



Making good mining project decisions in iron ore and other commodity markets

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*CRU offices as of September 2017

- Established in 1969 offering unrivalled business intelligence on the global metals, mining and fertilizer industries
- Market Analysis, Price Assessment, Consulting & Conferences
- Primary research and robust, transparent, methodologies
- Global team of analysts. Key to gaining a real understanding of critical markets
- We strive to provide customers with the best service and the closest contact: flexible, personal and responsive

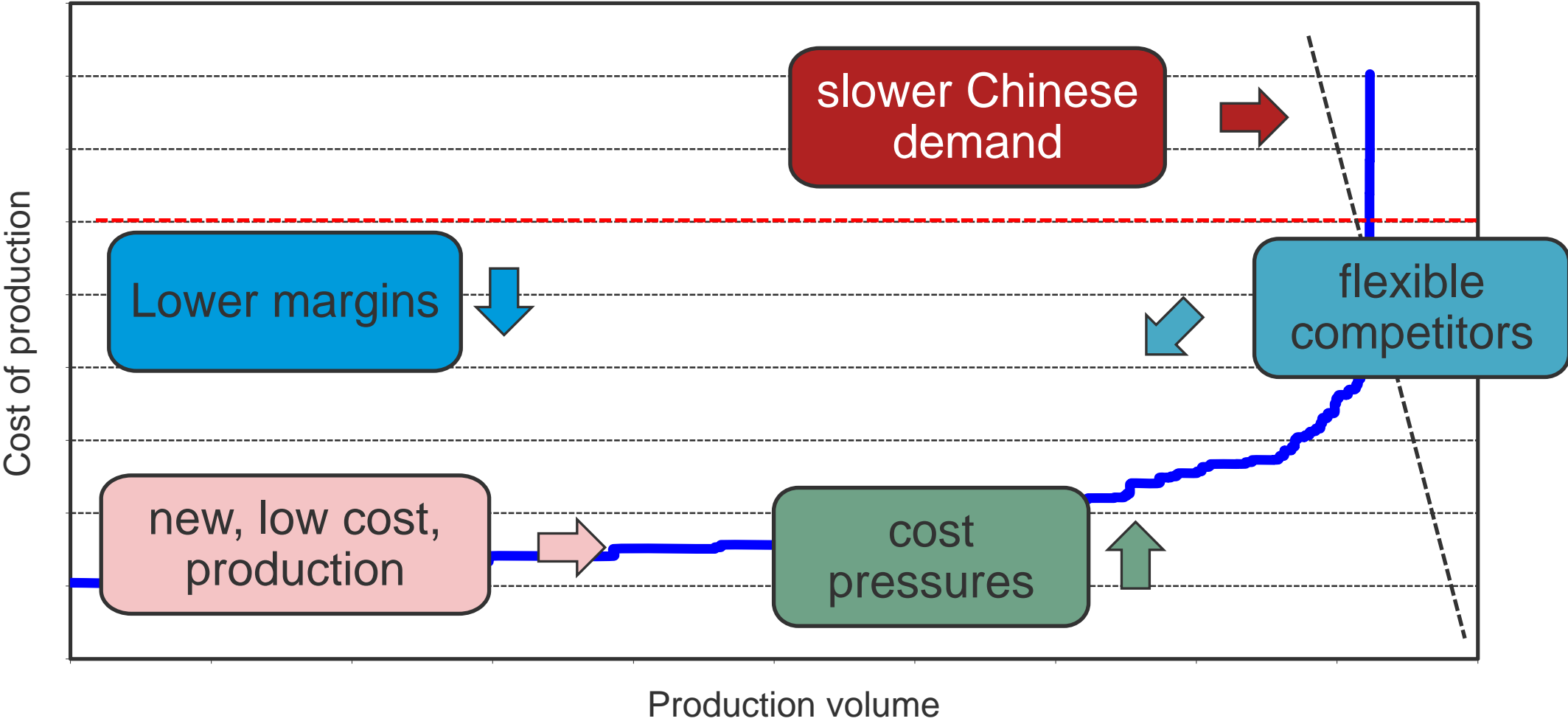
A significant research team, with over 250 employees world-wide

Agenda

1. EXPOSIBRAM 2013 prediction
2. Iron Ore market conditions
3. Commodity market outlooks
4. Selecting the right mining project
5. Conclusions

What did I forecast at EXPOSIBRAM 2013?

Miners would face challenging conditions to operate or develop mines & projects

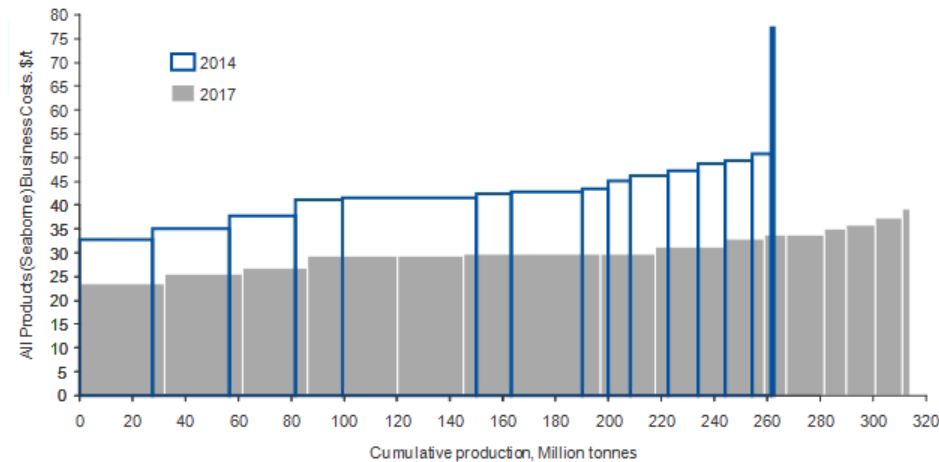


Despite challenges, iron ore still delivers great returns

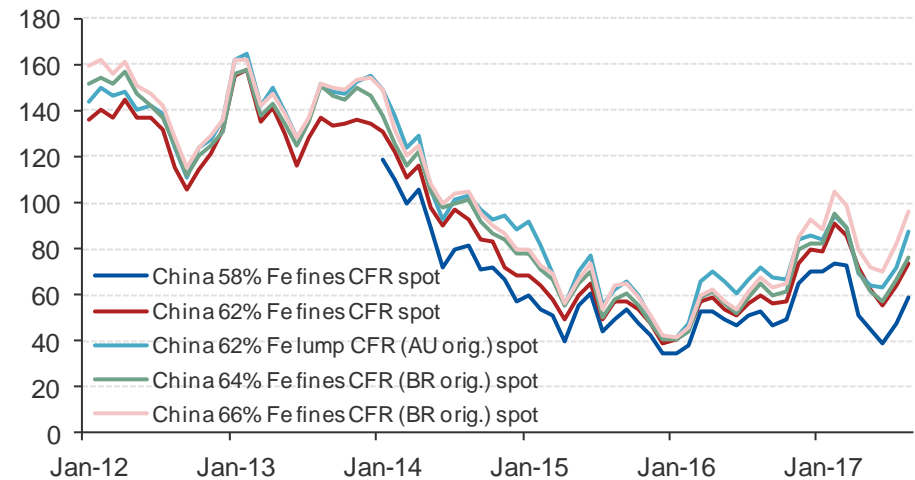
Miners have adapted, margins are good

Rio Tinto Iron Ore CRU Business Cost Curve (2014 & 2017)

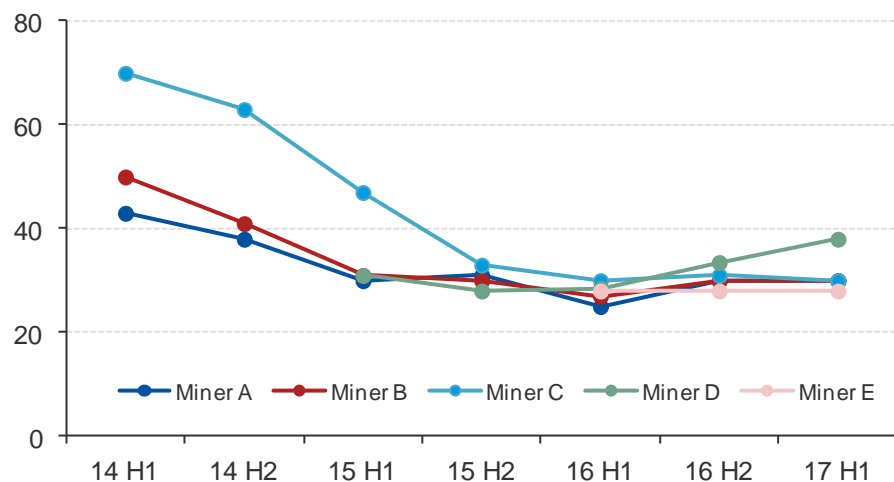
All products, Seaborne market cost curve



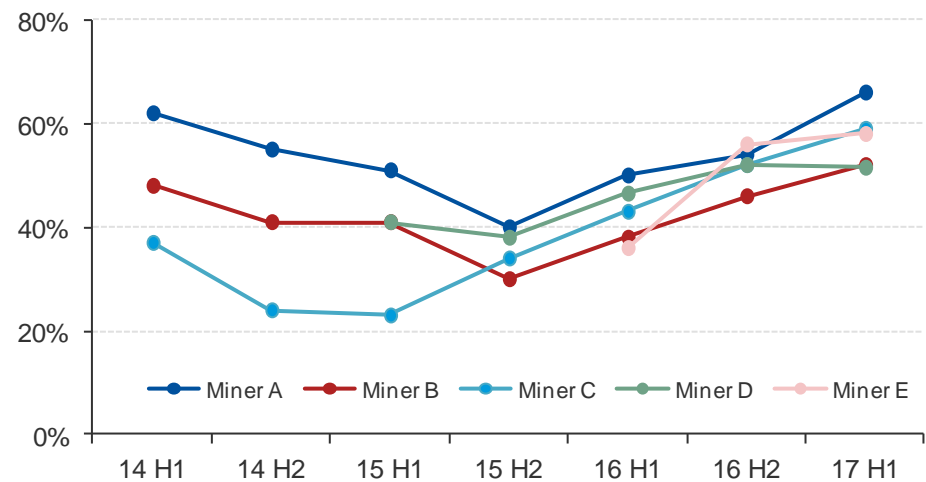
Iron Ore Price, various grades, US\$/t



Iron Ore Breakeven Price, various assets, US\$/t



Iron Ore Margin on Earnings, various assets, %



Supply behaviour will determine the medium term iron ore price

Prices will fall to 50's unless there is voluntary capacity utilisation management

Displacement requirements		2014	2015	2016	2017	2018	2019	2020	2021
Low-cost seaborne export additions, Mt									
Australia	BHPB	37	18	4	8	5	15	0	0
	Rio Tinto	37	33	3	7	6	3	(4)	0
	FMG	54	13	11	(1)	0	0	0	0
	Hancock Prospecting	0	0	23	22	5	0	0	0
Brazil	Vale	12	17	10	18	35	11	9	0
	Anglo American	0	9	8	2	2	7	0	0
	Samarco	4	(1)	(24)	0	9	8	0	0
India		0	0	18	(0)	1	0	(0)	0
Depletion and other non-price related supply falls		0	0	0	(8)	(2)	(3)	0	(3)
Variation in seaborne supply, Mt		143	89	54	47	61	42	5	- 3
Variation in seaborne demand, Mt									
China				71	(21)	19	8	(4)	0
Excl. China				(5)	5	9	4	5	2
Combined total				66	(16)	28	12	1	2
Displacement required to balance market, Mt		(89)	(109)	12	(64)	(33)	(29)	(3)	5
China spot, 62% Fe fines (US\$/t)		97	56	58	69	55	64	70	70
Percentile (global)		88%	75%	93%	95%	85%	88%	90%	90%

Notes: supply and demand are shown in wet metric tonnes. Prices are dry tonnes. BHPB and Rio Tinto additions include Australian operations only. Depletion and other non-price related supply falls include depletion at existing operations or other cuts to production for non-price related reasons.



BHP



Companhia Siderúrgica Nacional



Rio Tinto

SAMARCO



CRU is optimistic about broader commodity performance

Cobalt leads by a country mile whilst Nickel is off the pace

Price supportive factors	Nickel	Iron Ore	Aluminium	Them. Coal	Copper	Zinc	Cobalt
Stronger demand	2.7%	-0.15%	5.8%	0.4%	2.4%	2.1%	6.7%
Limited new supply	X	X	X	-	✓	✓	✓
Production cuts required	X	✓	Expected	Expected	X	X	X
Market forecast in deficit	✓	X	-	X	-	✓	✓
Stocks critically low	No	No	No	China?	from 2020	Concs	from 2019
Mine costs rising	1.9%	10%	20%	9.3%	-1.8%	16%	
2017 price forecast ⁽¹⁾	10%	19%	21%	26%	26%	32%	123%
2021 price forecast ⁽²⁾	45%	22%	40%	34%	57%	83%	146%



When investing in projects it all comes down to asset value

How well does your portfolio match your Risk Appetite and Risk Tolerance?

Focus

Commodity Exposure



Product Premium



Mineralogy / Processing



Management Experience



Scenario Analysis



Ideal Mining Project in 2017

Seek exposure to commodities that are hot but not too hot. i.e. Cobalt, Zinc or Copper

Seek exposure to projects with inherent value premium such as quality or location

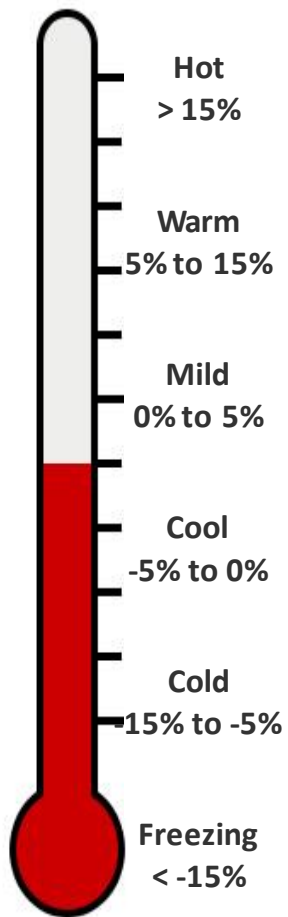
Seek proven mineralogy and technology unless you have the appetite and resources to invest in commodity, operations & technology risk

Test & tackle common project bias like anchoring, competitor neglect and confirmation bias

Test assumptions, VaR and CFaR with robust, independent scenario analysis

...and focus on metals exposed to the 'Green Evolution'

CRU basket of 36 mining, metals & fertilizer price forecasts | 2020 over 2016*



- 37% Metals
- 20% Mining / Raw Materials
- 13% Fertilizers
- -7% Precious Metals

Conclusions

1. The challenges predicted at EXPOSIBRAM 2013 remain.
2. Iron Ore miners have adapted to these challenges. Will **capacity utilisation** be flexible or responsive to prices in the future?
3. All mining projects need a unique reason for success. Check projects for bias, test robustness through **scenario analysis**.
4. Metals exposed to the '**Green Evolution**' will perform well – as long as we don't create over-capacity!



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