sales Vol Lithium from Austr	TnTone		> 23	23	50% SQM
Lithium Price Average	\$/kg	14.5	- [19.0 - 15.0]		
Margin Chile	\$/kg	6.5	- [4.3 - 7.3]		10.0 / 15.0 US\$/kg
Margin Australia	\$/kg	-	- [3.2 - 8.2]		10.0 / 15.0 US\$/kg

- CORFO payments (SP): [40% price > 10 - 25% price 7/10 - 13.7% at 10] (*)
- The cost of lithium is expected, in the short term, to be at least US\$0.5 lower than average LTM.
- Although we have a series of cost savings initiatives, in this projection they are not considered.
- Inflation is considered in the cost projection. The projected lithium prices are nominal.

Sidebar: in **Sept 2019** SQM was targeting **150kt** in Atacama in **2025**. It now is targeting **180kt** in **2023**. Capex to grow this carbonate expansion is only USD400M, a capital intensity of only ~\$3,600 for 110kta additional capacity (70kta to 180kta)

In January 2020, SQM's JV partner **Wesfarmers** announced:

"Following review of the DFS, Wesfarmers and SQM have agreed to undertake additional work which will result in the deferral of the final investment decision on the project to the first quarter of calendar year 2021. Key actions include:

- conducting further work to **optimize project design to reduce capital and operating costs**
- exploring opportunities to improve utility and infrastructure solutions for the project
- investigating initiatives to further leverage WesCEF's existing capabilities including by providing shared services and reducing operating costs
- ongoing discussions with key customers to ensure product specifications are aligned with continued changes in battery chemistry"



In its flurry of year-end announcements, SQM again let an implicit cat out of the bag. It appears that Mt. Holland will cost USD 1.2B – a full 63% more than Kidman’s original IPFS - and will be enlarged slightly (11%) from 45,000 to 50,000Mt.

The USD 1.2B figure comes from reading the SQM tea leaves from their November 19 and December 23 announcements in which their approved capex budget increased from \$1.3B to \$1.9B and lithium capex budget from \$400M to \$1B. \$600M would be for SQM’s half share. 50 kta capacity equates to \$24,000 capital intensity per ton of capacity – 7X larger than SQM’s Atacama capital intensity.

November 19, 2020: *Last night in our press release, we described details of our **2021-2024 investment plan**, which will require approximately **\$1.3B in Chile**. This plan will include the completion of our lithium expansion plans that are currently underway at our facilities near Antofagasta requiring approximately **\$240M**. Additionally yesterday the Board approved an expansion plan to reach 180,000 metric tons of lithium carbonate and 30,000 metric tons of lithium hydroxide capacity in 2023, requiring an investment of approximately **\$150M**. In short, we will invest **just under \$400M in lithium expansions (in Chile)**...Our plans to develop the Mt. Holland lithium hydroxide project continue. We have been working diligently with our partners finalizing some studies and will make a definitive investment decision in January 2021. Any potential **future capex** related to this project **is not included in the \$1.3 billion capex plan** outlined in the press release yesterday*

December 23, 2020: *The board has approved initiating the process to increase the company’s capital of up to \$1.1B. The capital increase is intended to finance part of our ambitious **\$1.9B investment plan for the years 2021-24**. Most of the capex (\$1.3B) will be executed in Chile. This plan also includes the 50,000 metric ton Mt. Holland lithium hydroxide project in Western Australia, a 50/50 JV with Wesfarmers.*

The Final Investment Decision on the Mt. Holland project is expected to be taken by the board during the first quarter 2021, before the preemptive rights offering period. The EGM will be held on January 22, 2021. The capital increase will be subject to a mandatory 30-day pre-emptive rights offering period for existing shareholders under Chilean law, and it is expected that a **parallel pre-emptive rights offering will be made to existing holders of the company’s ADRs**.

I would expect an SQM rights offering to ADR holders should be accompanied by SEC-level disclosure which hopefully will include as much detail about the Mt Holland capex and opex as **IGO Ltd** presented the market last month about **Greenbushes** and **Kwinana** for its investment in **Tianqi**. Ditto more information about SQM’s recent supply agreement with **LG Energy Solutions**, a rare client disclosure by SQM that makes sense to me now as it conditions the market to raise a meaningful \$1.1B. We shall see.



LG Energy Solutions & SQM Transparency

December 22, 2020: SQM announced a long-term agreement to supply lithium products to LG Energy Solutions. The agreement will run from 2021-2029 (9 years). SQM will supply battery grade lithium carbonate and lithium hydroxide for the production of high-quality cathode material. In total the contract considers, approximately **55,000 mt of lithium carbonate equivalent**. The signing of this large scale, long-term supply agreement is an important milestone for SQM not only because it is part of its growth strategy, but also because it solidifies its prominent position as a high quality lithium supplier for the production of batteries for electric vehicles. LGES and SQM are two significant players in the electromobility industry who are both fully committed to the development of the industry's future. As always, **SQM remains committed to environmental responsibility, social responsibilities and transparency** and look forward to strengthening its business relationship with LGES in the future.

55,000 over 9 years equates to 6,000 tons per year. It is not clear how much is hydroxide vs. carbonate. Not clear what years in which those tons are to be delivered. Not clear if they're from Atacama or Mt Holland. Not clear the pricing mechanism. Nor if it is take or pay. #opaque

By comparison, Ganfeng in 2018 ahead of its Hong Kong listing disclosed take or pay contracts over 6 years representing more than twice the average annual tonnage, with more transparency in terms of product mix, timing and quantities, as well as some color on price formula.

- 47,600 of lithium hydroxide from January 1, 2019 to December 31, 2022. I.e, average ~15,900/y
- Plus 38,000 tons of lithium hydroxide from 2021 to 2025 (average~7,600/y) and 7,000 tons of lithium carbonate in the year 2019 to 2021 (average ~2,300t/y).
- In total 85,600 hydroxide over 7 years or an average of 12,230 tons per year.

LG Chem is one of our customers and we are principally supplying lithium carbonate and hydroxide, one of the core materials used to make batteries, to LG Chem. In August 2018, our Company entered into a purchase agreement with LG Chem for a term commencing from January 1, 2019 to December 31, 2022. Pursuant to the purchase agreement, our Company agreed to supply no less than an aggregate of approximately 47,600 tons of lithium hydroxide to LG Chem in the year 2019 to 2022. The parties agreed and allowed certain fluctuation of the annual targeted purchase volume in each financial year provided that if LG Chem fails to purchase at least the minimum agreed targeted purchase volume for any specific year, LG Chem shall compensate our Company based on a specified amount per kilogram of difference between the actual purchased volume and the minimum targeted purchase volume. Likewise, our Company shall compensate LG Chem based on the same specified amount per kilogram should we fail to supply the minimum targeted volume in any specific year. There is no predetermined purchase price under the framework purchase agreement. However, the parties agreed that the purchase price shall be determined on a quarterly basis based on a pre-agreed pricing formula. In addition, due to increasing demand from LG Chem's downstream customers, on September 18, 2018 we entered into a supplemental purchase agreement with LG Chem whereby we agreed to supply LG Chem an incremental 38,000 tons of lithium hydroxide in the year 2021 to 2025 and 7,000 tons of lithium carbonate in the year 2019 to 2021 based on the same pricing formula. The purchase agreements were entered into on an arm's length basis and on normal commercial terms and in the ordinary course of business of our Company. Save as disclosed above, our Company did not enter into any other transaction, agreement or arrangement with LG Chem concerning the acquisition of our Shares.



Concluding Remarks

An important attraction to DLE technologies is that they can help improve a major problem with brine resources – the ability to produce consistent, high quality, low impurity product. While sustainability is gaining traction and battery quality specifications tougher to meet, SQM has not publicly demonstrated interest in exploring DLE technologies in Atacama. Time will tell if the company using “conventional” evaporation ponds can improve its quality or if the company will continue to revert to its iodine and potash playbook and take advantage of its insanely low capital intensity per ton and low operating cost to dominate the commodity end of the lithium carbonate market. I bet on the latter. Given the incentives SQM’s regulators CORFO/CCHEN have implemented – short 9-year life but large tonnage allotment, progressive royalties, undifferentiated by quality – SQM’s behavior is economically rational.

By extension, I believe that a dichotomy of “China commodity carbonate” and “ex-China specialty hydroxide” may result in Wall Street de-rating the EV/EBITDA multiple of SQM’s Atacama tons and affix a multiple similar to commodity producers like iron ore or copper. Albemarle, Ganfeng, Livent who supply ex-China Tier One OEMs should trade at a substantial premium reflecting higher quality, more sustainable earnings from long-term, premium priced contracts. For this and many other reasons, I own and prefer ALB as a big cap “lithium proxy” and have not owned SQM since they walked away from **Lithium Americas**. I see significant risk that SQM will underperform and have much greater confidence in the discipline with which ALB manages its more diverse world class assets. This doesn’t mean SQM can’t experience huge swings in profitability and stock price performance in the event we are wrong about a carbonate price ceiling. Should China carbonate spike as it did in 2016, SQM could earn super normal returns. This could happen, paradoxically, if SQM has a Vale-like disaster or is otherwise unable to meet its increasingly aggressive production targets with reduced water use and brine extraction. SQM could soar as FMG has in iron ore, though this scenario would also significantly benefit ALB.

In 2020 there was some speculation that SQM would sell out of Mt. Holland to Wesfarmers or another player. This seems unlikely, considering SQM could lose its Atacama lease in 2030 and as a major industry player it needs to have asset and product diversity.

But a Chilean company not known for being a great JV partner, operating very far from home with a resource not super similar to its Caliche ore in Chile, for a battery quality hydroxide product for which it is not currently a major player, carries meaningful risk. For exposure to WA’s hard rock-to-hydroxide “lithium valley,” **Mineral Resources** and **Albemarle** are better plays. If I’m right about Mt. Holland’s substantially higher \$1.2B capex and \$6,800 opex (FWIW - IGO showed \$7,200-7,800 for Tianqi’s Kwinana buying Greenbushes feed from \$500-600/t), then the math Rodney and I did when Albemarle invested in Mineral Resources Wodgina arriving at an incentive price of ~\$14,000 LiOH seems the ballpark for long-term contracts. Worth noting is that the WA iron ore boom is pushing up labor rates and the AUD/USD strength is also hurting WA competitiveness, supporting higher LiOH prices.

Finally, **congratulations to Yahua on their 5-year hydroxide deal with Tesla**. In a Minviro era which labels **Galaxy-like Australian rock to China conversion the highest carbon footprint** way to produce Tesla’s S3XY hydroxide, the outlook for higher LCA scoring, lower carbon, lower capex, lower opex hard rock-to-hydroxide projects in North America and Europea - proximate to Tesla’s Austin and Berlin Gigafactories – should be very bright.



RK Equity Research, Capital Raising, Advisory, Merchant Banking
11 Years Experience with Lithium Battery Materials Developers



Disclaimer

Lithium-ion Rocks, Rock Stock Channel and Lithium-ion Bull are periodic publications, written and/or produced by RK Equity Advisors, LLC. In this article/episode and any other newsletters, podcasts or videos Howard Klein and/or RK Equity affiliate Rodney Hooper may share some rationale for a stock in which we have some conviction – for or against – and may own directly in our own retirement or taxable accounts. If you agree or disagree with and act on or against the rationale of anything written in this or any other Lithium-ion Bull or Lithium-ion Rocks! podcast or Rock Stock Channel video, that is your free choice. But to be clear, the commentary you’re reading, hearing or seeing is not investment advice, nor a recommendation and may not be unbiased. RK Equity, Howard Klein and Rodney Hooper are not registered investment advisors nor a broker-dealer. We may act, or may have acted in the past, as a financial advisor, or capital raiser for certain of the companies mentioned herein and may receive, or may have received, remuneration for services from those companies. Howard Klein, Rodney Hooper, RK Equity may make purchases and/or sales of securities mentioned here-in from time to time, subject, of course, to restricted periods in which we may possess material, non-public information. As of January 4, 2020 RK Equity, Howard Klein or Rodney Hooper own securities in Mineral Resources, Piedmont Lithium, E3 Metals Corp, Albermarle, Livent, European Metals Holdings, Bacanora, Critical Elements, Frontier Lithium, MP Materials, Camino Corp, Talon Metals, Nouveau Monde Graphite and have or have had over the past 60 months fee-paying advisory assignments with Western Lithium/Lithium Americas, CleanTeq, Millennial Lithium, Altura Mining, E3 Metals Corp, NeoMetals, Critical Elements, Nouveau Monde Graphite, Kidman Resources, Nemaska, Camino Corp, Bacanora, European Metals Holdings, Savannah Resources, Talon Metals, Lithium Power International and Piedmont Lithium. The information contained herein is not financial advice and whether in part or in its entirety, neither constitutes an offer nor makes any recommendation to buy or sell any securities.