

IODINE

(Data in metric tons elemental iodine unless otherwise noted)

Domestic Production and Use: Iodine was produced in 2011 by two companies operating in Oklahoma, with a fourth company initializing iodine production in Montana in March 2010. Production in 2011 was estimated to have increased from that of 2010. To avoid disclosing company proprietary data, U.S. iodine production in 2011 was withheld. The operation at Woodward, OK, continued production of iodine from subterranean brines. Another company continued production at Vici, OK. Prices for iodine have increased in recent years owing to high demand, which has led to high utilization of capacity. The Japanese earthquake and tsunami in March 2011 tightened iodine supplies through disruptions in Japanese iodine production and panic buying of potassium iodide anti-radiation tablets. As a result, prices in 2011 became erratic. The average c.i.f. value of iodine imports in 2011 was estimated to be \$27.00 per kilogram.

Domestic and imported iodine were used by downstream manufacturers to produce many intermediate iodine compounds, making it difficult to establish an accurate end-use pattern. Of the consumers that participate in an annual U.S. Geological Survey canvass, 16 plants reported consumption of iodine in 2010. Iodine and iodine compounds reported were unspecified organic and inorganic compounds, including ethyl and methyl iodide, 66%; resublimed iodine, 15%; ethylenediamine dihydroiodide, 5%; crude iodine, 4%; hydriodic acid, 4%; potassium iodide, 3%; and other, 3%.

Salient Statistics—United States:	2007	2008	2009	2010	2011^e
Production	W	W	W	W	W
Imports for consumption, crude content	6,060	6,300	5,190	5,710	4,600
Exports	1,060	950	1,160	1,070	660
Shipments from Government stockpile excesses	93	—	—	—	—
Consumption:					
Apparent	W	W	W	W	W
Reported	4,470	4,590	4,550	4,670	4,000
Price, average c.i.f. value, dollars per kilogram, crude	21.01	21.52	25.55	24.71	27.00
Employment, number ^e	30	30	30	30	30
Net import reliance ¹ as a percentage of reported consumption	100	100	89	99	99

Recycling: Small amounts of iodine were recycled, but no data were reported.

Import Sources (2007–10): Chile, 83%; Japan, 16%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations
			<u>12-31-11</u>
	Iodine, crude	2801.20.0000	Free.
	Iodide, calcium or copper	2827.60.1000	Free.
	Iodide, potassium	2827.60.2000	2.8% ad val.
	Iodides and iodide oxides, other	2827.60.5100	4.2% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: In response to strong demand for iodine in recent years driven by the liquid crystal display (LCD) and x-ray contrast media industries, coupled with a supply shortfall resulting from the Japanese disaster, iodine prices were expected to be volatile throughout 2011 and into early 2012. It was unclear if Japanese iodine production would return to predisaster levels; however, with an increase in Chilean production and further recovery in Japan, prices were expected to stabilize in mid-2012. With a projected global economic recovery, demand for iodine used in biocides, iodine salts, LCDs, synthetic fabric treatments, and x-ray contrast media was expected to increase at a rate of between 3.5% and 4% per year during the next decade.

As in recent years, Chile was the world's leading producer of iodine, followed by Japan and the United States. Chile accounted for more than 58% of world production in 2010, having two of the leading iodine producers in the world. The Chilean producers were operating near capacity and were expected to expand production in response to changes in demand and to capitalize on price increases. The third largest Chilean producer initiated a new project at Algorta, Chile, which was expected to replace its current operation at Lagunas, Chile.

Several government programs were expected to affect future iodine demand. The European Union prohibited its 27 member countries from using or selling iodine for the purpose of disinfecting drinking water. China's Ministry of Health announced the reduction of iodine content in salt owing to fears that iodized salt is causing a rise in thyroid disease. The U.S. Environmental Protection Agency approved the restricted use of the soil fumigant iodomethane (methyl iodide) as an alternative to ozone-depleting methyl bromide. Australia and Belgium required bread manufacturers to use iodized salt with the intent of limiting iodine deficiency in their populations.

World Mine Production and Reserves:

	Mine production		Reserves ²
	<u>2010</u>	<u>2011^e</u>	
United States	W	W	250,000
Azerbaijan	300	300	170,000
Chile	17,500	18,000	9,000,000
China	590	590	4,000
Indonesia	75	75	100,000
Japan	9,700	9,800	5,000,000
Russia	300	300	120,000
Turkmenistan	270	270	170,000
Uzbekistan	<u>2</u>	<u>2</u>	<u>NA</u>
World total (rounded)	³ 28,700	³ 29,000	15,000,000

World Resources: In addition to the reserves shown above, seawater contains 0.05 parts per million iodine, or approximately 34 million tons. Seaweeds of the Laminaria family are able to extract and accumulate up to 0.45% iodine on a dry basis. Although not as economical as the production of iodine as a byproduct of gas, nitrate, and oil, the seaweed industry represented a major source of iodine prior to 1959 and remains a large resource.

Substitutes: There are no comparable substitutes for iodine in many of its principal applications, such as in animal feed, catalytic, nutritional, pharmaceutical, and photographic uses. Bromine and chlorine could be substituted for iodine in biocide, colorant, and ink, although they are usually considered less desirable than iodine. Antibiotics can be used as a substitute for iodine biocides.

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data. — Zero.

¹Defined as imports – exports + adjustments for Government and industry stock changes.

²See [Appendix C for resource/reserve definitions and information concerning data sources.](#)

³Excludes U.S. production.

*Correction posted on February 27, 2012.