PCA Portland Cement Association
THE Monitor Flash Report
Breaking Analysis of the Economy, Construction and Cement Industries
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# Cement Shortage Assessment

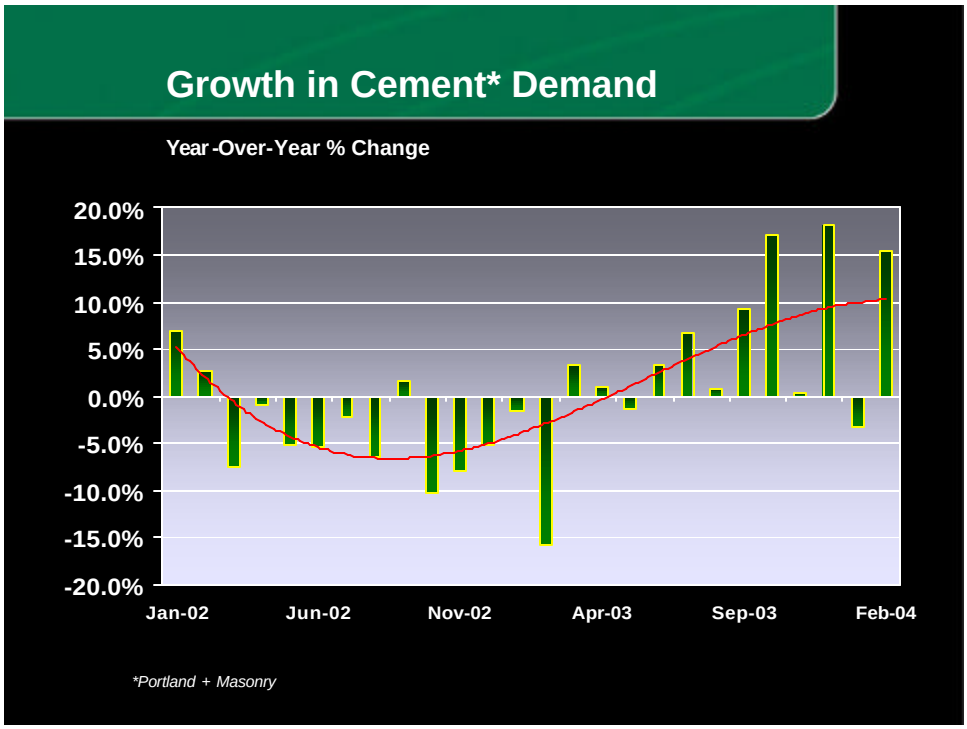
Recently cement has become in short supply in parts of the U.S., particularly in the Southeast and Southwest. In one sense, these shortages reflect the success of efforts by PCA and many others to encourage the use of concrete. However, shortage conditions have the potential to discourage the future use of concrete, particularly if the underlying causes of the shortage are misunderstood.

This report explains the two root causes for the current shortage: 1) global transportation conditions that hinder the flow of cement imports, and 2) added demand associated with the ongoing U.S. economic recovery.

## Point 1:

### Low interest rates, coupled with a rapidly improving economy, resulted in stunning increases in demand for cement since October 2003.

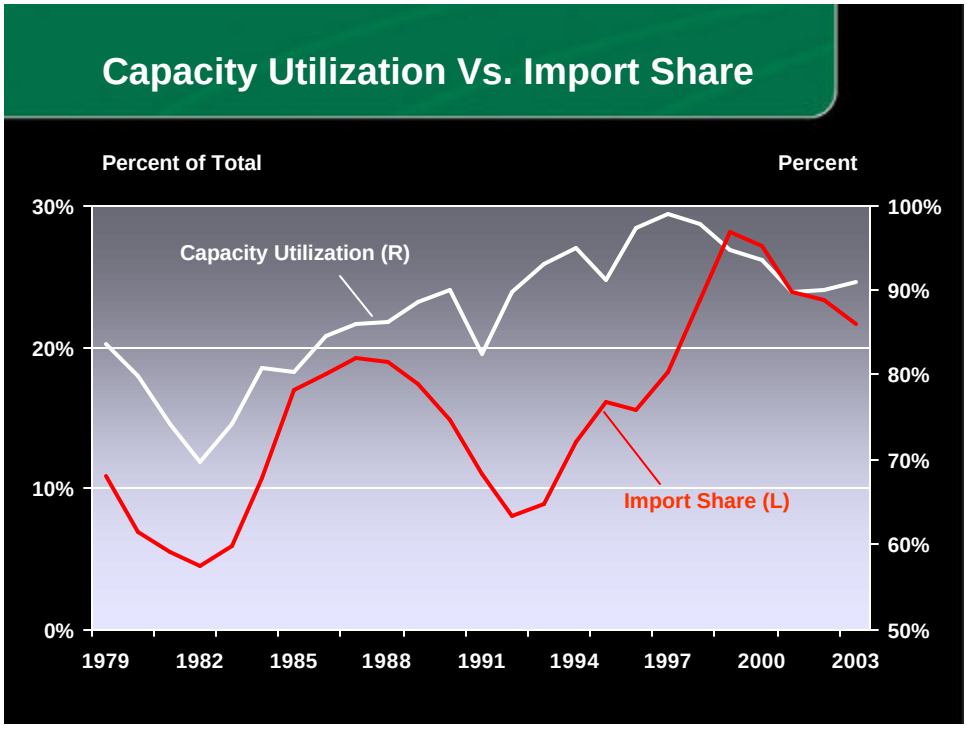
Since the third quarter of 2000, anemic economic growth led to weakness in cement demand. Weakness in the nonresidential and public sectors accounted for soft cement demand. Recently, economic growth accelerated and cement demand eventually began recording gains. The combination of stronger economic growth and favorable winter weather conditions resulted in double-digit cement demand growth during the fourth quarter of 2003.



**Point 2:**

**The U.S. cement industry is dependent on imports as a vital source of supply.**

The domestic cement industry currently has the theoretical capacity to produce 93 million tons of cement per year. Domestic cement production totaled nearly 85 million tons during 2003 and averaged nearly 83 million tons during the past three years. Cement consumption totaled 107.5 million tons during 2003 and has averaged more than 106 million tons during the past three years. Imports compensate for the shortfall between domestic capacity and consumption and are viewed as "swing supply." As capacity utilization rates rise, cement companies rely on imports. During times of lower capacity utilization, import volume generally declines. Based upon past history and accounting for lags, a 100 basis point change in capacity utilization results in a 45 basis point change in import share.



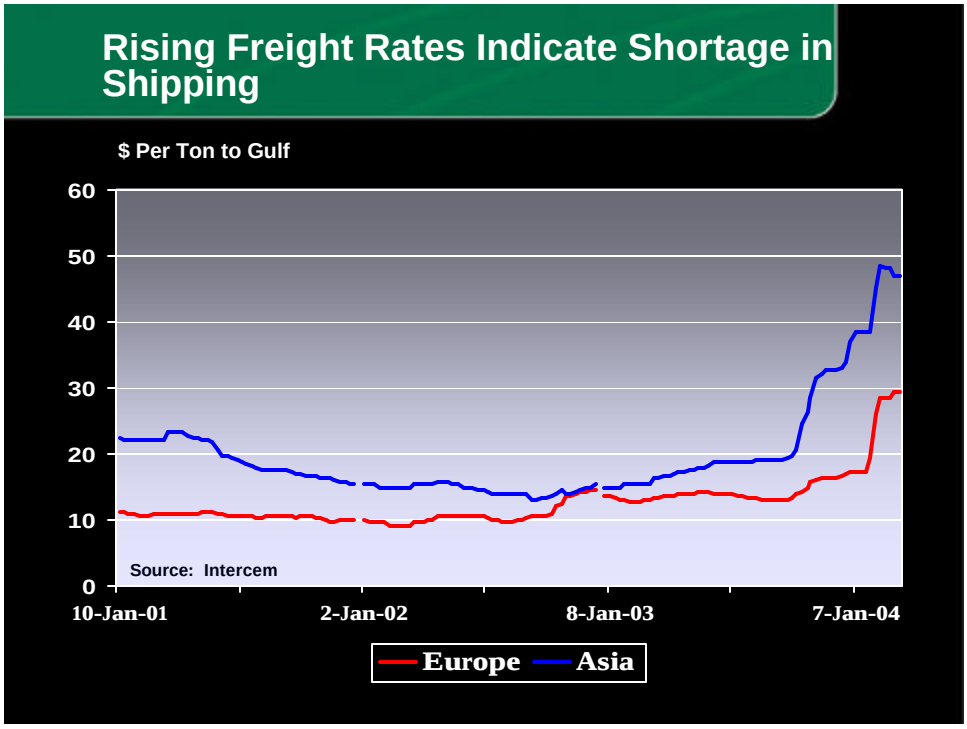

Imports have helped to meet the demand for cement in the U.S. The ability to import cement, however, depends on surplus cement capacity in Asia, Europe, and Latin America, as well as on the availability of ships to carry cement from the producing country to the U.S.

**Point 3:**

**China's surge in economic growth has burdened the global shipping industry resulting in a shortfall in ships available to carry product to the U.S. from Asia and Europe.**

China's goal of improving infrastructure and other commercial projects to prepare for the 2008 Olympic games is dramatic and a key source of the country's 10%+ real GDP growth rate.

This tremendous economic growth has increased demand on international markets for steel scrap, basic metals, wheat, cotton, and a host of other dry bulk products. To meet these multi-product demands, seaborne freight flows to China have increased dramatically and over a relatively short period of time. Tight ship availability and strong freight demand originating from China have increased freight rates by 200% from January 2003 to April 2004.




In an effort to maximize their return, seaborne shipping companies have redeployed the shipping fleet to Asia – generating a shortage of carriers in the Europe-to-U.S. fleet. As a result, freight rates have increased and a decline in ship availability in Europe has materialized.

The increase in freight rates reflects a shortage in seaborne capacity to handle newly emerging international demands. Indeed, despite expanding economic growth and increased trade demands, the number of bulk carrier ships worldwide has been stagnant from 1985 to 2001. China's dramatic increase on international shipping demand was largely unforeseen by the shipping industry.

While the demands for fleet expansion are now clearly evident, building a ship takes two years, which implies that the current shortfall will last at least that long. Plus, a large portion of the international commercial fleet is old and in need of replacement which means that a significant portion of new ship production will go toward replacement rather than expansion, offering little short-term relief.

**Point 4:**

**Lacking the availability of ships to carry cement from Europe and Asia, cement import flows to the U.S. have been disrupted.**

U.S. cement companies depend on cement imports to cover the shortfall between domestic capacity and consumption. The lack of ships plays a critical ingredient in shortage conditions.

**Recent Cement Import Performance**
**- Annualized Growth Rates**

| June | July | Aug | Sept | Oct | Nov | Dec | Jan |
|---|---|---|---|---|---|---|---|
| 3.3% | 6.6% | 0.8% | 9.3% | 17.2% | 0.4% | 18.2% | -3.7% |

Despite the tight supply of shipping vessels, since June 2003, imports have increased in every month with the exception of January 2004.

Unfortunately, these increases have not been enough to close the gap between cement production and consumption. Furthermore, despite efforts to increase import supplies the annualized rate of U.S. cement imports dipped to slightly more than 20 million tons during November and December – well below the 26.4-million-ton average during the 1998-2002 period.

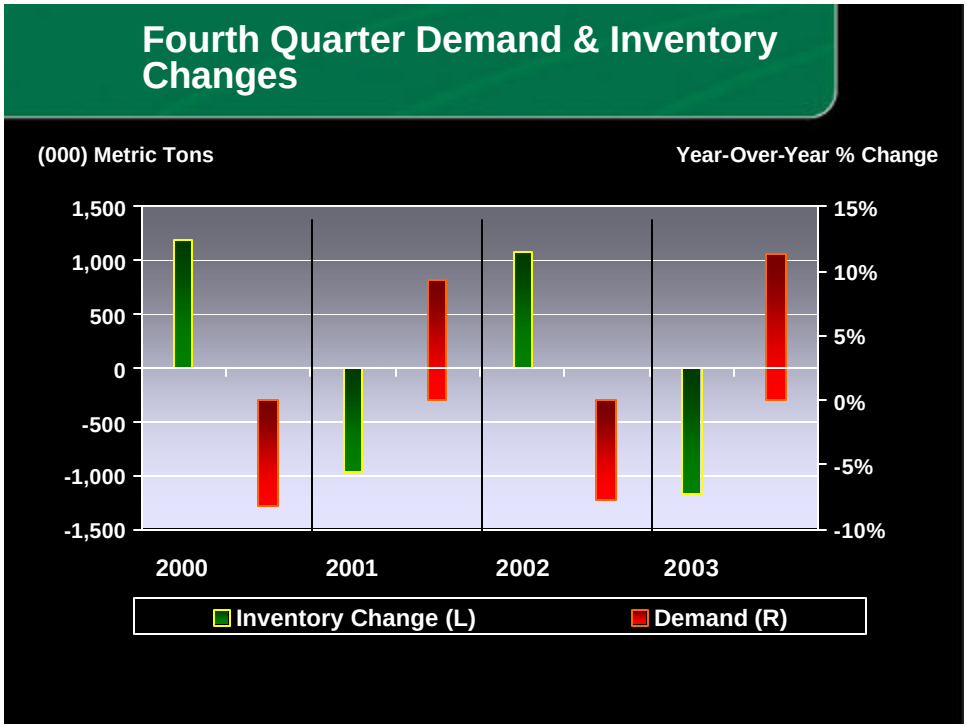
**Point 5:**

**Due to strong winter cement demand, inventory draws cannot be relied upon to manage temporary mismatches between cement demand and supply in many regions of the country.**

As in any market, temporary supply and demand imbalances generally result in an inventory change. When supply exceeds demand, an inventory build materializes. When demand exceeds supply, an inventory draw materializes. This inventory mechanism tends to add stability to the marketplace by ensuring business customers supply and reducing their risks associated with conducting business. It should be noted that demand for any product tends to be stronger in a low risk environment than in a high risk environment. Instability and market imbalances add risk and are not in the best interests of consumers or suppliers.

During the winter months, cement producers typically overproduce to build inventories in preparation of stronger spring demand. Favorable weather conditions, coupled with stronger economic activity, led to strong fourth-quarter 2003 demand which prevented cement producers from building inventories.

According to the United States Geological Survey, cement inventories declined during 2003 from 7.7 million tons to 6.5 million tons – a 1.3 million ton or 15.4% decline. A significant portion of this decline in inventories materialized during the fourth quarter of 2003. (Note: Similar conditions prevailed in 2000, but free-flowing imports and an easing in first-quarter 2001 demand prevented shortages from materializing.)



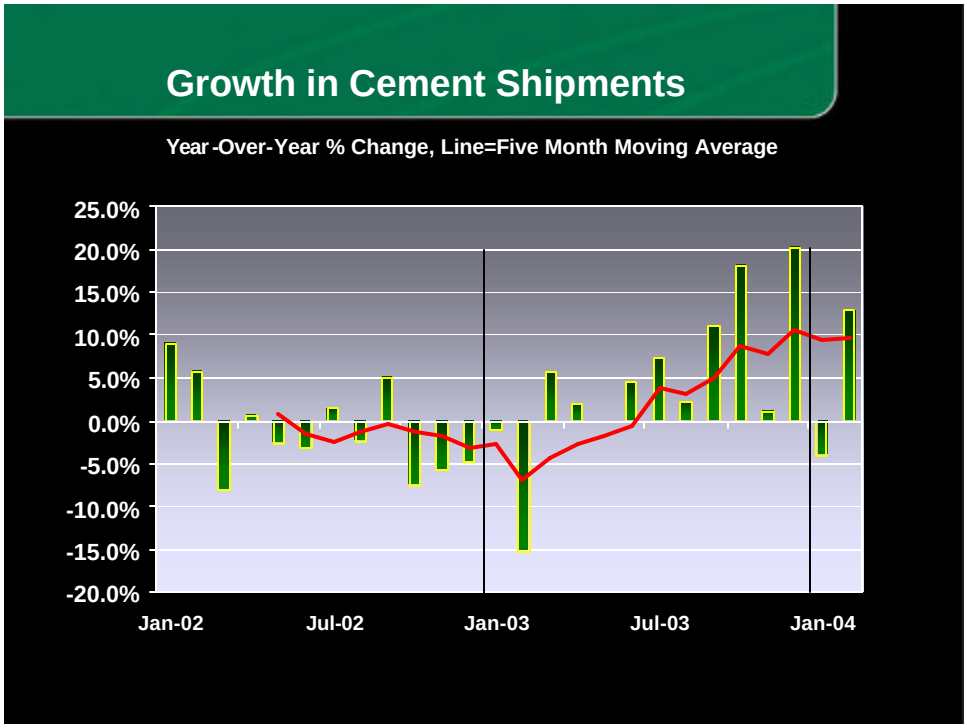

Late 2003 draw down in inventories reflected a temporary mismatch between cement demand and supply in many regions of the country resulting from strengthening demand conditions.

Unfortunately, the late 2003 draw down in inventories resulted in a lower inventory position entering the strong spring selling season. This has resulted in a reduced ability of cement producers to cope with strong demand conditions.

**Point 6:**

**Despite increases in domestic cement shipments, complete relief of import shortfalls cannot materialize due to the size of domestic capacity.**

During the past six months, cement producers have increased shipments by an average of 8.6% over 2002 levels despite a 7% increase in total U.S. cement consumption.




Regions with stronger demand conditions or those dependent on imports have experienced even larger increases in domestic shipments.

Cement Supply Dynamics

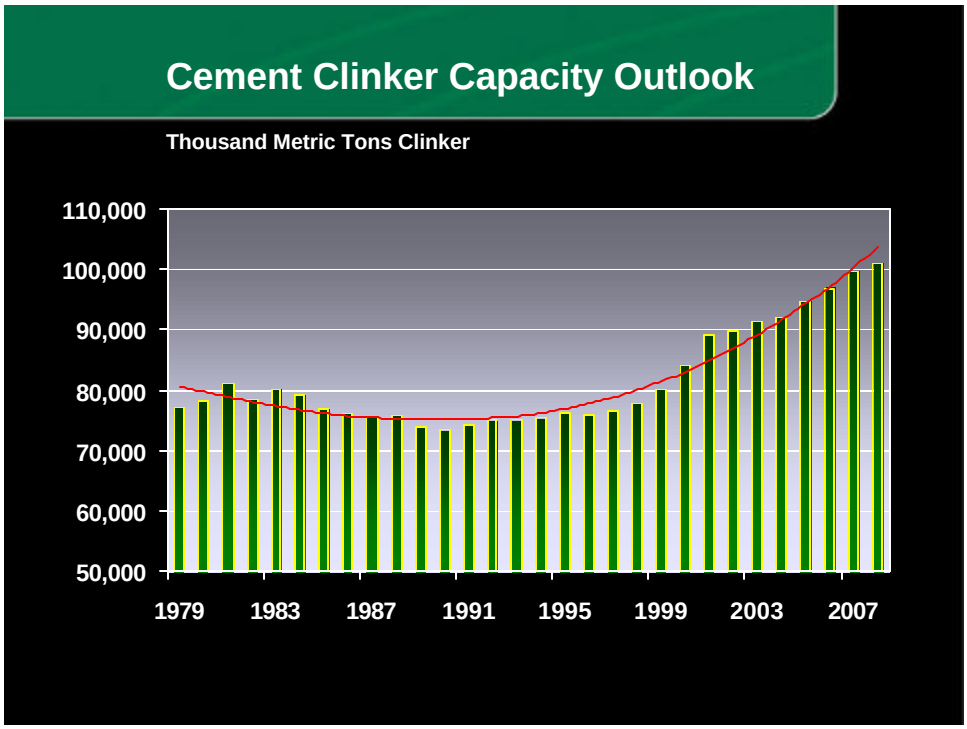
| | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|
| Portland Consumption | 104,074 | 105,195 | 108,079 | 103,766 | 107,521 |
| Domestic Shipments of Portland | 78,214 | 80,335 | 82,243 | 81,032 | 84,960 |
| Clinker Imports | 4,570 | 3,760 | 1,916 | 1,920 | 1,985 |
| Cement Imports | 24,756 | 24,891 | 23,914 | 22,208 | 21,910 |
| Total Imports | 29,326 | 28,651 | 25,830 | 24,128 | 23,895 |
| Clinker Capacity | 80,162 | 84,052 | 89,817 | 91,145 | 93,445 |
| Capacity Share of Total Demand | 77% | 80% | 83% | 88% | 87% |

These increases in domestic shipments must be viewed in the context of their overall importance to total U.S. cement supply. It is improper to assume that a 10% increase in production implies a 10% increase in supply to the market. During the past five years, domestic shipments have averaged 83% of total consumption. A ten percent increase in production, therefore, typically satiates only 8% more of total consumption.

**Point 7:**

**Among some cement producers, kiln production is running at or above its effective capacity.**

To achieve increases in domestic shipments, some plants have been running 24 hours a day, seven days a week, matching or exceeding effective capacity maximums. Theoretically, U.S. cement producers have the capacity to produce 93 million tons of cement clinker. In the real world, plant specific process disruptions hinder the ability of the industry to meet theoretical capacity estimates.




According to our estimates, U.S. kiln capacity is currently running at 97% to 103% of straight time effective capacity. In other words, the domestic industry is generally running at or near flat out maximums.

This frenzied pace of production has been maintained for some time. In some cases, normal downtime for maintenance scheduled for the fourth quarter has been delayed to meet demand increases. Postponement of maintenance, particularly of expensive kilns, can only last so long. Some delayed maintenance may materialize soon, even in the face of stressed market conditions.

**Point 8:**

**U.S. cement producers have embraced an aggressive expansion strategy.**

Shortage conditions are in no one's best interest long term. To this end, many cement companies have engaged in aggressive modernization and expansion programs. Announced capacity increases are projected to result in nearly 10 million tons of new capacity by 2008 – roughly an 11% increase in domestic capacity. The ability to achieve these expansions may often be delayed by the lengthy permitting process. In some cases, expansion projects have been delayed years, potentially affecting construction and U.S. economic growth adversely.

**Point 9:**

**Despite perceptions to the contrary, exports play no role in shortage conditions**

Several "experts" blame the cement shortage on a surge in export demand arising primarily from China. These experts apparently applied market conditions facing steel scrap to the cement industry with no support in statistics or reality.

The U.S. is a net importer of cement – not a net exporter. The U.S. exports only 800,000 to 900,000 tons of cement annually. More than 85% of total annual U.S. exports are to Canada. The high Canadian share of total U.S. exports is explained by U.S. plant locations near the Canadian border. Exports to Canada are more than offset by roughly 5 million tons of Canadian exports (U.S. imports) to the U.S.

United States Cement Exports

| | Total | Exports to Canada | Canadian Share of U.S. Exports | Non Canadian Exports | Shipments by Domestic Producers | Non-Canadian Export Share of Shipments |
|---|---|---|---|---|---|---|
| 2001 | 780,929 | 640,492 | 82.0% | 140,437 | 91,037,000 | 0.2% |
| 2002 | 873,613 | 734,980 | 84.1% | 138,633 | 89,770,000 | 0.2% |
| 2003 | 885,200 | 767,272 | 86.7% | 117,928 | 89,880,000 | 0.1% |

Aside from exports to Canada, the U.S. exported 118,000 tons – roughly 1/10$^{th}$ of one percent of total cement shipments by domestic producers. China accounted for 4,000 tons – a miniscule amount in the context of 90 million tons of U.S. shipments.

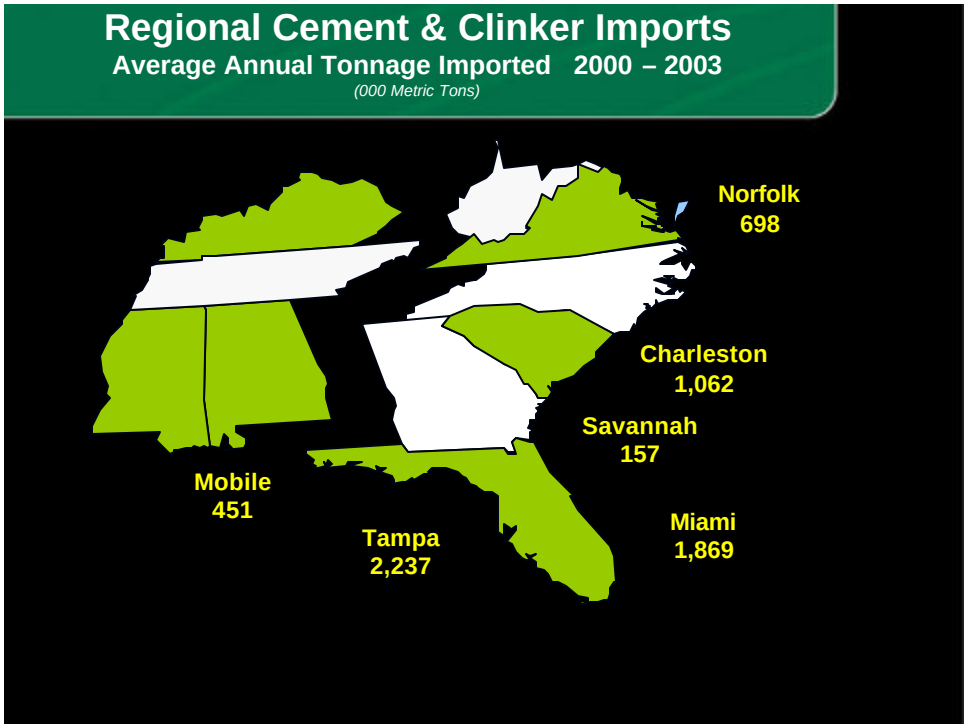
Furthermore, China's consumption of U.S. cement is unlikely to change much in the near future. China's cement capacity is seven times the size of the U.S. market. If this ample capacity is not enough to feed China's immediate and longer term plans, it is likely that it will supplement its supply from other Asian sources – not the U.S.

U.S. cement capacity is directed at U.S. users – not foreign markets. For the most part, what is produced here stays here. Unlike the steel scrap situation, export conditions play absolutely no role in the current shortage situation.

**Point 10:**

**Regions with strong demand growth and high dependence upon cement imports are most vulnerable to tight conditions.**

Regions in the Southeast and Southwest have generally experienced some of the strongest sustained demand gains in the country and are highly dependent upon imports as a source of cement supply. As a result, these regions, particularly Florida, have met with severe supply constraints. In the most severely supply constrained areas some companies have put their customers on allocation – distributing only a portion of ordered cement.




General economic growth has been more pronounced in the southern and western regions of the U.S. As a result, the Southeast has experienced extremely strong cement demand, with annual growth rates for most states, during the last six months of 2003 averaging double digit gains. Furthermore, the growth rates in cement demand accelerated significantly during the fourth quarter.

## Southeastern Demand Growth
- Annual Rate

| | 3rd Quarter | 4th Quarter |
|---|---|---|
| DELAWARE | -1.0% | 8.1% |
| MARYLAND | 5.6% | 23.1% |
| VIRGINIA | 2.5% | 20.0% |
| NORTH CAROLINA | 4.2% | 21.8% |
| SOUTH CAROLINA | 9.0% | 24.5% |
| GEORGIA | 25.7% | 29.7% |
| FLORIDA | 12.6% | 11.0% |
| ALABAMA | 11.7% | 13.9% |
| MISSISSIPPI | 17.5% | 16.7% |
| LOUISIANA | 10.0% | 27.7% |
| TENNESSEE | 8.0% | 11.7% |
| KENTUCKY | 3.5% | 19.7% |
| WEST VIRGINIA | 7.5% | 27.4% |

Florida's growth rates in demand are more muted than many of the other states in the region. This is because while many states in the Southeast experienced demand downturns in 2002, Florida remained strong. In contrast to other states in the region, Florida's impressive gains are measured against strong demand levels from the previous year.

In addition, the Southeast is highly dependent upon imports as a source of supply. Eight major seaports service the southeastern seaboard. Among these, five seaports have reflected large declines in import volume during the second half of 2003 totaling more than a 560,000 ton shortfall from 2002 levels during the same time frame. While modest or neutral gains materialized in the remaining seaports servicing the southeastern coast, they have not been enough to erase these shortfalls.

## Southeast Port Cement Import Declines: 2003.6 – 2003.12

| Charleston | Baltimore | Savannah | Norfolk | Mobile |
|---|---|---|---|---|
| -316,496 | -143,405 | -84,928 | -13,024 | -3,591 |

Once cement tonnage is brought into port, its movement is not tracked. Cement, for example, could enter the New Orleans port and be used locally or transported to Kentucky (or even further) by barge. Furthermore, no attempt has been made to estimate cross flows between regions, but southeastern port traffic generally stays in the region.

To a greater or lesser degree, similar situations exist in Texas, Louisiana, and southwestern states such as Nevada and Arizona. Each shortage condition has its roots in strong demand conditions and transportation constraints.

**Point 11:**

**Regional shortages can ripple through to other regions.**

A shortage in one geographic region forces supply to migrate to areas. This of course reduces supplies in the host region as well. In other words, significant shortages in one region tend to ripple through to other regions, broadening the shortage

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