



America's Cement Manufacturers™

SURVEY OF PORTLAND CEMENT CONSUMPTION BY USER GROUP

FIRST QUARTER 2016

Market Intelligence Group

Ed Sullivan
Group Vice President & Chief Economist
847.972.9006

Brian Schmidt
Market Intelligence Analyst
847.972.9042

Table of Contents

- Survey Overview** 4
- Survey Response Rate** 5
- Portland Cement Consumption**..... 6
 - Data..... 7
 - Analysis 8-9
 - Forecast 10
- User Groups** 12
 - Ready-Mixed Concrete 14-15
 - Precast Concrete16-17
 - Concrete Brick & Block Manufacturers18-19
 - Streets & Highways Contractors20-21
 - Packaged Product Producers22-23
 - Prestressed Concrete 24-25
 - SC/RCC/FDR Paving26-27
 - Building Materials Dealers28-29
 - Oil & Gas Well Drilling 30-31
 - Concrete Pipe 32-33
 - Fiber Cement Siding Manufacturers34-35
 - Concrete Roof Tile..... 36-37
 - Interlocking Pavers 38-39
 - Waste Stabilization & Solidification 40-41
 - SC/RCC for Water Resources 42-43
 - All Other Manufacturers and Contractors 44

Survey Overview

The Portland Cement Association's (PCA's) Market Intelligence Group conducts a quarterly survey of portland cement consumption by user segment. The intent of this report is to help member companies, PCA staff, and promotional allies better evaluate market conditions surrounding the use of concrete and other cement based products.

Data for eighteen user segments is collected:

- **Building Materials Dealers**
- **Concrete Brick & Block Manufacturers**
- **Fiber-Cement Siding**
- **Concrete Pipe**
- **Concrete Roof Tile**
- **Interlocking Pavers**
- **Oil & Gas Well Drilling**
- **Packaged Product Producers**
- **Precast Concrete**
- **Prestressed Concrete**
- **Ready-Mixed Concrete**
- **Full- Depth Reclamation (FDR) Paving**
- **Soil-Cement (SC) Paving**
- **Roller Compacted Concrete (RCC) Paving**
- **Soil-Cement/ Roller Compacted Concrete (SC/RCC)-Water Resources**
- **Streets & Highways Contractors**
- **Waste Solidification & Stabilization (S/S)**
- **All Other Manufacturers and Contractors**

Survey forms are sent to all PCA member cement companies in the United States. Totals exclude masonry and white cement. Cement tonnage is reported in metric tons.

Survey results are adjusted to correspond to U.S.G.S. (U.S.) cement consumption volumes as reported by cement companies in their respective monthly surveys to those agencies. Although this survey excludes white cement, white cement consumption cannot be excluded from the U.S.G.S. survey and may account for up to 1.5% of quarterly volume.

NOTE: *Survey of Portland Cement by User Group* has historically covered data for the both the U.S. and Canada. Beginning in Q3 2013, total consumption and figures for individual segments reflect U.S. volumes only.

The Portland Cement Association (PCA) and its members make no express or implied warranty with respect to this publication or any information contained herein. In particular, no warranty is made of merchantability or fitness for a particular purpose. PCA and its members disclaim any product liability (including without limitation any strict liability in tort) in connection with this publication or any information contained herein. This report may not be electronically redistributed or produced in whole or in part without authorization of the Portland Cement Association.

© 2016 Portland Cement Association. All rights reserved.

Survey Response Rate

The following companies/plants reported for the First Quarter of 2016:

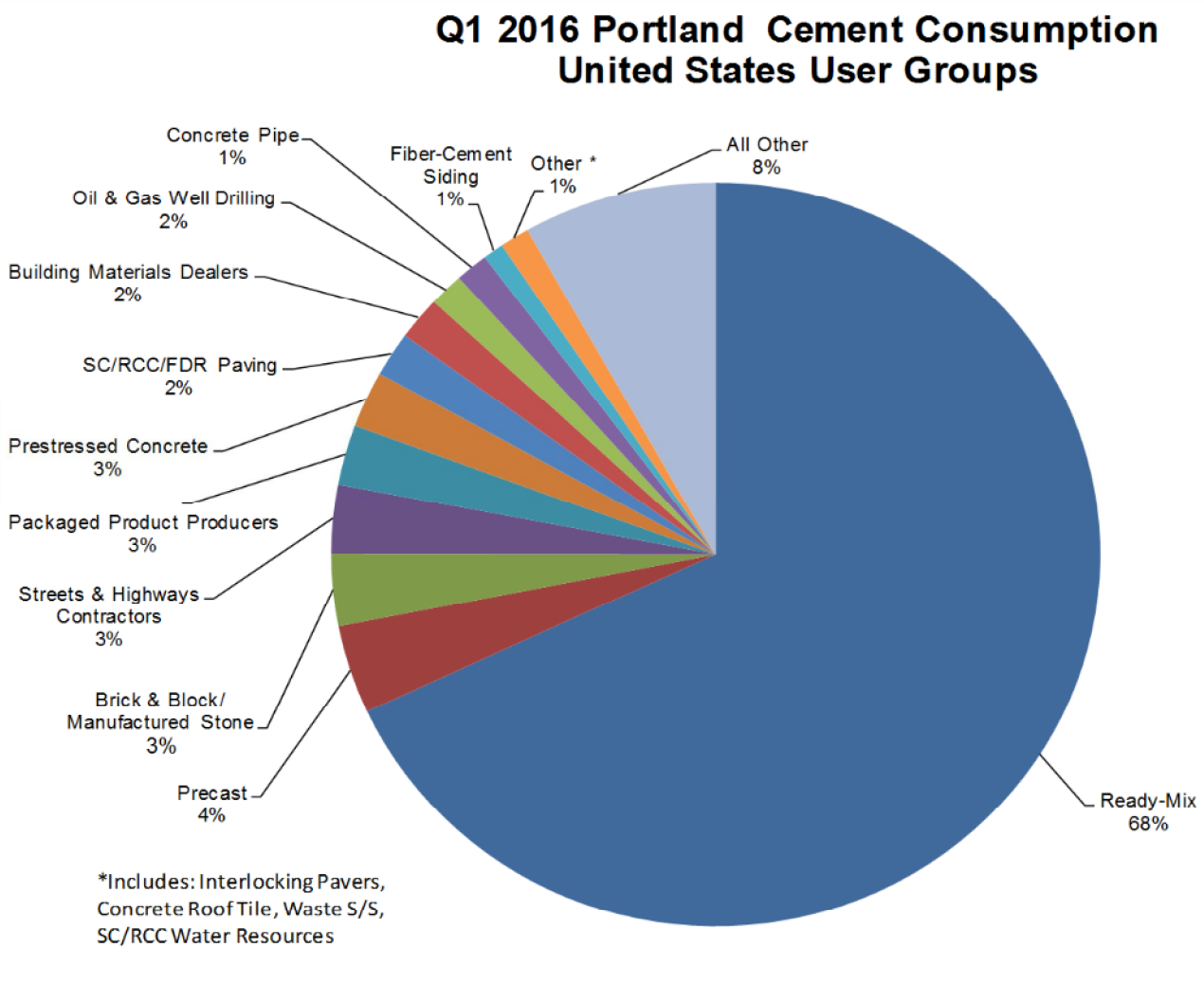
*American Cement Company
Argos USA Corporation
Ash Grove Cement Company
Buzzi Unicem USA
CalPortland
CEMEX
Continental Cement
Drake Cement LLC
Essroc Cement Corp.
GCC of America Inc.
LafargeHolcim
Lehigh Cement Company
Martin Marietta Materials, Inc.
Mitsubishi Cement Corporation
The Monarch Cement Company
National Cement Company of Alabama
National Cement Company of California
Phoenix Cement Company
St. Mary's Cement Inc. (U.S.)/VCNA
Suwannee American Cement/ VCNA
Texas Lehigh Cement Co, LP
Titan America LLC*

Industry Response Rate: 88%

Portland Cement Consumption

First Quarter 2016

Cement consumption in the first quarter of 2016 was 18,531,759 metric tons (mt), up 15.3% from the first quarter of 2015. In first quarter 2016, Ready-Mixed Concrete captured 68.1% of total consumption, followed by All Other (8.1%), Precast (3.8%), Brick & Block/Manufactured Stone (3.1%), and the Streets & Highways Contractors (3.0%) segment.

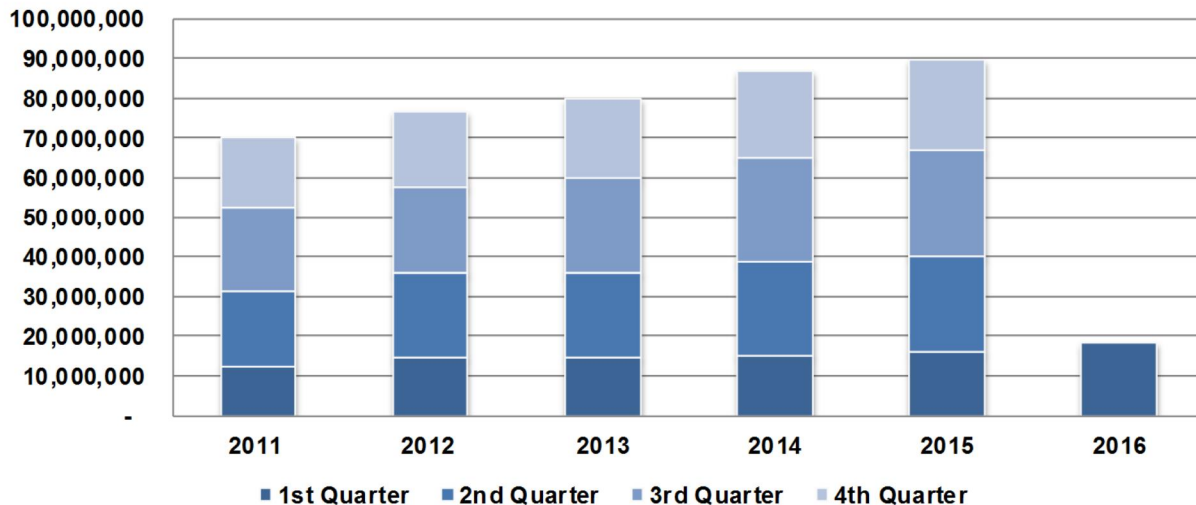


NOTE: Portland cement consumed by the ready-mixed market and used in street and highway construction may be reported under Ready-Mixed Concrete and not under Streets & Highways Contractors.

Portland Cement Consumption, First Quarter 2016: Data

U.S. Shipments (Metric Tons)	1st Quarter		
	2016	2015	Change
Ready-Mix	12,615,576	10,899,424	15.7%
Precast	707,288	546,707	29.4%
Brick & Block/ Manufactured Stone	581,557	550,980	5.5%
Streets & Highways Contractors	554,780	338,189	64.0%
Packaged Product Producers	480,715	426,742	12.6%
Prestressed Concrete	454,706	249,099	82.5%
SC/RCC/FDR Paving	360,974	284,675	26.8%
Building Materials Dealers	348,747	389,222	-10.4%
Oil & Gas Well Drilling	270,164	732,819	-63.1%
Concrete Pipe	256,137	227,812	12.4%
Fiber Cement Siding Manufacturers	161,678	89,454	80.7%
Concrete Roof Tile Manufacturers	100,708	132,517	-24.0%
Interlocking Pavers	71,450	62,464	14.4%
Waste S/S	51,918	59,534	-12.8%
SC/RCC Water Resources	5,702	6,800	-16.1%
All Other	1,509,661	1,074,840	40.5%
Total	18,531,759	16,071,278	15.3%

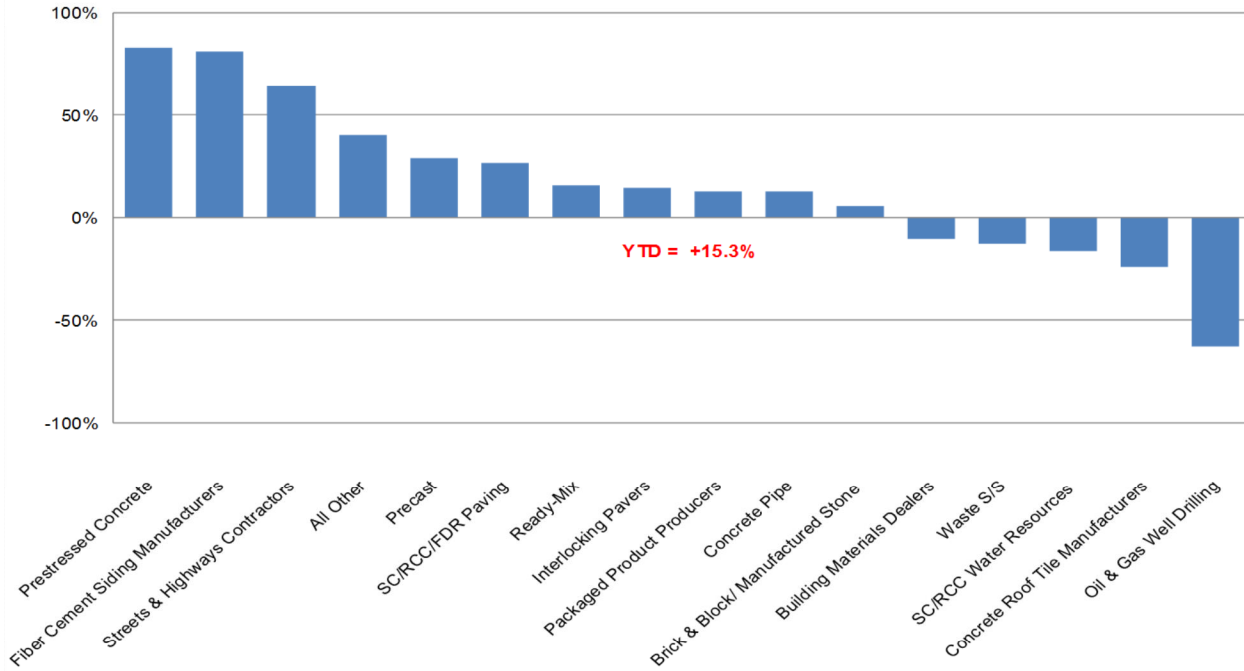
Portland Cement Consumption
(Metric Tons)



Portland Cement Consumption, First Quarter 2016: Analysis

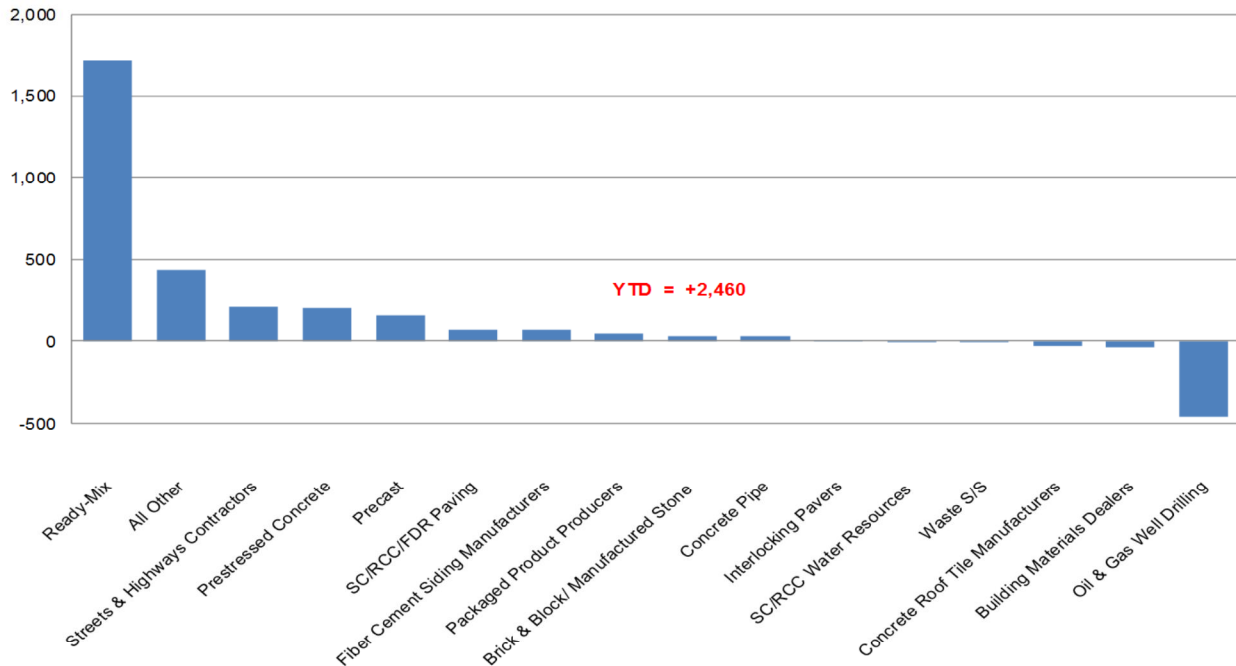
Market Dynamics: Leaders & Laggards

YTD Change (%)
2016/2015



Market Dynamics: Leaders & Laggards

YTD Volume Change (000 mt)
2016/2015



Portland Cement Consumption, First Quarter 2016: Analysis & Outlook

U.S. portland cement consumption grew 15.3% in the first quarter of 2016 against the same period in 2015. The double-digit growth recorded in the first quarter is reflective of a very mild winter in most of the United States. Year-to-date growth rates will continue to ease as the year progresses. While the economic fundamentals are sound in each of the three construction sectors, cement consumption remains constrained by a dramatic reduction in oil & gas well drilling volumes and its incidental effects.

PCA believes the economic foundation that could support healthy growth is in place. The labor market, for example, is solid with unemployment below 5%. Wages are beginning to increase. By historical standards, interest rates and household debt-to-income ratios are extremely low, while household wealth and home prices continue to accelerate. Beyond these fundamentals, however, are potential economic and political perils that may drag on growth. Oil prices remain weak and, based on the latest EIA projections, are expected to recover slowly. While global headwinds have lessened to some degree, they still result in weakened export opportunities, especially in the context of a strong dollar. Finally, the policy uncertainty surrounding the election of Donald Trump clouds the near-to-medium term economic picture. While uncertainly associated with presidential elections tends to steal some economic steam, this election represents a higher magnitude of risk.

In turn, each segment's forecast risk for 2017 is heightened. While it is unlikely that drastic policies will materialize in calendar year 2017, uncertainty will, to various degrees in each sector, exert an adverse impact on construction activity. Even lacking a specific policy initiative targeting Obamacare reform, for example, some plans to build new outpatient facilities may be put on hold until clarity in policy. This alone will affect user groups highly concentrated in commercial construction to a myriad of degrees.

Uncertainty regarding Trump's economic policies has also led to speculation that aggressive, perhaps debt based, stimulatory fiscal policies may add pressure on already tight labor markets, resulting in inflation. Higher inflation expectations soon get reflected in long-term interest rates – such as mortgage rates. Higher mortgage rates, in the context of rising home prices, suggests an acceleration in average new home monthly payments. This has already materialized. Mortgage rates have increased 50 basis points since Trump's election. Pressure on mortgage rates is expected to continue through 2017. Higher mortgage rates has prompted PCA to lower its single family starts projection for 2017.

Public construction contains perhaps the largest swing of potential outcomes due to the new administration. While Trump's infrastructure plan remains unclear, the funding level he has suggested on the campaign trail is massive. PCA's latest forecast details spending levels and timing assumptions regarding the infrastructure plan. However, federal funding would not be allocated until 2018 at the earliest and since this report provides only near-term guidance, it is largely outside the scope of analysis for each segment. The importance of state and local spending levels—influenced largely by home prices and job creation—and the five-year transportation bill (FAST) will remain the main determinants of user groups concentrated in the public sector in the near-term.

Finally, with the dramatic decline in oil prices, drilling activity and oil well cement consumption have collapsed. Not only does the oil & gas well drilling segment act as a drag on cement consumption, for every one ton of oil well cement lost, roughly 3 tons of collateral cement consumption in terms of roadway, multifamily, retail and other uses of cement. Fortunately, the ratio of the adverse impact on collateral cement consumption is expected to ease even with future oil price declines. Using EIA's projections, PCA expects oil well cement to decline another 53% in 2016 followed by a modest rebound in 2017.

Portland Cement Consumption: Forecast

Cement Consumption (000 mt)	Actual	% Change Y/Y	PCA Projection		% Change Y/Y	% Change Y/Y
	2015	2015	2016	2017	2016	2017
United States	89,737	3.7%	92,135	94,879	2.7%	3.0%
Ready-Mix	63,814	6.8%	66,047	67,994	3.5%	2.9%
Streets & Highways Contractors	3,348	-22.4%	3,444	3,532	2.9%	2.6%
Oil & Gas Well Drilling	2,289	-30.0%	1,074	1,283	-53.1%	19.5%
Brick & Block/ Manufactured Stone	2,792	-4.3%	3,014	3,126	8.0%	3.7%
Precast	2,601	-2.5%	2,819	2,903	8.4%	3.0%
SC/RCC/FDR Paving	2,165	28.2%	2,231	2,282	3.0%	2.3%
Packaged Product Producers	1,929	-10.3%	2,057	2,128	6.7%	3.5%
Building Materials Dealers	1,829	-0.9%	1,929	2,009	5.5%	4.1%
Concrete Pipe	1,142	1.0%	1,182	1,215	3.5%	2.8%
Prestressed Concrete	1,478	27.9%	1,584	1,618	7.1%	2.1%
Concrete Roof Tile Manufacturers	360	-5.5%	380	393	5.5%	3.4%
Interlocking Pavers	304	-6.5%	322	331	5.9%	2.8%
Fiber Cement Siding Manufacturers	590	66.0%	639	655	8.3%	2.5%
Waste S/S	386	200.8%	401	403	3.9%	0.5%
SC/RCC Water Resources	58	22.4%	59	60	2.4%	1.7%
All Other	4,652	-2.0%	4,953	4,947	6.5%	-0.1%
Total	89,737	3.7%	92,135	94,879	2.7%	3.0%

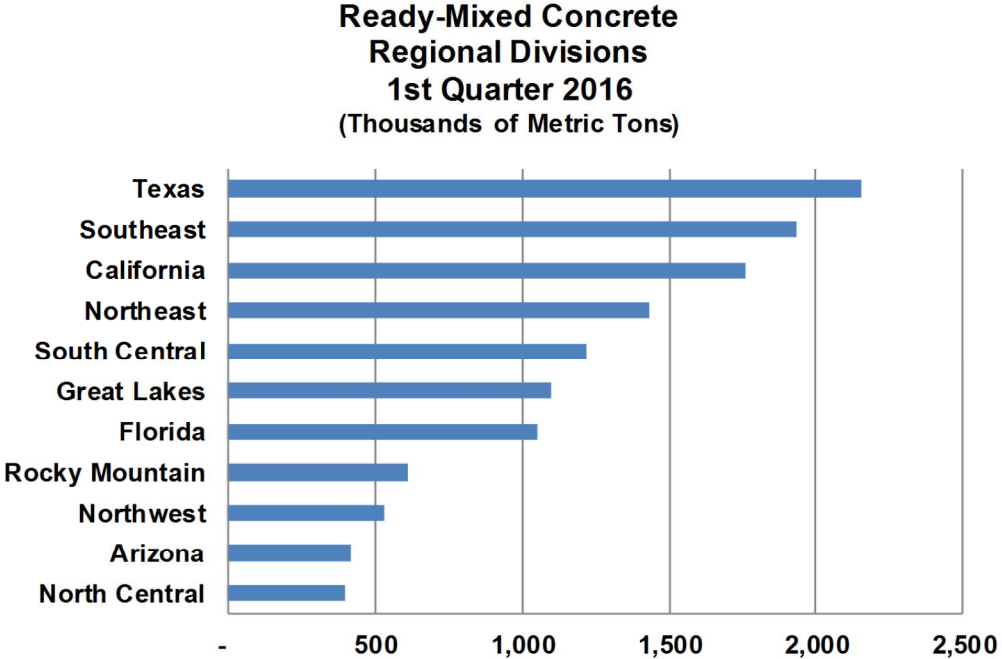
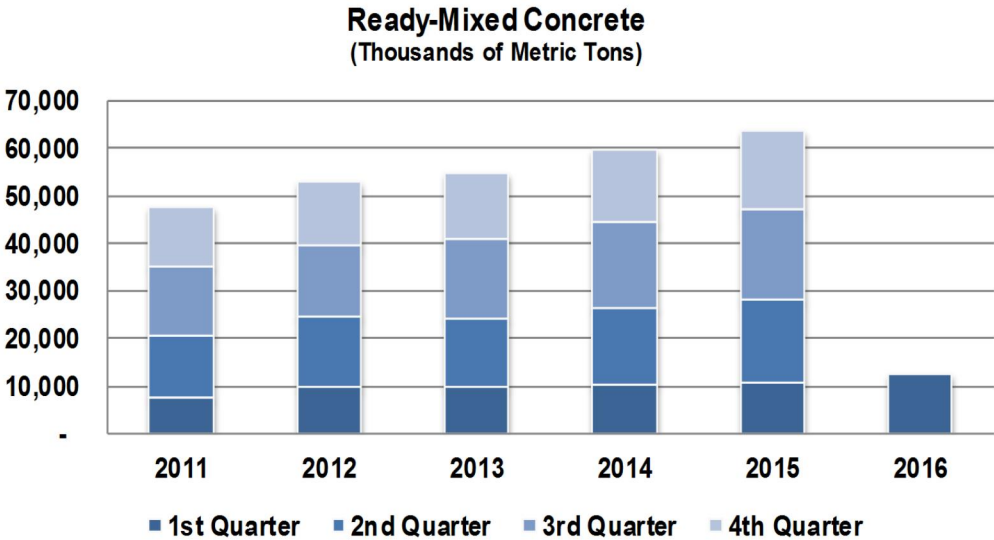
User group forecasts are developed using estimated distributions of segment cement volumes, allocated to primary construction sectors, and linked to PCA's most recent U.S. forecast.

Market	Residential	Nonresidential	Public
Ready-Mixed Concrete	32%	15%	53%
Streets & Highways Contractors	0%	0%	100%
Brick & Block/ Manufactured Stone	43%	47%	10%
Precast Concrete	7%	50%	43%
Oil & Gas Well Drilling	0%	100%	0%
SC/RCC/FDR Paving	3%	12%	85%
Building Materials Dealers	75%	15%	10%
Packaged Product Producers	75%	15%	10%
Concrete Pipe	35%	10%	55%
Prestressed Concrete	7%	50%	43%
Interlocking Pavers	79%	13%	8%
Fiber Cement Siding	85%	15%	0%
Waste S/S	0%	30%	70%
Concrete Roof Tile	80%	10%	10%
SC/RCC Water Resources	0%	10%	90%

USER GROUPS

Ready-Mixed Concrete: Data

Ready-mixed concrete accounted for 68.1% of total U.S. cement consumption in the first quarter of 2016. (12,615,576). This reflects a 15.7% increase from first quarter 2015. The largest regional cement consumer for the ready-mixed segment was Texas with 2,150,477 mt, followed by the Southeast with 1,931,646 mt.



Ready-Mixed Concrete: Analysis

Ready-mixed refers to concrete that is batched for delivery from a central plant instead of mixed on the job site. Ready-mixed concrete is shipped to every market segment in North America. As a result, the market drivers for ready mix users generally mirror total cement demand. The principal exception is large highway construction projects which tend to rely on Street & Highway contractors.

Ready-Mixed Concrete (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	9,941	9,757	10,333	10,899	12,616		
% Change Y/Y	29.2%	-1.9%	5.9%	5.5%	15.7%		
% Change YTD	29.2%	-1.9%	5.9%	5.5%	15.7%		
2nd Quarter	14,582	14,437	16,187	17,156			
% Change Y/Y	13.1%	-1.0%	12.1%	6.0%			
% Change YTD	19.1%	-1.3%	9.6%	5.8%			
3rd Quarter	15,108	16,647	18,134	19,471			
% Change Y/Y	4.2%	10.2%	8.9%	7.4%			
% Change YTD	12.9%	3.0%	9.3%	6.4%			
4th Quarter	13,413	14,106	15,120	16,288			
% Change Y/Y	6.6%	5.2%	7.2%	7.7%			
% Change YTD	11.3%	3.6%	8.8%	6.8%			
Total	53,045	54,947	59,775	63,814		66,047	67,994
% Change Y/Y	11.3%	3.6%	8.8%	6.8%		3.5%	2.9%

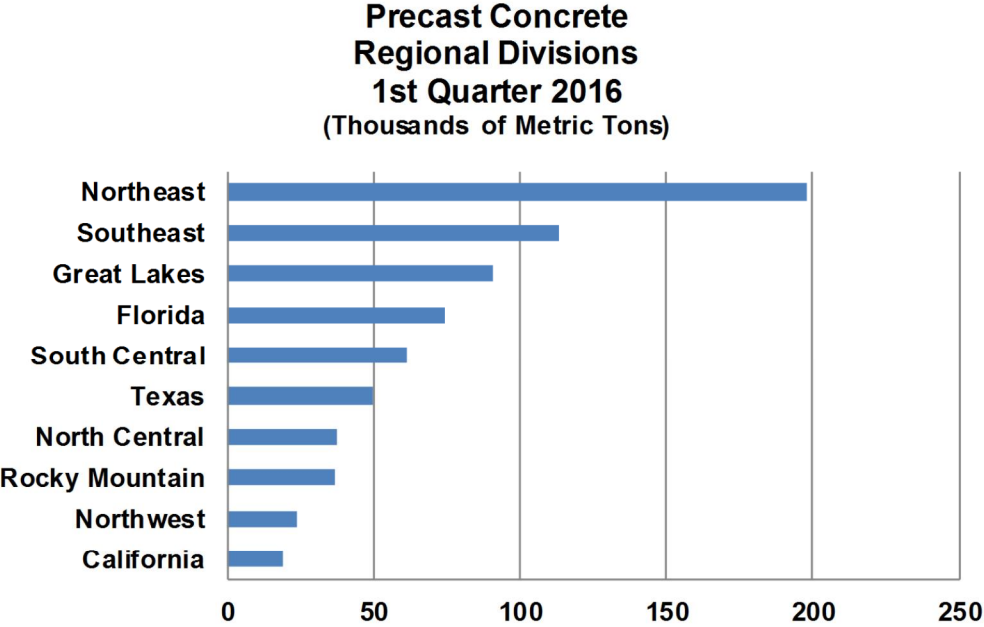
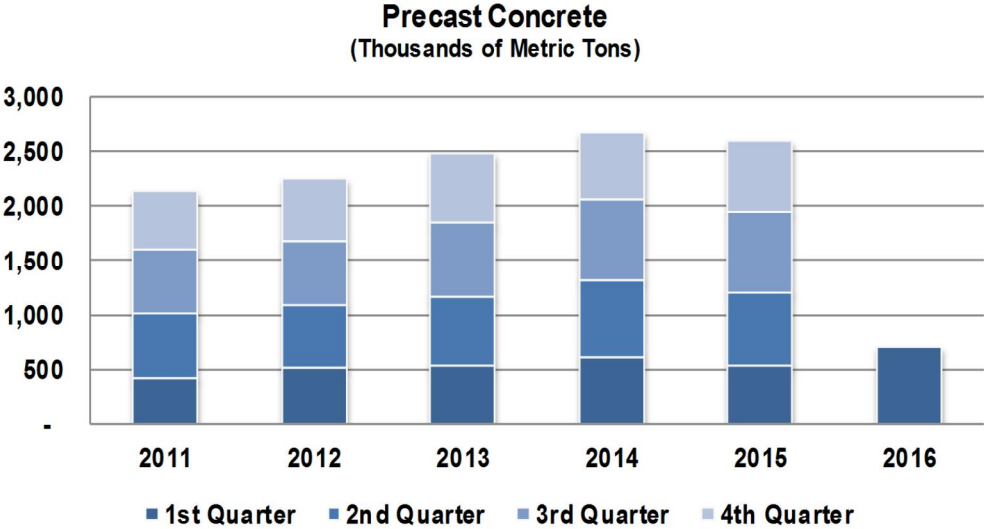
Growth in ready-mixed concrete typically mirrors the dynamics of the overall cement market. With oil well cement (historically the third largest user group) acting as a drag on the total cement market, ready-mix's growth rates are expected to outperform those of total cement consumption.

The fundamental macroeconomic indicators remain strong. A robust labor market, rising home prices, low interest rates and debt ratios, and healthier ROI's suggest all three construction sectors could contribute to growth throughout the forecast horizon. Yet uncertainty clouds the outlook in construction activity. Continued weakness in global markets, a strong dollar, looming high federal debt levels, and anemic oil prices, coupled with the risks associated with the recent election of Donald Trump weigh on growth. PCA has lowered its single family starts projections for 2017 as well as its expected cement consumption in both nonresidential and public construction — to the detriment of ready-mixed concrete's 2017 growth potential. Further down the forecast horizon, however, the prospect of vigorous federal funding of infrastructure, coupled with favorable tax policy may add steam to not only public but private construction, which would benefit the ready-mixed concrete segment longer-term.

PCA expects the ready-mix segment to grow at approximately in excess of 3% in 2016, followed by growth rates in line with PCA's national forecast later down the forecast horizon.

Precast Concrete: Data

Shipments of portland cement to U.S. precast manufacturers increased 29.4% to 546,707 mt during the first quarter of 2016 when compared to the year-ago levels. Precast concrete accounted for 3.8% of total portland cement shipments in first quarter 2015. The Northeast region was the largest regional cement consumer in this category with 198,018 mt, followed by the Southeast region with 112,969 mt.



Precast Concrete: Analysis

Precast concrete is concrete cast in forms in a controlled environment and allowed to achieve a specified strength prior to placement on location. Examples of products include, but are not limited to, architectural wall panels, catch basin covers, concrete furniture, and floor slabs.

Precast Concrete (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	510	532	617	547	707		
% Change Y/Y	20.0%	4.2%	16.1%	-11.4%	29.4%		
% Change YTD	20.0%	4.2%	16.1%	-11.4%	29.4%		
2nd Quarter	584	642	700	669			
% Change Y/Y	0.6%	10.0%	9.0%	-4.5%			
% Change YTD	8.8%	7.3%	12.2%	-7.7%			
3rd Quarter	593	685	739	733			
% Change Y/Y	-2.3%	15.5%	7.8%	-0.8%			
% Change YTD	4.7%	10.2%	10.6%	-5.2%			
4th Quarter	558	626	612	653			
% Change Y/Y	6.6%	12.1%	-2.2%	6.7%			
% Change YTD	5.1%	10.7%	7.4%	-2.5%			
Total	2,245	2,485	2,668	2,601		2,819	2,903
% Change Y/Y	5.1%	10.7%	7.4%	-2.5%		8.4%	3.0%

The collapse of nonresidential construction, which is responsible for half of precast cement consumption, led to a dramatic tonnage loss for this segment. Since the Great Recession, however, the precast segment has generally outperformed most other user-groups.

Cement consumed in nonresidential construction projects has been growing at a healthy pace, coming off historical lows, as job creation led to a decline in vacancy rates and firming of leasing rates. With some large industrial projects winding down and the onset of slower economic growth and job creation over the next two years, growth generated from commercial construction may begin to abate.

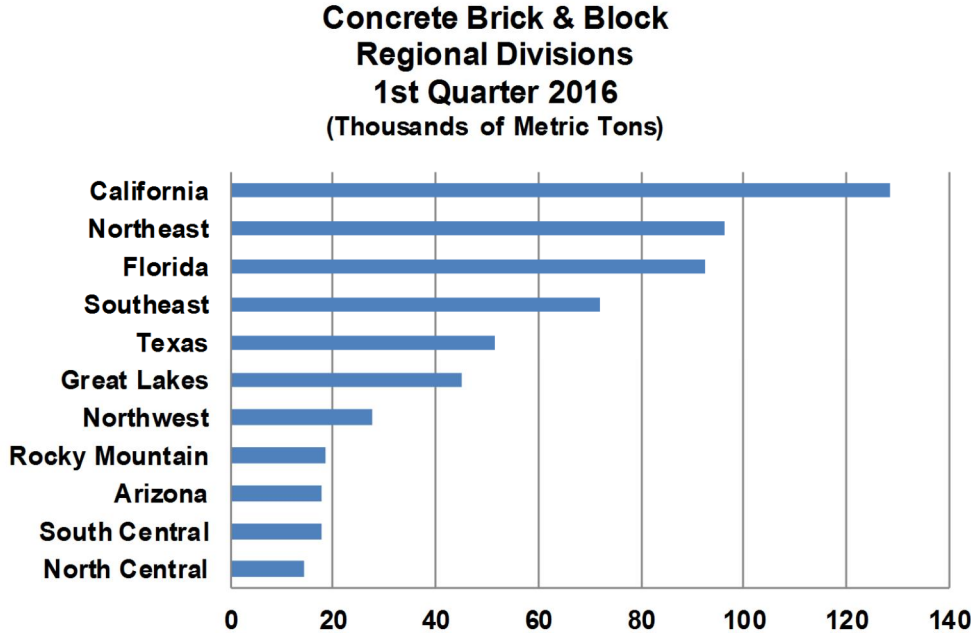
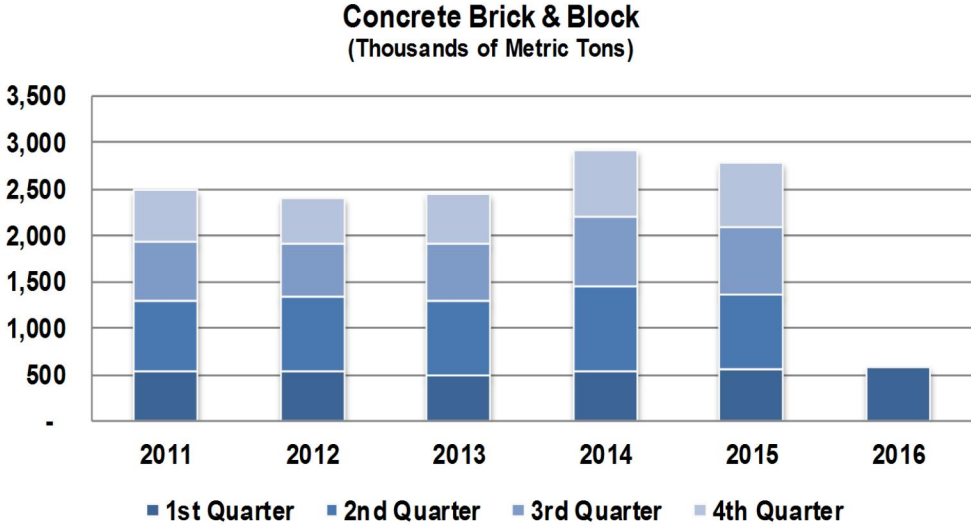
Precast concrete is also allocated an upwards of 40% toward public construction, which is expected to finish 2016 with slight growth. While job creation is expected to slow, impacting the state and local side of the public spending equation, federal infrastructure commitment will go a long way for precast's medium-to-long-term performance.

Despite the relative strength of the commercial and public sectors, 2015 year-end volumes were slightly negative. Bear in mind, the precast market has outperformed overall cement consumption since the downturn. Coming off large growth in first quarter 2016, PCA expects this segment to rebound with growth in excess of 8% in 2016.

Concrete Brick & Block Manufacturers: Data

The Concrete Brick & Block Manufacturers segment was the fourth largest user segment in first quarter 2016 with a 3.1% share of total U.S. consumption. Consumption was 581,557 mt, up 5.5% from first quarter 2015. During first quarter 2016, the California region was the largest regional cement consumer in this category with 128,369 mt, followed by the Northeast with 96,216 mt.

NOTE: Some of the decline in tonnage after 2005 in this category can be attributed to the creation and distribution of volumes into the newly added Interlocking Pavers category in 2006. Interlocking Pavers were previously reported in this category.



Concrete Brick & Block Manufacturers: Analysis

The Concrete Brick & Block Manufacturers segment consumes cement that is used to produce bricks manufactured from regular aggregate concrete to various mixtures of lightweight aggregates.

Concrete Brick & Block (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	547	494	530	551	582		
% Change Y/Y	2.4%	-9.8%	7.4%	3.9%	5.5%		
% Change YTD	2.4%	-9.8%	7.4%	3.9%	5.5%		
2nd Quarter	781	804	920	805			
% Change Y/Y	3.0%	3.0%	14.4%	-12.5%			
% Change YTD	2.8%	-2.3%	11.7%	-6.5%			
3rd Quarter	582	622	759	741			
% Change Y/Y	-9.5%	6.9%	22.0%	-2.4%			
% Change YTD	-1.3%	0.5%	15.1%	-5.1%			
4th Quarter	503	527	708	695			
% Change Y/Y	-11.2%	4.8%	34.3%	-1.8%			
% Change YTD	-3.6%	1.4%	19.2%	-4.3%			
Total	2,413	2,447	2,917	2,792		3,014	3,126
% Change Y/Y	-3.6%	1.4%	19.2%	-4.3%		8.0%	3.7%

Given the Brick & Block segment's regional volume distribution, with shipments highly concentrated in the Southeast, Northeast, California, Florida, and Arizona, strong growth potential exists as many of these regions were hit hardest by the housing collapse. Now, these markets have some of the highest growth projections.

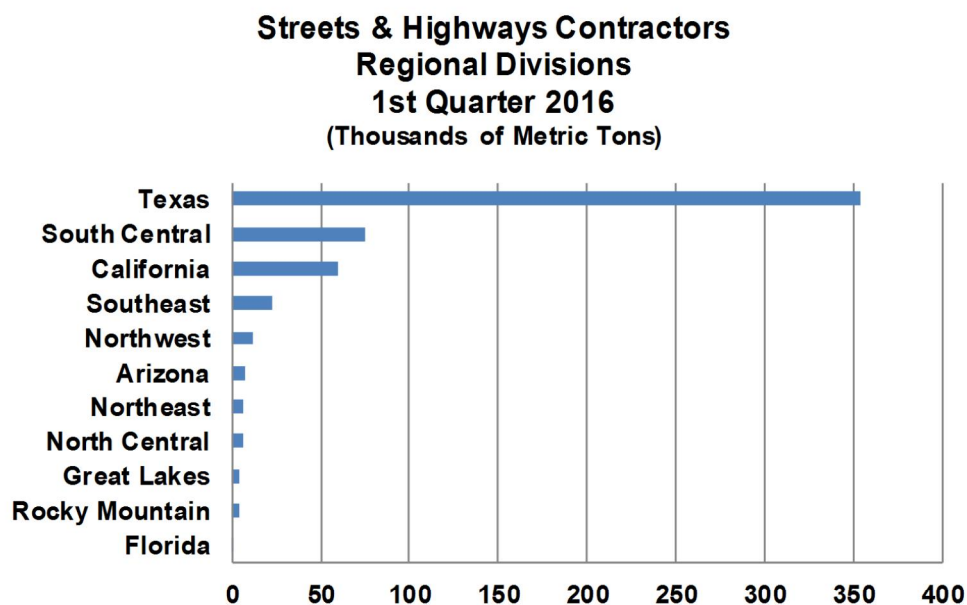
Nonresidential construction gains have also provided some support for the Brick & Block segment. Job creation, either directly or indirectly, translate into higher occupancy and leasing rates. Such growth translates into stronger net operating income for nonresidential properties. As NOI increases, property values strengthen. With the strengthening property values, lending risk declines, and access to credit becomes more available. The combination of improved NOI, increases in property values and more available credit, sets the stage for a commercial construction expansion. While the labor market is expected to remain healthy, job growth is projected to slow which may moderate growth generated from commercial construction going forward.

While this user group finished 2014 with double-digit growth, its volume gains have underperformed given its concentration in residential and commercial construction. Volumes in 2015 were slightly negative. PCA expects 2016 volumes to grow at a healthy 8% followed by more moderate growth in 2017.

Streets & Highways Contractors: Data

The Streets & Highways Contractors segment was responsible for 3.0% of total U.S. shipments in first quarter 2016, accounting for 554,780 mt, and translates to a 64% year-ago increase. In first quarter 2016, Texas was the largest regional cement consumer in this category with 353,889 mt, followed by the South Central region with 75,295 mt.

NOTE: This segment does not equal the total amount of portland cement used to pave streets and highways because it does not include cement used to make ready-mixed concrete, which is then used by streets and highways contractors.



Streets & Highways Contractors: Analysis

The outlook for Streets & Highways contractors cement volume is based on three key assessments including: 1) the magnitude of state and local discretionary infrastructure outlays, 2) federal highway funding commitments through legislation as recently witnessed with FAST, and 3) the proportion of street & highway projects in which cement is sold to a contractor and mixed on-site.

Streets & Highways Contractors (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	402	514	484	338	555		
% Change Y/Y	30.6%	27.9%	-6.0%	-30.1%	64.0%		
% Change YTD	30.6%	27.9%	-6.0%	-30.1%	64.0%		
2nd Quarter	1,104	906	943	894			
% Change Y/Y	36.1%	-17.9%	4.1%	-5.2%			
% Change YTD	34.6%	-5.7%	0.5%	-13.6%			
3rd Quarter	1,499	1,531	1,582	1,226			
% Change Y/Y	20.5%	2.2%	3.4%	-22.6%			
% Change YTD	27.1%	-1.8%	2.0%	-18.3%			
4th Quarter	861	763	1,305	890			
% Change Y/Y	-2.1%	-11.3%	71.0%	-31.8%			
% Change YTD	19.2%	-3.9%	16.1%	-22.4%			
Total	3,865	3,715	4,315	3,348		3,444	3,532
% Change Y/Y	19.2%	-3.9%	16.1%	-22.4%		2.9%	2.6%

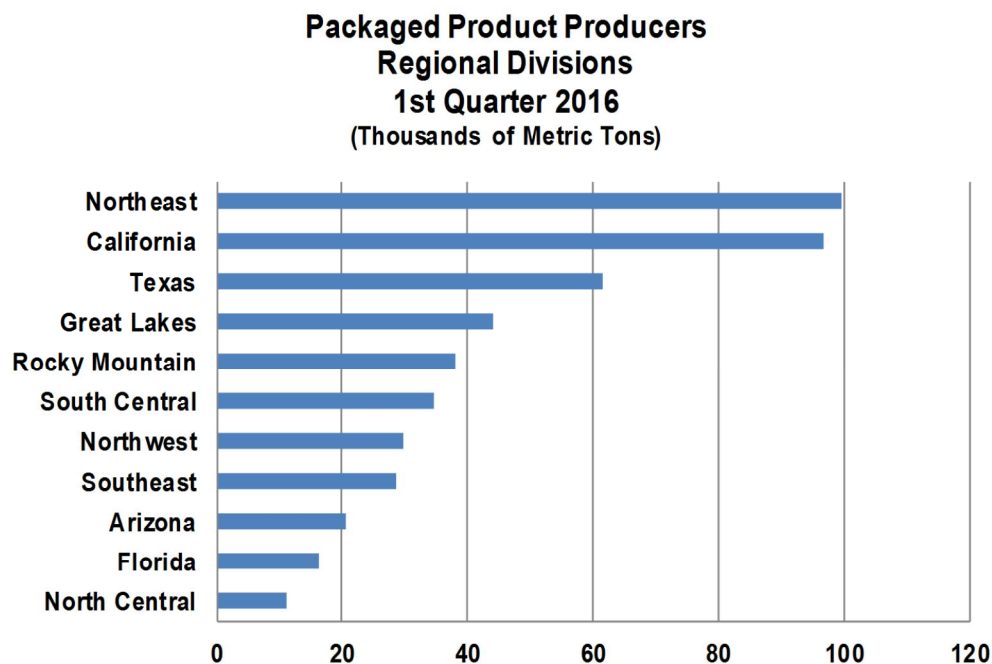
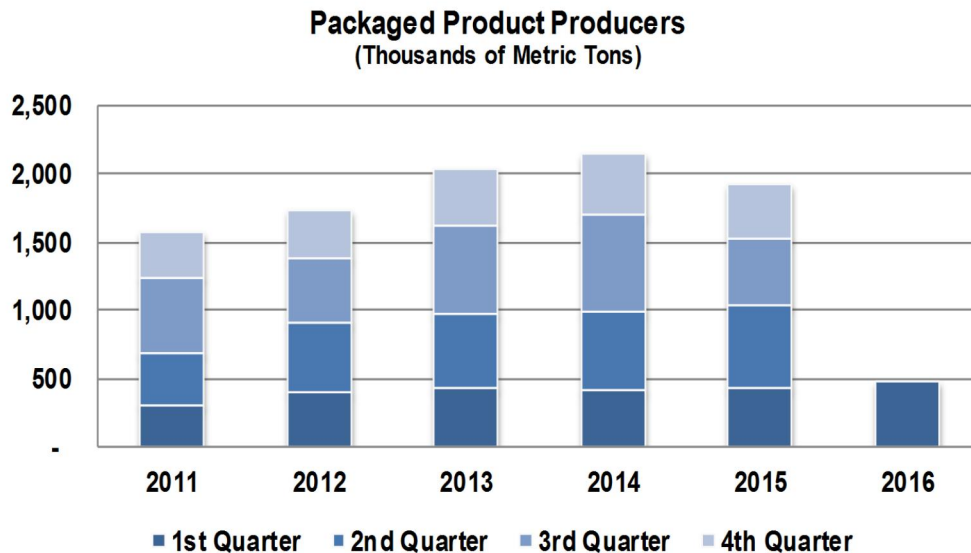
Sustained job creation and rising home prices that have resulted in increased property tax receipts has given state and local governments the ability to fund street & highway projects. This occurred at a time when there was no increase in federal spending. Going forward, as the economy's momentum slows, and job creation softens slightly, states' ability to spend will continue to expand, but eventually ratchet down to a slightly slower growth pace.

On the federal side, Congress has recently passed a \$305 billion five-year transportation bill named Fixing America's Surface Transportation Act (FAST). Of this, \$207.4 billion will be targeted at the Federally Aided highway system, which represents a 9.7% increase in nominal dollars from current levels and allows for annual increases in funding roughly in line with expected inflation. When assessing the net impact of federal infrastructure funding, one must bear in mind that such programs are typically met with offsetting reductions on the part of state and local DOTs. This phenomenon is referred to as state and local sterilization. During ARRA, when state and local governments were strapped for cash, sterilization of 88% materialized. With improving fiscal conditions, PCA assumes 25% sterilization will occur at the state and local level.

The Streets & Highways Contractors segment finished 2014 with sizable gains, despite modest growth during most of 2014, after immense fourth quarter growth. In the Q4 2014 report, PCA approached fourth quarter volumes with skepticism and warned of a possible adverse 2015. It now appears that such a scenario has unfolded. Year-end 2015 volumes are down 23%, despite the fundamentals of the market suggesting flat-to-positive growth. PCA treats 2015 volumes and the ensuing large volume growth in Q1 2016 as a potential data reporting anomaly. PCA's latest forecast expects approximately 3% growth in Highways & Streets in 2016 and 2017.

Packaged Product Producers: Data

This user segment consumed approximately 480,715 mt of portland cement during the first quarter of 2016, a 12.6% increase from first quarter 2015. The Packaged Product Producers segment accounted for 2.6% of total consumption. During first quarter 2016, the Northeast region was the largest regional cement consumer in this category with 99,509 mt, followed by California with 96,643 mt.



Packaged Product Producers: Analysis

The Packaged Product Producers segment includes bagged cement and mixtures (i.e., SAKRETE®, QUIKCRETE®) producers.

NOTE: Prior to 2005, cement consumption in this user segment was captured in the All Other category.

Packaged Product Producers (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	405	432	420	427	481		
% Change Y/Y	31.8%	6.9%	-2.9%	1.6%	12.6%		
% Change YTD	31.8%	6.9%	-2.9%	1.6%	12.6%		
2nd Quarter	496	538	573	613			
% Change Y/Y	30.8%	8.4%	6.5%	7.0%			
% Change YTD	31.3%	7.7%	2.3%	4.7%			
3rd Quarter	484	651	715	489			
% Change Y/Y	-13.2%	34.6%	9.8%	-31.6%			
% Change YTD	11.3%	17.1%	5.3%	-10.5%			
4th Quarter	350	411	442	400			
% Change Y/Y	4.7%	17.5%	7.6%	-9.5%			
% Change YTD	9.9%	17.2%	5.8%	-10.3%			
Total	1,734	2,032	2,150	1,929		2,057	2,128
% Change Y/Y	9.9%	17.2%	5.8%	-10.3%		6.7%	3.5%

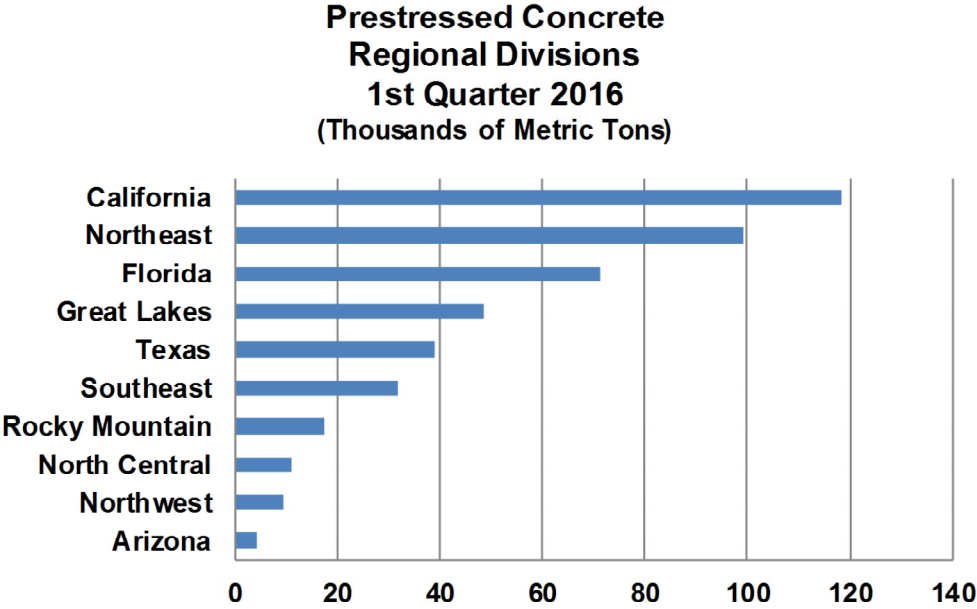
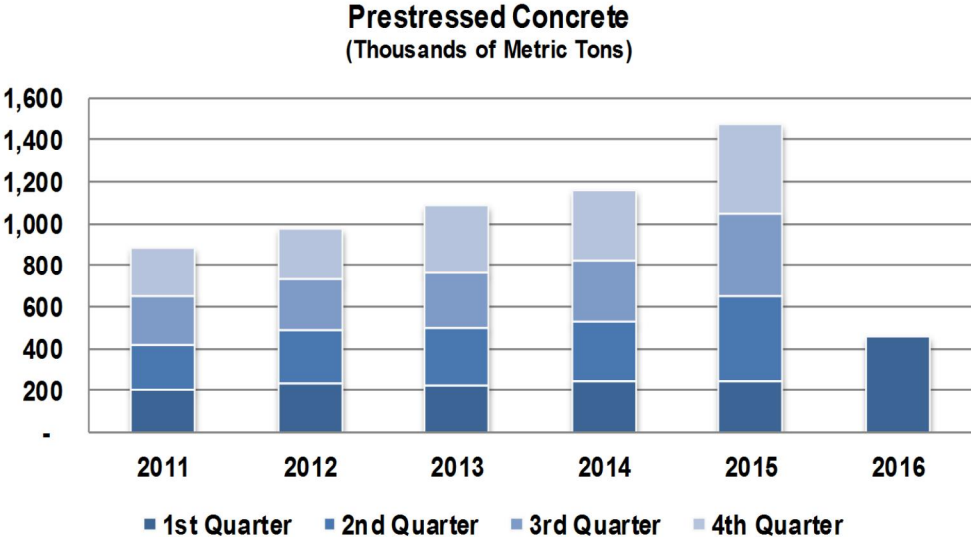
While this segment is concentrated mainly in residential construction, much of it is consumed in improvements to the existing housing stock. Growth in Packed Product Producers segment since the recession may have been countercyclical improvements-based demand.

Year-end 2015 volumes for this segment were down approximately 10%. PCA's latest national forecast expects improvements spending and improvements-based cement consumption to be slightly negative to flat in 2016 and 2017. Despite this, the Packaged Product Producers segment grew 13% in the first quarter of 2016. PCA expects this segment to rebound from 2015's volume dip and benefit from some of the starts-related demand in the residential market.

Prestressed Concrete: Data

During first quarter 2016, the prestressed concrete segment consumed 454,706 mt of cement, up 82.5% from first quarter 2015. This segment accounted for 2.5% of total cement consumption. During first quarter 2015, California was the largest regional cement consumer in this segment with 118,197 mt, followed by the Northeast with 99,145 mt.

NOTE: Prestressed concrete was added as a new segment in 2006. This user segment includes tons for the concrete railroad tie user segment which was eliminated in 2008. Prior to 2006, portland cement consumption for the Prestressed Concrete user segment was captured either in the All Other segment or the Precast segment.



Prestressed Concrete: Analysis

This segment includes cement applications in which compressive stresses are induced by high-strength steel bars in a concrete element. Loads are then applied to the element which will balance the tensile stresses imposed in the element during service. Applications include high-rise office buildings, landmark bridges, parking structures, correctional facilities, stadiums, and schools.

Prestressed Concrete (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	230	229	246	249	455		
% Change Y/Y	9.8%	-0.4%	7.4%	1.1%	82.5%		
% Change YTD	9.8%	-0.4%	7.4%	1.1%	82.5%		
2nd Quarter	258	274	288	407			
% Change Y/Y	22.1%	6.3%	5.0%	41.4%			
% Change YTD	15.9%	3.1%	6.1%	22.8%			
3rd Quarter	245	265	292	394			
% Change Y/Y	4.8%	8.5%	10.2%	34.9%			
% Change YTD	12.0%	4.9%	7.5%	27.1%			
4th Quarter	248	319	330	428			
% Change Y/Y	8.0%	28.9%	3.3%	29.8%			
% Change YTD	10.9%	11.0%	6.3%	27.9%			
Total	980	1,088	1,156	1,478		1,584	1,618
% Change Y/Y	10.9%	11.0%	6.3%	27.9%		7.1%	2.1%

The prestressed concrete market closely mirrors the dynamics of the precast segment and will, therefore, reflect market assumptions and potential assumed in PCA's current forecast. While precast volumes were slightly negative in 2015, the prestressed market finished the year with 27% growth, following large advances in the second, third, and fourth quarters. Robust growth for this segment in previous years was not unexpected given its concentration in nonresidential construction. Over the next several years, as commercial sector growth rates moderate, so too will those of the prestressed concrete market.

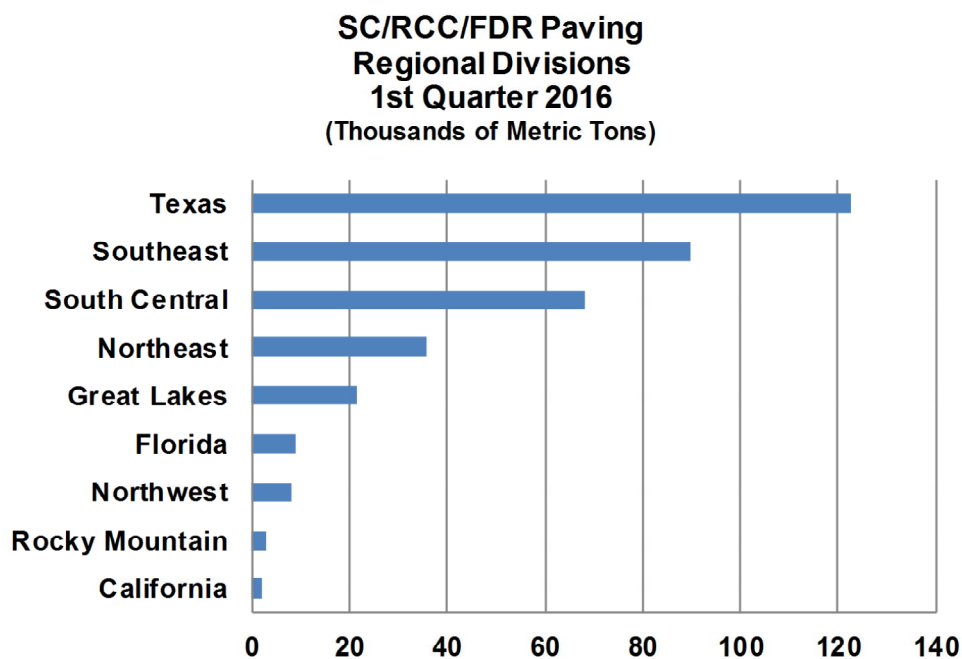
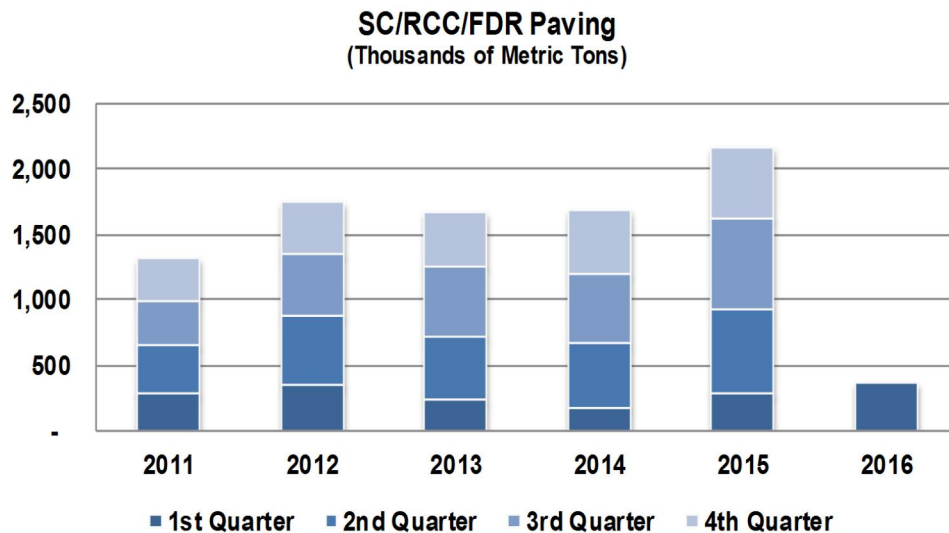
While growth in this segment has been subdued by public spending troubles in the past, public spending is expected to be positive in 2016 and 2017 as state and local governments' balance sheets have been becoming healthier due to the increase in net job creation and rising home prices. With the possibility of a large infrastructure bill materializing in 2018, the prestressed segment may enjoy more robust growth longer-term as well.

First quarter 2016 recorded sizable growth over the same period in 2015. PCA expects this growth rate to ease as the year continues, but forecasts approximately 7% growth for the prestressed segment in 2016.

Soil-Cement/ Roller Compacted Concrete/ Full-Depth Reclamation for Paving: Data

SC/RCC/FDR paving projects consumed approximately 360,974 mt in the first quarter of 2016 (2.1% share of total cement consumption). This was an increase of 26.8% from first quarter 2015. The largest regional consumer in the first quarter of 2016 was Texas with 122,823 mt, followed by the Southeast region with 89,962 mt.

NOTE: In 2008, cement consumption for the soil-cement and roller compacted concrete paving segments was split into three segments (SC, RCC, and FDR Paving), after having been combined in prior years.



Soil-Cement/ Roller Compacted Concrete/ Full-Depth Reclamation for Paving: Analysis

Soil-cement or cement-treated base (CTB) is a highly compacted mixture of soil/aggregate, portland cement, and water. Soil-cement is used as a base material under both asphalt and concrete applications such as streets, highways, parking lots, and commercial pavements.

Roller compacted (RCC) concrete is placed with modified asphalt type pavers and compacted. It is typically used for heavy-duty pavements due to its high strength, economy, and ease of placement.

Full-depth reclamation (FDR) with cement is a type of CTB that utilizes the existing asphalt and underlying base materials through an in-place recycling process that creates a strong, durable base that can be surfaced with either concrete, asphalt, or a chip seal.

SC/RCC/FDR Paving (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	354	235	169	285	361		
% Change Y/Y	19.7%	-33.8%	-27.9%	68.3%	26.8%		
% Change YTD	19.7%	-33.8%	-27.9%	68.3%	26.8%		
2nd Quarter	515	490	502	648			
% Change Y/Y	44.5%	-4.8%	2.3%	29.1%			
% Change YTD	33.2%	-16.6%	-7.5%	39.0%			
3rd Quarter	491	534	528	695			
% Change Y/Y	43.3%	8.8%	-1.1%	31.5%			
% Change YTD	36.7%	-7.4%	-4.8%	35.7%			
4th Quarter	389	414	490	538			
% Change Y/Y	17.0%	6.4%	18.2%	9.9%			
% Change YTD	31.8%	-4.4%	0.9%	28.2%			
Total	1,750	1,673	1,689	2,165		2,231	2,282
% Change Y/Y	31.8%	-4.4%	0.9%	28.2%		3.0%	2.3%

SCC and FDR are primarily public works applications executed by state, county, or municipal DOT's. Parking lots and access roads offer private sector opportunities. As such, these applications are highly determinant on state and local fiscal positions as well as the municipalities' comfort with the applications' advantages. As PCA's latest forecast suggests, state and local tax revenues have been increasing and a faster job creation scenario will ease current budget perils. Budget constraints can, ironically, provide upside potential for these segments due to their cost effectiveness and politically correct sustainable solutions.

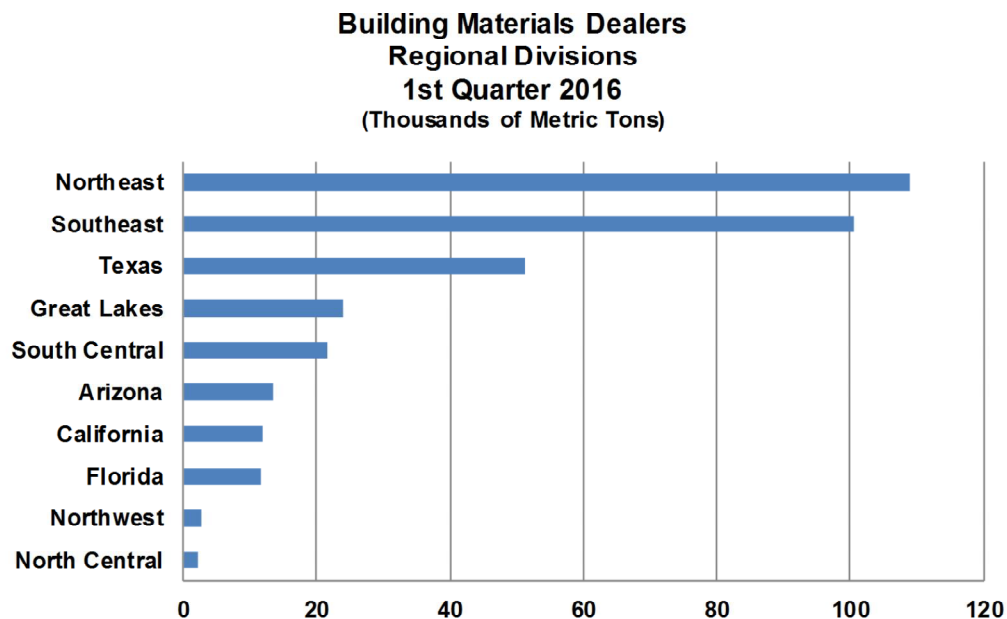
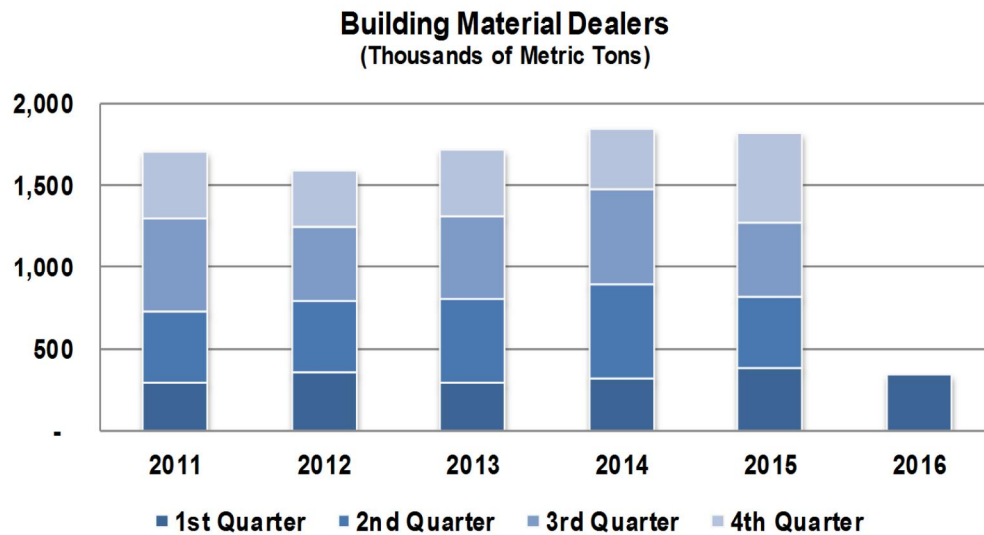
RCC is mixed between private and public applications. The private sector includes commercial and industrial applications such as warehouse facilities, intermodal yards, and ports. In the public sector, applications include military facilities, highway shoulders and bases, and exposed RCC for streets and local roads. With the increased cost and potential supply constraints of asphalt, RCC is being considered as a cost effective alternative, although the recent plunge in oil prices have the potential to threaten some of alternative paving's relative cost savings.

Year-end 2015 volumes recorded gains in excess of 28%. PCA expects continued growth in 2016 and 2017 as state and local governments, perhaps aided by significant federal dollars, have more money to spend on improving road quality.

Building Materials Dealers: Data

This user segment consumed approximately 348,747 mt of portland cement during first quarter 2016, a 10.4% decrease from first quarter 2015. The Building Material Dealers segment accounted for 1.9% of total consumption. The Northeast region was the largest regional cement consumer in this category with 109,027 mt, followed by the Southeast with 100,598 mt.

NOTE: This segment was added to the survey in 2006. Prior to 2006, consumption for this category was captured in the All Other segment.



Building Materials Dealers: Analysis

This segment consists of enterprises (i.e. Home Depot, Lowes, Menards) engaged in retailing products such as manufactured bagged cement, fencing, glass, doors, plumbing fixtures and supplies, electrical supplies, prefabricated buildings and kits, and kitchen and bath cabinets and countertops.

Building Materials Dealers (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	358	296	324	389	349		
% Change Y/Y	21.5%	-17.2%	9.3%	20.2%	-10.4%		
% Change YTD	21.5%	-17.2%	9.3%	20.2%	-10.4%		
2nd Quarter	435	505	568	430			
% Change Y/Y	1.5%	16.1%	12.5%	-24.2%			
% Change YTD	9.6%	1.1%	11.3%	-8.1%			
3rd Quarter	452	510	587	453			
% Change Y/Y	-21.2%	12.9%	15.1%	-22.8%			
% Change YTD	-4.0%	5.4%	12.8%	-13.9%			
4th Quarter	343	401	366	556			
% Change Y/Y	-17.4%	16.8%	-8.7%	52.0%			
% Change YTD	-7.2%	7.8%	7.8%	-0.9%			
Total	1,587	1,712	1,845	1,829		1,929	2,009
% Change Y/Y	-7.2%	7.8%	7.8%	-0.9%		5.5%	4.1%

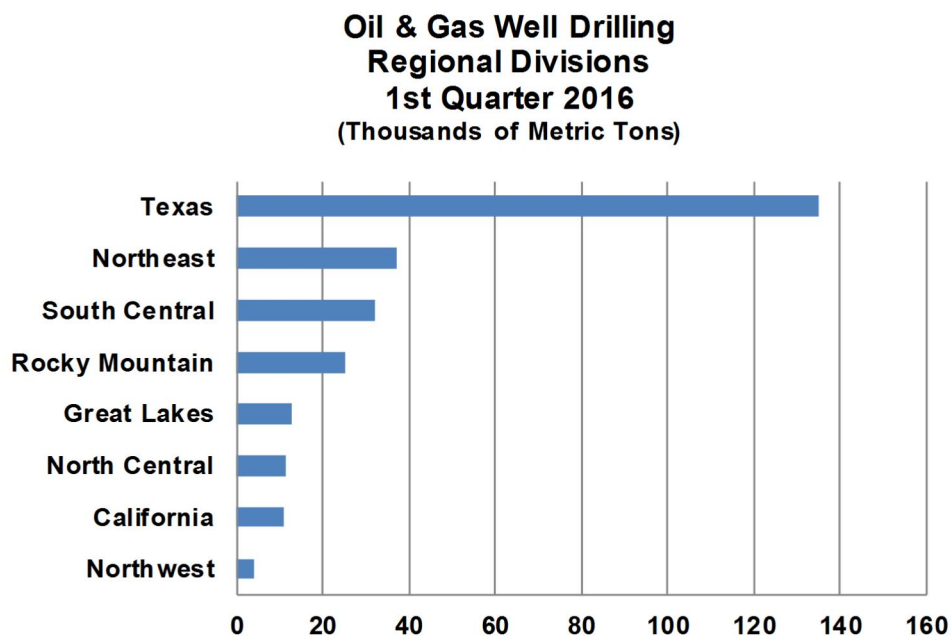
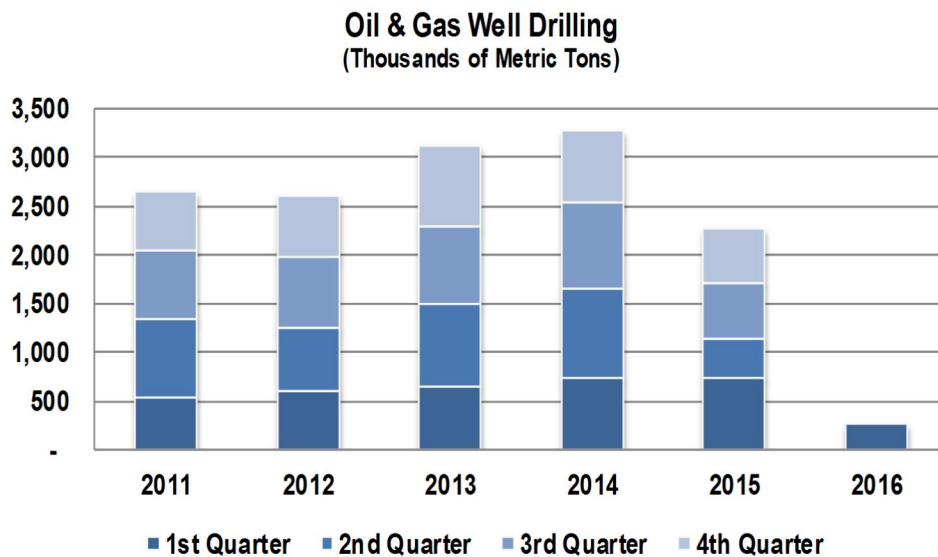
Similar to the Packaged Products Producers segment, the Building Materials Dealers industry is heavily reliant on performance in the residential sector (75%), and is fairly unsaturated in the nonresidential (15%) and public (10%) construction sectors. Consequently, its growth will be primarily contingent upon residential gains, namely improvements activity. Past growth in this segment may have been attributed to countercyclical improvements projects, but throughout the forecast horizon, the lion's share of residential consumption will come from starts-related demand.

This segment has recorded volume volatility throughout 2015. Fourth quarter volumes grew 51% to end the year slightly negative. More substantial growth is expected in 2016 as the Building Materials Dealers segment may benefit from the commercial and public sectors while the residential improvements market is expected to be flat.

Oil & Gas Well Drilling: Data

In first quarter 2016, the Oil & Gas Well Drilling segment accounted for 270,164 mt of portland cement, translating into a 63.1% decrease from first quarter 2015. The Oil & Gas Well Drilling segment represents 1.5% of total consumption. During first quarter 2016, Texas was the largest regional cement consumer in this category with 135,089 mt, followed by the Northeast region with 37,066 mt.

NOTE: Cement for oil and gas well drilling is primarily used for below ground casing and grouting.



Oil & Gas Well Drilling: Analysis

The Oil & Gas Well Drilling segment refers to cement that is made according to API specifications, and is used for down-hole work

Oil & Gas Well Drilling (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	602	655	730	733	270		
% Change Y/Y	12.7%	8.8%	11.4%	0.4%	-63.1%		
% Change YTD	12.7%	8.8%	11.4%	0.4%	-63.1%		
2nd Quarter	640	836	913	414			
% Change Y/Y	-19.9%	30.6%	9.2%	-54.7%			
% Change YTD	-6.9%	20.0%	10.1%	-30.2%			
3rd Quarter	735	810	887	585			
% Change Y/Y	4.3%	10.2%	9.6%	-34.1%			
% Change YTD	-3.0%	16.4%	10.0%	-31.6%			
4th Quarter	619	819	741	558			
% Change Y/Y	2.2%	32.4%	-9.6%	-24.7%			
% Change YTD	-1.8%	20.2%	4.8%	-30.0%			
Total	2,596	3,120	3,271	2,289		1,074	1,283
% Change Y/Y	-1.8%	20.2%	4.8%	-30.0%		-53.1%	19.5%

Weakness in the global economy coupled with increased supply from the United States resulted in a significant decline in oil price. Oil prices declined dramatically beginning in the late fall of 2014 and appeared to stabilize before recording another dramatic decline during the late 2015 fall-early 2016. Current West Texas Intermediate (WTI) per barrel prices stand around \$45.

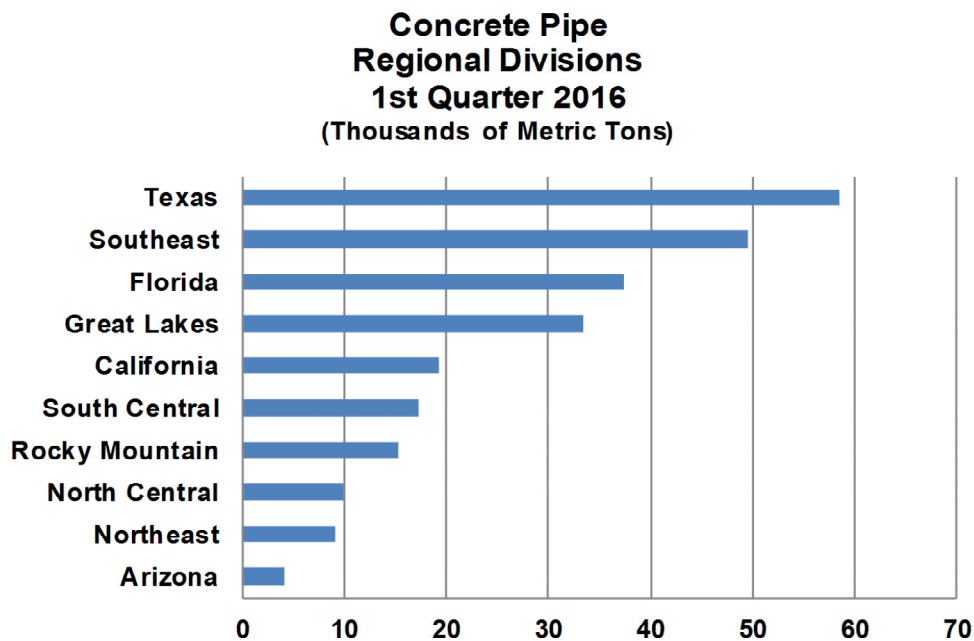
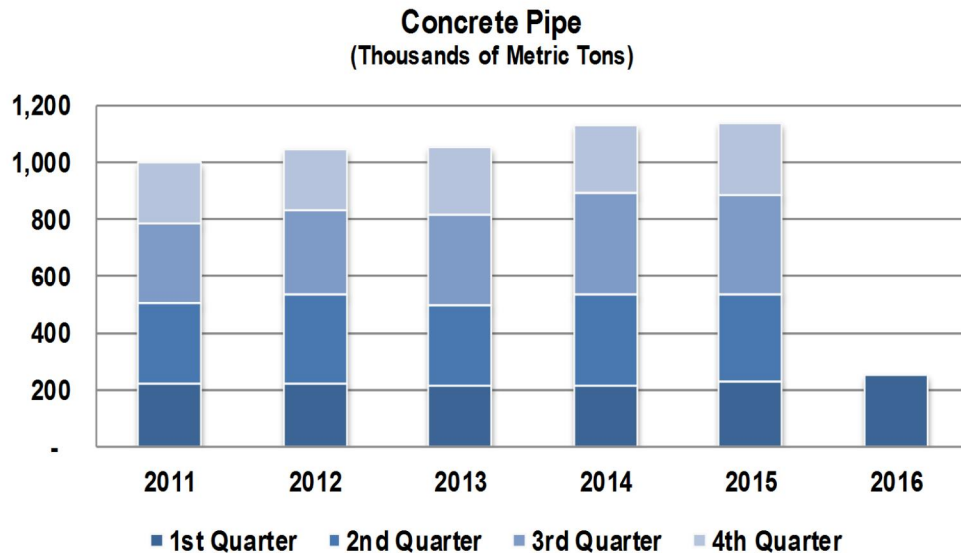
PCA relies on Energy Information Agency (EIA) projections contained in their short-term and long-term annual forecasts. Oil prices are expected to increase modestly in 2017 and average around \$50/barrel.

Oil prices are highly correlated to drilling activity and thus oil well cement consumption. The volumes reported in this survey have generally reflected the steep decline in oil prices and rig counts. With the exception of the flat first quarter 2015, which was followed by a volumes collapse in the following quarter, declines have generally kept pace with what has been expected for this segment. Volumes in the first quarter 2016 fell another 63% against a first quarter 2015 that was perhaps overstated.

The oil & gas well drilling market is projected to record another 53% decline in 2016, followed by a marginal recovery of 20% - coming off depressed volumes - in 2017.

Concrete Pipe: Data

The Concrete Pipe segment consumed approximately 256,137 mt of portland cement during the first quarter of 2016 (1.4% share of total cement consumption). This reflects an 12.4% increase from first quarter 2015. During first quarter 2016, Texas was the largest regional cement consumer in this category with 58,522 mt, followed by the Southeast region with 49,461 mt.



Concrete Pipe: Analysis

Concrete pipe serves as a conduit material for irrigation, water supply lines, sanitary sewers, culverts, and storm drains.

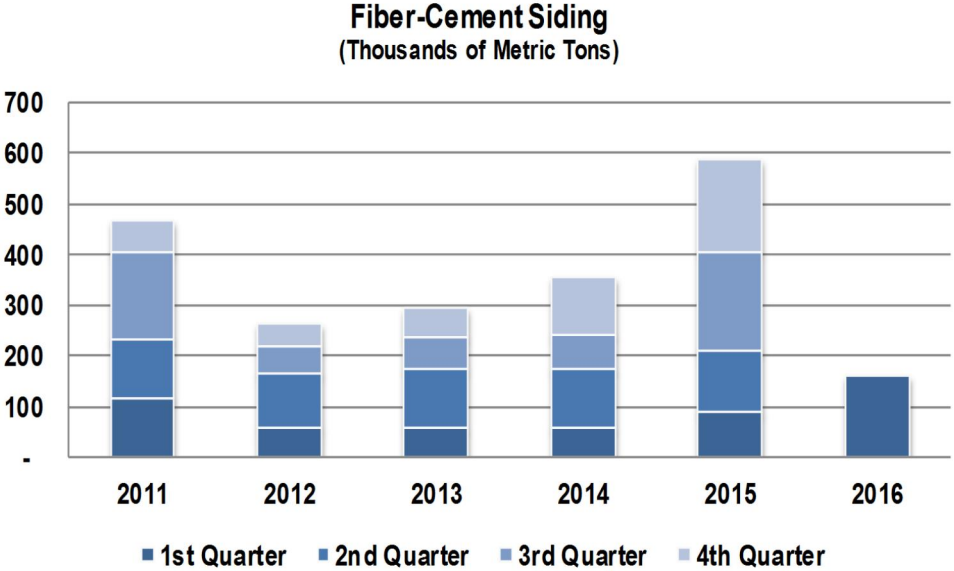
Concrete Pipe (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	226	211	213	228	256		
% Change Y/Y	2.4%	-6.4%	0.9%	7.0%	12.4%		
% Change YTD	2.4%	-6.4%	0.9%	7.0%	12.4%		
2nd Quarter	306	285	322	309			
% Change Y/Y	8.8%	-6.9%	12.8%	-4.0%			
% Change YTD	6.0%	-6.7%	7.7%	0.4%			
3rd Quarter	299	321	361	349			
% Change Y/Y	5.2%	7.5%	12.4%	-3.2%			
% Change YTD	5.7%	-1.6%	9.6%	-1.1%			
4th Quarter	218	233	234	256			
% Change Y/Y	2.0%	7.1%	0.5%	9.0%			
% Change YTD	4.9%	0.2%	7.5%	1.0%			
Total	1,049	1,051	1,130	1,142		1,182	1,215
% Change Y/Y	4.9%	0.2%	7.5%	1.0%		3.5%	2.8%

Despite its public sector concentration, annual volumes have been positive since 2010. It is likely that demand in 2010-2012 was supported by government stimulus projects, resulting in moderate gains. While public works construction absorbed some of the cement demand lost by the battered residential market in recent years, the rebounding housing environment has given the concrete pipe segment further traction.

While the Concrete Pipe segment may benefit from gains in the private construction markets, perhaps boosting its growth rate in 2016 and 2017, it is largely expected to grow in line with the public sector. Over the past several years, state and local governments have carried the weight in terms of construction projects. According to PCA's latest forecast, job creation is expected to slow over the next two years which will eventually ratchet down the pace of state and local infrastructure projects. Fortunately, this state and local slowdown may coincide with increased infrastructure spending on the part of the federal government, to the benefit of larger, more cement-intensive jobs like pipe work.

Fiber-Cement Siding: Data

The Fiber-Cement Siding segment consumed 161,678 mt of portland cement during the first quarter of 2016. This accounted for 0.9% of total cement consumption. Consumption in the Fiber-Cement Siding segment increased 80.7% in the first quarter of 2016 compared to 2015.



NOTE: Regional data withheld due to confidentiality restrictions

Fiber-Cement Siding: Analysis

Fiber-Cement Siding offers the appearance of traditional wood-based siding materials with much lower maintenance requirements, while maintaining its shape and color much better than vinyl siding.

Fiber-Cement Siding (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	60	61	58	89	162		
% Change Y/Y	-49.4%	1.6%	-3.6%	53.3%	80.7%		
% Change YTD	-49.4%	1.6%	-3.6%	53.3%	80.7%		
2nd Quarter	104	113	115	120			
% Change Y/Y	-7.4%	8.6%	1.9%	4.0%			
% Change YTD	-28.9%	6.0%	0.0%	20.6%			
3rd Quarter	54	64	68	197			
% Change Y/Y	-69.1%	19.2%	6.6%	187.6%			
% Change YTD	-46.2%	9.3%	1.8%	67.8%			
4th Quarter	45	57	114	184			
% Change Y/Y	-28.5%	26.5%	99.1%	62.0%			
% Change YTD	-43.8%	12.2%	20.6%	66.0%			
Total	263	295	355	590		639	655
% Change Y/Y	-43.8%	12.2%	20.6%	66.0%		8.3%	2.5%

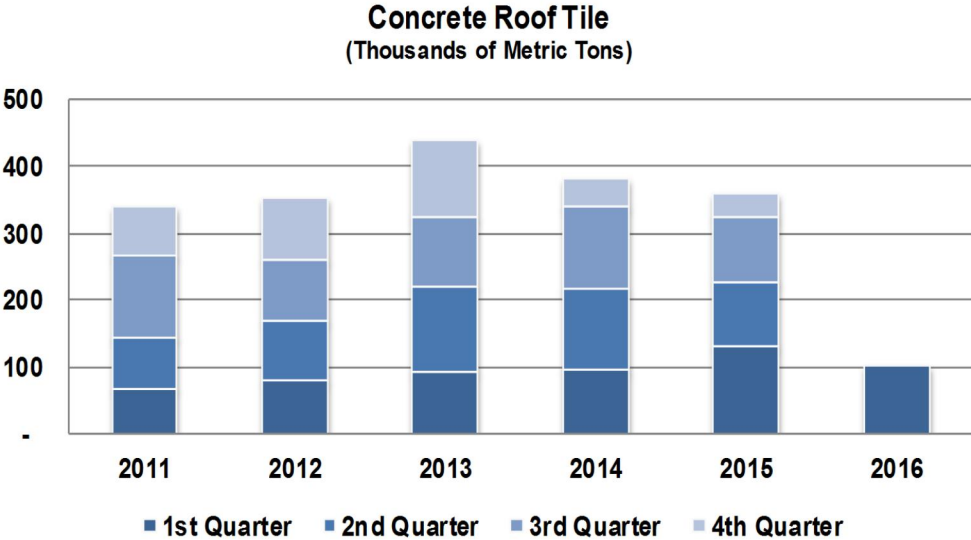
The fiber-cement siding industry is heavily concentrated (around 85%) in the residential sector, which was chiefly responsible for this segment's weak performance since the start of the housing recession. PCA believes the conditions are in place for a recovery in residential construction, albeit at a somewhat slower pace than previously anticipated. Job creation and easier access to credit is expected to translate into housing start gains—1.2 million starts anticipated in 2016 and 1.25 million in 2017, which comes to the benefit of fiber-cement-siding.

The industry has seen some innovations such as ease of installation and selection availability which improve market opportunity. Fiber-cement siding is more durable and versatile than its competitors, but it is also more expensive. Decisions on the part of builders in regard to material usage is largely influenced by initial cost of construction. Aesthetics and taste may influence certain projects on an ad hoc basis, which may be responsible for this segment's volatility.

Following strong growth in 2014, volumes shot up 65% in 2015. While some of this growth may reflect survey reporting issues, such as underreporting in the past, PCA expects robust growth for this segment in 2016 as well.

Concrete Roof Tile: Data

The Concrete Roof Tile user segment consumed 100,708 mt of portland cement during the first quarter of 2016, a 24% decline from 2015 levels. This segment accounted for 0.5% of total cement consumption.



NOTE: Regional data withheld due to confidentiality restrictions

Concrete Roof Tile: Analysis

Concrete roofing tiles offer elegant, enduring aesthetics for house designs and improved marketability for the builder. They are also very versatile and provide greater protection to the homeowner.

Concrete Roof Tile (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	79	94	95	133	101		
% Change Y/Y	19.4%	19.1%	1.0%	39.5%	-24.0%		
% Change YTD	19.4%	19.1%	1.0%	39.5%	-24.0%		
2nd Quarter	89	125	123	93			
% Change Y/Y	15.1%	40.5%	-2.1%	-23.9%			
% Change YTD	17.1%	30.4%	-0.8%	3.8%			
3rd Quarter	94	106	122	100			
% Change Y/Y	-23.2%	12.7%	15.4%	-18.3%			
% Change YTD	-1.4%	24.1%	4.5%	-4.2%			
4th Quarter	92	113	41	35			
% Change Y/Y	22.6%	22.8%	-63.3%	-16.5%			
% Change YTD	3.9%	23.7%	-13.0%	-5.5%			
Total	354	438	381	360		380	393
% Change Y/Y	3.9%	23.7%	-13.0%	-5.5%		5.5%	3.4%

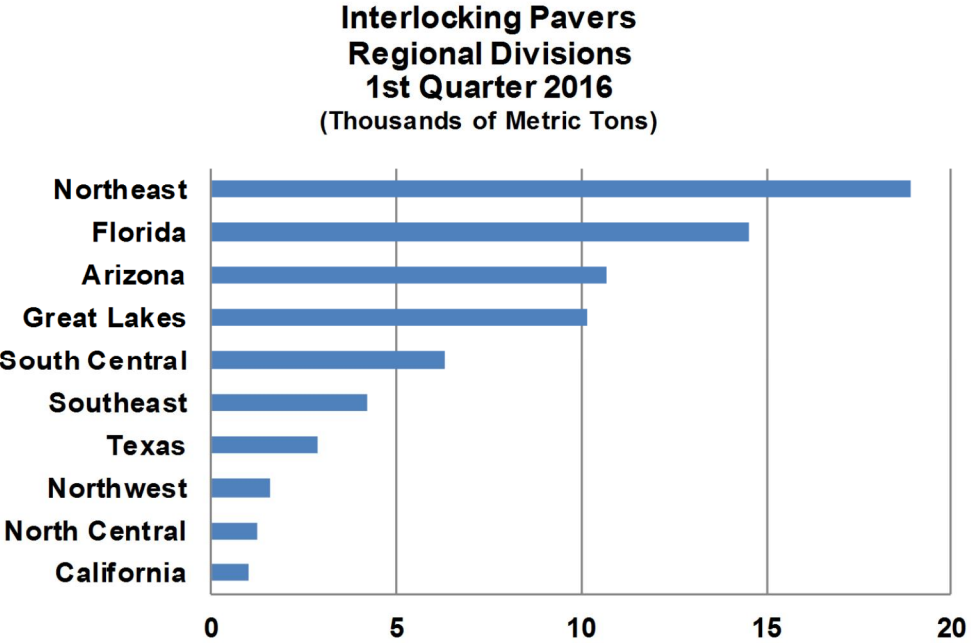
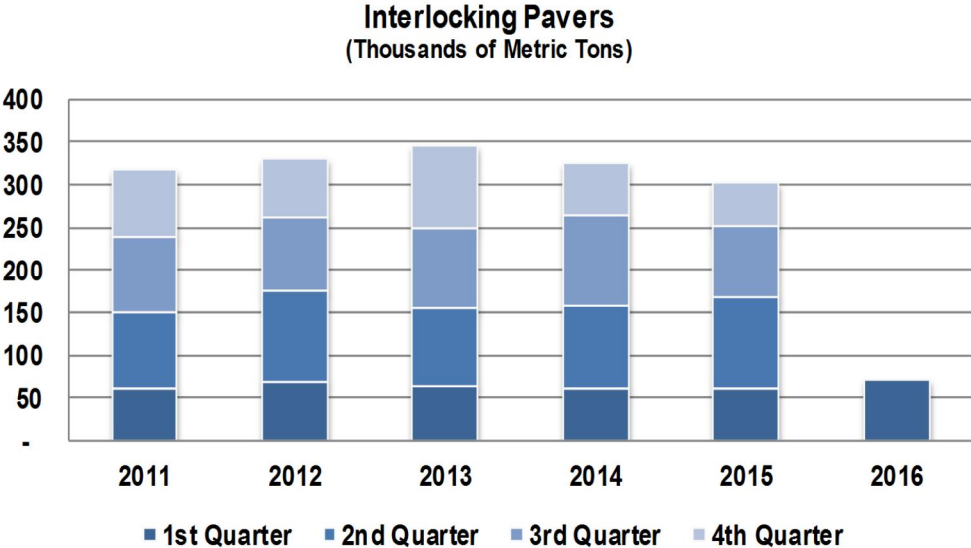
The Concrete Roof Tile industry is targeted heavily toward the residential sector (approximately 80%). Not only did this segment suffer dramatic tonnage loss following the housing collapse, but its concentration in the West and Southeast housing markets, which were particularly battered during the recession, did not provide much support. Now, according to PCA's latest regional forecast, these regions have the strongest future growth potential.

This segment was on track to record modest growth in 2014, but volumes in the fourth quarter plunged 63% followed by a rebound in the first quarter of 2015. While year-end 2015 volumes were negative, PCA believes the fundamentals behind the Concrete Roof Tile market are sound and, absent survey reporting issues, this segment is expected record significant growth in 2016.

Interlocking Pavers: Data

The Interlocking Pavers segment consumed 71,450 mt of cement in first quarter 2016, a 14.4% increase from first quarter 2015. The Interlocking Pavers segment accounted for 0.4% of total cement consumption. During first quarter 2016, the Northeast region was the largest regional cement consumer in this category with 18,897 mt, followed by Florida with 14,505 mt.

NOTE: The Interlocking Pavers category was added in 2006. Consumption for this user segment was previously captured in the Brick & Block or All Other categories.



Interlocking Pavers: Analysis

The Interlocking Pavers segment (also called pavers, concrete pavers, paving stones, paving block, and brick pavers) reflects paver applications used for foot traffic, light vehicle traffic, or special units used for heavy traffic. Pavers are primarily used for patios, walkways, driveways, and housing development roads which infiltrates storm water, thereby reducing or eliminating retention pond requirements.

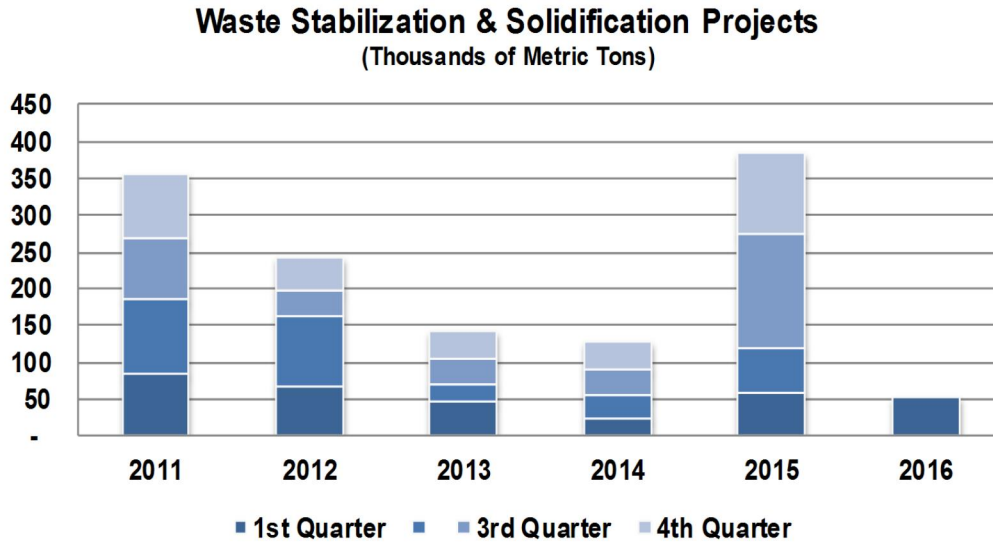
Interlocking Pavers (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	68	63	62	62	71		
% Change Y/Y	12.7%	-7.2%	-1.8%	1.0%	14.4%		
% Change YTD	12.7%	-7.2%	-1.8%	1.0%	14.4%		
2nd Quarter	108	92	95	105			
% Change Y/Y	20.9%	-14.1%	2.7%	11.1%			
% Change YTD	17.6%	-11.5%	0.9%	7.1%			
3rd Quarter	86	93	109	86			
% Change Y/Y	-5.3%	8.7%	16.3%	-21.3%			
% Change YTD	8.9%	-4.8%	6.7%	-4.5%			
4th Quarter	70	98	60	50			
% Change Y/Y	-9.9%	39.8%	-38.9%	-15.5%			
% Change YTD	4.3%	4.6%	-6.2%	-6.5%			
Total	331	346	325	304		322	331
% Change Y/Y	4.3%	4.6%	-6.2%	-6.5%		5.9%	2.8%

While overall portland cement consumption—and particularly segments concentrated in the residential sector—has been recovering since the Great Recession, the interlocking pavers segment has recorded tenuous growth at best. In fact, volumes are still less than half of peak 2006 levels. Going forward, housing starts are expected to average approximately 8.4% growth each year throughout the forecast horizon, which should come to the direct benefit of the Interlocking Pavers segment. This segment may also benefit from state and local building projects which could employ pavers for foot and light vehicle traffic.

An emerging focus on "green" building initiatives may facilitate positive momentum for the interlocking pavers industry. Growing efforts on the part of federal, state, and local governments to reduce environmental impacts of increased runoffs may be favorable for interlocking pavers. Utilizing permeable concrete interlocking pavers for patios, walkways, and driveways helps eliminate runoff and pollutants, recharges ground-water, and helps reduce downstream erosion and flooding.

Waste Stabilization & Solidification (S/S): Data

Waste Stabilization & Solidification projects consumed approximately 51,918 mt of portland cement during the first quarter of 2016 (0.3% share of total cement consumption). This represented a decrease of 12.8% from first quarter 2015.



NOTE: Regional data withheld due to confidentiality restrictions

Waste Stabilization & Solidification (S/S): Analysis

Waste stabilization/solidification(S/S) involves mixing cement into contaminated media or waste to immobilize contaminants within the treated material.

S/S Applications include:

- Brownfield clean-up and redevelopment of contaminated industrial and commercial sites.
- Superfund sites (Federal) to clean up hazardous waste sites.
- Management and disposal of radioactive waste.
- Federal facilities remediation projects conducted by Federal agencies other than EPA.

Waste S/S (000 mt)

PCA Projection

Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	66	45	23	60	52		
% Change Y/Y	-22.5%	-31.1%	-49.0%	157.4%	-12.8%		
% Change YTD	-22.5%	-31.1%	-49.0%	157.4%	-12.8%		
2nd Quarter	96	25	32	61			
% Change Y/Y	-4.2%	-74.0%	26.6%	92%			
% Change YTD	-12.6%	-56.6%	-22.1%	119%			
3rd Quarter	34	33	35	154			
% Change Y/Y	-58.7%	-3.9%	6.9%	341.3%			
% Change YTD	-26.7%	-47.5%	-12.9%	205.7%			
4th Quarter	46	38	39	112			
% Change Y/Y	-47.2%	-17.9%	1.8%	189.5%			
% Change YTD	-31.8%	-41.9%	-9.0%	200.8%			
Total	242	141	128	386		401	403
% Change Y/Y	-31.8%	-41.9%	-9.0%	200.8%		3.9%	0.5%

The application of cement for waste stabilization is not so much tied to the economics or performance of one particular construction sector, but rather the application and enforcement of environmental regulations. In the private sector, the dominant use is for voluntary clean-up of Brownfield sites (property which may be compromised by the presence of a hazardous substance).

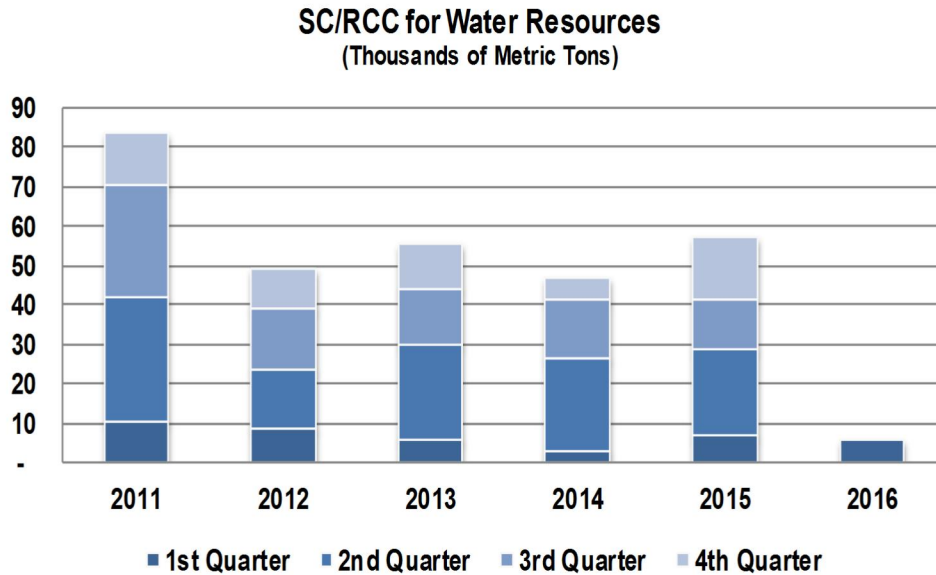
Through several EPA programs such as the Brownfields Program and Resource Conservation and Recovery Act, cement waste treatments are often applied to manufactured gas plants and mining sites. In addition to the EPA, the Department of Energy and Department of Defense are now significant participants in this application of cement. One drawback to growth in this cement application is that S/S is just one of many types of remediation methods.

This segment can be volatile as demand for waste stabilization cement is typically on a provisional basis, as witnessed with huge swings in growth rates in recent years. While PCA was projecting sizable growth in the Waste S/S segment in 2015, 2015 recorded 200% year-over-year growth. It is possible that such large growth rates reflect both actual growth and a survey reporting anomaly with the potential for a payback in 2017. While volumes declined in the first quarter of 2016, PCA expects modest growth in this segment for the next several years.

Soil-Cement/Roller Compacted Concrete for Water Resources: Data

Approximately 5,702 mt of portland cement was consumed by the SC/RCC Water Resources segment during first quarter 2016, reflecting a 16.1% decline against volumes reported in first quarter 2015.

NOTE: Cement consumption in this user segment is subject to extreme fluctuations due to the project orientation.



NOTE: Regional data withheld due to confidentiality restrictions

Soil-Cement/Roller Compacted Concrete for Water Resources: Analysis

This segment encompasses soil-cement used for embankment slope protection, stream bank protection, grade control structures, and reservoir and channel linings. Roller compacted concrete (RCC) is a proven and economical alternative for building new dams and for replacing or rehabilitating existing dams. RCC is also used as emergency spillway or overtopping protection for earth embankment dams and as a low permeable liner for water and wastewater ponds.

SC/RCC Water Resources (000 mt)						PCA Projection	
Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	9	6	3	7	6		
% Change Y/Y	-15.1%	-35.4%	-47.5%	124.3%	-16.1%		
% Change YTD	-15.1%	-35.4%	-47.5%	124.3%	-16.1%		
2nd Quarter	15	24	23	22			
% Change Y/Y	-53.4%	66.1%	-3.0%	-5.6%			
% Change YTD	-43.7%	27.5%	-11.6%	9.2%			
3rd Quarter	16	14	15	13			
% Change Y/Y	-45.6%	-8.9%	4.2%	-14.6%			
% Change YTD	-44.5%	13.0%	-6.5%	0.7%			
4th Quarter	10	12	6	16			
% Change Y/Y	-22.1%	12.6%	-49.4%	172.9%			
% Change YTD	-40.9%	12.9%	-15.5%	22.4%			
Total	49	56	47	58		59	60
% Change Y/Y	-40.9%	12.9%	-15.5%	22.4%		2.4%	1.7%

The need for flood control, dam rehabilitation and water storage are the major demand factors driving this market. Many current dams are more than 50 years old and have major deficiencies including inadequate spillways. The need for water storage will grow as a result of urbanization, economic growth, and increased irrigation needs. Funding for projects in this segment originates at both the federal and local levels. Federal funding originates from programs such as the National Resources Conservation Services which are responsible for dam rehabilitation and flood control. Municipal funding, often through the issuance of bonds, is the more dominant funding mechanism for water storage and treatment infrastructure improvement.

An overwhelming share of water resource projects are publically funded, which may explain a countercyclical bump in this segment's volumes in 2009 with a weak performance following—reflecting public sector budget constraints. In light of PCA's latest forecast which suggests greater spending on the part of state and local governments, this segment may start to show genuine improvement. While dramatic year-over-year gains may be witnessed, it must be kept in mind that they are based off extremely depressed levels and current volumes are less than 30% of what they were in 2006.

All Other Manufacturers and Contractors: Data

The All Other segment (8.1% share of total cement consumption) consumed 1,509,661 mt of cement in the first quarter of 2016. This segment includes government municipalities, specialty chemical manufacturers, mines, and general miscellaneous contractors. In the first quarter of 2016, portland cement consumption by this segment increased 40.5% from first quarter 2015. In first quarter 2016, the Texas region was the largest regional cement consumer in this category with 519,024 mt, followed by the Northeast region with 206,401 mt.

All Other (000 mt)

PCA Projection

Year	2012	2013	2014	2015	2016	2016	2017
1st Quarter	934	1,135	1,006	1,075	1,510		
% Change Y/Y	-12.7%	21.5%	-11.4%	6.8%	40.5%		
% Change YTD	-12.7%	21.5%	-11.4%	6.8%	40.5%		
2nd Quarter	1,089	1,193	1,111	1,162			
% Change Y/Y	3.6%	9.5%	-6.9%	4.6%			
% Change YTD	-4.6%	15.0%	-9.1%	5.7%			
3rd Quarter	1,100	1,174	1,362	1,262			
% Change Y/Y	0.1%	6.7%	16.0%	-7.4%			
% Change YTD	-3.0%	12.1%	-0.6%	0.6%			
4th Quarter	969	1,014	1,270	1,154			
% Change Y/Y	5.4%	4.6%	25.2%	-9.1%			
% Change YTD	-1.1%	10.3%	5.2%	-2.0%			
Total	4,093	4,516	4,749	4,652		4,953	4,947
% Change Y/Y	-1.1%	10.3%	5.2%	-2.0%		6.5%	-0.1%

All Other Manufacturers and Contractors Regional Divisions 1st Quarter 2016 (Thousands of Metric Tons)

