

# How Benchmark Minerals is enabling a new lithium price mechanism for the EV revolution

Benchmark World Tour 2018 –Seoul, Tokyo 10-14 September 2018

Simon Moores, Managing Director  
Benchmark Mineral Intelligence

# The world's leading EV supply chain voice



**Benchmark Mineral Intelligence** is the world's leading voice and most trusted provider of independent price assessments for the lithium ion battery and electric vehicle (EV) supply chain.

**Benchmark** is globally known for setting the lithium industry's reference price which is relied upon to negotiate contracts between actors in the industry, including lithium extraction operators, to cathode manufacturers, battery cell producers and automotive OEMs.

**Benchmark's** Lithium Price Assessments and analysis is also relied upon by the financial community to aid critical investments into the lithium ion supply chain.

The Company also produces regular price assessments on cobalt chemicals and graphite anode.

The EV and battery cell supply chain is the **Benchmark's** sole focus and speciality.

In addition to and wholly separate from its Price Assessment Division, **Benchmark** also provides lithium forecasting and consultancy services that are relied upon by a wide range of customers from governments, electronics manufacturers, EV makers, battery cell producers, and lithium miners.

To complement its publishing activities, **Benchmark** has created the industry's leading platform to discuss the subject - *The Benchmark World Tour*. Starting in 2015, the annual series offers free investment and industry seminars, has grown to 15 cities in North America, Europe, Asia and Australia.

**Benchmark** also hosts an industry gathering for the lithium ion supply chain in October of each year. *Benchmark Minerals Week* consists of two main conferences, *Graphite & Anodes* and *Cathodes*, and is the world's meeting place to negotiate deals and network.

**Benchmark's** price data, insight, and understanding of the subject is unrivalled and culminated in being summoned to the US Senate to testify in 2017. In addition, **Benchmark** has been invited to give guest lectures at the University of Oxford and advise the UK Government.





# Benchmark's lithium prices are now a proxy for EV demand

## Brent Crude – Platts / Bloomberg



## Benchmark Minerals' Lithium Price Assessments

### Still Rising

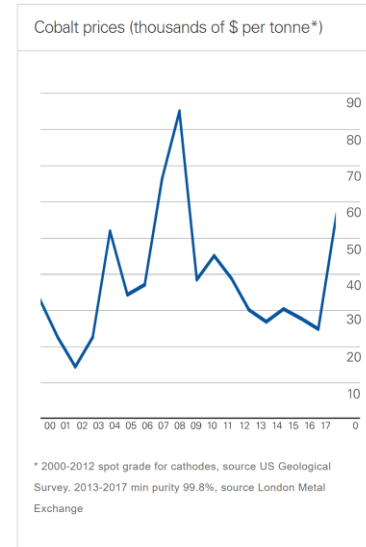
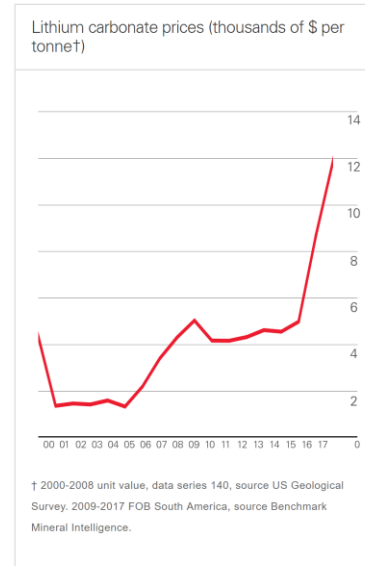
Lithium prices have extended gains even as new supply enters the market



# Big Oil publicly acknowledges lithium for the first time...

## Statistical Review of World Energy

Key materials for the changing energy system



... citing Benchmark Minerals lithium price – the industry's reference price

## North America (May)

**NEW YORK, USA**  
MAY-7th You missed it

**TORONTO, CANADA**  
MAY-9th You missed it

**CHICAGO, USA**  
MAY-11th You missed it

**SAN FRANCISCO, USA**  
MAY-14th You missed it.

**VANCOUVER, CANADA**  
MAY-16TH You missed it.

## Europe (June)

**LONDON, UK**  
JUNE 18th

**BERLIN, GERMANY**  
JUNE 20th

**LONDON, UK**  
JUNE 22nd

## Asia & Australia (September)

**HONG KONG, CHINA**  
SEPTEMBER 10th

**SEOUL, SOUTH KOREA**  
SEPTEMBER 12th

**TOKYO, JAPAN**  
SEPTEMBER 14TH

**PERTH, AUSTRALIA**  
SEPTEMBER 17TH

**MELBOURNE, AUSTRALIA**  
SEPTEMBER 19TH

**SYDNEY, AUSTRALIA**  
SEPTEMBER 21ST

**STOCKHEAD**



## Vanadium could have its 'Elon Musk' moment as it powers 25pc of 'stationary' batteries

Resources

September 19, 2018 | Reuben Adams

Elon Musk, boss of electric car maker Tesla. Pic: Getty

Vanadium could have its "Elon Musk moment" as it advances towards powering 25 per cent of stationary battery storage by 2028.

That's the view of Benchmark Minerals Intelligence boss Simon Moores, who spoke at the battery metals research firm's conference in Perth on Monday.

**Bloomberg**

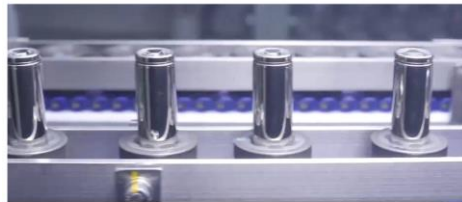
## Chinese Lithium Giant Agrees Three-Year Pact to Supply Tesla

Bloomberg News  
September 21, 2018, 3:25 PM GMT+7

- Deal by Ganfeng follows supplementary agreement with LG Chem
- Shenzhen-listed producer plans initial offering in Hong Kong

**INSIDE EVs**

Tesla Lands Lithium Supply Deal With Chinese Giant



12 H BY MARI KANE 6

Ganfeng Lithium Co. finds Tesla and LG Chem among its customers.

## Australian Mining

Home News Features Oil & Gas Mine Map Events Resources Magazine

### Vanadium joins world's largest battery tech tour for first time

April 20, 2018 News Ewen Hosie

Australian Vanadium is to join Benchmark Mineral Intelligence's Benchmark World Tour 2018, the first company to do so.

Vanadium managing director Vincent Menting on the inclusion, said that "lithium ion moment [was] coming".



**STOCKHEAD**



95 per cent of the EV market and 50 per cent of the battery storage market will be lithium ion by 2028, according to Benchmark Minerals Intelligence. Pic: Getty

Production of lithium ion batteries is increasing exponentially and will drive long-term demand for materials such as lithium, cobalt, graphite and nickel, investors were told at a **Benchmark Mineral Intelligence conference** in Perth on Monday. "In 2015, we declared that the battery mega factories were coming," said Benchmark managing director Mr Simon Moores. "In August 2018 there were 42 mega factories built or being built - up from three in 2015."

**LITHIUM**  
Investing News

**Simon Moores: We're in the Midst of a Global Battery Arms Race**

Priscila Barrera - June 11th, 2018



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## What is happening with the lithium price?





# China Lithium Prices Down: Why?



Homepage ▾

Membership

Lithium ▾

Cobalt ▾

Account ▾

Available Minerals: Cobalt Lithium

DATE RANGE

Jan 2015  to Aug 2018 

CATEGORY

- Lithium Carbonate
- Lithium Hydroxide
- Spodumene

SHIPPING ROUTE

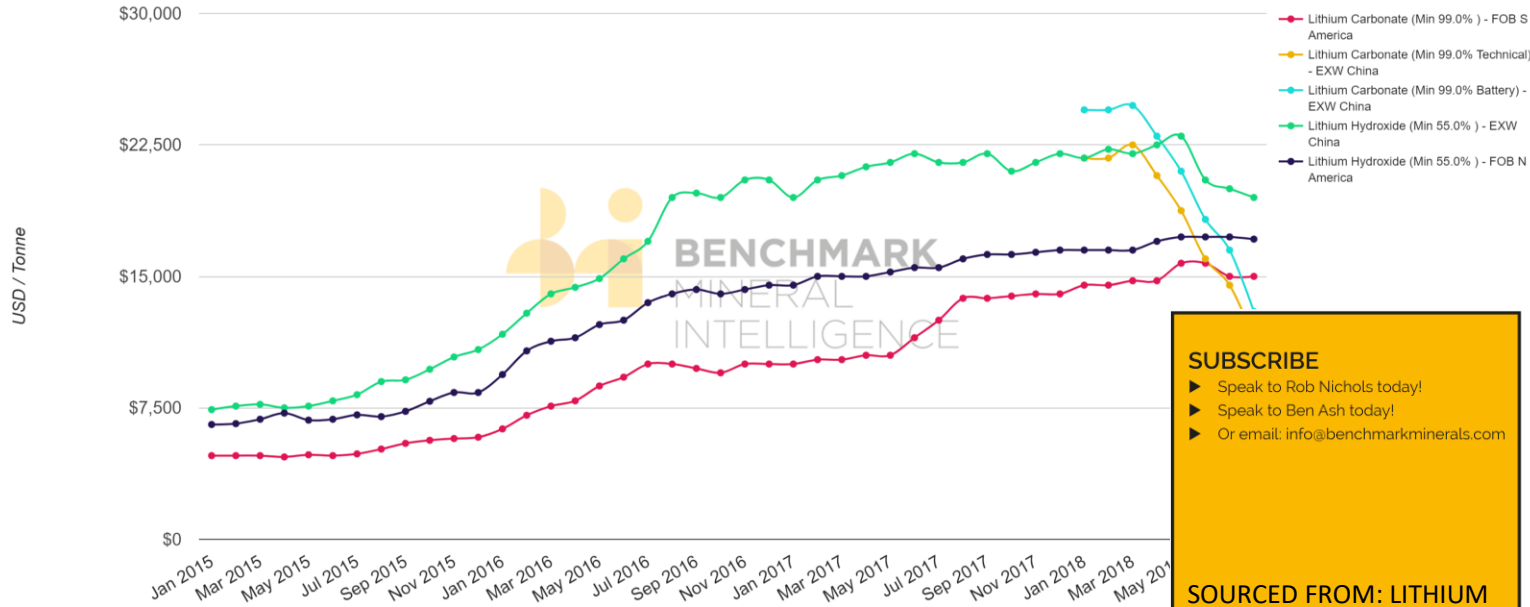
- CIF Asia
- EXW China
- CIF EU
- FOB S America
- CIF N America
- FOB N America
- FOB Australia

WHAT WOULD YOU LIKE TO DO?

DOWNLOAD IMAGE

DOWNLOAD DATA

Lithium Prices: Jan 2015 - Aug 2018



**SUBSCRIBE**

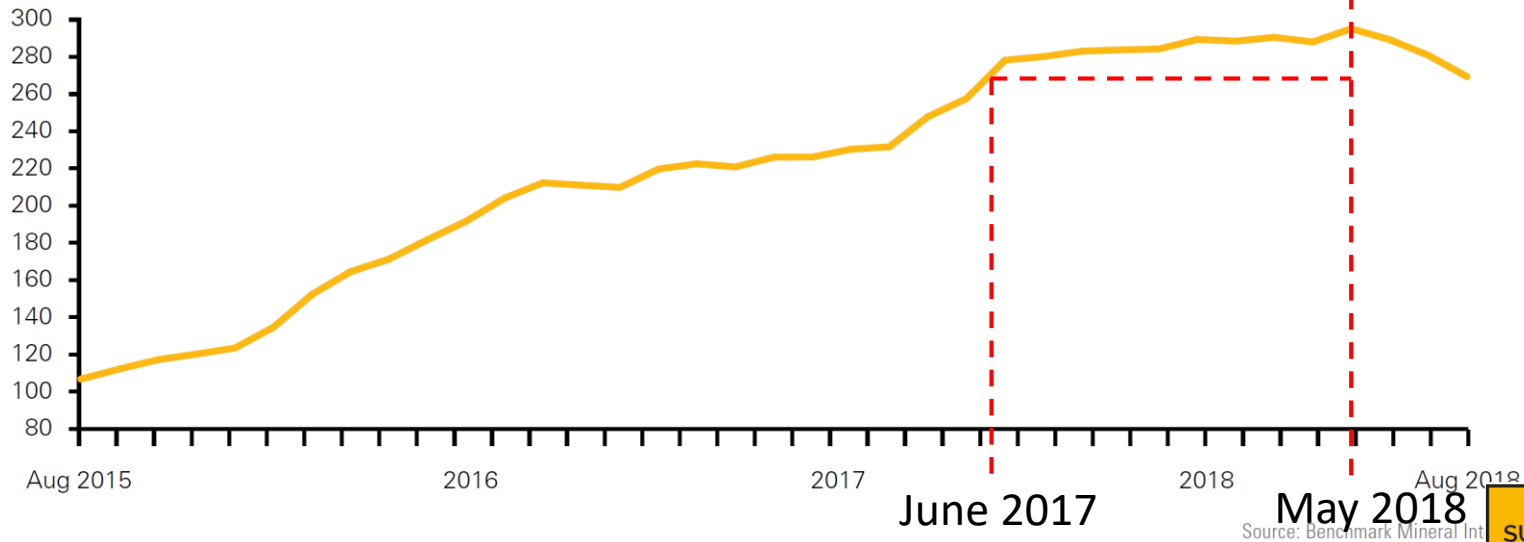
- ▶ Speak to Rob Nichols today!
- ▶ Speak to Ben Ash today!
- ▶ Or email: [info@benchmarkminerals.com](mailto:info@benchmarkminerals.com)

**SOURCED FROM: LITHIUM PRICE ASSESSMENTS**

# Benchmark Minerals Lithium Price Index @ June 2017 levels



## Benchmark Lithium Price Index



	1M	Y-O-Y	YTD	TODAY	LAST
LITHIUM INDEX	-4.1%	-3.2%	-6.9%	270.1	281.6

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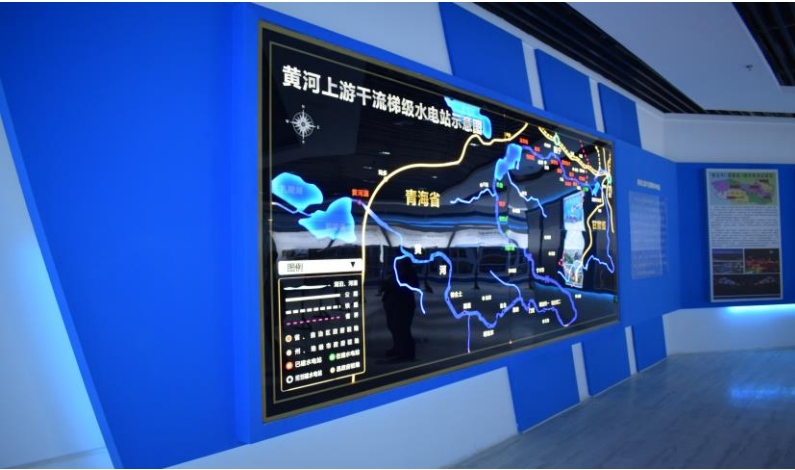
SOURCED FROM: LITHIUM PRICE ASSESSMENTS

# China Lithium Prices Down: Why?

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# China Lithium Prices Down: Why?



- New supply from **Qinghai, China**
  - Technical grade not battery grade
  - 2017: 15,000 tpa / 25-30,000 tpa
  - Not as easy to upgrade to battery grade
  - Low quality carbonate = feedstock for hydroxide
- Supply from: Fozhao, Citic – established producers
- Major recent rain flood event may delay new volumes in H2
- Demand for EV historically very soft in Q1/Q2 and very strong in Q3/Q4

## Further reading: Lithium

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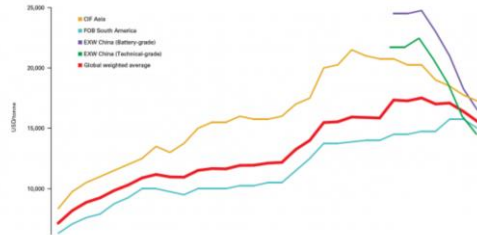
### PLIGHT OF THE PRA AND HOW BENCHMARK BECAME THE LITHIUM INDUSTRY'S REFERENCE PRICE

© 4th June 2018 [Batteries](#), [Chile](#), [China](#), [Disruptive technology](#), [Energy storage](#), [EV](#), [Lithium](#), [Minerals](#), [Supply Chain](#), [Uncategorised](#) [Benchmark Mineral Intelligence](#)

**SINCE ITS INCEPTION IN 2014, THE RISE OF BENCHMARK MINERAL INTELLIGENCE AS THE LITHIUM INDUSTRY'S REFERENCE PRICE HAS BEEN THE IDEAL CASE STUDY FOR HOW THE COMMODITIES PUBLISHING INDUSTRY IS CHANGING.**

[CLICK TO READ http://www.benchmarkminerals.com/plight-of-the-pra-and-how-benchmark-became-the-lithium-industrys-reference-price/](http://www.benchmarkminerals.com/plight-of-the-pra-and-how-benchmark-became-the-lithium-industrys-reference-price/)

## Further reading: Lithium



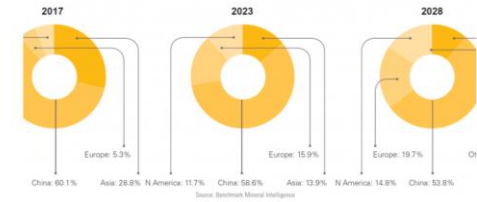
CHINA'S LITHIUM PRICE DECLINE IS NOT THE FULL PICTURE TO AN INDUSTRY SURGING

© 20th August 2018 | Lithium, Uncategorized | Andy

[CLICK TO READ: http://www.benchmarkminerals.com/chinas-lithium-price-decline-is-not-the-full-picture-to-an-industry-surgin/](http://www.benchmarkminerals.com/chinas-lithium-price-decline-is-not-the-full-picture-to-an-industry-surgin/)



[CLICK TO READ http://www.benchmarkminerals.com/teslas-gigafactory-to-be-worlds-biggest-battery-plant-but-china-will-dominate-electric-vehicle-lithium-ion-production-for-next-decade/](http://www.benchmarkminerals.com/teslas-gigafactory-to-be-worlds-biggest-battery-plant-but-china-will-dominate-electric-vehicle-lithium-ion-production-for-next-decade/)



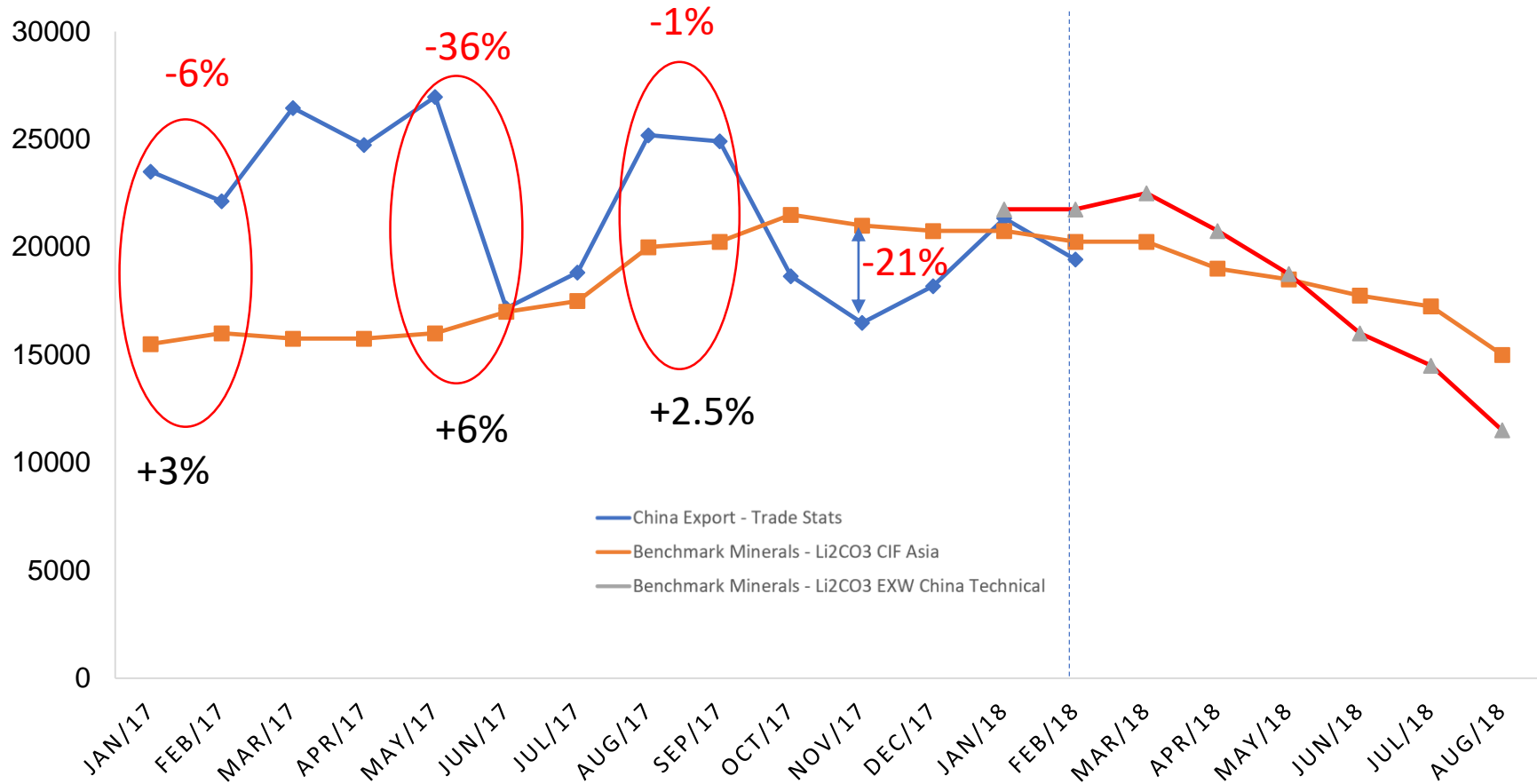
TESLA'S GIGAFACTORY TO BE WORLD'S BIGGEST BATTERY PLANT, BUT CHINA WILL DOMINATE ELECTRIC VEHICLE LITHIUM ION PRODUCTION FOR NEXT DECADE



## Why can't you trust trade statistics?

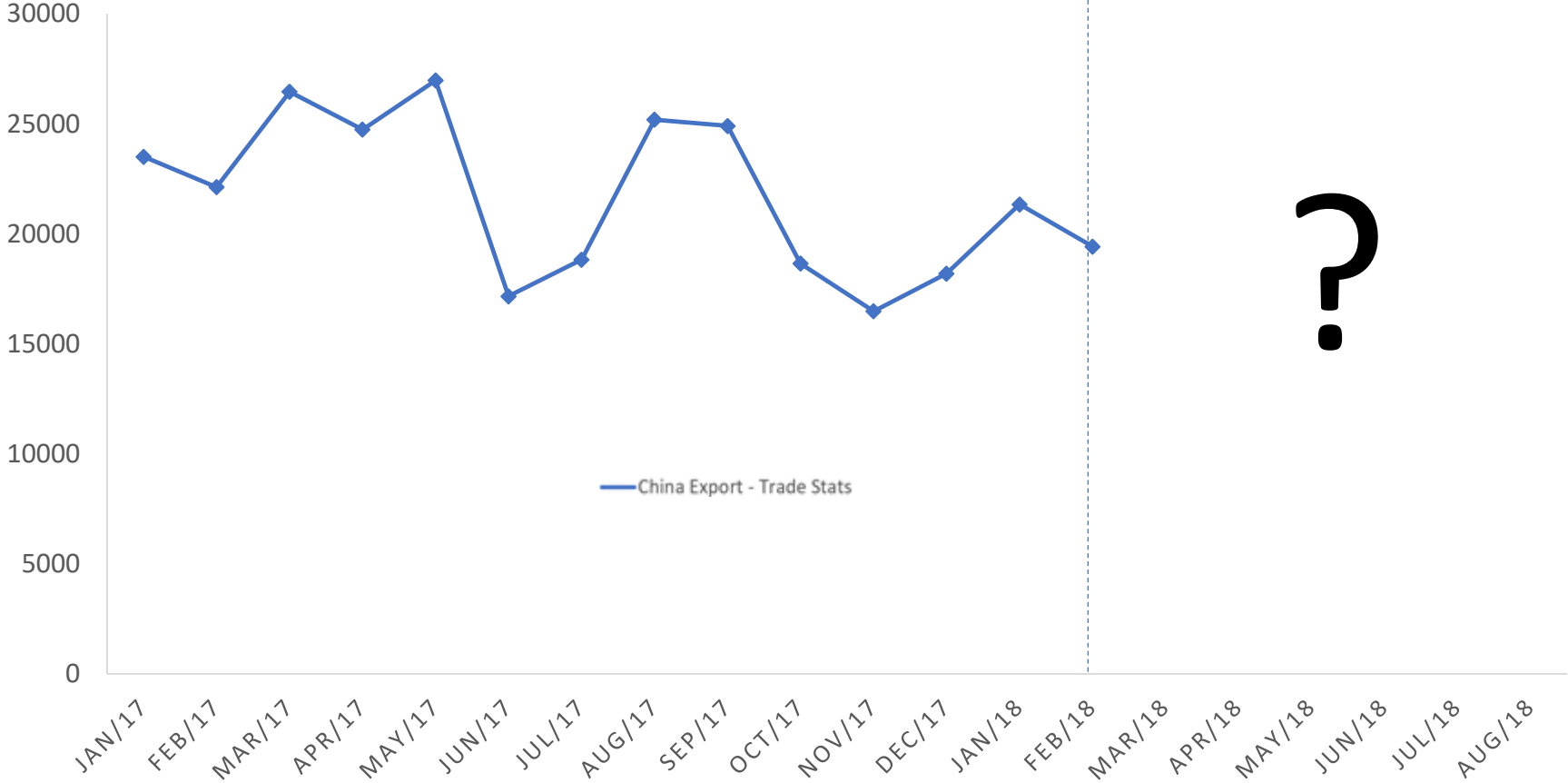


# China trade stats is not the price to tie a contract to



China trade stats is not the price to tie a contract to

### China has blocked data since February...



**How do we collect our lithium prices?**

**Our lithium prices are collect the same way the oil industry started**

Developed by lithium experts for lithium ion supply chain



Telephone



Electronic



Travel / In Person



Australia



Chile



China



Argentina



**LITHIUM PRICE DATA**

What do we do with our lithium price data?

## LITHIUM PRICE DATA

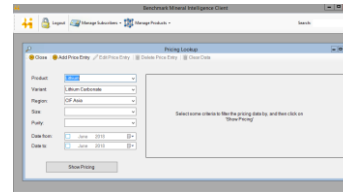


**“Assessed” or Judged Internally each month**

*“What is the prevailing / fair price range for each grade?”*



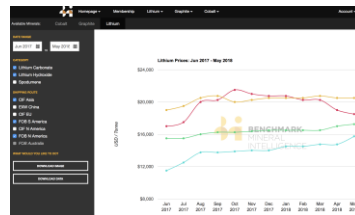
Audit trail



Evidence saved / logged



**The World’s Lithium Reference Price**





# What Lithium prices do we have?

## 1. Lithium Prices by Grade

# 1. Lithium Prices by Grade

## If you need a specific trade route...

- Benchmark Minerals publishes 11 Lithium Prices / Grades
  - 6 Lithium Carbonate
  - 4 Lithium Hydroxide
  - 1 Spodumene

### SUBSCRIBE

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SOURCED FROM: LITHIUM  
PRICE ASSESSMENTS

### LITHIUM GRADES

Benchmark tracks 11 lithium chemical grades which reflect the bulk of traded material in the market. We categorise the grades primarily by end use/where it is consumed. These chemicals are:

#### LITHIUM CARBONATE

Lithium Carbonate, FOB South America  
Lithium Carbonate, CIF North America  
Lithium Carbonate, CIF Asia  
Lithium Carbonate, CIF Europe  
Lithium Carbonate, EXW China (Battery grade)  
Lithium Carbonate, EXW China (Technical grade)

#### LITHIUM HYDROXIDE

Lithium Hydroxide, FOB North America  
Lithium Hydroxide, CIF Asia  
Lithium Hydroxide, CIF Europe  
Lithium Hydroxide, EXW China

#### LITHIUM FEEDSTOCK

Spodumene concentrate, FOB Australia

#### STANDARD SPECIFICATION:

LITHIUM CARBONATE	
Formula	$\text{Li}_2\text{CO}_3$
$\text{Li}_2\text{CO}_3$ content	Min 99.0%
Particle size	<40 $\mu\text{m}$
Common impurities	Na, K, Ca, Cl, $\text{SO}_4$

#### STANDARD SPECIFICATION:

LITHIUM HYDROXIDE	
Formula	$\text{LiOH}$
LiOH content	Min 55.0%
Particle size	<40 $\mu\text{m}$
Common impurities	Na, K, Ca, Cl, $\text{SO}_4$

#### STANDARD SPECIFICATION:

LITHIUM CONCENTRATE	
Formula	$\text{Li}_2\text{O}$
$\text{Li}_2\text{O}$ content	6%
Particle size	< 75 $\mu\text{m}$
Common impurities	$\text{Al}_2\text{O}_3$ , $\text{SiO}_2$

# 1) Lithium Prices by Grade

You can lift these specific prices from our online database

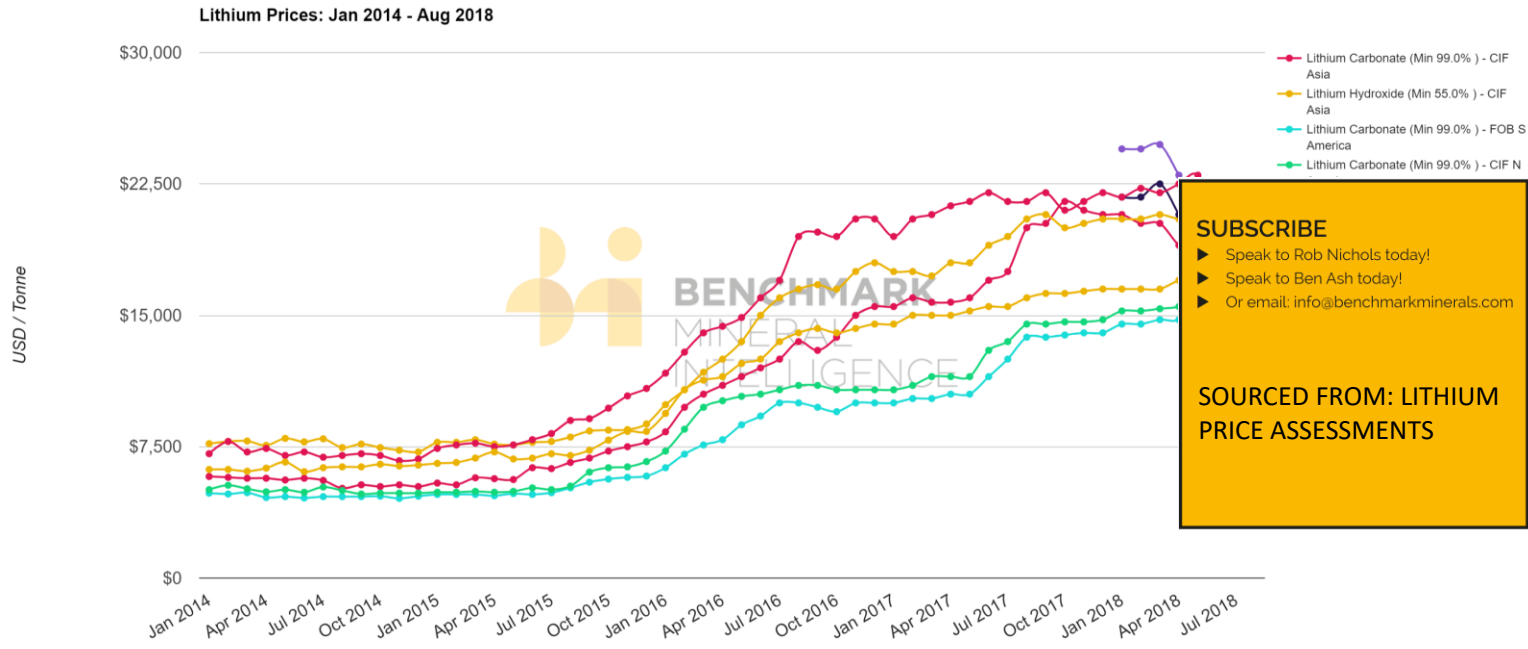
Available Minerals: Cobalt **Lithium**

DATE RANGE  
Jan 2014 to Aug 2018

CATEGORY  
 Lithium Carbonate  
 Lithium Hydroxide  
 Spodumene

SHIPPING ROUTE  
 CIF Asia  
 EXW China  
 CIF EU  
 FOB S America  
 CIF N America  
 FOB N America  
 FOB Australia

WHAT WOULD YOU LIKE TO DO?



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**SOURCED FROM: LITHIUM PRICE ASSESSMENTS**

## 2. Lithium Prices by Weighted Average

## If you need just one Carbonate or Hydroxide Price...

August 2018  
Assessment

LITHIUM CARBONATE (WEIGHTED AVERAGE)	
Current price	\$14,350
Last price	\$15,563
% change	-7.79%

LITHIUM HYDROXIDE (WEIGHTED AVERAGE)	
Current price	\$18,588
Last price	\$18,863
% change	-1.46%

SPODUMENE CONCENTRATE (6% Li <sub>2</sub> O)	
Current price	890
Last price	915
% change	-2.73%

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SOURCED FROM: LITHIUM  
PRICE ASSESSMENTS

### 3. Lithium Prices by Index

#### **SUBSCRIBE**

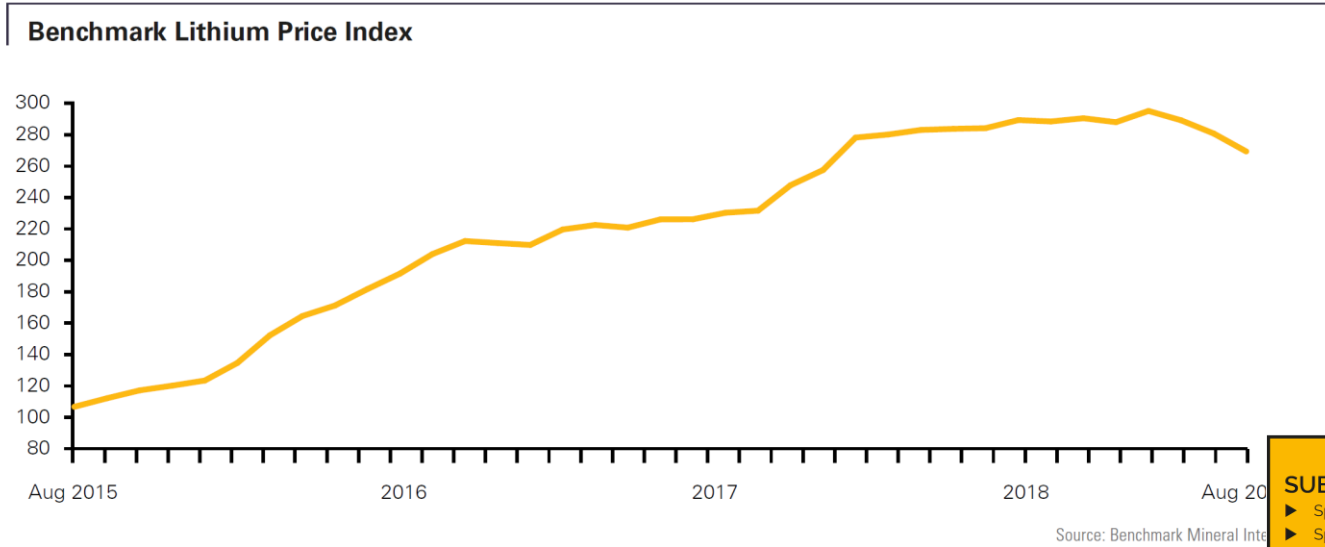
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**SOURCED FROM: LITHIUM  
PRICE ASSESSMENTS**



### 3. Lithium Prices by Index

If you need to track price movements of all LCEs



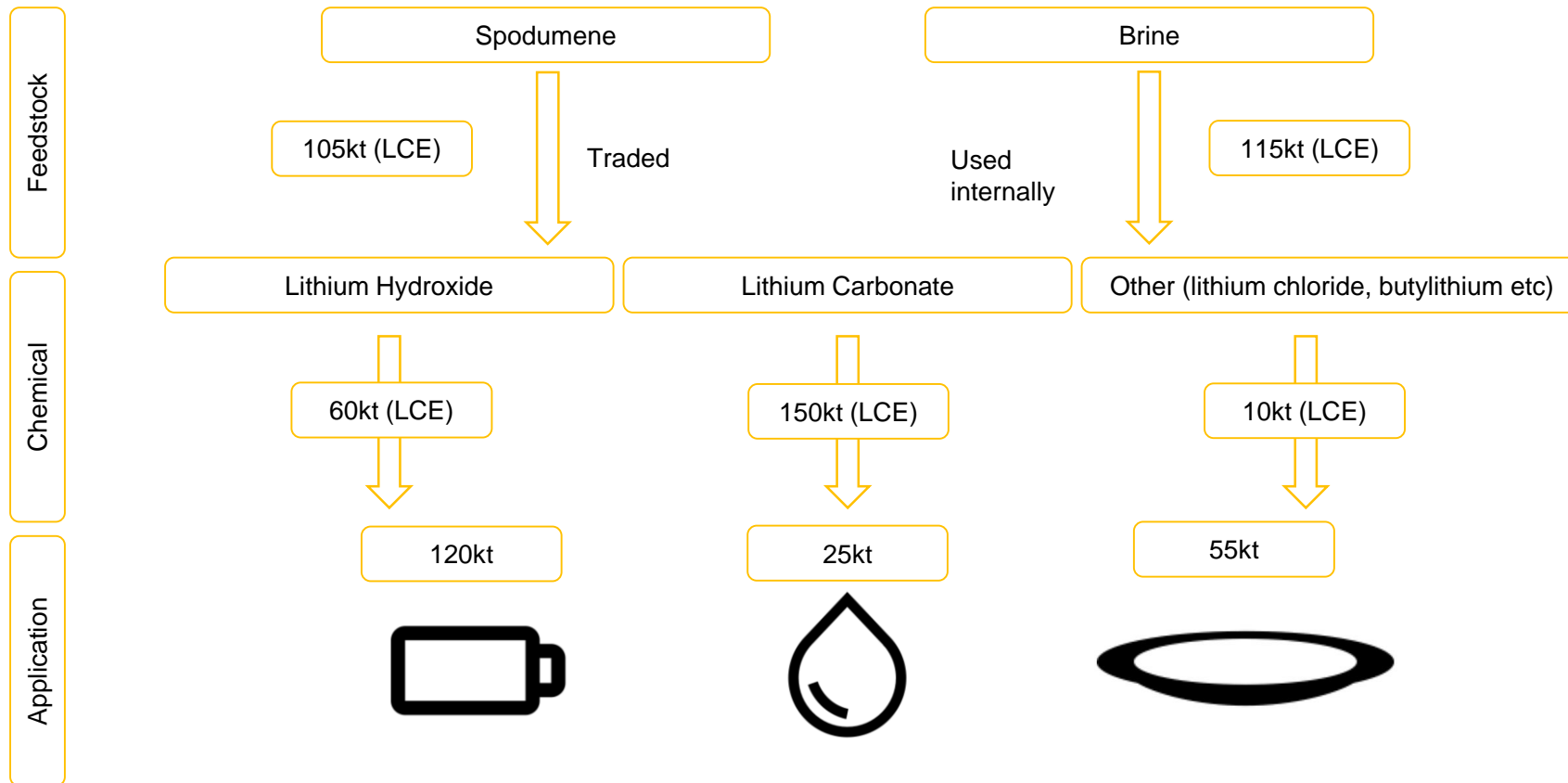
	1M	Y-O-Y	YTD	TODAY	LAST
LITHIUM INDEX	-4.1%	-3.2%	-6.9%	270.1	281.6

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**SOURCED FROM: LITHIUM PRICE ASSESSMENTS**

# Lithium Volumes in 2017



**Benchmark pricing is accepted and trusted by the lithium ion supply chain as the industry's only reference price**

## Who uses our prices?

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The press:



**WALL STREET  
JOURNAL**

*The  
New York  
Times*

**Bloomberg**

**QUARTZ**

**The  
Economist**

Licensers:

**Bloomberg  
Intelligence**



**THOMSON REUTERS**

+ 1 Major Provider

Financial institutions:

Deutsche Bank



**UBS**

The industry:



- ❖ Working with companies across the supply chain to integrate our prices into industry contracts

**How can you use our lithium prices in your contracts?**

## 1. Direct Price Usage Per Grade:

**Gives specific prices, region by region**  
**Good for: Specific contracts, short term deals (1 year)**

Lithium Carbonate, EXW China, Battery Grade, 99.0%, August 2018: \$13,000

\$12,000      \$13,000      \$14,000  
LOW            MID POINT        HIGH

**Use any of the range**

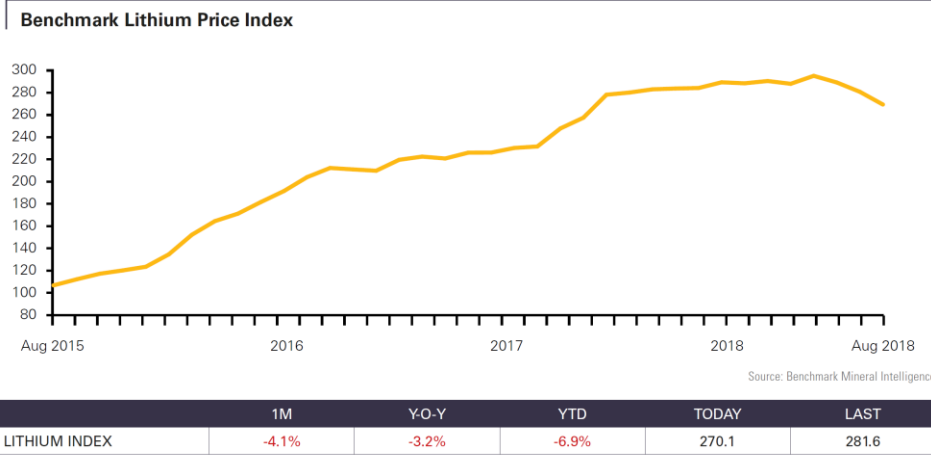
August to September ↓ 21%

**Start at your own price point  
and tie to % up or down**

## Indexing Average Global Average Movements:

**Decreases volatility & gives global trend not regional**  
**Good for: Long term, multi-year contracts (3, 5, 10 years)**

### Benchmark Lithium Price Index



**OR**

### Weighted Carbonate / Hydroxide Averages

LITHIUM CARBONATE (WEIGHTED AVERAGE)	
Current price	\$14,350
Last price	\$15,563
% change	-7.79%

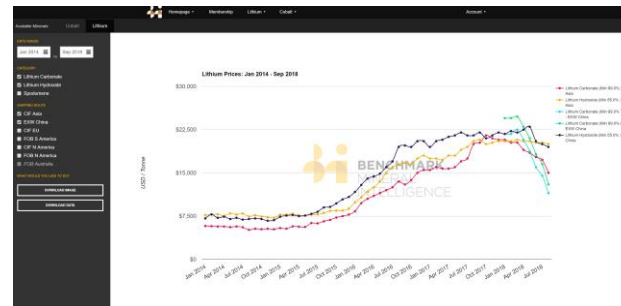
LITHIUM HYDROXIDE (WEIGHTED AVERAGE)	
Current price	\$18,588
Last price	\$18,863
% change	-1.46%

We have three types of Lithium Price Groups

There is zero additional cost to use our prices in contracts

Benchmark also offers free, impartial advice on contracts under NDA.

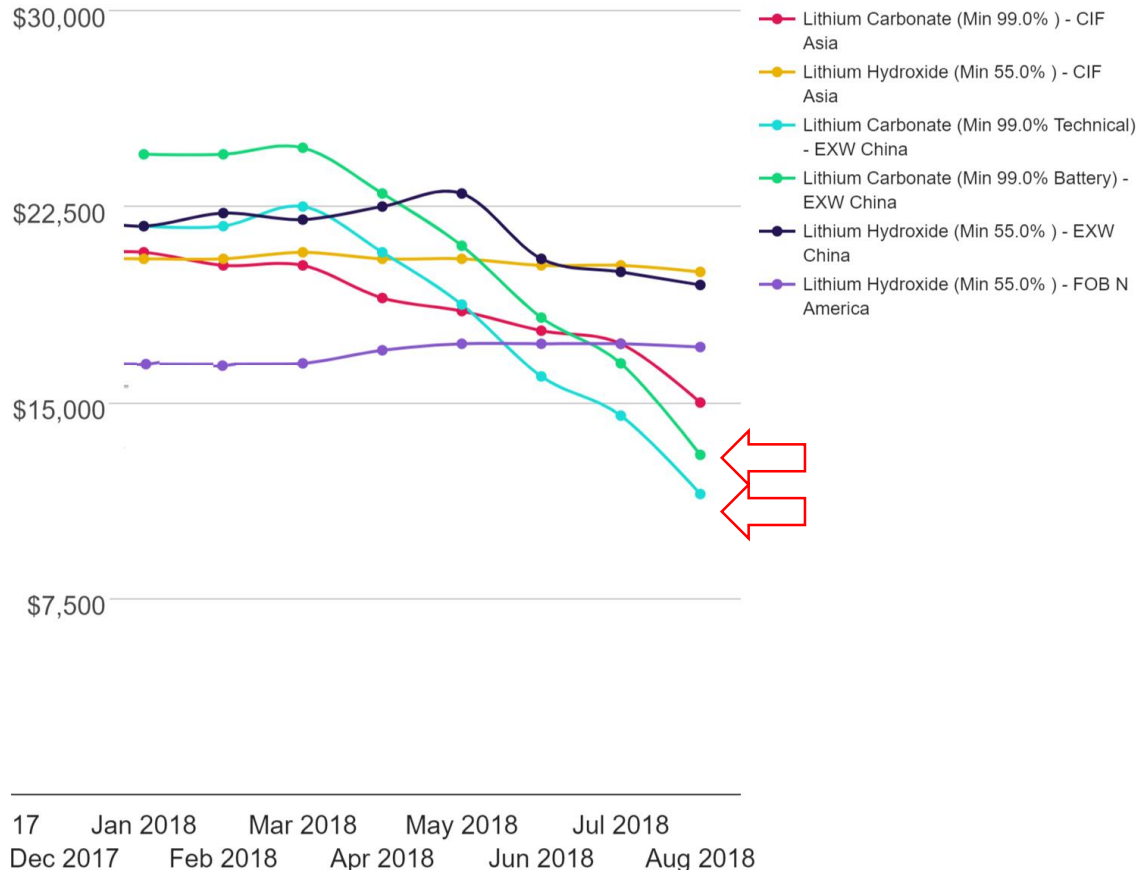
You just need to subscribe...





## Lithium today: The ideal time to get deals done

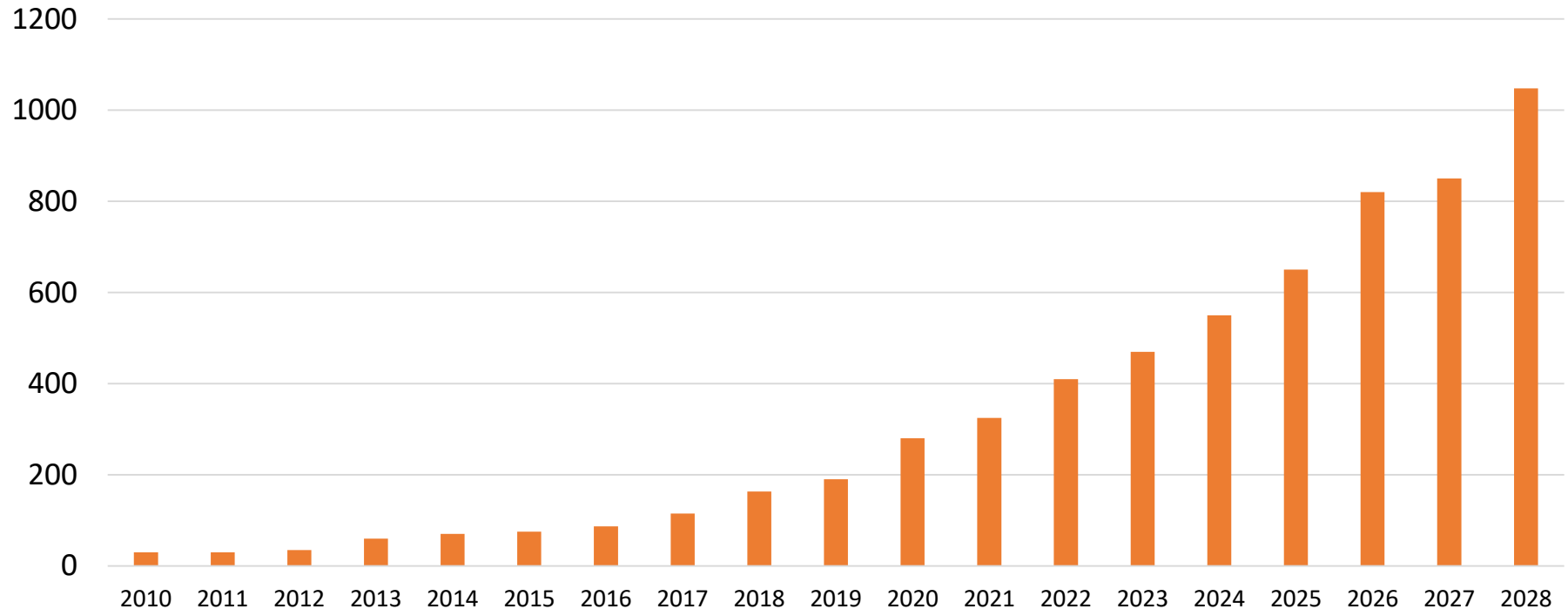
## Supply: Lithium price @ more reasonable levels



### SUPPLY:

- Strong likelihood China carbonate prices will act as a drag on ROW in Q4
- Low Chinese carbonate prices will be used to renegotiate down spodumene prices for 2019
- New volumes from SQM / ALB in Chile in H2, extraction rates increased
- What is a fair lithium **carbonate** price? Many in China believe \$10-12/kg and **hydroxide** at \$12-14/kg
- Benchmark's belief: Carbonate \$11-14/kg and Hydroxide \$15-17/kg

## Demand: Lithium ion battery capacity growth 2010 to 2028



- Major supply contracts agreed start in 2019 – Ganfeng / LG Chem @ 47,600 (hydroxide)
- Rise of the lithium ion battery megafactories continues – Caspar will explore
- Tesla alone will consume 26,000 tones lithium hydroxide @ Gigafactory in 2019
- 2019 still the year where true EV demand will not have yet hit the market – **time to do deals!**

**Benchmark Minerals is the world's lithium reference price**

# Newport Beach, California 22-25 October 2018

[www.benchmarkminerals.com/events](http://www.benchmarkminerals.com/events)



**GRAPHITE +  
ANODES 2018**



**CATHODES**  
2018

