

Note: Key data/information in this page is hidden, while that in the report is not.

1 Source of phosphate rock

1.1 Phosphorus ore

1.1.1 Deposit information

In China, there are abundant phosphorus resources currently, with more than xxxx discovered deposits. These phosphorus deposits are basically located in xxxx provinces. As of 2014, the proved reserves of phosphate rock are about xxxxt tonnes.

Although the proved reserves of phosphate rock in China are large, they are difficult to exploit. This is because about xxxx phosphorus deposits are not open-casting rocks which lead to high mining cost. Furthermore, though xxxx deposits are open-casting, most of them are located in sloping terrain, which increases difficulties in exploiting.

Consequently, the basic reserves and economic reserves of phosphate rock are only xxxxt tonnes and xxxxt tonnes respectively, which are much less than the proved reserves.

Figure 1.1.1-1 Distribution of phosphorus deposits in China, 2014



Source: CCM

Table 1.1.1-1 Types and reserves of phosphorus deposits in China, 2014

Region	Deposit type	Major deposit	Reserves, tonne
Middle China and East China	XXXX	XXXX	XXXX
Middle-west China and Southwest China	Sedimentary	XXXX	XXXX
Northwest China and North China	XXXX	XXXX	XXXX
South China	XXXX	XXXX	XXXX

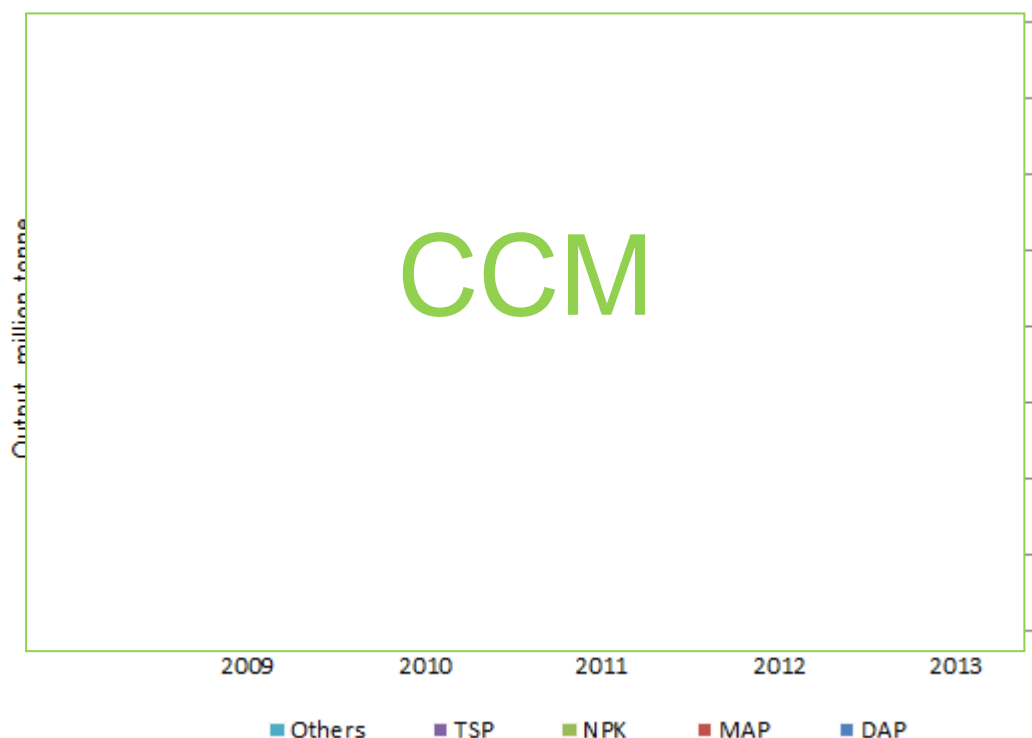
Source: Geological Institute of China Chemical Geology and Mine Bureau & CCM

- High-analysis phosphate fertilizer

Before 2012, the output of high-analysis phosphate fertilizer in China has been seen a steady growth. But in 2013, it faced with a small decrease after a peak in 2012, which was mainly because of the weaker downstream demand brought the lower operating rate of phosphate fertilizer manufacturers in China than before. Among all the high-analysis phosphate fertilizer in China, the diammonium phosphate(DAP) has occupied xxxx of the total, followed by monoammonium phosphate(MAP), which took up around 40% of the total in the past five years.

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Figure 1.3.1-3 Output structure of high-analysis phosphate fertilizer in China, 2009-2013



Source: CCM

Figure 1.3.1-4 Output structure of high-analysis phosphate fertilizer in China, 2013



Source: CCM

- Low-analysis phosphate fertilizer

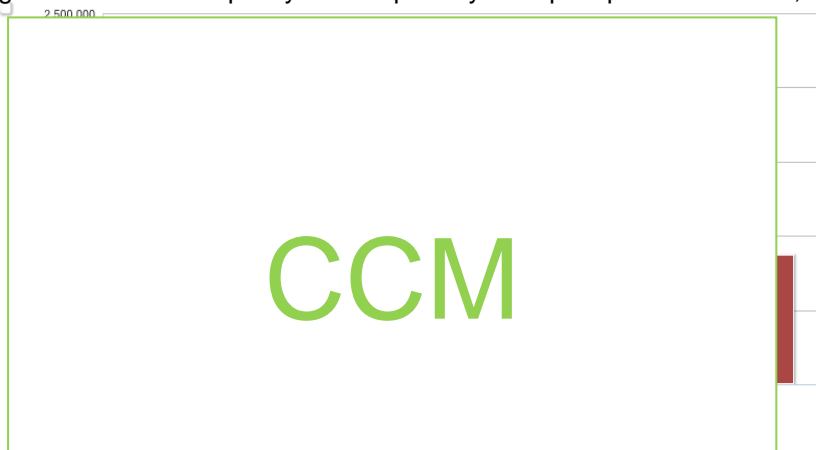
With the high production cost and weak demand, the low-analysis phosphate fertilizers seized less and less market share, which mainly includes calcium magnesium phosphate fertilizer and calcium superphosphate fertilizer. In the past ten years(2003-2013), there has been a transparent decrease of low-analysis phosphate fertilizer in China, with a drop rate of over xxx from xxx million tonnes in 2003 decreased to xxx million tonnes in 2013. The output of low-analysis phosphate fertilizer in 2013 accounted for xxx of the total of phosphate fertilizer.

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1.3.2.1.1 Capacity and output of yellow phosphorus

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Figure 1.3.2.1.1-1 Capacity and output of yellow phosphorus in China, 2009-2013



Source: CCM

- Capacity

In China, the development of yellow phosphorus industry developed fast in the past two decades, but overcapacity also existed in yellow phosphorus industry. The capacity of yellow phosphorus in China increased to xxxx in 2009 from only xxxx in 2000, with a CAGR of 1xxxx. In 2009, in order to promote its sound development, the Chinese government released a policy of *Entrance Threshold for Yellow Phosphorus Industry* to regulate the reckless expansion. As a result, the expansion growth rate of yellow phosphorus slowed down during 2009-2013.

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1.3.2.3.2.2 Export

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In the past five years (2009-2013), the export volume of phosphates saw a small downtrend, from xxxtonnes in 2009 to xxxtonnes in 2013, seeing a CAGR of xxxx. On the contrary, export volume of polyphosphates showed a small growth, from xxxtonnes in 2009 to xxxtonnes in 2013. However, the export volume of sodium triphosphate dropped down significantly, with a CAGR of xxxx during 2009-2013, which was mainly attributed to the development of China's detergent industry xxxx the domestic consumption of xxxx.

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Figure 1.3.2.3.2.2-1 Export situation of phosphates in China, 2009-2013



Source: CCM

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1.3.2.3 Consumption in China

Table 1.3.2.3-2 Consumption of yellow phosphorus in China by region, 2013, tonne

Province/region	Thermal phosphoric acid	Phosphorus trichloride	Others	Total
Jiangsu	XXXX	XXXX	XXXX	XXXX
Yunnan	XXXX	XXXX	XXXX	XXXX
Sichuan	XXXX	XXXX	XXXX	XXXX
Hubei	XXXX	XXXX	XXXX	XXXX
Guangxi	XXXX	XXXX	XXXX	XXXX
Zhejiang	XXXX	XXXX	XXXX	XXXX
Shandong	XXXX	XXXX	XXXX	XXXX
Others	XXXX	XXXX	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX

Source: CCM

Yellow phosphorus is mainly used in production of thermal phosphoric acid and phosphoric trichloride in China. In 2013, about xxxx and xxxx of its total consumption was consumed in production of the two products respectively.

Yellow phosphorus' consumption in other phosphorus chemicals is increasing. The consumption in products such as red phosphorus, phosphorus pentasulfide, sodium hypophosphite, xxxx and phosphorus pentoxide increased at a CAGR of xxxx during 2010-2013. The proportion of yellow phosphorus' consumption in this segment will be on the xxxx in 2014–2018, driven by the development of fine phosphorus chemical industry.

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1.3.2.4 Yellow phosphorus derivatives

- Phosphoric acid and phosphates

In China, the development of phosphorus chemical industry is wet-process based, together with thermal-process method.

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Table 1.3.2.4-1 Comparison of phosphoric acid by different methods in China

Item	Thermal phosphoric acid	Wet-process phosphoric acid
Purity	XXXX	XXXX
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XXXX	XXXX	XXXX

Sources: CCM

Table 1.5.1-2 Evaluated cost of phosphate rock based on different grades of crude ores in China, 2014

Item	28% P ₂ O ₅ content		23% P ₂ O ₅ content	
	Cost, USD/t	Share, %	Cost, USD/t	Share, %
XXXX	XXXX	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	XXXX	XXXX
Others	XXXX	XXXX	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX

Source: CCM

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Table 1.5.1-4 Evaluation on cut-off years and projected cost of phosphate rock in China

P ₂ O ₅ content Grade	2013 Reserves, tonne	Cut-off year of exploiting remaining rock	Exploited cost, USD/t
More than 30%	XXXX	2030	XXXX
25%-30%	XXXX	XXXX	XXXX
20%-25%	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	XXXX
XXXX	XXXX	XXXX	
5%-10%	XXXX	XXXX	
2%-5%	XXXX	XXXX	

Source: CCM

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3.1.2 Restricted policy in the industry and its effect to the industry

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Table 3.1.2-1 Policies and regulations on integrating phosphorus chemical industry in China as of June 2014

Date issued	Title	Main spirit
XXXX	XXXX	XXXX
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XXXX	XXXX	XXXX

Source: China Phosphate Fertilizer Industry Association, China Chemical Mining Association, the Ministry of Industry and Information Technology of China, Department of Land and Resources of Hubei Province & CCM