China Silicon Carbide Industry Report,
2016-2020
Feb.2017
METHODOLOGY
Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications.

Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES
The primary information sources include Company Reports, and National Bureau of Statistics of China etc.
Abstract

China is the largest producer and exporter of silicon carbide in the world, with the capacity reaching 2.2 million tons, sweeping more than 80% of the global total. However, excessive capacity expansion and oversupply lead to the capacity utilization less than 50%. In 2015, the silicon carbide output in China totaled 1.02 million tons, with the capacity utilization rate of only 46.4%; in 2016, the total output was estimated to be about 1.05 million tons, with the capacity utilization rate of 47.7%.

Since China’s silicon carbide export quota was abolished, China’s silicon carbide export volume grew rapidly during 2013-2014, and tended to stabilize during 2015-2016. In 2016, China’s silicon carbide exports came to 321,500 tons, up 2.1% year on year; wherein, Ningxia’s export volume amounted to 111,900 tons, accounting for 34.9% of the total exports and acting as a main silicon carbide exporter in China. As China’s silicon carbide products are mainly low-end preliminarily processed products with moderate added value, the average price gap between export and import is enormous. In 2016, China’s silicon carbide exports had the average price at USD0.9 / kg, less than 1/4 of the import average price (USD4.3 / kg).

Silicon carbide is widely used in iron& steel, refractories, ceramics, photovoltaic, electronics and so on. In recent years, silicon carbide has been included in the third generation of semiconductor materials as a hot spot of the global R & D and applications. In 2015, the global silicon carbide substrate market size reached about USD111 million, and the size of silicon carbide power devices reached about USD175 million; both of them will see the average annual growth rate of more than 20% in the next five years.

At present, China has succeeded in R & D of semiconductor silicon carbide, and realized the mass production of 2-inch, 3-inch, 4-inch and 6-inch silicon carbide monocrystalline substrates, silicon carbide epitaxial wafers, and silicon carbide components. Representative enterprises include TanKeBlue Semiconductor, SICC Materials, EpiWorld International, Dongguan Tianyu Semiconductor, Global Power Technology and Nanjing SilverMicro Electronics.

Today, the development of silicon carbide crystals and devices has been contained in Made in China 2025, New Material Industry Development Guide, National Medium and Long-term Science and Technology Development Plan (2006-2020) and many other industrial policies. Driven by multiple favorable policies and emerging markets such as new energy vehicles and smart grid, Chinese semiconductor silicon carbide market will witness quick development in future.
# SiC Wafer and Device-related Enterprises in China

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<th>Type</th>
<th>Company</th>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
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<tr>
<td>SiC Monocrystalline</td>
<td>TankBlue Semiconductor</td>
<td>2007</td>
<td>Six SiC crystal growth furnaces were put into operation in Xinjiang Production Base.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009</td>
<td>Mass production of 2-inch and 3-inch SiC wafers was achieved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011</td>
<td>Mass production of 4-inch SiC crystals</td>
</tr>
<tr>
<td></td>
<td>STCC Materials</td>
<td></td>
<td>6-inch SiC monocrystalline substrates were developed</td>
</tr>
<tr>
<td>SiC Epitaxial Wafers</td>
<td>EpWorld International</td>
<td>2012</td>
<td>3-inch and 4-inch SiC semiconductor epitaxial wafers were industrialized.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2014</td>
<td>Successful production of 6-inch SiC epitaxial wafers made</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the company the first vendor that provided commercial 6-inch SiC epitaxial wafers in China.</td>
</tr>
<tr>
<td></td>
<td>Tianyu Semiconductor Technology</td>
<td>2014</td>
<td>The company self-developed SiC epitaxial growth basal plane dislocation (BPD) suppression technology, and achieved zero-BPD in 4-inch SiC epitaxial wafers for the first time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td>Annual capacity: 20,000 to 30,000 3-inch and 4-inch SiC epitaxial wafers.</td>
</tr>
<tr>
<td>SiC Devices</td>
<td>Global Power Technology</td>
<td>2014</td>
<td>The self-developed SiC Schottky diodes (600V-3300V) were successfully mass-produced. Among them, the yield rate of 600V/10A, 1200V/20A and other products competed with the international advanced level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td>The company developed 1200V/10A SiC R&amp;T devices successfully and mass-produced 3300V/50A high-power Schottky diodes products.</td>
</tr>
<tr>
<td></td>
<td>Yangtze Electronic Technology</td>
<td>2015</td>
<td>The company planned to raise RMB 150 million for SiC chip and module R &amp; D and industrial construction projects.</td>
</tr>
<tr>
<td></td>
<td>Nanjing SilverMicro Electronics</td>
<td>2014</td>
<td>The company released SiC MOSFET series products suitable for high-voltage industrial applications.</td>
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<td></td>
<td>Wedge Industrial</td>
<td>2015</td>
<td>The company and Maple Semiconductor Inc. co-invested to set up Shenzhen Wedge Maple SiC Semiconductor Co., Ltd., whose products will be mainly used in electric vehicles and special motors.</td>
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<tr>
<td></td>
<td>CSIC</td>
<td>2016</td>
<td>The company planned to build a SiC power module R &amp; D and industrialization project with a total investment of RMB2 billion in Xiamen. Covering a land area of about 40 mu, the project mainly works on design, R &amp; D and manufacturing of third-generation semiconductor SiC power modules, with the high-power module capacity of 11.5 million kVA/a and the annual output value of about RMB 4 billion after the completion.</td>
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Phone: +86 10 82600828 ● Fax: +86 10 82601570 ● www.researchinchina.com ● report@researchinchina.com
The report mainly deals with the followings:

◆ Development of global silicon carbide industry, including the status quo of SiC raw materials and SiC wafer, etc.
◆ Development of China silicon carbide industry, including status quo, supply and demand, competitive landscape, import & export, price trend, and development trends, etc.;
◆ Development of upstream and downstream sectors of silicon carbide industry;
◆ Operation, silicon carbide business, etc. of 18 silicon carbide manufacturers.
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