

PHOSPHATE ROCK

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Phosphate rock ore was mined by 6 firms at 12 mines in 4 States and upgraded to an estimated 26.1 million tons of marketable product valued at \$1.3 billion, f.o.b. mine. Florida and North Carolina accounted for more than 85% of total domestic output; the remainder was produced in Idaho and Utah. Marketable product refers to beneficiated phosphate rock with phosphorus pentoxide (P₂O₅) content suitable for phosphoric acid or elemental phosphorus production. More than 95% of the U.S. phosphate rock mined was used to manufacture wet-process phosphoric acid and superphosphoric acid, which were used as intermediate feedstocks in the manufacture of granular and liquid ammonium phosphate fertilizers and animal feed supplements. Approximately 45% of the wet-process phosphoric acid produced was exported in the form of upgraded granular diammonium and monoammonium phosphate (DAP and MAP, respectively) fertilizer, and merchant-grade phosphoric acid. The balance of the phosphate rock mined was for the manufacture of elemental phosphorus, which was used to produce phosphorus compounds for a variety of food-additive and industrial applications.

<u>Salient Statistics—United States:</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010^e</u>
Production, marketable	30,100	29,700	30,200	26,400	26,100
Sold or used by producers	30,200	31,100	28,900	25,500	28,300
Imports for consumption	2,420	2,670	2,750	2,000	2,100
Consumption ¹	32,600	33,800	31,600	27,500	30,400
Price, average value, dollars per ton, f.o.b. mine ²	30.49	51.10	76.76	127.19	50.00
Stocks, producer, yearend	7,070	4,970	6,340	8,120	5,800
Employment, mine and beneficiation plant, number ^e	2,500	2,500	2,600	2,550	2,300
Net import reliance ³ as a percentage of apparent consumption	7	14	4	1	15

Recycling: None.

Import Sources (2006–09): Morocco, 100%.

Tariff: Item	Number	Normal Trade Relations <u>12-31-10</u>
Natural calcium phosphates:		
Unground	2510.10.0000	Free.
Ground	2510.20.0000	Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: In 2010, phosphate rock consumption and trade increased worldwide after depressed market conditions in 2008 and 2009. U.S. production was about the same as in 2009, as companies attempted to lower stocks of phosphate rock that had accumulated over the previous year. Domestic phosphoric acid and phosphate fertilizer production increased over that of 2009. The world spot price of phosphate rock began 2010 around \$90 per ton and increased in the third quarter to around \$150 per ton.

A new 3.9-million-ton-per-year phosphate rock mine in northern Peru began operation in July. The leading U.S. phosphate rock producer acquired a 35% share of the joint venture between the Brazilian and Japanese owners of the mine. The U.S. company will have the right to purchase up to 35% of the annual phosphate rock output to supplement its domestic phosphate rock production.

A new 5-million-ton-per-year phosphate rock mine began operation in Saudi Arabia late in 2010. The associated phosphate fertilizer plant was to open in 2011. World mine production capacity was projected to increase to 228 million tons by 2015 through mine expansion projects in Algeria, Brazil, China, Israel, Jordan, Syria, and Tunisia, and development of new mines in Australia, Kazakhstan, Namibia, and Russia.

World Mine Production and Reserves: Significant revisions were made to reserves data for Morocco, using information from the Moroccan producer and a report by the International Fertilizer Development Center. Reserves information for Russia was revised using official Government data and may not be comparable to the reserves definition in Appendix C. Reserves data for Algeria, Senegal, and Syria were revised based on individual company information.

	Mine production		Reserves ⁴
	2009	2010 ^e	
United States	26,400	26,100	1,400,000
Algeria	1,800	2,000	2,200,000
Australia	2,800	2,800	82,000
Brazil	6,350	5,500	340,000
Canada	700	700	5,000
China ⁵	60,200	65,000	3,700,000
Egypt	5,000	5,000	100,000
Israel	2,700	3,000	180,000
Jordan	5,280	6,000	1,500,000
Morocco and Western Sahara	23,000	26,000	50,000,000
Russia	10,000	10,000	1,300,000
Senegal	650	650	180,000
South Africa	2,240	2,300	1,500,000
Syria	2,470	2,800	1,800,000
Togo	850	800	60,000
Tunisia	7,400	7,600	100,000
Other countries	8,620	9,500	620,000
World total (rounded)	166,000	176,000	65,000,000

World Resources: Domestic reserves data were based on U.S. Geological Survey and individual company information. Phosphate rock resources occur principally as sedimentary marine phosphorites. The largest sedimentary deposits are found in northern Africa, China, the Middle East, and the United States. Significant igneous occurrences are found in Brazil, Canada, Russia, and South Africa. Large phosphate resources have been identified on the continental shelves and on seamounts in the Atlantic Ocean and the Pacific Ocean.

Substitutes: There are no substitutes for phosphorus in agriculture.

^eEstimated.

¹Defined as phosphate rock sold or used + imports.

²Marketable phosphate rock, weighted value, all grades.

³Defined as imports – exports + adjustments for Government and industry stock changes.

⁴See Appendix C for resource/reserve definitions and information concerning data sources.

⁵Production data for China do not include small artisanal mines.