

CEMENT

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2011, about 66 million tons of portland cement and 1.8 million tons of masonry cement were produced at 103 plants in 35 States. Cement also was produced at two plants in Puerto Rico. Output improved slightly overall but was still at a very low level relative to the more than 90-million-ton-per-year levels of 2002–07 and reflected recent plant closures and idlings, and idlings of spare kilns at active plants. Although slightly higher than levels in 2009–10, sales volumes in 2011 were still more than 57 million tons below the record level of 2005. The overall value of sales was about \$6.6 billion. Most of the cement was used to make concrete, worth at least \$37 billion. About 71% of cement sales went to ready-mixed concrete producers, 12% to concrete product manufacturers, 10% to contractors (mainly road paving), 3% to building materials dealers, and 4% to other users. In descending order, Texas, California, Missouri, Florida, Pennsylvania, Michigan, and Alabama were the seven leading cement-producing States and accounted for about 53% of U.S. production.

Salient Statistics—United States: ¹	2007	2008	2009	2010	2011^e
Production:					
Portland and masonry cement ²	95,464	86,310	63,929	66,452	67,700
Clinker	86,130	78,382	56,116	59,812	59,500
Shipments to final customers, includes exports	115,426	97,322	71,489	71,194	72,300
Imports of hydraulic cement for consumption	21,496	10,744	6,211	6,013	5,600
Imports of clinker for consumption	972	621	556	613	500
Exports of hydraulic cement and clinker	886	823	884	1,178	1,700
Consumption, apparent ³	116,600	96,800	71,500	71,200	72,300
Price, average mill value, dollars per ton	104.00	103.50	99.00	92.00	91.00
Stocks, cement, yearend	8,890	8,360	6,080	6,166	5,500
Employment, mine and mill, number ^e	16,000	15,000	13,000	12,000	12,000
Net import reliance ⁴ as a percentage of apparent consumption	19	11	8	8	6

Recycling: Cement kiln dust is routinely recycled to the kilns, which also can burn a variety of waste fuels and recycled raw materials such as slags and fly ash. Certain secondary materials can be incorporated as supplementary cementitious materials in blended cements and in the cement paste in concrete. Cement is not directly recycled, but there is significant recycling of concrete for use as aggregate.

Import Sources (2007–10):⁵ Canada, 34%; China, 18%; Republic of Korea, 12%; Mexico, 7%; and other, 29%.

Tariff: Item	Number	Normal Trade Relations
		12-31-11
Cement clinker	2523.10.0000	Free.
White portland cement	2523.21.0000	Free.
Other portland cement	2523.29.0000	Free.
Aluminous cement	2523.30.0000	Free.
Other hydraulic cement	2523.90.0000	Free.

Depletion Allowance: Not applicable. Certain raw materials for cement production have depletion allowances.

Government Stockpile: None.

Events, Trends, and Issues: Construction spending levels remained low in 2011 because of the continuing depressed housing market, high numbers of housing foreclosures, lower tax revenues to the States, tight credit, and high levels of unemployment. In the construction sectors requiring significant quantities of concrete (hence cement), stimulus spending had only minor and localized impact in 2011. Imports continued to fall, but slightly higher overall sales allowed for a modest increase in cement production. Beginning in 2008, a large number of plants were put into indefinite idle status or were closed altogether. This trend continued into 2011, with one already idle plant being formally closed, and another plant being idled indefinitely, with few prospects for reopening. Most multikiln plants had only a single kiln operating in 2011. One new plant opened in 2011.

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The manufacture of clinker for cement releases a great deal of carbon dioxide, and plant-level reporting of these emissions to the U.S. Environmental Protection Agency (EPA) became mandatory in 2010. Carbon dioxide reduction strategies by the cement industry mainly aim at reducing emissions per ton of cement product rather than by a plant overall. These strategies include installation of more fuel-efficient kiln technologies, partial substitution of noncarbonate sources of calcium oxide in the kiln raw materials, and partial substitution of supplementary cementitious materials (SCM), such as pozzolans, for portland cement in the finished cement products and in concrete. Because SCM do not require the energy-intensive clinker manufacturing (kiln) phase of cement production, their use, or the use of inert additives or extenders, reduces the unit monetary and environmental costs of the cement component of concrete. Research continued toward developing cements that require less energy to manufacture than portland cement, and(or) that utilize more benign raw materials.

A new National Emissions Standards for Hazardous Air Pollutants (NESHAP) protocol for cement plants finalized in 2010 by the EPA was being appealed in 2011 by the cement industry. The protocol would significantly lower the acceptable emissions levels of mercury and certain other pollutants. It was unclear how many plants would be able to comply with the new limits; the mercury limits were further expected to make it difficult for cement plants to continue to burn fly ash as a raw material for clinker manufacture.

World Production and Capacity:

	Cement production		Clinker capacity ^e	
	2010	2011 ^e	2010	2011
United States (includes Puerto Rico)	67,200	68,400	⁶ 111,000	⁶ 108,000
Brazil	59,100	62,600	50,000	53,000
China	1,880,000	2,000,000	1,500,000	1,600,000
Egypt	48,000	45,000	46,000	46,000
Germany	29,900	33,000	31,000	31,000
India	210,000	210,000	240,000	250,000
Indonesia	22,000	22,000	42,000	42,000
Iran	50,000	52,000	57,000	59,000
Italy	36,300	35,000	46,000	46,000
Japan	51,500	47,000	63,000	60,000
Korea, Republic of	47,200	46,000	50,000	50,000
Mexico	34,500	35,000	42,000	42,000
Pakistan	30,000	30,000	42,000	42,000
Russia	50,400	52,000	65,000	65,000
Saudi Arabia	42,300	44,000	50,000	50,000
Spain	23,500	20,700	42,000	42,000
Thailand	36,500	36,000	50,000	50,000
Turkey	62,700	64,000	64,000	66,000
Vietnam	50,000	50,000	55,000	55,000
Other countries (rounded)	<u>480,000</u>	<u>480,000</u>	<u>460,000</u>	<u>460,000</u>
World total (rounded)	^e 3,310,000	3,400,000	3,100,000	3,200,000

World Resources: Although individual plant reserves are subject to exhaustion, cement raw materials, especially limestone, are geologically widespread and abundant, and overall shortages are unlikely in the future.

Substitutes: Virtually all portland cement is used either in making concrete or mortars and, as such, competes in the construction sector with concrete substitutes, such as aluminum, asphalt, clay brick, rammed earth, fiberglass, glass, steel, stone, and wood. A number of materials, especially fly ash and ground granulated blast furnace slag, develop good hydraulic cementitious properties by reacting with the lime released by the hydration of portland cement. Where not constrained in supply, these SCM are increasingly being used as partial substitutes for portland cement in many concrete applications.

^eEstimated.

¹Portland plus masonry cement unless otherwise noted; excludes Puerto Rico.

²Includes cement made from imported clinker.

³Production of cement (including from imported clinker) + imports (excluding clinker) – exports + adjustments for stock changes.

⁴Defined as imports (cement and clinker) – exports.

⁵Hydraulic cement and clinker.

⁶Capacity includes nearly 6 million tons classified as indefinite idle status rather than closed.