

2023 U.S. CEMENT INDUSTRY ANNUAL YEARBOOK

CONSTRUCTION FACTS

INDUSTRY TRENDS

DOMESTIC &
INTERNATIONAL
COVERAGE

SAMPLE

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U.S. CEMENT INDUSTRY ANNUAL YEARBOOK 2023

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Table 1

Construction and Economic Activity

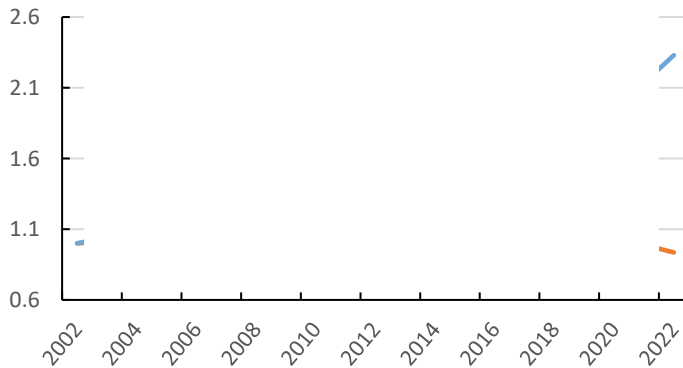


Year	Construction <i>(Billions 2009\$)</i>	Real GDP <i>(Billions 2009\$, SAAR)</i>	Ratio Construction % of GDP <i>(Percent)</i>	Ratio Portland Cement* to Construction <i>(MT per \$Billion)</i>	Ratio Portland Cement* to GDP <i>(MT per \$Million)</i>
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009					
2010					
2011					
2012					
2013					
2014					
2015					
2016					
2017					
2018					
2019					
2020					
2021					
2022					

* Portland and Masonry

Source: U.S. Department of Commerce, Bureau of Economic Analysis, U.S. Geological Survey, PCA Market Intelligence

Index of Construction and Economic Activity
(Index 2002 = 1.0)



Ratio Portland Cement to Construction
(Metric Tons per Million \$2009)

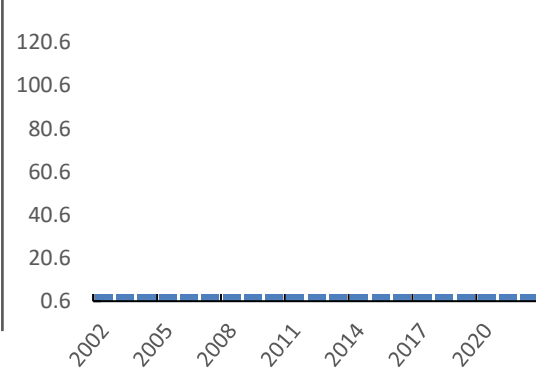


Table 2

Construction Put-in-Place (*Billions of \$2009*)



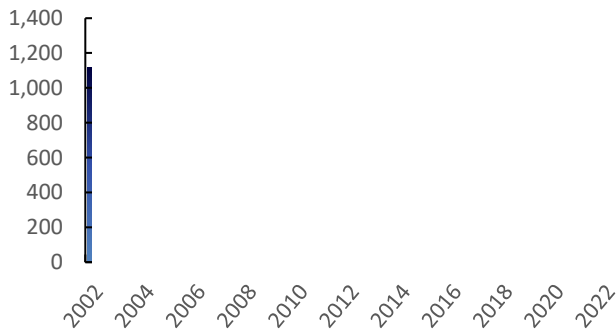
Year	Total	Residential	Share of Total (%) Nonresidential	Share of Total (%) Public	Share of Total (%) Other ¹	Share of Total (%)
2002	1,112	481.1	43.3	201.5	18.1	38.6

Percent Change
2022 / 2021

¹ Public Utility, Farm Nonresidential, Miscellaneous

Source: U.S. Department of Commerce, U.S. Census Bureau

Total Construction
(*\$2009 Bil*)



Share of Total Construction Spending
(*Percent*)

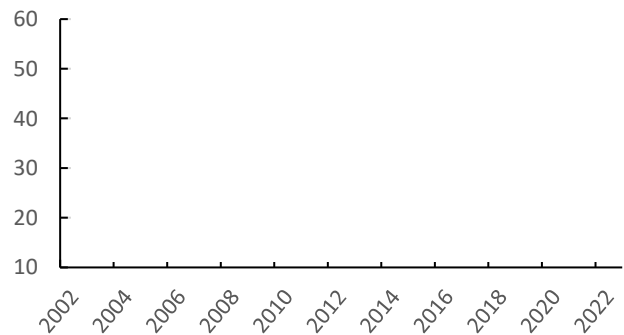


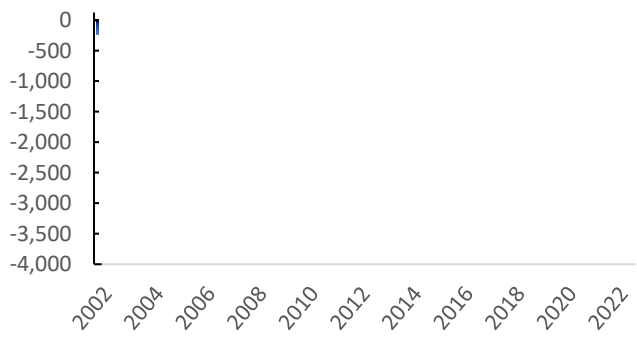
Table 3
Government Deficits



Year	Federal Debt (\$ Bil)	Federal Deficit/ Surplus (\$ Bil)	Federal Deficit Share of GDP (%)	Federal Debt share of GDP (%)	Long-Term Interest Rate (%)	Nonminal GDP (\$ Bil)
200						
200						
200						
200						
200						
200						
200						
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201						
201						
201						
202						
202						
202						

Source: United States Department of Treasury, United States Federal Reserve

Federal Deficit/Surplus
(\$ Bil)



Federal Debt Share of GDP
(Percent)

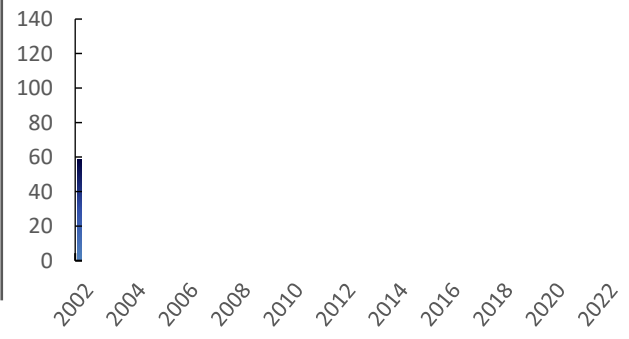


Table 4
Foreign Trade



Year	Value of Exports (\$ Bil)	Value of Imports (\$ Bil)	Trade Deficit (\$ Bil)	Trade Deficit as a % of GDP (%)	Value of USD (Major Currencies Index)
2022	2,334	3,691	-1,357	5.9	127.0

Source: Bureau of Economic Analysis





Table 5
Residential Drivers

Year	Single Family				Multifamily				
	Mortgage Rate (%)	Median Home Price (\$000)	Average Monthly Payment (\$)	1st Time Home Buyers* (000)	Median Rent (\$)	Mortgage to Rent Ratio	Vacancy Rate (%)	Apartment Age Population* (000)	Housing Stock (000)
21									
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* Estimated

Source: U.S. Census Bureau, Freddie Mac

Single Family Average Monthly Payment (\$)

Multifamily Vacancy Rates (Percent)

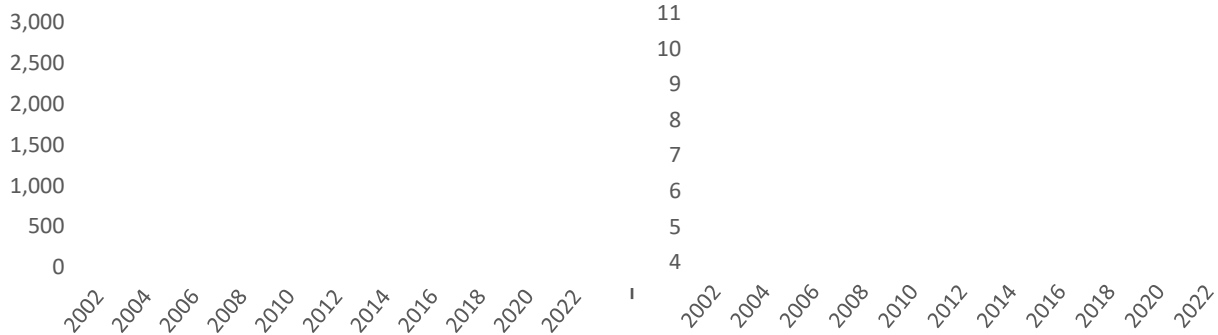


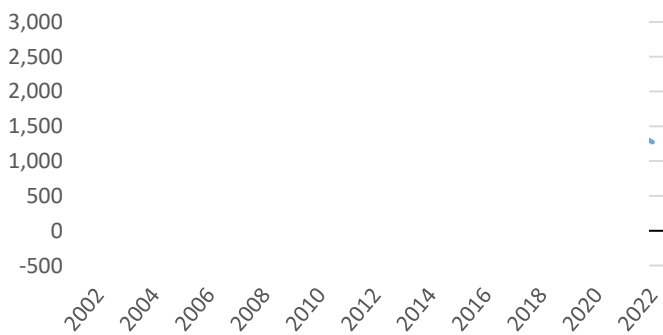


Table 6
Net Residential Balance

Year	Households (000)	Annual Change in Households (000)	Single Family Starts (000)	Multifamily Starts (000)	New Net Supply* (000)
------	---------------------	-----------------------------------------	-------------------------------	-----------------------------	-----------------------------

*Includes estimated data for Manufactured Home Placements after 2013 & subtracts estimated Demolitions after 2012
Source: U.S. Census Bureau

Annual Change in Households
(000)



Annual Net New Housing Supply
(000)

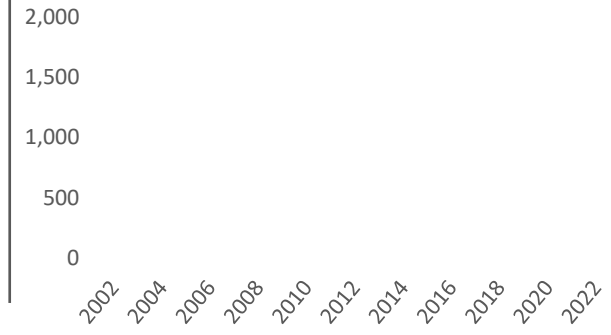




Table 7

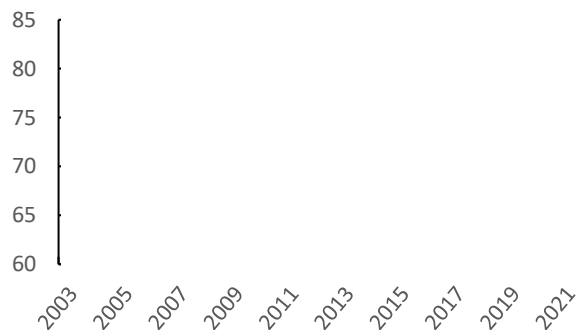
Nonresidential Drivers

Year	Commercial				Institutional			
	Manufacturing Capacity Utilization (%)	Office Vacancy Rate (%)	Retail Sales Growth (%)	Air Travel Growth (%)	Change in Population 5 - 19 (%)	Student Teacher Ratio	Healthcare Expenditure Share of GDP (%)	Pop 65+ Share of Total Pop (%)

*Estimate

Sources: U.S. Census Bureau, U.S. Department of Transportation, CB Commercial, U.S. National Center for Education Statistics, U.S. Department of Health, Bureau of Economic Analysis, Centers for Medicare and Medicaid Services, Federal Reserve Board

Manufacturing Capacity Utilization (Percent)



Office Vacancy Rate (Percent)

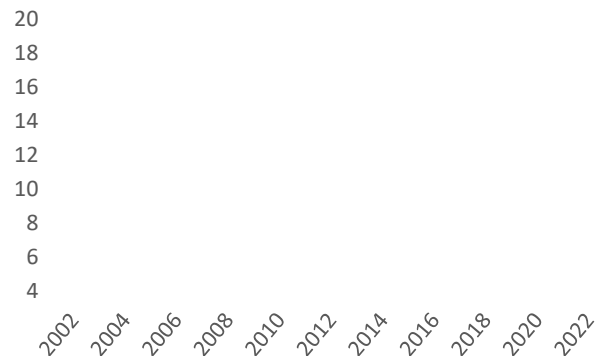


Table 8
Public Drivers



Year	State/Local Share of Total Public Construction ¹ (%)	State Governments Revenues ¹ (\$ Bil)	State Revenue Per Capita ¹ (\$)	Municipal Bond Rate (%)	Real Public Construction Spending Per Capita (2009\$)
------	--------------------------------------------------------------------	-----------------------------------------------------	-----------------------------------------------	----------------------------	----------------------------------------------------------

¹ Based on nominal values

Sources: U.S. Bureau of Economic Analysis, Moody's Investors Service, U.S. Census Bureau

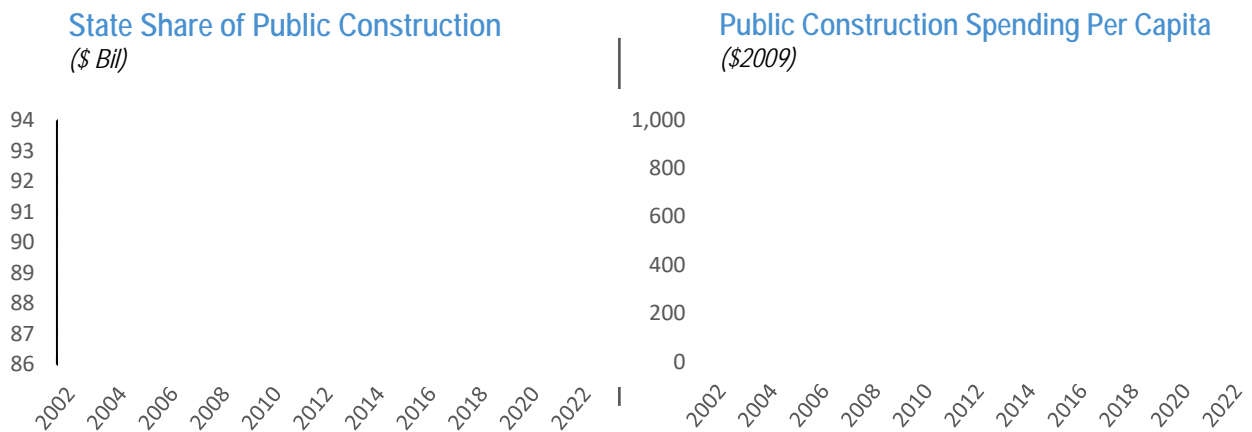




Table 9

U.S. Cement Industry Consumption - Exports - Imports - Shipments

(Thousands of Metric Tons)

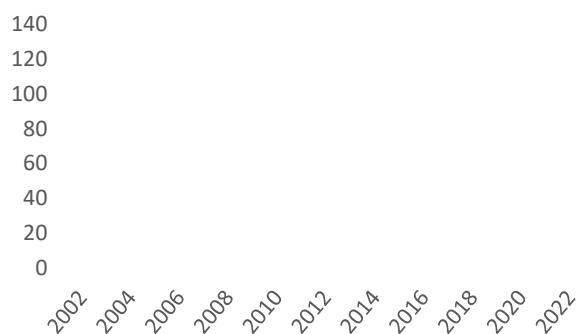
Year	Consumption*			Cement Exports	Cement Imports	Change in Stocks	Total Shipments by Domestic Producers
	Portland Cement	Masonry Cement	Total				

* Excludes Alaska, Foreign and Puerto Rico

Note: Domestic shipments include cement shipments from domestic manufacturers and cement shipments ground from imported clinker, but exclude finished cement imports.

Sources: U.S. Geological Survey, Department of Commerce - Foreign Trade Division, PCA Market Intelligence

U.S. Portland Cement Consumption
(Million Metric Tons)



Federal Debt Share of GDP
(Million Metric Tons)

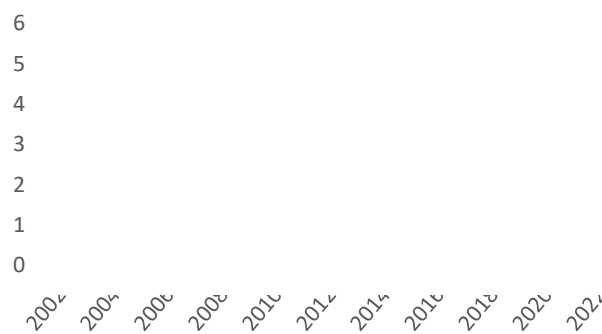


Table 10

U.S. Cement Industry Consumption - Exports - Imports - Shipments



(Year-Year % Change)

Consumption*

Year	Portland Cement	Masonry Cement	Total	Cement & Clinker Exports	Cement Imports	Total Shipments by Domestic Producers
------	-----------------	----------------	-------	--------------------------	----------------	---------------------------------------

Source: Calculated from Table 9

U.S. Portland Cement Consumption

(Year-Year % Change)



U.S. Masonry Cement Consumption

(Year-Year % Change)

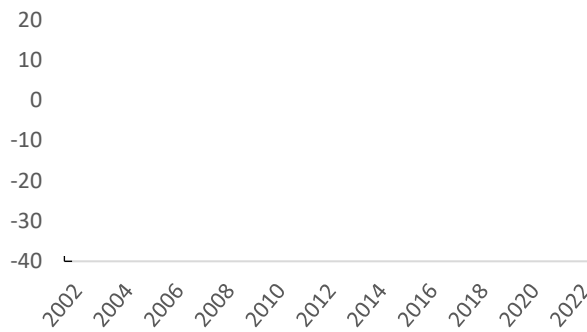




Table 11

Apparent Use of Portland Cement by Market

(Thousands of Metric Tons)

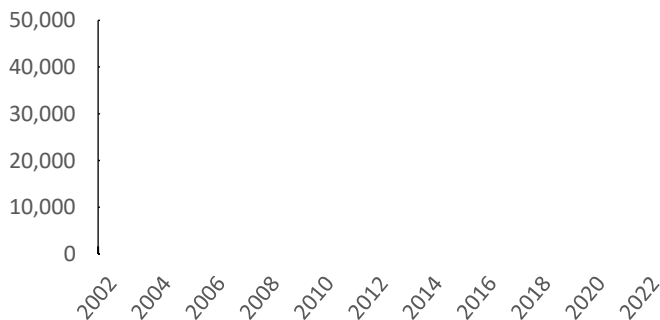
Market	2018	2019	2020	2021	2022	5 Year Average	5 Year Average Share (%)
Total							
Residential Buildings							
New Housing Units							
Single Family							
Multi Family							
Improvements							
Nonresidential Buildings							
Industrial							
Office							
Hotels, Motels							
Hospitals, Institutions							
Religious							
Educational							
Other Commercial							
Public Utility & Other							
Farm Nonresidential							
Oil & Gas Wells							
Miscellaneous							
Public Construction							
Buildings							
Highways & Streets							
Military/Public Security							
Conservation							
Sewer Systems							
Water Supply Systems							

**Nonresidential includes Public Utility, Farm, Oil & Gas, and Miscellaneous in pie chart

Source: PCA Market Intelligence: Apparent Use of Portland Cement by State and Market

Apparent Use of Portland Cement

(Residential Buildings - Thousand Metric Tons)



Apparent Use of Portland Cement by Market (5 Year avg. Share)

■ Residential Buildings

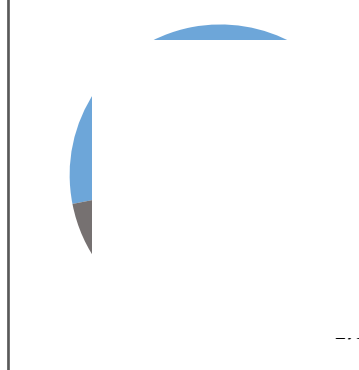


Table 12

Alternative Measure of Cement Usage Intensity

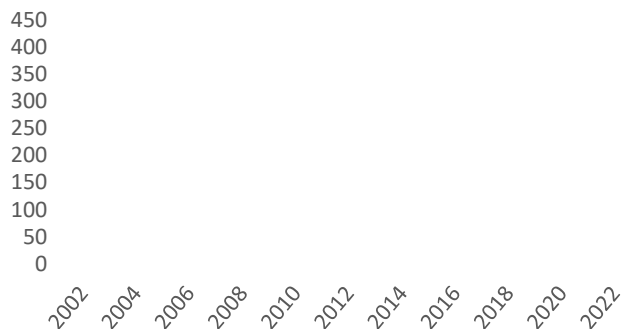


Year	Real Consturction \$ per Capita (000, \$2009)	Portland Cement Consumption per Capita (000) (Metric Tons)	Portland Cement Consumption per Million Construction \$ (Metric Tons)	Portland Cement Consumption per Construction Worker (Metric Tons)
------	-----------------------------------------------------	---------------------------------------------------------------------	--------------------------------------------------------------------------------	----------------------------------------------------------------------------

5 Year avg.
10 Year avg.
20 Year avg.

Sources: U.S. Dept. of Labor, U.S. Dept. of Commerce, PCA

Portland Cement consumption Per Capita
(Metric Tons)



Construction Spending per Capita
(000, \$2009)

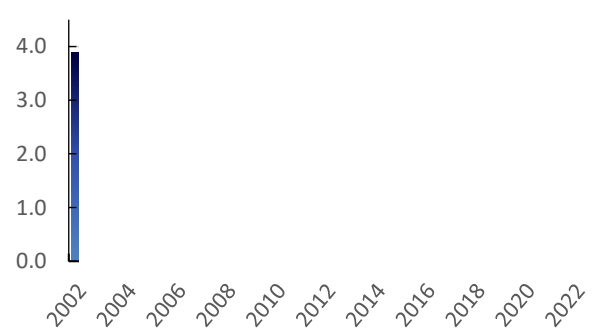


Table 13

Single Family Construction



Year	Single Family Starts (000)	Mortgage Rate (%)	Payment share of Household Income (%)	1st Time Home Buyers ¹ (000)	Home Ownership Rate (%)	Single Family Cement (000 MT)	Cement Tons per SF Start (Metric Tons)
------	-------------------------------	----------------------	------------------------------------------	--------------------------------------------	----------------------------	----------------------------------	-------------------------------------------

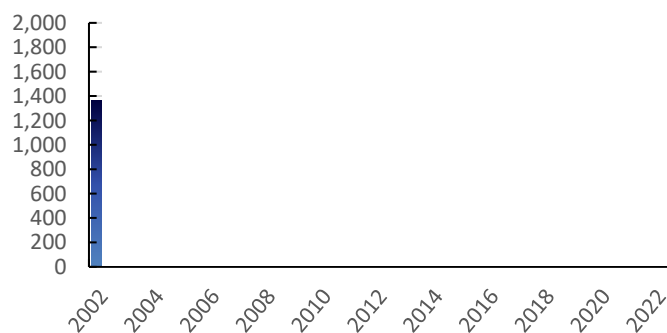
*Estimate

*Median household income has been estimated based on a 5 year average

¹Ages 30-39

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, Moody's Analytics Estimated

Single Family Starts
(000 of Units)



Single Family Cement Intensity
(Metric Tons Per Single Family Start)

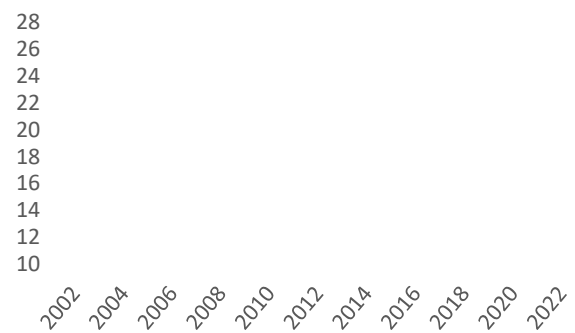


Table 14

Multifamily Construction



Year	Multifamily Starts (000)	Vacancy Rate (%)	Mortgage to Rent Ratio (%)	Apartment Age Population ¹ (000)	Retirement Age Population ² (000)	Multifamily Cement (000 MT)	Cement Tons per MF Start (Metric Tons)
------	-----------------------------	---------------------	-------------------------------	------------------------------------------------	-------------------------------------------------	--------------------------------	-------------------------------------------

¹Ages 30-39

²Ages 65 and older

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, Moody's Analytics Estimated

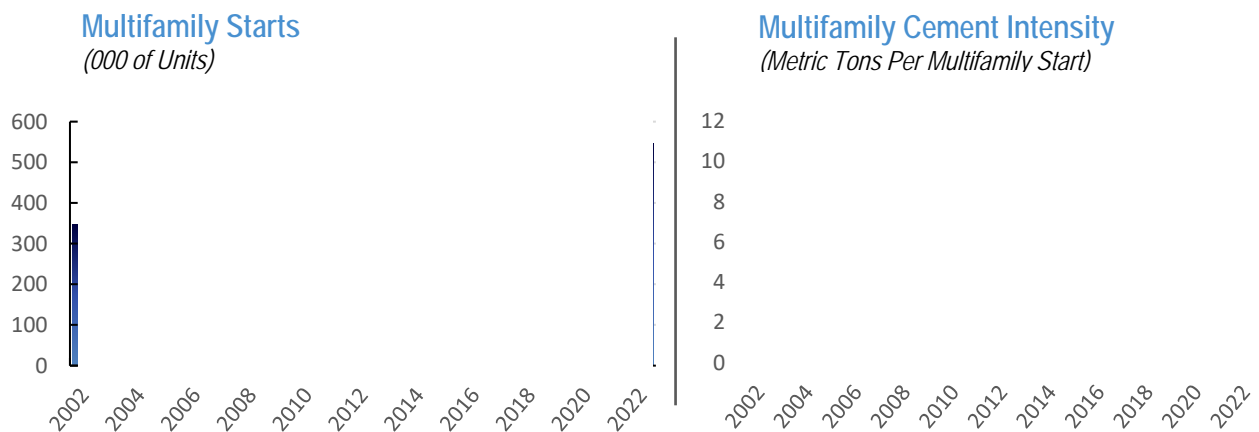


Table 15

Education Construction

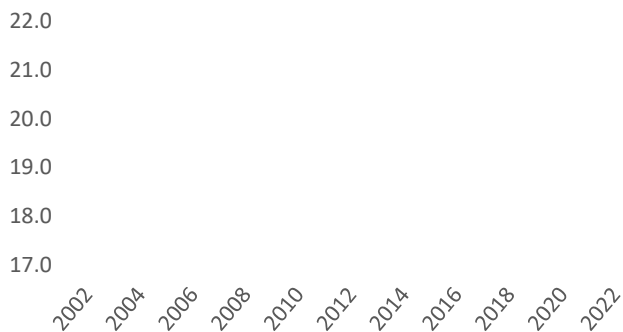


Year	Education Construction (\$2009 Bil)	School Age Share of Population (%)	Student Teacher Ratio	Educational Cement (000 MT)	Cement Tons Per Million \$ (Metric Tons)
------	----------------------------------------	------------------------------------------	--------------------------	-----------------------------------	------------------------------------------------

*Estimate

Sources: National Center for Education Statistics, PCA Market Intelligence: Apparent Use of Portland Cement & Construction Put-In-Place Trend Analysis, U.S. Census Bureau

School Age Share of Population
(%)



Student Teacher Ratio

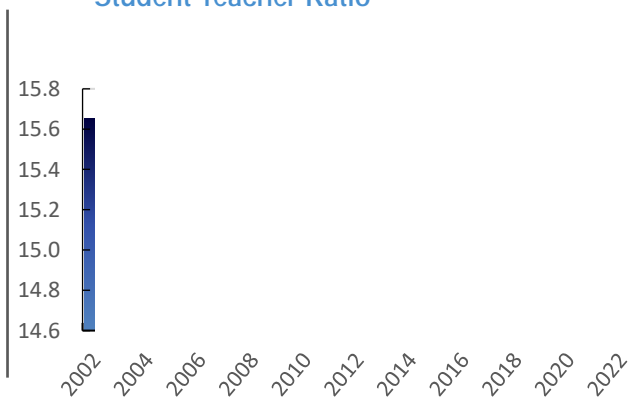


Table 16

Manufacturing Construction

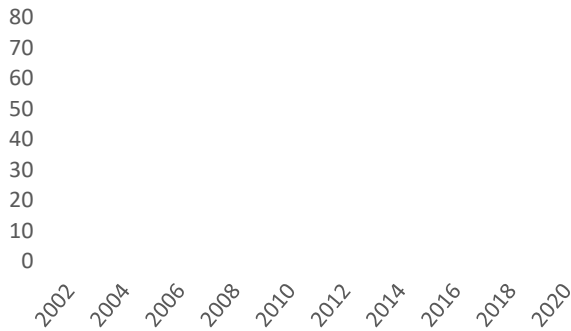


Year	Manufacturing Construction (\$2009 Bill)	Industrial Production Index (2007 = 100)	Manufacturing Capacity Utilization (%)	Change in Manufacturing Employment (000)	Industrial Vacancy Rate (%)	Manufacturing Cement (000 MT)	Cement Tons Per Million (Metric Tons)
------	---------------------------------------------	---------------------------------------------	-------------------------------------------	---------------------------------------------	--------------------------------	----------------------------------	------------------------------------------

2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, CB Commercial and Bureau of Labor Statistics

Manufacturing Construction Spending
(\$2009 Bil)



Cement Intensity in Manufacturing
(Metric Tons Per Million \$2009)

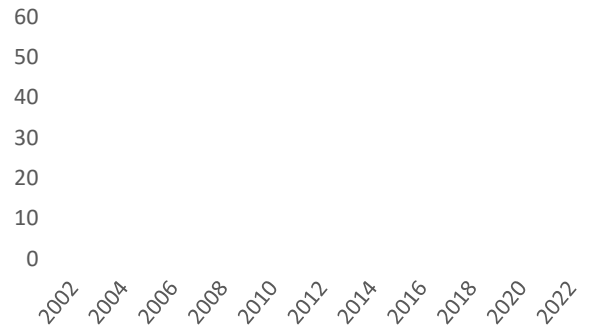


Table 17

Medical Construction



Year	Medical Construction (\$2009 Bill)	Population Insured (%)	Medical Cement (000 MT)	Cement Tons Per Millions \$ (Metric Tons)
------	---------------------------------------	---------------------------	----------------------------	-------------------------------------------------

*Estimate

Sources: PCA Market Intelligence: Apparent Use of Portland Cement & Construction Put-In-Place Trend Analysis, U.S. Census Bureau

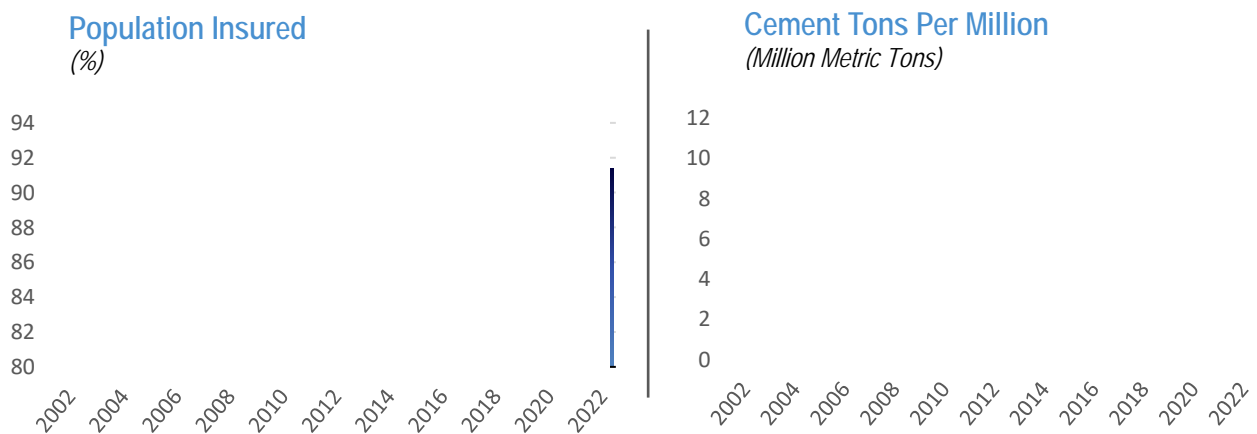


Table 18
Office Construction

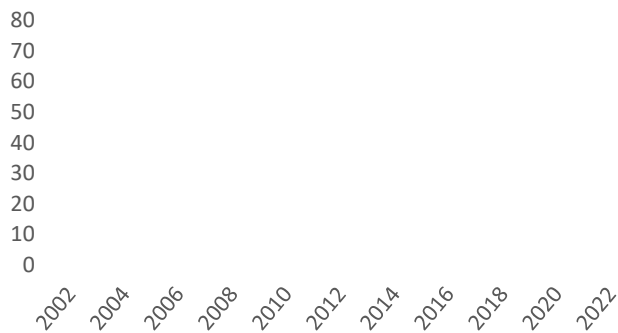


Year	Office Construction (\$2009 Bil)	Office Employment (000)	Change in Office Employment (000)	Estimated Office Capacity ¹ (000)	Office Vacancy Rate (%)	Office Cement (000 MT)	Cement Tons Per Million \$ (Metric Tons)
------	-------------------------------------	----------------------------	--------------------------------------	-------------------------------------------------	----------------------------	---------------------------	---------------------------------------------

¹Employment Based

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, CB Commercial and Bureau of Labor Statistics

Office Construction Spending
(\$2009 Bil)



Cement Intensity in Office Construction
(Metric Tons Per Million \$2009)

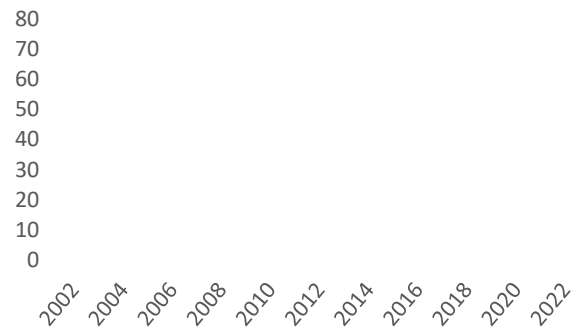


Table 19

Retail Construction



Year	Retail Construction (\$2009 Bill)	Real Consumer Spending Growth (%)	Change in Retail Employment (000)	Consumer Sentiment Index (1985=100)	Retail Cement (000 MT)	Cement Tons Per Million \$ (Metric Tons)
2002	51.7	2.1	220	107	12,011	233.9

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, CB Commercial and Bureau of Labor Statistics

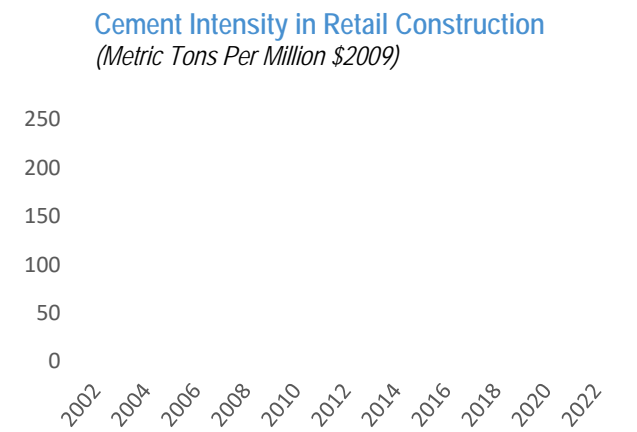
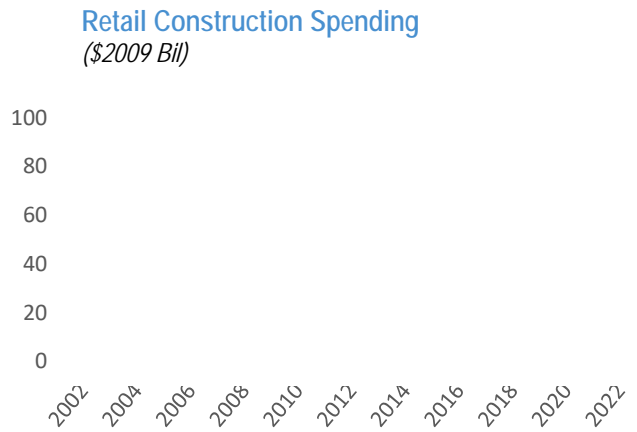


Table 20

Total Public Construction



Year	Public Construction (\$2009 Bil)	State/Local Share of Total Public ¹ (%)	Change in Government Employment (000)	Public Cement (000 MT)	Cement Tons Per Million \$ (Metric Tons)
------	-------------------------------------	----------------------------------------------------------	------------------------------------------------	---------------------------	------------------------------------------------

¹ Based on Nominal value

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, CB Commercial, Bureau of Labor Statistics, Federal Highway Administration, Bureau of Economic Analysis

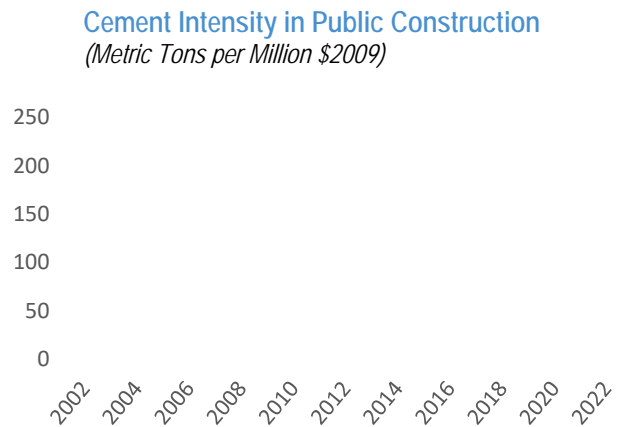
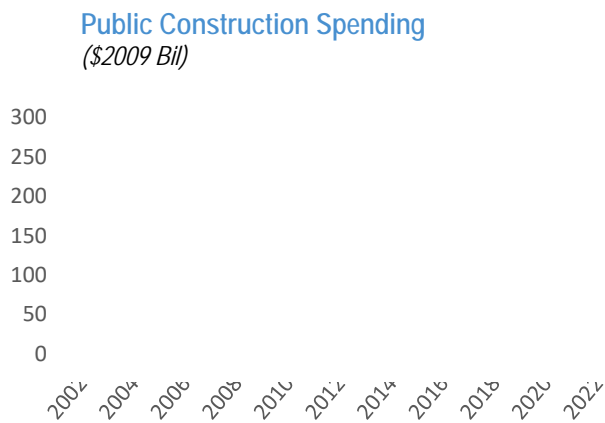


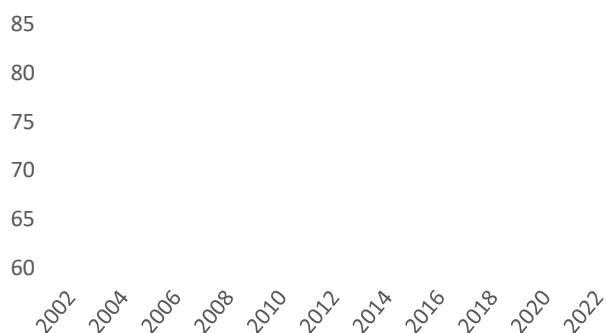


Table 21
Highway Construction

Year	Highway Construction (\$2009 Bil)	Highway Trust Fund Authorizations ^{1,2} (\$2009 Bil)	Estimated Discretionary Highway Spending ³ (\$ Bil)	Highway Cement (000 MT)	Cement Tons Per Million \$ (Metric Tons)
------	--------------------------------------	------------------------------------------------------------------	-------------------------------------------------------------------	----------------------------	---------------------------------------------

¹ Highway Trust Fund encompasses ISTE/TEA/SAFETEALU/MAP-21 and subsequent extensions following 2009 expiration
² Data based on planned allocations, not actual funding
³ Includes ARRA Spending
 Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, U.S. Department of Transportation

Highway Construction Spending
(\$2009 Bil)



Cement Intensity in Highway Construction
(Metric Tons per Million \$2009)

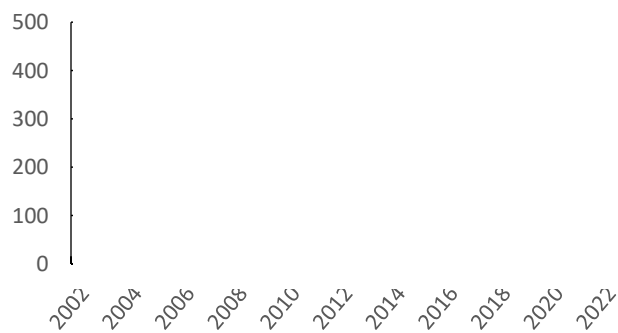




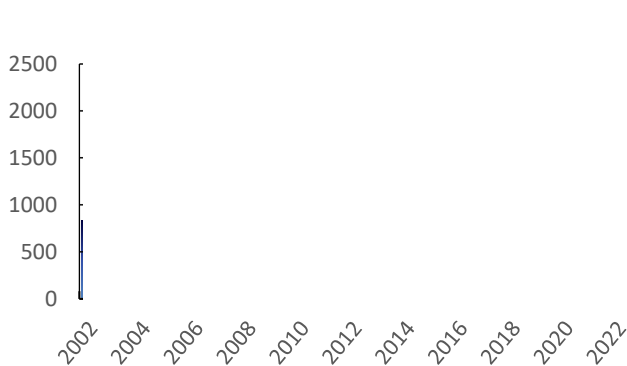
Table 22

Oil Exploration and Production

Year	WTI Oil Price (\$ Per Barrel)	Active Rig Count	U.S. Oil Production Share of World (%)	Oil Well Cement (000 MT)	Oil Well Cement/ Active Rig
2002	26.9	824	11.7	1,050	1.3

Sources: Baker Hughes Incorporated, FCA Market Intelligence: Apparent Use of Portland Cement & Construction Put-In-Place Trend Analysis, U.S. Energy Information Administration

Active Rig Count



Oil Well Cement / Active Rigs

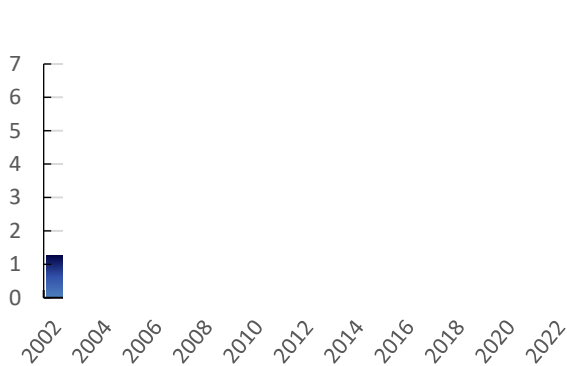




Table 23

Portland Cement Consumption Growth by State (*Compound Annual Growth Rate*)

	1993 - 2002	2003 - 2012	2013 - 2022	1993 - 2022
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
U.S. Total

Source: U.S. Geological Survey

Table 24

Top 20 States in Portland Cement Consumption¹



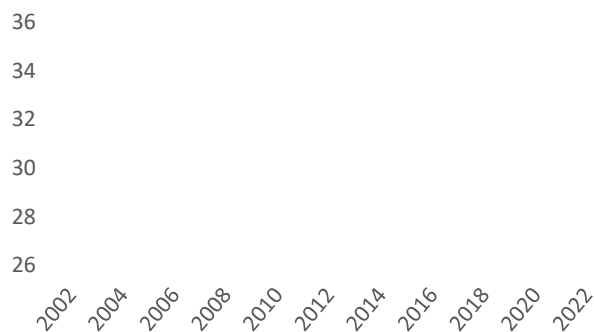
(Thousands of Metric Tons)

State	2002	State	2012	State	2022
-------	------	-------	------	-------	------

¹U.S. Total excludes AK, Foreign, and Puerto Rico

Sources: U.S. Geological Survey

Portland Cement Consumption
(Top 3 States: TX, CA, FL - Share of Total U.S., %)



Portland Cement Consumption
Share of Total U.S.
2022

■ Top 10 States ■ Mid 20 States ■ Remaining states

Table 25



Top 20 MSAs in Portland Cement Consumption¹

(Thousands of Metric Tons)

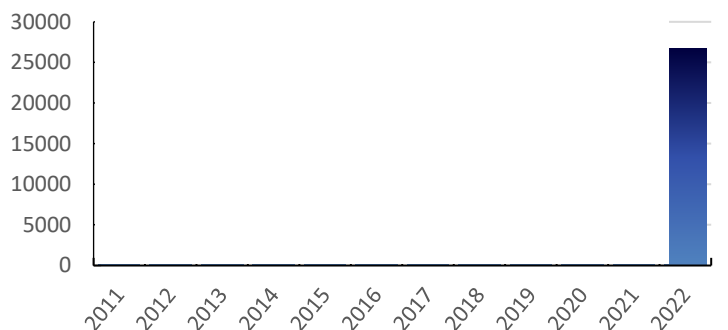
MSA	2012	MSA	2022
-----	------	-----	------

TOTAL U.S. 18,712 TOTAL U.S. 18,707

¹U.S. Total excludes AK, Foreign, and Puerto Rico

Sources: PCA Market Intelligence

Top 10 MSAs Total Portland Cement Consumption



MSA Portland Cement Consumption Share of Total U.S. 2022



Table 26
Highway Infrastructure Funding



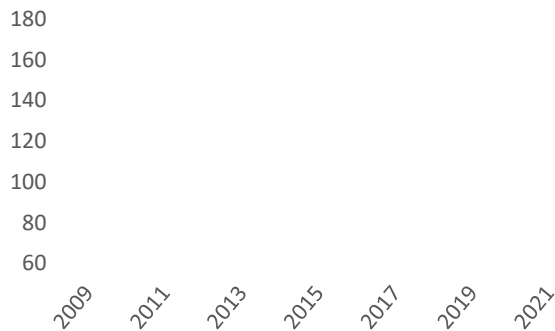
Year	Gas Tax	Deflated Gas Tax (1993\$) (¢ per Gallon)	Gas Tax Highway Allocation	Gas Tax Public Transit Allocation	Vehicle Miles Traveled (Bil Miles)	Fuel Economy (Avg MPG)	Highway Construction Cost Index (2009=100)	Weighted Gas Tax* (¢ per Gallon)
------	---------	---------------------------------------------	----------------------------	-----------------------------------	---------------------------------------	---------------------------	-----------------------------------------------	-------------------------------------

*Estimate

Gas consumption per state/gas tax revenue per state

Sources: PCA Market Intelligence, U.S. Geological Survey, U.S. Census Bureau, U.S. Department of Transportation, Federal Highway Administration, U.S. Bureau of Economic Analysis (BEA)

Gas Tax vs. Highway Construction Cost Inflation



Average Miles Per Gallon
(Average MPG for All Vehicle Types)

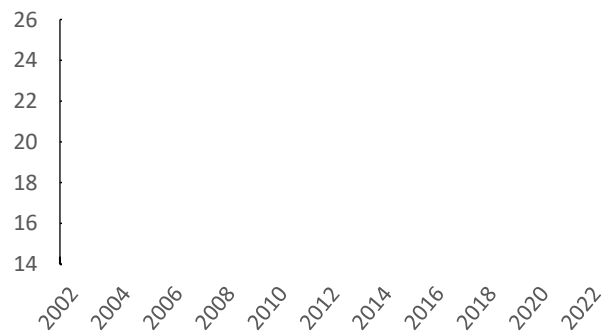


Table 27

Highway Congestion Measures



Year	Highway Lane Miles	Total Licensed Drivers (000)	Total Vehicles on Road (000)	Lane Miles per Thousand Drivers	Lane Miles per Thousand Vehicles	Fatalities (Per Million Drivers)
------	--------------------	------------------------------	------------------------------	---------------------------------	----------------------------------	----------------------------------

*Estimate

Sources: Federal Highway Administration, National Highway Traffic Safety Administration

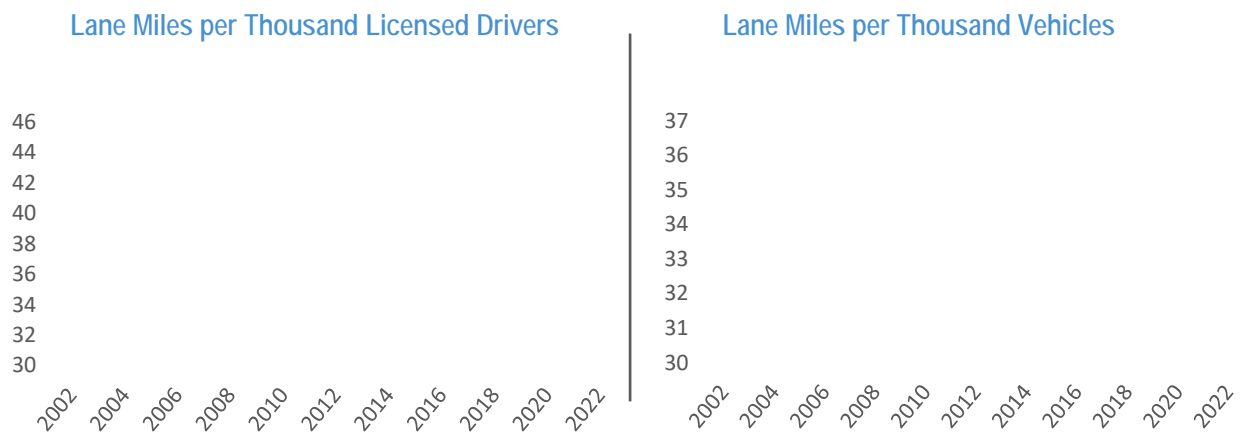




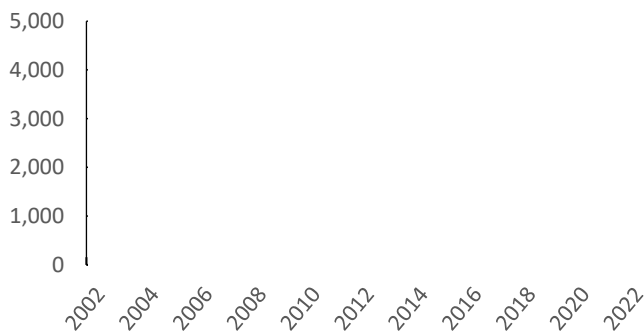
Table 28

Airport Infrastructure Funding

Year	Airport and Airway Trust Fund Tax Receipts <i>(Mil \$)</i>	Airport and Airway Trust Fund Balance <i>(Year End)</i>	Airport Construction Spending <i>(Mil \$)</i>	Cargo Tax <i>(%)</i>	Domestic Passenger Tax <i>(%)</i>	International Departure Ticket Tax <i>(\$ per Passenger)</i>
------	---------------------------------------------------------------	------------------------------------------------------------	--------------------------------------------------	-------------------------	--------------------------------------	-----------------------------------------------------------------

Sources: Federal Aviation Administration, U.S. Census Bureau, Internal Revenue Service

Airport Construction Spending
(Mil \$)



Air Traffic Tax Receipts
(Mil \$)

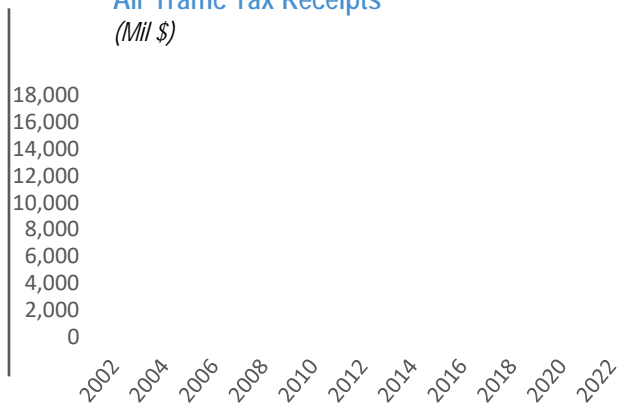




Table 29

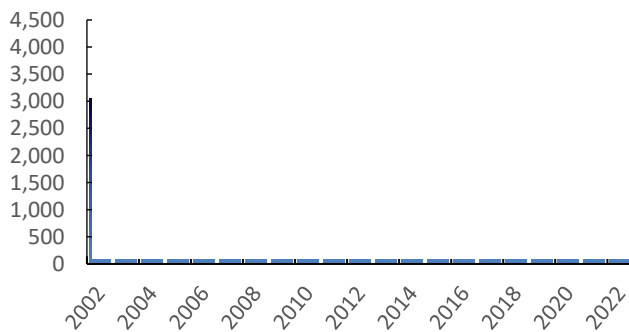
Airport Congestion Measures

Year	Air Travelers (000)	Air Travelers (% Change)	Total Landed Cargo (000 Tons)	Active Aircraft (000)	Hours Flown per Aircraft	Travelers per Aircraft	Aviation Incidents
------	------------------------	-----------------------------	-------------------------------------	-----------------------------	-----------------------------	---------------------------	-----------------------

*Estimate

Sources: Federal Aviation Administration, National Transportation Safety Board

Ratio of Total Travelers to Aircraft



Cargo Tons Per Aircraft
(Tons)

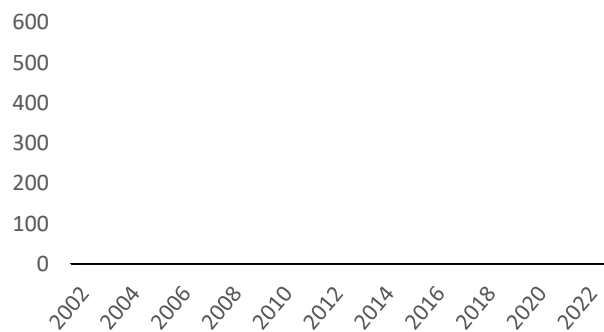


Table 30

Seaport Congestion Measures



Year	U.S. Waterborne Commerce (Million Short Tons)	U.S. Waterborne Commerce (% Change)	Water Transportation Gross Output (Mil \$)	Water Transportation Gross Output (% Change)	Ratio Water Transportation to GDP (%)
2022	2,120*	-0.6*	33,281*	28.6*	0.1*

*Estimate

Sources: U.S. Army Corps of Engineers, Maritime Administration, Bureau of Economic Analysis

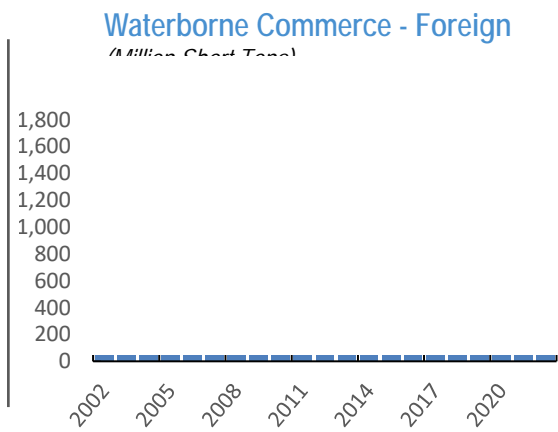
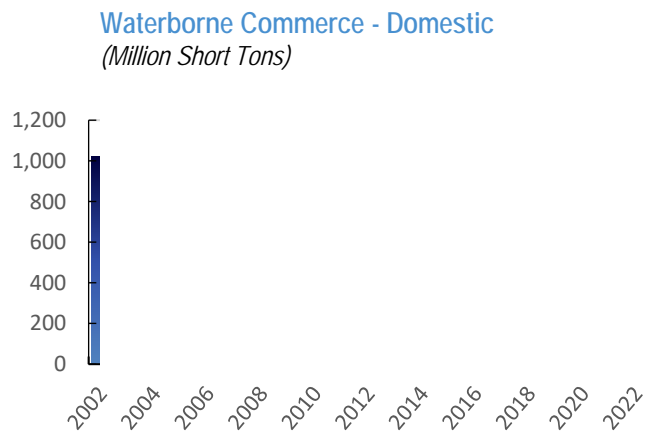




Table 31
Clinker Capacity*

(Thousands of Metric Tons)

Year	Number of Plants ¹	Number of Kilns	Average Kiln Capacity	Daily Clinker Capacity	Annual Clinker Capacity
2002	33	120	310	200	51,010

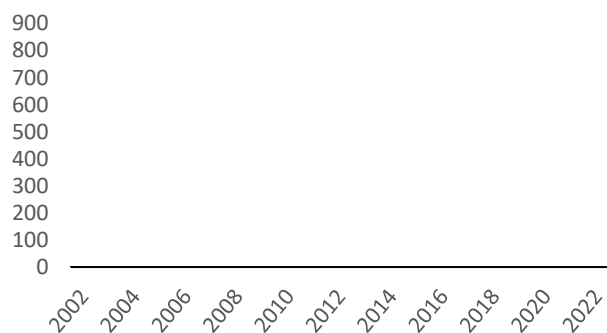
¹ Count reflects clinker-producing plants only

* Years when Plant Information Summary is not published are estimated by adding expansions and subtracting only announced permanent closures. 2022 Capacity will be updated in the upcoming Plant Information Summary.

**Reflects Capacity Adjustments through 12/31/2022

Source: PCA U.S. Portland Cement Industry: Plant Information Summary

Average Kiln Capacity
(Thousands of Metric Tons)



Clinker Capacity
(Thousands of Metric Tons)

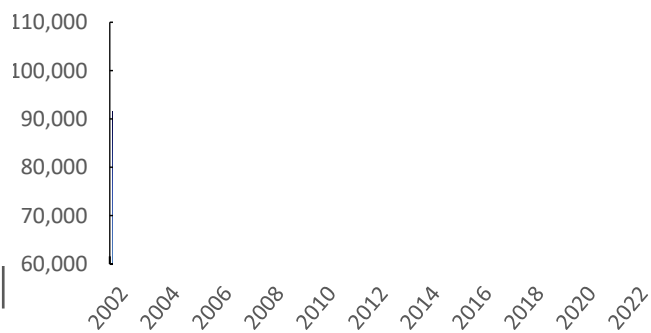




Table 32

Clinker Production, Capacity, and Capacity Utilization

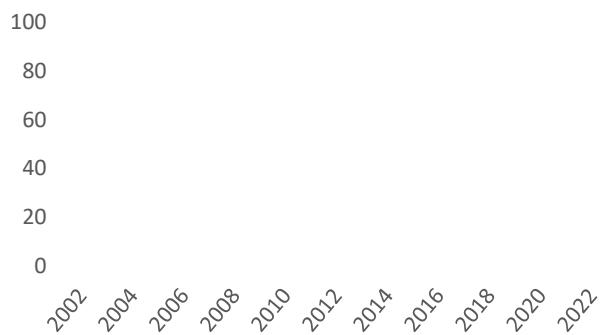
Year	Clinker Production (MMT)	Clinker Capacity* (MMT)	Utilization Rate (%)
2002	70.0	70.0	100
2003	70.0	70.0	100
2004	70.0	70.0	100
2005	70.0	70.0	100
2006	70.0	70.0	100
2007	70.0	70.0	100
2008	70.0	70.0	100
2009	70.0	70.0	100
2010	70.0	70.0	100
2011	70.0	70.0	100
2012	70.0	70.0	100
2013	70.0	70.0	100
2014	70.0	70.0	100
2015	70.0	70.0	100
2016	70.0	70.0	100
2017	70.0	70.0	100
2018	70.0	70.0	100
2019	70.0	70.0	100
2020	70.0	70.0	100
2021	70.0	70.0	100
2022	70.0	70.0	100

* Years where Plant information Summary is not published are estimated by adding expansions and subtracting only announced permanent closures.

Clinker is the primary intermediate product of cement making. Kilns produce clinker which is finely ground to make finished cement. Clinker comprises approximately 92% of cement's final weight.

Source: U.S. Geological Survey, PCA U.S. Portland Cement Industry: Plant Information Summary

Clinker Production
(Million Metric Tons)



Capacity Utilization Rate
(Percent)

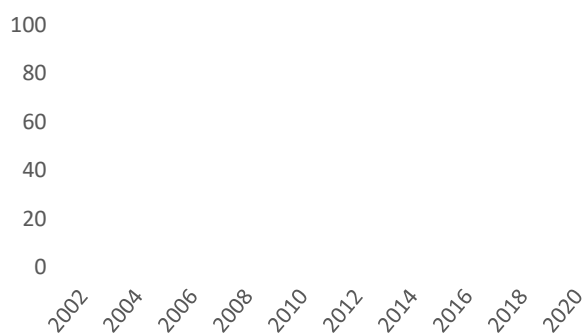


Table 33

Age Distribution of U.S. Clinker Capacity by Process, 2022*

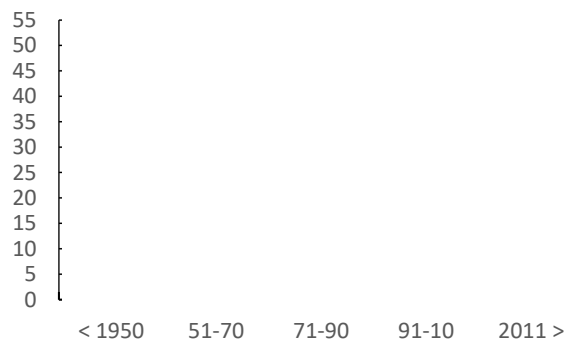


Age of Kilns	Wet Process	Dry Process	Total
--------------	-------------	-------------	-------

* Reflects Capacity Adjustments through 12/31/2022, with planned expansions and permanent closures estimated

Source: PCA U.S. Portland Cement Industry: Plant Information Summary

Age Distribution of U.S. Kilns - 2022
(Percent)



Average Kiln Age
(Percent of Kiln Age)

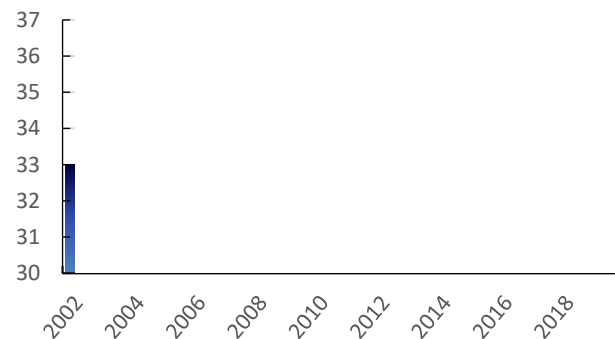


Table 34

Clinker Capacity by Census District*



(Thousands of Metric Tons)

Year	New England	Mid Atlantic	South Atlantic	East North Central	East South Central	West North Central	West South Central	Mountain Pacific	Total
------	-------------	--------------	----------------	--------------------	--------------------	--------------------	--------------------	------------------	-------

* Years without Plant Information Summary published are estimated

**Reflects Capacity Adjustments through 12/31/2022

Source: PCA U.S. Portland Cement Industry: Plant Information Summary

Clinker Capacity**

2022

New England
1%

Mid Atlantic
2%

tral

10%

10%

1

Table 35

U.S. Cement Company Clinker Capacity

(Gray and White Plants) (Thousands of Metric Tons - Estimated as of 12/31/2022)

Rank	Company	Clinker Capacity*	Percent of Industry
-------------	----------------	--------------------------	----------------------------

**Reflects Capacity Adjustments through 12/31/2022*

Source: PCA U.S. Portland Cement Industry: Plant Information Summary



Table 36

Foreign Affiliated U.S. Clinker Capacity

(Gray and White Plants)

Clinker Capacity
(000 Metric Tons)

12/31/2022*

Company

Affiliation as of December 31st, 2022

Country

**Reflects Capacity Adjustments through 12/31/2022*

Source: PCA Market Intelligence

Table 37

Capacity Expansion Estimates



(Clinker, Thousand of Metric Tons)

Year On

Stream	Company	Location	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
--------	---------	----------	------	------	------	------	------	------	------	------	------	-------

Table 38

15 Largest States Ranked by Cement Grinding Capacity



(Thousands of Metric Tons - as of 12/31/2022)

State	1999			2010			2022		
	Grinding Rank	Capacity	U.S. Total	Grinding Rank	Capacity	U.S. Total	Grinding Rank	Capacity	U.S. Total

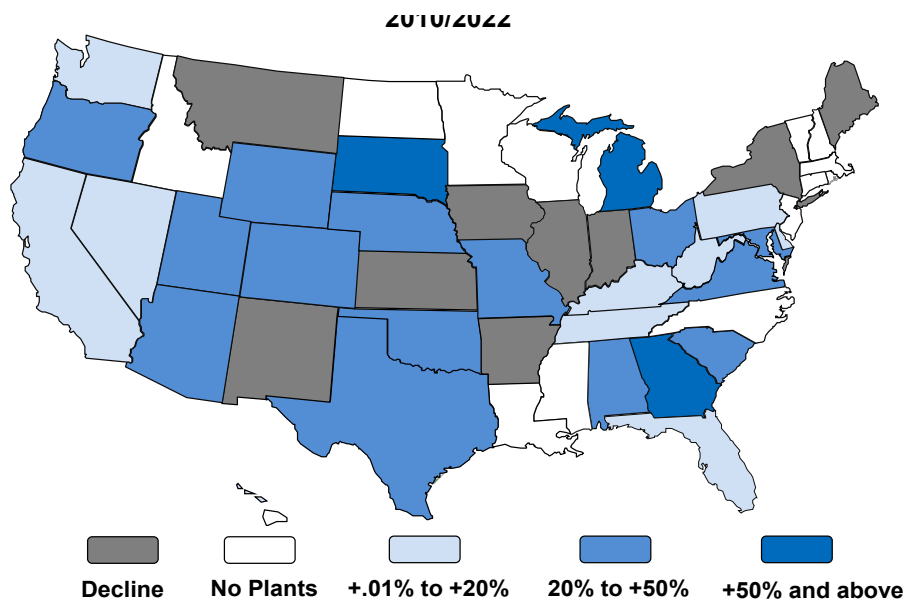


Table 39
Cement Imports



(Thousands of Metric Tons)

Year	Clinker	Finished Cement	Total	U.S. Cement Consumption ¹	Percent Share of Consumption		
					Clinker	Finished Cement	Total
2022	1,242	20,319	20,301	110,097	1.1	22.9	24.0

¹Portland and Masonry excludes AK, Foreign, and Puerto Rico

Sources: U.S. Census Bureau: Economic Indicators Division, U.S. Geological Survey

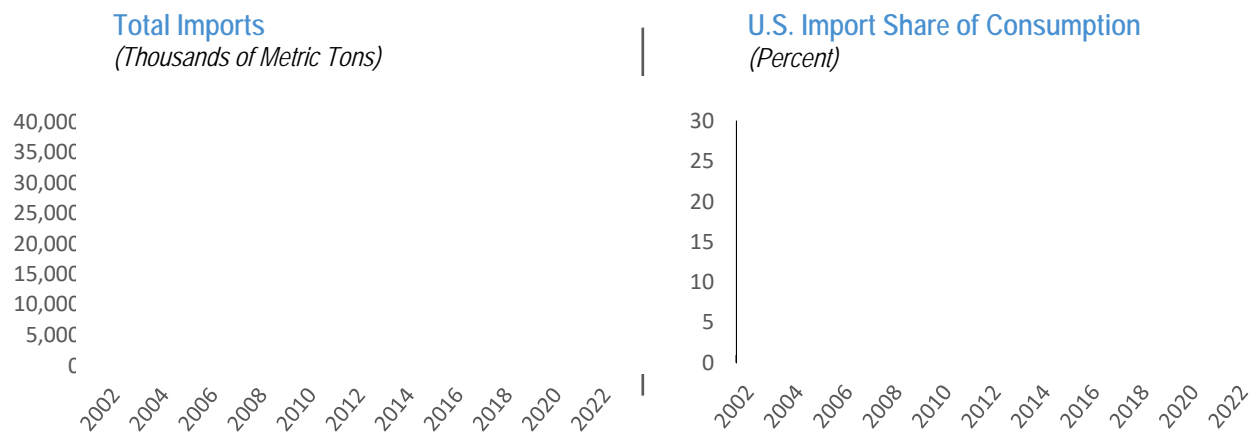


Table 40



U.S. Cement and Clinker Imports by Port - Top Customs Districts

(Thousands of Metric Tons)

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Table 42

Cement & Clinker Imports By Census District



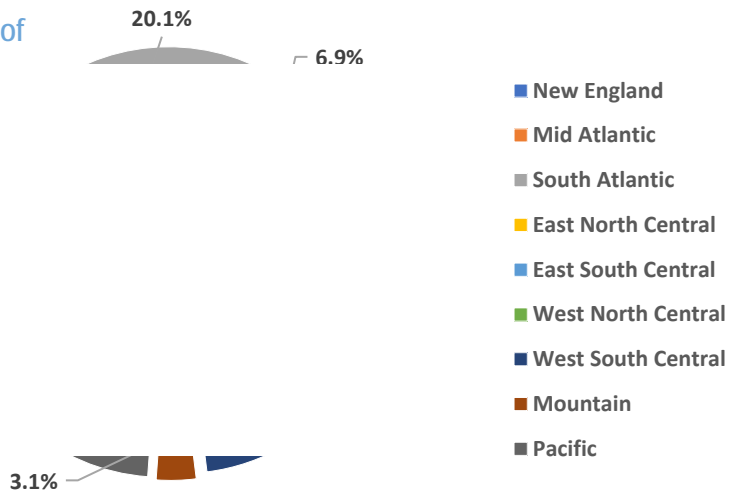
(Thousands of Metric Tons)

Year	New England	Mid Atlantic	South Atlantic	East North Central	East South Central	West North Central	West South Central	Mountain	Pacific	Total
------	-------------	--------------	----------------	--------------------	--------------------	--------------------	--------------------	----------	---------	-------

¹ Includes Puerto Rico and U.S. Virgin Islands

Source: PCA U.S. Portland Cement Industry: Plant Information Summary

Portland Cement Consumption Share of Total U.S. 2022



- New England
- Mid Atlantic
- South Atlantic
- East North Central
- East South Central
- West North Central
- West South Central
- Mountain
- Pacific

Table 43



Cement* Inventories at Year-end

(Thousands of Metric Tons)

Year	Stocks at Mills & Terminals	Year-Year % Change	U.S. Consumption	Year-Year % Change	Days Supply
------	-----------------------------	--------------------	------------------	--------------------	-------------

* Portland & Masonry (excludes Puerto Rico)
 Source: U.S. Geological Survey

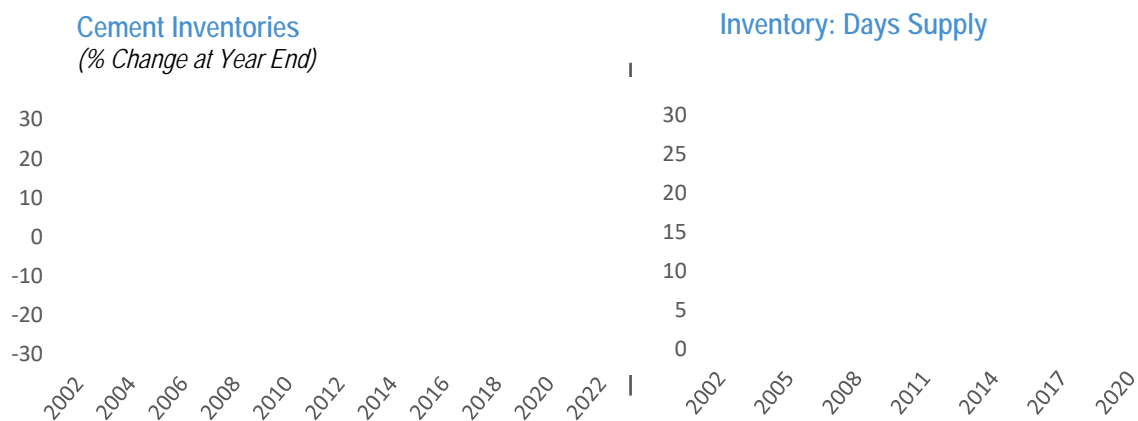


Table 44

Supplementary Cementitious Materials (SCM)



Year	Fly Ash (000 MT)	Slag Cement (000 MT)	Electric Arc Furnaces (% of Steel Production)	Basic Oxygen Furnaces (% of Steel Production)	Coal As % of U.S. Electrical Generation
------	---------------------	-------------------------	--------------------------------------------------	--------------------------------------------------	--------------------------------------------

*Estimate

Sources: American Coal Ash Association, Slag Cement Association, U.S. Energy Information Administration. U.S. Geological Survey

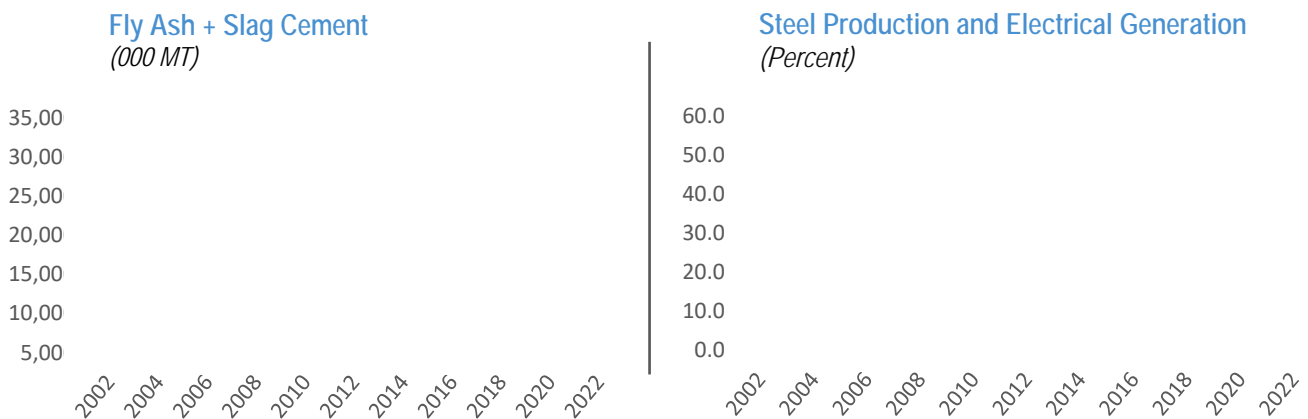




Table 45

Portland Cement Shipments by Type of Customers

(Thousands of Metric Tons)

- Ready-Mix
- Streets & Highways Contractors
- Brick & Block/ Manufactured Stone
- Precast
- SC/FDR/RCC Paving
- Packaged Product Producers
- Oil & Gas Well Drilling
- Prestressed Concrete*
- Concrete Pipe
- Building Materials Dealers
- Interlocking Pavers
- Fiber Cement Siding Manufacturers
- Waste S/S**
- SC/RCC Water Resources
- Concrete Roof Tile Manufacturers
- All Other

Total Shipments

Source: PCA Survey of Consumption by User Group

Consumption by User Groups

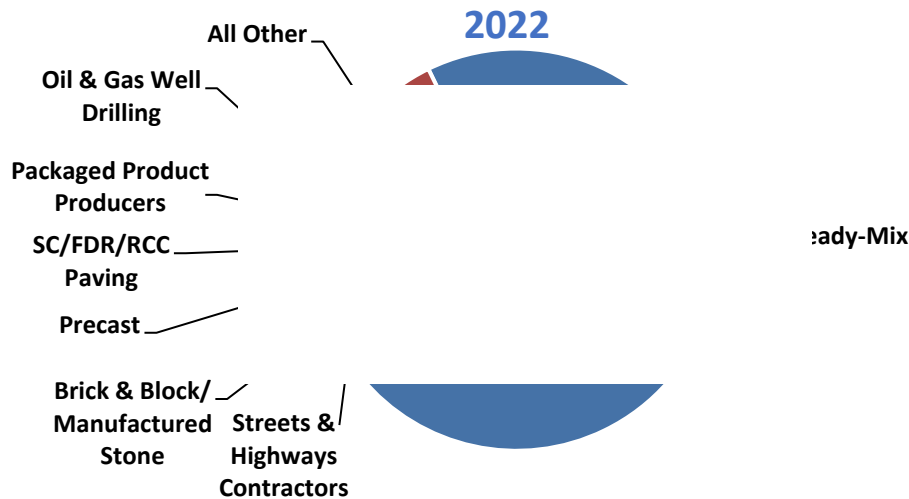




Table 46

Portland Cement Shipped from U.S. Plants by Type of Product

(Thousands of Metric Tons)

	2019		2020		2021	
	Quantity	% of Total	Quantity	% of Total	Quantity	% of Total
General Use and Moderate Heat (Types I and II)						
High-Early Strength (Type III)						
Sulfate-Resisting (Type V)						
Block						
Oil Well						
White						
Blended						
Portland Slag and Pozzolan						
Portland Fly Ash and Other						
Miscellaneous						
Total Shipments						

Source: U.S. Geological Survey

Table 47

Shipments of Portland Cement from Mills by Type of Carrier

Shipments to Ultimate

- Rail
- Truck
- Barge & Boat
- Unspecified

Shipments from Plant

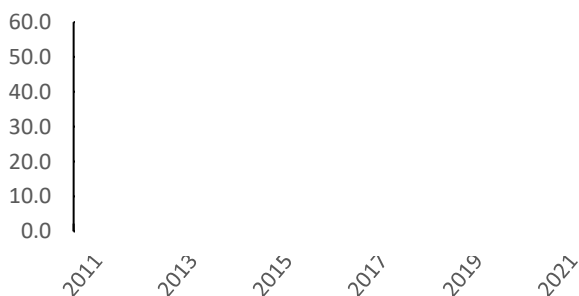
- Rail
- Truck
- Barge & Boat
- Unspecified

Percent of Total Shipments

- Terminal to customer
- Plant to customer

Source: U.S. Geological Survey

Fly Ash + Slag Cement



Steel Production and Electrical Generation

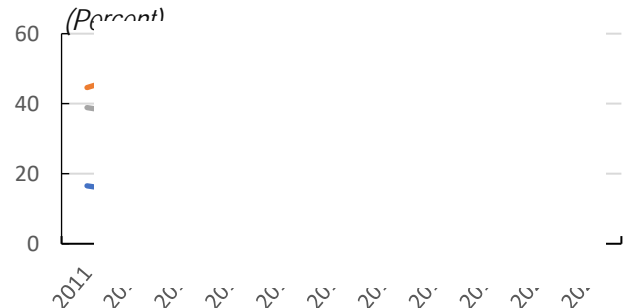




Table 48

Summary of Energy Consumption

(Thousands of BTUs per Equivalent Metric Ton*)

% Change

Gasoline

Middle Distillates**

Diesel

Fuel Oil

Residual oil

LPG

Total Petroleum Products

Natural gas

Coal

Petroleum Coke

Total Coal and Coke

Alternative Fuel

Total Fuel

Electricity

Total Fuel and Power

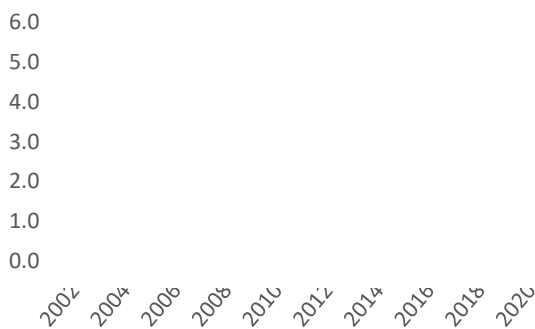
* Equivalent Metric Ton = weighted average of 92% clinker production plus 8% finished cement production

**Collection of Diesel and Fuel Oil individually commenced in 2011

Source: PCA U.S. Labor-Energy Input Survey

Energy Resources

(Million BTU per 000 Tons Produced)



U.S. Plants - Energy Consumption

(Coal and Coke)

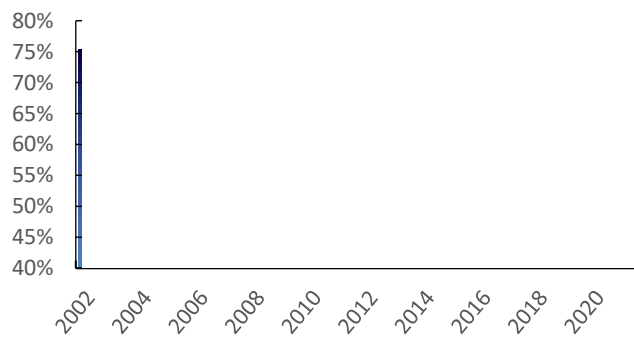


Table 49

Alternative Fuels Utilized



United States

2

Total Reporting Plants

Plants using Alternative Fuel

Percent

Types of Alternative Fuels Us

Tire Derived Fuel

Waste Oil

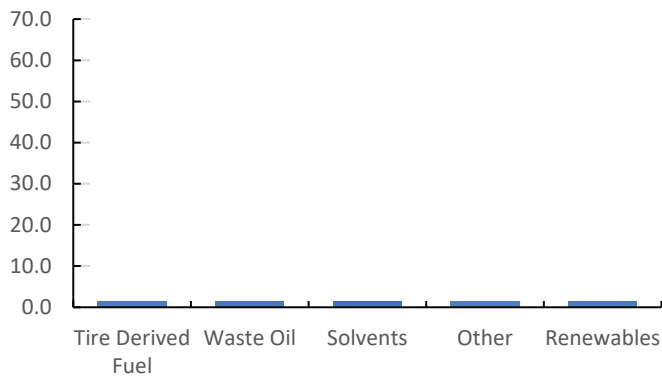
Solvents

Other

Renewables

Source: PCA U.S. Labor-Energy Input Survey

Count of Alternative Fuels - 2021
(Number of Alternative Fuels Used)



Percent of Plants Using Alternative Fuel
(Percent of Reporting Plants)



Table 50

Plant Fuel Mix



(% Distribution of BTUs Consumed)

- Coal and Coke
- Natural Gas
- Petroleum Products
- Electricity
- Alternative Fuels

Total Fuel

Source: PCA U.S. Labor-Energy

Table 51

Energy Consumption by Process

(Thousands of BTUs per Equivalent Metric Ton*)

% Change

Fuel & Electricity

- All Plants
- Wet-Process Plants
- Dry-Process Plants

Fuel

- All Plants
- Wet-Process Plants
- Dry-Process Plants

Electricity (kWh per l

- All Plants
- Wet-Process Plants
- Dry-Process Plants

*Equivalent Metric Ton = 1

Source: PCA U.S. Labor-Energy

Table 52

Resources Used in Producing Cement¹



(Per Thousand Metric Tons of Cement Production)

Year	Energy* (Million BTUs per Ton)	Labor** (Tons per Hour)
------	-----------------------------------	----------------------------

¹Portland and Masonry

* Equivalent Energy Ton = weighted average of 92% clinker production plus 8% finished cement production

**Equivalent Labor Ton = weighted average of 85% clinker production plus 15% finished cement production

Source: PCA U.S. Labor-Energy Input Survey, U.S. Geological Survey

Labor
(Tons Per Hour)



Labor Resources
(Employee - Hours per 000 Tons Produced)

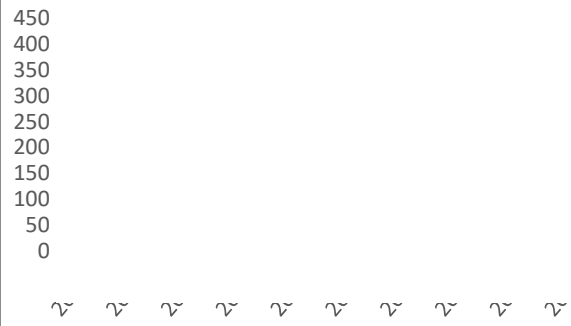


Table 53

U.S. Cement Industry Employment



(Thousands)				
Year	All Employees	Production Workers	Cement Tons¹ Per Employee	Cement Tons¹ Per Production Worker

¹ Portland + Masonry

* Estimate

Source: Annual Survey of Manufacturers, U.S. Census (NAICS 327310)

Table 54

U.S. Cement Industry Financial Statistics

(Median Results Cement Operations)	Industry Total
Gross Margin (%)	
Operating Profit (%)	
Operating Profit (\$/ton)	
Annual Capital Expenditures (% of sales)	

Source: PCA Financial Benchmarking Survey

Table 55

Cement Industry Operating Statistics



Value of Shipments (\$Billion)

Employment (000)

Payroll (\$ Million)

Energy (\$ Million)

Purchased Fuel & Power

Fuel

Power

NonEnergy Material

Investment (\$ Million)

New Capital Expenditures

Buildings

Equipment

Key Ratios - Percent of Shipments

Payroll

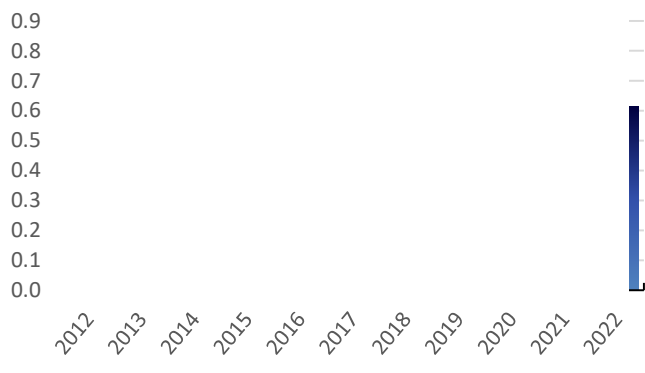
Purchased Fuel and Power

NonEnergy Materials

**Estimate*

Source: Annual Survey of Manufacturers, U.S. Census (NAICS 327310)

U.S. Cement Industry - Capital Expenditures (Billion \$)



Value of Industry Shipments (Billion \$)

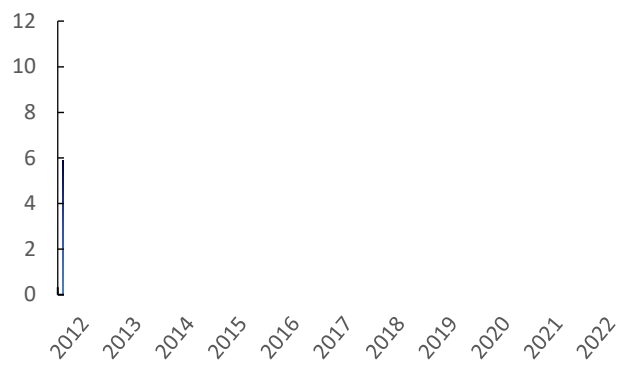




Table 56

Top World Producers of Hydraulic Cement

(Millions of Metric Tons)

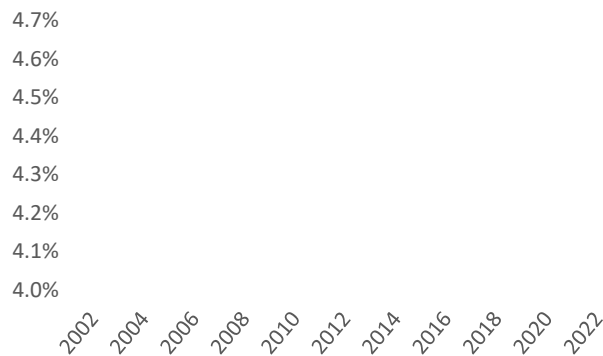
China
 India
 United States
 Turkey
 Iran
 Brazil
 Russia
 Pakistan
 Japan
 Egypt

World Total

* Estimated

Sources: U.S. Census Bureau, F

U.S. Share of World Population



Total World Production of Hydraulic Cement (Million Metric Tons)

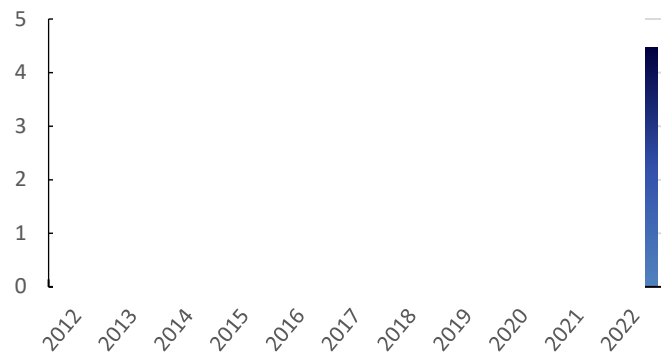


Table 57

Population Growth Rates for Top World Producers of Hydraulic Cement



(Year-Year % Change)

China
 India
 United States
 Turkey
 Vietnam
 Iran
 Indonesia
 Egypt
 Japan
 Russia
 South Korea
 Brazil
 Saudi Arabia
 Pakistan

Total World

**Includes Puerto Rico.*

Source: U.S. Census Bureau: International Data Base

Share of G7 Countries to Total World Cement Consumption - 2022

(Percent)

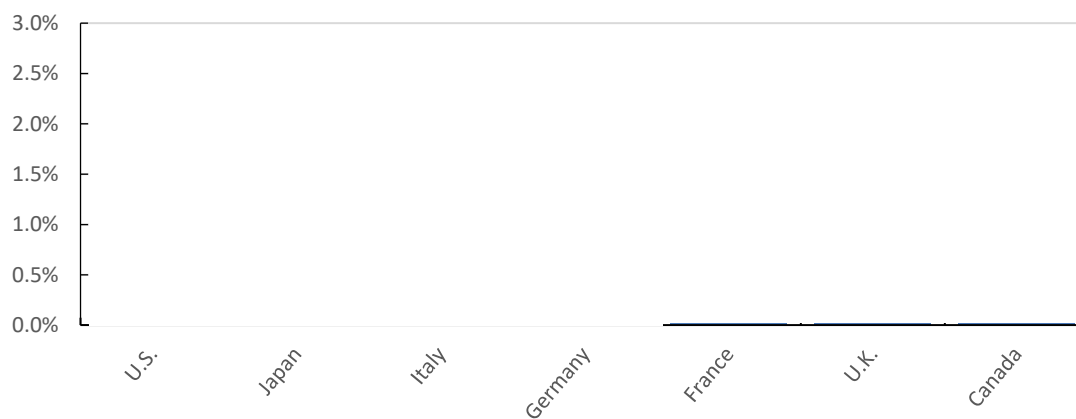


Table 58

Cement Consumption



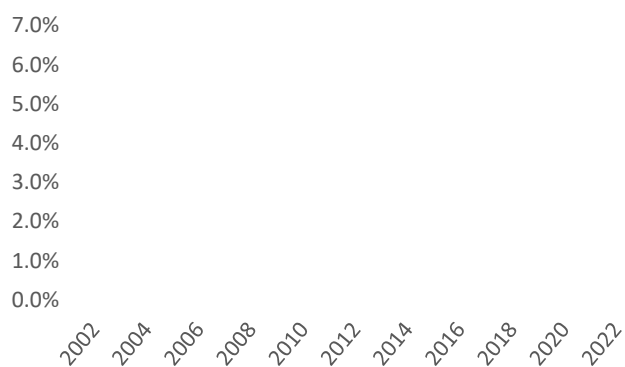
(Million Metric Tons)

G7 Countries

Year	U.S.	Japan	Italy	Germany	France	U.K.	Canada	Total G7 Consumption	World Consumption	G7 Share of World Consumption
------	------	-------	-------	---------	--------	------	--------	-------------------------	----------------------	-------------------------------------

Source: U.S. Census Bureau, International Cement Review, United States Geological Survey

U.S. Share of Cement Consumption



Cement Consumption Per Capita

