

Overview of the Global Manganese Industry with a special focus on China

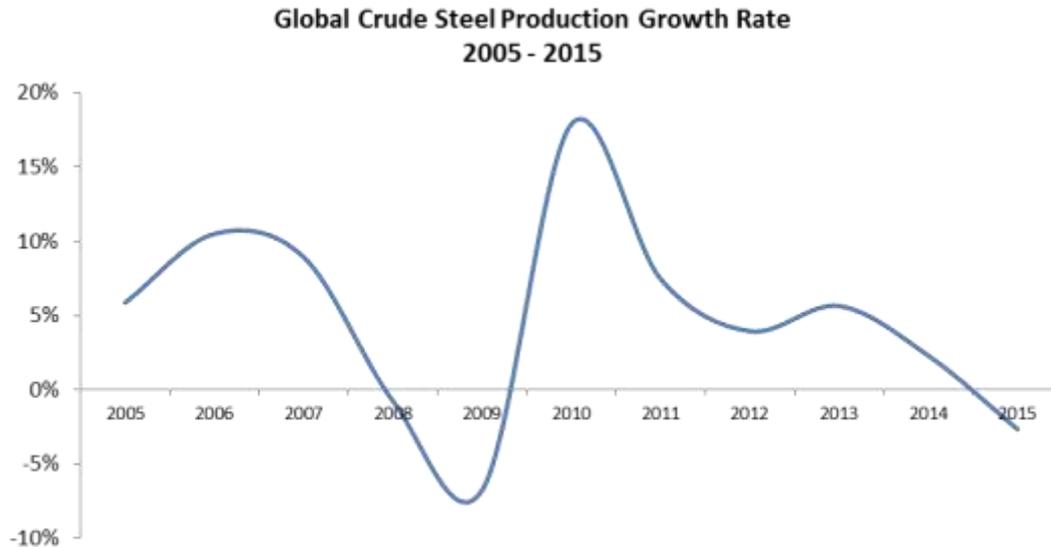
Aloys d'Harambure
Market Research Manager
International Manganese Institute (IMnI)

Global crude steel production decreased in 2015, for the first time since recession-hit 2009.

It was 1.71 billion mt, down 3% on 2014, with global capacity utilisation around 75%.

Huge oversupply in global steel industry: around 170 million mt of existing steel capacity needs to be taken offline permanently to get back to around 85% utilisation capacity: decent margins for steel mills (Macquarie).

Low demand and high export volumes depressed steel prices in 2015.



Source: World Steel Association, CRU, IMnI

Production in China contracted for the first time in more than 30 years, by 1.9% last year (CRU), to 897 million mt, while the rest of the world reduced output by 3.5% (Worldsteel).

Chinese producers offset falling domestic demand with an increase of more than 20% in exports to 112 million mt, pressuring foreign steelmakers.

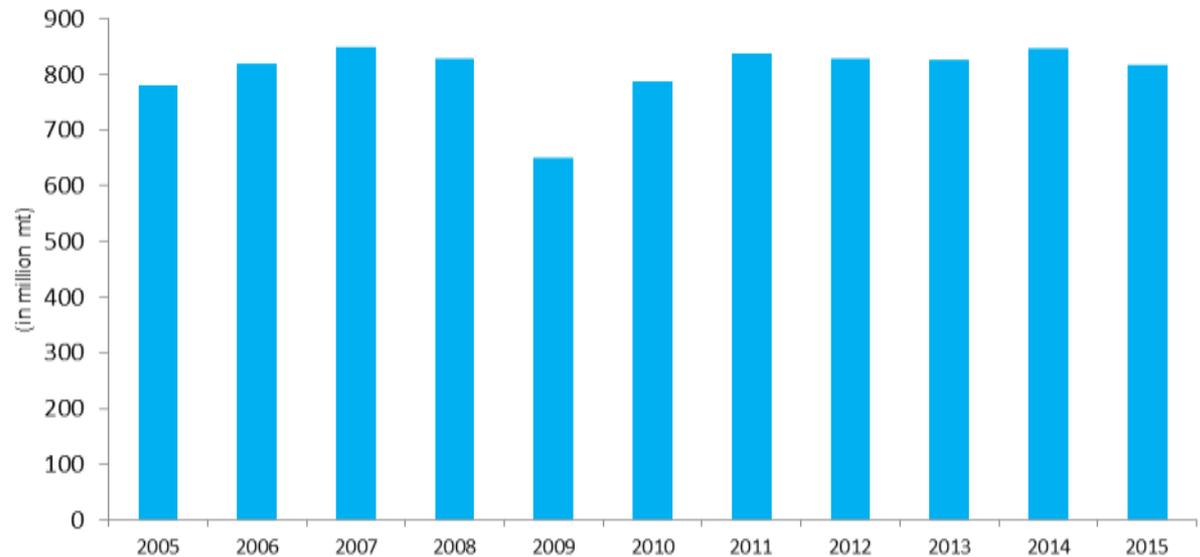
With a global steel market that was already oversupplied, this amplified the market share battle.

2015 crude steel production change in the ROW: -3.5%:

- Japan -5% (2nd largest producer after China),
- **USA -11%** (strong dollar attracting imports from South Korea, China, Turkey, Japan),
- South Korea -3%,
- Turkey -7%,
- Italy -7%.

In India, +2.6% YoY (in spite of growing steel imports from China).

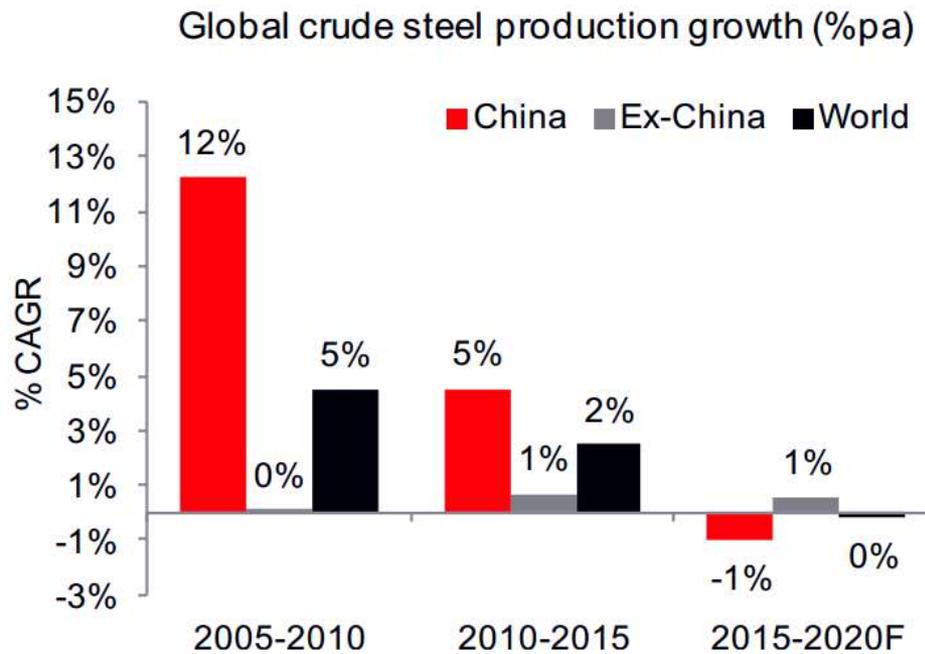
**World Excluding China Crude Steel Production
2005 - 2015**



Source: World Steel Association, IMnI

China's surging steel exports reduce steel supply in the ROW, and international prices, impacting demand for Mn alloys.

Global steel production is expected to remain flat in 2015-2020, after a period of around 2% CAGR between 2010 and 2015 (Macquarie).



Source: worldsteel, Macquarie Research, January 2016

Let us analyse how the Mn alloys and Mn ore markets are adapting to this « new normal ».

1 – Global manganese alloys: output down on lower demand from steelmakers

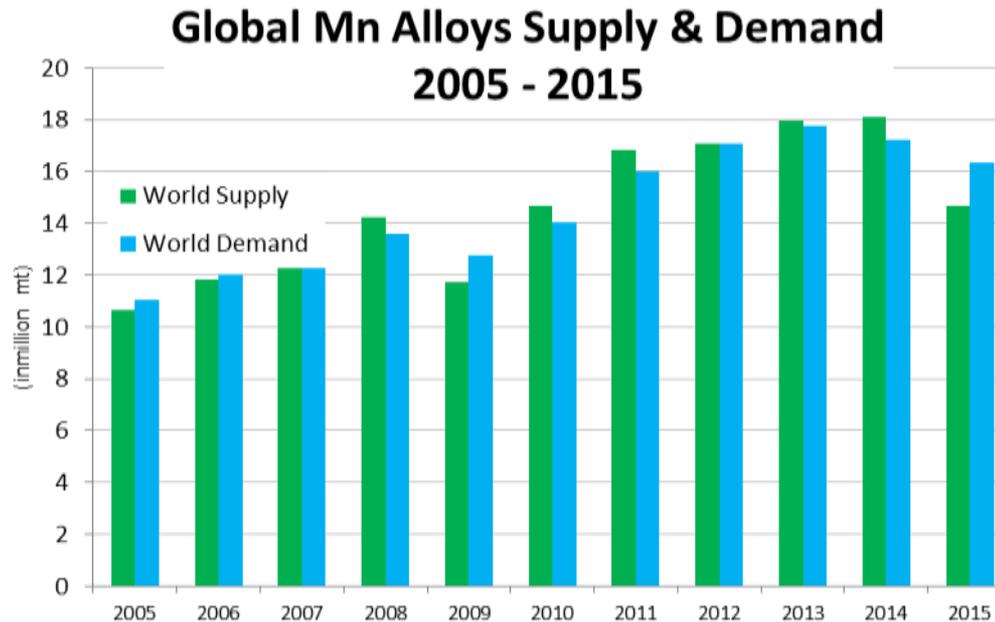
2 – China's manganese alloys: stocks and production falling

3 – Global manganese ore: large production cuts in 2015/2016

4 – China's manganese ore: lower output and imports

1 – Global Mn Alloys

Mn alloys supply in 2015: -20% over 2014, to 14.7 million mt.
Meanwhile, demand from steelmakers: -5% YoY, to 16.4 million mt.

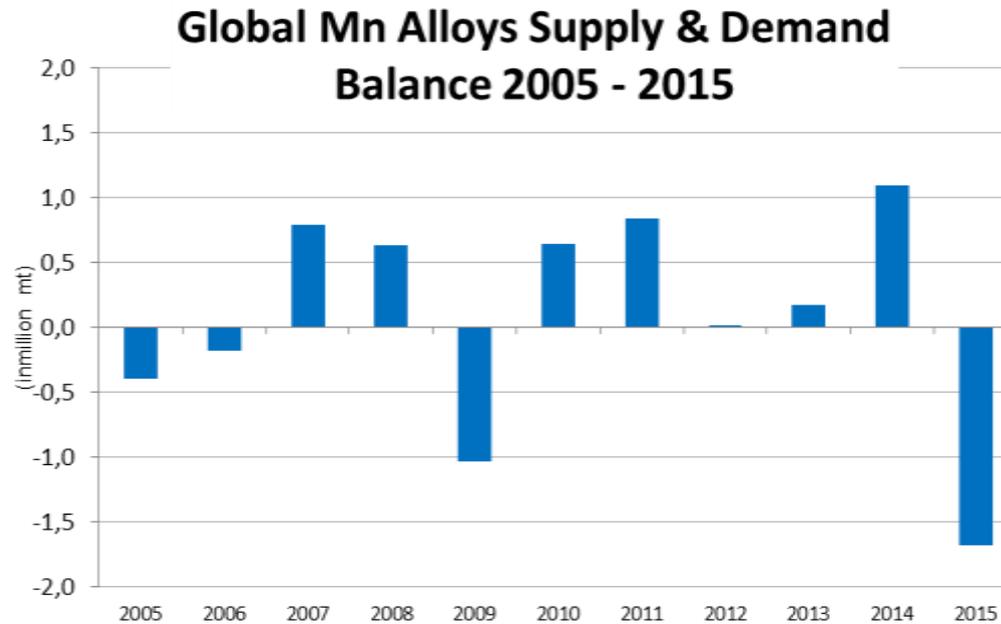


Source: IMnI

Last year, Mn alloys supply dropped, especially in China and India, and supply & demand balance became negative, as stocks accumulated in the past were consumed.

1 – Global Mn Alloys

Between 2010 and 2014, excess Mn alloys supply has been accumulated, especially in China.
Correction in 2015: 1.7 million mt of Mn alloys undersupply (stocks decreased, especially in China, Africa and Europe).



Source: IMnI

However, the cumulative supply & demand balance from 2011 to 2015 is still positive.
That is why Mn alloys prices crashed in 2015, in spite of demand being higher than current production.

1 – Mn Alloys Capacity Closure



Several Mn alloys producers around the world have announced production cuts for 2015/2016, especially in China, India and South Africa.

Product	Country	Capacity cut (in '000 mtpy)	Date
SiMn	China	1 879	2015
	India*	600	2015
	South Africa	144	05/2015
	Brazil	129	04/2015
	Norway	60	12/2015
	USA	53	02/2015
	Slovakia	39	01/2016
	Mexico	33	07/2015
HC FeMn	China*	350	2015
	South Africa	103	04/2015
	India*	72	2015
Ref FeMn	China	66	2016
Total	Mn alloys	3 528	in 2015/2016

*IMnI estimate

Globally, more than 3.5 million mt of Mn alloys capacity cut has been announced in 2015-2016, due to low prices.

1 – Mn Alloys Future Projects



Meanwhile, new competitive Mn alloys plants will start this year and ramp up production by 2020, including in Malaysia and Indonesia, but also in China and India, where large producers build new plants, displacing older small producers.

Product	Country	Company/Project	Capacity (in '000 mtpy)	Start
HC FeMn	India	Tata Steel - Joda plant	10	H1 2016
	India	Brahm Energy - Bankura project	118	indefinite
	Indonesia	Gulf Minerals Corporation - Kupang Project	144	Q4 2016
	Malaysia	Sakura Ferroalloys	110	Q2 2016
	Malaysia	OM Sarawak	50	H1 2016
Ref FeMn	Malaysia	Pertama Ferroalloys (JV of Asia Minerals, Nippon Denko, Shinsho Corp.)	55	H1 2016
SiMn	China	Minmetals (Hunan) Ferroalloys	60	2016
	Georgia	Rusmetali (owned by Georgian Alloys Group)	12	2016
	India	Tata Steel - Joda plant	60	H1 2016
	Malaysia	OM Sarawak	30	H1 2016
	Malaysia	Sakura Ferroalloys	70	Q2 2016
	Malaysia	Pertama Ferroalloys (JV of Asia Minerals, Nippon Denko, Shinsho Corp.)	120	2016
Total	Mn alloys		839	by 2020

Some of these projects will never come on line (India, China), but those who will are likely to add pressure on some other producers facing higher production costs (South Africa, China, India, South Korea, etc.).

Comparing new projects (+0.84 Mt) and plants closure (-3.5 Mt), it is obvious that more Mn alloys capacity is being idled than built, so the Mn alloys market is progressively adjusting to the lower demand.

1 – Mn Alloys

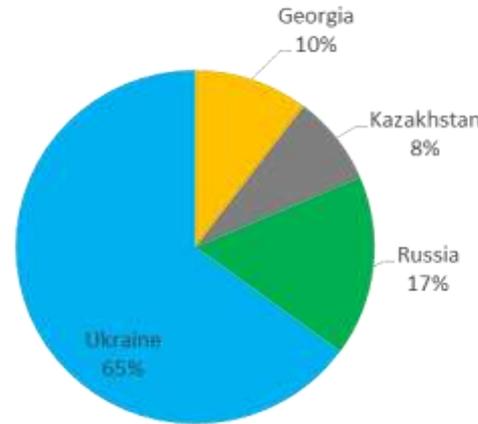
Focus on the CIS



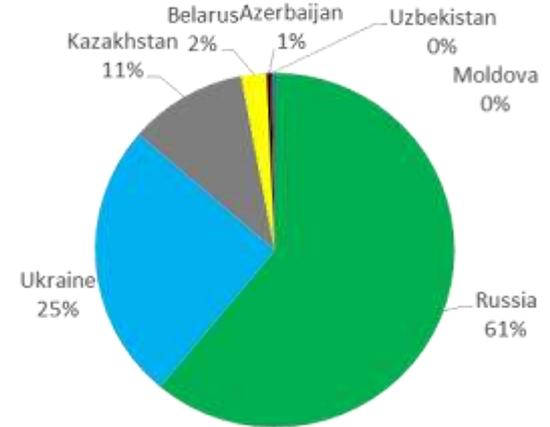
Ukraine’s Mn alloys capacity (around 1.9 million mt per year) is huge compared to its needs, as most of the CIS demand for Mn alloys comes from steelmakers in Russia.

Ukraine is the second biggest exporter of Mn alloys in the world, after India, and ships its material mostly to Russia, Europe and Turkey.

CIS Mn Alloys Capacity by Country in 2015
(source: IMnI)



CIS Mn Alloys Demand by Country in 2015
(source: IMnI)



Russia imposed in November 2015 a 26.35% provisional import duty on Ukrainian SiMn (to be confirmed in April), making Ukrainian material uncompetitive in Russia: opportunity for Russian, Kazakh and Georgian SiMn producers.

Demand for Ukrainian SiMn in Russia reduced by around 50% according to media sources, forcing Privat to cut production (Zaporozhye announced in February 2016 it will cut staff) since its material could not entirely be diverted to Europe (where competition with Chinese and Indian suppliers is tough), Turkey and Asia.

1 – Global manganese alloys: output down on lower demand from steelmakers

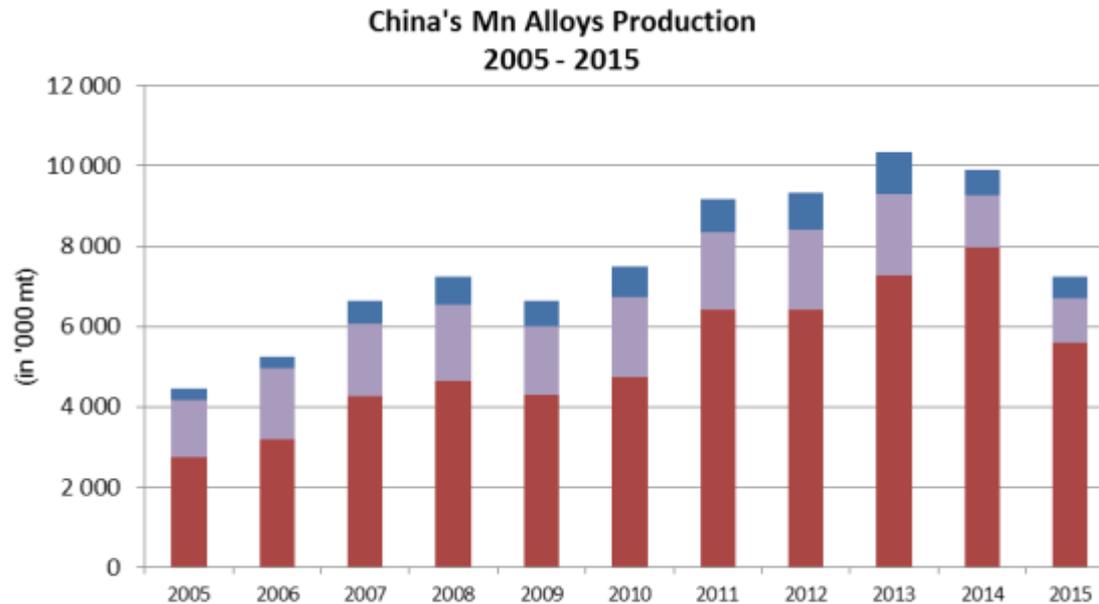
2 – China's manganese alloys: stocks and production falling

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4 – China's manganese ore: lower output and imports

2 – Focus on China Mn Alloys S & D

Chinese smelters produced 7.2 million mt of Mn alloys last year, down 27% over 2014, and close to 2010 production levels.



Source: IMnI

Why did Mn alloys output drop by 27% last year, while crude steel production contracted by only 2% in China?

2 – Focus on China Mn Alloys S & D

Mn alloys production fell at a faster rate (-27% YoY) than steel production (-2%) in China last year because:

- local governments reduced their help to companies incurring losses but still producing (“zombie companies”),
- pessimism for the future of the steel industry spreading,
- stricter environmental regulations for Mn alloys producers,
- large stocks of Mn alloys, especially SiMn, accumulated over the last few years.



Source: IMnI

Because of a 20% export tax on Chinese ferro-alloys, domestic smelters could not offload their material abroad, so many small-scale Chinese smelters had no choice but to cut production, and sell from stocks accumulated in the past.

Therefore, a destocking process started last year, and the Mn alloys supply and demand balance became negative in 2015 in China, for the first time since 2009.

2 – Focus on China Mn Alloys Stocks



How much of China's Mn alloys stocks have been consumed in 2015?

This is hard to tell since the market is highly fragmented, with many small producers not sharing their stats, but this is what we know:

- stocks reported by some of our Chinese Members decreased in 2015 by 38% for HC FeMn and by 98% for Ref FeMn and SiMn;
- we conducted a survey in China, asking SiMn producers about the trend for their sales, production and stocks: around 98% of the 130 respondents reported lower SiMn inventory during Q4 2015:

SiMn Inventory	Up	Stable	Down
October 2015	1%	19%	81%
November 2015	1%	1%	98%
December 2015	1%	1%	98%

This corroborates our estimates based on supply & demand balance in China, showing that China's Mn alloys stocks have fallen last year.

The extent of this fall in inventory is hard to know for sure, but we estimate it was 1.1 million mt last year, representing around 13% of China's Mn alloys production.

2 – Focus on China

SiMn Producers



Many Chinese Mn alloys producers, generally using older and more polluting furnaces, cut production or even shut down last year.

At the end of last year, only 71 producers of SiMn out of 382 producers surveyed were still operating in China (= 19%, against 25% in Q3), and on average they were operating at only 18% of their production capacity.

Although SiMn production fell last year by 27%, capacity continued to increase (by 8% over 2014):

- because the central government has been trying to control capacity with administrative orders, forcing small furnaces using old technologies to shut down,
- some small producers invested in bigger furnaces, increasing China's capacity,
- but at the same time, **most small furnaces were not really shut down permanently**: small producers would temporarily shut down during inspections, and then resume production after the inspectors were gone **as soon as prices recovered**.

SiMn producers in China in 2015	Producers in Operation	% of producers surveyed in Operation	Capacity Utilisation Ratio	Capacity per year ('000 mt)
January	95	25%	25%	25 243
February	79	21%	23%	25 303
March	87	23%	22%	25 303
April	79	21%	22%	25 303
May	87	23%	22%	25 348
June	93	25%	23%	25 316
July	92	24%	23%	25 316
August	95	25%	20%	25 571
September	92	24%	20%	25 721
October	71	19%	19%	26 651
November	71	19%	19%	26 651
December	71	19%	18%	26 651

Source: CNFEOL, IMnI

Most small-scale Chinese Mn alloys producers shut down in 2015.

Some seem willing to come back online, as SiMn prices now recover, but the bounce up of Mn ore prices and challenges sourcing imported ore are currently preventing them from doing so.

Many producers could take the opportunity to come back online once SiMn prices catch up with Mn ore rise, and this is likely to also coincide with the spring/summer months when seasonal electricity discounts are offered in some Chinese provinces.

1 – Global manganese alloys: output down on lower demand from steelmakers

2 – China's manganese alloys: stocks and production falling

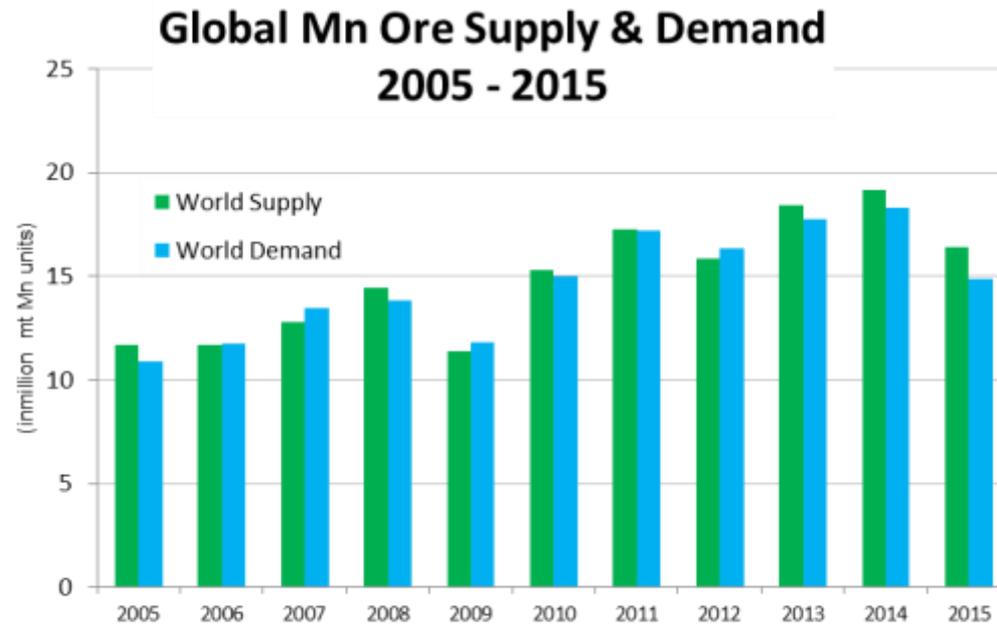
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3 – Global Mn Ore

Demand for Mn ore fell last year, by -19% YoY, to 14.9 million mt (Mn units), following the trend of Mn alloys production.

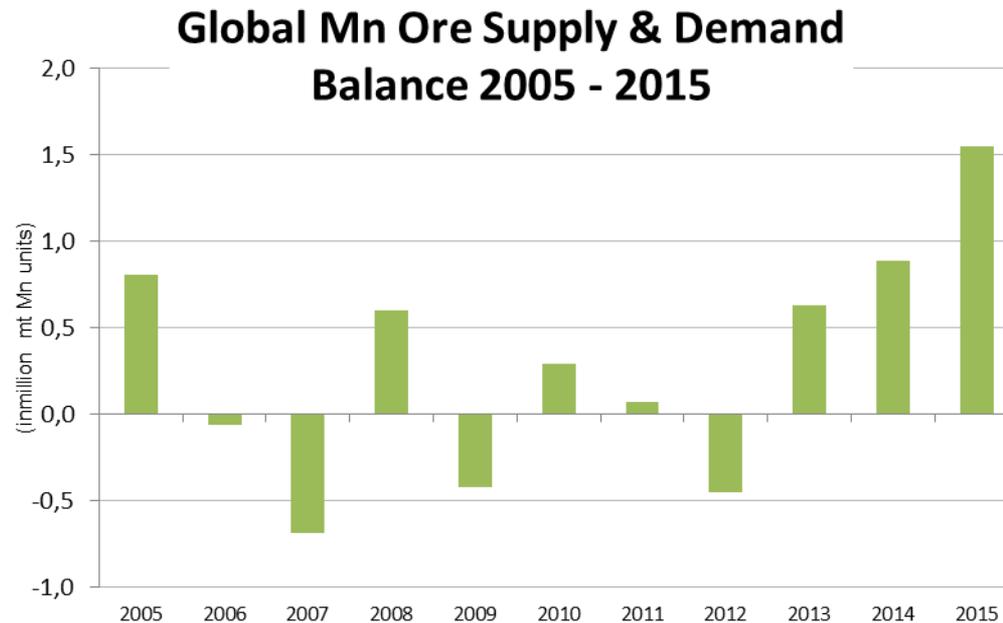
Mn ore supply also reduced, but by -14%, to 16.4 million mt (Mn units).



Source: IMnI

Even though Mn ore supply reduced last year, it was still larger than demand, so the market remained oversupplied.

Excess supply in 2015: around 1.5 million mt (Mn units): stocks increased, both at alloy plants (due to overbuying) and at mines (when demand started to decrease), especially in Brazil, some African countries, India and Australia.



Source: IMnI

Supply adjustments were only made at the very end of last year, because of price falls in November and December.

Because of these production cuts announced in 2015/2016, some of the stocks accumulated in 2013 - 2015 (mostly at alloy plants) are being consumed in 2016, and the market is becoming more balanced.

3 – Mn Ore Capacity Closure



Production cuts in announced in 2015/2016:

Country	Capacity cut (in '000 mtpy)	Date
China*	5 520	2015
Australia	1 620	02/2016
	1 000	12/2015
South Africa	900	02/2016
	780	05/2015
	750	01/2016
Gabon	317	01/2016
Georgia	220	01/2016
Mn Ore	11 107	in 2015/2016

*IMnI estimate

We estimate that around 23% of China's Mn ore capacity was closed in 2015.

Globally, around 11.7 million mt of Mn ore capacity cuts were announced at the end of 2015 and beginning of 2016, due to low Mn ore prices and high stock levels.

3 – Mn Ore Future Projects



Several new manganese ore projects have been announced to come on stream over the next few years, especially in Asia.

Country	Company/Project	Extra Capacity (in '000 wet mtpy)	Expected Start
Australia	Groote Eylandt Expansion Project (GEMCO; owned by South32)	500	Q2 2016
Brazil	HC8	120	Q3 2016
India	Rungta Mines	161	2016
	MOIL Ukwa project	105	2019
	MOIL Kandri project	57	2018
	Brahm Energy - Bankura project	330 (sinter)	indefinite
	MOIL Parsoda project	40	2016
	Tata Steel - Joda plant	50 (sinter)	H1 2016
Malaysia	Pertama Ferroalloys (JV of Asia Minerals, Nippon Denko, Shinsho Corp.)	200 (sinter)	Q2 2016
South Africa	Kudumane Manganese Resources (Asia Minerals)	500	2017
Togo	Ferrex (Nayega project)	250	2016
Mn Ore		2 313	by 2020

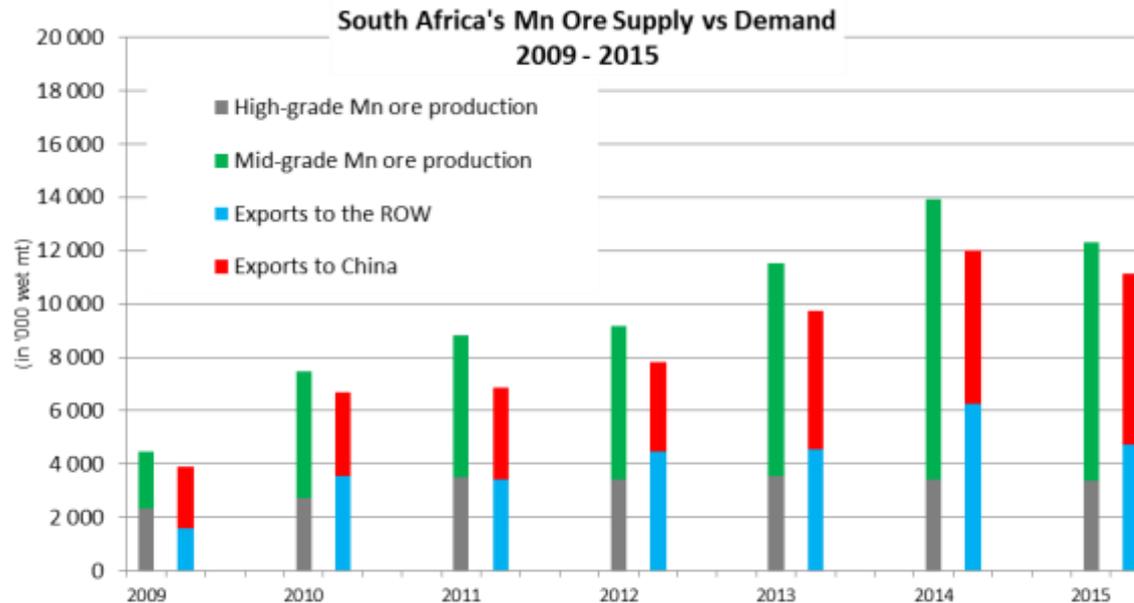
Assuming all these projects will actually come on line, extra capacity (+2.3 Mt) is much lower than mine closure (-11.7 Mt), so the Mn ore market is progressively adjusting to the lower demand, and it could return to equilibrium by mid-2017 (CRU), or even before if more mines cut output.

3 – Mn Ore Focus on Africa



Mid-grade ore production in South Africa has been growing at a 38% per year average rate between 2009 and 2014, much faster than exports (+23% CAGR) and domestic Mn alloys production (+18% CAGR):

Reasons: constraints on Transnet's rail capacity (limiting exports), Eskom's electricity supply and rising prices (limiting domestic Mn alloys production).



Source: GTIS, IMnI

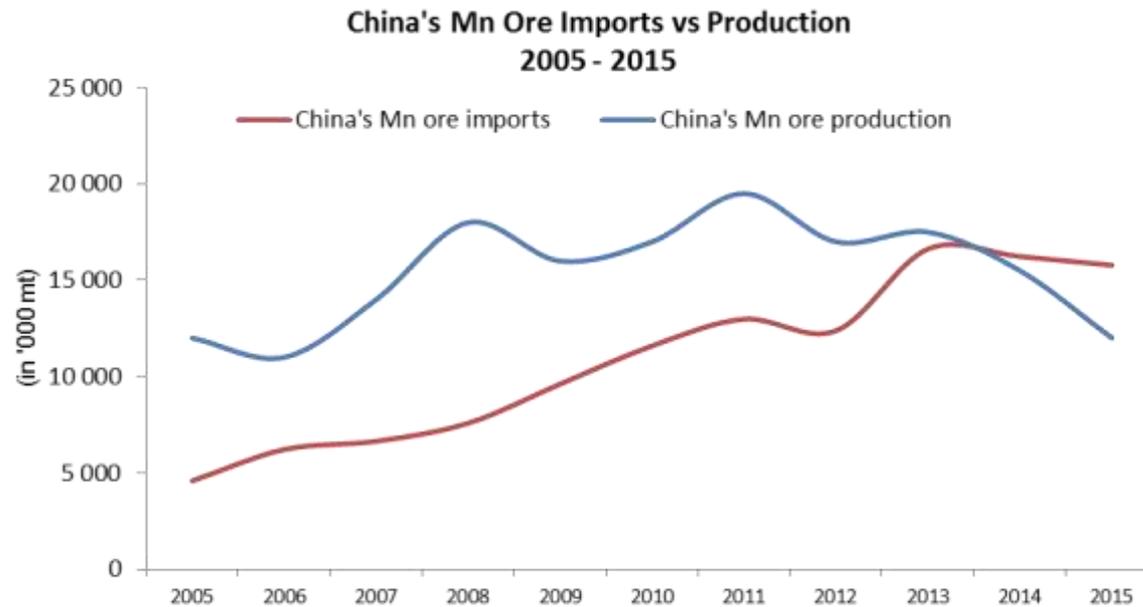
Rail capacity in South Africa is now improving following Transnet's investments, and exports have been supported by the fall of the South African rand in 2015, but demand for seaborne ore decreased last year.

South Africa's total Mn ore exports decreased by 8% in 2015 to 11.4 million wet mt, forcing several producers to adjust supply. But SA's exports to China have increased by 9.4% to 6.4 million mt in 2015.

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4 – Focus on China: Mn Ore Prod vs Imports

Due to large Mn alloys production cuts, manganese ore demand weakened in China last year. Manganese ore production and imports followed the same trend.



Source: GTIS, IMnI

China imported 15.8 million tonnes of manganese ore in 2015, down 3% from the previous year. Domestic Mn ore production was around 12 million mt, down 23% over 2014.

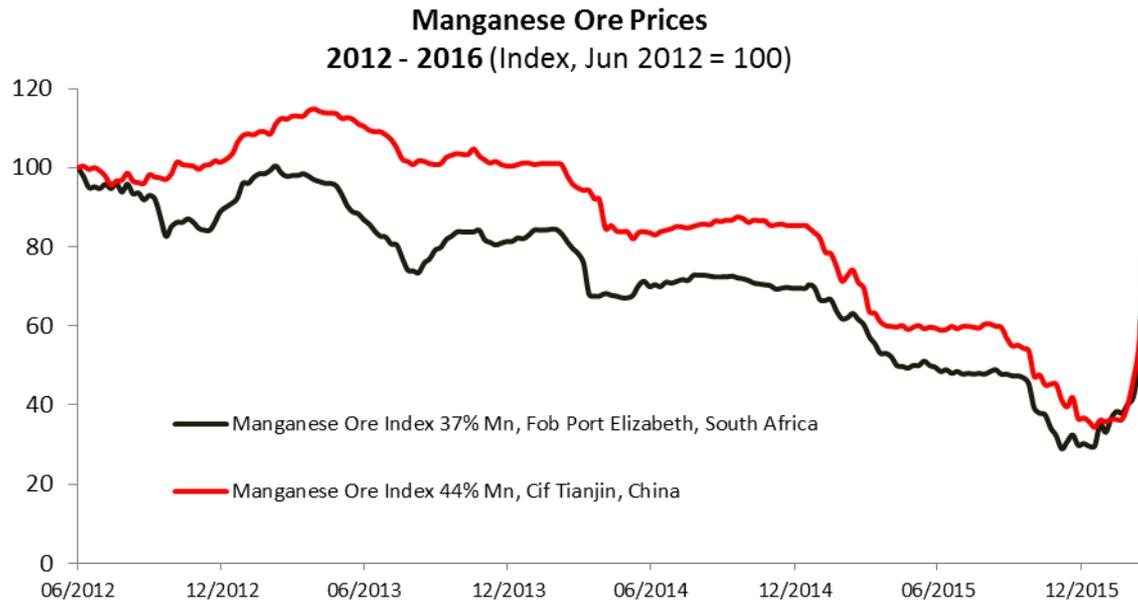
Why did China's manganese ore production drop much more than its imports last year?

4 – Focus on China: Mn Ore Prod vs Imports



Why did China's manganese ore production drop much more than its imports last year?

- high grade ore requirements of newly built closed furnaces (domestic output is low grade),
- depletion of local mines and corresponding higher mining costs,
- weak incentive to mine domestic low-grade ore when the price of imported ore is so low (it decreased by 57% in 2015).



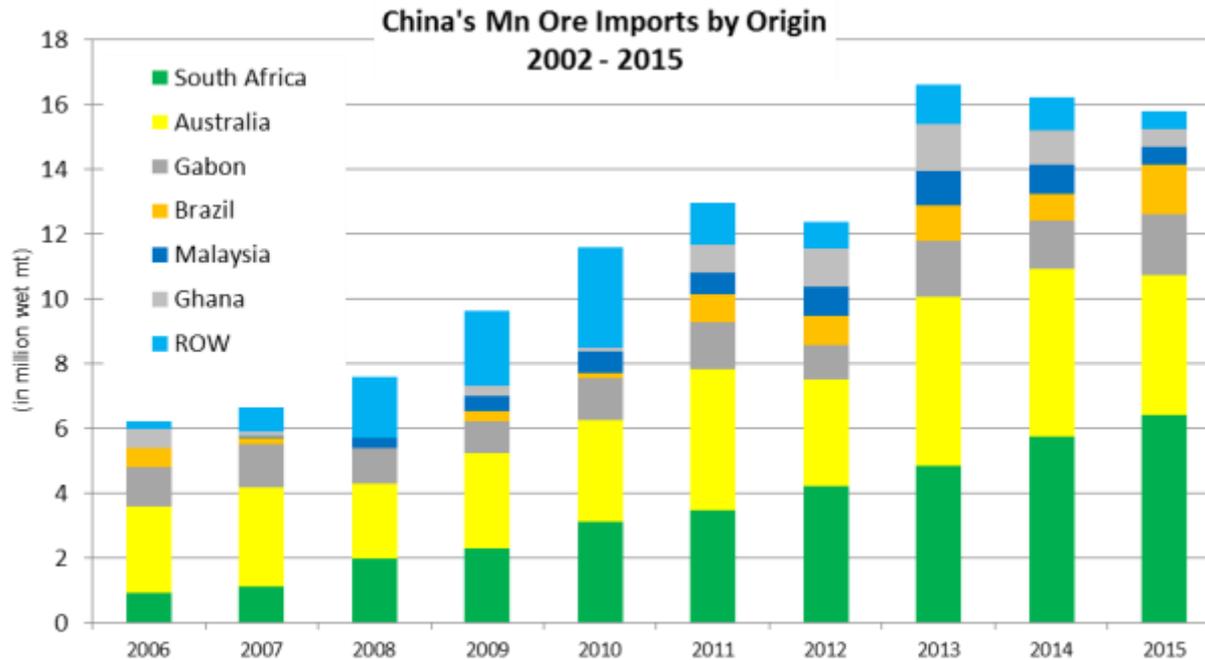
Source: Metal Bulletin, IMnI

In summary, although Mn ore imports in China decreased last year, imported ore is progressively replacing domestic ore at Chinese smelters. That is why China's manganese ore imports reduced by only 3% in 2015, while domestic manganese ore production fell by 23%.

4 – Focus on China: Mn Ore Prod vs Imports



China imported 15.8 million tonnes of manganese ore in 2015, down 2.8% from the previous year. Imports from Australia dropped by 17%, Malaysia 38%, Ghana 49% (carbonate ore for EMM production) and the ROW 47%.



Source: GTIS, IMnI

South African Mn ore exporters increased their market share of China's imports, shipping 11% more material in 2015, to 6.4 million tonnes, supported by the 25% fall of the Rand against the dollar. Imports from Gabon rose by 27% to 1.9 million mt, and those of Brazil reached 1.5 million mt, up by 90%.



- Last year, China's crude steel output declined for the first time in 30 years, to 897 million mt. There was no "hard landing", since production contracted by only 2%.
- Industry estimates place China's steel overcapacity at 300 million mt per year. At the beginning of 2016, China announced a plan to reduce its steel capacity by 100 to 150 million mtpy by 2020.
- These production cuts in China's steel industry combined with trade barriers (USA, EU, India) are likely to reduce China's steel exports in 2016, supporting steel supply in the rest of the world.
- This is a good news for Mn alloys producers in the USA, Europe, Japan.
- The Mn ore market remained oversupplied last year, as demand fell faster than production, but recent production cuts are contributing to rebalance the market. It could return to equilibrium in 2017 or this year.
- Mn ore prices have been skyrocketing over the last few weeks, due to a restocking of Chinese Mn alloys producers. This restocking is due to production cuts since November 2015, especially in South Africa, resulting in lower stocks of Mn ore in China, combined to rising SiMn prices in China. Nobody wanted to have large stocks, but as soon as demand improves, consumers are chasing producers for material on the spot market, resulting in higher prices.
- But these Mn ore price gains could disappear if temporary production shutdowns are reversed or not fully implemented, in the absence of improved steel demand (Macquarie).

Thank you!



All the data used in this report is available to **IMnI Members**
www.manganese.org

Non-Members can get in touch at stats@manganese.org

Aloys d'Hambure
International Manganese Institute (IMnI)