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(Data in thousand metric tons of silicon content unless otherwise noted)

Domestic Production and Use: Five companies produced silicon materials at eight plants, all east of the Mississippi River. Most ferrosilicon was consumed in the ferrous foundry and steel industries, predominantly in the Eastern United States, and was sourced primarily from domestic quartzite (silica). The main consumers of silicon metal were producers of aluminum and aluminum alloys and the chemical industry. The semiconductor and solar energy industries, which manufacture chips for computers and photovoltaic cells from high-purity silicon, respectively, accounted for only a small percentage of silicon demand.

Salient Statistics—United States:	2012	2013	2014	2015	2016[e]
Production:					
Ferrosilicon and silicon metal[1]	390	392	401	411	396
Imports for consumption:					
Ferrosilicon, all grades[2]	173	159	186	162	170
Silicon metal	136	118	139	139	128
Exports:					
Ferrosilicon, all grades[2]	12	10	9	9	7
Silicon metal	75	38	45	37	46
Consumption, apparent:[3]					
Ferrosilicon, all grades[2]	W	W	W	W	W
Silicon metal[4]	W	W	W	W	W
Total	607	631	670	661	634
Price,[5] average, cents per pound Si:					
Ferrosilicon, 50% Si	100	103	108	101	82
Ferrosilicon, 75% Si	92	94	98	88	69
Silicon metal[4]	127	122	140	127	91
Stocks, producer, yearend:					
Silicon alloys and metal	35	25	27	33	39
Net import reliance[6] as a percentage of apparent consumption:					
Ferrosilicon, all grades[1]	<50	<50	<50	>50	>50
Silicon metal[4]	<50	<50	<50	<50	<50
Total	36	39	42	38	38

Recycling: Insignificant.

Import Sources (2012–15): Ferrosilicon: Russia, 41%; China, 25%; Canada, 11%; Venezuela, 10%; and other, 13%. Silicon metal: South Africa, 26%; Brazil, 25%; Canada, 15%; Australia, 13%; and other, 21%. Total: Russia, 23%; China, 14%; Canada, 13%; Brazil, 12%; South Africa, 12%; and other, 26%.

Tariff: Item	Number	Normal Trade Relations 12–31–16
Silicon, more than 99.99% Si	2804.61.0000	Free.
Silicon, 99.00%–99.99% Si	2804.69.1000	5.3% ad val.
Silicon, other	2804.69.5000	5.5% ad val.
Ferrosilicon, 55%–80% Si:		
More than 3% Ca	7202.21.1000	1.1% ad val.
Other	7202.21.5000	1.5% ad val.
Ferrosilicon, 80%–90% Si	7202.21.7500	1.9% ad val.
Ferrosilicon, more than 90% Si	7202.21.9000	5.8% ad val.
Ferrosilicon, other:		
More than 2% Mg	7202.29.0010	Free.
Other	7202.29.0050	Free.

Depletion Allowance: Quartzite, 14% (Domestic and foreign); gravel, 5% (Domestic and foreign).

Prepared by **Emily K. Schnebele [(703) 648–4945, eschnebele@usgs.gov]**

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Government Stockpile: None.

Events, Trends, and Issues: Combined domestic ferrosilicon and silicon metal production in 2016, expressed in terms of contained silicon, was expected to decrease from that of 2015. Domestic production during the first 8 months of 2016 was 7% less than during the first 8 months in 2015. By August 2016, annual average U.S. ferrosilicon spot market prices had decreased by 16% and 25%, for 50%-grade and 75%-grade ferrosilicon, respectively, and the annual average silicon metal spot market price had decreased by 32% compared with that of the same period in 2015. Globally, oversupply in the market combined with decreased steel production and weak aluminum alloy demand contributed to decreased silicon prices. Domestic production was also affected by lower priced imports. Decreases in production and destocking of inventory were expected to stabilize prices by the end of 2016.

World Production and Reserves:

	Production[e, 7]		Reserves[8]
	2015	2016	
United States	411	396	The reserves in most major producing countries are ample in relation to demand. Quantitative estimates are not available.
Bhutan[9]	78	78	
Brazil	117	100	
Canada	54	54	
China	5,000	4,600	
France	121	121	
Iceland[9]	75	75	
India[9]	60	60	
Malaysia[9]	68	68	
Norway	375	380	
Russia	747	747	
South Africa	84	84	
Spain	81	81	
Ukraine[9]	59	64	
Other countries	300	300	
World total (rounded)	7,630	7,200	

Excluding the United States, ferrosilicon accounts for about 65% of world silicon production on a silicon-content basis. The leading countries for ferrosilicon production were, in descending order and on a contained-weight basis, China, Russia, and Norway, and, for silicon metal, the leading producers were China, Norway, and France. China contributed approximately 65% to the total global estimated production of silicon materials in 2016.

World Resources: World and domestic resources for making silicon metal and alloys are abundant and, in most producing countries, adequate to supply world requirements for many decades. The source of the silicon is silica in various natural forms, such as quartzite.

Substitutes: Aluminum, silicon carbide, and silicomanganese can be substituted for ferrosilicon in some applications. Gallium arsenide and germanium are the principal substitutes for silicon in semiconductor and infrared applications.

[e]Estimated. W Withheld to avoid disclosing company proprietary data.
[1]Includes statistics for ferrosilicon and silicon metal containing less than 99.9% silicon.
[2]Ferrosilicon grades include the two standard grades of ferrosilicon—50% and 75% silicon—plus miscellaneous silicon alloys.
[3]Defined as production + imports – exports + adjustments for industry stock changes.
[4]Metallurgical-grade silicon metal.
[5]Based on U.S. dealer import price.
[6]Defined as imports – exports + adjustments for industry stock changes.
[7]Production quantities are combined totals of estimated silicon content for ferrosilicon and silicon metal, as applicable, except as noted.
[8]See Appendix C for resource and reserve definitions and information concerning data sources.
[9]Ferrosilicon only.