Aloys d’Harambure, International Manganese Institute (IMnI)

Overview of the Global Manganese Industry
Where do we get our data?

Market research firms

Analyst → Phone calls → Estimations → Forecasts → Reports

vs

IMnI Members

Submit their data every month → Analyst → Reviews the data → Reports
Introduction

I - Steel

II - Manganese Alloys (HC FeMn, Ref FeMn, SiMn)

III - Manganese Ore

Conclusion
Economic development is a key driver for steel production

Macro-economic trends 2015:
- **China’s slowing growth**: weaker domestic demand and weaker growth in industrial production
- **falling oil prices**: support the recovery in the USA and the EU by reducing manufacturing costs and boosting consumer spending power
- **currencies**: weak € supports the eurozone’s economy, while **strong US dollar** hurts the competitiveness of US exports
- **BRIC countries under pressure**: lower demand from China, low energy prices and trade sanctions against Russia, electricity supply issues in Brazil

Source: World Steel Association (WSA), International Monetary Fund, UBS
Introduction

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Conclusion
Global crude steel production: 4 periods:

In 2014, **global crude steel production reached 1,665 million mt** (new record high)

But comparing 2013 to 2014, it was up by only 1% or 16 million mt

→ **lowest growth rate since the economic crisis in 2008/2009**

Global crude steel production is still growing, but at a slowing pace than before

China played a significant role in these results

Source: IMnl, World Steel Association
I – Steel – Top 10 Producers

YoY % change per country in crude steel production in 2014:

Crude steel production expanded mostly in South Korea, Russia and India
more moderately in the USA and Germany
remained stable in China and Japan
and decreased in Ukraine, Turkey and Brazil
China is a key driver of global crude steel production. Last year, China produced 823 million mt of crude steel, up only 0.1% YoY.

Crude steel production slowing in China:
- weak construction demand
- sluggish manufacturing sector
- overcapacity of industrial sector

China: steel domestic consumption dropped last year, pushing for higher steel exports (new record high at 94 million mt in 2014)

China’s steel industry is facing overcapacity.

Stricter environmental regulation to reduce steel production in 2015.
EU28: steel production was 169 million mt in 2014, up 1.8% from 2013

EU28 steel demand in 2014: +3.3% YoY

EU28 steel imports in 2014: +14% YoY

→ In 2014, **EU steel mills suffered a further loss of market share** to third country suppliers, including China

In 2015, a weak euro and falling oil prices support the European economy
→ construction sector depressed at the beginning of 2015, automotive sector recovering

**Overcapacity and cheap steel imports likely to offset a small recovery of the steel market**
USA: steel production was 88 million mt in 2014, up 1.5% from 2013

In 2015, the drop in oil prices supports the economic recovery (good performance of the US automotive industry)

Strong dollar
\[\rightarrow\] reduces steel exports from the USA
\[\rightarrow\] increases the attractiveness of the American market for foreign steel producers

Fierce competition of low-cost steel imports from China, South Korea and Turkey
\[\rightarrow\] steel imports into the USA in 2014 increased by 38% YoY to 44 million mt
\[\rightarrow\] several US steel producers are slashing production in 2015
Introduction

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Conclusion
II - Mn Alloys – HC FeMn Supply & Demand

HC FeMn in 2014:
- supply: 4.9 million mt, up 9% from 2013
- demand: 4.97 million mt, up 5% from 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Change 2013-2014 (in '000 mt)</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>255</td>
<td>164</td>
<td></td>
</tr>
<tr>
<td>C.I.S.</td>
<td>111</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>European Union (28)</td>
<td>49</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td>23</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Oceania</td>
<td>18</td>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>0,5</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td>-</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Other Europe</td>
<td>-19</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>-35</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>402</td>
<td>259</td>
<td></td>
</tr>
</tbody>
</table>

• India, and to a lesser extent China & Japan, increased HC FeMn production in 2014

• Kramatorsk restarted production in the Donbass region of Ukraine at the beginning of 2014, after being taken over by Evgeny Ivanov, owner of the Satka Metallurgical Mill in Russia
II - Mn Alloys – HC FeMn Supply & Demand Balance

**Supply**
- Asia 71%
- Africa 9%
- EU28 5%
- C.I.S. 6%
- Oceania 3%
- Middle East 2%
- South America 2%
- North America 1%
- Other Europe 1%

**Demand**
- EU28 11%
- North America 7%
- Middle East 4%
- C.I.S. 4%
- South America 2%
- Africa 1%
- Other Europe 1%
- Oceania 1%

**Supply/Demand Balance 2014 (in '000 mt)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (28)</td>
<td>-296</td>
</tr>
<tr>
<td>North America</td>
<td>-293</td>
</tr>
<tr>
<td>Middle East</td>
<td>-114</td>
</tr>
<tr>
<td>South America</td>
<td>-22</td>
</tr>
<tr>
<td>Other Europe</td>
<td>7</td>
</tr>
<tr>
<td>Asia</td>
<td>31</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>86</td>
</tr>
<tr>
<td>Oceania</td>
<td>137</td>
</tr>
<tr>
<td>Africa</td>
<td>397</td>
</tr>
<tr>
<td>World</td>
<td>-68</td>
</tr>
</tbody>
</table>

**HC FeMn supply**
EU28, North America, Middle East in deficit
Africa, Oceania in surplus
II - Mn Alloys – HC FeMn Trade

Major HC FeMn Net Trade Flows in 2014
(in ‘000 mt, source GTIS)

North America
- EU28
- Other Europe
- Africa
- South America
- Asia
- CIS
- Oceania
- Other Europe

Trade volumes:
- North America: 225
- EU28: 164
- Other Europe: 44
- Africa: 10
- South America: 15
- Asia: 70
- CIS: 20
- Oceania: 82
Ref FeMn in 2014:
supply: 1.84 million mt, up 7.3% from 2013
demand: 1.86 million mt up 7.7% from 2013

- China increased its Ref FeMn production in 2014
- In South Africa, BHP Billiton & Assmang produced more Ref FeMn in 2014 than in 2013
II - Mn Alloys – Ref FeMn Supply & Demand Balance

Supply
- Asia 70%
- Other Europe 13%
- Africa 7%
- North America 6%
- EU28 2%
- South America 1%
- C.I.S. 1%
- Middle East 0%
- Oceania 0%

Demand
- North America 13%
- EU28 10%
- South America 3%
- Middle East 3%
- C.I.S. 1%
- Other Europe 1%
- Africa 1%
- Oceania 0%
- Asia 68%

Supply/Demand Balance 2014 (in '000 mt)

<table>
<thead>
<tr>
<th>Region</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (28)</td>
<td>-152</td>
</tr>
<tr>
<td>North America</td>
<td>-139</td>
</tr>
<tr>
<td>Middle East</td>
<td>-46</td>
</tr>
<tr>
<td>South America</td>
<td>-39</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>-9</td>
</tr>
<tr>
<td>Oceania</td>
<td>-3</td>
</tr>
<tr>
<td>Asia</td>
<td>28</td>
</tr>
<tr>
<td>Africa</td>
<td>116</td>
</tr>
<tr>
<td>Other Europe</td>
<td>218</td>
</tr>
<tr>
<td>World</td>
<td>-26</td>
</tr>
</tbody>
</table>

Ref FeMn supply
EU28, Americas, Middle East in deficit
Other Europe and Africa in surplus
II - Mn Alloys – Ref FeMn Trade

Major Ref FeMn Net Trade Flows in 2014
(in ‘000 mt, source GTIS)

- North America: 30
- EU28: 11
- Other Europe: 28
- Middle East: 11
- Asia: 41
- South America: 23
- Africa: 13
- Oceania: 34
- Other: 111
II - Mn Alloys – SiMn Supply & Demand

SiMn in 2014:
- supply: 12.8 million mt, down 4.3% from 2013
- demand: 13.2 million mt down 2.5% from 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.I.S.</td>
<td>304</td>
<td>195</td>
</tr>
<tr>
<td>Africa</td>
<td>95</td>
<td>32</td>
</tr>
<tr>
<td>Other Europe</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Oceania</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Middle East</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>European Union (28)</td>
<td>-6</td>
<td>49</td>
</tr>
<tr>
<td>North America</td>
<td>-6</td>
<td>101</td>
</tr>
<tr>
<td>South America</td>
<td>-63</td>
<td>-23</td>
</tr>
<tr>
<td>Asia</td>
<td>-924</td>
<td>-729</td>
</tr>
<tr>
<td>World</td>
<td>-578</td>
<td>-333</td>
</tr>
</tbody>
</table>

- Kazchrome in Kazakhstan and Chelyabinsk in Russia produced more SiMn in 2014
- China reduced sharply its SiMn production in 2014
  - ample stocks
  - high electricity tariffs in Southern China
  - low prices for SiMn
  - stricter environmental regulation
II - Mn Alloys – SiMn Supply & Demand Balance

Supply

- Asia 78%
- C.I.S. 11%
- Other Europe 2%
- EU28 2%
- Africa 2%
- North America 2%
- South America 1%
- Oceania 1%
- Middle East 1%

Demand

- Asia 75%
- C.I.S. 7%
- EU28 6%
- North America 5%
- Other Europe 2%
- Middle East 2%
- South America 2%
- Africa 1%
- Oceania 0%

Supply/Demand Balance 2014 (in '000 mt)

<table>
<thead>
<tr>
<th>Region</th>
<th>Supply/Demand Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (28)</td>
<td>-571</td>
</tr>
<tr>
<td>North America</td>
<td>-441</td>
</tr>
<tr>
<td>Middle East</td>
<td>-112</td>
</tr>
<tr>
<td>South America</td>
<td>-42</td>
</tr>
<tr>
<td>Other Europe</td>
<td>33</td>
</tr>
<tr>
<td>Asia</td>
<td>85</td>
</tr>
<tr>
<td>Oceania</td>
<td>103</td>
</tr>
<tr>
<td>Africa</td>
<td>138</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>465</td>
</tr>
<tr>
<td>World</td>
<td>-342</td>
</tr>
</tbody>
</table>

SiMn supply
EU28, Americas, Middle East in deficit
CIS, Africa and Oceania in surplus
II - Mn Alloys – SiMn Trade

Major SiMn Net Trade Flows in 2014
(in ‘000 mt, source GTIS)
5 new manganese alloys projects to come on stream soon in Asia
Including 3 major projects in Malaysia
→ cheap ore, labour & electricity
→ a threat for Indian SiMn producers?

In South Africa, Eskom is struggling to supply electricity, rising power prices
Introduction

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Conclusion
Mn ore (wet) in 2014:

**supply**: 61 million mt, up 3% from 2013

**demand**: 56 million mt, down 1% from 2013

### Change 2013-2014 (in '000 mt)

<table>
<thead>
<tr>
<th>Region</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>2,008</td>
<td>-352</td>
</tr>
<tr>
<td>North America</td>
<td>72</td>
<td>-97</td>
</tr>
<tr>
<td>European Union (28)</td>
<td>25</td>
<td>-105</td>
</tr>
<tr>
<td>Middle East</td>
<td>0</td>
<td>61</td>
</tr>
<tr>
<td>Oceania</td>
<td>-19</td>
<td>-478</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>-50</td>
<td>149</td>
</tr>
<tr>
<td>South America</td>
<td>-88</td>
<td>-49</td>
</tr>
<tr>
<td>Other Europe</td>
<td>-107</td>
<td>106</td>
</tr>
<tr>
<td>Asia</td>
<td>-146</td>
<td>178</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td>1,695</td>
<td>-586</td>
</tr>
</tbody>
</table>

New mn ore miners in South Africa ramping up production in 2014

→ United Manganese of Kalahari (UMK),
→ Tshipi Borwa,
→ African Rainbow Minerals
### Mn ore (wet) 2014

#### Supply
- Asia: 44%
- Africa: 33%
- Oceania: 13%
- EU28: 0%
- Middle East: 0%
- Other Europe: 0%
- North America: 1%
- South America: 4%
- C.I.S.: 5%

#### Demand
- Asia: 82%
- C.I.S.: 9%
- Other Europe: 2%
- North America: 2%
- EU28: 2%
- South America: 1%
- Africa: 1%
- Middle East: 1%
- Oceania: 0%

#### Supply/Demand Balance 2014 (in '000 mt)

<table>
<thead>
<tr>
<th>Region</th>
<th>Balance ('000 mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>-19,434</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>-2,094</td>
</tr>
<tr>
<td>European Union (28)</td>
<td>-994</td>
</tr>
<tr>
<td>Other Europe</td>
<td>-962</td>
</tr>
<tr>
<td>North America</td>
<td>-427</td>
</tr>
<tr>
<td>Middle East</td>
<td>-310</td>
</tr>
<tr>
<td>South America</td>
<td>1,820</td>
</tr>
<tr>
<td>Oceania</td>
<td>7,686</td>
</tr>
<tr>
<td>Africa</td>
<td>19,803</td>
</tr>
<tr>
<td>World</td>
<td>5,089</td>
</tr>
</tbody>
</table>

Mn ore supply
- Asia, CIS, Europe and N. Americas in deficit
- Africa, Oceania and S. America in surplus
Major Mn Ore (wet) Net Trade Flows in 2014
(in ’000 mt, source GTIS)
### III - Mn Ore Projects

<table>
<thead>
<tr>
<th>Country</th>
<th>Company/Project</th>
<th>Capacity (in '000 mtpy)</th>
<th>Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>Pertama Ferroalloys (JV of Asia Minerals, Nippon Denko, Shinsho Corp.)</td>
<td>200 (sintered Mn ore)</td>
<td>H2 2015</td>
</tr>
<tr>
<td>Togo</td>
<td>Ferrex - Nayega project</td>
<td>60 (first phase), ramping up to 250</td>
<td>2016</td>
</tr>
<tr>
<td>India</td>
<td>Rungta Mines</td>
<td>161</td>
<td>2016</td>
</tr>
<tr>
<td>India</td>
<td>MOIL - Kandri project</td>
<td>57</td>
<td>2018</td>
</tr>
<tr>
<td>India</td>
<td>MOIL - Ukwa project</td>
<td>105</td>
<td>2019</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Gulf Minerals/Asia Minerals</td>
<td>180</td>
<td>2018</td>
</tr>
</tbody>
</table>

**Most new manganese ore projects located in Asia**

But in Africa, investments in **transportation system and port terminals** to increase exports capacity:
- **South Africa**: rail-freight parastatal **Transnet is investing in a new manganese terminal at Ngqura port** (expected capacity: 12 million mtpy by February 2019 and 16 million mtpy by October 2020)

- **Congo/Angola**: investment in the rail network, to link the Kisenge manganese mine owned by Entreprise Miniere de Kisenge-Manganese (EMK-Mn), and the port of Lobito on the Atlantic coast of Angola
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Conclusion
### Conclusion – China in the Steel and Mn Industries

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>World</th>
<th>World Excluding China</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2014 compared to 2013</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude Steel Production</td>
<td>0.1%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Total Mn Alloys Production</td>
<td>-6%</td>
<td>-0.3%</td>
<td>9%</td>
</tr>
<tr>
<td>Mn Ore Production</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>
• Slowing growth in China weighing on demand for manganese alloys

• Global **crude steel production still growing**, but at a slowing pace (almost zero growth in China in 2014, the USA and the European Union recovering)

• **HC FeMn production increased in Asia and CIS countries last year**, and decreased in Africa

• **Global Ref FeMn production expanded in 2014**, mostly driven by a growing demand in Asia & North America

• **SiMn production in China dropped last year due to a slowing demand, but increased in the CIS and Africa**, 2 major exporters of SiMn to Europe and North America

• **Mn ore market remains in oversupply**, as production increased in Africa in 2014, and new projects are expected to start in Asia over the next few years
Conclusions – Key Drivers of the FeMn Industry in 2015

Electricity supply & prices
- Energy crisis in Brazil & South Africa
- Rising electricity tariffs in India
- Changing electricity regulation in China (more and more Chinese producers are trying to negotiate directly with energy providers to get cheaper electricity tariffs and avoid paying fees to the grid companies)
- Liberalisation of the power market in Ukraine → higher electricity prices

China’s economy
- Domestic steel production
- Environmental regulation

India’s SiMn exports
- India is the world’s largest exporter of SiMn
- Indian Rupee currency evolution
- Anti-dumping investigation on India’s SiMn imports into Europe

CIS Mn alloys production
- The CIS exports large volumes of SiMn and HC FeMn into Europe
- Russia vs Ukraine conflict
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