

Argus White Paper:

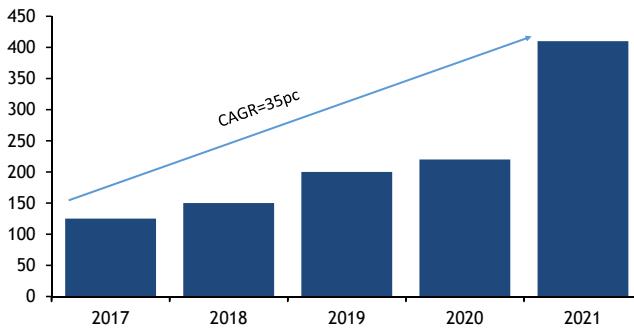
Rapid changes driving need for new lithium concentrate pricing



China's lithium consumption is on the rise, driven by a sharp increase in demand from industries that rely on the metal for battery production — most notably new energy vehicles (NEVs), but also the so-called '3C' sectors (communications, computers and consumer electronics). As this demand outpaces supply, increasingly volatile prices require new tools to manage.

China is the largest lithium salts producer in the world and its consumption for lithium feedstocks grew at an average rate of 35pc/yr in 2017-21. Rapid growth is likely to continue, and even accelerate, in the next few years as China rushes to achieve its target of hitting peak carbon dioxide emissions by 2030 and carbon neutrality by 2060. Beijing wants NEVs to make up 20pc of the country's vehicle sales by 2025, and 40pc by 2030.

Lithium feedstock consumption in China '000t LCE



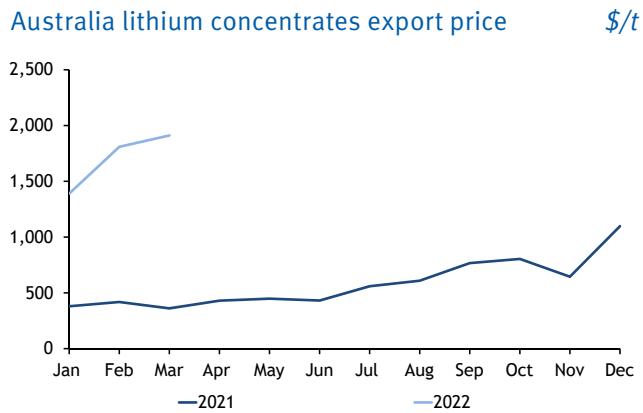
Yet despite being the largest global producer of salts, China imports lithium concentrate (spodumene) to satisfy demand that its own resources cannot meet. Recently, however, a shortfall in new feedstock projects coming on stream has resulted in supply chain bottlenecks. With availability tight, prices have risen and import prices have become increasingly volatile.

Spodumene concentrate prices have been climbing since early last year. Export prices from Australia averaged \$380/t

in January 2021, but topped \$1,000/t in December 2021, and then soared to \$1,911/t in March 2022 — a 400pc gain over 15 months.

Spodumene pricing is changing

Security of supply has become a top priority for lithium-ion battery and electric vehicle (EV) makers worldwide. And the lithium industry has been calling for greater transparency around spodumene pricing to better understand lithium products costs.



Lithium concentrate producers typically sell feedstock through offtake agreements with converters. But according to market participants, there is currently a disconnect between longer-dated spodumene offtake pricing arrangements — which reference lithium chemical pricing inputs — and the emerging spodumene spot sales market. For example, Australian spodumene producer Pilbara Minerals last year restarted

its Ngungaju Plant, which will lead to a ramp-up in capacity to 180,000-200,000 dmt/yr by mid-2022 after it restarted its operation last year. But with none of these concentrates notionally committed to any offtake arrangements, there will probably be more hitting the spot market.

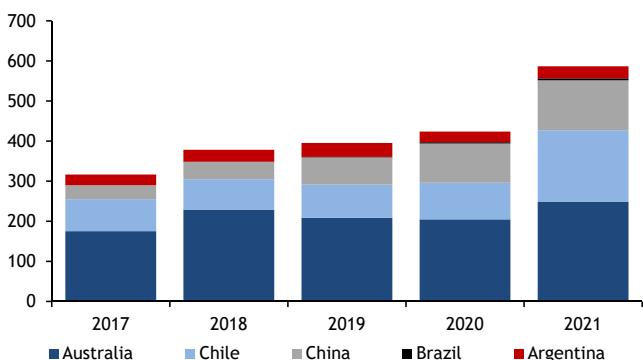
As spot trades grow in share, there will be a greater need for more transparent and flexible pricing for spodumene to reflect market changes in a timely manner. It was against this backdrop that *Argus* on 17 May launched a lithium concentrate (spodumene) cif China assessment to help market participants keep track of lithium feedstock prices.

The new assessment for lithium concentrate (spodumene), 6pc Li₂O cif China, will be published every Tuesday via the *Argus Metals International* (AMI) service, and accompanies *Argus*' existing comprehensive coverage of the global lithium complex, including:

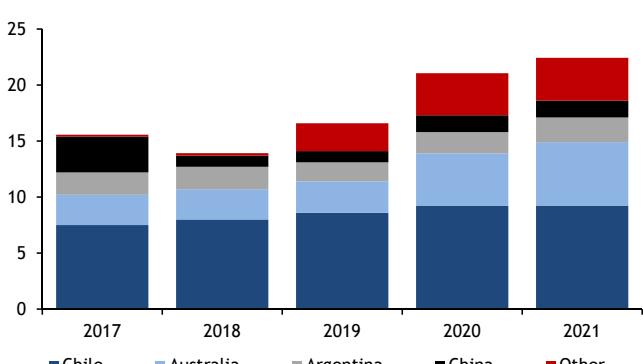
- Lithium carbonate min 99.5pc cif China
- Lithium carbonate min 99.5pc ex-works China
- Lithium cobalt oxide min 60pc Co ex-works China
- Lithium hydroxide min 56.5pc ex-works China
- Lithium hydroxide min 56.5pc fob China

Full methodology available on request.

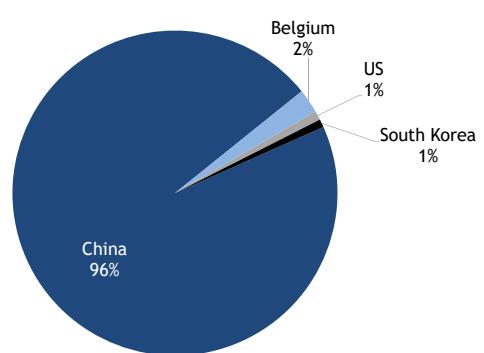
World lithium mined production '000t LCE



World lithium reserves mn t



Australia's spodumene export by proportion, 2021 %



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Spodumene capacity and capacity expansions					'000 t/yr
Country	Mine/Project	Company	Existing capacity	New capacity	Scheduled production start-up
Australia	Greenbushes	Talison Lithium	1,340	280 600	2022 2024
Australia	Mt Cattlin	Allkem	210	0	/
Australia	Mt Marion	MRL/Ganfeng	450	450	2022
Australia	Pilgangoora	Pilbara Minerals	330	220-250 100	2022 -
Australia	Wodgina	MRL/ALB	0	500 250	2022 2023
Australia	Bald Hill	Alita Resources	0	155	2022
Australia	Finniss	Core Lithium	0	175	Q4 2022
Australia	Kathleen Valley	Liontown	0	500	2024
DRC	Manono	AVZ Minerals	0	700	2023
Mali	Goulamina	Firefinch/Ganfeng	0	506 325	2024 -
Portugal	Mina do Barroso	Savannah Resources	0	175	2023
Brazil	Mibra Mine	AMG Lithium	90	40	2023
Canada	James Bay	Allkem	0	330	2024
Brazil	Grota do Cirilo	Sigma Lithium	0	230 230	4Q 2022 2023
Canada	Rose Lithium-Tantalum	Critical Elements Lithium	0	237	2023-2024
Canada	Authier/ North American Lithium	Sayona Mining	0	230	2023
Ethiopia	Kenticha	Abyssinian Metals Limited	0	200	2023

– Mt Marion's installed plant capacity is on track to reach 900,000 t/yr of mixed grade product, which is equivalent to around 600,000 t/yr of 6pc grade product, by the end of 2022

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