

ASX Announcement

29 October 2014

Presentation at Metal Bulletin Conference

Attached is a copy of a presentation prepared by Mr Andrew Wood, Group Executive Strategy & Development, for the Metal Bulletin 4th Asian Bauxite & Alumina Conference held on 29 October 2014.



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4th Asian Bauxite & Alumina Conference

29 - 30 October 2014

Grand Copthorne Waterfront Hotel, Singapore



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The market after January 2014 – assessing the challenges and opportunities for bauxite and alumina

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AWAC JV: world's largest bauxite and alumina producer



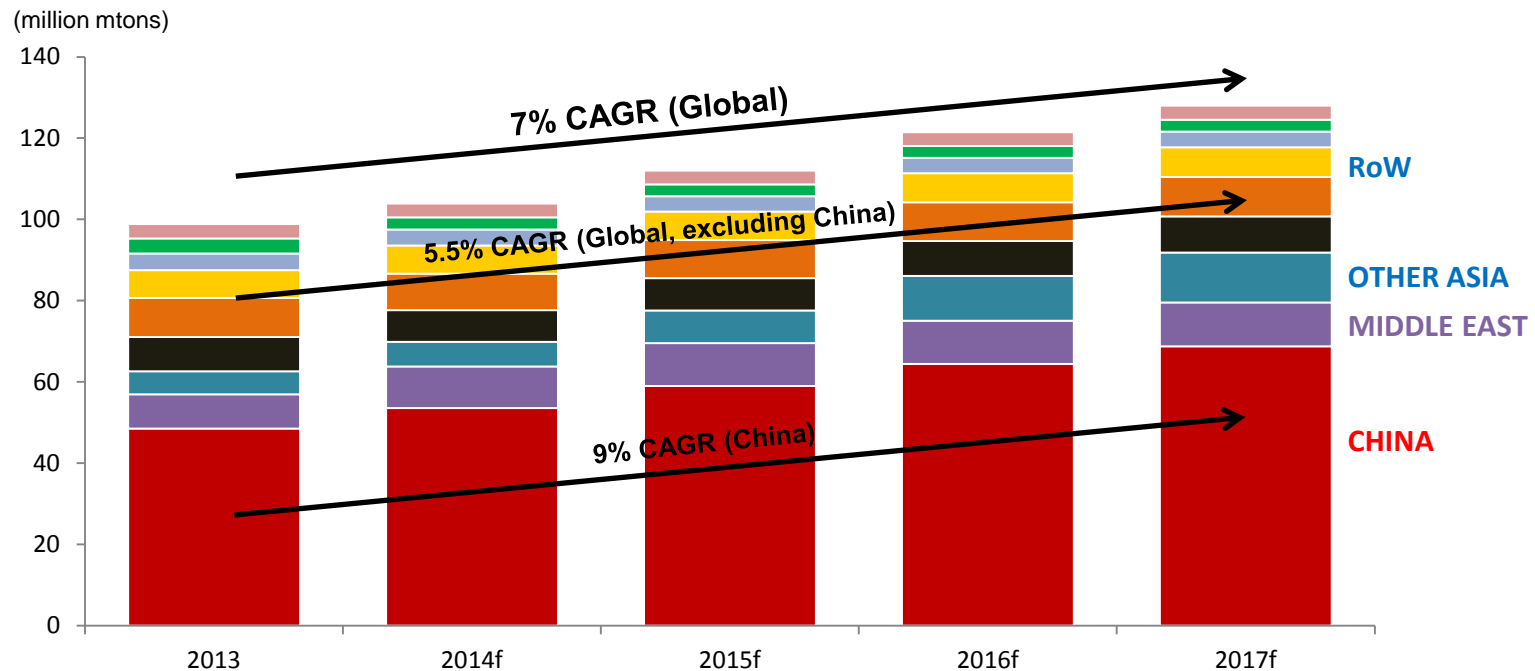
- Alcoa Inc. 60% (and manager), Alumina Limited 40% ownership
- 7 + bauxite mines and 8 refineries, producing 15.8 million tonnes of alumina in 2013 (Jamalco interest to be sold to Noble Group)
- JV produced 354,000 tonnes of aluminium in 2013 (Point Henry now shut)
- Mine and refinery (1.8 million t) under construction in Saudi Arabia⁽¹⁾ – JV with Ma'aden (AWAC⁽²⁾ 25.1%)

⁽¹⁾ Greenfield project due to begin production in the fourth quarter of 2014

⁽²⁾ AWAC is a joint venture between Alumina Limited (40%) and Alcoa Inc (60%)

Strong demand growth for alumina (mainly China, Middle East and India)

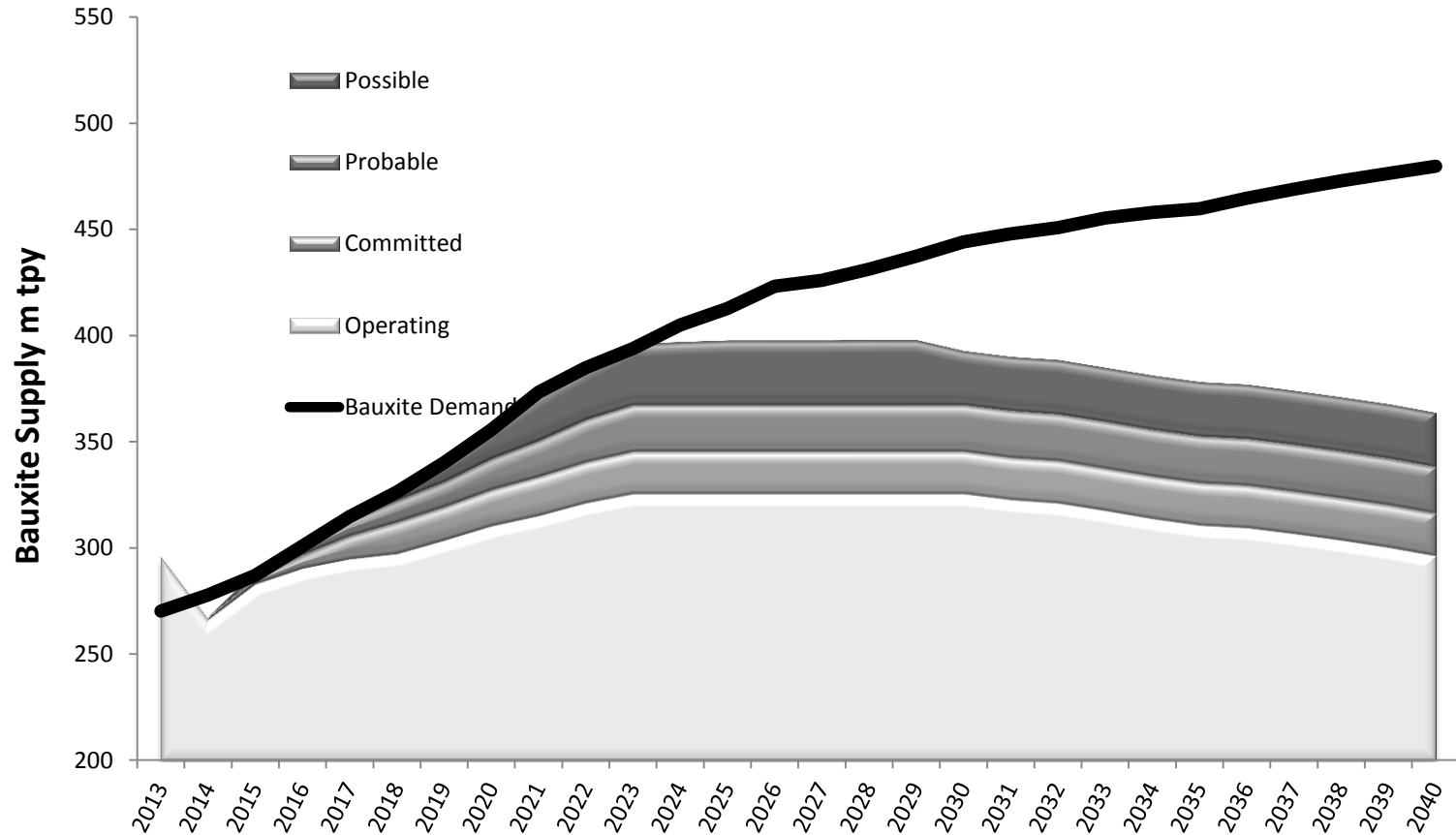
Global Metallurgical Alumina Demand Forecast



Growth requires additional ~20m tonnes of bauxite each year for next 4 years⁽¹⁾

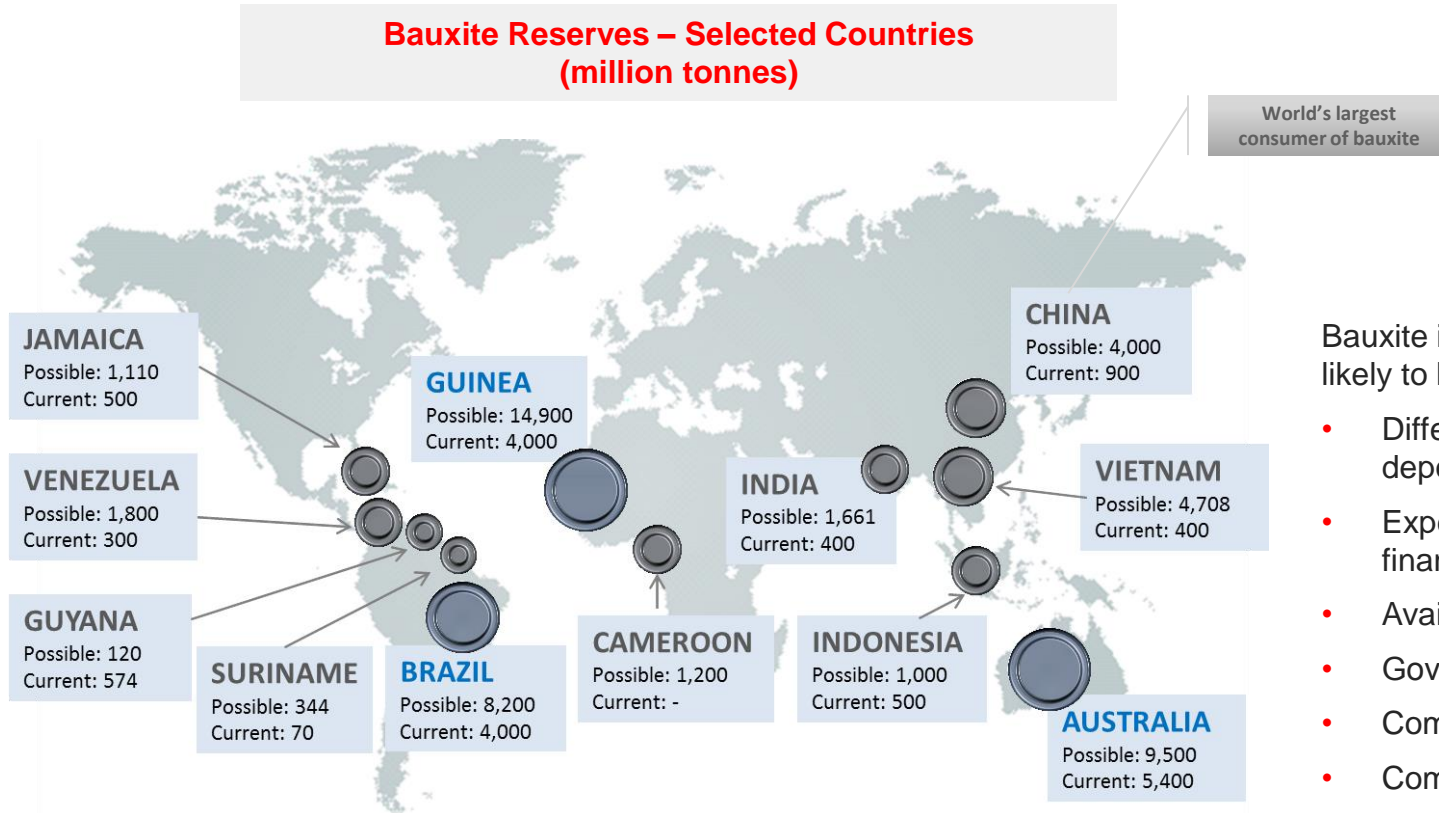
World bauxite supply-demand: gap potentially from 2016

Bauxite supply and demand forecast, 2013-2040 (graph assumes Indonesian export ban is lifted)



Global bauxite economic reserves

Many deposits exist but unclear when and where sufficient new supply will be mined



Bauxite is plentiful but supply growth likely to be limited by:

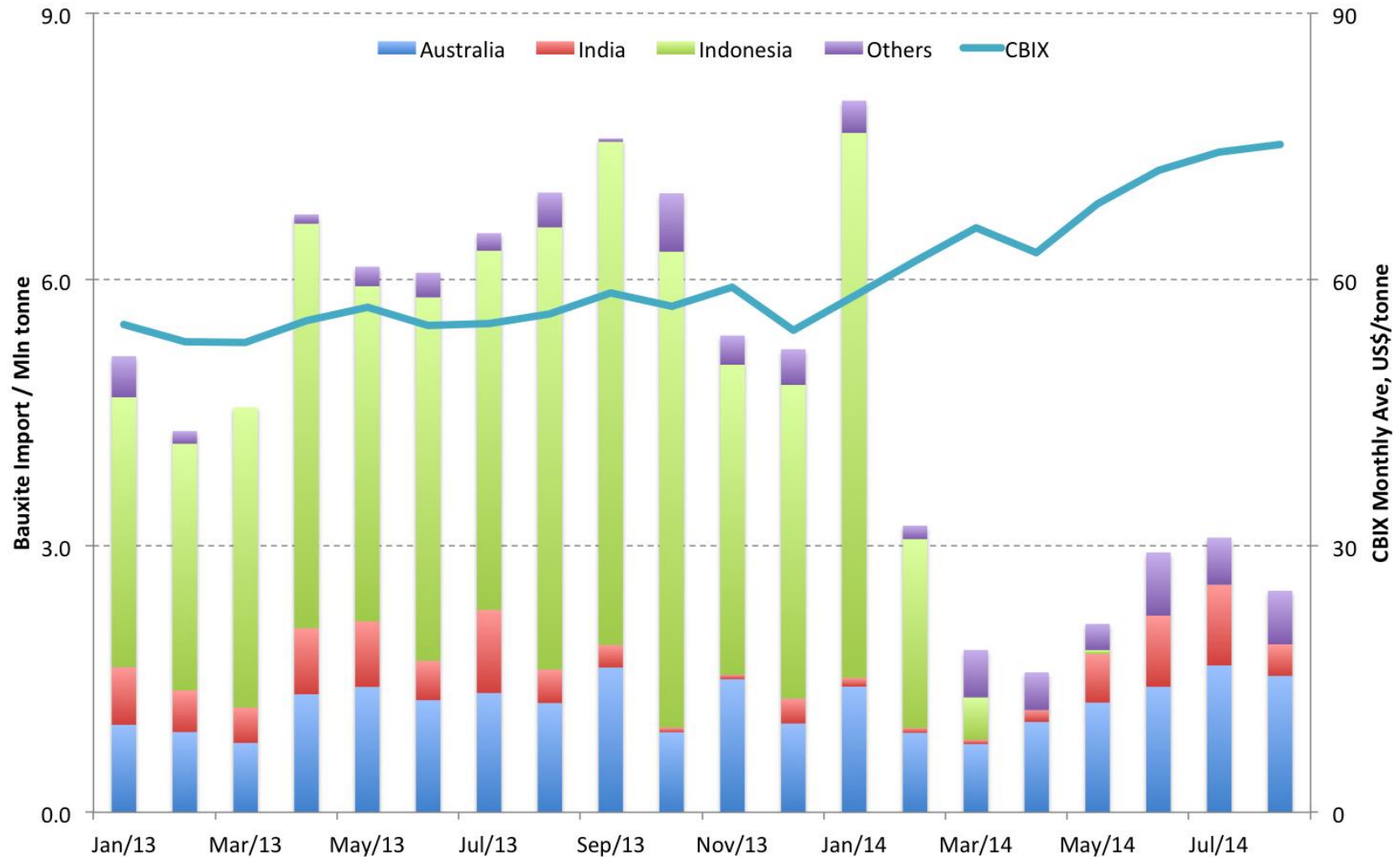
- Differing quality and size of deposits
- Expected investment returns and financing issues
- Available infrastructure or its cost
- Government approvals' challenges
- Community and NGO demands
- Competing uses of land
- Changing mining codes & taxes

- Pre-ban huge bauxite stockpiles built up in China
- Complete stop in bauxite exports from Indonesia
 - no export licences issued
- Rate of bauxite imports into China reduced
 - 2.86 million tonnes imported in September (mainly from Australia, India)
 - 3.3 million tonnes of alumina curtailments in Shandong since January
- Wide range of bauxite sources have been trialled by Chinese
 - differing sources, types, qualities, costs and freight
 - shortfall partly covered by alumina imports
- Likely to contribute to longer term world bauxite shortages
 - insufficient potential large-scale, low cost mines without large hurdles

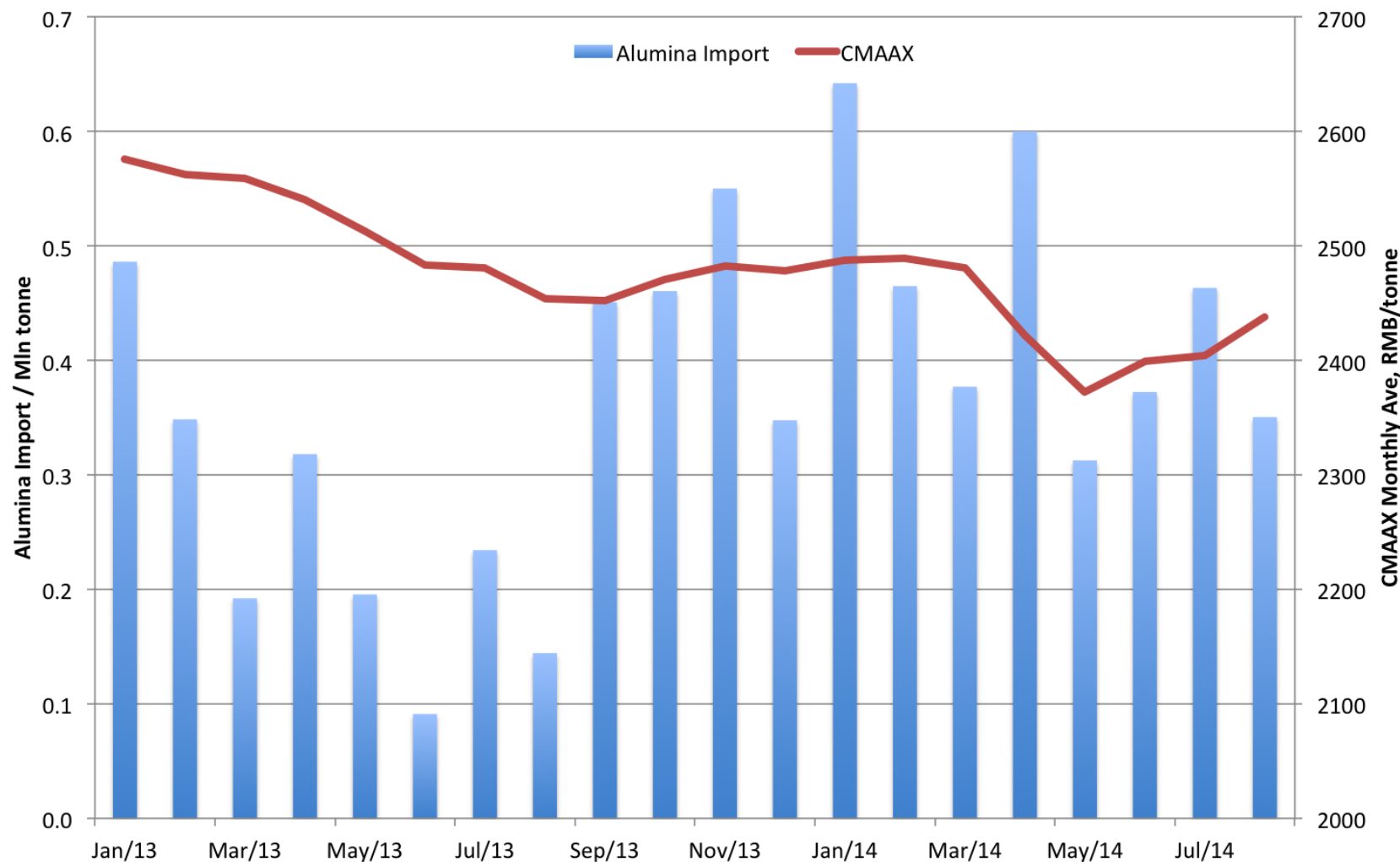
What has happened in Indonesia since the ban?

- Mining of bauxite for export has stopped
- Many mines, wash plants and ponds left as they were
- Bauxite mining employees lost jobs
- Refinery projects in Indonesia not advancing quickly:
 - many seeking concurrent exports of bauxite
 - significant infrastructure required for many projects
- Inauguration of President Joko Widodo on 20 October:
 - election campaign included cutting bureaucracy and corruption, attracting investment and building infrastructure
 - signs that Jokowi wants “win-win” outcomes so Indonesia gains from bans
 - query how long the political settling-in will last and if and when Jokowi may need to resolve any bauxite issues
 - in meantime, assume bauxite export ban continues and need to build a refinery

Chinese bauxite import volumes and value-in-use price

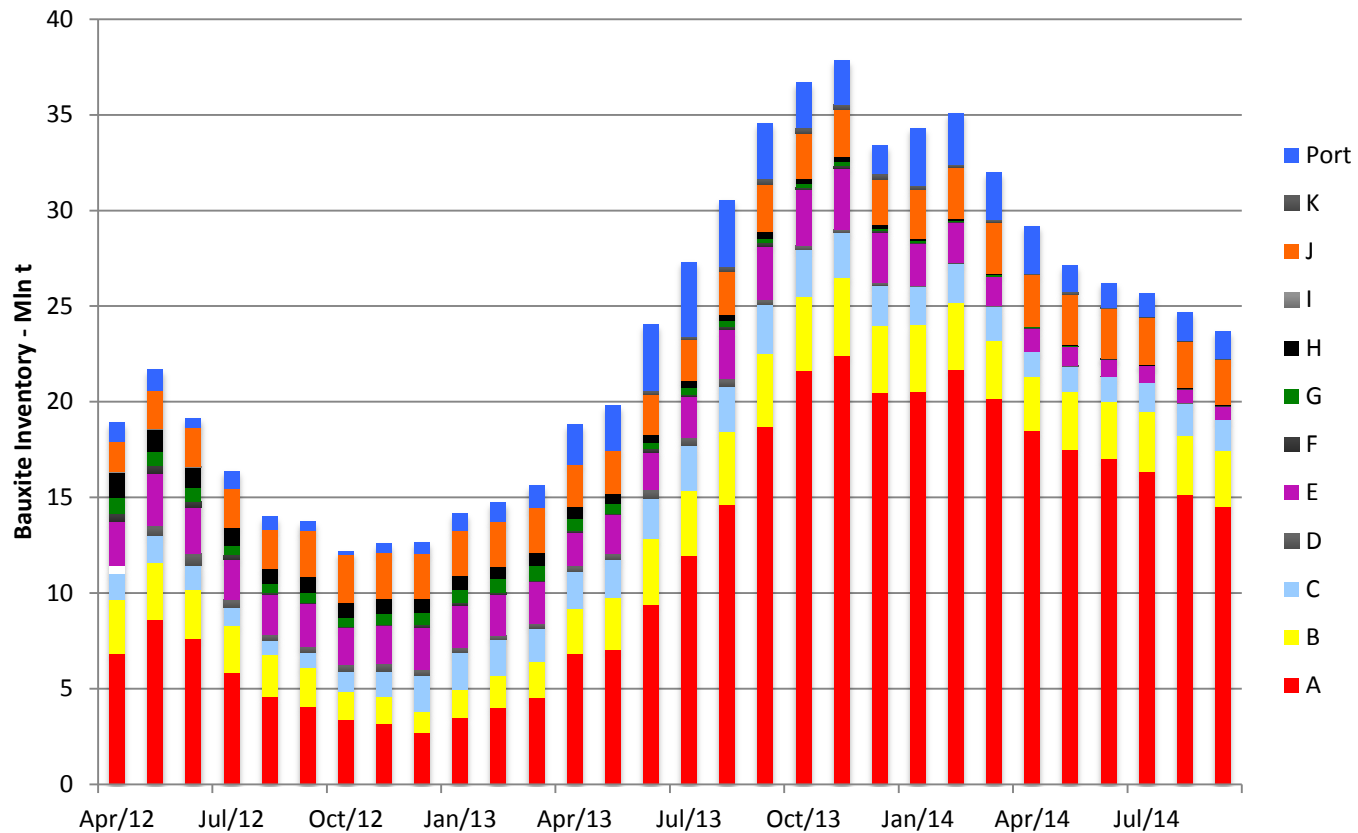


Chinese alumina import volumes and domestic price



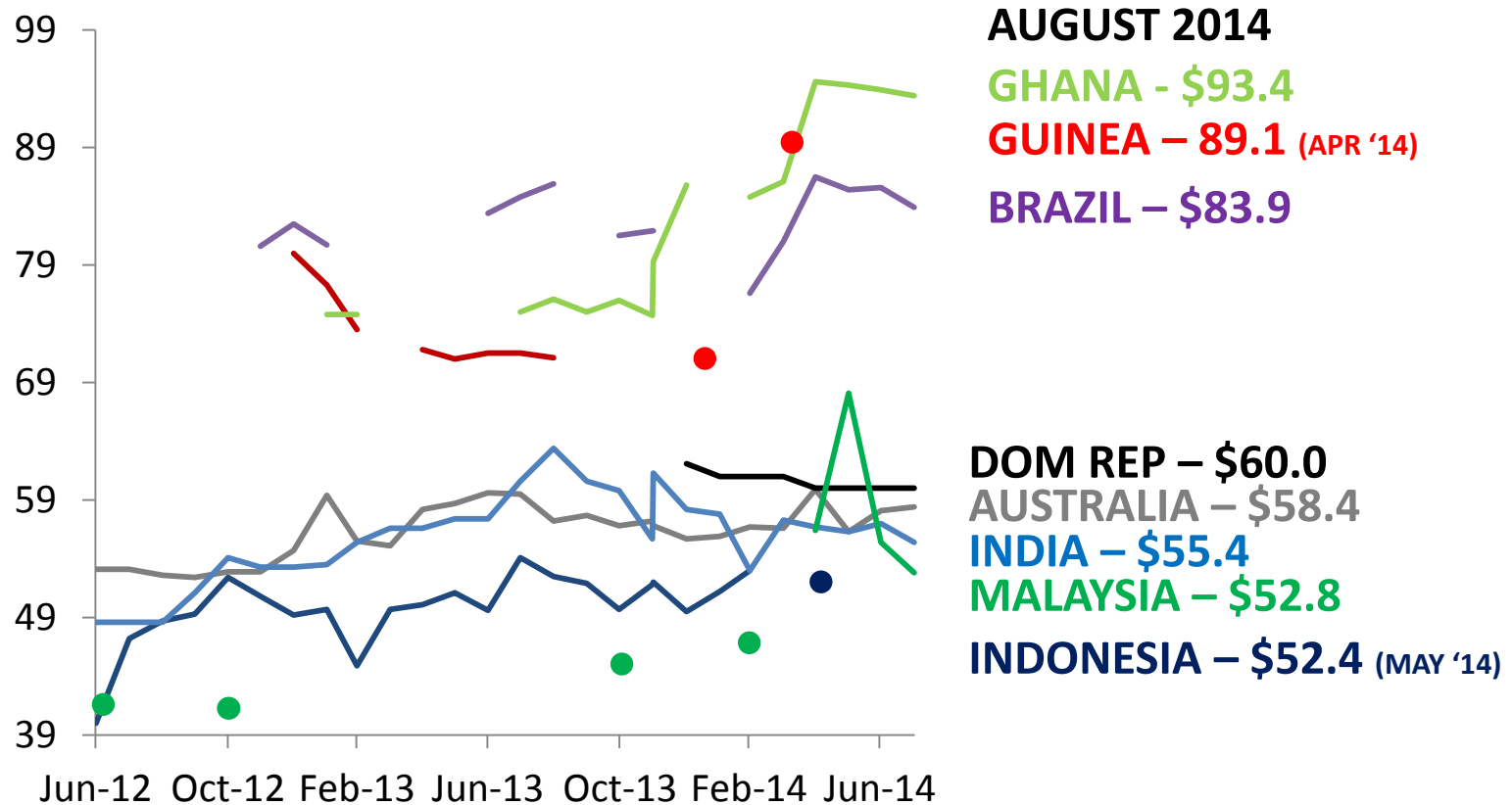
Chinese bauxite inventories reducing

Chinese bauxite inventories by company (at current consumption rates)



China imported bauxite – Atlantic sources at much higher landed prices

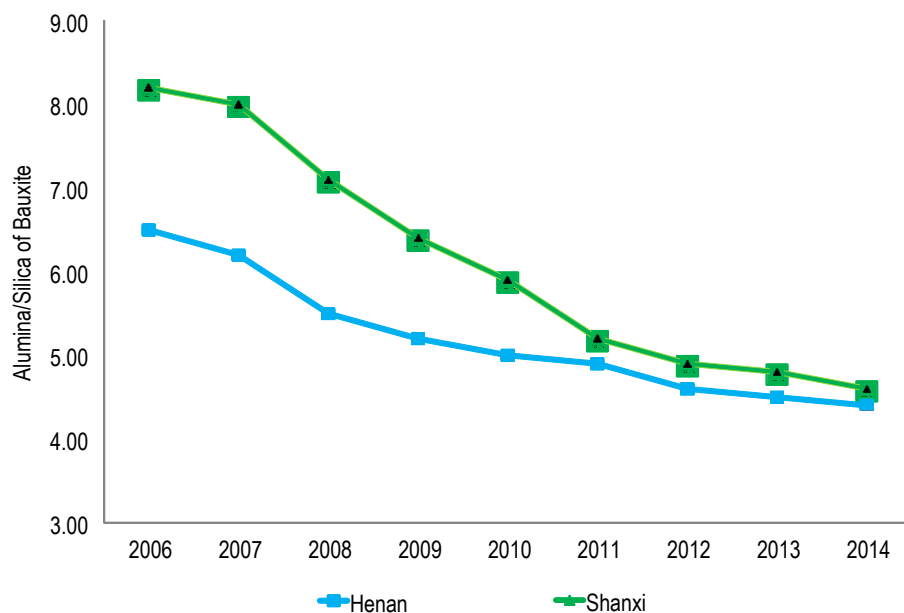
Landed prices of imported bauxite



China's domestic bauxite issues

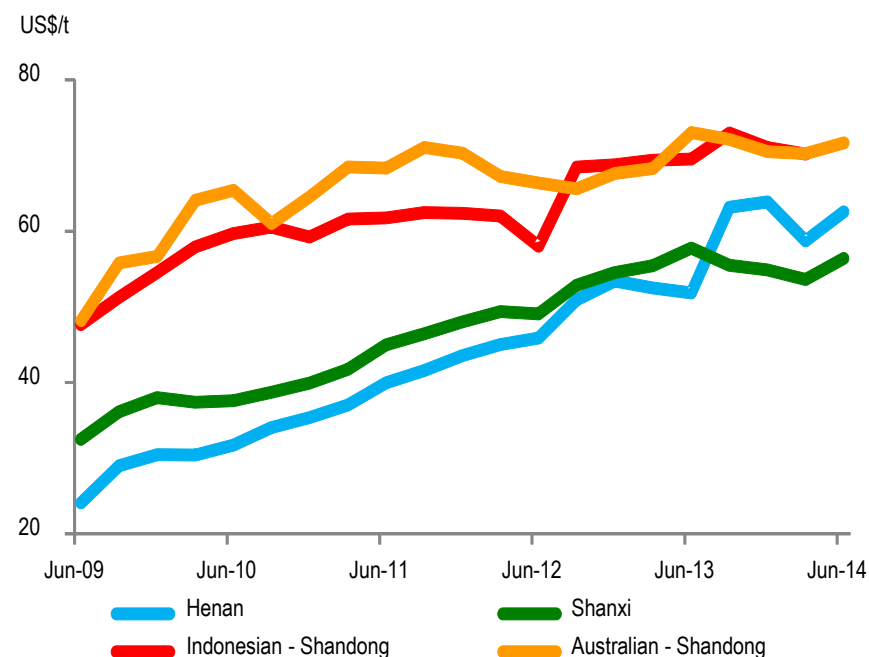
Declining grade and allocation system increases costs

Declining bauxite quality in key alumina producing provinces



- Alumina/Silica ratio is a key determinant of bauxite quality
- Historical pure Bayer process economic limit above 5.0

ViU adjusted bauxite prices

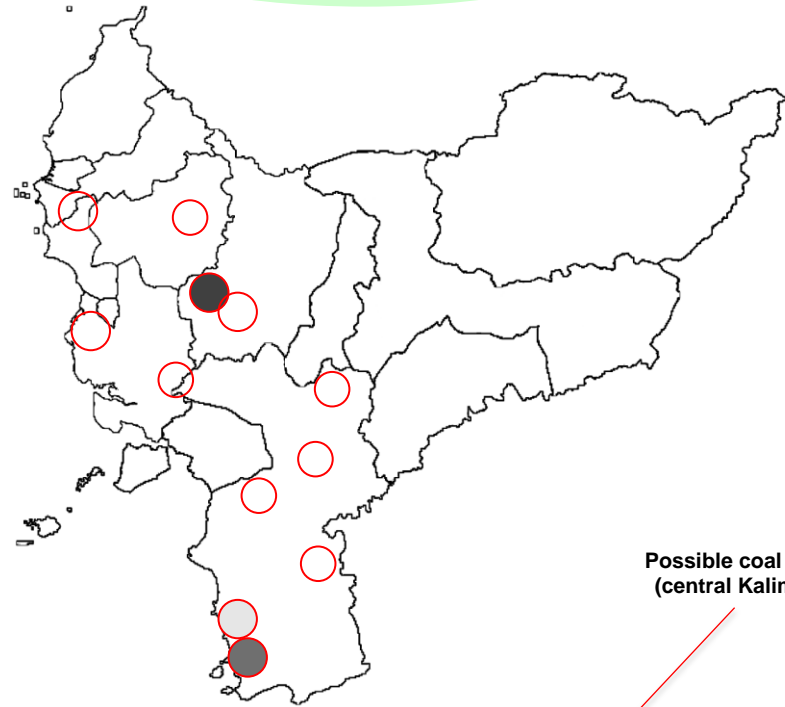


- ViU reflects grade, logistics & processing costs
- ViU rising faster than costs to mine, reflecting A/S ratio

Indonesia alumina project locations

Kep. Riau

W. Kalimantan



Possible coal sources
(central Kalimantan)

- Planned/proposed
- Construction commenced
- In commissioning (PT Antam chemical grade refinery)

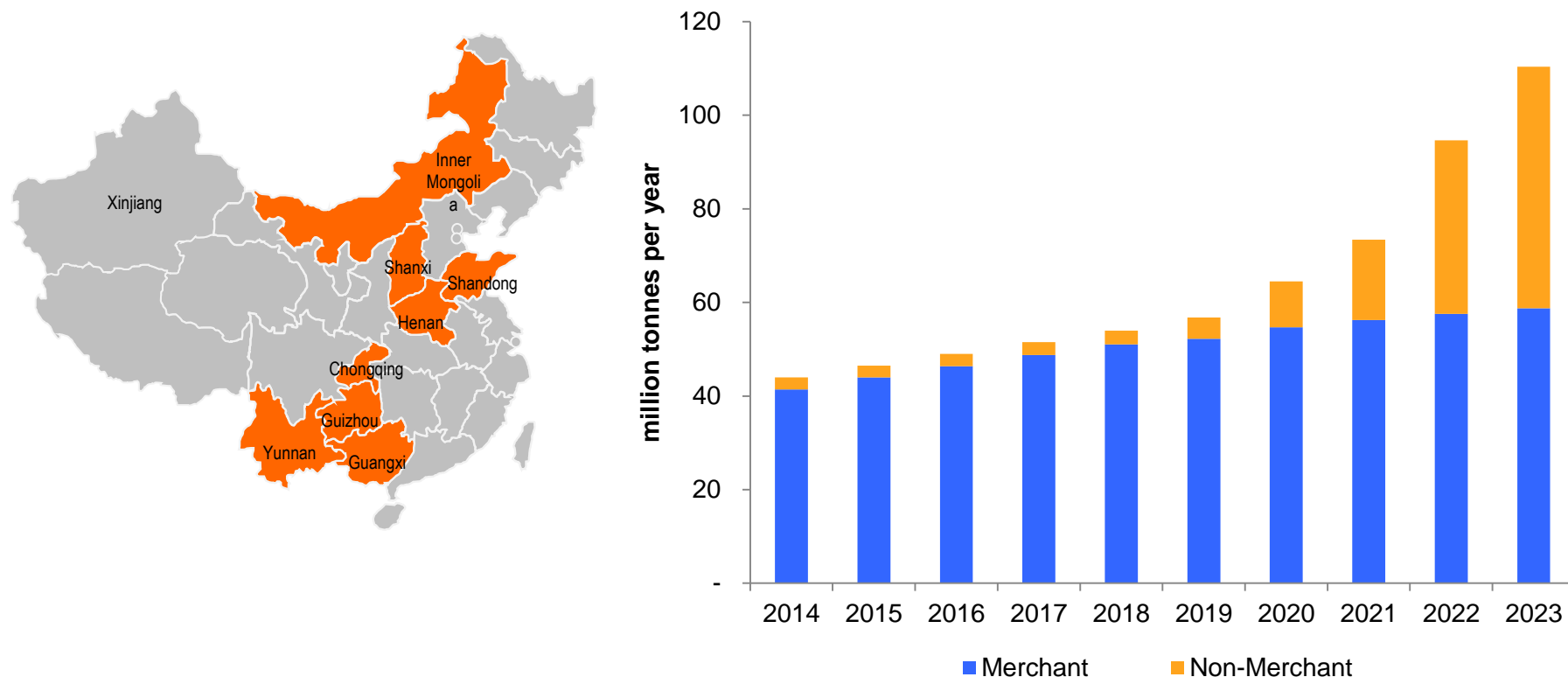
Indonesia alumina projects (planned and under construction)

No.	Refinery Name	Location	Status
1	Antam-CGA	West Kalimantan	Undergoing Commission
2	Hongqiao - Harita	West Kalimantan	Commenced construction*
3	Chalco	West Kalimantan	Planned
4	Rusal/Arbaya Energi	West Kalimantan	Planned
5	Antam - SGA	West Kalimantan	Planned
6	Persada	West Kalimantan	Planned
7	Mekko	West Kalimantan	Planned
8	Jinjiang	West Kalimantan	Planned
9	Putra	West Kalimantan	Planned
10	Alakasa	West Kalimantan	Planned
11	DSM	West Kalimantan	Planned
12	ICBS	West Kalimantan	Planned
13	MKU	Bintan	Planned
14	Telaga	Bintan	Planned
15	Indo Kapuas	Bintan	Planned
16	Tanjung Air	Bintan	Planned
17	Hermina	Bintan	Planned

The estimated cost of a Chinese style modular refinery, built largely in China and installed in Indonesia, is approximately \$1200/t, plus costs of coal and bauxite mines and associated infrastructure such as roads and a port

Chinese bauxite import volumes forecast to continue to grow

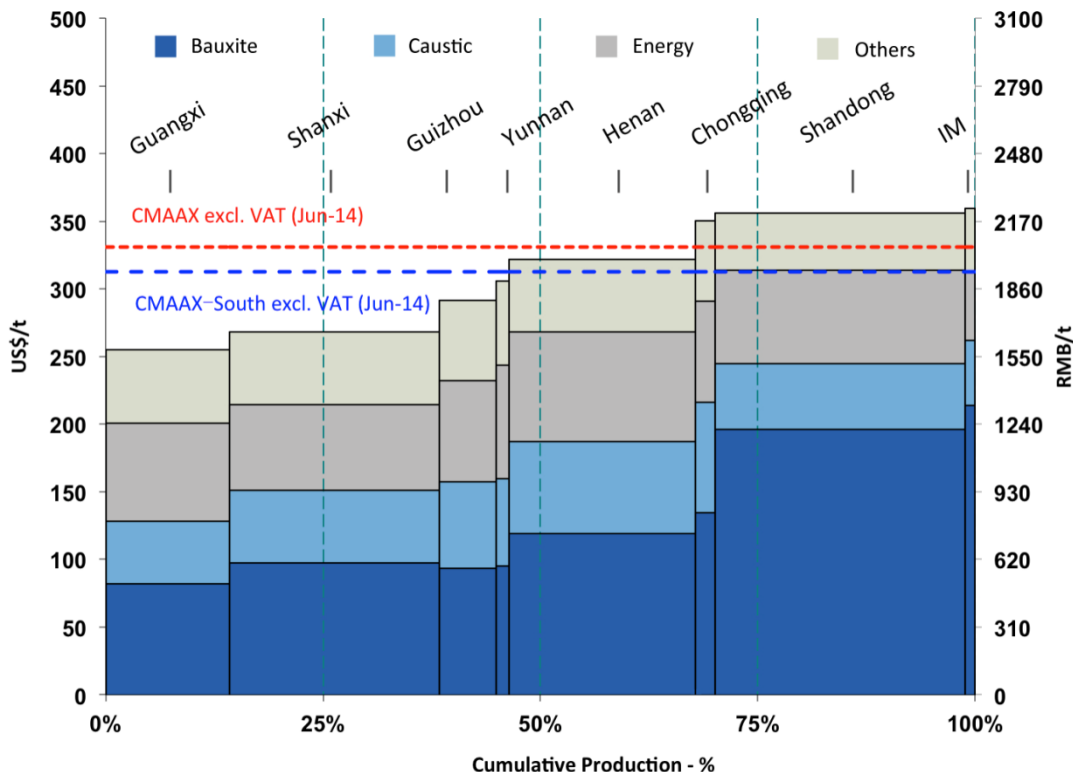
Forecast Chinese Bauxite Imports by Destination Province - 2014 to 2023 (mln t/yr)



- Shandong to remain the major merchant bauxite-consuming province over the period to 2023
- Under-utilised logistics allow Inner Mongolia (rail) and Chongqing (barge) to become new entrants
- Henan and Shanxi refineries likely to import significant bauxite tonnes (due to local allocation and quality issues)

World marginal cost producers in Shandong – Henan and Shanxi may move up curve

China Alumina Cash Cost Curve by Province (Q2 2014)

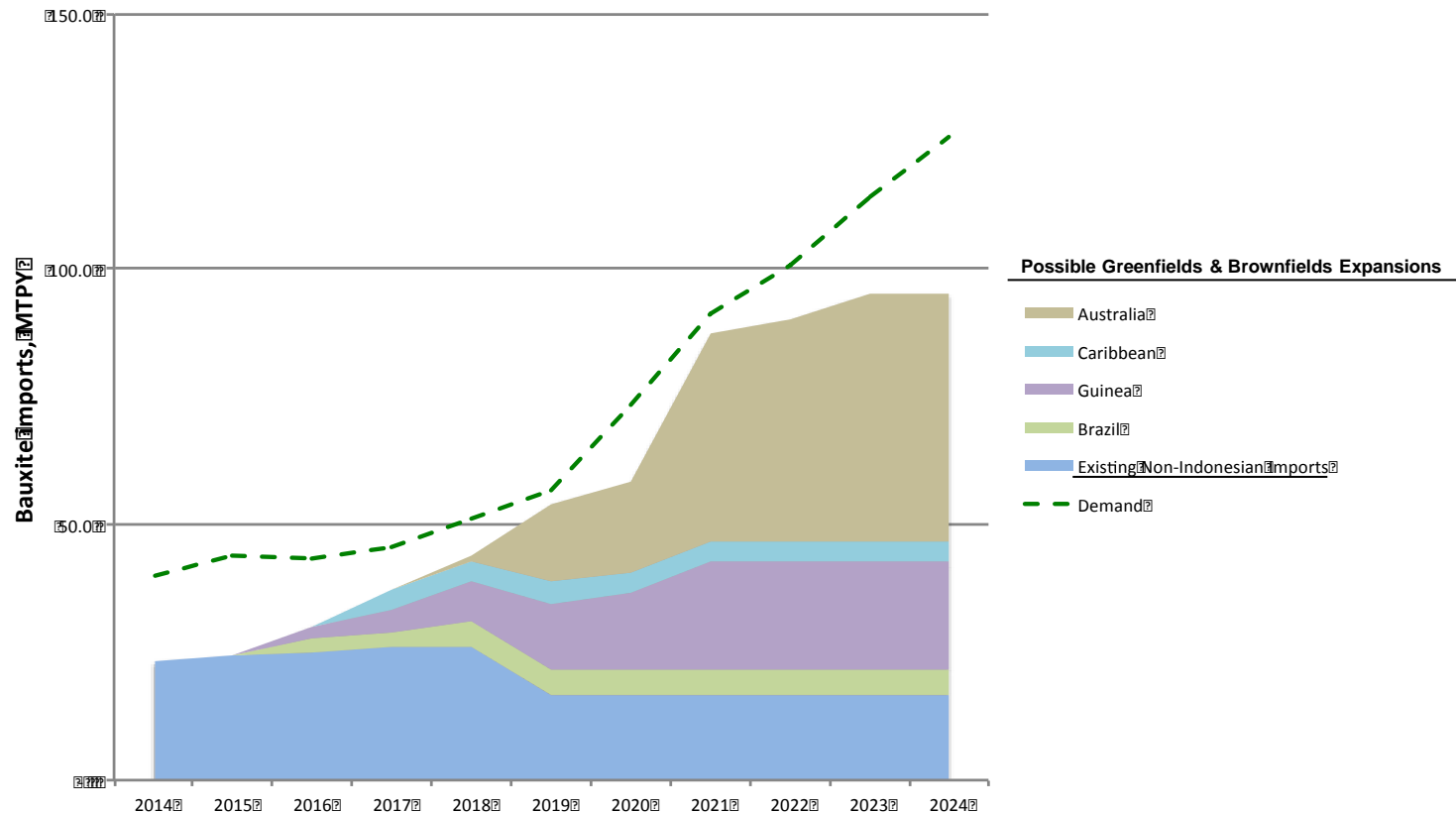


- Marginal producers dependent on bauxite imports
- Deteriorating domestic bauxite grades and allocation issues
 - should lead to increased bauxite/alumina imports or higher domestic processing costs
- Henan and Shanxi costs could increase as grades deplete and allocation restricts bauxite movements from around 2019

Shandong is global marginal producer, with approx. 20 m tonnes of capacity
Henan & Shanxi are forecast to face similar issues due to worsening bauxite quality

Forecast Chinese bauxite imports* to 2024 from potential supply regions (if Indonesian ban is unchanged)

– likely greater alumina imports needed to bridge the gap



* Assumes Indonesian bauxite export ban remains in place over the period

Indonesian ban a likely positive for alumina prices

Scenarios	Chinese Import Bauxite Price Up? ⁽¹⁾	Alumina Prices Up? ⁽¹⁾
Bauxite export ban holds, no refineries built Chinese bauxite stockpiles will deplete during 2015	✓✓✓✓	✓✓✓✓
Greenfields refinery (earliest 2016), no bauxite exports	✓✓✓	✓✓✓
Limited volume bauxite exports (earliest 2015) whether permitted due to: i. corresponding alumina production from a new refinery; ii. some value-adding beneficiation to bauxite; or iii. some other policy relaxation	✓✓	✓✓
Unlimited volume bauxite exports (unlikely near term) – likely to be at higher cost and lower than historical average volume due to: i. expected higher tax (up to 50%?) ii. higher transport costs to river/coast iii. competing land use costs iv. greater sustainability costs (social and environmental)	✓	✓

Even at unsustainable historical peaks, Indonesian supply unlikely to meet China's needs post-2019

Future impact of Indonesian bauxite ban

- Assuming ban extends into 2015 then (from 2nd half) potential in China for:
 - 10-15 million tonne bauxite gap as stockpiles run out
 - alumina produced on bauxite imports may drop by up to 6 million t (annualised)
- This may mean:
 - acceleration of domestic bauxite usage (bringing forward 2019 gap),
 - further alumina imports into China, and
 - higher bauxite and alumina prices
- At some stage, it is possible that in Indonesia:
 - refineries will be built, with permitted pro rata bauxite export and performance bonds and/or
 - some export of value-added bauxite short of alumina but beyond standard washing could be permitted and at a higher tax rate
- From 2019, demand increase requiring new mines likely to raise Chinese imported bauxite price materially lifting marginal cost of alumina production