

II-2 International trade

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Table II-3 International trade of phosphate ore, 2000 to 2008

| Year | Trade volume (million tonne)① | Price (USD/t) ② | Value (USD million) |
|---------|-------------------------------|-----------------|---------------------|
| 2000 | | | |
| 2001 | | | |
| 2002 | | | |
| 2003 | | | |
| 2004 | | | |
| 2005 | | | |
| 2006 | | | |
| 2007 | | | |
| 2008 e. | | | |

Source: ①International Fertilizer Industry Association (IFA), ②U.S. Geological Survey (USGS)

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III Demand and end use markets

III-1 Summary of demand

Table III-1 Global consumption volume of yellow phosphorus by region, 2008

| Countries | Volume, tonne | Share |
|--------------|---------------|-------|
| China | | |
| USA | | |
| Germany | | |
| Netherlands | | |
| Japan | | |
| Kazakhstan | | |
| India | | |
| Poland | | |
| Czech | | |
| Vietnam | | |
| Others | | |
| Total | | |

Source: CCM International

Note: Others include France, Italy, UK, Brazil, Russia, etc.

III-2.2 Production of thermal phosphoric acid

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Global production situation

Table III-3 Main thermal phosphoric acid producers in the world, 2008

| No. | English name | Country | Capacity (t/a) | P4 consumption (tonne) | Raw material source |
|-------|---|----------------|----------------|------------------------|---------------------|
| 1 | Yunnan Malong Industry Group Co., Ltd | China | | | |
| 2 | Guangxi Mingli Group CO., LTD | China | | | |
| 3 | Hubei Xingfa Chemicals Group Co., Ltd. | China | | | |
| 4 | | China | | | |
| 5 | | Netherlands | | | |
| 6 | | China | | | |
| 7 | | China | | | |
| 8 | | China | | | |
| 9 | | China | | | |
| 10 | | Kazakhstan | | | |
| 11 | | China | | | |
| 12 | FOSFA | Czech Republic | | | |
| 13 | CIECH | Poland | | | |
| 13 | Thermphos (China) Food Additive Co., Ltd. | China | | | |
| 14 | Others | - | | | |
| Total | | - | | | |

Source: CCM International

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III-9 Yellow phosphorus consumption in major countries

➤ Netherlands, Kazakhstan, Russia, Vietnam, Czech Republic and Poland

Table III-9 Consumption of yellow phosphorus in the Netherlands, Kazakhstan, Russia, Vietnam, Czech Republic and Poland, 2008

| Country | Product | Consumption of yellow phosphorus (tonne) |
|----------------|-------------------------|--|
| Netherlands | Thermal phosphoric acid | |
| Kazakhstan | Thermal phosphoric acid | |
| Vietnam | Thermal phosphoric acid | |
| Czech Republic | Thermal phosphoric acid | |
| Poland | Thermal phosphoric acid | |
| | Phosphorus trichloride | |
| Russia | Thermal phosphoric acid | |

Source: CCM International

Note: Estimated inventory of yellow phosphorus is respectively in Kazakhstan, Netherlands and

IV Supply of yellow phosphorus

IV-1 Supply summary

Table IV-1 Competitiveness analysis of yellow phosphorus industry in China, the USA, Kazakhstan and the Netherlands, 2008

| Item | | China | USA | Kazakhstan | Netherlands |
|-----------------------------|--------------------------|-------------|-------------|-------------|-----------------|
| Production factors | Phosphate ore supply | Self-supply | Self-supply | Self-supply | Mostly imported |
| | Labor cost | Low | High | Moderate | High |
| | Technology | | | | |
| Related industry | Electricity power | | | | |
| | industry | | | | |
| | Transportation | | | | |
| Industry strategy | Concentrative degree | | | | |
| Domestic consumption | Yellow phosphorus market | | | | |
| Policy | | | | | |

Source: CCM International

IV-4.1 Introduction

➤ Resource supply

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Table IV-7 Historical data of electric power supply and price in Kazakhstan, 2003~2007

| Year | 2003 | 2004 | 2005 | 2006 | 2007 |
|---------------------------------------|------|------|------|------|------|
| Electric power generated, million kWh | | | | | |
| Average electricity prices, USD/ kWh | | | | | |
| Imported electric power, million kWh | | | | | |
| exported electric power, million kWh | | | | | |

Source: CCM International

IV-7 Forecast on supply and supply-demand balance to the next 5 years

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Table IV-9 Forecast on yellow phosphorus consumption by end use sector, tonne, 2009~2013

| Year | 2009 | 2010 | 2011 | 2012 | 2013 |
|-------------------------|------|------|------|------|------|
| Thermal phosphoric acid | | | | | |
| Phosphorus trichloride | | | | | |
| Phosphorus pentasulfide | | | | | |
| Sodium hypophosphite | | | | | |
| Phosphorus pentoxide | | | | | |
| Red phosphorus | | | | | |
| Others | | | | | |
| Total | | | | | |

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V Global trade and flow of yellow phosphorus

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V-4 Global flow of yellow phosphorus and future trend

Table V-12 Flow of yellow phosphorus in 2003 and 2008 by exporter

| Supplier | Destination①, 2003 | Share, 2003 | Destination①, 2008 | Share, 2008 |
|-------------|--------------------|-------------|--------------------|-------------|
| Kazakhstan | Poland | | Poland | |
| | Czech Republic | | Czech Republic | |
| | Germany | | Germany | |
| | Netherlands | | Japan | |
| | Argentina | | Russia | |
| Netherlands | Germany | | Germany | |
| | UK | | UK | |
| | Belgium | | France | |
| | Japan | | Japan | |
| | Argentina | | Argentina | |
| USA | Czech Republic | | USA | |
| | Brazil | | Brazil | |
| | Mexico | | - | |
| China | Canada | | - | |
| | Japan | | Japan | |
| | India | | India | |
| | USA | | USA | |
| | Italy | | Italy | |
| | Germany | | Germany | |
| | Poland | | Poland | |
| | Philippines | | Philippines | |

| | | | |
|-----------------|--|--------------|--|
| South Korea | | Netherlands | |
| Malaysia | | Malaysia | |
| South Africa | | South Africa | |
| Vietnam | | Viet Nam | |
| Taiwan Province | | South Korea | |
| Australia | | Chile | |
| UK | | Belgium | |
| Chile | | Switzerland | |
| France | | - | |
| Netherlands | | - | |
| Belgium | | - | |
| Argentina | | - | |
| Mexico | | - | |

Source: CCM International

Note: ① Destination only includes main importers