

## POTASH

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

**Domestic Production and Use:** In 2017, the estimated sales value of marketable potash, f.o.b. mine, was \$400 million, which was 25% less than that in 2016. 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. Sylvinite 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 sylvinite ore by deep-well solution mining. Solar evaporation crystallized the sylvinite 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 remainder was used for chemical and industrial applications. About 75% of the potash produced was SOPM and SOP, which are required by certain crops and soils. MOP accounted for the remaining 25% of production and was used for agricultural and chemical applications.

<b>Salient Statistics—United States:</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017<sup>e</sup></b>
Production, marketable <sup>1</sup>	960	850	740	500	480
Sales by producers, marketable <sup>1</sup>	880	930	620	600	510
Imports for consumption	4,650	4,970	5,000	4,550	5,700
Exports	255	100	106	99	100
Consumption, apparent <sup>1,2</sup>	5,300	5,800	5,500	5,000	6,100
Value, dollars per ton of K <sub>2</sub> O, average, all products, f.o.b. mine <sup>3</sup>	715	735	880	680	790
Employment, number, mine and mill	1,600	1,400	1,300	1,150	900
Net import reliance <sup>4</sup> as a percentage of apparent consumption	82	85	87	90	92

**Recycling:** None.

**Import Sources (2013–16):** Canada, 83%; Russia, 8%; Israel, 3%; Chile, 2%; and other, 4%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–17</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.

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

**Government Stockpile:** None.

**Events, Trends, and Issues:** Domestic production of potash was slightly lower than that in 2016, owing to the indefinite closure of an underground mine in New Mexico. Production data are rounded to avoid disclosing company proprietary data. Imports of MOP from Canada increased in 2017 to compensate for reductions in MOP production in New Mexico. U.S. consumption was estimated to have increased because of stronger demand for potash fertilizers. The only U.S. producer of SOP planned to complete a capacity expansion of its solar evaporation facility on the Great Salt Lake in Utah by early 2018. This will increase its annual production capacity to 500,000 tons of SOP (255,000 tons of K<sub>2</sub>O).

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A company from Canada continued to develop a potash mine and processing facility in southeastern New Mexico. The firm initially had planned to produce SOP from polyhalite (a potassium-calcium-magnesium sulfate mineral), but revised its plans to market polyhalite as a specialty crop nutrient to avoid incurring the cost of constructing a SOP production facility. A new feasibility study was expected to be completed by early 2018 and the company expected to start production by 2020.

In Canada, a potash producer based in Germany started production at a new solution mine in Saskatchewan. The initial annual production capacity of the mine was 2 million tons of MOP (1.2 million tons of K<sub>2</sub>O). The company planned to increase capacity incrementally to 2.9 million tons of MOP by 2022. A proposed merger between two of the three largest Canadian potash producers received approval from authorities in Canada, Brazil, India, and Russia in 2017. Approval by the U.S. Federal Trade Commission and regulators in China was expected by the end of 2017. If approved, the new company would be the world's largest potash producer with 33% of world capacity.

In 2017, new potash mines started production in Canada, Russia, and Turkmenistan. Between 2018 and 2021, other new mines globally were planned to start production in Belarus, China, Russia, and Spain, and expansions to existing facilities were ongoing in Belarus, China, and Russia. These new projects would increase world production capacity to 65.5 million tons of K<sub>2</sub>O in 2021 from 59.9 million tons of K<sub>2</sub>O in 2017. Other new potash mine projects in Australia, Canada, China, Eritrea, Ethiopia, Laos, Peru, and the United Kingdom have been delayed until after 2021 owing to financing difficulties and low potash prices. Canada, Russia, and Belarus will remain the leading world producers and suppliers, by order of magnitude. World potash demand for all uses was projected to increase to 45.6 million tons in 2021 from 42.0 million tons in 2017, with the largest consumption in Asia and South America.

**World Mine Production and Reserves:** Reserves for Brazil, Russia, Spain, the United Kingdom, and the United States were revised with information contained in individual company reports.

	Mine production		Reserves <sup>5</sup>	
	2016	2017 <sup>e</sup>	Recoverable ore	K <sub>2</sub> O equivalent
United States <sup>1</sup>	500	480	1,000,000	210,000
Belarus	6,180	6,400	3,300,000	750,000
Brazil	301	300	310,000	24,000
Canada	10,800	12,000	4,200,000	1,000,000
Chile	1,200	1,200	NA	150,000
China	6,200	6,200	NA	360,000
Germany	2,800	2,900	NA	150,000
Israel	2,050	2,200	NA	<sup>6</sup> 270,000
Jordan	1,200	1,300	NA	<sup>6</sup> 270,000
Russia	6,480	7,200	3,000,000	500,000
Spain	670	680	NA	44,000
United Kingdom	450	450	NA	40,000
Other countries	480	500	250,000	90,000
World total (rounded)	39,300	42,000	NA	3,900,000

**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 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>Includes MOP, SOP, SOPM, and some parent salts. Does not include other chemical compounds that contain potassium.

<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.