

## POTASH

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

**Domestic Production and Use:** In 2016, the estimated sales value of marketable potash, f.o.b. mine, was \$430 million, which was 37% less than that in 2015. Potash denotes a variety of mined and manufactured salts, which contain the element potassium in water-soluble form. In agriculture, the term potash refers to potassic fertilizers, which are potassium chloride (KCl), potassium sulfate or sulfate of potash (SOP), and potassium magnesium sulfate (SOPM) or langbeinite. Muriate of potash (MOP) is an agriculturally acceptable mix of KCl (95% pure or greater) and sodium chloride for fertilizer use. Most U.S. production was from southeastern New Mexico, where two companies operated three underground mines and one deep-well solution mine. Sylvinites and langbeinite ores in New Mexico were beneficiated by flotation, dissolution-recrystallization, heavy-media separation, solar evaporation, or combinations of these processes, and provided more than 75% of total U.S. producer sales. In Utah, two companies operated three facilities. One company extracted underground sylvinites ore by deep-well solution mining. Solar evaporation crystallized the sylvinites ore from the brine solution, and a flotation process separated the MOP from byproduct sodium chloride. The firm also processed subsurface brines by solar evaporation and flotation to produce MOP at its other facility. Another company processed brine from the Great Salt Lake by solar evaporation to produce SOP and other byproducts.

The fertilizer industry used about 85% of U.S. potash sales, and the chemical industry used the remainder. About 60% of the potash produced was SOPM and SOP, which are required by certain crops and soils. MOP accounted for the remaining 40% of production and was used for agricultural and chemical applications.

<b>Salient Statistics—United States:</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016<sup>e</sup></b>
Production, marketable <sup>1</sup>	900	960	850	740	520
Sales by producers, marketable <sup>1</sup>	980	880	930	620	560
Imports for consumption	4,240	4,650	4,970	5,000	4,800
Exports	200	255	100	106	100
Consumption, apparent <sup>1,2</sup>	5,000	5,300	5,800	5,500	5,300
Price, dollars per ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>3</sup>	650	590	560	570	360
Employment, number, mine and mill	1,500	1,600	1,400	1,300	1,000
Net import reliance <sup>4</sup> as a percentage of apparent consumption	82	82	85	87	90

**Recycling:** None.

**Import Sources (2012–15):** Canada, 85%; Russia, 8%; Chile, 3%; Israel, 3%; and other, 1%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–16</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.

**Events, Trends, and Issues:** U.S. potash production and sales decreased significantly in 2016 because the leading company closed one underground mine indefinitely in the second quarter and stopped production of MOP from its other underground mine in New Mexico. The company will only produce SOPM from its underground mine and MOP from its solution mines in New Mexico and Utah. The other company in New Mexico stopped producing MOP in 2014 and has produced only SOPM since January 2015.

U.S. consumption of potash was down owing to a drop in agricultural use in the first half of the year and lower industrial usage, primarily in oil well-drilling mud additives. The world potash market in 2016 was marked by weak demand in the first half of the year, mainly in China and India, the largest consumers of potash. This caused an oversupply situation and lower prices, resulting in reduced production from the major suppliers in Belarus, Canada, and Russia. World consumption was estimated to have increased in the second half of the year.

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The U.S. producer of SOP from the Great Salt Lake was expected to complete an expansion to its facility in 2017 that will increase production capacity from 290,000 tons per year of SOP to 500,000 tons per year of SOP. The increase includes SOP produced from solar evaporation and purchased KCl.

A Canadian company continued predevelopment activity on a new underground mine in southeastern New Mexico, which will produce SOP only. The company planned to begin production after 2018, with an annual production capacity of 650,000 tons of SOP.

According to the industry producers association, world consumption for all uses of potash was projected to increase gradually from 39 million tons K<sub>2</sub>O in 2016 to 43 million tons of K<sub>2</sub>O in 2019. Asia and South America would account for most of the growth in consumption. Annual production capacity was projected to increase globally from 56 million tons in 2016 to 65 million tons in 2020. Potash exploration and development is expected to remain very active during the next decade. In 2016, about 30 potash-mining projects were in progress worldwide that were expected to be completed between 2016 and 2020. The majority of the new capacity would be from projects in Belarus, Canada, China, Russia, and Turkmenistan. Other projects in various stages of development in Argentina, Australia, Brazil, Canada, Congo (Brazzaville), Eritrea, Ethiopia, Kazakhstan, Laos, Peru, Thailand, and the United Kingdom were not expected to be completed until after 2021.

**World Mine Production and Reserves:** Reserves for China and Russia were revised using official Government information. Reserves for the United States were revised to include updates by the existing producers and for a new mine planned in New Mexico.

	Mine production		Reserves <sup>5</sup>	
	2015	2016 <sup>e</sup>	Recoverable ore	K <sub>2</sub> O equivalent
United States <sup>1</sup>	740	520	1,200,000	270,000
Belarus	6,470	6,400	3,300,000	750,000
Brazil	293	300	300,000	13,000
Canada	11,400	10,000	4,200,000	1,000,000
Chile	1,200	1,200	NA	150,000
China	6,200	6,200	NA	360,000
Germany	3,100	3,100	NA	150,000
Israel	1,260	1,300	NA	<sup>6</sup> 270,000
Jordan	1,410	1,400	NA	<sup>6</sup> 270,000
Russia	6,990	6,500	3,000,000	860,000
Spain	690	700	NA	20,000
United Kingdom	610	600	NA	70,000
Other countries	300	300	250,000	90,000
World total (rounded)	40,700	39,000	NA	4,300,000

**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 Manitoba and 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 0.7 to 2.5 billion tons. A large potash resource lies about 2,100 meters under central Michigan and contains more than 75 million tons. Estimated world resources total about 250 billion tons.

**Substitutes:** No substitutes exist for potassium as an essential plant nutrient and as 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. NA Not available.

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

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

<sup>3</sup>Average prices based on actual sales; excludes soluble and chemical muriates.

<sup>4</sup>Defined as imports – exports.

<sup>5</sup>See [Appendix C](#) for resource and reserve definitions and information concerning data sources.

<sup>6</sup>Total reserves in the Dead Sea are divided equally between Israel and Jordan for inclusion in this tabulation.