China Silicon Metal Overview and Prospect

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GM of Ferro-Alloys.Com (China)
ABOUT SINO-MINEMET

- Export Coal, Coke, Metals and Ferroalloys;
- Import Ores, alloys and scrap, Coal related Machines
- 2010 invested in Metallurgical CaSi Plant, 40K mt/pa with top grade quality.
- Licensed A Class company in exporting ferroalloys.
- Major exporter of FeSi, CaSi, Ca Metal, Mg Metal, Mn Metal, FeV in China.
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Part I. Global Silicon Metal Introduction

1. Global Silicon Metal Capability and Production
2. Main Silicon Metal Companies
3. Global Silicon Metal Market
Global Silicon Metal Capability

- Up till 2014, global capacity of silicon metal was totally 5.1 million tons.
  - China, 3.85 million tons
  - Brazil, 300,000 tons
  - USA, 200,000 tons
  - Norway, 190,000 tons
World Silicon Metal Production

- In 2014, the total silicon metal global production was 2.552 million tons, up by 10% Y-O-Y.
Main Silicon Metal Companies

In 2014, there were 10 enterprises with silicon capability over 30,000 tons, which mainly distributed in Brazil, Norway, American, Spain, Russia, Australia etc. The Atlantic Ferro alloy, Metallurgy and Norway Elkem are the largest three companies in the world. The total production of the three reached 490,000 tons, accounting for 19.2% in the global total.

<table>
<thead>
<tr>
<th>Country, Region</th>
<th>Company</th>
<th>Capability</th>
<th>Production 2013</th>
<th>Production 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA &amp; Canada</td>
<td>Globe Metallurgical</td>
<td>200</td>
<td>136</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>(Purchase Timminco in 2012)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>Rima</td>
<td>80</td>
<td>68</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>CCM</td>
<td>45</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>CBCC</td>
<td>40</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>Norway</td>
<td>Liasa</td>
<td>55</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>Spanish, South Africa, France</td>
<td>Ferroatlantica</td>
<td>260</td>
<td>200</td>
<td>220</td>
</tr>
<tr>
<td>Russia</td>
<td>OOO Sual-Kremniy-Ural</td>
<td>50</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>ZAO Kremniy</td>
<td>50</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Australia</td>
<td>Simcoa</td>
<td>33</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>
Global Silicon Metal Market

• In 2013-2015, the silicon metal market price in the west continued to rise continuously due to the unstable supply and shortage of electricity power in Brazil, who is the main supplier of silicon metal to the west countries.
Part II. Chinese Silicon Metal Introduction

1. Chinese Silicon Metal Capability and Production
2. Main Companies Introduction
3. Chinese Silicon Metal Market
4. Chinese Silicon Export
Now, the annual capability of silicon metal in China was 3.85 million tons, mainly distributed in Southwest of China. Nowadays, Chinese new capability of silicon metal rose up while some of the outdated capabilities were eliminated. In 2014, 106,000 tons of outdated capability were eliminated increased.
Chinese Silicon Metal Production

- Seen from the following chart, the production of silicon metal in China has increased rapidly since 2011. China was by far the leading producer of silicon metal with production achieving at 1.70 million tons in 2014. The active export market stimulated the capability utilization rate and then drove the production.
Chinese Silicon Metal Production

- In 2014, the total production of silicon metal in China was 1.7 million tons, up by 17.2% Y-O-Y. Productions in main districts were as follows,
- Yunnan, 450,000 tons; Xinjiang, 310,000 tons; Sichuan, 240,000 tons; Guizhou, 130,000 tons; Hunan, 100,000 tons; Gansu, 100,000 tons
Main Silicon Metal Companies in China

- In 2014, the total capability and production of top 10 producers were respectively 950,000 tons and 519,000 tons, accounting for 25% and 30.5% in Chinese total. Most of the companies are producing chemical materials.
- Main silicon companies and their production are as the follows chart,

<table>
<thead>
<tr>
<th></th>
<th>Capability</th>
<th>Production 2013</th>
<th>Production 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>XINJIANG HOSHINE SILICON INDUSTRY CO., LTD.</td>
<td>260</td>
<td>147</td>
<td>200</td>
</tr>
<tr>
<td>HEIHE HOSHINE SILICON INDUSTRY CO., LTD.</td>
<td>96</td>
<td>40</td>
<td>52</td>
</tr>
<tr>
<td>HU BEI SAN XIN SILICON CO., LTD.</td>
<td>160</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>GAN SU SAN XIN SILICON CO., LTD.</td>
<td>80</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>BLUESTAR SILICON MATERIAL CO., LTD.</td>
<td>66</td>
<td>38</td>
<td>51</td>
</tr>
</tbody>
</table>
Chinese Si Metal Market

- Si metal price in China rebounded since 2014. Now, the market kept stable with a low capability utilization rate of only 40~50%. In winter, many of the producers in south of China stop production due to the electricity price rise in drought season. However, we expect the producers will rise the capability utilization rate from end-April or May when it come to wet reason in China. And the price may slightly drop due to lower electricity price and enlarged supply in that period.
China Si Metal Power cost

- **Electricity consumption**: 12000~13000KVA / 1mt silicon metal, accounting about a half in the production cost

- **Electricity Price in China:**
  - Southwest: RMB0.28~0.35/KVA in wet season and RMB0.43~0.48 in dry season;
  - Northwest (Xinjiang): RMB0.21~0.32/KVA
  - Northwest (Guansu): RMB0.42~0.46/KVA
  - South and Southeast China: RMB0.55~0.60/KVA.

- **Expectation**: The electric power reform promoted by the Chinese government emphasizes on restoring the commodity property of electric power, leaving the power system to the hands of the market. Should the new reform be implemented, ferroalloy enterprises whose are in production of ferrosilicon, silicon metal and others would benefit much. So we expect the cost of the silicon metal may drop in the future.
China is the largest producer and supplier of silicon metal in the world. In recent years, the export volumes of silicon metal kept rising due to the removal of 15% export tariff from Jan 1st, 2013.

According to the Customs statistic, in 2014, China totally exported 871,256 tons of silicon metal, up by 23.71% Y-O-Y.
China Si Metal Export—Mainly destination

- Chinese silicon metal mainly shipped to S. Korea, Japan, Thailand, Germany etc.
- 2014, China total export, 871,256 tons (+23.71% Y-O-Y)
  - S. Korea, 178,391 tons (+42.87%), accounting for 21% in total
  - Japan, 159,807 tons (+35.88%), accounting for 18% in Total
  - Thailand, 62,596 tons(+26.37%), accounting for 7% in Total
  - Germany, 44,442 tons (+84.55%). accounting for 5% in Total

- With the global economy warming up in 2013, the silicon demands from Aluminum alloys industry in Japan, Poly-silicon industry in South Korea, and chemical industry in European countries rapidly increased and stimulated the export market of Chinese silicon metal. And then the Chinese domestic market also driven up by the enlarged purchase activities.
Part III. Outlook on Silicon Metal Demand

1. Si Metal Supply and Demand Balance in China
2. Outlook—Production and Price
3. Outlook—Export
4. Outlook—Silicone
5. Outlook—Al Alloys
6. Outlook—Poly silicon
## Si Metal Supply and Demand Balance in China

<table>
<thead>
<tr>
<th>Unit: ,000 tons</th>
<th>Year 2013</th>
<th>Year 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>1450</td>
<td>1700</td>
</tr>
<tr>
<td>Export</td>
<td>704.3</td>
<td>871.2</td>
</tr>
<tr>
<td>Import</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Apparent Consumption</td>
<td>750</td>
<td>858.8</td>
</tr>
<tr>
<td>--Al alloys</td>
<td>270</td>
<td>320</td>
</tr>
<tr>
<td>--silicone</td>
<td>320</td>
<td>350</td>
</tr>
<tr>
<td>--poly-silicon</td>
<td>106</td>
<td>140</td>
</tr>
<tr>
<td>--others</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Actual Consumption</td>
<td>736</td>
<td>850</td>
</tr>
</tbody>
</table>

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Si Metal Consumption in China

- Silicon metal is mainly for export and used in the industries of Al alloys, silicone, poly-silicon and ect.
- In 2014, the total supply of si metal is 1.70 million tons, 51% (871,200 tons) is for export while 20% (0.35 million tons) used in silicone, 19% (0.32 million tons) used in Al alloys and 8% (140,000 tons) used in poly-silicon.
Outlook--Production up and Price Stable

- **Si metal Production in 2015** is expected up continuously.
  - Demand: rapid progress of the downstream industries such as Daily chemical and Decoration industry.
  - Capability: there are more projects under construction in Yunnan and Xinjiang.

- **Si metal price in 2015** expect stable
  - enlarged capability and production will depress the price
  - cost of human resource and management will push up the price
  - Environmental Law effected and some of plants have to close
  - generally, the price of silicon metal in 2015 is expected stable
Outlook--Export

• Export: After the removal of 15% export tariff for silicon metal, the export volumes enlarged greatly.

• The rapid development of global Al alloys industry and silicone industry will drive the export of Chinese silicon metal.

• We expect the export volume can reach 0.9 million tons above in 2015. (excluding Smuggling VAT record)
Outlook-- Silicone

- **Silicone**: the silicone industry has developed rapidly during the past decade with production rising from 240,000 tons in 2006 to 1,500,000 tons in 2014. The silicon metal consumption reached 350,000 tons in 2014.

- In the future, Chinese silicone industry will slow its develop steps and demand for silicon metal is expected stable at the current level.
Outlook--Al Alloys

• **Al Alloy Industry**: about 19% of silicon metal is used for Al alloys production. In the recent years, the Al alloy production in China rose from 3.6 million tons to 6.35 million tons. Al alloy die-casting is widely used in auto industry. With the rapid development of auto industry, the demand for Al alloy die-casting will be greatly stimulated.

• Therefore, the silicon metal demand in Al alloys industry will enlarge continuously. We expect it will be more than 350,000 tons in 2015.
Outlook—Poly-silicon

- **Poly-silicon**: In the recent years, the poly-silicon production has expanded from less than 20,000 tons in 2006 to more than 130,000 tons in 2014, which drove the silicon metal demand from 22,000 tons to 140,000 tons.

- However, the poly-silicon industry is in over-capacity and the market kept gloomy, and some of the large producers cut or stopped production, which will lead the silicon metal demand slightly decrease in this industry.
CONCLUSION

• Global Si-Mtl production is no big challenge
• Supply Over Demands Slightly
• Chinese Si Metal meet great Challenge against Environmental Law
• Market will be stable
2015第12届中国铁合金国际会议
12th China Ferro-Alloys International Conference
时间：2015年5月27-29日 地点：青岛
May 27-29, 2015 Qingdao China
主办方 (Hosts): CCMC Ferro-Alloys.com
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