THE PETROCHEMICAL FEEDSTOCK MARKET: ABUNDANCE TURNS TO SCARCITY

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The adhesive industry continues to face upstream cost pressure from two convergent events: Increased energy prices, in the form of more expensive oil and natural gas and capacity constraints among suppliers of key raw materials. The supply of key base chemicals, ethylene, propylene, and butadiene as well as various aromatics has been most affected by both supply constraints and energy costs. Below is a brief synopsis of the ethylene, propylene, and styrene block copolymers markets.

Ethylene

Ethylene - Historic and Projected Capacity
(In MM Lbs.)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Global	213,276	228,670	242,233	245,130	247,783	257,694	270,579	280,320	293,495
% change	N/A	7.2%	5.9%	1.2%	1.1%	4.00%	5.00%	3.60%	4.70%
Capacity utilization %	94%	89%	87%	88%	92%	94%	93%	93%	93%

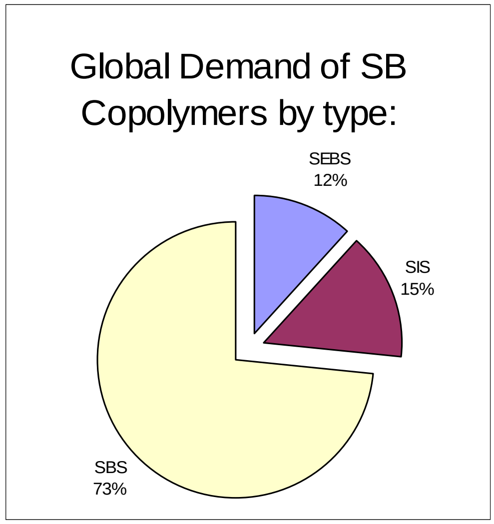
- The demand for ethylene driven by demand for its derivative products, 60% of that being polyethylene plastics.
- The ethylene market is expected to continue its strength in 2006.
- Pricing remains strong in the range of $1,150 per metric ton for North America, somewhat less in Europe and Asia
- Average utilization is expected to be 93% for the coming year. With the high utilization rates, ethylene prices are expected to fall only slightly from their recent highs.
- The top ten producers have between 45-50% of industry capacity worldwide
- Current surpluses in North America represent less than 5% of total demand and is expected to remain tight with scheduled outages for the first half of 2006 and little new capacity coming on line in the short term
- Most of the future planned ethylene capacity is scheduled to be built in the Middle East and Asia, with minimal expansion in North America through the rest of the decade.
- Middle East ethylene capacity could impact the market starting in then next few years but many plants are currently delayed.
- Overall, sustained economic recovery is critical for demand growth to match capacity additions

Propylene

- Propylene consumption is dominated by polypropylene (PP), which is one of the fastest growing derivatives at 5-6%/year.
- The North America propylene market continues to be strong.
- Current spot prices for chemical and polymer grade propylene are 41.5 and 46 cents/lb, respectively.
- U.S. propylene market is very tight as producers have mostly implemented price increases for polymer and chemical grade products
- In Europe, demand continues to be strong and since a number of crackers have experienced operating problems, supply is tight as well.
- The propylene market in Asia has begun to show signs of softening, with China showing lackluster demand.
  - this softening could be temporary as a number of outages in propylene derivative units in Japan created a temporary loosening of demand as well.
- The outlook for propylene remains solid, with strong fundamentals continuing through 2006 and margins continuing near peak levels.
- For propylene, the U.S. dominate position in global trade will be maintained as global steam cracker propylene capacity will fall short of demand by 30 million tons by 2010.
- Middle East ethane-based ethylene production will provide little propylene. With Asia significantly short propylene, on purpose production and high prices will be needed to meet the shortfall.
- Propylene prices are expected to continue following ethylene to historically high levels.

Styrene Block Copolymers

- There are three major types of SB copolymers including:
  - (1) styrene-butadiene-styrene(SBS)
  - (2) styrene-isoprene-styrene (SIS) (profiled in this section)
  - (3) styrene-ethylenebutylene-styrene (SEBS).



- SBS is primarily used in: adhesives & sealants, footwear, polymer modification, modified bitumen roofing, asphalt pavement modifying
- SEBS copolymers rival polypropylene/EPDM blends on a manufacturing cost economics basis and tend to compete in similar vulcanized rubbers applications
- Styrene is currently trading near its all time high at 60 cents/lb., although margins for styrene producers are not as favorable due to lower capacity utilization of 80-85%
- The market for Styrene-isoprene-styrene (SIS) is primarily adhesives (pressure sensitive adhesives).
- There are > 10 product brands and 30-40 product varieties.
- In the U.S. 80-90% of SIS is used in adhesives
- U.S. production of SIS is projected to climb from 103,000 tons in 2005 to 134,000 tons by 2010.
- Only 13 styrene-butadiene-styrene block copolymer producers can produce styrene-isoprene-styrene (SIS) block copolymers

Conclusion

While up cycles have historically been short lived, lasting about 4-5 quarters, the current one may last longer given the current global economic environment. The outlook appears favorable for feedstock producers through 2006 at least and a case can be made for the up cycle extending beyond given the expected capacity growth.

Caution is still advised because of the difficulty in predicting cycles as unforeseen events affecting ability of the downstream businesses to continue to support high prices and the global economy are key risks. Until now firms throughout the value chain have by and large been successful passing costs to customers. However, those firms that are not in a position of power in the value chain will have margins squeezed the longer this cycle continues.

About The Author

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Todd joined The ChemQuest Group, Inc. in 1998 after receiving his MBA from Miami University in Oxford, Ohio. As Manager of Strategic Planning, he maintains up-to-date profiles on major industry participants as well as targeted value chains in the Coatings, Adhesives, and Sealants industries. He also holds a B.B.A. degree in Finance and Management from the University of Cincinnati. Contact Todd Muhleman at 513-469-7555.

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