ResearchInChina

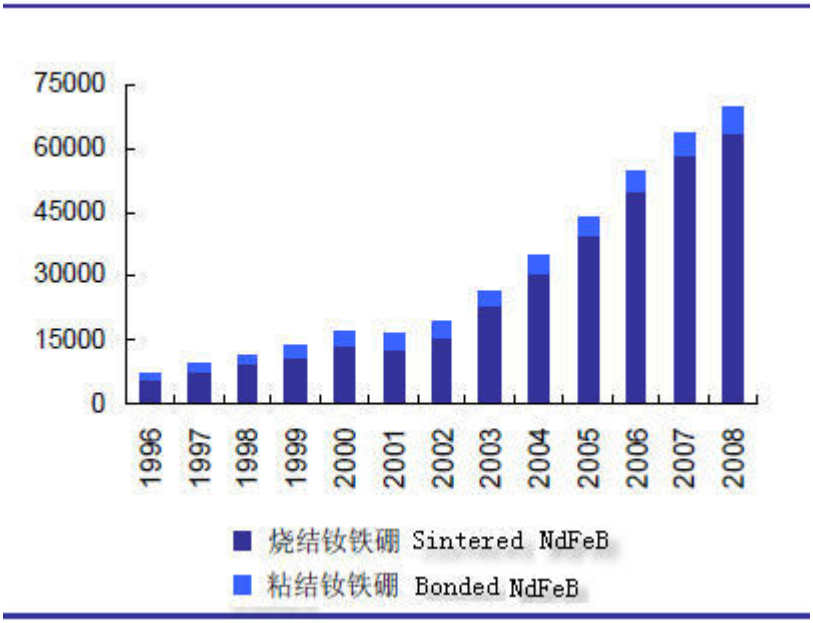
China Rare Earth Permanent Magnet Industry Report, 2009-2010

May/2010

2.3 China's Nd-Fe-B Output Volume & Output Value are not in Positive Proportion

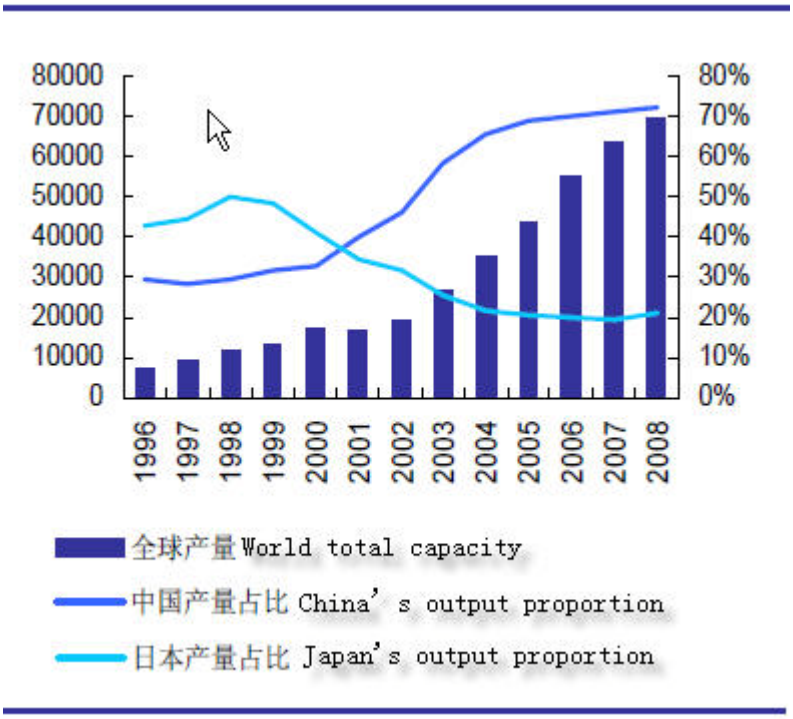
In 2002-2008, global sintered NdFeB output volume saw an annual growth rate of 26.5% on average, of which China accounted for 76%. In sharp contrast, China only accounted for 58% of the global total output value of NdFeB permanent magnet materials, while Japan held a share as high as 38% of the total output value, though only accounting for 21% of the global total output volume.

Output of Global Nd-Fe-B Magnet, 1996-2008 (Ton)



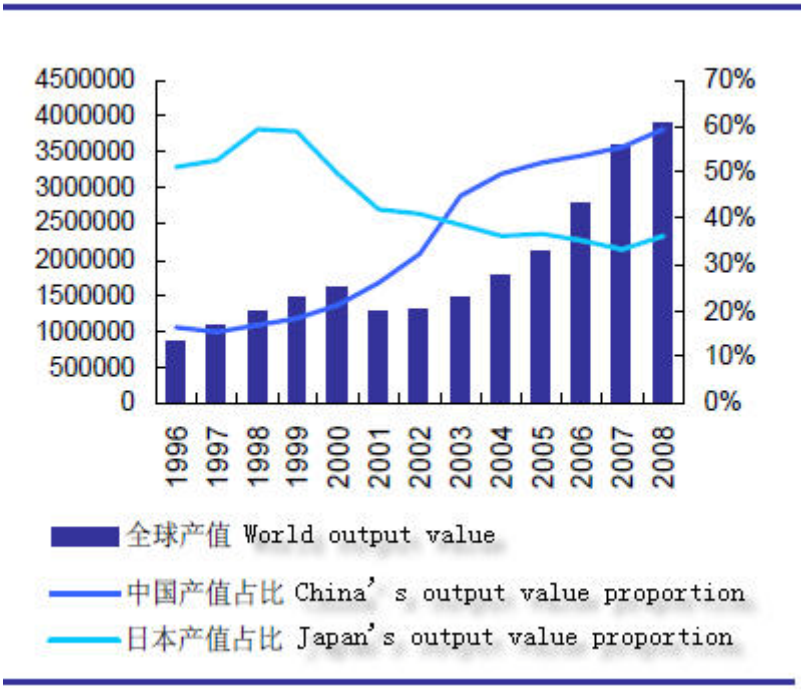
Source: IEEE; ResearchInChina

Global Proportion of Nd-Fe-B Output Volume, China VS Japan, 1996-2008 (Ton)



Source: IEEE; ResearchInChina

Global Proportion of Nd-Fe-B Output Value, China VS Japan, 1996-2008 (USD1,000)



Source: IEEE; ResearchInChina

It's caused by the unreasonable structure of China's NdFeB market. Although China has most of the resources and cost advantages, high-performance and high value-added NdFeB permanent magnet materials are not mainstream products of China. Most of the Chinese enterprises can only rely on low-end products to promote the market supply. The annual average price of sintered NdFeB permanent magnet materials in China market is only 40% of that in the Japan market, and Japan occupies 70% of the high-performance NdFeB permanent magnet material market.

3.2.5 Demand for Rare Earth Permanent Magnet Material in Wind Power Field Market

Overview of Direct-driven Permanent Magnet Generator

Wind Power Generators includes four types, namely stall-regulated wind generators, variable-speed constant-frequency double-fed wind generators, direct-driven permanent magnet wind generators and hybrid-driven wind generators.

Types and Application of China's Wind Power Generators

Type	Application	Advantages
Stall-regulated wind generator	It was the mainstream before 2007, but its market shares have declined in recent two years.	Mature technology, high reliability, suitable for islands, mountains and other wind fields.
Variable-speed constant-frequency double-fed wind generator	1.5MW double-fed wind generator is the mainstream now.	Advanced and mature technology, perfect supply chain; will still be the main force of China's wind power market in the next years.
Direct-driven permanent magnet wind generator	An important type	The absence of gear boxes and the adaptability to power grid will make it have powerful competiveness.
Hybrid-driven wind generator	A new type	It has the advantages of direct-driven permanent magnet wind generator and double-fed wind generator, and will be promising.

Source: ResearchInChina

With direct-driven permanent magnet simultaneous generators, gear boxes become unnecessary for wind power generation system, so that the efficiency is improved, the maintenance of generators is reduced, and the noises are decreased. Besides, Direct-driven Permanent Magnet Wind Power Generation System is light, efficient and reliable.

As for switching devices (IGBT, etc.) and permanent magnet which account for a higher proportion of the total cost of Direct-driven Permanent Magnet Wind Power Generation System, their performance has been improved and their cost has also been declining, with the development of power & electronics technology and permanent magnet materials. Therefore, Direct-driven Permanent Magnet Wind Power Generation System is outstanding among many Variable-Speed Constant-Frequency Wind Power Generation Systems and will be promising in the future.

Demand of NdFeB Permanent Magnet Materials in Wind Power Industry

In 2009, the installed capacity of wind power totaled 21GW, up 74% year on year; while the annual newly-increased installed capacity of wind power reached 9GW, up 92% year on year. The new-increased installed capacity of China in the industry represents 29% of the world, next only to America.

At present, China has poised to build 6 10 million-kw-level wind power bases. The wind power industry in China is expected to maintain higher absolute growth in the upcoming years. It is believed that the industry is bound to see a substantial market potential due to the improved power system and intensified policies.

China has three types of generating areas of low wind speed, which account for 50% approximately of its total wind resources. So it is more appropriate for applying direct-drive permanent magnate wind power units. It is estimated that the proportion of direct-drive permanent magnate wind power units will be increasingly up. The domestic enterprises possess the proprietary intellectual property rights of direct-drive permanent magnate units. Among the newly-increased large wind power units in 2009, the direct-drive units occupy 15% or so. And the figure is expected to be close to 20% in 2010. By 2014, the permeability of direct-drive permanent magnet units is expected to surpass 50%.

Although the growth of wind power installed capacity will slow down, the average compound annual growth rate of direct-drive permanent magnet units is expected to realize 28%. Meanwhile, the demand for rare earth permanent magnet materials will grow in an equal basis. The main rare earth permanent magnet material for wind power is NdFeB. Suppose a 1.5MW direct-drive permanent magnet unit demands a total of 1.2 tons of NdFeB permanent magnet materials, another 3,991 tons of NdFeB permanent magnet materials will be needed by 2010 in China.

NdFeB Demand in China's Wind Power Industry

	2008	2009	2010E	2011E	2012E	2013E	2014E
Newly-Increased Installed Capacity (MW)	6298	7790	12472	15000	15000	17000	20000
Newly-Increased Installed Capacity of Direct-Drive Permanent Magnet Wind Power Units (MW)	629.8	1558	4988.8	6750	7500	9350	12000
Consumption of Rare Earth Permanent Magnet Materials (ton)	503.8	1246.4	3991.0	5400.0	6000	7480	9600
Consumption of Nd	151.2	373.9	1197.3	1620.0	1800	2244	2880

Source: ResearchInChina

→ Related Reports

- ***China Rare Earth Industry Report, 2009***
  http://www.researchinchina.com/htmls/Report/2009/5768.html

- ***China Organic Silicon Industry Report, 2009-2010***
  http://www.researchinchina.com/htmls/Report/2010/5873.html

- ***Global and China Refractory Material Industry Report, 2009-2010***
  http://www.researchinchina.com/htmls/Report/2010/5877.html

- ***China Cement Industry Report, 2009***
  http://www.researchinchina.com/htmls/Report/2009/5803.html

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