

## POTASH

(Data in thousand metric tons of K<sub>2</sub>O equivalent unless otherwise noted)

**Domestic Production and Use:** In 2011, the production value of marketable potash, f.o.b. mine, was about \$780 million. Potash was produced in Michigan, New Mexico, and Utah. Most of the production was from southeastern New Mexico, where two companies operated three mines. New Mexico sylvinitic and langbeinitic ores were beneficiated by flotation, dissolution-recrystallization, heavy-media separation, or combinations of these processes, and provided more than 75% of total U.S. producer sales. In Utah, which has three operations, one company extracted underground sylvinitic ore by deep-well solution mining. Solar evaporation crystallized the sylvinitic ore from the brine solution, and a flotation process separated the potassium chloride (muriate of potash or MOP) from byproduct sodium chloride. Two companies processed surface and subsurface brines by solar evaporation and flotation to produce MOP, potassium sulfate (sulfate of potash or SOP), and byproducts. In Michigan, one company used deep-well solution mining and mechanical evaporation for crystallization of MOP and byproduct sodium chloride.

The fertilizer industry used about 85% of U.S. potash sales, and the chemical industry used the remainder. More than 60% of the potash produced was MOP. Potassium magnesium sulfate (sulfate of potash-magnesia or SOPM) and SOP, which are required by certain crops and soils, also were produced.

<b>Salient Statistics—United States:</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011<sup>e</sup></b>
Production, marketable <sup>1</sup>	1,100	1,100	720	930	1,100
Sales by producers, marketable <sup>1</sup>	1,200	1,100	630	1,000	1,000
Imports for consumption	4,970	5,800	2,220	4,760	5,600
Exports	199	222	303	297	215
Consumption: <sup>1</sup>					
Apparent <sup>2</sup>	5,900	6,700	2,600	5,400	6,500
Reported <sup>3</sup>	5,900	6,700	2,500	5,600	6,400
Price, dollars per metric ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>4</sup>	400	675	800	605	700
Employment, number:					
Mine	480	525	510	540	540
Mill	580	615	640	650	650
Net import reliance <sup>5</sup> as a percentage of apparent consumption	81	84	73	83	83

**Recycling:** None.

**Import Sources (2007–10):** Canada, 88%; Belarus, 8%; Russia, 3%; and other, 1%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b><u>12-31-11</u></b>
	Potassium nitrate	2834.21.0000	Free.
	Potassium chloride	3104.20.0000	Free.
	Potassium sulfate	3104.30.0000	Free.
	Potassic fertilizers, other	3104.90.0100	Free.
	Potassium-sodium nitrate mixtures	3105.90.0010	Free.

**Depletion Allowance:** 14% (Domestic and foreign).

**Government Stockpile:** None.

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**Events, Trends, and Issues:** World potash production and consumption were estimated to have increased compared with those of 2010, returning to nearly those of 2008, which was before the global downturn in the fertilizer industry. The leading U.S. producer continued its development of a new solution mine in New Mexico. The company expected to begin production about 1 year after receiving approval from Government agencies. Exploration and development activities for potash continued by other companies in Arizona, New Mexico, North Dakota, and Utah; however, none of these projects were expected to begin production for at least 7 to 10 years.

The only U.S. producer of SOP acquired the sole Canadian SOP producer in early 2011. No changes were planned for the Canadian operations.

The two Russian potash producers merged in 2011 to create the second leading potash producer in the world. The company later announced plans to increase its annual production capacity from 10.5 million tons of MOP to 19 million tons of MOP by 2021. Many other global development and expansion projects are expected to increase world production capacity substantially over the next decade, with significant additions to capacity planned in Argentina, Belarus, Brazil, Canada, China, Congo (Brazzaville), and the United Kingdom.

World potash consumption was projected to increase by about 4% annually during the next 5 years, owing to world population growth and the concurrent need for increased production of food and biofuels.

**World Mine Production and Reserves:** Reserve data for China and Russia were obtained from official Government sources and may not be comparable to the reserve definition in Appendix C. Reserves for Chile were revised based on information reported by the leading producer in that country.

	Mine production		Reserves <sup>6</sup>
	2010	2011 <sup>e</sup>	
United States	<sup>1</sup> 930	<sup>1</sup> 1,100	130,000
Belarus	5,250	5,500	750,000
Brazil	453	400	300,000
Canada	9,788	11,200	4,400,000
Chile	800	800	130,000
China	3,200	3,200	210,000
Germany	3,000	3,300	150,000
Israel	1,960	2,000	<sup>7</sup> 40,000
Jordan	1,200	1,400	<sup>7</sup> 40,000
Russia	6,280	7,400	3,300,000
Spain	415	420	20,000
United Kingdom	427	430	22,000
Other countries	—	—	50,000
World total (rounded)	33,700	37,000	9,500,000

**World Resources:** Estimated domestic potash resources total about 7 billion tons. Most of these lie at depths between 1,800 and 3,100 meters in a 3,110-square-kilometer area of Montana and North Dakota as an extension of the Williston Basin deposits in Saskatchewan, Canada. The Paradox Basin in Utah contains resources of about 2 billion tons, mostly at depths of more than 1,200 meters. The Holbrook Basin of Arizona contains resources of about 1 billion tons. A large potash resource lies about 2,100 meters under central Michigan and contains approximately 40 million tons. Estimated world resources total about 250 billion tons.

**Substitutes:** There are no substitutes for potassium as an essential plant nutrient and an essential nutritional requirement for animals and humans. Manure and glauconite (greensand) are low-potassium-content sources that can be profitably transported only short distances to the crop fields.

<sup>e</sup>Estimated. — Zero.

<sup>1</sup>Data are rounded to no more than two significant digits to avoid disclosing company proprietary data.

<sup>2</sup>Defined as production + imports – exports.

<sup>3</sup>Defined as sales + imports – exports.

<sup>4</sup>Average prices based on actual sales; excludes soluble and chemical muriates.

<sup>5</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>6</sup>See Appendix C for resource/reserve definitions and information concerning data sources.

<sup>7</sup>Total reserves in the Dead Sea are arbitrarily divided equally between Israel and Jordan for inclusion in this tabulation.