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Initiation of Coverage

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Powering the EV growth, initiating coverage on Tianqi

Promising outlook for lithium; initiating coverage on Tianqi with a Buy

Rapid commercial EV sales in China triggered the lithium carbonate price to jump 160% in the past six months. We believe the momentum of strong EV sales, especially commercial EV, will continue driving lithium demand in the coming years. In the EV/battery supply chain, we believe lithium is in a sweet spot, enjoying a tight demand/supply balance and favorable industry structure with the top four suppliers controlling c.86% of global supply. Tianqi is global No.3 lithium supplier and will likely be the major beneficiary of the favorable trend. We thus initiate coverage of Tianqi with a Buy.

Strong EV sales will to drive demand for lithium batteries

In 2015, China sold 172,641 units of commercial EV, implying six-fold growth. We believe double-digit growth for commercial EV in China will likely continue as: 1) subsidies remain meaningful in absolute terms, 2) the subsidy policy now covers the whole country and more types of commercial EVs, and 3) the EV penetration for public buses has reached the critical scale to pull the sales momentum. We believe passenger EVs' growth will also be strong in the coming five years, due to the government's supportive policies. We believe overall Chinese EV sales (commercial plus passengers) will grow at 42% in 2016 and 30% in the next two years, and will drive lithium demand to post a 7-8% CAGR in the coming years.

Lithium as the upstream of EV/battery supply chain might be a sweet spot

Our investigation into the EV/battery supply chain suggests that lithium should be the sweet spot of the whole supply chain. Mid-stream producers might be facing technological uncertainty and aggressive capacity expansion. Downstream producers will need to continue to cut the cost of batteries and EVs to ensure greater end-customer adoptions. Only upstream lithium producers will fully benefit from this trend, regardless of technology options. Meanwhile, the supply increase process of upstream players has been very slow. We also see c. 86% of market supply controlled by the top four suppliers as a major positive for lithium producers. Market concentration should sustain the lithium up cycle longer.

Initiating coverage on Tianqi with a Buy; major risk: EV sales weakness

Tianqi is the world's third-largest lithium supplier, controlling c.18% of global lithium output. Tianqi not only owns the world-class Greenbushes mine, but also acquired a large, brand-new lithium carbonate processing factory in Zhangjiagang in 2015. Thus, Tianqi is well positioned to benefit from this lithium upcycle. With boosts in both price and volume, we forecast Tianqi's 2016DBe/2017DBe NPAT to grow 744% and 14% respectively. The high lithium price and upcoming strong earnings growth will continue to drive the share price, in our view. The company is currently trading at 15x 2016DBe EPS and 13x 2017DBe EPS. We think the PE valuation is not demanding. Meanwhile, the high PB valuation at 6.1x 2016DBe BVPS and 4.5x 2017DBe BVPS can be justified by 40%+ ROAE in coming two years. We derive our target price of RMB149.9 from the DCF method, implying 38% upside potential. We rate Tianqi as Buy. Major risks of our thesis are weaker-than-expected EV sales and faster-than-expected lithium new production ramp-ups.

Key Changes

Company	Target Price	Rating
002466.SZ	– to 149.9(CNY)	NR to Buy

Source: Deutsche Bank

Top picks

Tianqi Lithium (002466.SZ),CNY108.3	Buy

Source: Deutsche Bank

Companies Featured

Tianqi Lithium (002466.SZ),CNY108.3 Buy

	2014A	2015E	2016E
P/E (x)	86.5	125.3	14.8
EV/EBITDA (x)	29.3	37	9.6
Price/book (x)	3.53	8.81	6.09

Source: Deutsche Bank

Tianqi DBe vs Consensus (2016)

	DBe	consensus	DBe/con.
Revenue	4903	3045	161%
EBIT	2772	998	278%
NPAT	1888	399	474%

Source: Deutsche Bank estimates

Table Of Contents

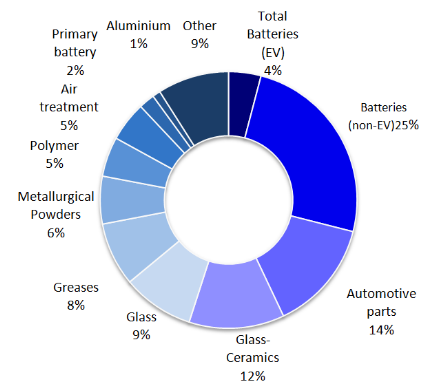
Executive summary

Strong EV sales drive lithium demand growth

We expect China EV sales to post a CAGR of 27% in the coming five years, and will meet the government target of putting 5m EV units on the road by the end of 2020. With the rapid development of the electrical vehicle (EV) industry in China, we believe the demand for lithium in EV batteries will post a CAGR of 19% in the coming five years. In our view, this will lead to overall global lithium demand growth accelerating from a CAGR of 6.3% for the past decade to a CAGR of 7~8% in the coming five years.

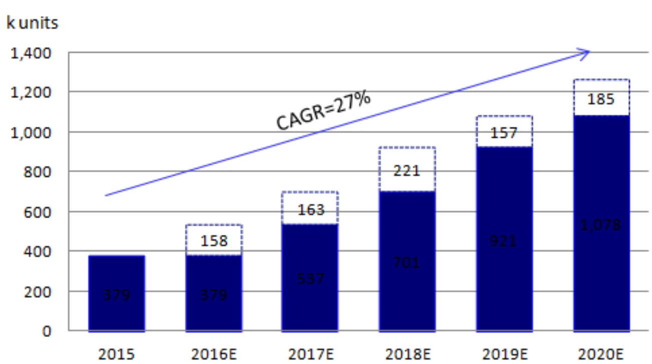
Our base-case scenario is that China EV sales will grow at 42%/30%/31% in 2016/2017/2018, respectively. Annual sales numbers will reach c.921,000 units in 2018 and c.1,263,000 units in 2020, compared with 87,000 units in 2014. That will translate into 39m kwh of demand for lithium batteries, which also translates into 25kt LCE (lithium carbonate equivalent) demand by the end of 2018E, or about 13% of global LCE as of the end of 2014. The global lithium demand breakdown in 2014 is shown in Figure 1.

Figure 1: Global lithium demand breakdown by industry in 2014



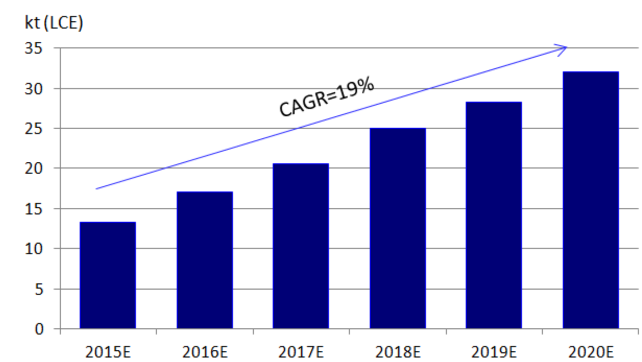
Source: Deutsche Bank, Orocobre

Figure 2: China EV sales estimates



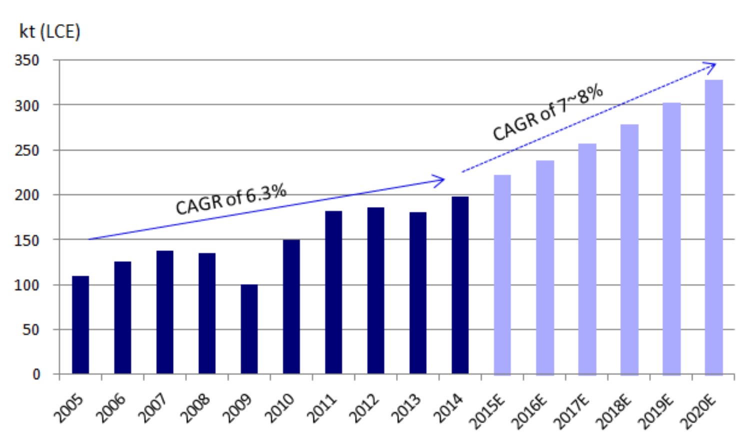
Source: Deutsche Bank estimates, MIIT

Figure 3: Lithium demand estimates for China EV battery



Source: Deutsche Bank estimates, MIIT

Figure 4: Global lithium demand estimates



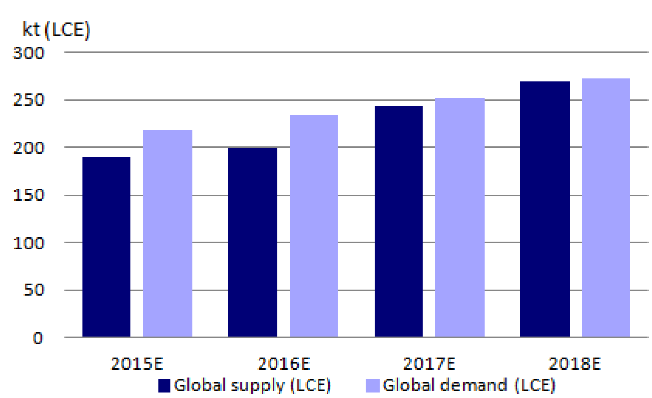
Source: Deutsche Bank estimates, USGS

Lithium is the right place to be along the supply chain

There are several segments in the EV/battery supply chain, and we believe that upstream might eventually be the most attractive place to be. We expect upstream players to benefit from increases in both selling price and volume, which will drive their top line and bottom line to climb significantly in coming years. For mid-stream segments such as cathodes, anode, electrolytes and separators, the entry barriers are not necessarily high, and players might be facing risks of picking the right technology. For downstream companies such as EV/battery producers, reducing ASP is critical to ensuring that sales volume takes off. As such, upstream lithium might be the best place to be along the supply chain because of common usage, limited resources, and the unlikelihood that the ramp-up for new supply will be timely in the next three years.

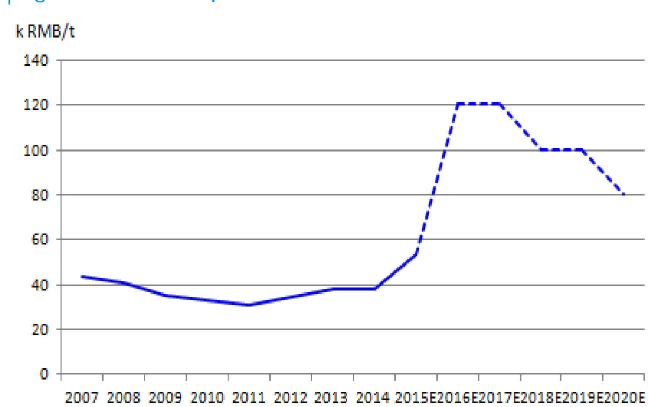
Based on our forecast of high growth in the EV and lithium battery industries, the slow ramp-up of new lithium supply, and the oligopolistic nature of lithium supply, we expect lithium producers to enjoy great profitability in the coming years. We forecast the lithium carbonate price to remain high above RMB120,000/t from 2016 to 2018, as the deficit of lithium is likely to continue, at least in the coming two to three years (see Figure 5 and Figure 6). Our cost sensitivity analysis leads us to conclude that the high price of lithium will not deter EV/lithium battery penetration from growing quickly, because total cost of lithium material as a % of the total battery is only c. 2-4% in 2015. Furthermore, EV manufacturers cannot find suitable replacements for lithium batteries. However, mid-stream players such as cathode producers might face a margin squeeze.

Figure 5: Global lithium demand/supply estimates



Source: Deutsche Bank estimates, Orocobre

Figure 6: Lithium price forecasts



Source: Deutsche Bank estimates, Wind

Initiating coverage on Tianqi Lithium with a Buy

Figure 7: Summary of Tianqi Lithium

	Tianqi Lithium		
Primary operation		Spodumene concentrates mining	
		Lithium compounds processing	
Current Capacity			
Mining		740ktpa	
Processing (in LCE)		35kpta	
Financials	2015E	2016E	2017E
(RMB mn)			
Revenue	1805	4903	5991
NPAT	224	1888	2156
PE	125x	15x	13x
PB	9x	6x	5x
ROE	7.3%	48.5%	39.9%

Source: Deutsche Bank estimates, Company data

Tianqi Lithium – an industry leader, controlling one-fifth of world lithium supply

Founded in 1995 and after acquiring Talison in 2013, Sichuan Tianqi has become one of the largest lithium compound producers in the world, controlling c. 18% of the world market share. Tianqi's primary operations are 1) mining spodumene concentrates in Australia, and 2) processing spodumene concentrates to lithium chemical compounds in its China factories.

For Tianqi, we believe the visibility of its organic earnings growth will be high in light of: 1) high ASP of lithium compounds and expected increase in ASP of spodumene concentrates. and 2) flexibility to increasing volume of both spodumene concentrates in Talison, from current low utilization rate of only 60% only and lithium compounds in Zhangjiagang factory. The factory was acquired in 2015 and is now ready to ramp up.

Boosted by increases in both prices and the sales volume of spodumene and lithium compound, we forecast that Tianqi's top line could reach RMB4,903mn and RMB5,991mn, up 172% YoY and 22% YoY, in 2016E and 2017E, respectively. Accordingly, we estimate that Tianqi's bottom line could grow significantly, to RMB1,888mn and RMB2,156mn, up 744% and 14% YoY in 2016 and 2017, respectively.

DCF-based TP suggests 38% upside; initiating coverage with a Buy

We derive our target price from a DCF model, with WACC of 8.5%. We adopt 10.8% as the cost of equity to reflect a risk-free rate of 3.9%, a market risk premium of 5.6% and beta of 1.24. Using a terminal growth rate of 3%, we set our target price at RMB149.9 implying 38% upside potential from current levels. Current share price is trading at 108.3, implying 15x PE and 6xPB while our target price implies a 2016/17E PE of 21x/18x. In addition, we believe our TP can be justified by 40%+ ROAE in the coming two years and strong FCF yield of 5% above. Major risks: slower-than-expected demand pick-up from EV; slower ramp-up of either the Talison mine or Zhangjiagang factory; and quicker-than-expected increase in global lithium supply.

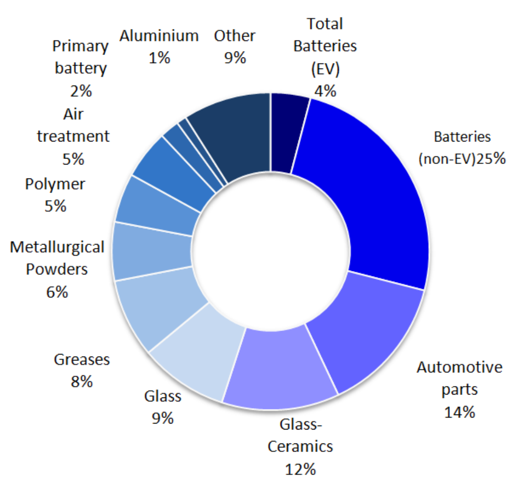
Key new driver: EV batteries

EV batteries – the significant driver of lithium demand

Lithium is used in various industries, including electronics, metallurgical, pharmaceutical, ceramics, glass and military industry. The lithium battery is already the largest downstream application for lithium, accounting for c. 29% of total global lithium demand in 2014, followed by automotive parts, ceramics and glass. So far, most lithium batteries have been used for non-EV products, mainly consumer electronic products like notebooks, tablet computers and cell phones. Batteries for EVs (electric vehicles) represented c.4% of total lithium demand in 2014.

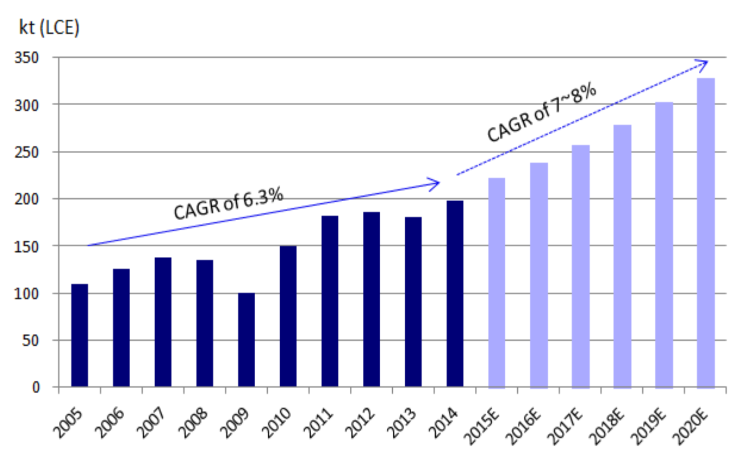
The EV battery will be a very important driver for lithium demand growth in the coming years, while the rest of lithium's applications might either have growth rates similar to global GDP growth in the low single digits or have not started commercialization to be promoted on a mass scale yet (e.g. battery for storage). With the rapid development of the EV, demand for lithium for EV batteries will help to boost global lithium demand. We expect the high growth of EV batteries to accelerate the demand growth trajectory for lithium from a CAGR of 6.3% in the past decade to a CAGR of 7-8% in the next five years. See Figure 9.

Figure 8:Global lithium demand by market (2014)



Source: Deutsche Bank, Orocobre

Figure 9: Global lithium demand estimates

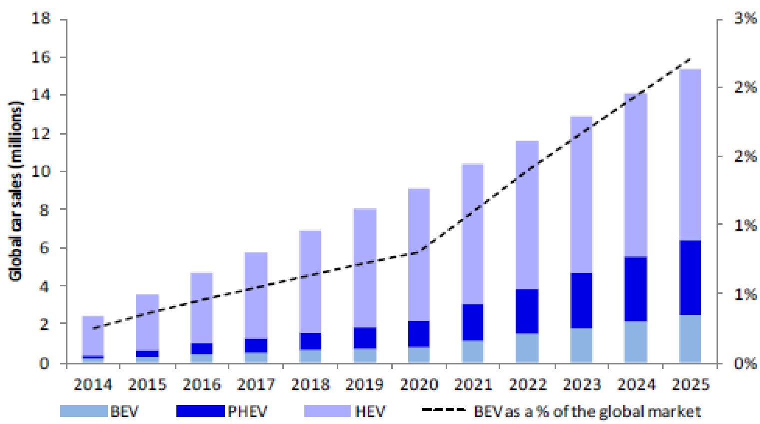


Source: Deutsche Bank estimates, USGS

Global EV sales boosted by regulatory changes

In Deutsche Bank's report "Pricing the car of tomorrow", published on 14 December 2014, US auto analyst Rod Lache stated his expectation that global EV sales would be boosted by unrivaled technological and regulatory changes. The new US Fuel Economy Regulations require automakers to improve fuel economy steadily from 38 miles per gallon (MPG) to 54.5MPG by 2025, while European Fuel Economy Regulations call for an emissions target of 95 g/km (equivalent to 58MPG) of CO2 by 2020. In order to achieve these requirements and targets, electrification will likely transform from niche to mainstream with strong growth at a CAGR of 25%. Deutsche Bank expects global EV sales, including BEV (battery electric vehicle), PHEV (plug-in hybrid electric vehicle), and HEV (hybrid electric vehicle), to increase to 9m units by 2020.

Figure 10: Deutsche Bank global EV sales estimates



Source: Deutsche Bank estimates, HIS

Strong China EV sales driven by government subsidies and traditional vehicle plate quotas in big cities

Unlike EV sales in US and Europe, which are driven by regulatory changes, we believe China EV sales are and will continue to be driven by government subsidies and purchasing quotas on traditional vehicles in big cities. In 2015, China replaced the US to become the largest EV market in the world. It sold 379 thousand units EV in 2015, representing a 332% YoY growth rate. Those strong sales also included c. 88,144 PHEVs (plug-in hybrids) and 290,874 BEVs (battery electric vehicles). The breakdown for passenger EVs vs. commercial EVs is 206,377 units for passengers and 172,641 units for commercial (see Figure 12). HEVs (hybrid electric vehicles) are not taken into account in these statistics and government subsidies because the Chinese government wants to leap-frog development for the EV industry and strategically does not focus on HEVs. HEV is considered to be a New Energy vehicle but previous subsidies on HEVs were cancelled in the middle of 2013.

After several years' subsidy and government promotion, the sales of China EV have started to take off in 2015. We expect that the growth of China EV sales will continue to be strong in the next few years as supportive government policies and quotas on traditional vehicle plates in big cities will continue to be

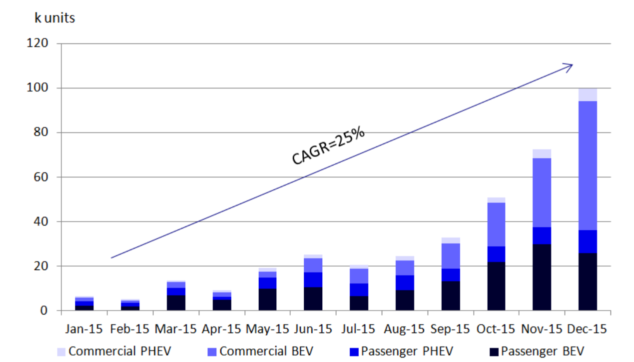
Figure 11: EV sales in China in 2015

Sales (unit)		2015
Passenger	Passenger BEV	142,867
	YoY	261%
	Passenger PHEV	63,510
	YoY	236%
	Total	206,377
	Total YoY	253%
Commercial	Commercial BEV	148,007
	YoY	841%
	Commercial PHEV	24,634
	YoY	81%
	Total	172,641
	Total YoY	489%
	EV+PHEV sold	379,081
	Total YoY	332%

Source: Deutsche Bank, MIIT

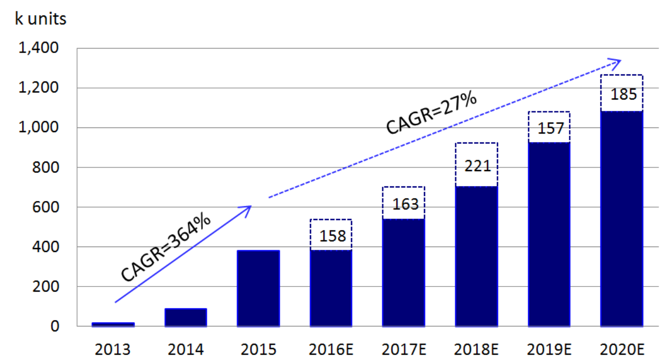
favorable to EV sales. We forecast that annual EV sales in China will grow to c. 921,000 units by the end of 2018, with a CAGR of 27% in line with the Chinese government's target of putting 5m units on the road by the end of 2020.

Figure 12: Monthly China EV sales in 2015



Source: Deutsche Bank, MIIT

Figure 13: Estimated annual China EV sales



Source: Deutsche Bank estimates, MIIT

Commercial EV sales are stimulated by heavy subsidies

Forecast commercial EV will post a CAGR of 17% during 2016-2018

We believe the new subsidy will sustain strong demand growth into 2016. We forecast total commercial EV sales to post a CAGR of 17% in 2016-2018 (20%/15%/15% in the next three years respectively). Subsidies will be cut in 2019-2020 by 40% based on subsidy amount at the 2016 level, and that will trigger producers/operators who want to enjoy the subsidy to accelerate their adoption. We think the next three years will still be a high growth age for commercial EV sales in China.

Government subsidy plays an important role

The Chinese central government started to promote EVs in 2009. The latest regulations (2016-2020 version) on the subsidies on sales remain material, ranging widely from RMB24k-RMB600k/unit. In order to further promote commercial EV buses, in the middle of 2015, the Ministry of Finance announced that it would give an operation subsidy for EV buses running in cities (see Figure 14).

Subsidies are important for both passenger EVs and commercial EVs but more critical for commercial EV sales. Aggregate subsidies for commercial buses could be as high as 60% of total ASP, while the subsidy for passenger cars is usually less than 40% of the final ASP (including both central government and local government subsidies; the ratio of central government subsidy to local government was typically 1:1 before 2016, but local government subsidy policies are still not yet decided.).

Figure 14: Operation subsidy for EV buses

Thousand RMB/year	6≤L<8	8≤L<10	L≥10
BEV bus	40	60	80
PHEV bus	20	30	40

Source: Deutsche Bank, MOF

Compared to the simple and direct 2013-2015 version (see Figure 15), the latest commercial EV subsidy policy (2016-2020 version; see Figure 16) is much more complicated and favorable to commercial EV with better energy efficiency.

The old version of the subsidy was given only according to the length of EV, which was considered to be highly related to the battery capacity. However, in reality, the subsidy didn't encourage the adoption of batteries with higher performance.

Figure 15: 2013-2015* subsidy regulation on commercial EVs

Thousand RMB	6 ≤L<8	8 ≤L <10	L ≥10
BEV	300	400	500
PHEV	/	/	250

Source: Deutsche Bank, MOF

For the new subsidy policy, we notice several key changes from the old one.

- First of all, the new policy is expanded to cover the whole country, while the old policy was only applied for c.88 cities.
- Second, the new policy is applicable to more varieties of commercial EVs, including commercial EVs with a length of less than six meters and EV trucks, but the absolute amount of the subsidy for previous existing varieties will be cut significantly.
- Third, the policy introduces a new indicator for lithium battery performance termed as "Ekg," defined as "wh/(km·kg)" to quantify the energy needed to move the vehicle per kilogram per kilometer.
- Last but not least, the amount of subsidy given is now divided into more than 170 different brackets based on 1) the type of EV, 2) Ekg, 3) driving range, and 4) the length of the EV.

To sum up, the new policy prioritizes mainly battery capacity (the larger the better) and comprehensive EV efficiency (the higher the better). Comprehensive EV efficiency is highly reliant on lithium battery efficiency and efficiency improvements in either the mechanism system or electronic system.

By contrast to the old version, we expect the new policy to be helpful and more efficient in terms of stimulating the quick development of the lithium battery industry. EV makers should be inclined to purchase larger capacity lithium batteries to obtain higher subsidies since lithium performance (energy density) is unlikely to be improved significantly in the short term. In the long term, as lithium battery size has a limit, improvement in lithium battery performance can be expected.

Figure 16: 2016-2020* subsidy regulation on commercial EVs**

Thousand RMB	Ekg (Wh/km·kg)	Standard auto（10m<length of auto≤12m）*** Driving range (Use battery only) R 6≤R<20	20≤R<50	50≤R<100	100≤R<150	150≤R<250	R≥250
	Ekg<0.25	220	260	300	350	420	500
	0.25≤Ekg<0.35	200	240	280	320	380	460
BEV	0.35≤Ekg<0.5	180	220	240	280	340	420
	0.5≤Ekg<0.6	160	180	200	250	300	360
	0.6≤Ekg<0.7	120	140	160	200	240	300
PHEV	／	／		200	230	250	250

Source: Deutsche Bank, MOF
**subsidy in 2017-2018 will be cut by 20%, comparing to that in 2016 and 2019-2020 will be cut by 40%,comparing to that in 2016.*
***For other commercial cars like truck and logistics cars, subsidy will be given at RMB1.8k/Kwh.*
****For auto with length less than 6 meters, 6 to 8 meters, 8-10 meters , and 12 meters above, will give 0.2, 0.5, 0.8, and 1.2 times of subsidy of standard vehicle respectively*

After factoring in the subsidies from both the central government and local government, the final sales price of a commercial EV is almost equivalent to that of a traditional commercial car. However, the system does not leave much time for EV manufacturers to increase efficiency and decrease cost, because the government subsidies in 2017-2018 and 2019-2020 will be cut by 20% and 40%, respectively, compared to those in 2016. In order to maintain the competitiveness of commercial EVs against traditional commercial vehicles, EV manufacturers are guided by government to cut costs as soon as possible.

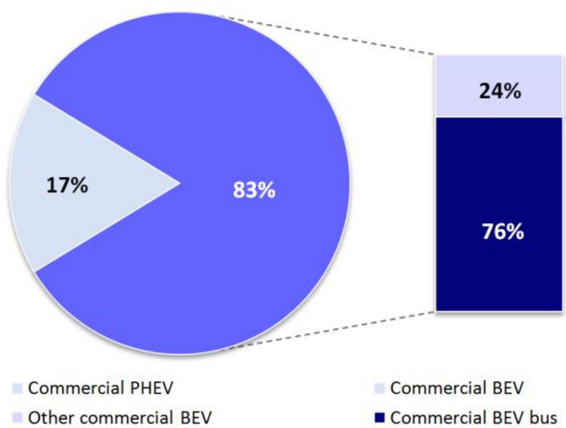
Sales structure in 2016 turning back to normal, as we expected

The heavy subsidy cut expected in 2016 led commercial EV sales in 2015 to be structurally biased to buses of 6-8 meters. However, we expect commercial EV sales in 2016 to return to their normal pattern, which should have a similar sales mix as traditional commercial bus (Figure 18).

In the first 11 months of 2015, China sold c. 109,000 commercial EVs, including c. 18,900 commercial PHEVs and c. 90,000 commercial BEVs. Of these 90,000 commercial BEVs, 76% were commercial buses (c. 68,000). By further breaking down the types of these commercial buses, we found that 75% were buses with a length of 6-8 meters (see Figure 17). Normally, buses with a length of 6-8 meters account for only c.15% of total commercial buses. Figure 18 demonstrates the sales structure for commercial buses in 2015 (Jan.-Nov.)

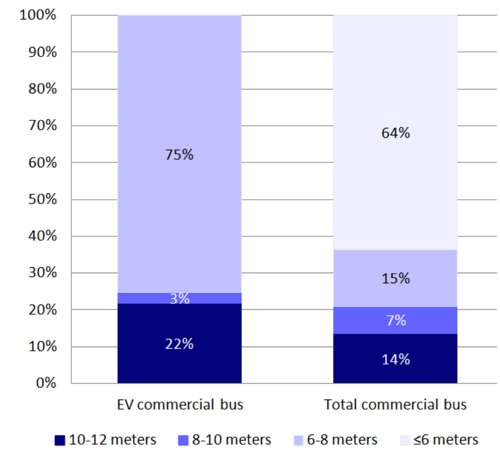
We believe the unusual structure of EV sales in 2015 was driven by the expected subsidy changes in 2016. According to the new policy (2016-2020 version) for commercial EVs, subsidies will be cut to various degrees for all buses of different lengths. Buses with a length of 6-8 meters will be affected the most. Taking buses with a common driving distance range (from 50km to 150km) as an example, the subsidy on it will be cut by c. 50%, even for the most efficient group (Ekg<0.25), and it will be cut by as much as 73% for the least efficient group (0.6≤Ekg<0.7). Figure 19 compares the impact of the subsidy changes on buses of different lengths. We expect the structure of EV commercial bus sales in 2016 to return to the normal pattern of total commercial bus sales structure. We also expect the total sales of commercial EV to remain strong, mainly driven by buses of lengths other than 6-8 meters. Buses of less than 6 meters accounted for the majority (64%) of total commercial buses sold (including both traditional vehicles and EVs) in Jan.-Nov. 2015, and this type of buses were not able to benefit from government subsidies previously. Now, with new subsidy policy, EV buses of less than 6 meters will come back to be the main stream of overall commercial EV sales.

Figure 17: China commercial EV sales breakdown (Jan-Nov.2015)



Source: Deutsche Bank, MIIT

Figure 18: Bus sales breakdown by length



Source: Deutsche Bank, MIIT, d1ev

Figure 19: 2013-2015 version vs. 2016-2020 version of subsidy for commercial cars

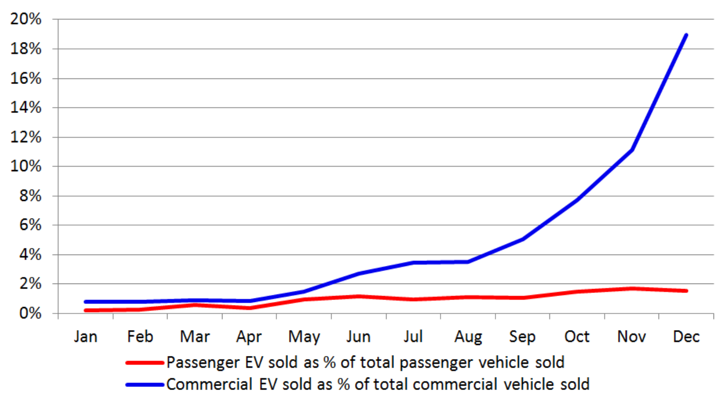
k RMB/ unit	50≤R＜100			100≤R＜150		
Ekg<0.25	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%
L≤ 6	120	0	na.	140	0	na.
6≤L＜8	300	600	-50%	350	600	-42%
8 ≤L＜10	480	800	-40%	560	800	-30%
10 ≤ L＜12	600	1000	-40%	700	1000	-30%
L ≥ 12	672	1000	-33%	768	1000	-23%
k RMB/ unit	**50≤R＜100**			**100≤R＜150**		
0.35≤Ekg<0.5	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%
L≤ 6	96	0	na.	112	0	na.
6 ≤ L＜8	240	600	-60%	280	600	-53%
8 ≤ L＜10	384	800	-52%	448	800	-44%
10 ≤ L＜12	480	1000	-52%	560	1000	-44%
L ≥ 10	576	1000	-42%	672	1000	-33%
k RMB/ unit	**50≤R＜100**			**100≤R＜150**		
0.6≤Ekg<0.7	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%	New policy (2016-2020 Version)*	Old Policy (2013-2015 Version)*	Changes in%
L≤ 6	64	0	na.	80	0	na.
6 ≤ L＜8	160	600	-73%	200	600	-53%
8 ≤ L＜10	256	800	-68%	320	800	-44%
10 ≤ L＜12	320	1000	-68%	400	1000	-44%
L ≥ 10	384	1000	-62%	480	1000	-33%

Source: Deutsche Bank, MOF
**include both central government and local government subsidy with the ratio of 1:1 assumed but exclude operation subsidy*

Critical penetration of commercial EVs achieved to sustain future sales

In 2015, the proportion of commercial EV sales to total commercial vehicle sales had climbed from less than 1% in Jan. 2015 to 19% in Dec. 2015. In our view, improving penetration of commercial EV could improve the sustainability of commercial EV sales in the coming years by 1) letting more drivers adapt to new driving habits and 2) allowing transportation companies to increase their familiarity with EV operations and enlarge their maintenance exposure to EVs. We believe the improving penetration rate of commercial EVs will amplify the need of new commercial EVs to pursue convenience and cut costs on economies of scale.

Figure 20: EV sales vs. total vehicle sales in China in 2015



Source: Deutsche Bank, MIIT

Passenger EV sales will be strong due to favorable policies

Forecasting passenger EV will post a CAGR of 46% during 2016-2018

We believe the new subsidy will boost demand in 2016. We forecast total passenger EV sales will post a CAGR of 46% in 2016-2018 (60%/40%/40% in the coming three years respectively) under favorable subsidy policies and restrictive quota policies on traditional vehicles in big cities. Considering the government subsidy will be further cut by 40% in 2019-2020 based on subsidy amount in 2016, we also think the next three years will still be a golden period for passenger EV sales in China too.

Subsidy remains meaningful

Similar to the subsidy on commercial EVs, the subsidy on passenger EVs is also material to sales. Under the new regulation, the subsidy was cut by c.RMB5,000-10,000 for each unit, compared to the 2013-2015 version. In addition, the government raised the subsidy threshold on the requirement for EV driving range when the vehicle is only relying on the using battery. Originally, the requirement was 80km and the new requirement is raised to 100km. The purpose is to promote improvements in battery capacity and performance.

Nevertheless, the amount of the new 2016-2020 version of the subsidy remains meaningful, ranging from RMB25k/unit to RMB55k/unit (see Figure 21). Combined with the local government subsidy, the total subsidy could reach RMB50k-100k/unit, if assuming the subsidy ratio for the central government and local government will remain at 1:1 as it used to be before 2016.

Figure 21: Central government subsidy regulation on passenger vehicles

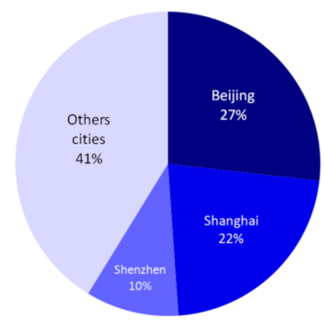
k RMB	Driving range (Use battery only) R			
2013-2015 version	80≤R＜150	150≤R＜250	R≥250	R≥50
BEV	35	50	60	⁄
PHEV	⁄	⁄	⁄	35
2016-2020 version	100≤R＜150	150≤R＜250	R≥250	R≥50
BEV	25	45	55	⁄
PHEV	⁄	⁄	⁄	30

Source: Deutsche Bank, MOF

Restrictive policies on traditional vehicles keep boosting EV sales in big cities

Passenger EV sales is mainly in big cities. See Figure 22. EV sales in Shanghai, Beijing and Shenzhen cities accounted for c. 60% total passenger EV sales in China We remain optimistic on demand as we believe the strong growth of EVs is deeply affected by restrictive quota policies on traditional vehicles in these big cities and odd-even rationing policy prospectively going forward. The high sustainability of these restrictive policies will drive strong passenger EV sales in the future, in our view.

Figure 22: EV sales breakdown by city *(First 11 months of 2015.)*



Source: Deutsche Bank estimates; China Vehicle Administrative Offices

EV sales in China alone bring additional 25kt of LCE demand in 2018

Figure 23 demonstrates our base scenario of EV sales in China. Annual growth rate of total EV sales in China will arrive at 42% in 2016, 30% in 2017 and 31% in 2018 respectively. We forecast China will sell c. 921,000 EVs in total including both BEV or PHEV by the end of 2018.

Figure 23: Estimated EV sales (in units and kwh) in China (base case scenario)

Sales (unit)		2014	2015	2016E	2017E	2018E
Passenger	Passenger BEV	39,587	142,867	228,587	320,022	448,031
	YoY		*261%*	*60%*	*40%*	*40%*
	Passenger PHEV	18,917	63,510	101,616	142,262	199,167
	YoY		*236%*	*60%*	*40%*	*40%*
Commercial	Commercial BEV	15,726	148,007	177,608	204,250	234,887
	YoY		*841%*	*20%*	*15%*	*15%*
	Commercial PHEV	13,589	24,634	29,561	33,995	39,094
	YoY		*81%*	*20%*	*15%*	*15%*
	Total	**87,818**	**379,018**	**537,372**	**700,529**	**921,180**
	YoY		*332%*	*42%*	*30%*	*31%*

Source: Deutsche Bank estimates, MIIT

Figure 24 demonstrates the lithium battery demand converted based on the EV sales in Figure 23 and then further calculated into the demand for lithium in LCEs (lithium carbonate equivalents). We assume capacity per battery will not change significantly in the next three years.

Our base-case scenario for 2016-2018 demonstrates that promising EV sales in China alone will bring c.45m kwh demand for lithium batteries, which is equivalent to 25kt demand of lithium in LCEs, implying a CAGR of 23% for the next three years. The China EV battery demand for LCE of 25kt in 2018 represented c. 13% of global LCE demand in 2014.

Other factors create upsides and downside of lithium demand driven by EVs

A larger capacity battery pack (battery pack is constituted of battery cells) tends to be required for an EV to drive for a long distance when the battery is the sole source of power. Current capacities of batteries used by Chinese EVs are relatively small. Comparing to Tesla S model, which uses battery capacity of 85/90kWh, many typical Chinese passenger EV models have battery capacities only ranging from 20kWh to 30kWh.

Enlarging the number of battery cells is the most direct and simplest way of increasing the capacity of a battery pack and this is then followed by larger than expected demand for lithium under our base-case scenario for EV sales.

There is also significant room for Chinese lithium battery producers to improve energy density. It is estimated that Tesla uses lithium battery packs with energy density as high as 233wh/kg, while typical Chinese companies can only produce battery packs with energy density at c.100-120wh/kg or 130-150wh/kg for LFP lithium battery or MNC/NCA lithium battery, respectively. With improvement of energy density, demand for lithium could be weaker-than-expected under the base-case scenario for EV sales.

We believe the net impact of these two factors in the coming years may not be significant. As such, we believe our forecast on demand for lithium for the base-case scenario is fair.

Figure 24: Lithium demand in LCE for EV batteries in China estimates (base case scenario)

	mn Kwh equivalent *	2014	2015	2016E	2017E	2018E
Passenger	BEV battery	0.94	3.40	5.44	7.62	10.66
	YoY		*261%*	*60%*	*40%*	*40%*
	PHEV battery	0.28	0.95	1.52	2.13	2.99
	YoY		*236%*	*60%*	*40%*	*40%*
	Total passenger battery	1.23	4.35	6.96	9.75	13.65
	YoY		*255%*	*60%*	*40%*	*40%*
Commercial	BEV battery	2.12	19.98	23.98	27.57	31.71
	YoY		*841%*	*20%*	*15%*	*15%*
	PHEV battery		0.00	0.00	0.00	0.00
	YoY		*0%*	*0%*	*0%*	*0%*
	Total commercial battery	2.12	19.98	23.98	27.57	31.71
	YoY		*841%*	*20%*	*15%*	*15%*
	Total battery	**3.35**	**24.33**	**30.94**	**37.32**	**45.36**
	YoY		*627%*	*27%*	*21%*	*22%*

Lithium carbonate demand (LCE) kt	2014	2015	2016E	2017E	2018E
Passenger	0.69	2.46	3.94	5.52	7.73
Commercial	1.16	10.88	13.05	15.01	17.26
Total demand (LCE)	**1.85**	**13.34**	**17.00**	**20.53**	**24.99**
New added		11.49	3.65	3.53	4.46
Total YoY		621%	27%	21%	22%

Source: Deutsche Bank estimated, MIIT

Scenario analysis of EV sales impact on lithium demand

EV sales growth remains a key to the demand for lithium batteries, in our view. Therefore, we run a scenario analysis on EV sales to gauge the possible demand for lithium in the coming years. Figure 25 summarizes lithium demand in LCE under our scenario analysis.

In our worst-case scenario, passenger EV sales in China will grow at only 30%/10%/10% in 2016/2017/2018, and commercial EV sales in China will grow at 5%/0%/0%, respectively. This growth will bring lithium demand in LCE to 14.54kt at the end of 2018, representing an increase of 22.6% compared to 2015. The scenario might imply an over-capacity for lithium can emerge as early as late 2017.

In our best-case scenario, passenger EV sales will grow at 90%/70%/70% in 2016/2017/2018, while commercial EV sales will grow at 35%/30%/30%, respectively, which could imply LCE demand of 35.96kt, an increase of 170 times that in 2015. The best-case scenario could imply the lithium supply tightness might sustain into even 2019.

Figure 25: Scenario analysis of lithium demand in LCE

	2015	2016E	2017E	2018E
Worst-case scenario				
Passenger EV YoY	*253%*	30%	10%	10%
Commercial EV YoY	489%	5%	0%	0%
Base-case scenario				
Passenger EV YoY	*253%*	60%	40%	40%
Commercial EV YoY	489%	20%	15%	15%
Best-case scenario				
Passenger EV YoY	*253%*	*90%*	*70%*	*70%*
Commercial EV YoY	489%	35%	30%	30%
Kt LCE	2015	2016E	2017E	2018E
Worst-case scenario				
LCE demand	13.34	14.62	14.94	15.30
YoY	*621%*	*10%*	*2%*	*2%*
Base-case scenario				
LCE demand	13.34	17.00	20.53	24.99
YoY	*621%*	*27%*	*21%*	*22%*
Best-case scenario				
LCE demand	13.34	19.37	27.05	38.35
YoY	*621%*	*45%*	*40%*	*42%*

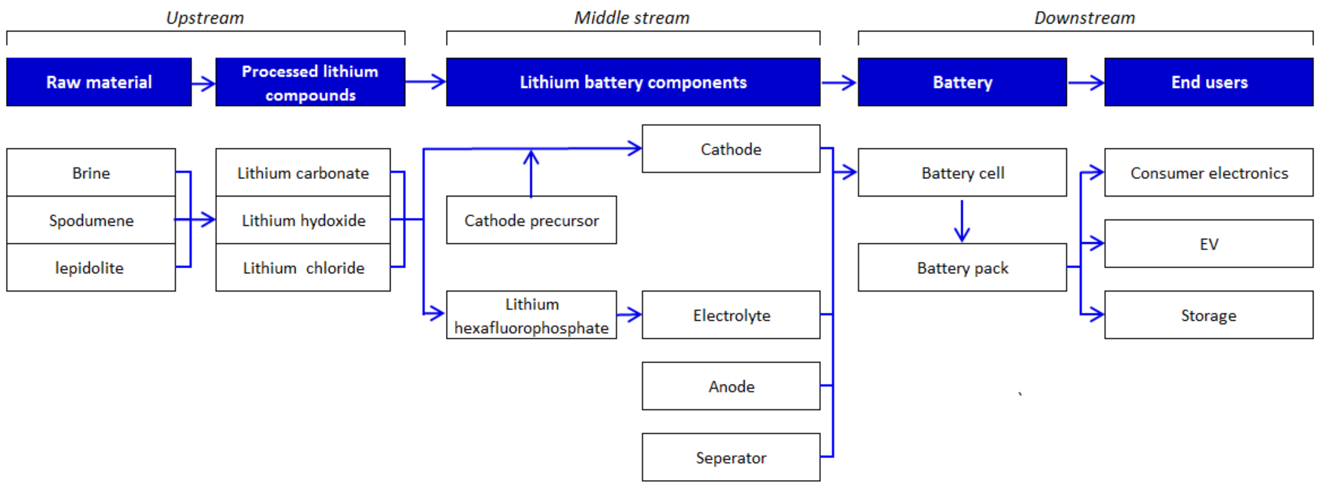
Source: Deutsche Bank estimates

Lithium battery supply chain – How to invest?

A long and fragmented industry chain

As shown in Figure 26, we break down the lithium battery supply chain into upstream, middle stream, and downstream components. Upstream players mainly provide lithium compounds used for cathode and electrolyte manufacturing. Middle-stream players produce components of lithium batteries, mainly including cathode, electrolyte, anode and separator, while downstream battery producers focus on assembly and packing. Despite having a simple industry supply chain structure, the whole industry chain could be considered long and fragmented, as many niche players focus only on one key activity, such as Ganfeng (mainly on lithium compounds processing) and Do-Fluoride (mainly on lithium hexafluorophosphate manufacturing). Although there have been several horizontal M&As in the past several years, very few vertical integration cases have occurred.

Figure 26: Industry chain of lithium batteries



Source: Deutsche Bank

So far, East Asian countries seem to be dominating the middle stream and downstream of the lithium battery supply chain (see Figure 27). Except for upstream companies, for which the location of resources is highly relevant, most middle-stream and downstream players are Chinese, Korean, and Japanese companies. Given significant investments in 2015 by these three countries and rapid development of China's EV market, we believe the market share of East Asian countries will increase further in the coming years, and the Chinese EV market will be the main battlefield.

Figure 27: Major players along the supply chain

Upstream Players		Middle stream Players						Downstream Players	
Lithium compounds		Cathode		Lithium hexafluorophosphate		Electrolyte		Battery	
FMC Corp	Argentina	Umicore	Belgium	Jiangsu Xintai	China	Capchen Technology	China	Panasonic	Japan
Orocobre	Argentina	Nichia	Japan	Do-Fluoride	China	Jiangsu Guotai	China	AESC	Japan
Albemarle	Chile	Reshine	China	Jiangsu Jiujiujiu	China	Mitsubishi Chemical	Japan	PEVE	Japan
Tianqi Group	China	L&F	Korea	Shida Shenghua	China	Ningbo Shanshan	China	BYD	China
Jiangxi Ganfeng	China	Shanshan	China	Tianci Materials	China	Panax Etec	Korea	LG	Korea
Galaxy	Australia	Sumitomo	Japan	Morita Chemical	Japan	Tianci Materials	China	Samsung	Korea
Neometals	Australia	Bamo-tech	China	Stella Chemifa	Japan	Ube industries	Japan	LEJ	Japan
		JGC	Japan	Kanto Denka Kogyo	Japan	Mitsui chemicals	Japan	Lishen	China
		Easpring	China	Central Glass	Japan	Tomiyama Pure chemical	Japan	SKI	Korea
		Nippon denko	Japan	Foosung	Korea	Jinniu Chemical	China		

Seperator		Anode	
Asahi Kaisei	Japan	TOSHIBA	Japan
Tonen/Toray	Japan	Nipon barbon	Japan
Sumitomo	Japan	BAK	China
Entek	US	ATL	China
SK	Korea	Maxell	Japan
Jinhui	China	Lishen	China
TDK	Japan	BYD	China
Ube	Japan	LGC	Korea

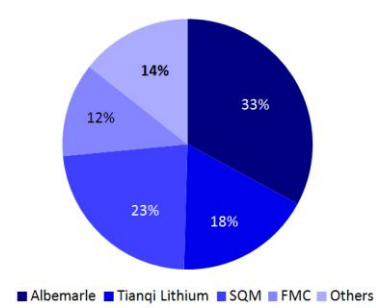
Source: Deutsche Bank, avicenne, SNE research

Upstream: 86% of supply controlled by four majors

We estimate that the upstream market is controlled by four major players: Albemarle, SQM, Tianqi and FMC, segment with c.33%, 23%, 18%, and 12% market share, respectively, and 86% market share as an aggregate.

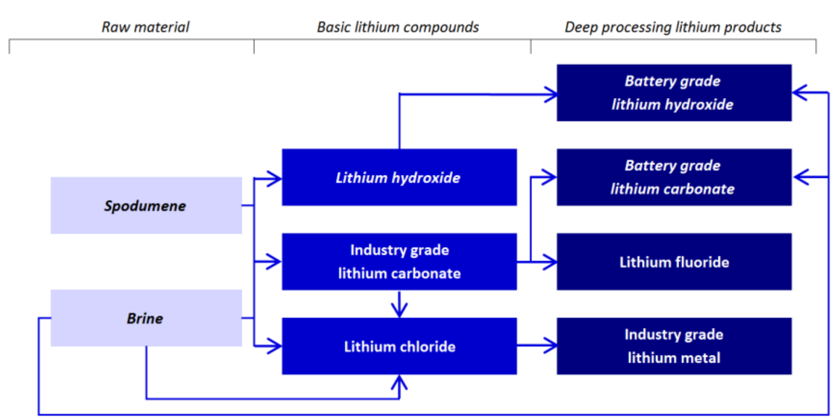
The major lithium basic products are industry-grade lithium carbonate, industry-grade lithium hydroxide, and lithium chloride from either a salt lake brine base or hard rock mineral base. Further processes will be needed to produce deep processing lithium products like battery-grade lithium carbonate/hydroxide, lithium metals and lithium fluoride.

Figure 28: Market share of four majors



Source: Deutsche Bank estimates

Figure 29: Lithium product processing paths



Source: Deutsche Bank, Company data

Lithium carbonate is more popular as a basic lithium compound product, and is widely accepted by downstream users (see Figure 30). But lithium hydroxide has been increasing its share of middle-stream usage since 2015 due to the increasing popularity of the NMC/NCA battery. (These are two types of lithium battery, using Lithium Nickel Manganese Cobalt or Lithium Nickel Cobalt Aluminum as cathodes; these two types are together called "ternary material lithium batteries.")

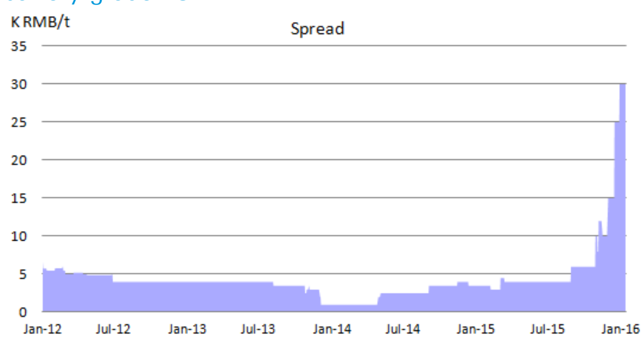
Figure 30: Global lithium compound production*

(metric tons)	2009	2010	2011	2012	2013
Lithium carbonate	33,728	55,203	69,933	71,702	66,458
Lithium chloride	6,676	10,369	8,344	8,495	8,291
Lithium hydroxide	2,987	5,101	5,800	5,447	4,197

Source: Deutsche Bank, USGS,
**Counted major lithium production countries including Argentina, Australia, Brazil, Canada, Chile and China.*

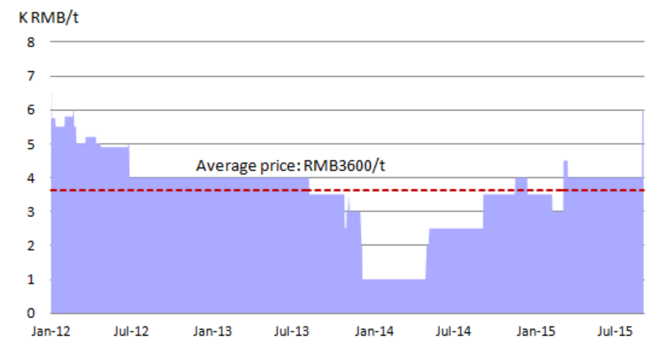
Based on their different end-applications, lithium compound products vary in terms of purity. Industry-grade lithium carbonate has a purity rate of 98.5%~99%, while battery-grade lithium carbonate has a rate of above 99.5%. Higher-purity compound products enjoy a price premium to reflect higher production costs and production know-how. As a matter of fact, some companies have found a way to produce battery-grade lithium compounds directly, mainly from a salt-lake brine base. Historically, the industry-grade lithium carbonate price has had a steady premium of RMB3,000-4000/t, implying the lower cost of processing industry-grade lithium carbonate to battery-grade lithium carbonate, in our view. The recent increasingly enlarged premium reflects strong structural demand for lithium batteries in the short to medium term.

Figure 31: Price premium of industry-grade LC over battery-grade LC



Source: Deutsche Bank, Wind

Figure 32: Historical price premium of industry-grade LC over battery-grade LC



Source: Deutsche Bank, Wind

Albemarle, FMC and SQM are almost all brine-based lithium compound producers. Most salt lakes with ample lithium resources are located in the US and South American countries (lithium triangle), including Bolivia, Argentina, and Chile. As the content of lithium is low, it is usually not economical to produce only lithium compounds from brine. As a matter of fact, most brine-based lithium compounds are produced as a byproduct during potash production. The major big projects are SQM's Salar de Atacama/Salar del Carmen in Chile, FMC's Salar del Hombre Muerto in Argentina, Albemarle's Silver Peak in the US and Orocobre's Salar de Olaroz Lithium Project in Argentina. See Figure 33: Major lithium projects in the world

Figure 33: Major lithium projects in the world

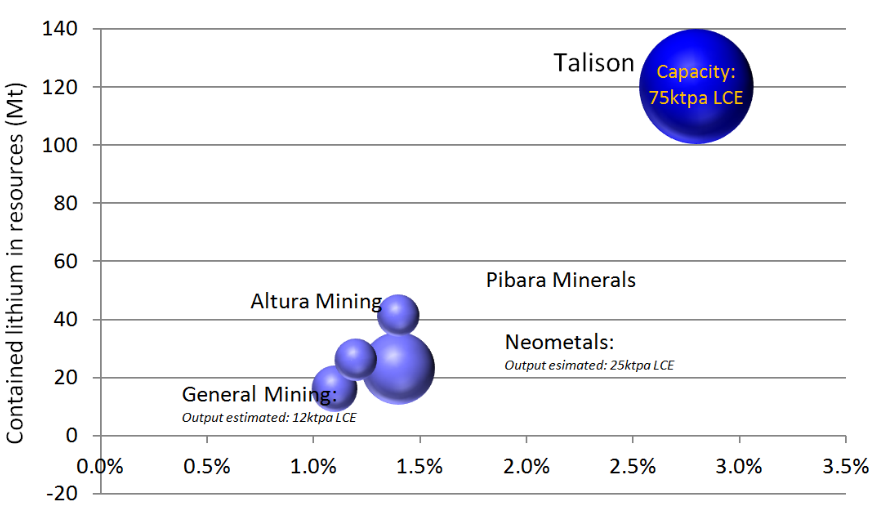
Company	Project/Mine	Lithium type	Country	as % of total
SQM	Salar de Atacama/ Salar del Carmen	Brine	Chile	23%
FMC	Salar del Hombre Muerto	Brine	Argentina	12%
Albemarle	Salar de Atacama/ La Negra	Brine	Chile	13%
Albemarle	Silver Peak	Spodumene	US	3%
Albemarle	Greenbushes @49%	Spodumene	Australia	17%
Tianqi	**Greenbushes @51%**	**Spodumene**	**Australia**	**18%**
Total				**86%**

Source: Deutsche Bank, Company data

However, it can be challenging to produce lithium compounds from brine. The technology of extracting lithium-ion from brine plays an important role in deciding the cost of producing lithium compounds. Other major challenges that the companies face are 1) high Mg/Li ratio, 2) weather, and 3) lack of infrastructure, among others. For example, Bolivia is still unable to develop its salt lake economically on a mass scale because of the high Mg/Li ratio, although its lake has the largest lithium reserve in terms of aggregate volume.

High-quality hard rock minerals are mainly found in Australia, but China also produces lithium compounds from relatively low-grade spodumene or lepidolite given the shortage of raw materials. The largest hard-rock mineral company in the world is Talison, with its Greenbush project owned by Sichuan Tianqi (51%) and Albemarle (49%). Its average grade level is c. 2.8%, with almost none comparable in the world in terms of reserve, capacity and ore grade.

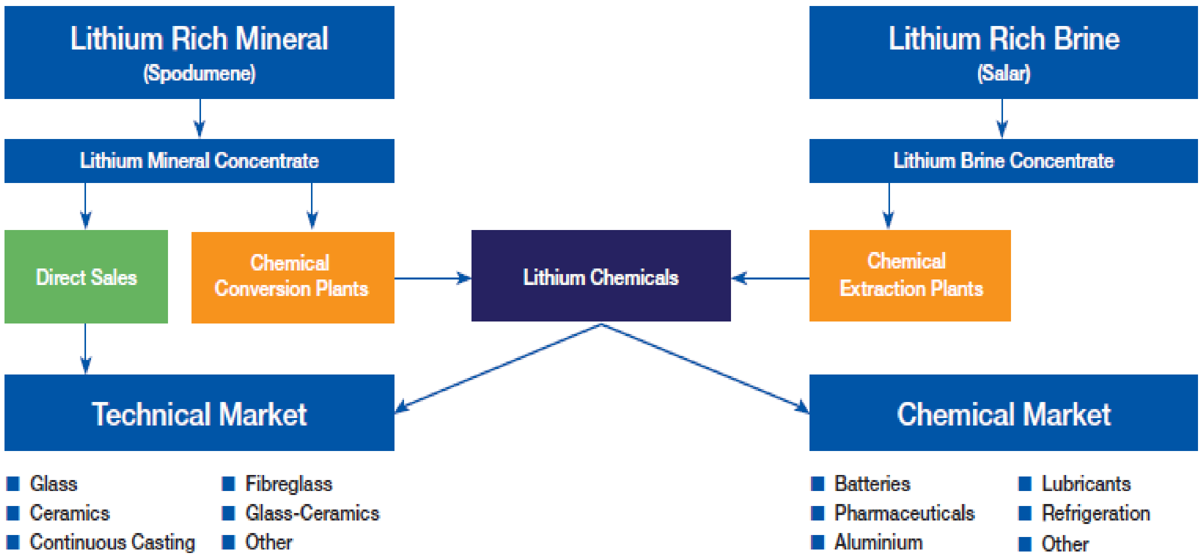
Figure 34: Comparison of major spodumene mines



Source: Deutsche Bank estimates, Neometals Ltd, Tianqi Lithium

One of the unique characteristics of high-grade hard-rock spodumene concentrates (SC7.3/SC7.5, demonstrates spodumene concentrates with 7.3%/7.5% LiO2, also called technical grade spodumene concentrates, contains less than 0.1% Fe2O3) is it can be directly used by downstream "technical markets" users, including glass, ceramics, fiberglass and continuous casting without further processing into lithium carbonate.

Figure 35:Lithium source, type and end users



Source: Deutsche Bank, Talison Lithium

Brine-based and hard-rock mineral-based lithium compound productions have both pros and cons. In simple terms, hard-rock mineral has higher OPEX but lower CAPEX; the number of high-grade mines is limited, but hard-rock mine operations are less affected by external factors like weather.

Figure 36: Comparison of salt lake brine and hard-rock minerals

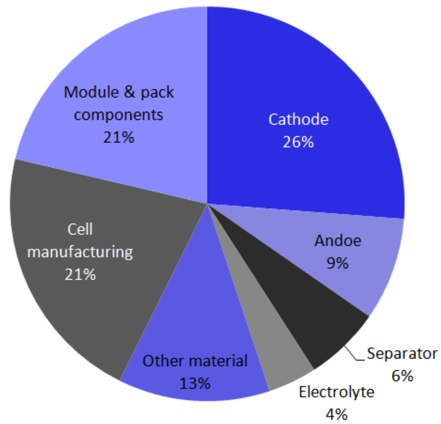
	Salt Lake Brines	Hard Rock Minerals
Resource approachable	Abundant but low recoveries	Very few high-grade mines
High-technology required	Yes	No
Scalable	No	Yes
Processing time	Long	Short
Weather dependent	Yes	No
Consistency	Medium	High
CAPEX	High	Low
OPEX	Low	High
As % of global lithium supply	60%-70%	30-40%

Source: Deutsche Bank estimates

Middle stream: eager for technology breakthroughs

The middle stream refers to the manufacturing of the four key components of batteries: cathodes, anodes, separators, and electrolytes. Cathodes, anodes, electrolytes, and separators account for roughly 26%, 8%, 6%, and 4% of the total manufacture cost of a lithium battery, respectively. (As our report is mainly focused on lithium, we discuss only cathodes and electrolytes, in which lithium is involved as a critical element.) In order to significantly improve the performance of the lithium battery, technology breakthroughs are highly anticipated in all four components. Although many promising solutions are being researched for each of the components, the competition remains intensive. And because of the technology competition, there will still be some technology uncertainty for mid-stream players.

Figure 37: Lithium battery manufacture cost breakdown

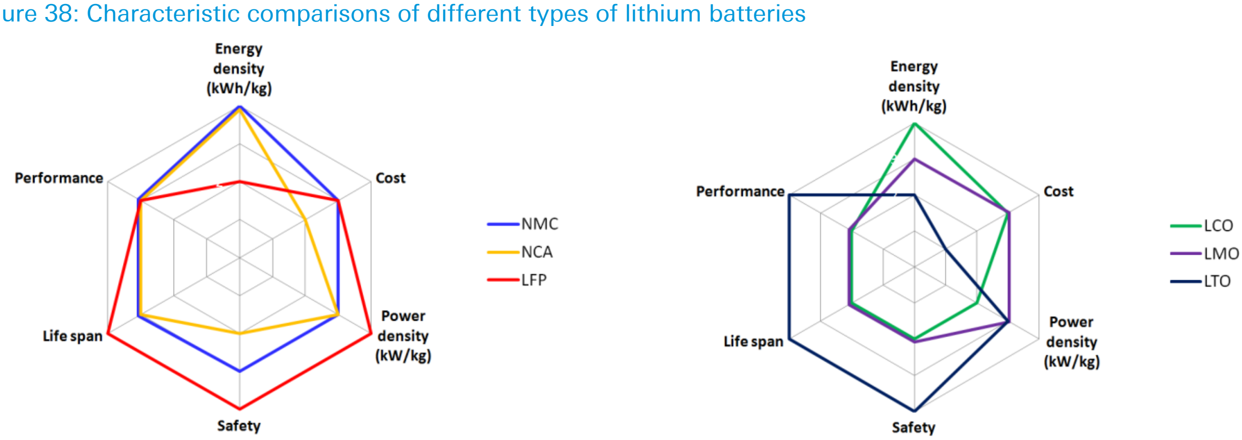


Source: Deutsche Bank

Cathode: NMC/NMA is the trend for EV battery, but LFP is not yet abandoned

The cathode is the key to improving battery performance, including production cost, life span, energy density and safety. There are technical options for cathode manufacturers, including NMC (Lithium Nickel Manganese Cobalt Oxide, LiNiMnCoO2), NCA (Lithium Nickel cobalt Aluminum Oxide, LiNiCoAlO2), LFP (Lithium Iron Phosphate LiFePO4), LCO (Lithium cobalt Oxide, LiCoO2), LMO (Lithium Manganese Oxide, LiMn2O4) and LTO (Lithium Titanate, Li4Ti5O12), etc. Unfortunately, none of the cathodes available right now can claim to be the optimal product. A trade-off among characteristics is necessary. Figure 38 compares the major characteristics of lithium batteries using different types of cathodes. Nevertheless, lithium is the common element regardless of technology choice.

Figure 38: Characteristic comparisons of different types of lithium batteries



Source: Deutsche Bank, Cadex Electronics, Battery university

Different types of lithium batteries are suitable for different types of usage based on the natural chemical characteristics resulting from varying cathodes. For the EV battery, the key considerations are safety and energy density (kwh/kg). Therefore, the current mainstream solutions are 1) ternary material series, NMC/NCA, which have higher energy density, but concerns on safety remain. The risks of fire hazard are higher; and 2) LFP, which is safer, but energy density is relatively low, and there has been slow progress on improvement so far. In China, most commercial EVs use LFP, as manufacturers put safety as the first priority, while passenger EV producers prefer to use NMC/NCA, as driving distance matters. A typical user of NCA is Tesla, while a typical user of LFP is BYD.

However, we believe LFP will not yet be given up, especially after several recent accidents involving explosions. The rise of the importance of safety has been swift. The CAAM (China Association of Automobile Manufacturers) just submitted a suggestion to the MIIT (Ministry of Industry of Information and Technology) in Jan. 2016, asking that it should not allow passenger EVs to install ternary material lithium batteries due to safety considerations. The policy risk may be significant to NMC/NCA cathode producers but has a limited impact on our forecast of lithium demand. In our forecast, only c.12% of commercial EVs will use NMC/NCA in 2015-2018.

We believe the technology debate will continue without any clear conclusion for a while. The risk of technical breakthrough, intensive competition, government policy interference, and lack of clear industry standards etc. will continue to affect the cathode manufacturing sector.

Electrolyte: current technical solution is steady

Electrolytes are made of lithium salt compounds (LiPF6, lithium hexafluorophosphate, which is having a relatively high barrier of entry and solvents, which are relatively easier to produce. Based on using different electrolyte solvents, lithium batteries can be divided into two basic types: liquefied lithium ion battery (LIB) and polymer lithium ion battery (PLB). PLB's electrolyte could be either gel or solid. However, lithium hexafluorophosphate is effectively a necessity in all popular solutions that have been developed so far.

Research on electrolytes is still underway to improve battery performance, such as enhancing low-temperature conductivity and reducing the viscosity of the electrolyte, improving cycle life, and increasing safety features, especially for larger-sized batteries. Significant efforts were have been made to try additives, new solvents, and a mixture of current popular solvents.

Anode – currently low profit and waiting for graphene to take off

For rechargeable lithium battery, the anode is the negative pole during discharge and positive pole during charge, helping to release the electrons into the circuit. The material typically used for this is graphite, which is in wide existence, easy to access, relatively cheap and practically good enough for most kinds of batteries. The production barrier for anodes is very low, and the profitability of anode producers is usually low as well. Graphene is considered to be a prospective replacement for graphite for next-generation anode material, but very limited applications can be observed so far and it is therefore not yet ready for commercialization.

Separator – Japanese producers still dominate

The battery separator is used to separate the cathode from the anode. A separator is usually produced by nylon, polypropylene (PE) and polyethylene (PP). The quality of separator decides the ion-transportation capability and will have a direct influence on battery performance. For EV batteries, some unique characteristics are essential, such as 1) higher shut-down temperature and melting point for safety purposes; 2) high puncture resistance; 3) homogenous pore size and distribution. The production know-how requirement is high. Japanese companies play a big role in this area.

Downstream: potential industry vertical integrators

Japan, Korea, and China are dominating the lithium battery market, with a c. 90% market share in terms of battery capacity shipment. Among these three countries, Japanese companies have the largest market share on their leading technology, while Korean and Chinese companies are catching up.

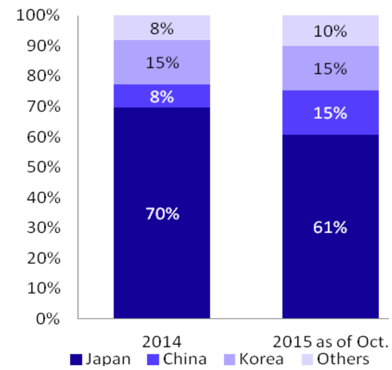
Lithium battery manufacturers mainly stem from traditional electrical appliance producers; the biggest ones are Panasonic (45.7% market share), PEVE (12% market share, was a joint venture of Panasonic and Toyota), AESC (10% market share, a joint venture of NEC and Nissan), BYD (9.1% market share), LG Chemical (7.7%), and Samsung SDI (5.2%) in the first 10 months of 2015. See Figure 39.

With first-mover advantage from cooperating with Tesla, Panasonic controls c. 40% market share of lithium battery for EV, but as China EV sales are emerging quickly and China replaces the US as the largest EV market in the world in 2015, it naturally attracts more investment to catch up with the strong battery demand. Global battery giants, Panasonic, LG and Samsung all announced they are now to expand their capacities in China in the coming years.

We should note that, compared to small-sized lithium batteries, batteries for EVs have higher quality requirements, especially for consistency of the battery cell and pack. Because of the short-board effect in the battery module, even just one low-quality battery cell will significantly hurt the final performance of the whole lithium battery module.

Quality control starts in the raw material production stage, especially in cathode manufacturing. Therefore, major battery manufacturers have meaningful in-house cathode capacity. With the increasing requirement for consistency, battery manufacturers may start to enlarge their in-house capacity and squeeze the market share of other independent cathode producers. On the other hand, downstream EV is also likely to purchase high-performance batteries for more comprehensive EV performance, which can enjoy a higher government subsidy. As such, we believe battery manufacturers have a strong motivation to be the major industry integrator for quality control purposes, starting with cathodes.

Figure 39: Lithium battery market share by country



Source: Deutsche Bank, SNE research

Lithium compounds and hexafluorophosphate are facing bottlenecks

The sales of EVs climbed much quicker than previous market expectations in 2015. New products orders were coming and spread along the supply chain. Consequently, to varying degrees, the prices of lithium carbonate, cathodes, hexafluorophosphate, electrolytes and batteries all went up in 2H15, with a very significant jump in the final quarter.

Figure 40: Price movements since June 2015

	Price MoM	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brines/Spodumene		0%	0%	0%	0%	0%	0%	0%
lithium carbonate		2%	3%	1%	3%	**3%**	**12%**	**61%**
Cathode	LFP	0%	0%	0%	0%	0%	0%	8%
	NCM,NCA	0%	0%	0%	0%	1%	-1%	2%
Hexafluorophosphate		0%	0%	0%	0%	**44%**	**38%**	**33%**
Electrolyte	LFP	0%	0%	0%	0%	**2%**	**4%**	**4%**
	NCM,NCA	0%	0%	0%	0%	**5%**	**19%**	**5%**
Battery	LFP	0%	0%	0%	0%	7%	0%	0%
	NCM,NCA	0%	0%	0%	0%	7%	0%	0%

Source: Deutsche Bank, CIAPS

Unsurprisingly, the bottleneck in the industry is where the price hiked the most, i.e. lithium carbonate and hexafluorophosphate. However, one may argue that the price hikes are merely transferring cost pressure down rather than representing larger negotiation power. Therefore, we use adjusted price hikes to reflect cost transferring capacity. After the adjustment, we can still see that lithium carbonate and hexafluorophosphate have been outperforming the other subsectors and that electrolyte manufacturers are the most vulnerable, followed by cathode.

Figure 41: Sample price hike (cost transfer adjusted) since June 2015

	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lithium carbonate	2.3%	3.3%	0.9%	3.4%	**3.1%**	**12.0%**	**60.7%**
Cathode (NMC)	-0.2%	-0.4%	-0.1%	-0.4%	0.3%	-2.4%	-11.1%
Hexafluorophosphate	-0.5%	-0.7%	-0.2%	-0.7%	**43.8%**	**20.2%**	**29.5%**
Electrolyte	0.0%	0.0%	0.0%	0.0%	**-13.9%**	1.4%	**-22.6%**
Battery LFP	0.0%	0.0%	0.0%	0.0%	7.2%	0.4%	-3.2%
Battery -NCM,NCA	0.0%	0.0%	0.0%	0.0%	7.1%	2.6%	-0.4%

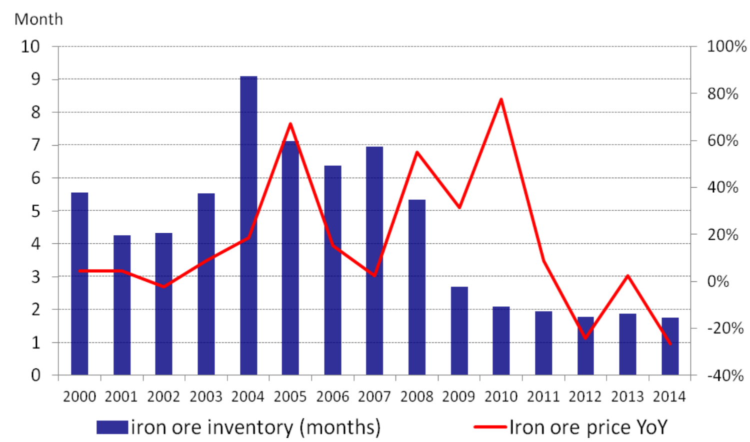
Source: Deutsche Bank estimates, Company data

Restocking could add 10-15% demand in the short term

Typically, new capacity would result in restocking raw material inventory. The inventory level is two to three months. The steel industry's historical experience demonstrates that a positive outlook on raw material prices will cause restocking action. When iron ore prices saw upward momentum in 2002-2003, the iron ore inventory level at steel mills was able to increase from four to five months to around six to seven months during 2005-2007. It was not until the profitability of downstream mills seriously deteriorated that iron ore inventory at mills remained high. Although iron ore hit a new high in 2010, steel mills did not have enough liquidity for iron ore restocking. Iron ore inventory at steel mills has been gradually cut to one to two months in recent years.

If the lithium industry booms in 2016-2018 as expected, we believe that raw material inventory could add one or two months in 2016 and 2017 and remain high in 2018, which is equivalent to an additional 10-15% of the previous total annual demand estimated in 2016/2017. As such, the short-term imbalance between demand and supply will be further enlarged, which should quickly pull up the price of lithium.

Figure 42: Sample company's iron ore stocking vs. iron ore price



Source: Deutsche Bank estimates, Company data

Capacity expansion capability decides future bottleneck

High profitability at the bottleneck will naturally encourage investments in capacity expansion, which poses a threat on profitability for those areas with low barriers to enter.

After a comprehensive analysis of capital requirements, production know-how, and access to raw materials, we believe upstream lithium players have the highest entry barriers, followed by hexafluorophosphate and battery manufacturers. We believe the subsectors with higher entry barriers and high market centralization will continue to benefit from higher profitability in the coming years.

Figure 43: Entry barrier analysis of lithium industry supply chain

	Hard rock minerals / Salt lake brines	Lithium compounds	Cathode	Hexafluorophosphate	Electrolyte	Lithium Batteries
Market centralization rate*						
Top 4 players' market share	◕ 86%	◑ 75%	○ 42%	◔ 62%	○ 50%	◑ 74%
Top 10 players' market share			◑ 67%	● 99%	◕ 85%	● 94%
Entry barrier	**High**	**Medium**	**Low**	**Mediuim**	**Low**	**Medium**
Capital requirement	High	Low	Low	Low	Low	Medium
Production know-how	Medium	Medium	Low	High	Low	Medium
Clear indsutry standard	Yes	No	No	Yes	Yes	Yes
Access to raw material	Easy	Hard	Medium	Easy	Medium	Easy

**top 4 players' market share*
***top 10 players' market share*

Source: Deutsche Bank estimates, industry expert

Figure 44 summarizes all the capacity expansion plan announcements to date. It demonstrates that hexafluorophosphate will have strong capacity growth in 2016E and 2017E, attracted by the current high profitability. We believe more investment plans in all industry subsectors will be announced in 2016 because there is a time window as long as 18 months since the company announced it would invest in projects to finally run factories at full capacities.

For most capacity expansions, it takes around one year to build a factory, if this is not postponed by others factors, usually in government environmental compliance. After that, the ramp-up of the new factories alone can take around six to eight months.

As shown in Figure 43, the shortage of supply in most subsectors will be greatly resolved, except in lithium raw material/compounds. Overall, we forecast that global lithium supply will be short of demand by 33kt in 2016 and 29kt in 2017 before a fall to 8kt in 2018. The two big international projects are Orocobre's Salar de Olaroz Lithium Project in Argentina and Neometals' Mt Marion lithium project in Australia. Orocobre is having difficulties running at c.40% utilization, while Mt. Marion will not start production until the 3Q2016.

Figure 44: Capacity expansion plans already announced vs. lithium battery demand estimated

YoY growth rate	2015E	2016E	2017E	2018E
Lithium battery demand (mn Kwh)	*627%*	*27.2%*	*20.6%*	*21.5%*
Lithium carbonate demand (kt)	*627%*	*27.4%*	*20.8%*	*21.7%*
Lithium compounds	6%	9%	35%	8%
Cathode	27%	38%	20%	15%
Hexafluorophosphate	24%	56%	33%	5%
Electrolyte	4%	15%	7%	0%
Battery*	179%	200%	na.	na.

*Source: Deutsche Bank estimates, Avicenna energy, GIIB, Chyxx *Rough estimate based on available market data.*

In China, major domestic expansion projects are in salt lakes in Qinghai and hard-rock mines in Sichuan. Although the plans look aggressive enough to increase some supply, we maintain the view that the ramp-ups and expansion of domestic mines won't turn around the tight supply situation of lithium. Historical experience has also demonstrated that various challenges will keep arising during the development of either domestic salt lake brine or hard-rock mines. It is highly possible that output of new projects constructed may not reach the designed level or the project actually fails.

Figure 45: Raw material/lithium compounds production expansion plan announced in China, 2015E-2018E

Company Name	Resource Type	Asset/Mines		2015E	2016E	2017E	2018E
Tibet							
Tibet Mineral Development	西藏矿业	Salt Lake Brine	西藏扎布耶盐湖二期工程	2	3	3	3
Tibet Urban Development	西藏城投	Salt Lake Brine	结则茶卡优质盐湖,龙木措	0	0	0	0
Qinghai							
China Minmetals Salt Lake	五矿盐湖	Salt Lake Brine	一里坪盐湖	0	0	5	5
Qinghai Saltlake Fozhao Lake Lithium	青海盐湖佛照蓝科锂业	Salt Lake Brine	察尔汗盐湖	3	3	3	10
Qinghai Lithium	青海锂业	Salt Lake Brine	东台吉乃尔盐湖	3	3	3	10
Qinghai East Taijinar Lithium Resources	青海东台吉乃尔锂资源	Salt Lake Brine	东台吉乃尔盐湖			na.	
Qinghai Hengxinrong Lithium	青海恒信融锂业	Salt Lake Brine	海西州大柴旦镇西台吉乃尔湖	2	5	18	18
Citic Guoan Information	青海中信国安	Salt Lake Brine	西台吉乃尔盐湖	0	0	0	0
Sichuan							
Sichuan Ni&Co Guorun New Materials	尼科国润 (中信集团)	Spodumene	马尔康锂辉石矿	2	2	2	2
United Science and Technology	众合股份	Spodumene	党坝锂辉石矿	7	7	18	18
United Science and Technology	众合股份	Spodumene	李家沟锂辉石矿	0	0	0	0
Youngy Co., Ltd	融捷股份	Spodumene	甲基卡锂矿	0	0	0	0
Sichuan Tianqi Lithium	天齐锂业	Spodumene	甲基卡锂矿		No plan to develop now.		
Jiangxi							
Jiangxi Special Electric motor	江特电机	Lepidolite	江西宜春	1	2	10	10
Ganfeng Lithium	赣峰锂业	Spodumene	广昌县头陂里坑锂辉石矿	0	0.2	1	1
Total output planned				**17**	**26**	**63**	**77**
Total output estimated				**17**	**22**	**40**	**47**
Total output estimated as % of global supply				**9%**	**11%**	**16%**	**18%**

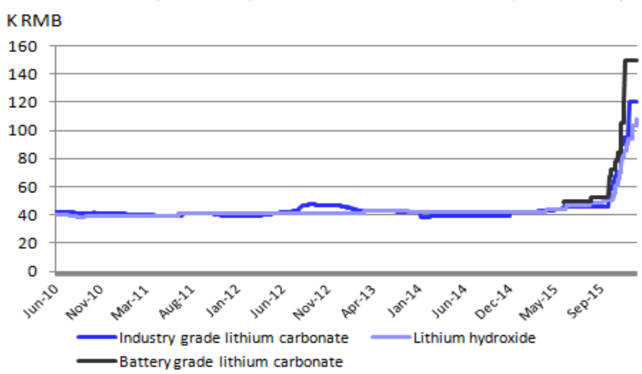
Source: Deutsche Bank estimates, Company data

Price of lithium carbonate

Price could remain high due to the tight supply

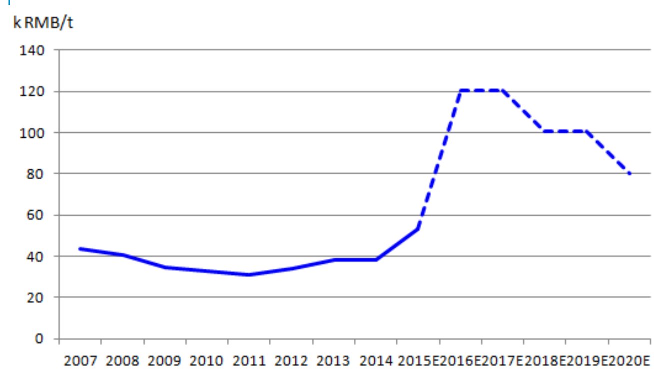
The average price of lithium carbonate saw a 44% YoY hike in 2015. At the end of 2015, the market price of lithium carbonate had reached RMB120,000/t. We believe that the price of battery grade lithium carbonate will remain high above RMB120,000/t until at least 2018. Strong EV sales in China and slow ramp-up of new lithium supply should allow the tight supply of lithium to continue.

Figure 46: Historical lithium compound price



Source: Deutsche Bank, wind

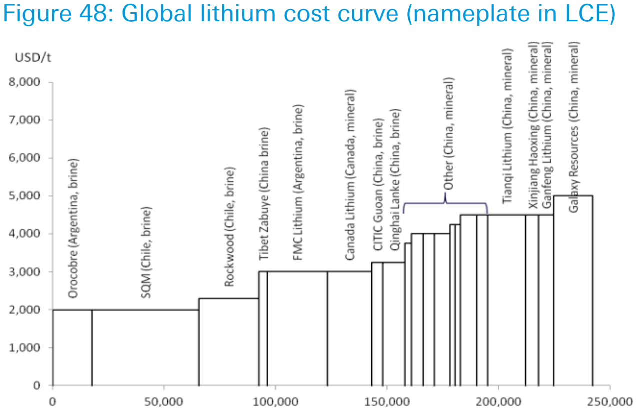
Figure 47: battery grade lithium carbonate price estimates



Source: Deutsche Bank estimates, wind

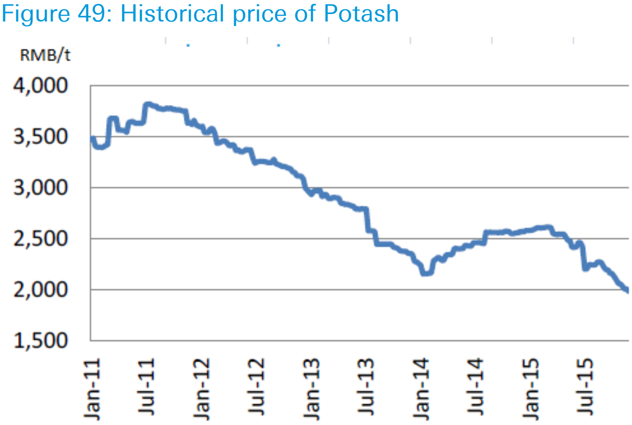
Brine-based producers are low cost producers (see Figure 48), but they are unable to increase production volume aggressively due to firstly due to technology bottlenecks of extracting lithium quickly. The second factor is that lithium has been producing as a by-product of potash production. The major producers are sensitive to potash price, which is already low. Meanwhile, the Argentinean government's quota system also constrained new projects to ramp up aggressively.

Figure 48: Global lithium cost curve (nameplate in LCE)



Source: Deutsche Bank, Orocobre

Figure 49: Historical price of Potash



Source: Deutsche Bank, Bloomberg Finance LP

Hard-rock miners, especially Chinese producers, are major marginal producers. Not only is the number of mines limited, but current rock-mine producers are experiencing slow government approval process (for example, Zhonghe's Dangbei spodumene mine), slow process of recovering old mines (e.g. Ganfeng's newly acquired Jiangxi Lithium's Guangchang county Poliken spodumene mine), and postponement of building new mines (e.g. Rongjie's Jiajika spodumene mine) due to various kinds of problem.

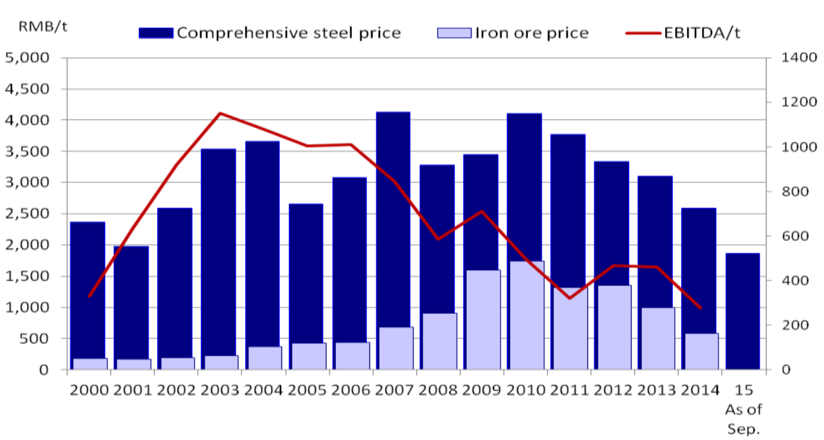
As such, we expect limited incremental upstream expansion which will help to sustain the high price of lithium and profitability level of existing lithium producers in the next three years. And we believe lithium will remain a seller's market due to the shortage of supply.

Implications for midstream and downstream producers

We believe the high price of lithium carbonate may pressure middle stream players and squeeze their profit margins. But downstream battery makers are less sensitive to the price of lithium carbonate. In addition, other kinds of batteries, like Ni-MH, Ni-Cd or lead acid, are unlikely to replace lithium batteries when the latter's price rises due to their limited energy density. EV makers have no choice but accept lithium battery as its power source.

Based the historical experience of the steel industry, we believe that the high price of raw materials will be maintained for upstream players with stronger negotiation power, but is likely to squeeze downstream players' profitability. Figure 50 demonstrates that iron ore prices continued to hit new highs until 2010, although downstream steel mills' EBITDA/t went down continuously starting in 2003.

Figure 50: Historical iron ore price vs. steel mills' profitability



Source: Deutsche Bank estimates, Bloomberg Finance LP, Wind

Battery manufacturers, by contrast, seem not too concerned about raw material price hikes, as lithium carbonate accounted for only c. 2-4% of the total cost of lithium batteries when lithium carbonate was c. RMB 37,000/t. In addition, it is able absorb this price hike from squeezing the middle stream players and improving manufacture efficiency.

As such, if the lithium carbonate price soared and stabilized at RMB120,000/t, c.225% hike of our base price of RMB37,000, the cost of lithium will account for 6-12% of battery manufacturers overall production costs.

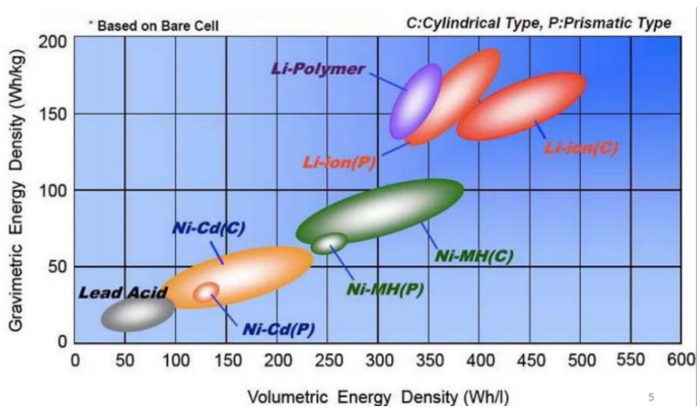
Figure 51: Price sensitivity analysis of battery manufacturing

Lithium carbonate price hike	50%	100%	200%	300%	400%
Battery cost influenced estimated*	3-6%	4-8%	6-12%	8-16%	10-20%

Source: Deutsche Bank
*When lithium carbonate price was at c. RMB37,000/t

When the lithium battery price rises, EV makers are unable to replace lithium batteries with other kinds of batteries like Ni-MH, Ni-Cd, or lead acid, which have much lower energy density than that of lithium battery (see Figure 52). As we mentioned above, energy density is one of the two most important characteristics of EV batteries, as it strongly decides the driving distance.

Figure 52: Energy density comparison among different types of batteries



Source: Deutsche Bank, MIT

In conclusion, we believe lithium battery manufacturers can or have to accept the price hike in lithium carbonate due to 1) the total cost being insensitive enough to a lithium carbonate price hike, 2) the cost increase from lithium carbonate price hike can be off-set by other cost decrease driven by manufacturing efficiency improvement, and 3) no other replacements being available.

Rating
Buy

Asia
China

Resources
Metals & Mining

Company
Tianqi Lithium

Reuters	Bloomberg
002466.SZ	002466 CH

Price at 28 Jan 2016 (CNY)	108.30
Price target - 12mth (CNY)	149.90
52-week range (CNY)	173.03 - 37.80
HANG SENG INDEX	19,683

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Price/price relative

Performance (%)	1m	3m	12m
Absolute	-18.5	58.2	138.3
HANG SENG INDEX	-10.5	-13.7	-20.0

Source: Deutsche Bank

DBe vs. Consensus (2016)

RMB mn	DBe	Consensus	DBe/Con.
Revenue	4,903	3,045	161%
EBIT	2,772	998	278%
NP	1,888	399	474%

Source: Deutsche Bank estimates, Bloomberg

The power of lithium; initiating coverage with a Buy

Tianqi- major beneficiary of lithium boom; initiating coverage with a Buy

Tianqi Lithium is the third-largest lithium producer globally, supplying a critical raw material for Electric Vehicle (EV) batteries. Demand trends are clear, especially in China where EV sales will rise 34% over the next three years. Supply is constrained and highly concentrated, with 86% controlled by four producers, supporting a very strong price outlook until 2018. With high quality, low cost reserves and well timed processing capacity additions, earnings are set to surge eight-fold this year, taking RoE to 48.5%. We initiate coverage with a Buy with a TP of RMB149.9, implying 38% upside.

High Lithium price supported by demand and industry structure

The average lithium price rose 44% last year and will gain a further 126% to RMB120,000/t in 2016, a level that will likely be maintained until at least 2018. Strong EV sales in China, a slow ramp-up of new supply and a concentrated industry structure are the key supporting factors. The EV battery industry is at the start of a rapid growth phase and generates demand for lithium with a CAGR of 7~8% in the coming years. For Tianqi and other leading producers, we project an outlook very similar to the iron ore boom last decade.

Global No. 3 lithium supplier with meaningful shipment increase

Tianqi controls close to 18% of global lithium capacity. In 2015, through Talison (51%-owned), we estimate that Tianqi shipped c.34kt LCE (equity adjusted volume, vs. global production of 190kt LCE estimated). As well as owning the world class Greenbushes mine, which has one of the largest and highest grade spodumene reserves in the world, Tianqi recently acquired a lithium carbonate processing plant in Zhangjiagang, which doubled its processing capacity. With further ramp-up of Greenbushes' spodumene concentrate shipments and Zhangjiagang's processing plant, we believe Tianqi's shipments for spodumene concentrates and lithium compounds will increase 30%/20% and 93%/7% in 2016/2017 respectively.

DCF-based TP suggest 38% upside; initiating coverage with a Buy

With resilient lithium price and strong shipment growth, we forecast earnings to rise eight-fold this year and further 14% in 2017, generating an RoE of 48.5%. We derive our target price from a DCF model, with WACC of 8.5%. We adopt 10.8% as the cost of equity to reflect a risk-free rate of 3.9%, a market risk premium of 5.6% and a beta of 1.24. Using a terminal growth rate of 3%, we set our target price at RMB149.9, implying 38% upside potential from current levels. Major risks: slower-than-expected demand pick-up from EV.

Forecasts And Ratios

Year End Dec 31	2013A	2014A	2015E	2016E	2017E
Sales (CNYm)	1,068.2	1,422.4	1,805.2	4,902.5	5,991.2
Reported EPS FD(CNY)	-1.30	0.54	0.86	7.30	8.33
Reported NPAT (CNYm)	-191.0	130.5	223.7	1,888.2	2,156.4
DB EPS growth (%)	–	–	59.1	744.1	14.2
PER (x)	–	86.5	125.3	14.8	13.0

Source: Deutsche Bank estimates, company data

[1] DB EPS is fully diluted and excludes non-recurring items

[2] Multiples and yields calculations use average historical prices for past years and spot prices for current and future years, except P/B which uses the year end close

Model updated:30 January 2016

Running the numbers

Asia

China

Metals & Mining

Tianqi Lithium

Reuters: 002466.SZ Bloomberg: 002466 CH

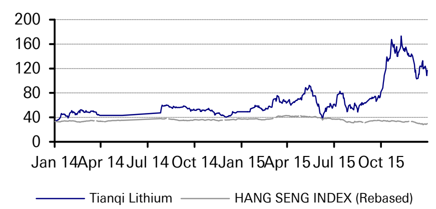
Buy

Price (28 Jan 16)	CNY 108.30
Target Price	CNY 149.90
52 Week range	CNY 37.80 - 173.03
Market Cap (m)	CNYm 28,024
	USDm 4,261

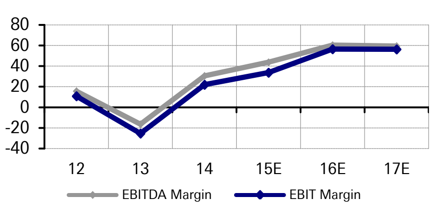
Company Profile

Sichuan Tianqi Lithium Industries, Inc. develops, manufactures and sells lithium products. The Company's products include industrial lithium carbonate, battery lithium carbonate, lithium chloride, and lithium hydroxide.

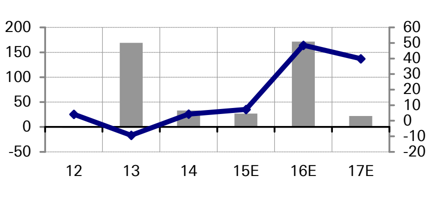
Price Performance



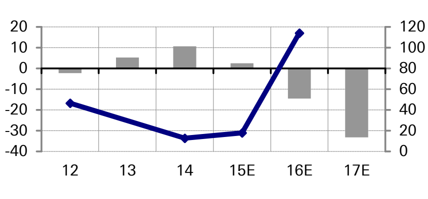
Margin Trends



Growth & Profitability



Solvency



James Kan
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Fiscal year end 31-Dec	2012	2013	2014	2015E	2016E	2017E
Financial Summary						
DB EPS (CNY)	0.28	-1.30	0.54	0.86	7.30	8.33
Reported EPS (CNY)	0.28	-1.30	0.54	0.86	7.30	8.33
DPS (CNY)	0.10	0.00	0.00	0.00	1.82	2.08
BVPS (CNY)	6.9	21.0	11.4	12.3	17.8	24.0
Weighted average shares (m)	147	147	240	259	259	259
Average market cap (CNYm)	4,342	5,194	11,295	28,024	28,024	28,024
Enterprise value (CNYm)	3,932	6,896	12,742	29,255	28,394	26,900
Valuation Metrics						
P/E (DB) (x)	104.0	nm	86.5	125.3	14.8	13.0
P/E (Reported) (x)	104.0	nm	86.5	125.3	14.8	13.0
P/BV (x)	4.67	1.44	3.53	8.81	6.09	4.51
FCF Yield (%)	nm	2.0	1.9	1.3	5.7	9.0
Dividend Yield (%)	0.3	0.0	0.0	0.0	1.7	1.9
EV/Sales (x)	9.9	6.5	9.0	16.2	5.8	4.5
EV/EBITDA (x)	63.1	nm	29.3	37.0	9.6	7.6
EV/EBIT (x)	91.1	nm	40.8	48.1	10.2	8.0
Income Statement (CNYm)						
Sales revenue	397	1,068	1,422	1,805	4,903	5,991
Gross profit	103	274	578	1,009	3,404	4,219
EBITDA	62	-175	434	790	2,961	3,562
Depreciation	19	96	122	182	189	187
Amortisation	0	0	0	0	0	0
EBIT	43	-271	313	608	2,772	3,375
Net interest income(expense)	-1	-42	-25	-34	-24	0
Associates/affiliates	0	0	0	0	0	0
Exceptionals/extraordinaries	-1	17	3	-7	-7	-7
Other pre-tax income/(expense)	8	12	37	7	7	7
Profit before tax	49	-283	328	574	2,747	3,375
Income tax expense	7	11	46	190	604	743
Minorities	0	-103	151	160	255	476
Other post-tax income/(expense)	0	0	0	0	0	0
Net profit	42	-191	131	224	1,888	2,156
DB adjustments (including dilution)	0	0	0	0	0	0
DB Net profit	42	-191	131	224	1,888	2,156
Cash Flow (CNYm)						
Cash flow from operations	-44	223	302	607	1,758	2,669
Net Capex	-186	-121	-85	-230	-170	-160
Free cash flow	-230	101	217	377	1,588	2,509
Equity raised/(bought back)	0	3,672	3,037	0	0	0
Dividends paid	-20	-87	-58	0	-472	-539
Net inc/(dec) in borrowings	447	41	-108	-50	-50	-50
Other investing/financing cash flows	-23	-3,590	-3,324	2	0	0
Net cash flow	174	138	-235	329	1,066	1,920
Change in working capital	*-112*	*443*	*-249*	*41*	*-573*	*-150*
Balance Sheet (CNYm)						
Cash and other liquid assets	500	682	437	766	1,832	3,752
Tangible fixed assets	202	1,075	1,026	1,072	1,061	1,052
Goodwill/intangible assets	132	2,975	2,774	2,776	2,768	2,751
Associates/investments	387	587	847	845	845	845
Other assets	348	1,346	1,046	1,027	1,697	1,831
Total assets	1,569	6,666	6,130	6,485	8,204	10,231
Interest bearing debt	477	952	944	894	844	794
Other liabilities	81	607	440	462	559	543
Total liabilities	557	1,559	1,384	1,356	1,404	1,337
Shareholders' equity	1,011	3,088	2,958	3,182	4,598	6,215
Minorities	0	2,019	1,787	1,947	2,202	2,678
Total shareholders' equity	1,011	5,107	4,745	5,129	6,800	8,893
Net debt	*-23*	*269*	*507*	*128*	*-987*	*-2,957*
Key Company Metrics						
Sales growth (%)	-1.5	169.2	33.2	26.9	171.6	22.2
DB EPS growth (%)	3.7	na	na	59.1	744.1	14.2
EBITDA Margin (%)	15.7	-16.4	30.5	43.8	60.4	59.5
EBIT Margin (%)	10.9	-25.4	22.0	33.7	56.5	56.3
Payout ratio (%)	35.2	nm	0.0	0.0	25.0	25.0
ROE (%)	4.2	-9.3	4.3	7.3	48.5	39.9
Capex/sales (%)	46.8	11.6	6.0	12.7	3.5	2.7
Capex/depreciation (x)	9.7	1.3	0.7	1.3	0.9	0.9
Net debt/equity (%)	-2.3	5.3	10.7	2.5	-14.5	-33.3
Net interest cover (x)	46.5	nm	12.7	17.9	114.1	nm

Source: Company data, Deutsche Bank estimates

Investment Thesis

Outlook – strong earnings growth driven by high Li price

Founded in 1995 and after acquiring Talison in 2013, Sichuan Tianqi has become one of the largest lithium compound producers in the world, controlling c. 18% of the world market share. Tianqi's primary operations are 1) mining spodumene concentrates in Australia and 2) processing spodumene concentrates to lithium chemical compounds in its China factories.

After a hike of 44% YoY in 2015, we believe that the average price of lithium carbonate in 2016 will have another 126% YoY increase and remain high at RMB120,000/t, until at least 2018. Strong EV sales in China and the slow ramp-up of new lithium supply should allow the tight supply of lithium to continue. Meanwhile, the top four suppliers of lithium control almost 86% of the supply. Lithium's outlook in coming years looks very similar to iron ore's boom story in the past decade.

For Tianqi, we believe the visibility of its organic earnings growth will be high in light of 1) high ASP of lithium compounds and expected increase in ASP of spodumene concentrates. and 2) flexibility to increasing volume of both spodumene concentrates in Talison, from current low utilization rate of only 60% only and lithium compounds in Zhangjiagang factory. The factory was acquired in 2015 and is now ready to ramp up.

Boosted by increases in both prices and the sales volume of spodumene and lithium compound, we forecast that Tianqi's top line could reach RMB4,903mn and RMB5,991mn, up 172% YoY and 22% YoY, in 2016E and 2017E, respectively. Accordingly, we estimate that Tianqi's bottom line could grow significantly, to RMB1,888mn and RMB2,156mn, up 744% and 14% YoY in 2016 and 2017, respectively.

Valuation

We derive our target price from a DCF model, with WACC of 8.5%. We adopt 10.8% as the cost of equity to reflect a risk-free rate of 3.9%, a market risk premium of 5.6% and beta of 1.24. Using a terminal growth rate of 3%, we set our target price at RMB149.9 implying 38% upside potential from current levels. Our target price implies a 2016/17E PE of 21x/18x. The share price is currently trading at RMB108.3, implying 2016/2017 PE of 15x/13x. We expect the ROE of Tianqi will reach 49%/40% in 2016/2017 and FCF yield will arrive at 5% and 8% in 2016/2017.

Risks

Major downstream risks: 1) Slower-than-expected demand from EV or other downstream industries. 2) Quicker-than-expected increase in lithium raw material supply, especially if there is a technology breakthrough in downstream salt lake brine extraction. And 3) Slower-than-expected utilization rate ramp-up in either the Greenbushes mine or the Zhangjiagang factory .

Valuation

DCF-based target price of RMB149.9

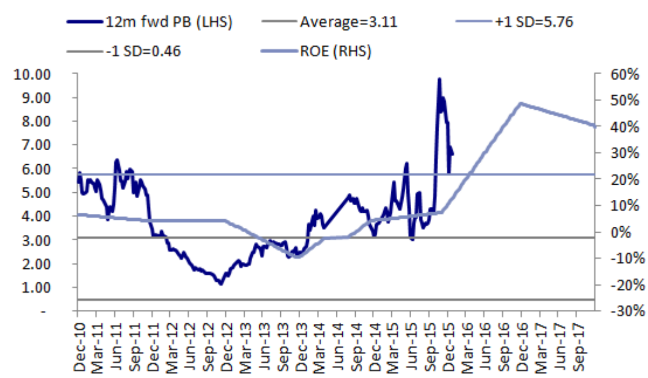
We derive our target price from a DCF model, with WACC of 8.5%. We adopt 10.8% as the cost of equity to reflect a risk-free rate of 3.9%, a market risk premium of 5.6%. We derive our target price from a DCF model, with WACC of 8.5%. We adopt 10.8% as the cost of equity to reflect a risk-free rate of 3.9%, a market risk premium of 5.6% and a beta of 1.24. Using a terminal growth rate of 3%, we set our target price at RMB149.9 implying 38% upside potential from current levels. Our target price implies a 2016/17E PE of 21x/18x. The share price is currently trading at RMB108.3, implying 2016/2017 PE of 15x/13x. We expect the ROE of Tianqi to reach 49%/40% in 2016/2017 and FCF yield will arrive at 5% and 8% in 2016/2017.

Figure 53: WACC for Tianqi's DCF valuation

Rf	3.9%
MRP	5.6%
Beta	1.24
Cost of equity	10.8%
Cost of debt	4.0%
Tax rate	22.0%
Post-tax cost of debt	3.1%
% capital in equity	70.0%
% capital in debt	30.0%
WACC	8.5%
Terminal growth rate	3.0%

Source: Deutsche Bank estimates

Figure 54: 12M forward PB vs. ROE



Source: Deutsche Bank, Company data

Compared to Tianqi's global lithium peers (Figure 55), we believe Tianqi's relatively low PEx in 2016/2017 makes it very attractive. Most of Tianqi's lithium peers have diversified businesses and thus the earnings growth might not be as strong as Tianqi's. Tianqi's high PBx at 6.1x 2016DBe BVPS can be justified by its 40%+ ROAE in the coming two years.

Figure 55: Global peers comparison table

Company	Ticker	Rating	Listing Curr	Price local (list curr) 1/26/16	Target Price (list curr)	M. cap (US$m) 1/26/16	3m avg. trading volume	PE (x)			PB (x)			EPS Growth % (rec)			ROE %		
								2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E	2015E	2016E	2017E
International producer																			
Sociedad Quimica y Minera	SQM.N	NR	USD	15.2	na	5,439	10	21.4	na	na	4.5	na	na	1.4	na	na	21.6	na	na
FMC Corp	FMC.N	NR	USD	33.7	na	4,496	55	14.2	11.3	10.1	2.1	1.8	1.7	(39.1)	25.0	11.9	17.5	16.9	19.5
Albemarle	ALB.N	Buy	USD	50.0	55	5,608	73	13.3	13.3	11.8	3.1	2.7	2.3	(10.1)	0.0	13.4	25.5	21.9	21.4
Orocobre Limited	ORE.AX	Hold	AUD	2.4	2.4	285	0	na	na	na	1.5	1.9	2.7	82.6	(5,026.6)	(1.7)	(0.5)	(27.6)	(35.3)
Domestic peers																			
Sichuan Tianqi Lithium	**002466.SZ**	**Buy**	**CNY**	**122.5**	**162.1**	**4,868**	**253**	**125.3**	**13.2**	**9.3**	**8.8**	**5.9**	**4.0**	**59.1**	**852.1**	**41.1**	**12.5**	**58.5**	**54.9**
Jiangxi Ganfeng Lithium Co Ltd	002460.SZ	NR	CNY	40.9	na	2,351	293	124.8	92.4	70.3	9.0	8.0	6.7	23.3	35.1	31.4	7.7	11.6	13.6
Youngy Co	002192.SZ	NR	CNY	41.4	na	1,089	33	591.1	58.3	28.4	15.3	9.7	7.4	na	914.3	105.2	2.4	19.7	27.1
HK/China non-ferrous																			
Chalco	2600.HK	Hold	HKD	2.3	2.7	8,195	5	na	na	4.3	1.1	1.2	0.5	88.5	6.2	na	(6.8)	(6.8)	11.4
Hongqiao Group	1378.HK	Buy	HKD	4.0	5.9	3,268	6	4.5	3.5	2.4	0.6	0.5	0.4	(14.8)	29.0	46.7	13.8	16.1	20.2
Jiangxi Copper	0358.HK	Hold	HKD	7.6	9	5,491	13	16.1	22.1	22.9	0.5	0.5	0.6	(33.2)	(27.2)	(3.3)	2.9	2.1	2.2
MMG	1208.HK	Hold	HKD	1.4	1.6	943	1	na	na	7.4	1.4	0.5	1.2	(300.0)	(76.3)	(366.7)	(14.2)	(23.5)	(52.0)
Zhaojin Mining	1818.HK	Hold	HKD	4.7	4.3	1,762	2	23.8	22.5	17.5	1.3	1.2	1.1	4.0	5.8	28.5	5.4	5.5	6.7
Zijin Mining	2899.HK	Hold	HKD	1.8	2.3	8,740	7	14.6	12.7	11.2	1.1	1.1	1.0	(7.6)	14.2	13.6	7.6	8.5	9.3
Zhong Ke San Huan	000970.SZ	Buy	CNY	10.6	17	1,717	63	37.4	29.2	19.9	2.7	2.5	2.3	(4.5)	27.9	46.8	7.4	9.0	12.2
Xiamen Tungsten	600549.SS	Sell	CNY	14.6	12	2,391	60	99.4	61.4	35.6	2.0	1.9	1.8	(78.9)	61.9	72.6	1.8	3.2	5.3
China Minmetals	000831.SZ	Sell	CNY	16.0	6	2,385	139	961.2	194.3	77.1	5.9	5.7	5.3	na	394.6	152.1	0.6	3.0	7.1

Source: Deutsche Bank, Bloomberg Finance LP

The author of this report would like to acknowledge Jason Zhu for his contribution.

Appendix 1

Important Disclosures

Additional information available upon request

Disclosure checklist

Company	Ticker	Recent price*	Disclosure
Tianqi Lithium	002466.SZ	117.00 (CNY) 29 Jan 16	NA

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Historical recommendations and target price: Tianqi Lithium (002466.SZ)
(as of 1/29/2016)

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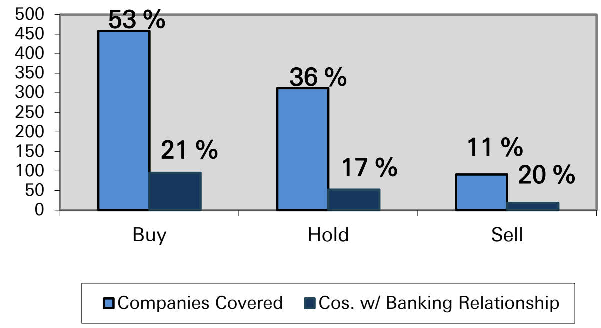

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