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ALUMINA
LIMITED

Global Bauxite Industry Update

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AWAC Joint Venture (Alumina Limited 40% interest)

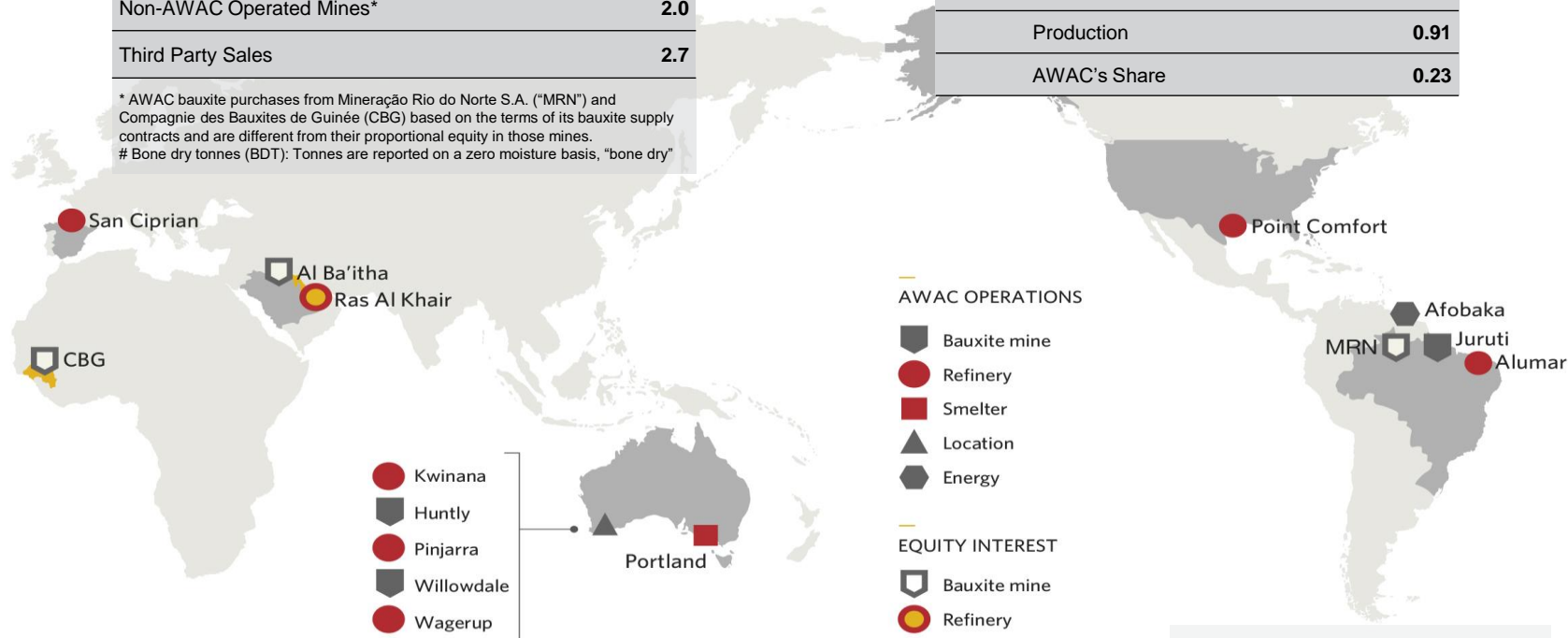
BAUXITE PRODUCTION (million BDT#)

	1H 2019
AWAC Operated Mines	19.9
Non-AWAC Operated Mines*	2.0
Third Party Sales	2.7

* AWAC bauxite purchases from Mineração Rio do Norte S.A. ("MRN") and Compagnie des Bauxites de Guinée (CBG) based on the terms of its bauxite supply contracts and are different from their proportional equity in those mines.
Bone dry tonnes (BDT): Tonnes are reported on a zero moisture basis, "bone dry"

ALUMINA PRODUCTION (million tonnes)

	1H 2019
AWAC Operated Refineries	6.2
Ma'aden Joint Venture	
Production	0.91
AWAC's Share	0.23



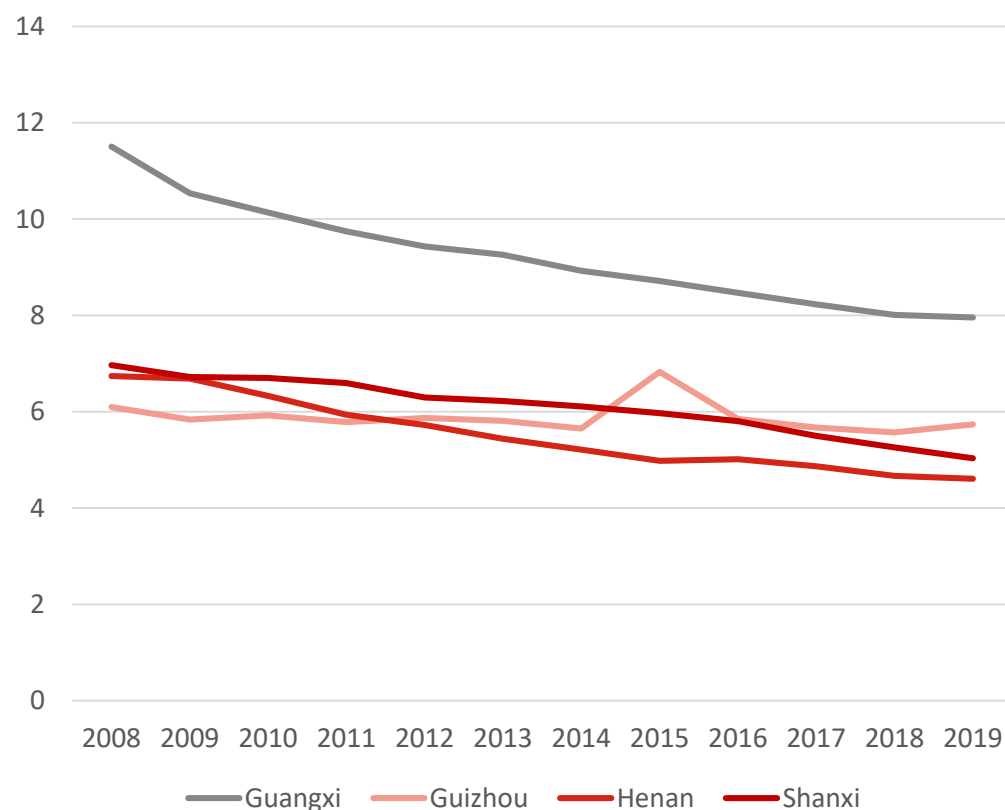
Alumina Limited net profit after tax of \$211 million (1H 2019)

2019 forecast third party bauxite sales 6.2 million BDT

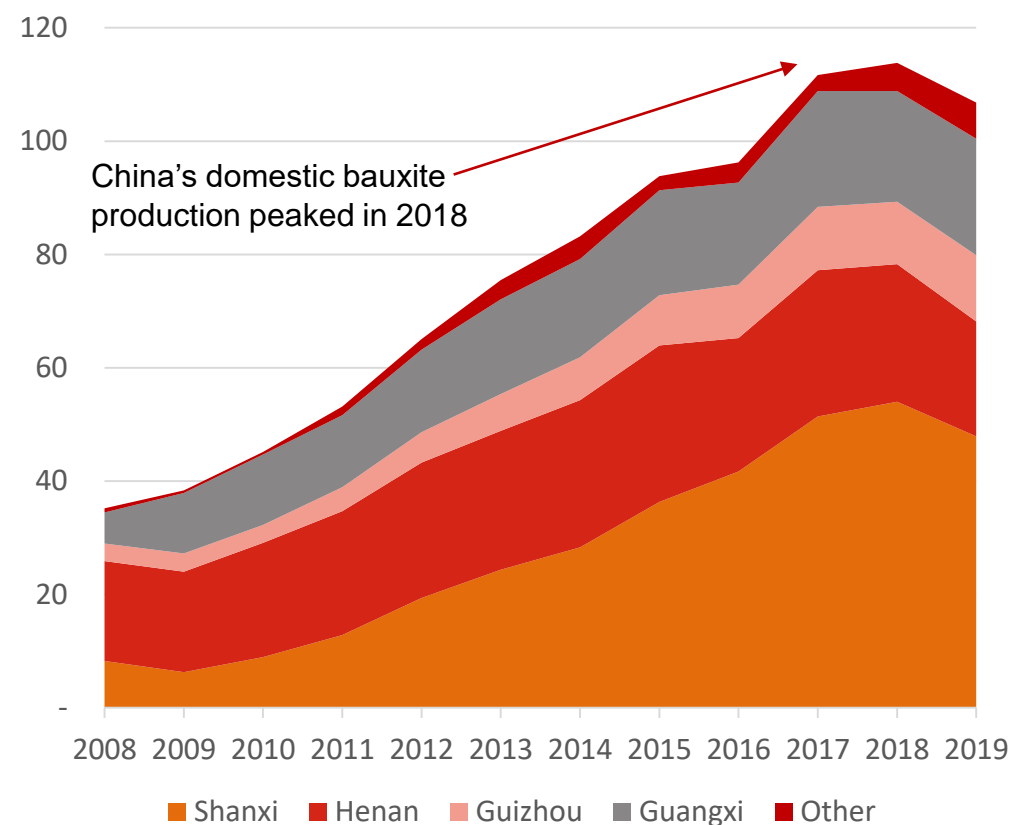
AWAC average alumina cash cost of production is \$218/t (1H 2019): lowest quartile global cash cost curve

Chinese domestic bauxite output peaked in 2018 – now declining on depleting reserves, lower grades and environmental constraints

Domestic bauxite grades (alumina to silica ratio) near uneconomic level in Henan, Shanxi

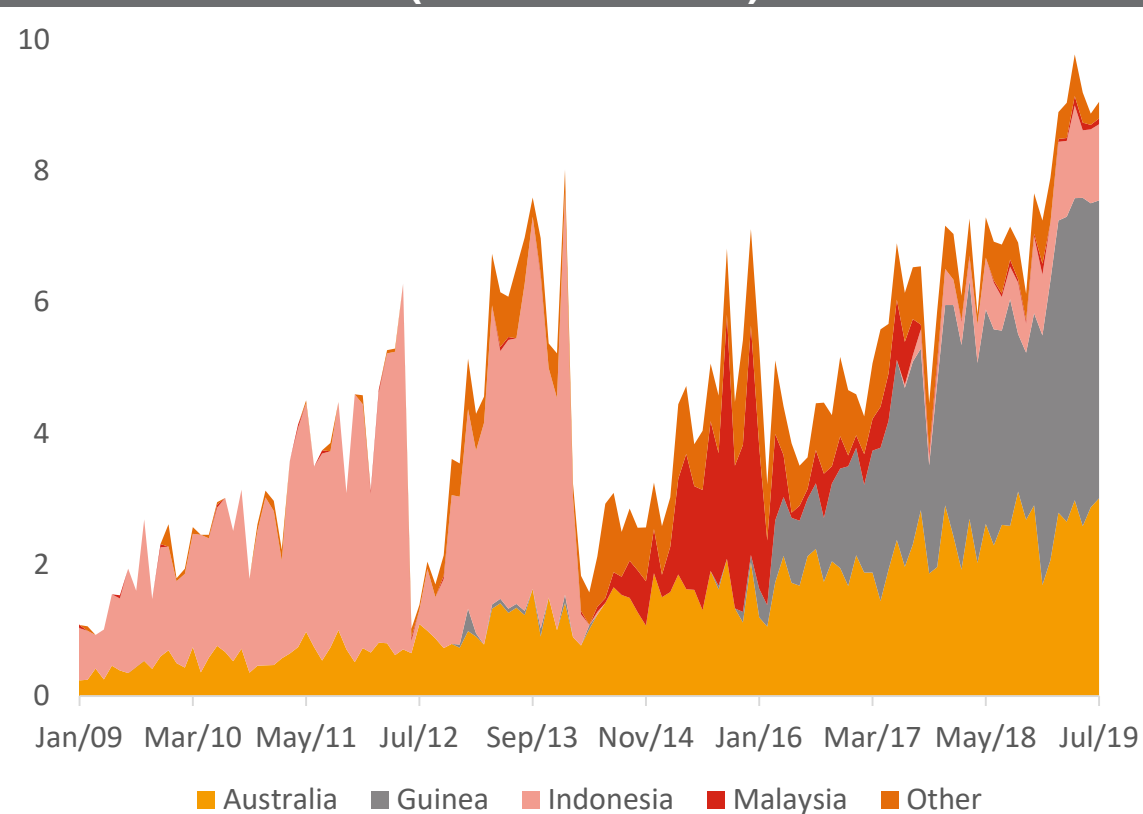


Historical Chinese domestic bauxite production (million dry tonnes)

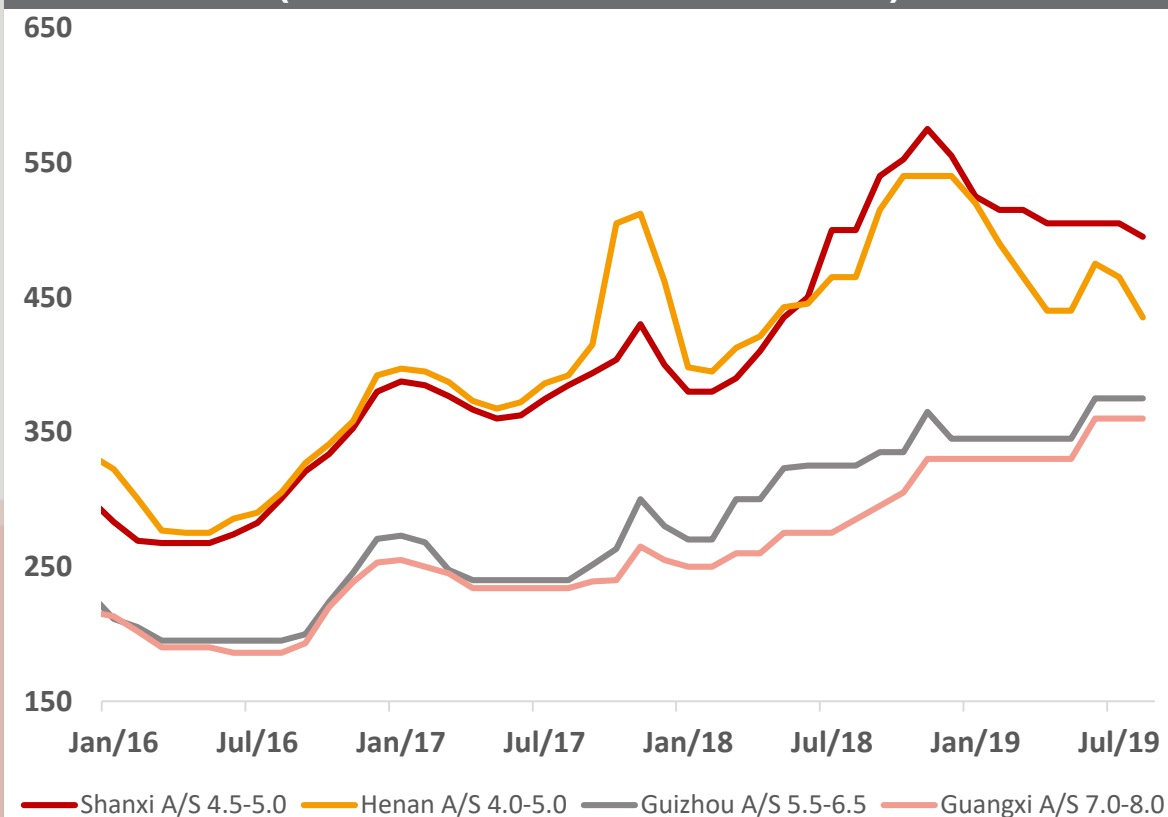


Chinese bauxite imports – increases from Guinea/Australia have replaced Indonesia/Malaysia as key sources; domestic price rises

**Chinese bauxite imports
(million tonnes)**

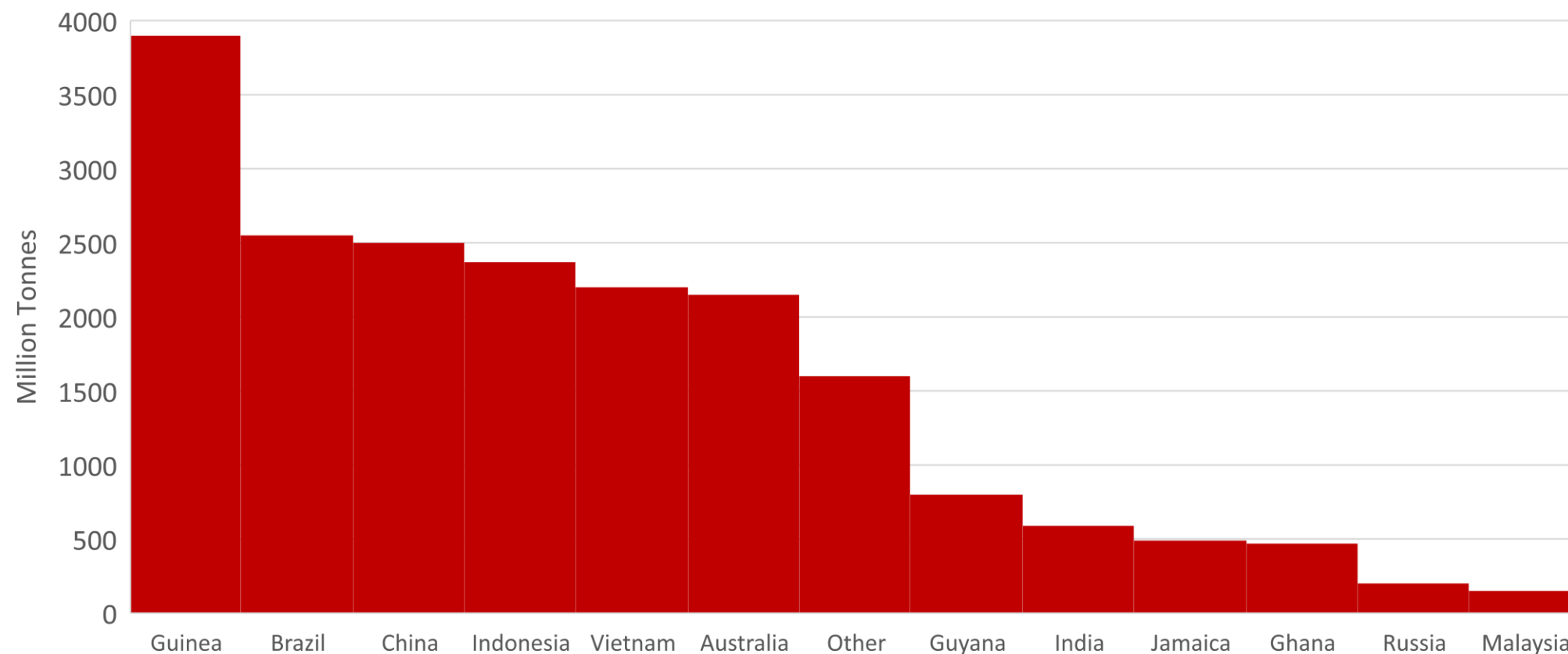


**Chinese domestic bauxite prices
(RMB/t delivered VAT included)**

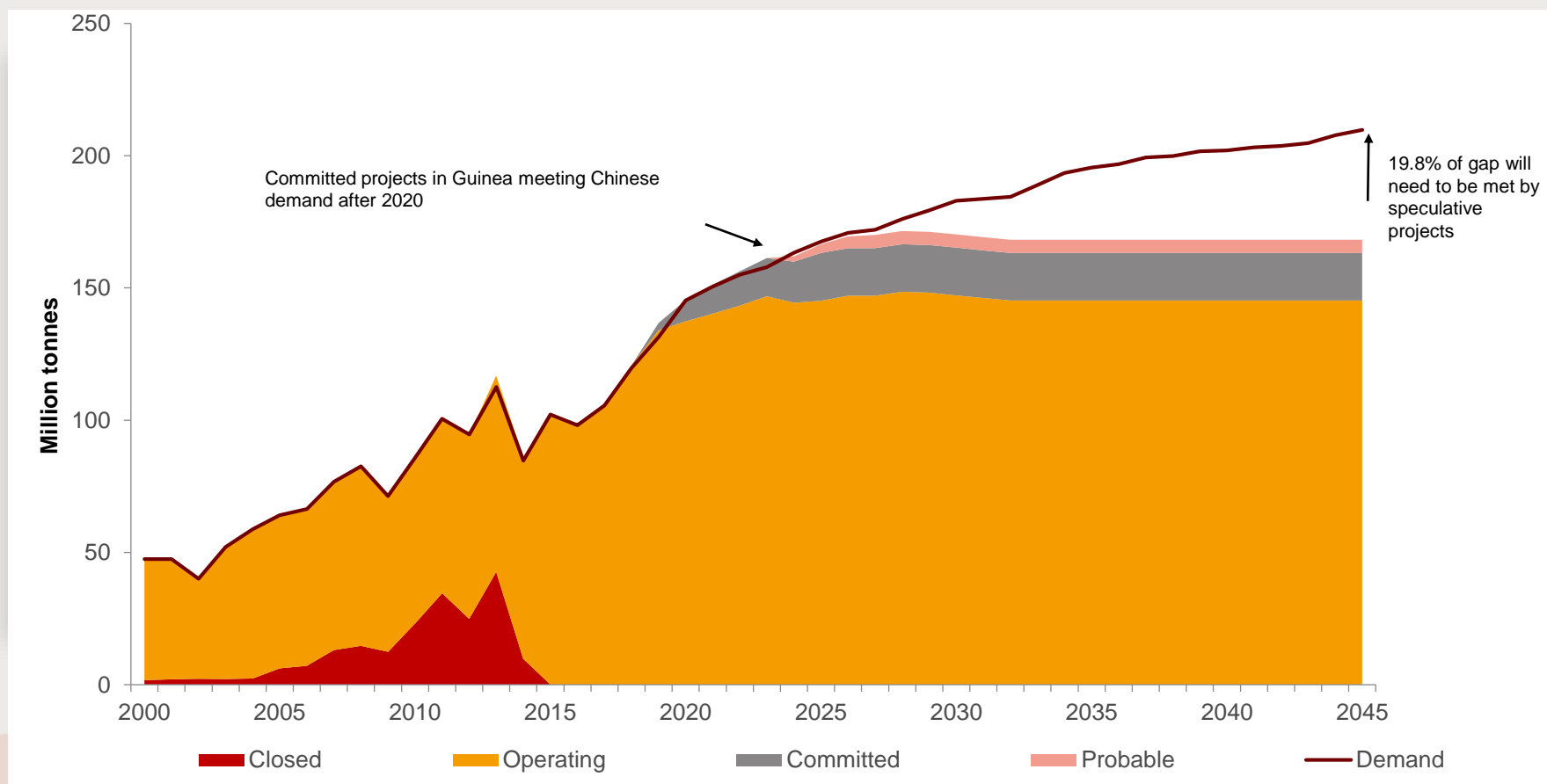


Ample global bauxite reserves – costs, logistics, sovereign issues, sustainability and competition will impact which reserves are developed

Global bauxite reserves can serve current alumina production rates for over 60 years



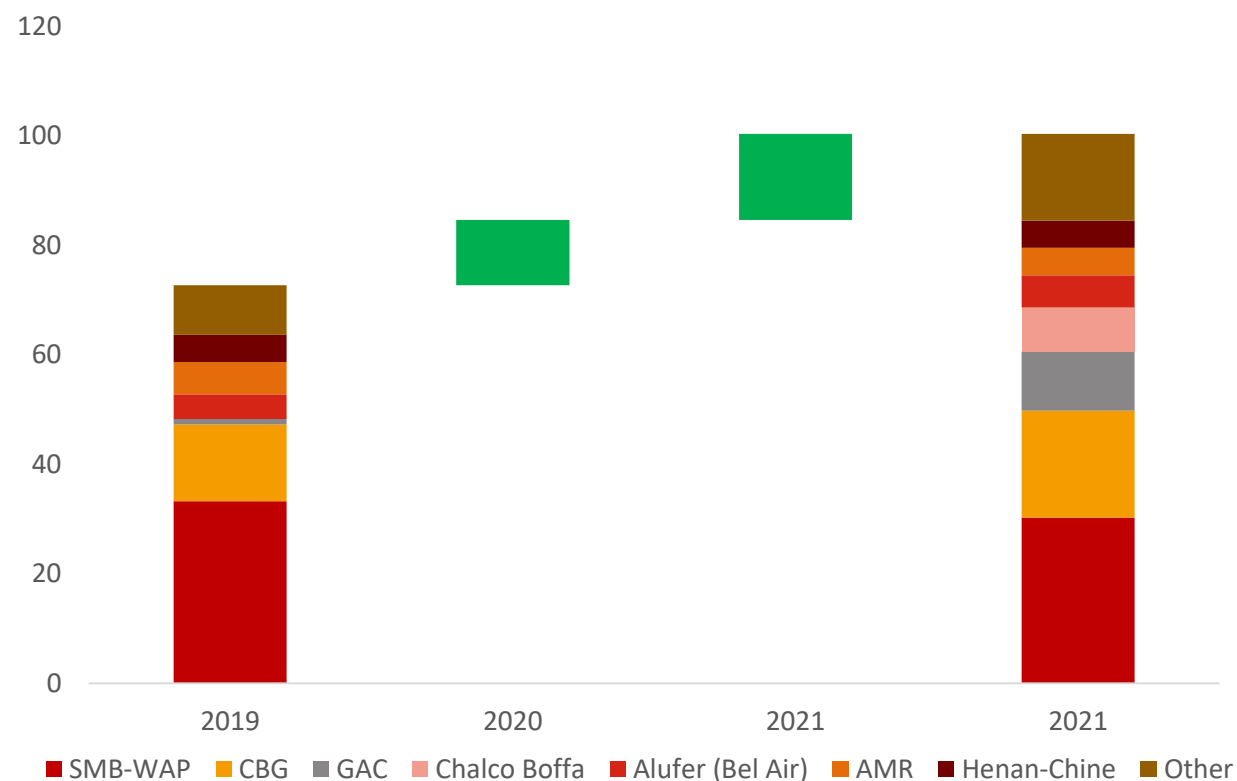
Global third party bauxite demand will be driven largely by China (and several new RoW refining projects in the next few years)



- Extra alumina production Al Taweelah (2m t) commissioning (at around 70%), Vedanta's Lanjigarh expansion (2m t) commissioning, PT Bintan Alumina Indonesia (1m t) under construction, Ketapang phase II (1m t) under consideration
- China's SGA production on-going growth forecast, totaling 70.6m t (2019), 74.4m t (2020) and 76.5m t (2021)

Guinean bauxite: not only larger miners but also marginal suppliers are likely to add supply over next two years

Forecast bauxite production in Guinea (million tonnes)



Project	2021 forecast production (million tonnes)
SMB-WAP	30.3
CBG	19.5
GAC	10.8
Chalco Boffa	8.1
Alufer (Bel Air)	5.9
AMR	5.0
Henan-Chine	5.0
other	15.8
Total	100.4

While little infrastructure was installed in Indonesia, Malaysia in their export heyday, significant infrastructure has been installed in Guinea

Concentration of risks for China in supply from Guinea

- Over half of import needs from a single country
- Guinean Government may require miners to refine in country (query availability of reasonable cost energy?)
- Guinean community, environmental expectations rising
- Greater freight cost exposure than Australasia



Bauxite barge, River Nunez



SMB Dapilon port, River Nunez, 22 million tpa capacity



SMB Katougouma port, River Nunez, Boké: 19 million tpa capacity

Responsible sourcing is another key to success



West Kalimantan, Indonesia, 2014



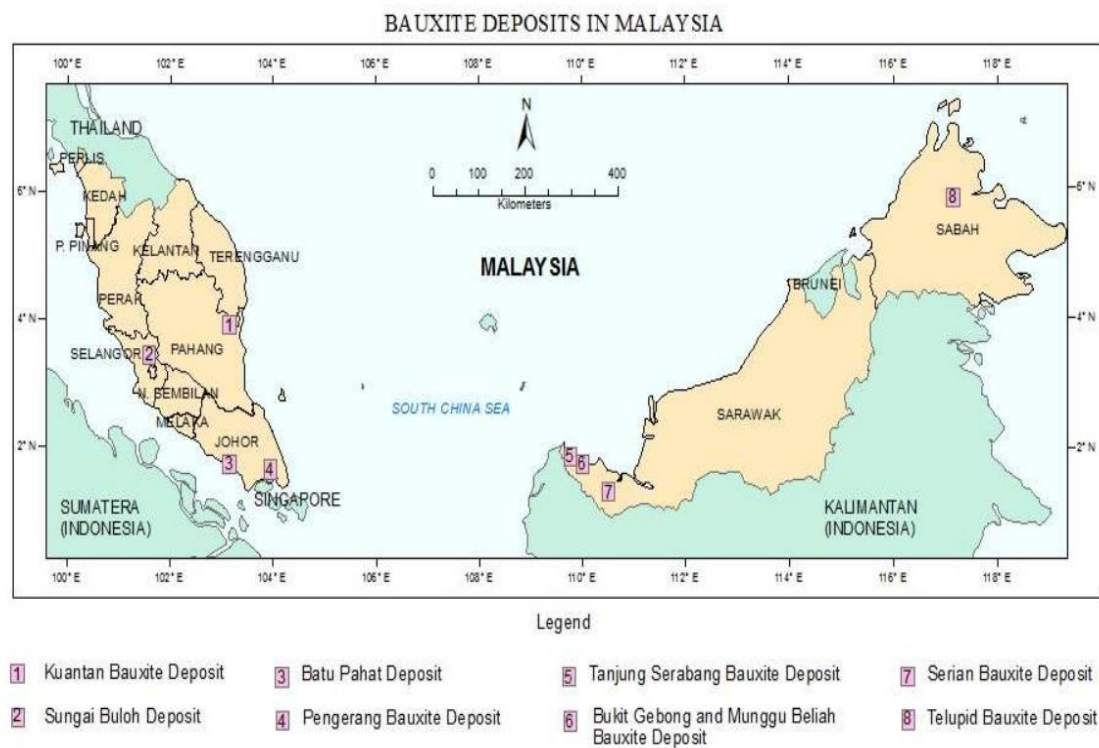
Kuantan, Malaysia, 2015



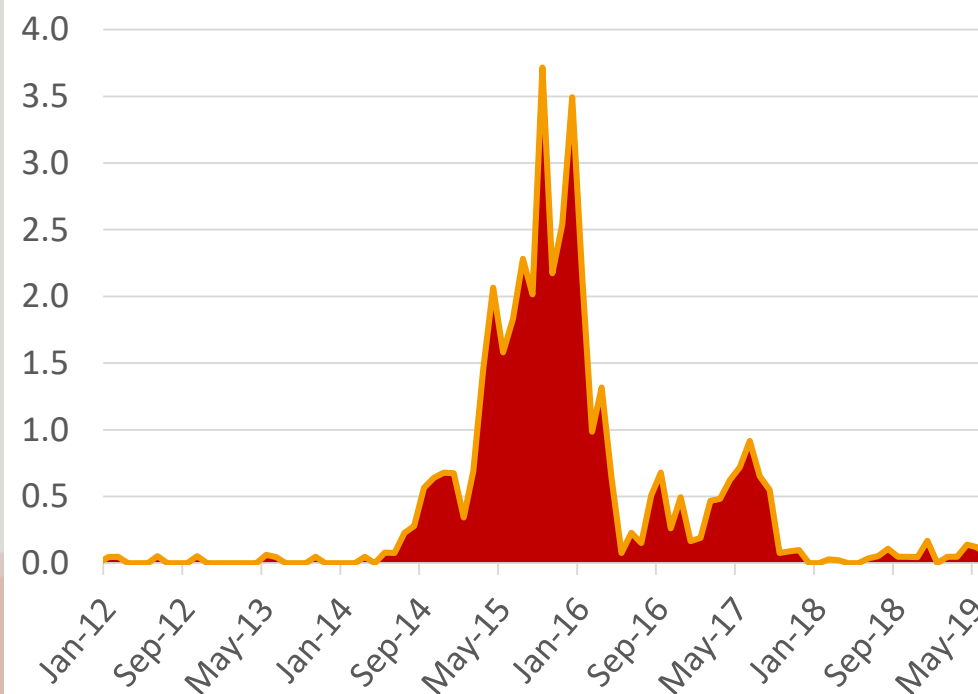
Sangaredi, Guinea, 2018

- Malaysia faced environmental issues after intensive bauxite mining and washing in 2015
- As a direct consequence, Malaysian government introduced a mining ban
- New projects in Guinea reportedly have higher environmental standards and, with no bauxite washing, there are no tailings dams (saving of cost and risk)
- With increasing awareness by local governments, responsible, sustainable mining is another key to success for potential new bauxite projects

Lifting of Malaysian mining ban and potential acceleration of Indonesian export ban unlikely to significantly impact the market

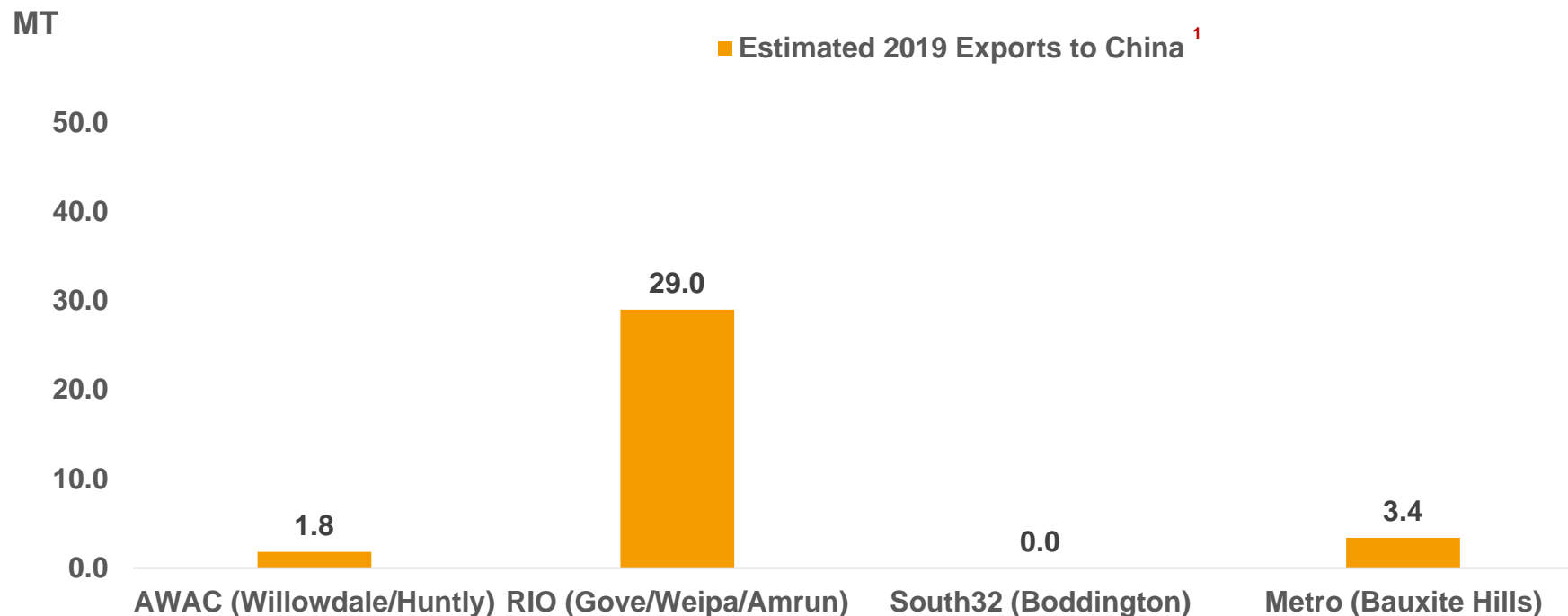


Malaysian Bauxite Exports to China (Million Tonnes)



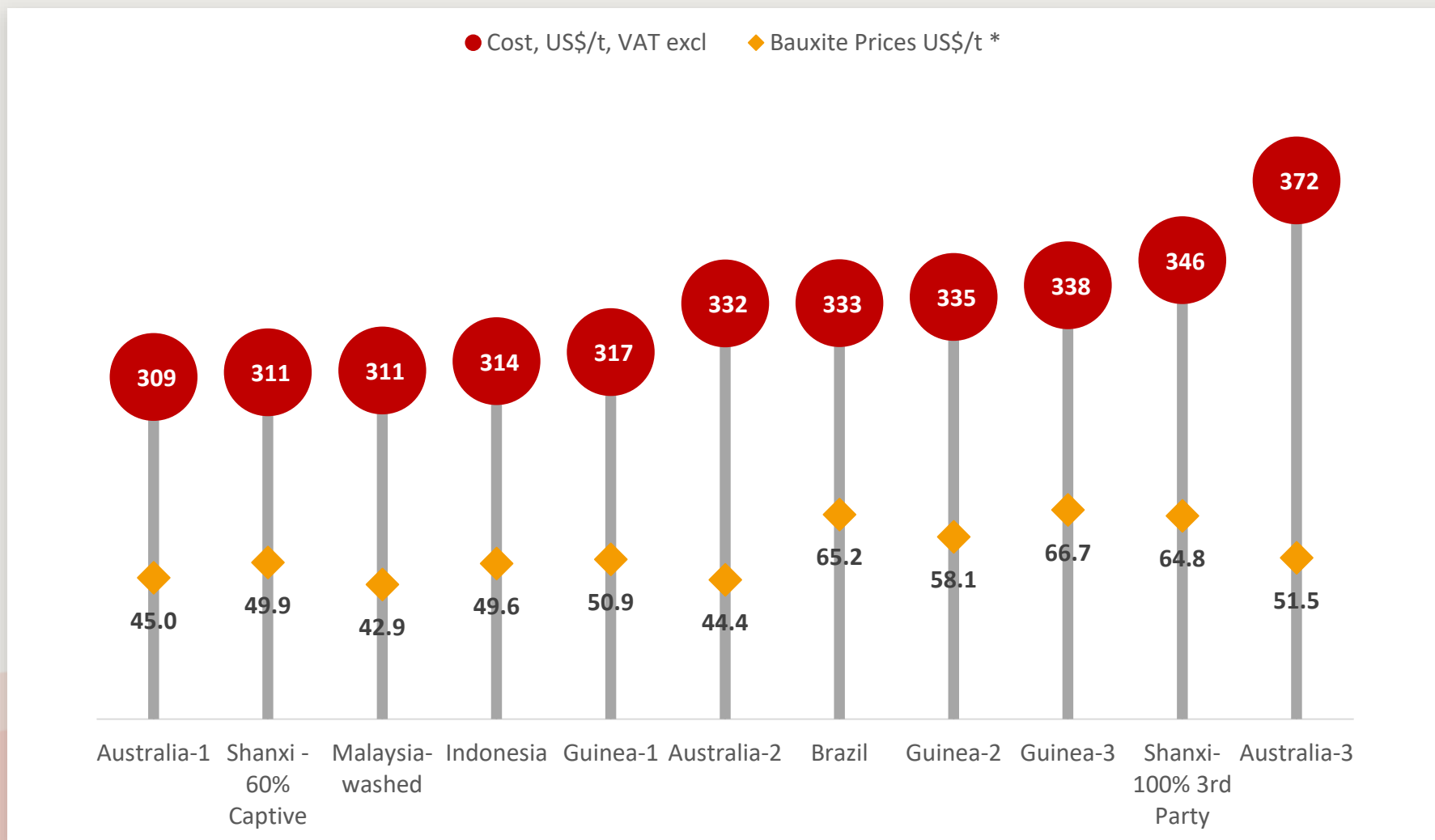
- New Standard Operation Procedures in Pahang likely to drive up production cost – and possibly capped at 600,000 t per month
- China's appetite has shifted to better quality Guinean bauxite. Higher grade bauxite in Malaysia requires washing, hence higher costs
- Johor resource limited; government reportedly axed new project. Some Terengganu exports likely with robust environmental measures
- Potential January 2020 Indonesian bauxite export ban would likely be covered by supply at higher cost from Guinea and Australia

Australian bauxite exports – Metro and AWAC adding modest growth to previous strong exports from Gove and Weipa



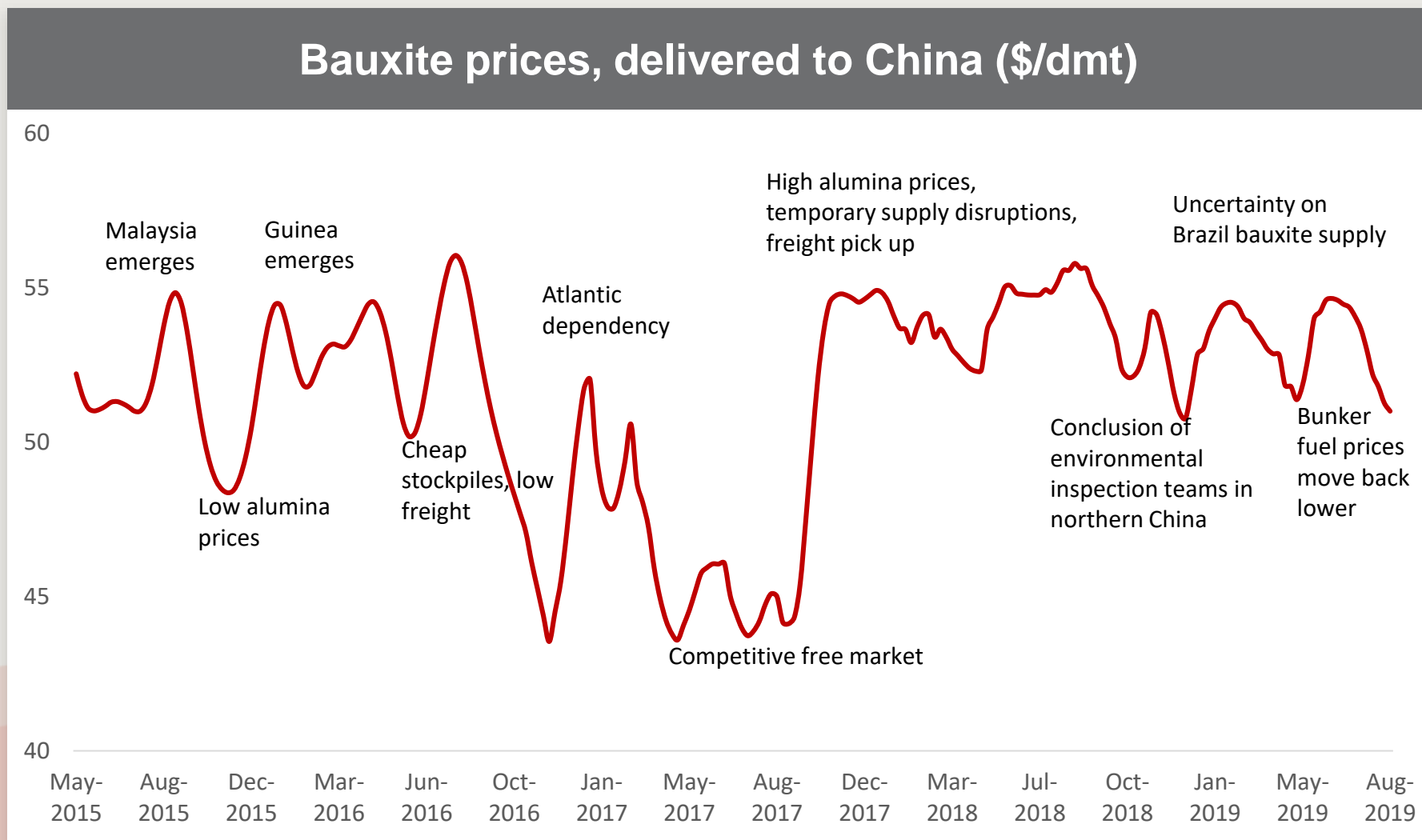
- Brownfields expansions (including Amrun with a net increase in exports of 10 million tpa, and AWAC exports forecast to rise to 1.8 million tonnes in 2019).
- Greenfields potential includes:
 - Aurukun, Glencore (could be 6 million tpa from 2023-2024)
 - Urquhart, Metallica Minerals, near Weipa
 - Bald Hill, Tasmania (bauxite sold now for cement) and Goulburn, NSW, Australian Bauxite
 - further northern Australian mines (like Gulkula, Gumatj/Yolngu)

Economic comparison at a Shanxi refinery using different bauxite sources (1H 2019 average) – closest/cheapest bauxite not always best option

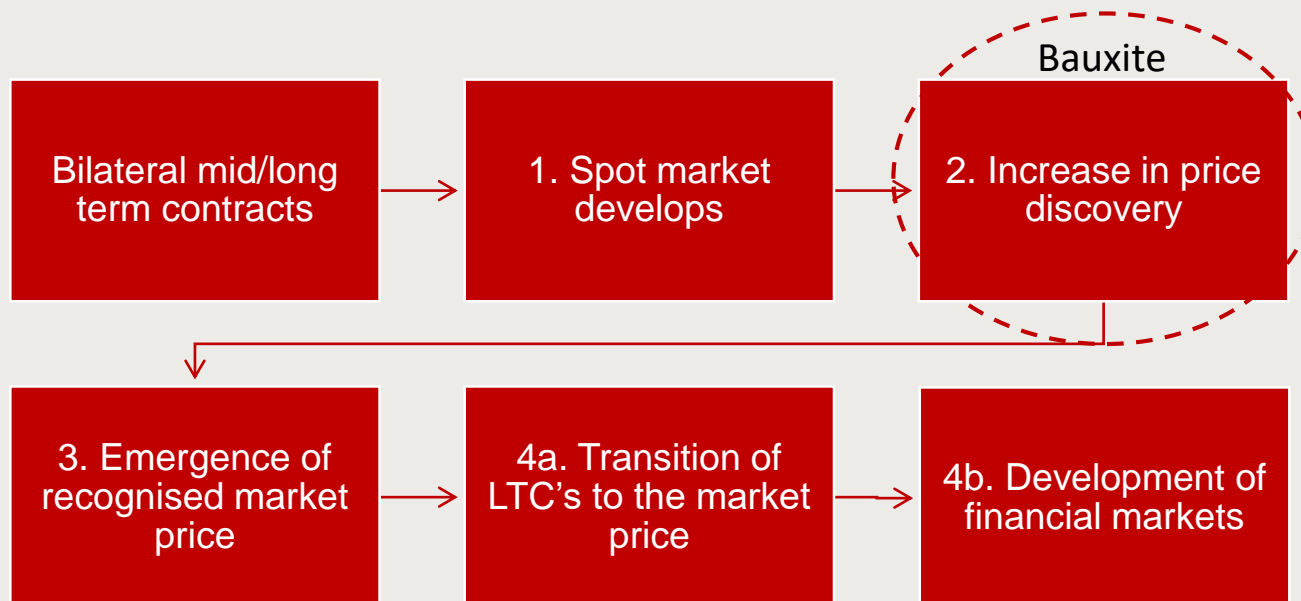


* Imported prices are CIF China, domestic prices are free at works, both excl. VAT

Pricing largely impacted by supply/demand and freight costs



Pricing stagnant on usual commodity price evolution path: low spot sales, non-homogenous product; single market price unlikely



Attempts to increase bauxite price discovery:

- Most sales under term contract (fixed price or alumina price link); illiquid spot sales level
- Fastmarkets MB FOB Kamsar Guinea and Trombetas Brazil, 2 key standards (monthly)
- CRU BPI-G and CM Group value-in-use normalised, delivered to China prices (weekly)
- Challenge to normalise various bauxite types/quality to single index for price setting-use
- Indices for regional benchmark standards more likely

In summary

- China's declining bauxite output continues to accelerate bauxite imports
- Global oversupply likely to continue near term, increasing Chinese stocks
- Chinese currently able to be selective on non-core supply sources
- Bauxite oversupply could reverse if supply constraints emerged in Guinea
- Large global reserves but not all will result in long term mines
- Miners with better economic (value-in-use) outcome for refiner preferred
- Responsible sourcing will add cost but will be key for new and sustained project success, given higher scrutiny from multiple stakeholders

Appendix

Robust imported bauxite demand growth by China likely over next 10 years

