

Global Lithium Market Outlook: Projects and Strategies to 2020 for a New Era of Demand

- Where are the prices of lithium derivatives likely to go over the next 10 years?
- With the pace of electric vehicle development what does the future hold for carbonate demand?
- Is Afghanistan really the new Saudi Arabia? Where does Argentina stand on new supply?
- What is Chile's future as it considers lifting the Atacama ban?

NEW
FOR 2011

Global Lithium Market Outlook: Projects and Strategies to 2020 for a New Era of Demand

Lithium enters a new era...

Following sluggish growth of lithium consumption from 1984 to 1993, demand soared from 1994 to 1997 in response to the advent of monochromatic computer monitors. Although consumption declined in the late-1990s, demand has strengthened in response to the emergence of the lithium-ion battery in portable electronics.

Lithium-ion batteries are widely used in cell phones, digital cameras, and power tools replacing the traditional nickel-cadmium (Ni-Cd) and nickel-metal hydride (Ni-MH) technology.

Today 90% of all laptops and around 60% of cellular phones contain a lithium compound in their batteries. The use of lithium in aluminium production on the other hand appears to be in permanent decline.

Until 1997 production and supply of lithium was firmly established in the USA, Russia, Chile, Australia, China, Zimbabwe and Canada.

Traditionally, lithium was extracted mainly from lithium oxide found in hard rock minerals such as spodumene, petalite, or lepidolite, commonly found in pegmatite rock. In 1997 the Chilean fertilizer company, SQM entered the market by producing lithium chloride as a co-product with potassium chloride from brines in the Salar de Atacama region and then processed it into lithium carbonate.

As a low cost, high volume producer of lithium carbonate, SQM drove the market price of lithium down by over 50%, forcing the reduction or closure of the higher cost operations – mainly spodumene – in many of these countries. SQM established Chile as the single most important producer of lithium and the brine deposits of the Atacama Desert as the world's most number one source.

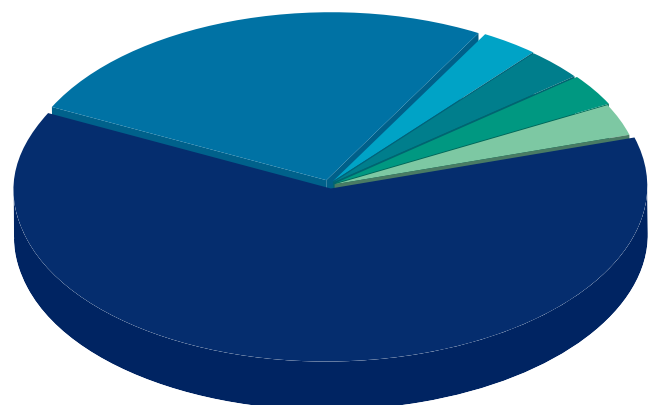
It has been over a decade since SQM entered the market and changed the shape of the industry. Since this time the price of lithium carbonate has recovered an average of \$5,749/t between 2008 and 2010.

Lithium prices not only held their own during the recent financial crisis, but improved to over \$6,000/t for LCE while other metals were in free-fall. At these prices we are experiencing a resurgence of the hard rock producer – competing head to head with brine producers for their share of the battery market.

Additionally countries such as Argentina are earnestly investing in their respective lithium industries, while technologies capable of extracting lithium carbonate from clay, geothermal brines and jadarite are all making significant headway.

Rincon Lithium was the first of a new generation of lithium juniors to start producing carbonate at the end of 2010. **The development means a new era in the industry is undisputedly underway.**

The world's lithium reserves by deposits



Continental Brines	62%
Hard Rock (pegmatite, spodumene)	26%
Geothermal Brines	3%
Oilfield Brines	3%
Hectorite	3%
Jadarite	3%

The last two years have seen the lithium industry go from obscurity to becoming the world's most talked about resource. The rate of exploration, resource development, government incentives and intervention and electric vehicle progress has never been seen before in the lithium industry.

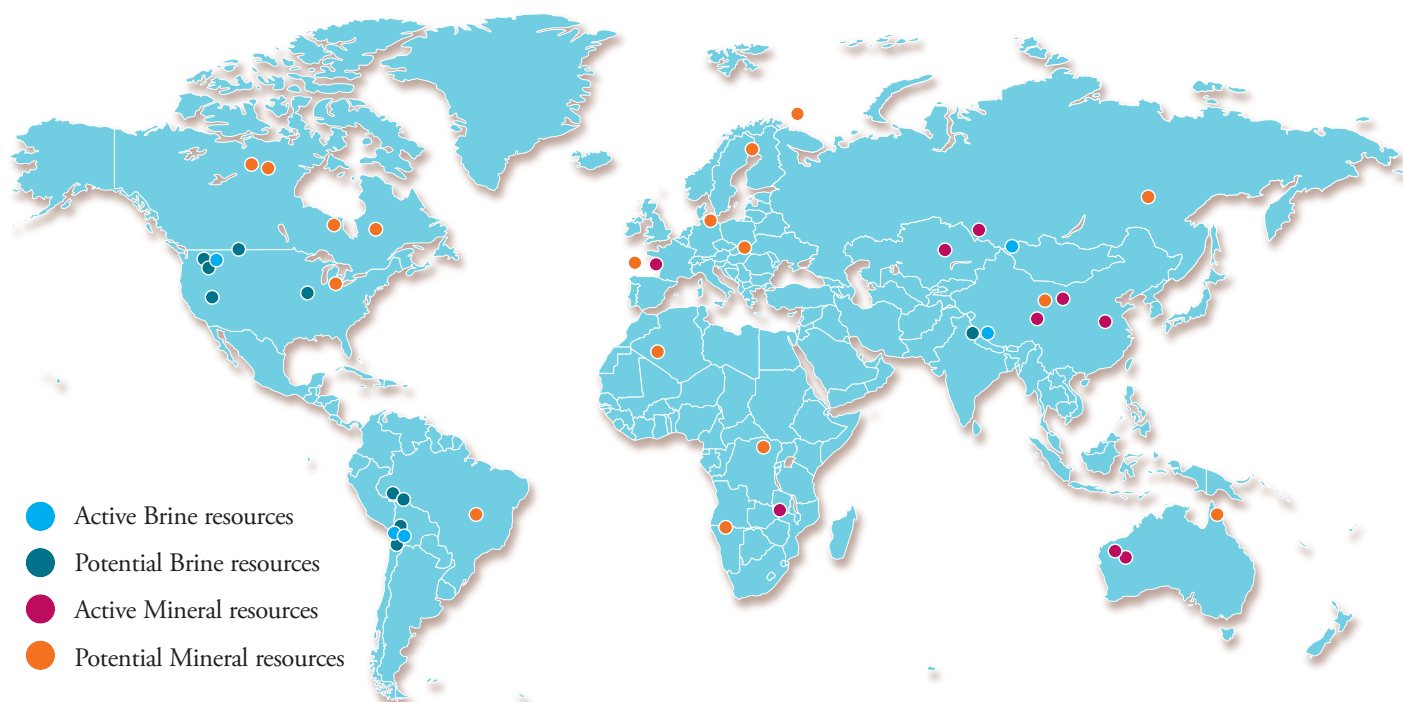
The NEW *Global Lithium Market Outlook: Projects and Strategies to 2020 for a New Era of Demand* is a much needed study, with over **250 pages of detailed analysis and market forecasts included.**

Why is this new study ground-breaking?

Metal Bulletin Research has conducted interviews with over 75 producers, end-users and key players in the lithium industry. With the focus on lithium carbonate, chloride and hydroxide new critical analyses and projections include:

- Comprehensive supply and demand forecasts by major country out to 2020;
- Lithium carbonate price forecasts out to 2020;
- In-depth analytical focus on Chile, Afghanistan, China and Argentina;
- The impact of hybrid and full electric vehicles to the lithium market – the emergence of the Nissan LEAF;
- A unique ground-floor up-analysis of the global electric vehicles' market with specific data revealed including detailed analysis and forecasts of emerging electric vehicles' potential by car model, analysis of kWh data and the specific volume unit lithium demand per car model;
- Full analysis of the trends in battery recycling on lithium demand;
- SWOT analysis for leading lithium producers including SQM, Chemetall, FMC and more;
- In depth analysis of glass, aluminium, pharmaceuticals, and portable electronics;
- Detailed independent recommendations on competitive strategies to be adopted by producers and investors.

Supply of Lithium

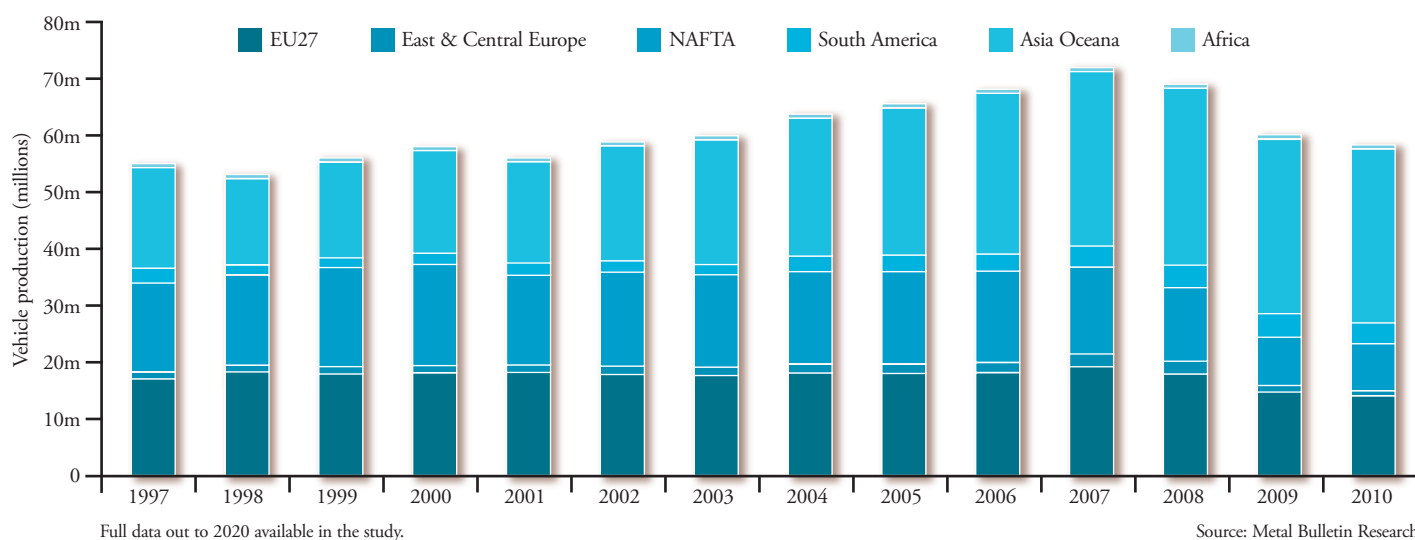


This study will reflect on the developments of the lithium industry and consider the likely outcome over the next ten years.

It will demonstrate electric vehicle demand through analysis of the electric vehicle market, estimating how many of each vehicle models will be produced and the amount of lithium required. Additionally we consider other key end-user markets for this important mineral and thus provide you with a thorough understanding of lithium demand dynamics.

It is evident that we are entering a paradigm shift with respect to how we fulfil our energy requirements and this brings with it significant investment opportunity.

Global vehicle production impacting future lithium demand



Biographies of authors

Lara Smith

*BSc (Chemistry, Statistics, Economics),
Bcom. Hons (Financial Analysis & Portfolio Management)*

Lara worked as a mining analyst for Beny Steinmetz Advisory Services, which specialised in exploration and production and bulk and base metals, uranium and diamonds in Africa and the Baltic regions. Whilst under their employment she completed in-depth research into the viability of expanding the current commodity portfolio to include a lithium deposit. Since this time, Lara has undertaken a number of research projects, most recently advising on development of a hard-rock lithium deposit in the DRC. She has also been invited as a keynote speaker at the 2011 Mining Indaba to present on the prospects of the lithium and rare earths markets.

Edson Mutyavaviri

*MBA, Bcom Hons (Accounting), CFA level 3 candidate,
Post Graduate Diploma in Management*

Edson is the co-author of the 2011 Lithium study – *Global Lithium Market Outlook: Projects and Strategies to 2020 for a New Era of Demand*. Having worked as a management consultant for over seven years in Zurich, London, South Africa and Zimbabwe, Edson brings a wealth of experience in analysis of company strategies to the fore. Edson has undertaken a number of consultancy projects, in the resource sector with specific emphasis on mineral developments in Africa. Most recently, Edson undertook an in-depth analysis on the feasibility of developing a hard-rock lithium deposit in the DRC.

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Brian is the Head of Research at Metal Bulletin Research. He has undertaken numerous major studies on the global steel, raw materials and finished product industries and has done extensive consultancy and market research work for a number of major steel producers and consumers as well as for financial institutions. He has presented papers at leading industry events on developments in the global steel industry.

Mike O' Driscoll

Editor of Industrial Minerals

MSc (Mining Geology), BSc (Geology & Geography)

Mike has been analysing the non-metallic minerals industry for 22 years and has been Editor of Industrial Minerals since 1995. During his career, Mike has visited a wide range of mineral and end-user operations worldwide, and has regularly organised, chaired and presented papers at industry conferences. He was Associate Editor and contributing author to the 7th edition of Industrial Minerals & Rocks, published by the Society for Mining, Metallurgy and Exploration (SME) in 2006.

Simon Moores

Industrial Minerals Lithium Market Specialist

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Simon was Industrial Minerals' lithium analyst from 2006-2010 writing regular global reviews and market comment on this rapidly developing market. He was a co-founder of the Lithium Supply & Markets series of conferences and co-chaired these events.

Simon has visited the brine extraction operations of SQM and Chemetall in the Salar de Atacama and the corresponding lithium carbonate processing facilities in Antofagasta, Chile. In addition he has visited the USA's only Lithium plant in Nevada.

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