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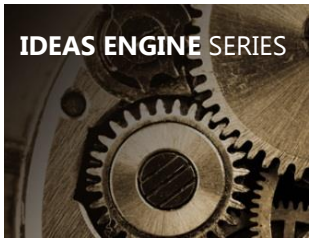
KEY CONCLUSIONS

Equity Research American Region
Specialty Chemicals
27 May 2014

Lithium—A Powerful Story for Investors

CATALYST ALERT



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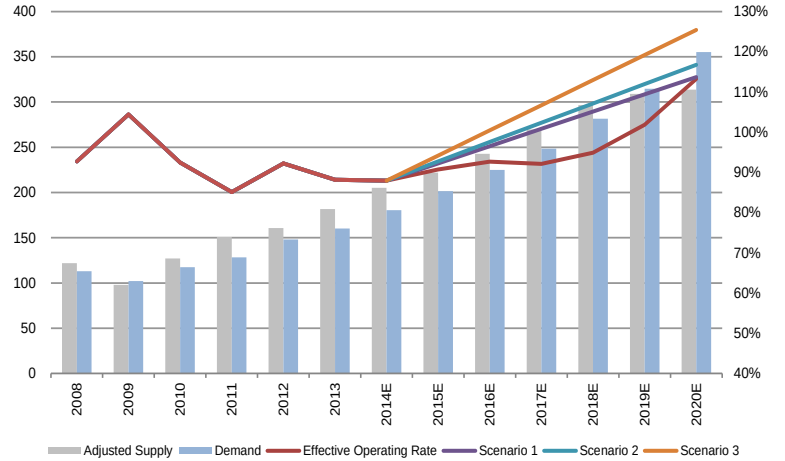
Improving Demand Outlook Points to Potential Pricing Power

Based on our detailed analysis of the global lithium supply/demand balance, we believe the industry is poised for significant volume growth, with a reasonable amount of risk to the upside around pricing as well.

- **Demand to be robust:** Driven by power storage demand (everything from power tools and handheld devices to electric vehicles), the global lithium industry should, we believe, enjoy a CAGR of roughly 12% through the end of the decade (starting in the mid/high single digits and accelerating afterwards as the EV market enjoys further penetration).
- **Supply will be short:** There have been investor concerns about the supply side of the equation given a number of announced projects in the lithium industry. Upon a detailed review of the projects, we believe the risk is that demand will actually outstrip supply as we approach the later part of the decade, with demand potentially as high as 125% of total capacity (in an industry where 90-95% utilization rates are considered full capacity).
- **Pricing has risk to the upside:** To be clear, the supply "shortage" does not mean there won't be enough lithium to meet the needs of the EV industry—there is plenty of lithium in the world. However, without significant incremental investment from the lower-cost producers (beyond the announced projects) pricing will need to push higher to facilitate investment in higher-cost projects/methods of lithium production (the way rising oil prices facilitated ultra-deep water and oil sand projects/investments).

With greater clarity around lithium demand (particularly from EV markets) and the risk to the upside for pricing, we believe the current lithium producers are likely to enjoy significant earnings growth through the decade. **The best way to play this trend is through the low-cost producers ROC (for which we raised our price target to $90) and to a lesser degree FMC (easier once it spin-off its Minerals division by 1Q15, which will have 20-25% of its earnings tied to lithium).**

Exhibit 1: **Adjusted Supply-Demand w. Scenarios**



Source: Company data, Credit Suisse estimates.

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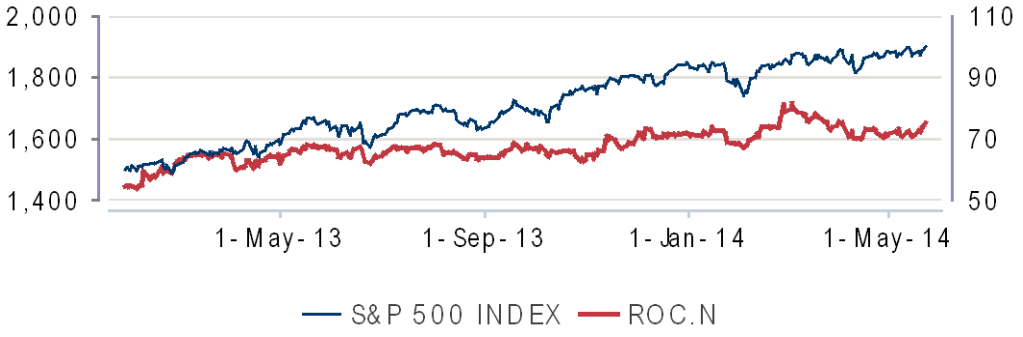
Financials

Rockwood Holdings Inc. (ROC.N)

Price (23-May-14,US$)				75.3
Market Cap (US$mn)				5674.1
		Previous Value		Current value
Rating				OUTPERFORM
Target Price (US$)		83.00		90.00
Year	12/13A	12/14E	12/15E	12/16E
EPS (CS Adj.) (US$)	2.02	2.02	2.61	3.15
EPS Prev (US$)		2.02	2.61	3.15
EPS (Qtr 1) (US$)	0.68	0.43	0.59	0.71
EPS (Qtr 2) (US$)	0.42	0.50	0.66	0.81
EPS (Qtr 3) (US$)	0.39	0.55	0.69	0.83
EPS (Qtr 4) (US$)	0.53	0.54	0.67	0.80



Source: Credit Suisse Estimates, IBES

Income Statement	2013FYA	2014FYE	2015FYE	2016FYE
Sales revenue	1,857	1,457	1,561	1,661
EBITDA	395	347	395	428
Depr. & amort.	-157	-96	-104	-104
EBIT (US$)	238	252	291	324
Net interest exp	-89	-56	-51	-48
Other adj.	0	0	0	0
PBT (US$)	149	196	241	276
Income taxes	-35	-49	-60	-69
Profit after tax	114	146	180	207
Minorities	1	-0	-4	-4
Preferred dividends	-0	-0	-0	-0
Associates & other	41	0	-0	0
Net profit (US$)	156	146	177	204
Other NPAT adjustments	0	0	0	0
Reported net income	156	146	177	204
Cash Flow	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
EBIT	238	252	291	324
Net interest	-89	-56	-51	-48
Change in working capital	-121	-33	-28	-28
Other cash & non-cash items	281	52	67	60
Cash flow from operations	309	214	279	308
CAPEX	-341	-246	-311	-340
Free cashflow to the firm	-32	-32	-32	-32
Cash flow from investments	2,095	828	-94	-84
Cashflow from financing	-2,180	-495	-480	-440
Changes in Net Cash/Debt	1,706	587	-135	-216
Net debt at start	1,478	-227	-814	-679
Change in net debt	-1,706	-587	135	216
Net debt at end	-227	-814	-679	-464
Balance Sheet	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
Total current assets	3,664	4,251	4,007	3,845
Total fixed assets	843	419	409	389
Total liabilities	2,459	2,466	2,345	2,390
Shareholder equity	2,920	2,559	2,416	2,179
Minority interests	153	153	153	153
Total liabilities and equity	5,532	5,178	4,914	4,722
Net debt	-227	-814	-679	-464

Per Share	2013FYA	2014FYE	2015FYE	2016FYE
Equiv. FPO (period Avg.) (mn)	77	72	68	65
EPS (CS Adj.) (US$)	2.0	2.0	2.6	3.1
Prev. EPS (US$)	2.0	2.0	2.6	3.1
DPS (US$)	1.6	1.8	1.8	1.8
Dividend yield (%)	2.2	2.4	2.4	2.4
Dividend Payout (%)	81.7	89.1	69.0	57.1
Earnings	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
Sales growth (%)	-47.1	-21.5	7.1	6.4
EBIT growth (%)	-52.2	5.6	15.8	11.3
Net income growth (%)	-48.2	-6.3	20.7	15.3
EPS growth (%)	-46.4	0.0	29.2	20.7
EBITDA margin (%)	21.3	23.8	25.3	25.8
EBIT margin (%)	12.8	17.3	18.7	19.5
Pretax profit margin (%)	8.0	13.4	15.4	16.6
Net income margin (%)	8.4	10.0	11.3	12.3
Valuation	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
EV/Sales (x)	2.9	3.3	3.2	3.1
EV/EBITDA (x)	13.8	14.0	12.6	12.2
EV/EBIT (x)	22.9	19.3	17.1	16.1
P/E (x)	37.3	37.3	28.9	23.9
Price to book (x)	2.0	2.1	2.1	2.2
Asset turnover	0.3	0.3	0.3	0.4
Returns	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
ROE	6.8	5.3	7.1	8.9
ROGIC (%)	0.1	0.1	0.1	0.1
Interest burden	0.6	0.8	0.8	0.9
Tax burden	0.2	0.3	0.3	0.3
Financial leverage	1.8	1.9	1.9	2.0
Gearing	**2013FYA**	**2014FYE**	**2015FYE**	**2016FYE**
Net debt/equity (%)	-7.4	-30.0	-26.4	-19.9
Net Debt to EBITDA (x)	Net Cash	Net Cash	Net Cash	Net Cash
Interest coverage ratio (X)	2.7	4.5	5.8	6.8

Source: Company data, Credit Suisse Estimates

Table of Contents

Summary

In previous lithium reports, we've delved into the mechanics of how to produce lithium, the major players, and the pricing outlook. In this piece, we update our lithium supply/demand model to incorporate a lot of the changes that have occurred such as the companies that have brought on capacity and the ones looking to bring up capacity. Since the last time we published our report, for example, Canada Lithium has merged with Sirocco Mining to become RB Energy, while Galaxy's 25k tonne per year of LCE project at Sal de Vida, Argentina has been facing issues owing to the lack of financing. On the demand side, many new electric vehicles have been introduced with the Tesla Model S targeted to see 35k vehicles sold in 2014. Meanwhile, Tesla is also pushing ahead for a "gigafactory" with 35 gWh of production that would equate to ~25k tonnes of lithium carbonate equivalent demand.

Indeed, the theme we've noticed in the compilation of this report is the relatively optimistic assumptions used in certain feasibility studies of project's that could come online. Many use a potash price (a byproduct of lithium brine production) that is outdated following Uralkali's change in marketing strategy and that artificially lowers the estimated "net production cost". In addition, in certain instances channel checks suggest feasibility studies use an elevated yield rates that may be complicated to achieve given that a lot of the areas signaled for new investment have a lower lithium concentration in ppm.

We expect electric vehicle sales (just plug-in hybrid and battery electric) to makeup ~4.7% of 2020 global auto sales that would imply nearly 5m electric vehicles purchased that year. This is slightly less than the midpoint of the estimates we've seen for electric vehicles sales with the range centering between 4.0-6.5m in 2020. Beyond greater penetration of EV sales, we'd highlight that there are important mix forces at work that could cause our demand numbers *to be conservative*. For example, battery electric vehicles consume ~66% more lithium carbonate equivalent per kWh than plug-in hybrid vehicles; so, with greater BEV adoption (as witnessed with the success of the Tesla Model S), this could put upward pressure on numbers. Another key point is that the Tesla Model S uses 80-150% more lithium carbonate equivalent per kWh than the majority of battery electric vehicles in the market at the moment—providing another lever for demand growth above our current estimates.

Oour base case scenario estimates that the market could grow increasingly tight looking out to the end of the decade that would be supportive of a positive pricing environment. Industry checks suggest lithium carbonate pricing could test $7,000-8,000 per tonne in 2020 (with some companies believing it could trend even higher). We would note that despite our outlook for a tight market looking out to 2020, as the price of lithium rises other production processes as well as lithium reserves will likely become more viable which will ensure that there is enough production to meet growing demand levels albeit at a higher price (think of it like oil where as the price trends higher owing to more robust demand growth, methods for production emerged from land drilling to more difficulty/costly methods like oil sands, shale fracking, and ultra-deep).

In our coverage space, Rockwood is the most levered to lithium with about 50% of its earnings coming from lithium while that figure is closer to 5% for FMC although could be closer to a quarter of the earnings mix for the upcoming FMC Minerals entity which will be spun off by 1Q15. We expect both companies to benefit from the solid demand outlook and supportive pricing environment looking ahead. That said, we highlight that ROC should be slightly better positioned as its assets in Chile are among the lowest cost in the world.

Bottom Line: Demand growth is projected to grow 12% annually compounded looking out to the end of the decade. While there are a number of capacity projects planned to come up during this time frame, we believe a number of them will be either delayed or potentially even cancelled suggesting a noticeable spread between theoretical capacity and effective capacity. Should this scenario play out, lithium pricing should see upward pressure looking forward with certain industry checks suggesting 2020 prices could be ~40-60% higher than today. This would be a positive for ROC and FMC in our space.

Stock Implications

US Implications

Rockwood (Outperform, TP $90)—Seconhd largest Lithium producer in the world with arguably the lowest cost position (once adjusting for competitor royalty fees).

Rockwood is focused on Lithium and Surface Treatment technologies with the EBITDA split evenly among the two segments. In the Lithium business, ROC is the second largest producer in the world with EBITDA margins in the ~38% level forecasted for this year. In Surface Treatment, ROC is the #2 player in the metal treatment area. Surface Treatment for ROC is largely focused on general industrial lines but also the Auto OEM, Aerospace, and Auto Components end markets—overall, the business has ~23% EBITDA margins.

We view ROC as one of the top midcap stocks in our coverage, as the strong positions in both of its high-growth and high-margin businesses should translate into above average EPS growth for the foreseeable future.

In Lithium, based on our supply/demand forecast, we forecast Lithium volumes could grow low double digits looking out to 2020 with the potential for pricing to rise by at least mid-single digits over the next five to six years. This should drive low-double-digit to mid-teens EBITDA growth for its core lithium business, if not higher.

From current operations, we estimate that every 1% price increase would amount to $0.05 of incremental EPS (off of a base of $2.02 in 2013). This does also does not incorporate ROC's impending closing of its 49% Talison equity JV that should add $0.40 of EPS in 2015.

In Surface Treatment, the business has seen solid growth with top line up high-single to low-double digits over the past year. While we believe this could moderate slightly, we believe the business will still face strong tailwinds in the near term that should result into solid cash generation for ROC (important if ROC decides to invest further in lithium) considering we expect EBITDA of ~$200m in 2014 and maintenance capex of just $30m.

Financially, the company is setting itself up to deliver more than 50% earnings growth in 2015 with the help of its lithium expansion, the Talison JV and the use of significant cash on the balance sheet. Rockwood is selling its TiO2 business to Hunstman for net proceeds of $1.05billion (deal expected to close over next few months) that will likely fuel further share repurchases—beyond the $500m that we currently model. With limited M&A opportunities on the horizon (lithium assets are scarce and surface treatment owners are reluctant to sell), we'd expect the majority of the proceeds to be deployed via buybacks which could fuel a strong run for the shares heading into the end of the year.

Even after paying for the Talison JV (~$475m), ROC will still face a net cash balance with further possibilities for cash deployment considering their target leverage ratio stands at 1.5-2.5x. We estimate that $1bn share repurchase program enacted in late 2014 could add $0.50-0.60 of EPS to 2015 in excess to the $0.40 of accretion that it should receive from its 49% stake in Talison.

FMC (Outperform, TP $97)—Fourth largest Lithium producer in the world; FMC planning a spinoff of its Materials business (Soda Ash and Lithium) to be concluded in 1H15.

FMC is currently the fourth largest lithium producer in the world and makes up roughly 23% of the Minerals segment within the corporation (or $223m of sales in 2013). FMC is also a player in the Agricultural Solutions (crop protection), Health & Nutrition, and Soda Ash markets. FMC is planning to separate its portfolio into two by 1Q15 with the Ag and H&N as part of the "new FMC" and FMC Minerals to comprise Soda Ash and Lithium.

We rate FMC shares as outperform and see roughly ~34% upside to our target price that is derived using a SOTP valuation on the business. We believe that the "new FMC" business could conservatively trade for 12x EBITDA—with room for upside. For FMC Minerals, we estimate Lithium should warrant a 13x EBITDA multiple which is a slight discount to ROC's assets considering ROC is lower cost and operates in an easier place to do business. For Soda Ash, we believe the valuation range would be between the 7-8x ranges given its more commodity end markets.

Although the muted Ag Solutions performance in 1Q14 will likely mute share performance in the near term (likely until 3Q numbers that prove out how much business was pushed out on difficult weather), on a longer term basis we have a favorable disposition for Ag considering its high growth (midteens) and solid margin mix (25-27% EBITDA margin). The business is seeing solid growth in Brazil where farmers often plant several times a year owing to the temperate climate and thus creates a multiplier effect for FMC's Ag chemical solutions. FMC is mostly levered to soybeans (28% of portfolio) with Cotton, Sugarcane, Tree Fruits/Veg also important crops.

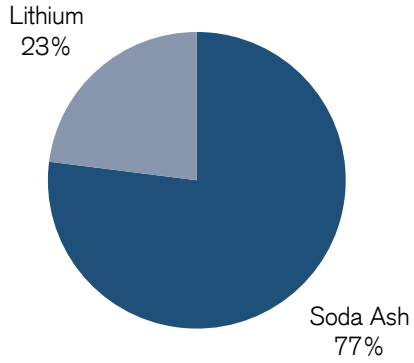
FMC's Health & Nutrition Business is a leading supplier of functional ingredients to the food and pharmaceutical/nutraceutical markets. Overall, demand remains solid with FMC recently maintaining their outlook on a strong start to the year.

In Soda Ash, the company has experienced volatile pricing in the past but is now seeing US domestic pricing (or half of its volumes) improve year over year with export pricing (remaining half of volumes) also seeing an uptick. Importantly, the company does not factor in any export pricing improvement for its 2014 EPS guidance and hence this could be a positive lever later this year.

FMC's lithium business had 1Q14 operating margins in the low teens percent. The company expects for the devaluation in the Argentinean peso to have a positive impact on the Lithium business this year (as a portion of its costs are in pesos while all of its revenue is pegged to the dollar). Overall, the company sees the business returning to mid-teens profitability in 2014 with stable pricing, consistent plant operations, and higher volumes to help. In 2015, the company should see further margin expansion and solid growth result in Lithium earnings increasing by 15-20% from 2014 levels. We estimate that normalized EBIT margins for this business are between 20–24% that should lift as volumes improve and pricing potentially moves higher.

Overall, we have long argued in our Rocket Turtle Thesis that the growth and stability of FMC's total portfolio (largely from Ag and H&N) has been underappreciated by the street and that as FMC continued to deliver this above average growth with limited volatility investors would eventually give FMC a premium multiple (similar to an ECL and PX). Although Soda Ash in the past and the delayed planting schedule have created "noise" to the story recently, we believe that as the separation of the two business nears, the valuation multiple should begin to improve and drive value for shareholders.

Exhibit 1: FMC Minerals Sales Mix



Source: Company data, Credit Suisse estimates

European Implications

European specialty chemicals hold a dominant position in the global battery materials space for Lithium based EV technology. We highlight key company exposures below:

Umicore (Underperform, TP €30)—Short- to midterm prospects and well placed to capture Tesla business. (potential c5-10% revenue contribution by 2020)
Umicore produce cathode materials for EV batteries and electronics. Their technology offering centres around LCO and NCA materials fit with current Tesla battery packs. Umicore currently have no production facilities in the US having built out assets in Europe and Asia. Umicore do have financial flexibility (ND/EBITDA<1x and significant free cash flow (c>€100mn p.a.)) leaving the option for further US investments. We estimate that if Umicore secured the entire contract for Tesla's cathode materials this is worth €2.5/share. Further opportunities arise from the Recycling business where UMI have a pilot smelter for the recycling of EV batteries—positive trends in the industry could lead to investments in a full scale version. We estimate this is worth €0.5-1/share.

BASF (Neutral, TP €82)—Well positioned for mid- to long-term growth, but only a small proportion of future business (company targets <1% revenue by 2020)
BASF produce cathode materials, electrolytes and separators for EV batteries. The company has a global production footprint and presence in the US markets. BASF's cathode technology centres on LCM/LIP and NiMH technology which, coupled with their integration into the majority of major auto makers, positions the company well for mid/longer term growth prospects.

BASF aim to be the global leader in battery materials by 2020, with targeted sales from this business unit of €500m. We highlight this represents <1% of 2014E revenues.

Clariant (Neutral TP CHF18)—Well positioned for mid- to long-term growth but group revenue contribution limited (we estimate c2-4% revenue contribution by 2020)
Clariant produce both Cathode materials and Anode materials for EV batteries. Clariant are the world's largest manufacturer/ IP holder of LIP cathode materials. They opened a plant in Canada (December 2011), with a capacity of 2,500 tonnes pa. (revenue potential>$100mn) Clariant is now the world's largest manufacturer of LIP. Clariant license their technology to 8 companies including BASF, beLife and Sony. We believe this should create a robust long term position in the larger vehicle EV battery market.

Lithium Production

Lithium can be found in trace amounts in a number of objects such as clay, minerals, sea water, brine etc. although the two most economical methods of production (given the higher lithium concentration) are spodumene mines and brine deposits. Spodumene is a mined mineral with lithium within; with the largest deposits for spodumene in Australia. The brine deposits are more cost effective with the cost to produce lithium from brine often being half the cost than for a spodumene facility. The largest brine deposits are in South America with Argentina, Bolivia, and Chile holding the biggest chunk of the brine deposits.

Mineral Production of Lithium

There are roughly 25 ores that have enough lithium oxide (Li_2O) content in the world that could be economically viable although realistically there are only a handful with meaningful amounts of lithium oxide to not only be viable but profitable as well. Among the handful of ores that are more important are Spodumene that has lithium oxide content ranging from 1.5-7%, Pegmatite with 3-4.5% lithium oxide content, and Lepidolite which has 2-4% lithium oxide content. Hectorite Clay is further down this list with a lithium oxide content typically in the 0.5-1.5% range. The locations with the most important mineral deposits are Perth, Australia, Bernic Lake, Canada, Masvingo, Zimbabwe, and Xinjiang Uygur in China.

Spodumene is the mineral that we are most concerned with given the abundant supply and relatively high lithium oxide content. Lithium originating from mineral production often serves the technical applications portion of the lithium market such as glass, ceramics, and metallurgy. In addition, more niche technical applications can include using lithium as a replacement for lead in lighting applications to make it lighter.

Despite spodumene mainly serving the technical grade lithium markets, spodumene can also be further processed into lithium carbonate. We find that typical spodumene assets have a lithium oxide content between 6-7% with lithium oxide being made up of 46.5% pure lithium which brings the pure lithium content for a typical spodumene asset between 2.80-3.25%. Realizing that lithium carbonate is made up of ~19% pure lithium results in requiring 5.8-6.7 spodumene tonnes to produce one tonne of lithium carbonate (or ~10 spodumene tonnes for one tonne of lithium hydroxide for comparison). Talison uses spodumene as its base mineral and owns the largest spodumene mine in the world with 61.5Mt of proven and probable mineral reserves. Talison has the capacity to produce ~740k tonnes of spodumene concentrate annually or ~110k tonnes of lithium carbonate equivalent which pegs the lithium oxide concentration of their mines at the 6% level.

We estimate that about one third of global lithium production is sourced from spodumene containing ores with Australia accounting for nearly 70% of the world's spodumene concentrate supply in 2013.

We estimate that cash production costs for spodumene based facilities that produce lithium carbonate are $3,500-5,000 per tonne for mines currently producing. The lower end of this range is represented by Australian mines with the higher end being represented by higher cost Chinese mines. From a timing perspective, spodumene mines can be built with the product reaching the market in about 3 years according to our channel checks.

Brine Production of Lithium

Brines (salt water solution typically pumped into evaporation ponds) makeup roughly 60% of global lithium production owing to the cheaper cost and lower energy intensity. Brine deposits are typically located in dry areas such that the evaporation rate is higher than the precipitation rate given the high solubility of the brine. The locations with the most prevalent mine deposits are the Salar de Atacama in Chile, the Salar del Hombre Muerto in Argentina with some deposits present in China and Bolivia having a vast amount of reserves yet very limited production.

Lithium from brine sources tend to serve chemical applications that include batteries, greases, aluminum production, air treatment (as an absorbent), initiator in rubber applications, pharmaceuticals, and aluminum-lithium alloys for aerospace.

In brine production, the main issues to focus on are the lithium concentration of the brine itself, the evaporation rate, and the amount of impurities in the lithium. Impurities can include items such as magnesium, calcium, and boron. For example, the higher magnesium content in the brine, the more reagent is required (typically lime) to remove it from the brine before separating the lithium which adds to the costs.

The higher the evaporation rate the quicker the lithium can be extracted from the brine pool. As far as evaporation differences at the various sites, the evaporation rates at the Salar de Uyuni are 40% of the level of the Salar de Atacama and hence takes longer for the brine to evaporate. In the Salar de Atacama, it takes roughly 18 months for the sun to evaporate the water and leave behind the concentrated lithium brine.

Lastly, lithium concentration is another important factor for asset performance and position in the cost curve. The Salar de Atacama in Chile has one of the highest lithium concentrations with an average concentration of 1,500ppm with ROC about a third higher than this average. Meanwhile, the lithium concentration in Argentina is more than 50% lower than in Chile making the assets inherently less efficient although the Mg:Li ratio is better.

Exhibit 2: Not All Salar's Are Created Equal

Salar	Lithium Concentration ppm	Evaporation Rate mm per year	Mi:Li Ratio	Companies in Area
Salar de Atacama, Chile	1,500	3,700	~4	SQM, Rockwood
Hombre Muerto, Argentina	692	2,775	1.5-2.5	FMC, Galaxy (attempt at Sal de Vida)
Salar del Rincon, Argentina	397	2,600		
Salar de Olaroz, Argentina	900	-	2.5-3.0	Orocobre, Lithium Americas
Salar de Uyuni, Bolivia	350	1,500	15+	

Source: Company data, COCHILCO, Credit Suisse estimates.

As far as the production process itself, at a company facility there typically exists a network of large evaporation ponds where they aggregate the water that is rich in lithium brine. Over 18-24 months (roughly, depending on the asset), the sun will evaporate the water and leave behind the lithium brine along with other salts at the bottom of the pool. The lithium brine is then extracted at which point it can be further processed (i.e. lithium carbonate or lithium chloride).

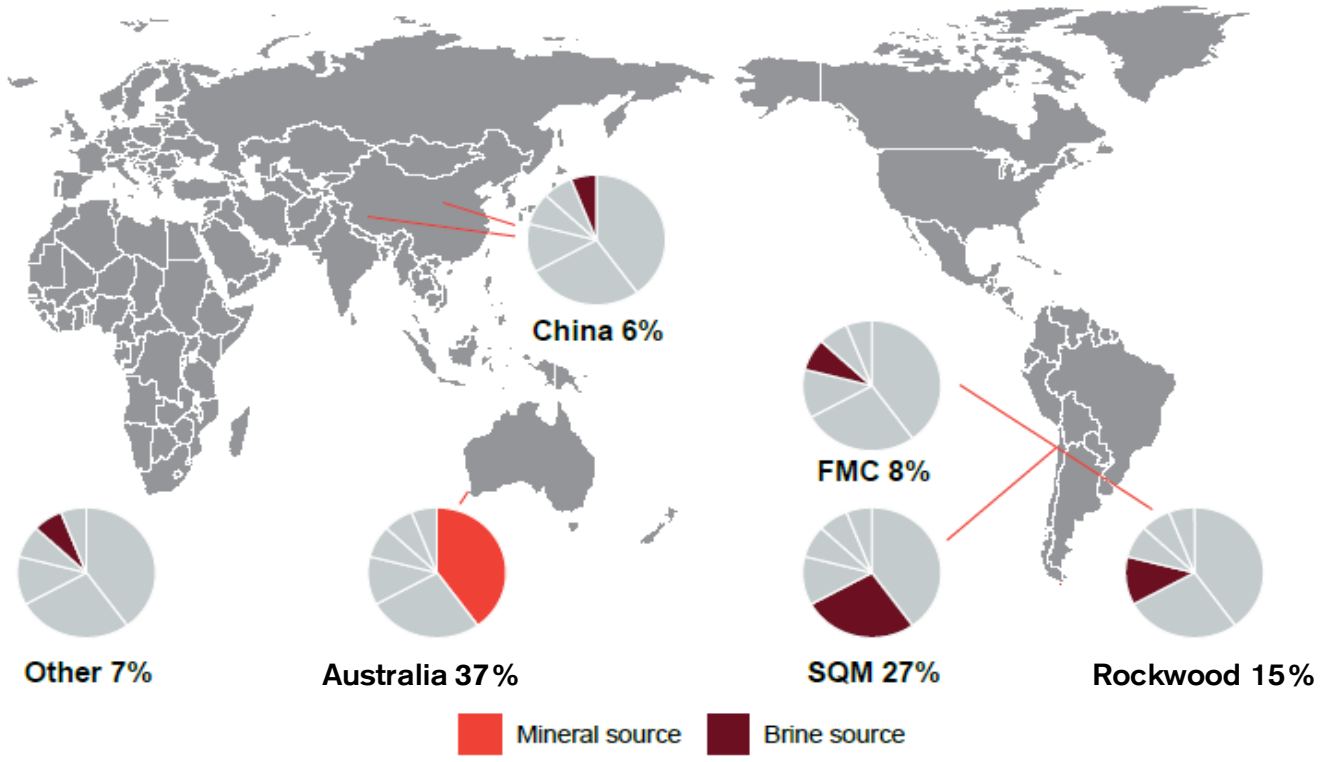
We estimate cash production costs for lithium producers tend to be between $2,000-3,000 per tonne but depending on the reserve we have heard of rates solidly higher (especially with Potash derivative credits having a lower value currently). The majority of the production costs are typically represented as net production costs whereby they refer to net of potash credits as potash is a by-product of lithium production.

Lithium Supply

We estimate the global nameplate capacity of the lithium market at 185k metric tonnes of lithium carbonate equivalent units. We use the industry standard lithium carbonate equivalent units format as it puts all lithium compounds on an apples to apples basis. Lithium carbonate (Li_2CO_3) is roughly 18.8% "pure" lithium vs. lithium metal (Li) that is 100% lithium.

The lithium market is somewhat oligopolistic with the major suppliers controlling a big proportion of the annual lithium production. The typical "big three" include SQM (brine producer, Chile based), Rockwood (brine focused, Chilean operations), and FMC (brine producer, Argentinean operations). We estimate that the "big three" controlled nearly 50% of the global lithium production in 2013. The other major player is Talison Lithium that is a spodumene-based lithium concentrate producer in Australia that has ~110k of lithium carbonate equivalent capacity; we estimate Talison's production equated to roughly a third of the global lithium market in 2013. We highlight that Talison does not have lithium converting capacity but only provides the spodumene concentrate (to mostly Chinese converters).

Exhibit 3: Global Lithium Market Share
estimated 2013 market share



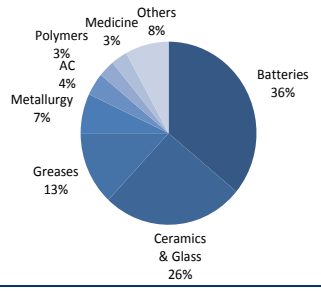
Source: Roskill Consultants and Company Data.

Lithium Demand

We estimate lithium consumption in 2013 was on the order of ~160k tonnes of LCE with the majority of the demand stemming from the battery market with 36% of the overall end use. We note that with the advent of electronics, power tools, e-bikes, and electric vehicles/energy storage lithium demand has been driven by batteries which is evident in batteries now comprising more than a third of the market from just 4% of the lithium end use in 2000.

Overall, we expect the lithium market to grow at a 12% CAGR looking out to 2020 driven by electric vehicle and battery demand. Our model indicates that lithium demand in 2020 could more than double from 2013 levels driven by EV growth.

Exhibit 4: Lithium Demand (2013)



Source: Company data, IHS, Credit Suisse estimates

Exhibit 5: Estimated Lithium Carbonate Content

	Lithium Carbonate content (grams)
Mobile Phone	1.7
Smart Phone	2.1
Tablet	19
Laptop	37
Power Tool	40
e-Bike	75
HEV (3 kWh)	2,500
p-HEV (10 kWh)	8,000
EV (35 kWh)	28,000
Energy Storage (1 MW)	600,000-800,000

Source: Company data, Credit Suisse estimates

The non-battery related portion of the lithium market is expected to grow at global GDP/Industrial Production type of levels apart from the battery component that we believe could grow 15%-plus for the next two to three years at which point it could accelerate given the expected growth in electronic vehicles and electricity storage.

To this point, Tesla recently announced that it will look to produce 35k Model S vehicles in 2014 that we believe should result in decent demand (~2k tonnes) but there will be more potential from the announced "Gigafactory." Based on our analysis the gigafactory with 35gWh of production would require roughly 25k tons of incremental lithium that could tighten the supply/demand balance for lithium on a global basis and help drive pricing up. There will be 50gWh battery pack output (or 15 gWh in excess of the cell output) that should also promote more lithium usage. In addition, we believe the pharma markets will tend to outperform the global GDP estimate slightly.

End Market Commentary

- ***Ceramics & Glass:*** Within the ceramics industry, lithium is used to lower heating temperatures and decrease the viscosity of the materials. In the glass industry, lithium reduces viscosity that eases production (as it lowers the melting point) and also improves glass strength and surface appearance. Typically, spodumene sourced lithium serves this market. We estimate this market will grow at the GDP type of level in the near-term with the potential for it to grow sub-GDP over time.

- ***Greases:*** Industry checks suggest that roughly 70% of greases use lithium with a growth forecast on the order of 2% annually. The greases are advantageous to use as they offer lubricating properties as well as good resistance to water, oxidation, and hardening. Greases are used in a variety of industries such as aerospace, auto, industrial, military, and marine.

- ***Metallurgy:*** Lithium carbonate has been used in older aluminum smelters as a way to reduce the energy required to produce aluminum— roughly 30% of the smelters in North America use lithium carbonate. Lithium is also used in aluminum-lithium alloys as a way to reduce weight and improve the strength relative to weight ratio. Aluminum-lithium alloys are used in certain aerospace models. We expect this segment of the market to grow at GDP type levels.

- ***Air Conditioning:*** Lithium bromide and lithium chloride are the main sources of lithium for this market and act as either absorption mediums in refrigeration and humidity control facilitators. We expect this market to grow at GDP type levels.

- ***Polymers:*** The polymers are of the market uses lithium as a catalyst in certain applications such as elastomers to modify asphalt and adhesives as well as copolymer resins used for packaging. Butyllithium is the main type of lithium that serves this market that we expect will grow in-line with GDP. Lithium helps weight control in this polymers and helps the production of tires and footwear.

- ***Medicine/Pharma:*** Lithium is used to prevent or treat depression and is also used in statin drugs (drugs that fight cholesterol) and is used in drugs such as Crestor, Lipitor, etc. We estimate growth in this market is in the mid-to-high single digits and constitutes a much larger percentage of the market on a lithium value basis vs. lithium volume basis.

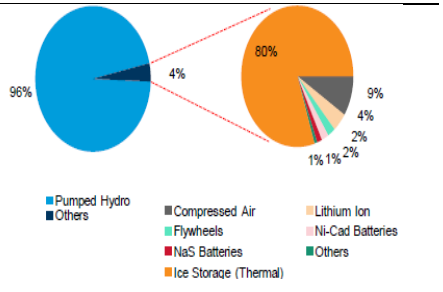
- ***Global Grid Storage Market:*** The problems with lithium-ion batteries for energy storage has been the high cost per kWh given the lack of scale from producers. Producers have yet to build a large scale grid storage business that is sub the $300 per kWh price point that has made it relatively expensive to use lithium-ion batteries for this purpose. As can be seen in Exhibit 6, lithium-ion still has a relatively low share of the U.S. grid storage market of 0.16%. That said, the large-scale energy storage market is growing 12%+ annually with lithium-ion one of the fastest-growing categories in this market. Investments are likely to outpace the rate of the market's growth for the next few years as U.S. energy storage technology investments are forecast to grow by 20-30% that should benefit lithium as an alternative to the currently favored technology of pumped hydro systems.

In addition, we believe there could be rapid growth in the emerging markets particularly China. As seen in Exhibit 7, China is just 4% of the grid energy storage market yet has the largest installed base of wind power with the Chinese energy storage market expected to grow to $500m per year by 2016.

While the industry is in its infancy, we are seeing the market develop and there has been progress as AES Energy Storage has helped bring online the Laurel Mountain, West Virginia lithium-ion powered storage facility for its 32MW wind farm project. In addition, Southern California Edison is moving along with a project at the Tehachapi Wind Resource Area to test a 32 MWh lithium-ion battery and smart inverter system that will store energy from ~5,000 wind turbines. The project is expected to be completed in 4Q15. There are others such as BYD & State Grid Corp of China—36MWh wind and solar storage project in Hebei, China.

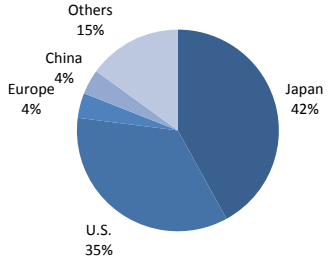
Additionally, Japan just launched a subsidy program to increase the installation of lithium-ion battery-based storage systems. The subsidies are budgeted for ~$100m and will be used for the installation of battery systems of 1kWh of capacity or more.

Exhibit 6: Installed Capacity of U.S. Grid Energy Storage
2011



Source: SVB, Credit Suisse estimates

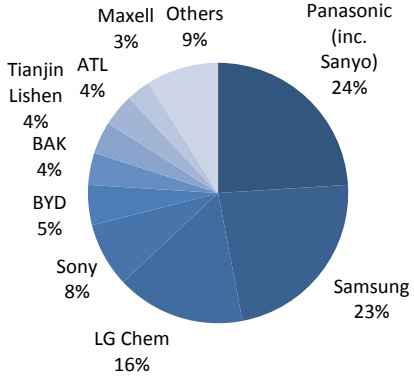
Exhibit 7: Installed Capacity of Grid Energy Storage
Geographic mix, 2011



Source: SVB, Credit Suisse estimates

- ***Batteries:*** There are two main types of batteries: primary and secondary batteries. Primary batteries are non-rechargable but can operate in a number of weather environments while also offering a low discharge rate. These batteries tend to be used in military, industrial, and commercial applications. Secondary batteries are more typical of the batteries one interacts with on a daily basis as these batteries can be recharged (these are lithium-ion batteries). Secondary batteries are prevalent in mobile technology and electric vehicles. At the moment, roughly 87% of the batteries are used for the mobile market with 13% being used for transportation. That said, with the advent of further investment in electric automotive technology, we expect the transport lithium carbonate market to be ~5x its size when comparing 2020 to 2014.

Exhibit 8: Lithium Ion Battery Market Share
Small Consumer Use; 2011



Source: SVB, Credit Suisse estimates

In transport batteries, lithium has gained share from other materials as lithium is highly reactive and is a very light material considering its energy density—in other words, it can hold large amounts of power in a "light" way relative to other materials. To this extent, Tesla CEO Elon Musk recently commented that nickel and cobalt are the main constituents in a battery cell from a weight perspective as lithium is ~1-2% of the overall cell mass. Lithium batteries are also more environmentally friendly than other materials as they can be recycled post its use.

Electric Vehicles — The Major Growth Driver

Fundamentally, the main growth driver for lithium demand from 2014 through 2020 will be electric vehicles as they are one of the biggest consumers of lithium on a unit basis. For example, demand for lithium from vehicles can range between 2.5-48kg versus a tablet that normally uses about 20 grams of lithium. There are three main categories of vehicles that use lithium that are all loosely categorized as "electric vehicles" and they include: hybrid electric vehicles (HEV), plug-in hybrid electric vehicles (PHEV), and battery electric vehicles (BEV). While they are all technically electric vehicles, since HEV's don't use much lithium at the moment and are less "electric" than the other two categories they are often excluded from calculations when referring to electric vehicle demand. In our model, we also delineate between the categories and view the PHEV and BEV as the main drivers of lithium demand given their higher content.

Types of "Electric Vehicles"

- HEV's are closer to a typical automobile as they use an internal combustion engine and a battery as an added propulsion system. They are not major consumers of lithium at the moment as they inherently require less battery power given the typical internal combustion engine that powers the car. For example, typical batteries for HEV's operate under the requisite of 3 kWh battery packs. In addition, HEV's don't require as much lithium as the other two categories since nickel metal hydride (NiMH) is more prevalent as a battery component than lithium. For example, Toyota's popular Prius hybrid line uses NiMH although there is speculation that Toyota could be moving toward lithium in its next line refresh—this will bear monitoring and would be a positive catalyst. At this moment, our industry checks suggest that the volume of lithium-ion usage from Toyota should increase from 2015 levels but nickel metal hydride will remain the mainstream choice.

- PHEV's have an internal combustion energy as well but have larger rechargeable batteries that can be recharged via plug. PHEVs are less prevalent on the road today than hybrids although they are making inroads with some of the major ones being the Chevy Volt, Toyota Prius Plug In, and Ford Fusion Energi in the US. In this category, essentially all of the vehicles utilize lithium as their battery pack component with battery packs typically ranging between 5-16.5 kWh. We assume a 10kWh battery pack assumption for the category based on a weighted average of the current vehicles on the market and their respective market share.

- BEV's are pure electric vehicles and only rely on batteries for propulsion. As a result, they require the largest amounts of energy in the battery pack with the Nissan Leaf using 24 kWh versus the Tesla Model S between 60-85 kWh (highlighting that not all BEV's are the same). The Toyota RAV4 is also a high lithium consumer given its battery pack is between 35-42 kWh. BEVs are making progress in the market as sales of this category more than tripled in the US during 2013. We assume a 35 kWh assumption for this category given the rapid rise in the Tesla Model S that uses dramatically more power than previous vehicles that used closer to the 25 kWh that the industry generally assumes for this category. Over time, we believe the category could ultimately end up using more than the 35 kWh vehicle driven by more powerful vehicles that will run longer distances. Based on the present market share in the US, the battery pack usage would imply a figure closer to the 40 kWh level but we lean conservative and assume 35 kWh.

Lithium Supply—Demand

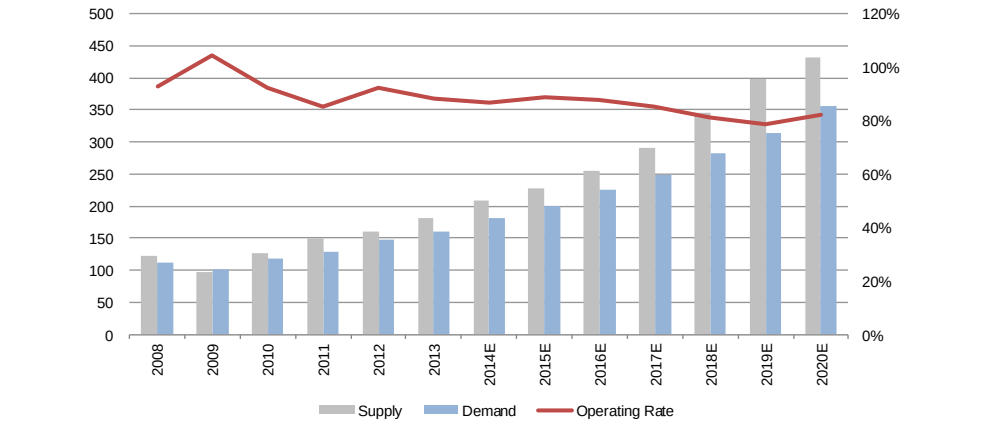
According to our estimates, under our base scenario lithium carbonate equivalent demand is expected to grow by 12% annually compounded looking out to 2020 driven by battery usage and electric vehicles. Since our last report, we've found that electric vehicles have become less of a niche category and are entering the mainstream automobile category at this point. This inflection point is driving demand for lithium as plug-in hybrid and battery electric vehicles use large amounts of lithium.

We believe the demand for lithium is even taking some of the industry by surprise as many of the previous demand assumptions will have to be revisited (and likely upwards) given some changing dynamics. Among these changing dynamics are that battery electric vehicles are growing dramatically and these cars are demanding more lithium to drive larger distances in a safe and reliable manner (i.e. don't recharge the car every 20 minutes). Historically, it has been long assumed that a normal battery electric vehicle consumes about ~20kg of lithium carbonate equivalent per kWh and that was the case a few years ago with the cars available at the time. However, with the Tesla Model S and other BEV models, more robust batteries can require more than double the lithium content than was previously assumed; indeed, the higher end Tesla Model S will require up to ~48kg of lithium carbonate equivalent per kWh.

While at fair value it looks like overall supply will keep up with demand based on annual projects. After taking a deeper look at the viability of each project and adjusting supply to reflect the likelihood of the announced nameplate capacity actually coming up we see a market that may potentially be reasonably short supply and require additional investment.

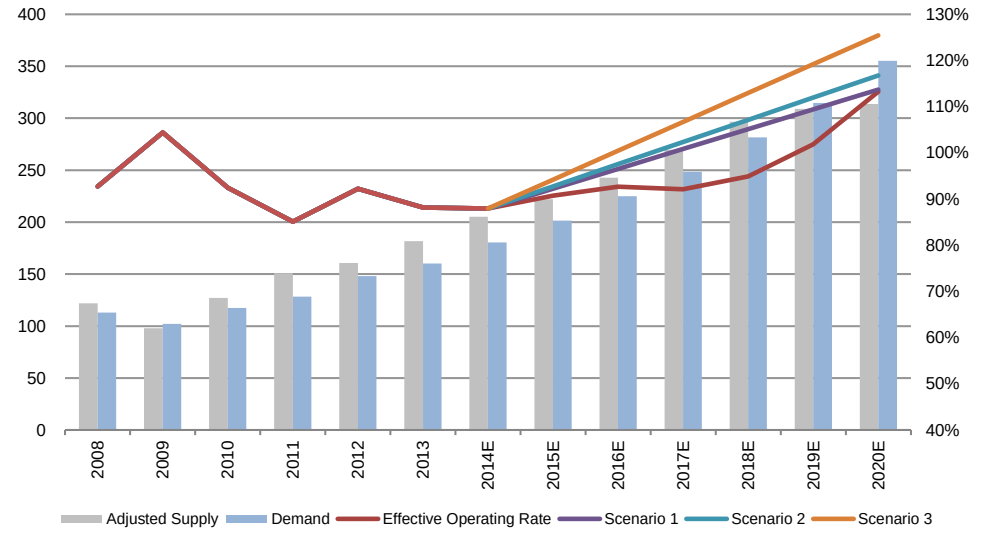
With demand expected to remain healthy and could even surprise to the upside, supply also looks reasonable at this point. Unadjusted supply (assuming that all of the projects that are announced come on-line at reasonable timelines) is expected to grow at an 13% annually compounded growth rate looking out to 2020. That said, once we adjust for what we believe are the more likely projects (essentially probability weight for the likelihood of financing of these project costs needed to be viable and factoring in realistic timelines), capacity growth is likely to trend closer to 7% annually compounded looking out to 2020.

Exhibit 9: Supply—Demand Balance with Unadjusted Supply
Thousands of lithium carbonate equivalent tonnes



Source: Company data, Credit Suisse estimates

Exhibit 10: Supply—Demand Balance with Adjusted Supply
Thousands of lithium carbonate equivalent tonnes



Source: Company data, Credit Suisse estimates

Bottom Line

We forecast demand to grow 12% annually compounded looking out to 2020 and adjusted supply to grow at a 7% rate making the market meaningfully tight in 2020. This could make companies rush projects to reduce the tightness in 2020 although as seen in Exhibit 11, our base case scenario gets us to an effective operating rate of 113% in 2020 suggesting there could be more slack added to the system and still remain above the 90% level often associated with better pricing. Our base case yields the most conservative results, with Scenario 3 (which is 40% PHEV and 60% BEV but assuming higher kWh batteries for BEV's) suggesting effective operating rates could reach 125% -- that would allow 125k tonnes of incremental capacity on the market yet still reach the 90% operating rate threshold.

The bump in operating rates should promote higher pricing that industry checks suggest could rise by 6-7% annually compounded looking out to 2020. That said, pricing power will likely be distributed to the medium-long term as we estimate current operating rates are in the high 80% level at this point.

Exhibit 11: **Supply-Demand with Different Scenarios**

	2020 Scenarios			
	Base	**Scenario 1**	**Scenario 2**	**Scenario 3**
Assumptions	55% PHEV/45% BEV	60% PHEV/40% BEV	40% PHEV/60% BEV	40% PHEV/60% BEV w. higher LCE conversion
Demand (k LCE tonnes)	355.2	356.7	366.2	393.5
Unadjusted Supply (k LCE tonnes)	433.0	433.0	433.0	433.0
Operating Rate	**82.0%**	**82.4%**	**84.6%**	**90.9%**
Adjusted Supply (k LCE tonnes)	313.7	313.7	313.7	313.7
Operating Rate	**113.2%**	**113.7%**	**116.7%**	**125.4%**

Source: Company data, Credit Suisse estimates.

Stock Implications

This should be a long-term positive for Rockwood and FMC in our coverage. Rockwood should see the most benefit from the strong backdrop for lithium pricing as lithium constitutes half of their EBITDA with mgmt. making expansion in lithium a strategic imperative. As part of this strategic imperative, ROC is expanding its brine capacity in Chile and should have ~53k tonnes of capacity available by next year while the Talison JV will give it control to 49% of Talison that has a theoretical capacity of 110k of LCE. So, while management is acting in a very shareholder friendly manner in the short term as it deploys cash (with cash available to enact a $1bn accelerated share repurchase agreement), the medium to long term also look very promising for Rockwood given healthy lithium fundamentals.

For FMC, we await the new strategic direction that they will take once under control of the new FMC Minerals venture that should come about in 1H15. We expect a CEO for the company to be announced in the coming months.

European specialty chemicals hold a dominant position in the global lithium EV based battery materials space, including BASF (N, €82), Clariant (N, CHF18) and Umicore (U/P, €30). We believe Umicore has the greatest potential revenue contribution as a percent of group earnings, we highlight the company is well positioned to, (1) capture Tesla business (short term), (2) build on future cathode battery technology trends through NCA materials (midterm), and (3) create further value options through EV battery recycling (long term). However we retain our U/P rating given the short/mid-term headwinds in their Recycling business (60% of group EBIT).

Companies Mentioned *(Price as of 23-May-2014)*

FMC Corporation (FMC.N, $75.74)
Ford Motor Co. (F.N, $16.02)
Galaxy Resc (GXY.AX, A$0.064)
Nemaska Lithium (NMX.V, C$0.1)
Orocobre (ORL.TO, C$2.18)
RB Energy (RBI.TO, C$0.66)
Rockwood Holdings Inc. (ROC.N, $75.32, OUTPERFORM, TP $90.0)
Soquimich (SQM.N, $29.87)
Talison Lithium (TLH.TO^C13, C$7.46)
Talison Lithium (TLH.TO^C13, C$7.46)
Talison Lithium (TLH.TO^C13, C$7.46)
Tesla Motors (TSLA.OQ, $207.3)
Toyota Industries (6201.T, ¥4,630)

Disclosure Appendix

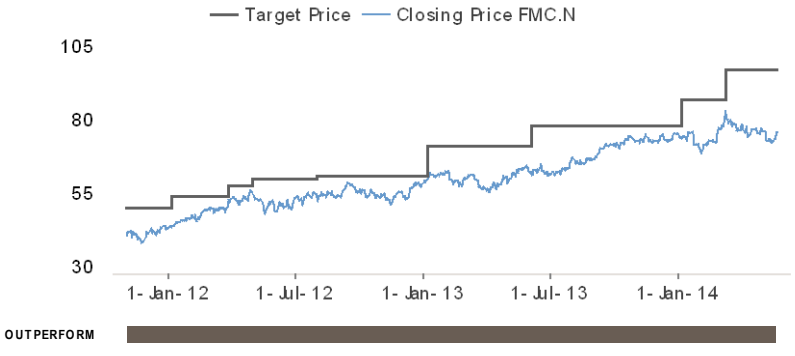
Important Global Disclosures

I, John P. McNulty, CFA, certify that (1) the views expressed in this report accurately reflect my personal views about all of the subject companies and securities and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

3-Year Price and Rating History for FMC Corporation (FMC.N)

FMC.N	Closing Price	Target Price	
Date	(US$)	(US$)	Rating
02-Nov-11	40.53	50.00	O
05-Jan-12	43.48	54.00	
27-Mar-12	52.84	57.50	
01-May-12	54.76	60.00	
01-Aug-12	52.87	61.00	
07-Jan-13	59.95	71.00	
04-Jun-13	62.18	78.00	
06-Jan-14	73.79	87.00	
10-Mar-14	83.10	97.00	

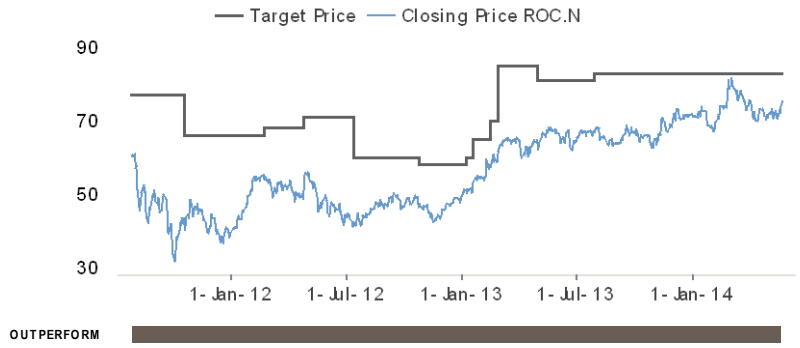
** Asterisk signifies initiation or assumption of coverage.*



3-Year Price and Rating History for Rockwood Holdings Inc. (ROC.N)

ROC.N	Closing Price	Target Price	
Date	(US$)	(US$)	Rating
27-Jul-11	60.57	77.00	O
19-Oct-11	40.50	66.00	
22-Feb-12	54.12	68.00	
25-Apr-12	53.90	71.00	
13-Jul-12	42.16	60.00	
25-Oct-12	47.35	58.00	
07-Jan-13	51.20	60.00	
18-Jan-13	53.54	65.00	
14-Feb-13	58.00	70.00	
27-Feb-13	61.94	85.00	
30-Apr-13	64.89	81.00	
29-Jul-13	67.33	83.00	

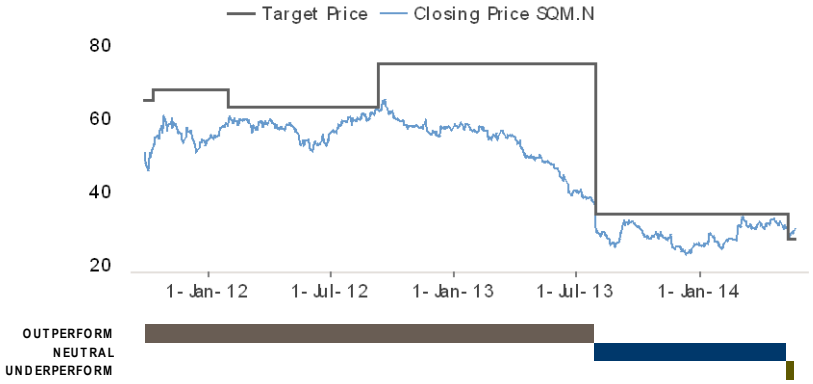
** Asterisk signifies initiation or assumption of coverage.*



3-Year Price and Rating History for Soquimich (SQM.N)

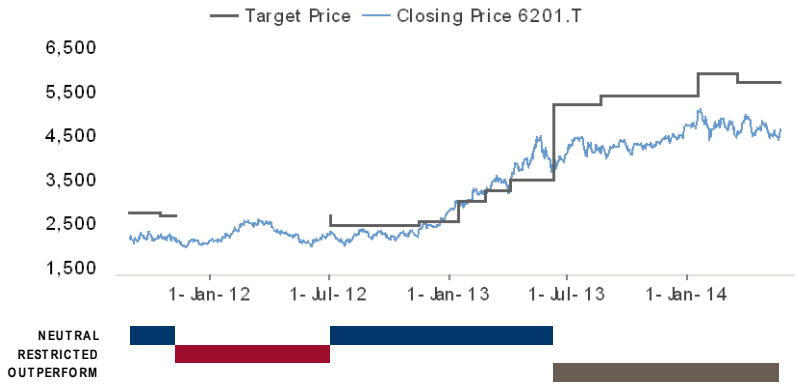
SQM.N	Closing Price	Target Price	
Date	(US$)	(US$)	Rating
29-Sep-11	50.50	65.00	O
11-Oct-11	51.93	68.00	
31-Jan-12	58.74	63.00	
10-Sep-12	62.32	75.00	
30-Jul-13	30.76	34.00	N *
13-May-14	30.60	27.00	U

** Asterisk signifies initiation or assumption of coverage.*



3-Year Price and Rating History for Toyota Industries (6201.T)

6201.T Date	Closing Price (¥)	Target Price (¥)	Rating
31-Aug-11	2,156	2,740	N *
17-Oct-11	2,253	2,670	
09-Nov-11	2,161		R
03-Jul-12	2,303	2,450	N
16-Nov-12	2,370	2,550	
15-Jan-13	2,965	3,000	
26-Feb-13	3,180	3,250	
05-Apr-13	3,490	3,500	
11-Jun-13	3,925	5,200	O
22-Aug-13	4,115	5,400	
17-Jan-14	5,050	5,900	
19-Mar-14	4,595	5,700	



** Asterisk signifies initiation or assumption of coverage.*

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Outperform (O) : The stock's total return is expected to outperform the relevant benchmark*over the next 12 months.

Neutral (N) : The stock's total return is expected to be in line with the relevant benchmark* over the next 12 months.

Underperform (U) : The stock's total return is expected to underperform the relevant benchmark* over the next 12 months.

**Relevant benchmark by region: As of 10th December 2012, Japanese ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. As of 2nd October 2012, U.S. and Canadian as well as European ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. For Latin American and non-Japan Asia stocks, ratings are based on a stock's total return relative to the average total return of the relevant country or regional benchmark; prior to 2nd October 2012 U.S. and Canadian ratings were based on (1) a stock's absolute total return potential to its current share price and (2) the relative attractiveness of a stock's total return potential within an analyst's coverage universe. For Australian and New Zealand stocks, 12-month rolling yield is incorporated in the absolute total return calculation and a 15% and a 7.5% threshold replace the 10-15% level in the Outperform and Underperform stock rating definitions, respectively. The 15% and 7.5% thresholds replace the +10-15% and -10-15% levels in the Neutral stock rating definition, respectively. Prior to 10th December 2012, Japanese ratings were based on a stock's total return relative to the average total return of the relevant country or regional benchmark.*

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Analysts' sector weightings are distinct from analysts' stock ratings and are based on the analyst's expectations for the fundamentals and/or valuation of the sector* relative to the group's historic fundamentals and/or valuation:

Overweight : The analyst's expectation for the sector's fundamentals and/or valuation is favorable over the next 12 months.

Market Weight : The analyst's expectation for the sector's fundamentals and/or valuation is neutral over the next 12 months.

Underweight : The analyst's expectation for the sector's fundamentals and/or valuation is cautious over the next 12 months.

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Rating	Versus universe (%)	Of which banking clients (%)
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Neutral/Hold*	40%	(49% banking clients)
Underperform/Sell*	13%	(46% banking clients)
Restricted	3%	

For purposes of the NYSE and NASD ratings distribution disclosure requirements, our stock ratings of Outperform, Neutral, and Underperform most closely correspond to Buy, Hold, and Sell, respectively; however, the meanings are not the same, as our stock ratings are determined on a relative basis. (Please refer to definitions above.) An investor's decision to buy or sell a security should be based on investment objectives, current holdings, and other individual factors.

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Price Target: (12 months) for Rockwood Holdings Inc. (ROC.N)

Method: We arrive at our $90 target price for ROC by returns-based analysis which plots Enterprise Value/EBITDA (earnings before interest, taxes, depreciation and amortization) versus estimated return on gross invested capital (ROGIC) for the peer group. We also use sum of the parts analysis as a basis for our target price methodology.

Risk: Risks to ROC's achievement of our $90 target price are (1) There is significant financial leverage in the capital structure, which could become a burden during a protracted economic slowdown. The pension plan is also underfunded by a significant amount which adds even more risk. (2) ROC intends to grow through acquisitions, which carries a number of risks including the risk of overpaying, buying bad assets, and taking on financial leverage. (3) The board is controlled by private equity holders whose motives may not always be aligned with common shareholders and further reductions of ownership by such holders could place the shares under pressure.

Please refer to the firm's disclosure website at https://rave.credit-suisse.com/disclosures for the definitions of abbreviations typically used in the target price method and risk sections.

See the Companies Mentioned section for full company names

The subject company (ROC.N) currently is, or was during the 12-month period preceding the date of distribution of this report, a client of Credit Suisse.

Credit Suisse expects to receive or intends to seek investment banking related compensation from the subject company (ROC.N, 6201.T, FMC.N) within the next 3 months.

As of the date of this report, Credit Suisse makes a market in the following subject companies (ROC.N, FMC.N, SQM.N).

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