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Prices and People

Chemical Profile: Chlorine

DEMAND

2004: 14.097 million short tons; 2005: 11.727 million tons; 2009: 14.695 million tons, projected. Demand equals production plus imports (2004: 518,000 tons; 2005: 524,000 tons) less exports (2004: 11,000 tons; 2005: 14,000 tons).

GROWTH

Historical (2000–2005): -2.8% (negative) per year. Future: 5.8% per year through 2009.

PRICE

Historical (2000–2005): High, $380 per ton, contract, tanks, f.o.b. Gulf Coast, frt. equald.; low, $65, same basis. Current: $360 to $375, same basis. Chlorine spot prices are currently at $295 to $310 per ton.

USES

Polyvinyl chloride (ethylene dichloride/vinyl chloride monomer), 36%; other organic chemicals, 41%; inorganic chemicals, 15%; water treatment, 4%; pulp and paper, 1%; miscellaneous, 3%.

MARKET PERSPECTIVE

Chlorine demand dropped 17% last year due to the hurricanes in the Gulf states. In particular, plants manufacturing chlorine derivatives were taken down, which otherwise would have consumed chlorine in ethylene dichloride and vinyl chloride monomer for polyvinyl chloride (PVC) production. This is chlorine's largest application segment. But chlorine consumption has come back strong as PVC demand is up, in part as a response to the hurricane damage of 2005, and also to meet the robust construction needs as the annual building season kicks into high gear.

Though most chlorinated organic chemicals exhibited slow or negative growth in recent years, phosgene is growing by an average of 3% per year because of greater production of isocyanates and polycarbonate. Phosgene alone accounted for nearly 1,650 thousand tons of chlorine last year; about 14% of total demand. In the inorganic chemicals category, chlorine is used in the manufacture of many diverse chemicals such as titanium dioxide, sodium and calcium hypochlorites and hydrogen chloride.

Exported chlorine has been in decline for the past three years as increasing energy costs have made chlorine produced here uncompetitive in previous markets—especially Asia. This high-cost energy effect has also cascaded into chlorine derivatives, making them less competitive and subsequently lessening the demand for elemental chlorine.

OUTLOOK

High energy costs in this country, coupled with low ECU margins for the trailing five years, have discouraged new investment in chlor-alkali plants while older units were being shut-down—about 15% of capacity since 2000. As chlorine demand builds in 2006, the industry will enjoy a profitable period with rising prices in a tight market, but imported chlorine will become more important to bridge the gap between production capability and consumption. Real domestic demand for chlorine derivatives will be somewhat less than GDP growth and chlorine is forecast to grow at 2 percent per annum, but skewed by the bounce-back in 2006 after last year's weather related decline. So, for the forecast period, the anticipated growth is projected to be 5.8%.

Producer	**Capacity***
Ashta, Ashtabula, Ohio	44
Bayer Material Science, Baytown, Tex.	330
Dow Chemical: Freeport, Tex.; Plaquemine, La.	4,600
DuPont, Niagara Falls, N.Y.	85
Erco Worldwide, Port Edwards, Wis.	75
Formosa Plastics, Point Comfort, Tex.	975
Fort James: Green Bay, Wis.; Muskogee, Okla.; Rincon, Ga.	22
GE Plastics: Burkville, Ala.; Mount Vernon, Ind.	185
Georgia Gulf, Plaquemine, La.	440
Magnesium Corporation of America, Rowley, Utah	165
Occidental Chemical: Convent, La.; Ingleside, Tex.; Mobile, Ala.; Muscle Shoals, Ala.; Niagara Falls, N.Y.; Taft, La.; Geismar, La.; Wichita, Kan.	2,585
Olin: Augusta, Ga.; Charleston, Tenn.; McIntosh, Ala., Niagara Falls, N.Y.	1,015
OxyVinyls, Deer Park, Tex.; LaPorte, Tex.	940
Pioneer Americas, Henderson, Nev.; St. Gabriel, La.	310
PPG Industries, Lake Charles, La.; Natrium, W. Va.	1,820
Sunbelt Chloralkali, McIntosh, Ala.	245
Vulcan/Mitsui, Geismar, La.	213
Westlake Vinyls, Calvert City, Ky.	410
TOTAL	14,459

*Thousands of short tons of chlorine per year produced mostly by electrolysis of brine. Most chlorine is generated by the electrolysis of sodium chloride solution using one of three cell types: mercury, diaphragm or membrane. The electrolysis process produces 1.1 tons of 50% caustic soda with each ton of chlorine.

OxyVinyls is a 76/24 joint venture between Occidental Chemical Corporation and PolyOne Corporation. Sunbelt Chloralkali is a 50-50 joint venture between PolyOne and Olin Corporation. Vulcan/Mitsui is a 51/49 joint venture between Vulcan Chemicals and Mitsui & Co.

In March of this year, Bayer MaterialScience announced it would expand chlorine capacity at its Baytown, Tex. facility from 330,000 tons per year to 550,000 tons per year by 2008. Last month, Occidental Chemical revealed it will convert its membrane-cell chloralkali plant at Taft, La. to produce potassium hydroxide (KOH), and then close its Muscle Shoals, Ala., mercury cell chloralkali plant (now producing KOH) when the conversion is completed in 2008. The Muscle Shoals facility has a chlorine capacity of 155,000 tons per year.

Shintech is constructing an integrated VCM plant in Plaquemine, La., which will include a chloralkali plant with a chlorine capacity of 1 billion pounds. The first stage of the project is anticipated to start up later this year, with the chlorine capacity at 600 million pounds. The project should be completed sometime in 2007.

In 2005, Occidental Chemical acquired Vulcan Materials Company and with it, chlorine plants in Geismar, La. and Wichita, Kan. with a combined chlorine capacity of 530,000 tons. A third chlorine plant in Port Edwards, Wis. that was owned by Vulcan was subsequently sold by Occidental to Erco Worldwide. That plant has a chlorine capacity of 75,000 tons.

In early 2004, Pioneer Americas announced it would not resume chloralkali production at its Tacoma, Wash., facility, which has been idled since March 2002. The plant had an annual chlorine capacity of 40,000 tons.

In September, 2003, Formosa Plastics shuttered its 230,000 ton chlorine facility at Baton Rouge, La. Occidental Chemical's chlorine facilities in Delaware City, Del. and Deep Park, Tex. were permanently shut down in the third quarter of 2005, eliminating a combined annual capacity of 725,000 tons.

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