

December 15, 2008

Chemicals

**Kevin W. McCarthy, CFA**

646.855.1370  
kmccarthy@bofasecurities.com

**B. Christian Massey, CPA, CFA**

646.855.2359  
bernard.c.massey@bofasecurities.com

**Top Picks**

Ticker	Rating	Price	Target
FMC	B	\$44.47	\$66.00
MON	B	\$69.73	\$150.00

**Least Favorites**

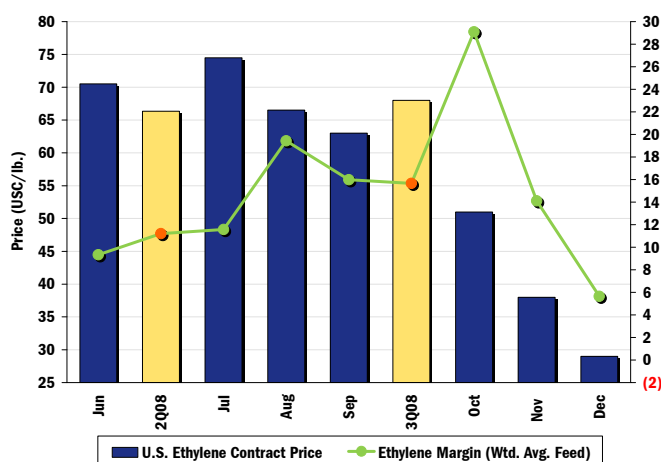
Ticker	Rating	Price	Target
NONE			

**ResinWatch**

**Nearing a Bottom; Margins Crushed in Dec. as Prices, Volumes Plummet**

- ▶ **Conclusion: margins compress further in December.** For commodity resins, we forecast an average price decline of 14% this month with ongoing compression of cash margins, exacerbated by negative operating leverage from low capacity utilization as commodity volumes run -20-30% vs. 3Q08. On a brighter note, spot prices ticked up last week, and volumes did as well, so we may be near a bottom.
- ▶ **Prices for petrochemical building blocks will decline 20-35% in December.** Benzene settled down 33% in December and we expect propylene to settle down \$0.10/lb from a base of \$0.30 for an identical decline of 33%. The Nov. ethylene contract settled down \$0.13/lb, or 25%, and we anticipate a similar drop of \$0.09/lb or 24% in December. In terms of feedstocks, ethane-based ethylene production remains cost-advantaged vs. naphtha, as has been the case since 1/07. Meanwhile, PE resin prices declined \$0.20/lb or 24% in Nov., and we forecast a drop of \$0.10/lb in Dec. Some producers have proposed a PE price hike of +\$0.07/lb for Jan., although we believe a rollover (flat) is more likely unless energy spikes. We expect integrated ethylene/PE cash margins to decline ~\$0.12/lb or 45% in Dec.
- ▶ **Exports remain under pressure.** Export economics are still disadvantaged due to a stronger USD and weak global demand, although NCX reports increased volumes to Asia in the back half of Nov. and Dec. vs. Oct. levels.
- ▶ **Impact to stocks:** Trends still favor consumers of petrochemicals, such as ROH, PPG, DD, CE, RPM and ALB vs. producers NCX, DOW, WLK, and GGC for whom price, margin and volume weakness suggest a tough 4Q. Longer term, we remain cautious on ethylene producers given supply-side risks and weaker demand. Overall, we favor specialty and hybrid names with top picks FMC and MON.
- ▶ **Valuation:** Our coverage universe trades for a median multiple of 9.8x 2008E EPS vs. 10.4x for the S&P500 index.
- ▶ **Sector View:** Market Weight.
- ▶ **PORTFOLIO MANAGERS' SUMMARY: Page 2.**

**Figure 1: U.S. Ethylene Price and Margin**



Source: CMAI, Banc of America Securities LLC estimates

**Figure 2: ResinWatch, December vs. November**

	Price	Margin
Ethylene	↓	↓
High density polyethylene (HDPE)	↓	↓
Low density polyethylene (LDPE)	↓	↓
Linear low density polyethylene (LLDPE)	↓	↓
Integrated PE	↓	↓
Polypropylene (PP)	↓	↓
Polystyrene (PS)	↓	↓
Polyester bottle resin (PET)	↓	↓
Polyvinyl chloride (PVC)	↓	↓

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## Portfolio Managers' Summary

### Stocks We Discuss In This Report

Ticker	Price	Rating	Target
DOW	\$20	Neutral	\$23
EMN	\$30	Neutral	\$36
NCX	\$5	Neutral	\$8
WLK	\$15	Neutral	\$17
GGC	\$2	Neutral	\$4

- ▶ **Our 12-month thesis on the sector.** We rate the chemicals sector as market weight. Our picks include three specialty names (MON, ALB and ARG) and three hybrids (CE, FMC and PPG). We remain cautious on deeply cyclical commodity petrochemical names.
- ▶ **Our call today in a nutshell.** We offer a monthly update of price/margin trends for ethylene and large volume resins.
- ▶ **Risks to our call.** We see the greatest risk to the chemicals sector as sharp deceleration of global demand across numerous end-use markets, coupled with increases in commodity petrochemical production capacity in 2009-2011, especially in Asia and the Middle East.

Table 1

### U.S. Commodity Chemicals Industry Prices and Cash Margins for Selected Polymers and Intermediates (¢/lb)

Prices	Aug	Sep	3Q08	Oct	Nov	Dec	4Q08E	Jan	Feb	Mar	1Q09E
Ethylene	66.5	63.0	68.0	51.0	38.0	29.0	39.3	29.0	31.0	31.0	30.3
Propylene	85.0	65.0	78.3	60.0	30.0	20.0	36.7	20.0	25.0	30.0	25.0
Styrene	85.0	86.5	85.7	81.3	47.3	38.0	55.5	33.0	35.0	37.0	35.0
Benzene (cents / gallon)	445.0	446.0	436.0	424.0	160.0	107.0	230.3	91.5	108.2	125.0	108.2
Chlorine (\$ / short ton)	265.0	265.0	265.0	250.0	240.0	230.0	240.0	220.0	220.0	220.0	220.0
Caustic (\$ / short ton)	790.0	860.0	786.7	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
ECU (\$ / ECU short ton)	1,244.0	1,318.3	1,239.4	1,438.0	1,428.0	1,418.0	1,428.0	1,408.0	1,408.0	1,408.0	1,408.0
High-Density Polyethylene (HDPE)	103.0	96.0	100.7	85.0	65.0	55.0	68.3	54.0	54.0	57.0	55.0
Low-Density Polyethylene (LDPE)	106.0	99.0	103.7	88.0	68.0	58.0	71.3	58.0	58.0	61.0	59.0
Linear Low-Density Polyethylene (LLDPE)	98.0	91.0	95.7	80.0	60.0	50.0	63.3	50.0	50.0	53.0	51.0
Polypropylene (PP)	111.0	95.0	106.0	86.0	55.0	44.0	61.7	43.0	47.0	51.0	47.0
Polystyrene (PS)	122.5	122.5	120.8	117.5	97.5	84.0	99.7	70.0	68.0	69.0	69.0
Polyethylene Terephthalate (PET)	96.0	91.5	96.0	82.5	70.0	65.0	72.5	62.0	61.0	63.5	62.2
Polyvinyl Chloride (PVC)	64.0	64.0	64.0	58.0	51.0	44.0	51.0	41.0	41.0	41.0	41.0
<b>Cash Margins</b>	<b>Aug</b>	<b>Sep</b>	<b>3Q08</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>4Q08E</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>1Q09E</b>
Ethylene (weighted average)	19.4	16.0	15.7	29.1	14.1	5.7	16.3	3.1	4.1	4.0	3.7
Styrene	14.1	16.3	14.4	17.5	16.3	13.9	15.9	10.0	9.5	10.0	9.8
ECU (\$ / ECU short ton)	787.0	879.3	764.9	1,013.5	1,023.4	1,001.8	1,012.9	975.6	978.4	981.1	978.4
High-Density Polyethylene (HDPE)	16.4	11.4	11.3	16.5	14.3	11.1	14.0	7.5	4.5	6.1	6.1
Low-Density Polyethylene (LDPE)	14.0	9.1	8.6	14.4	12.5	9.2	12.1	7.5	4.5	6.2	6.0
Linear Low-Density Polyethylene (LLDPE)	11.7	6.3	6.5	12.3	9.9	6.1	9.4	4.5	1.6	3.1	3.0
Polypropylene (PP)	6.0	10.3	7.5	6.6	6.1	4.8	5.8	3.5	2.8	1.8	2.7
Polystyrene (PS)	37.2	36.7	35.0	37.6	51.8	45.2	44.9	35.7	30.7	30.7	32.4
Polyethylene Terephthalate (PET)	-0.9	-1.3	-2.0	0.6	1.9	0.0	0.8	-1.5	-1.2	-1.3	-1.3
Polyvinyl Chloride (PVC)	18.7	21.2	17.0	25.8	27.3	23.5	25.5	20.3	19.1	19.1	19.5
Integrated ethylene/PE	33.8	25.2	24.9	43.8	26.6	14.8	28.4	9.7	7.7	9.1	8.8

Source: CMAI, Platts, Banc of America Securities LLC estimates

## Summary

### Price erosion continued in December.

**Prices and margins will decline in December.** We anticipate average resin price decreases of 12% in December on the heels of a 22% average decline in November. Cash margins continue to decline, and we anticipate a near-term bottom in 1Q09. The margin picture is mixed, with PE likely to stay flat in December and other resins down by double-digit percentages. Falling feedstock costs are likely to result in a fifth consecutive month of ethylene price declines. Following a decline of \$0.13/lb in November, we forecast another drop of \$0.09/lb in the December contract price of ethylene to \$0.29/lb. Spot ethylene is now trading at ~\$0.15–0.16/lb, or about half that level. Likewise, we expect integrated ethylene/PE resin margins to decline \$0.12/lb in December to \$0.15/lb from \$0.27/lb. While benchmark cash margins still appear healthy on paper in some cases, we believe real world margins will prove less so because: (1) weaker demand will result in negative operating leverage; and (2) higher-cost inventory being worked off at lower product prices, exacerbating earnings pressure among those companies that employ FIFO accounting. On a brighter note, spot prices ticked up slightly last week, and anecdotal evidence suggests that volumes did as well, so we may be near a bottom.

### Suppliers rationalized capacity in December.

**Global demand deceleration reflects 3 key factors:** (1) macro growth slowed (BofA projects U.S. GDP to decline 5.7% in 4Q); (2) downstream inventory is still being rationalized through the supply chain; and (3) a “buyer’s strike as purchasing managers defer orders given the deflationary energy backdrop. From a domestic perspective, a stronger USD and price disparities continue to diminish export activity causing previously exported tons to “back up” into the U.S. market. On the supply side, a key development this month was aggressive rationalization of capacity announced by several major players, including Dow, DuPont, BASF, Nova, Georgia Gulf, and others. As oil prices stabilize and destocking abates in 1H09, we should see apparent demand of -20-30% converge with actual underlying demand, perhaps in the range of -5-7%.

**Resin prices are likely to decline in December.** We project that the December polyethylene (PE) resin contract price will decline \$0.10/lb or 15% along with our expectation of lower ethylene monomer prices for December. Prices among other resins are also expected to decline and we see lower cash margins for all resins except for PE. PET prices could dip 7% while margins will be down more, almost to zero, and could turn negative in 1Q09. PS prices are expected to fall 14%, while margins decline by a similar amount. PVC resin prices will likely decrease 14% in December, with a similar drop in margins. We see PP resin as down 20% in December with lower margins.

### Benzene and propylene prices will drop by one-third in December.

**Prices for petrochemical building blocks will decline 20-35% in December.** We expect the December polymer-grade propylene contract to settle down \$0.10/lb from a base of \$0.30 for a decline of 33%, while the December benzene contract has already settled down \$0.53/gal., or -33% to \$1.07/gal. The Nov. ethylene contract settled down \$0.13/lb, or 25%, and we anticipate a similar drop of \$0.09/lb or 24% in December. In terms of feedstocks, ethane-based ethylene production remains cost-advantaged vs. naphtha, as has been the case since 1/07.

**We continue to forecast a cyclical downturn in 2009-2011.** Our global ethylene supply-demand analysis, which includes project timelines for all major ethylene crackers, suggests a cyclical decline in 2009-2011 based on aggregate capacity growth of 19%, double our demand growth forecast of 9-10% over the same 3-year period. In a global recession scenario, the supply-demand disparity could be exacerbated such that supply could grow at triple the pace of demand with utilization rates falling below

**We favor exposure to specialty chemicals at this juncture in the cycle.**

85%, an unhappy circumstance that portends a long period of weak pricing power for producers.

**We rate the sector as market weight with a preference for specialty names.** We remain cautious on ethylene names (NCX, WLK, DOW and EMN in order of operating leverage) given supply-side risks and deceleration of demand. Overall, we favor shares with significant specialty content, including top picks FMC and MON. Other Buy-rated names include CE, ALB, PPG and ARG. Among these names, CE and ALB are consumers of ethylene. We consider ethylene stocks hard to own in size at this juncture of the cycle given prospects of *supply*-driven cyclical decline and downward estimate revisions as demand slows around the globe.

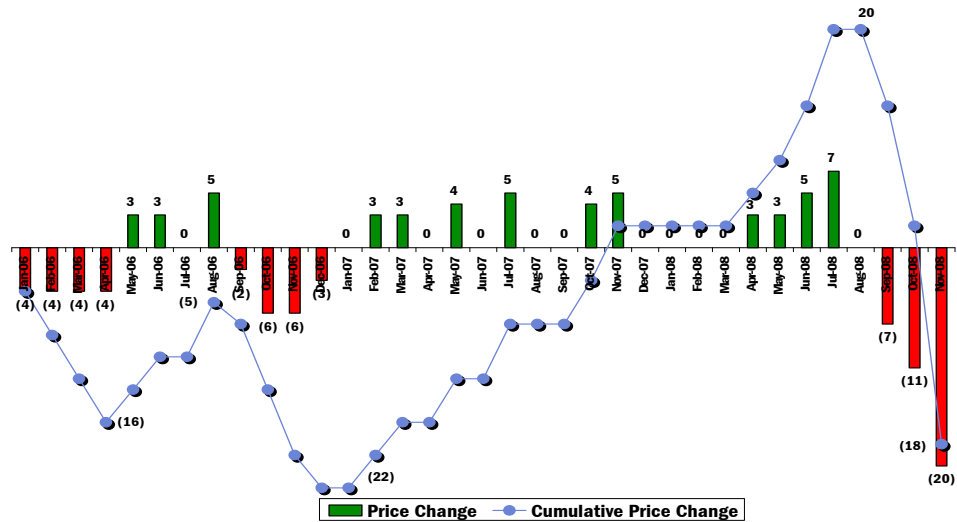
## **Polyethylene (PE)**

**PE price declines accelerated for the third consecutive month in November.** The November PE contract was settled down \$0.20/lb vs. October. Prices have plunged 68% since peaking in August. Four factors explain the price pressure: (1) reduced demand from de-stocking; (2) lower underlying consumption; (3) plunging costs for energy and related feedstocks; and (4) a “buyers’ strike”, or deferral of orders with the expectation of future price declines in a deflationary environment. Following three consecutive monthly declines, PE prices now stand at the same level as in February 2007. Industry consultant CMAI believes prices are likely to decline again in December, finishing this year \$0.10 lower than the November level. There are some indications that prices could bottom in December – January. NOVA Chemicals recently commented that PE orders were trending up in December, and they are trying to achieve a \$0.07/lb price increase for January. We believe a \$0.07 increase in January is unlikely unless energy spikes. HDPE production in 4Q09 will be lowest since 4Q05, leaving utilization rates below 80% for the second straight quarter (hurricanes in 3Q08) despite closures and idling by many producers. Exports declined sharply in November, before rebounding in early December as price gaps narrowed and Asian buyers replenished inventory. PE prices in Asia had declined faster than in North America, while the U.S. Dollar strengthened, making exports more expensive. Elsewhere, spot PE prices in Europe dove ~€320/MT to €1,120 in November, following a €300/MT decline in October, with cheap imports more pronounced than in the U.S. In Asia, PE prices bottomed at least temporarily in November, as producers cut operating rates to manage rising inventory.

November PE prices  
sank another  
\$0.20/lb.

Figure 3

**U.S. High-Density Polyethylene (HDPE)**  
**U.S. Price Movements, January 2006 – Present**  
(USC/lb)



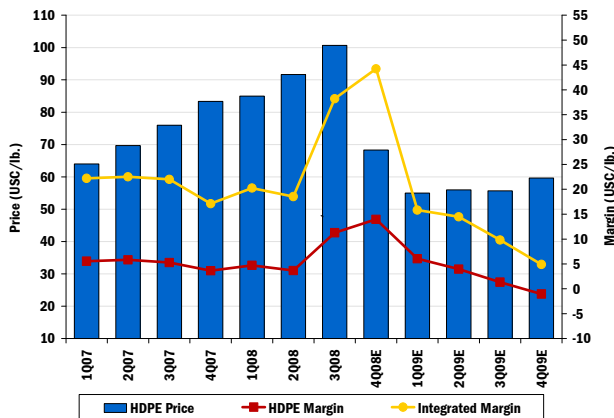
Source: CMAI, Banc of America Securities LLC estimates

PE prices are declining  
with lower feedstock  
costs during 4Q.

**Integrated ethylene/PE cash margins fell in November.** Margins contracted \$0.17/lb after peaking in October, as PE prices declined. We expect margins to fall through 1Q09, when integrated cash margins will be 70% lower than 4Q08. Accounting margins will be substantially lower during 4Q08 as inventory made from higher-cost feedstocks is flushed at lower PE prices. In Figures 4 and 5 we depict PE pricing, margin, and capacity utilization.

Figure 4

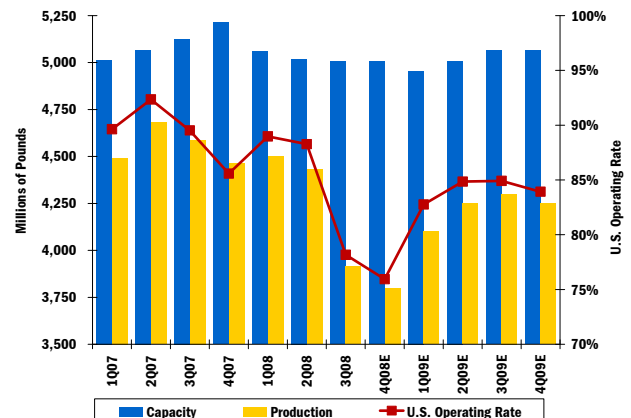
**High-Density Polyethylene (HDPE)**  
**Price and Margin, 2007 – 2009E**



Source: CMAI, Banc of America Securities LLC estimates

Figure 5

**High-Density Polyethylene (HDPE)**  
**Capacity Utilization, 2007 – 2009E**



**We expect 23% of N.A. ethylene capacity to be offline in December.** Many producers idled capacity or ran at lower rates due to poor demand, including Dow Chemical, Eastman Chemical, Equistar, Flint Hills Resources and Chevron. Additionally, Exxon Mobil's capacity in Beaumont, TX is still offline as is DuPont's plant in Orange, TX. Industry consultant CMAI expects that December offline capacity will be significantly to 23%. The nameplate operating rate for U.S. ethylene is forecast to be 74%, and the *effective* operating rate is expected to be 84% in December.

Table 2

**U.S. Ethylene Industry**  
**Ethylene Margins for Selected Feedstocks**  
(USC/lb)

Margins	Aug	Sep	3Q08	Oct	Nov	Dec	4Q08E	Jan	Feb	Mar	1Q09E
Ethylene (wtd.-avg. feedstock)	19.4	16.0	15.7	29.1	14.1	5.7	16.3	3.1	4.1	4.0	3.7
Ethylene (naphtha feedstock)	14.6	12.1	9.2	34.5	15.6	3.1	17.7	-2.0	-2.9	-2.7	-2.5
Ethylene (ethane feedstock)	19.5	20.2	17.6	28.0	17.2	9.2	18.1	8.2	9.0	7.9	8.4
Ethylene (propane feedstock)	22.7	9.5	17.7	27.4	13.6	5.1	15.4	2.9	4.9	6.9	4.9

Source: CMAI, Banc of America Securities LLC estimates

**Advantaged ethane-based economics are important for export economics.**

**Light feeds are still preferred to heavier feeds.** We expect naphtha-based ethylene production economics to remain inferior to gas-linked feeds in December, despite temporary improvement in recent months. Crude oil currently trades at \$44/bbl and natural gas at \$5.55/MMBtu, a ratio of 7.9, which is above that of thermal parity of 6.0, but down significantly from 8.6 in November and 12.2 in October. Although the price of natural gas-derived ethane has been more linked to crude oil (please see Figure 7), ethane-based ethylene production will likely remain advantaged over naphtha as long as oil prices remain high relative to natural gas. Ethane producers have been pricing the feedstock at a discount to naphtha which currently sets the cost ceiling for producing ethylene in N.A.

Figure 6

**Ethane vs. Natural Gas**  
USGC Price Premium on Btu Basis, January 2002 - Present  
(Percent)

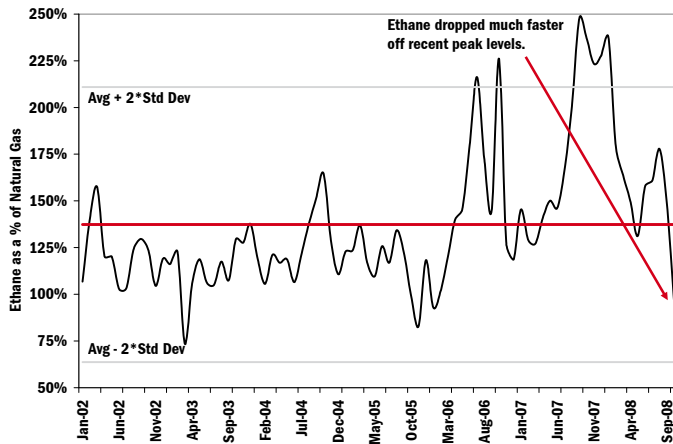
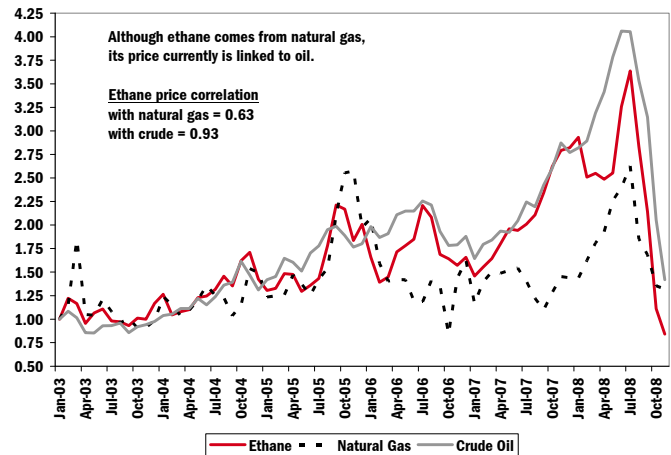


Figure 7

**Ethane vs. Natural Gas and Crude Oil**  
Indexed Prices, January 2003 - Present



Source: CMAI, Banc of America Securities LLC estimates

## Polystyrene (PS)

**Imports could become less of a factor in coming months.**

**We expect PS price declines to continue in December.** November prices settled down \$0.20/lb or 17% to \$0.975/lb. Polystyrene prices will likely continue to descend over the next two months to almost half of their September peak due to several factors: (1) feedstock prices keep falling (December benzene is at \$1.07/g vs. \$1.60 in November and \$4.24 in October); (2) continued destocking (although demand for food packaging appears to be reasonably stable); and (3) Asian import pressure given regional price differentials. We expect imports to become less of a factor in the next few months as regional price differences diminish. PS cash margins will likely decline in December as prices fall faster than costs. In W. Europe, prices are expected to fall in December to €725/ton, compared to ~€965/ton in November and ~€1215/ton in October. In Asia, PS prices fell by \$300/ton to ~\$700/ton, catching up with the fall in styrene. Figures 8 and 9 depict trends in PS price, margin, and capacity utilization. As we show in Figure 8, despite wide variations in raw material costs, margins will likely remain flat.

Figure 8

**Polystyrene  
Price and Margin, 2007 - 2009E**

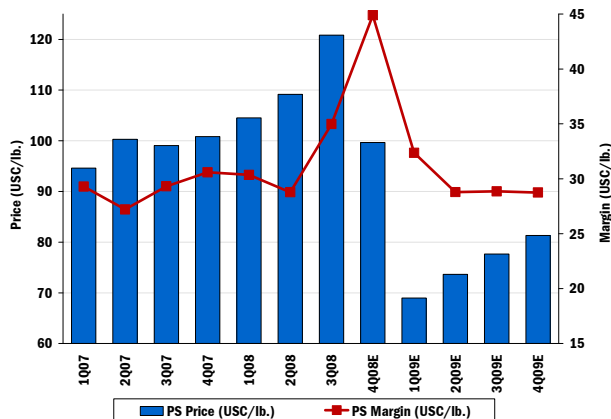
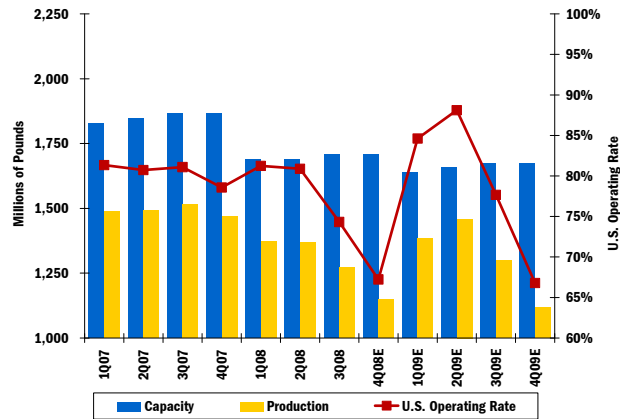


Figure 9

**Polystyrene  
Capacity Utilization, 2007 - 2009E**



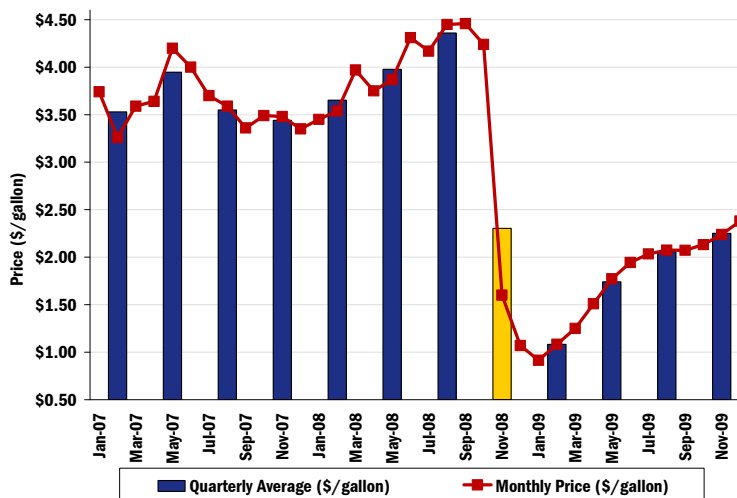
Source: CMAI, Banc of America Securities LLC estimates

**December benzene contract settled \$0.53/gal down to \$1.07.**

**Benzene fell again in December.** The December benzene contract settled down \$0.53/gal, or -33% to \$1.07/gal. Benzene is down 76% since peaking in September. Prices may fall into the \$0.80-0.90 range in January before rebounding (please see Figure 10). Benzene accounts for roughly 2/3 of PS cash cost with each \$0.10/gallon increase adding ~\$0.01/lb to PS cost. However, as we show in Figure 8, we do not expect PS profitability to be affected by benzene prices beyond October and November, as we expect producers to surrender cost relief and likewise pass through any cost increases when benzene costs rise. As a result, we still expect PS margins to remain within a tight range following a spike in 4Q08.

Figure 10

**U.S. Benzene Market**  
**Monthly & Quarterly Prices, January 2007 - December 2009E**  
(USD/gallon)



Source: CMAI, Banc of America Securities LLC estimates

**Competitors continue to rationalize styrenics capacity.** During the past two years, the industry has announced the shut down of roughly a billion pounds of polystyrene and two billion pounds of styrene monomer capacity, which we summarize in Table 3. NOVA chemicals announced idling of its Beaver Valley site on 11/21 with 475 million lbs of capacity, or 6.9% of total N.A. industry capacity. However, there will be capacity re-introduced to the market in December when Ineos NOVA’s Sarnia facility (950 million lbs per year, or 13.8% of total U.S. industry capacity) starts up after a turnaround. Unfortunately, the ongoing PS capacity reduction has been met with a similar, if not higher, reduction in demand. We do not foresee any significant improvement in demand at least until 2H09. Although tighter, the current supply/demand balance has not yet yielded attractive cash margins.

Table 3

**Styrenics**  
**Recent Shutdowns in the Americas**  
(million pounds per year)

	<b>Nameplate Capacity</b>	<b>% N.A. Capacity</b>	<b>Announcement</b>
<b>Polystyrene (PS)</b>			
NOVA (Chesapeake, OH)	300	3.9%	1/19/06
NOVA (Beaver Valley/ Monaca, PA)	475	6.9%	11/21/08
Dow Chemical (Samia, Ontario)	300	3.9%	8/31/06
Ineos NOVA (Montreal, Ontario)	120	1.6%	10/10/07
Ineos NOVA (Belpre, OH)	220	2.9%	11/29/07
Dow Chemical (Midland, MI)	300	3.9%	None; possible
American Polymers (Worcester, MA)	75	0.5%	None; plant closed
<b>Total PS</b>	<b>1,790</b>	<b>23.6%</b>	
<b>Styrene Monomer (SM)</b>			
Sterling (Texas City, TX)	1,700	10.6%	9/18/07
Dow Chemical (Aratu, Brazil)	330	2.1%	12/4/07
<b>Total SM</b>	<b>2,030</b>	<b>12.7%</b>	

Source: Company reports, CMAI, Banc of America Securities LLC estimates

## Polypropylene (PP)

**PP operating rates to stay consistently below 80%.**

**We project lower PP resin prices and cash margins in December.** PP prices in December are expected to settle down \$0.11/lb. Weak economic conditions, destocking, and lower propylene continue to depress the price of PP. Exports continue to drop due to USD appreciation and declining demand around the world. As a result, we have PP prices falling \$0.67/lb or 60% from August to December. Looking ahead, price declines could taper off as the market becomes more balanced, especially for prime material. Industry consultant CMAI expects PP prices to bottom out in December-January. Longer-term, North American producers will have to compete with new capacity in the Middle East, which will enjoy advantaged economics. Capacity additions will play a bigger role in 2010, when operating rates and margin should suffer as a result. CMAI expects excess capacity to reach 10-12 million tons at the bottom of this cycle with industry operating rates of less than 80%. Flint Hill Resources recently announced a shut down of 120 million pounds of PP resin capacity at its site in Odessa, TX. In total, producers have announced shutdowns of PP capacity totaling 3.1 billion lbs/yr, or 14.6% of N.A capacity. On the other hand, we expect at least 2.4 billion lbs/yr and perhaps more capacity to have come online by 2009. We summarize these shutdowns and additions in Table 4.

Table 4

**Polypropylene**  
**Recent and Upcoming Shutdowns and Additions in N.A.**  
(million pounds per year)

	<b>Nameplate Capacity</b>	<b>% N.A. Capacity</b>	<b>Timing</b>
<b>Polypropylene (PP) Shutdowns</b>			
Flint Hill Resources (Odessa, TX)	120	0.6%	2Q09
Ineos	450	2.1%	YE 2007
Ineos (Laporte/Battleground)	520	2.5%	2009
LyondellBasell (2 Canada sites)	840	3.9%	1H08
LyondellBasell (Morris, IL)	300	1.4%	4Q08
Dow Chemical	500	2.4%	YE 2007
Phillips-Sumika	240	1.1%	YE 2008
Koch/Flint Hills (Odessa)	120	0.6%	1H09
<b>Sub-total - PP Shutdowns</b>	<b>3,090</b>	<b>14.6%</b>	
<b>Polypropylene (PP) Additions</b>			
Formosa Plastics	170	0.8%	YE 2007 or yearly 2008
Lyondell Basell (restart of idle)	500	2.3%	1H08
Indelpro	880	4.1%	3Q08
Ineos	200	0.9%	2009
Total Petrochemical	660	3.1%	1H08
<b>Sub-total - PP Additions</b>	<b>2,410</b>	<b>11.2%</b>	
<b>Total - Net</b>	<b>-680</b>	<b>-3.4%</b>	

Source: Company reports, CMAI, Banc of America Securities LLC estimates

In Figures 11 and 12 we show trends in PP price, margin, and capacity utilization. Note that PP price and cash margins are expected to trend down beyond 2008 (please see Figure 11), although this long-term price forecast is predicated on lower propylene (and energy) costs. Operating rates will stay near 80%, a level last seen in 4Q01, due to increased capacity. Lower utilization will drive cash margins down during 2009 and 2010 despite a modest pick up in demand. The downward cash margin trend can be improved if enough capacity is shut in N.A.

Figure 11

**Polypropylene  
Price and Margin, 2007 - 2009E**

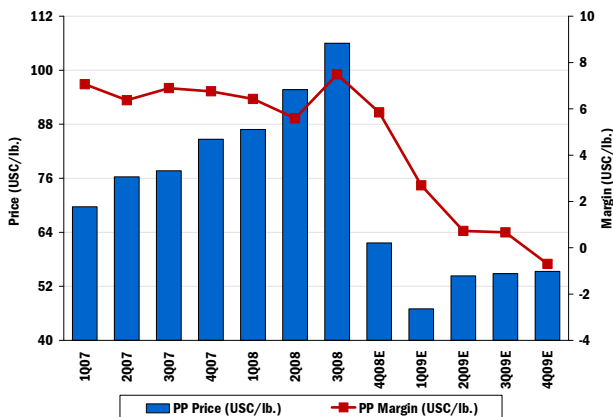
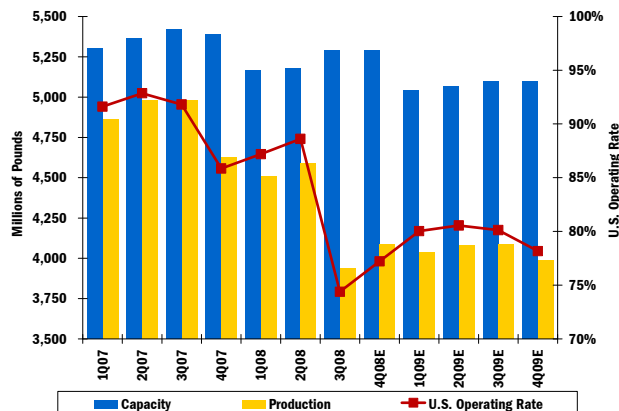


Figure 12

**Polypropylene  
Capacity Utilization, 2007 - 2009E**



Source: CMAI, Banc of America Securities LLC estimates

## Polyethylene Terephthalate (PET)

**We expect non-integrated PET margins to remain negative for now.**

**We project lower PET prices in December.** PET contract prices for November declined \$0.125/lb from October. At the same time, raw materials were down ~\$0.14/lb. Cash margins expanded to \$0.019/lbs as a result, reaching positive territory for the second month in a row. However, we expect cash margins to decline to ~(-0.02)/lb during 1Q09. Moreover, cash margins overstate real-world, reported margins since producers must liquidate high-cost inventory. Imports dropped by about 30% during November, affected by long lead times in the rapidly falling market and more balanced price levels globally. The PET industry must now contend with sustained volume pressure for the first time in history as global PET demand continues to weaken, driven by lower demand for packaged beverages, including bottled water. Demand is declining in most bottled drink categories, with consumers often preferring larger bottles, which typically contain ~1/2 the amount of resin per the same amount of liquid. In Figures 13 and 14 we show trends in PET price, margin, and capacity utilization. As we show in Figure 13, we expect non-integrated PET cash margin will remain negative for the foreseeable future. Figure 14 depicts our view of operating rates, expected to remain at or below 80% in 2008 and drop further towards 2H09.

Figure 13

**PET Bottle Resin  
Price and Margin, 2007 - 2009E**

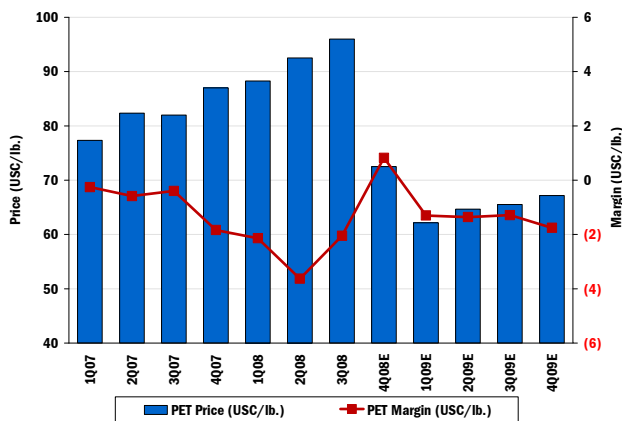
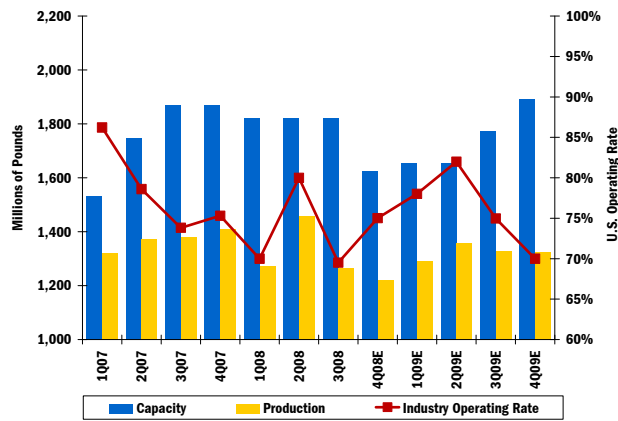


Figure 14

**PET Bottle Resin  
Capacity Utilization, 2007 - 2009E**



Source: CMAI, Banc of America Securities LLC estimates

**Producers are idling PET plants.** Eastman is idling its Columbia, SC plant temporarily to de-bottleneck capacity to 525 KMTPA, while Wellman is idling 210 KMTPA in Palmetto, SC. On 11/25, Invista announced idling of its Millhaven, Canada facility with the capacity of 200 KMTPA (440m lbs), in addition to the company's October announcement regarding idling of 150 KMTPA (330m lbs) Greer, SC facility. By way of contrast, Mossi & Ghisolfi (M&G) plans to add 200 KMTPA (440m lbs) of capacity by de-bottlenecking existing plants at Apple Grove, WV and Altamira, Mexico. Table 5 outlines a schedule of recent and expected PET capacity additions. Announced capacity additions are partially offset by idling of existing capacity.

Table 5

**PET Resin**

**North American Net Capacity Additions, 2006 -2010E**

(million pounds per year)

	2006	2007	2008E	2009E	2010E	Total
Eastman Chemical		410	(661)	386		135
Invista (Greer, SC)			(55)	(275)		(330)
Invista (Spartanburg, SC + Mexico)	110	330	220			660
Wellman	145	145				290
Indorama	20	150	35	26		231
DAK Americas		220	220			440
Mossi & Ghisolfi			440			
Others	(45)	(120)				(165)
<b>Total</b>	<b>230</b>	<b>1,135</b>	<b>199</b>	<b>137</b>	<b>0</b>	<b>1,701</b>
% of N.A. Capacity	2.6%	13.0%	2.2%	1.5%	0.0%	15.8%

Note: Eastman capacity additions are net of capacity rationalization

Source: Company reports, Chemical Data, CMAI, Banc of America Securities LLC estimates

**Polyvinyl Chloride (PVC)**

**Non-integrated PVC margin to revert back to breakeven.**

**We expect prices to decline through January.** PVC prices in October were down \$0.06/lb to \$0.58. We project additional declines in November – January on the back of

lower ethylene input costs. We expect November prices to decline \$0.07/lb, or 12% to \$0.51 from \$0.58. PVC prices in Asia fell to ~450/ton, but there are signs that inventories have been rationalized, so prices are looking for a bottom. Industry consultant CMAI projects that the non-integrated PVC cash margin will stay around breakeven throughout 2009. However, integrated producers should continue to see profits as a result of strong prices for chlorine's co-product, caustic soda, particularly in 2H08 and 1H09. In Figures 15 and 16 we show trends in PVC price, margin, and capacity utilization. As we show in Figure 15, we expect steady weakening of margins beyond 2008.

Figure 15

**Polyvinyl Chloride  
Price and Margin, 2007 - 2009E**

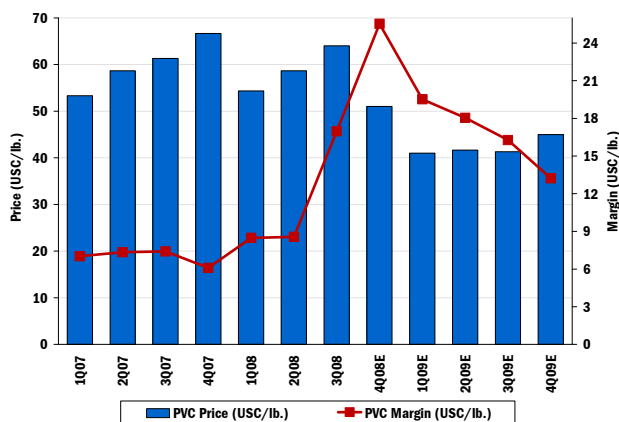
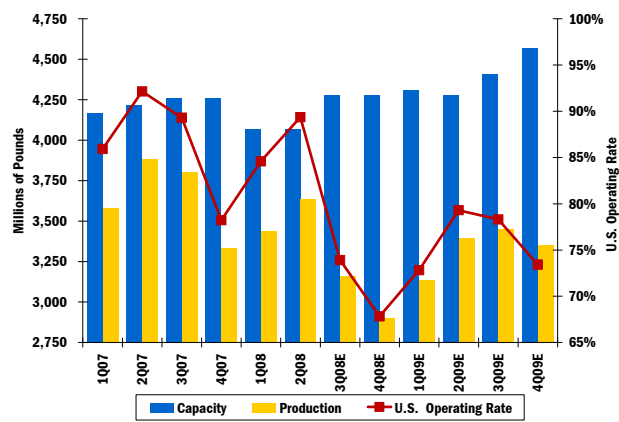


Figure 16

**Polyvinyl Chloride  
Capacity Utilization, 2007 - 2009E**



Source: CMAI, Banc of America Securities LLC estimates

**New PVC production capacity has been added recently.** We still expect a highly competitive PVC landscape in 2009 with net capacity expansion of 3.6% into a market with declining demand. GGC announced that it will close its 450 million lbs/year PVC plant in Sarnia, Ontario. In Table 6 we summarize upcoming PVC capacity additions.

Table 6

**U.S. and Canada PVC Market**  
**Major Incremental Capacity Additions, 2004 - 2011E**  
(million pounds per year)

Company	2004	2005	2006	2007	2008E	2009E	2010E	2011E	Total
Westlake	0	300	300	0	0	225	75	0	900
Shintech	0	0	0	0	385	275	330	330	1,320
Georgia Gulf	0	0	0	0	(700)	0	0	0	(700)
Formosa Plastic	0	0	0	0	400	0	0	0	400
OXY	0	0	(330)	150	0	150	0	0	(330)
<b>Total</b>	<b>0</b>	<b>300</b>	<b>(30)</b>	<b>150</b>	<b>535</b>	<b>650</b>	<b>405</b>	<b>330</b>	<b>1,590</b>
Production Capacity	17,000	17,300	17,270	17,420	17,505	18,155	18,560	18,890	20,480
<b>Net Capacity Increase %</b>	<b>0.0%</b>	<b>1.7%</b>	<b>-0.2%</b>	<b>0.8%</b>	<b>0.5%</b>	<b>3.6%</b>	<b>2.2%</b>	<b>1.7%</b>	<b>8.4%</b>

Note: Georgia Gulf's 700 mmlba capacity reduction in 2008 is net of 450 mmlba new capacity (Plaquemine, LA), temporary idling of 200 mmlba of older capacity and removing 500 mmlba of capacity (Oklahoma City, OK), and shutting 450 mmlba in Samia, Ontario.

Source: Company reports, CMAI, Banc of America Securities LLC estimates.

Commodity or "basic" chemicals are building blocks derived from oil, natural gas, or minerals. They are high-volume, low-growth, cyclical commodity products, the profitability of which can fluctuate dramatically with incremental changes in supply and demand. Including pharmaceuticals, the global chemicals industry generated \$2.7 trillion in sales in 2007, of which the U.S. accounted for approximately 25 percent. Basic chemicals comprise 35% of the market as broadly defined, or nearly 60% of the market excluding pharmaceuticals and consumer products.

**Commodity Chemicals**  
**Quarterly Price and Margin Trends, 2007 - 2009E**

(¢/lb, unless otherwise noted)

	3Q07	4Q07	2007	1Q08	2Q08	3Q08E	4Q08E	2008E	1Q09E	2Q09E	3Q09E	4Q09E	2009E
<b>Building Blocks</b>													
Ethylene	50.2	60.2	48.8	60.5	66.3	68.0	39.3	58.5	30.3	32.8	35.2	41.0	34.8
Propylene (Polymer Grade)	52.3	59.3	51.9	61.2	69.8	78.3	36.7	61.5	25.0	34.3	35.0	36.7	32.8
Styrene	68.1	68.8	68.2	72.5	78.8	85.7	55.5	73.1	35.0	42.7	46.7	50.7	43.8
Benzene (cents / gallon)	355.0	344.0	361.7	365.3	397.7	436.0	230.3	357.3	108.2	174.1	206.0	225.1	178.3
Chlorine (\$ / short ton)	322.5	322.5	316.3	300.0	275.0	265.0	240.0	270.0	220.0	200.0	200.0	190.0	202.5
Caustic (\$ / short ton)	350.0	383.3	332.1	453.3	540.0	786.7	980.0	690.0	980.0	910.0	825.0	690.0	851.3
ECU (\$ / ECU short ton)	707.5	744.2	681.5	798.7	869.0	1,130.3	1,318.0	1,029.0	1,298.0	1,201.0	1,107.5	949.0	1,138.9
<b>Resins</b>													
High-Density Polyethylene (HDPE)	76.0	83.3	73.3	85.0	91.7	100.7	68.3	86.4	55.0	56.0	55.7	59.7	56.6
Low-Density Polyethylene (LDPE)	79.0	86.3	76.3	88.0	94.7	103.7	71.3	89.4	59.0	60.0	59.7	63.7	60.6
Linear Low-Density Polyethylene (LLDPE)	71.0	78.3	68.3	80.0	86.7	95.7	63.3	81.4	51.0	52.0	51.7	55.7	52.6
Polyethylene (Weighted Average)	75.0	82.4	72.3	84.0	90.7	99.7	67.4	85.4	54.6	55.6	55.2	59.2	56.1
Polypropylene (PP)	77.7	84.7	77.1	86.8	95.7	106.0	61.7	87.5	47.0	54.3	54.8	55.3	52.9
Polystyrene (PS)	99.0	100.8	98.7	104.5	109.2	120.8	99.7	108.5	69.0	73.7	77.7	81.3	75.4
Polyethylene Terephthalate (PET)	82.0	87.0	82.2	88.3	92.5	96.0	72.5	87.3	62.2	64.7	65.5	67.2	64.9
Polyvinyl Chloride (PVC)	61.3	66.7	60.0	54.3	58.7	64.0	51.0	57.0	41.0	41.7	41.3	45.0	42.3

**Cash Margins**

(Cents per Pound Unless Otherwise Noted)

	3Q07	4Q07	2007	1Q08	2Q08	3Q08E	4Q08E	2008E	1Q09E	2Q09E	3Q09E	4Q09E	2009E
<b>Building Blocks</b>													
Ethylene (Ethane)	13.0	13.2	12.4	14.7	19.0	17.6	18.1	17.4	8.4	8.7	9.9	11.0	9.5
Ethylene (Propane)	10.2	7.7	10.0	12.3	13.2	17.7	15.4	14.7	4.9	9.6	7.9	5.1	6.9
Ethylene (Naphtha)	9.5	5.0	8.0	3.1	-6.3	9.2	17.7	5.9	-2.5	2.6	2.7	3.2	1.5
Ethylene (Weighted Average)	11.4	9.8	10.8	10.8	11.2	15.7	16.3	13.5	3.7	6.6	7.1	7.0	6.1
Styrene	11.6	10.7	11.2	11.6	11.3	14.4	15.9	13.3	9.8	9.5	9.7	9.6	9.7
ECU (\$ / ECU short ton)	464.8	473.6	420.9	482.0	499.6	764.9	1,012.9	689.9	978.4	885.6	803.3	626.6	823.5
<b>Resins</b>													
High-Density Polyethylene (HDPE)	5.3	3.6	5.1	4.7	3.7	11.3	14.0	8.4	6.1	4.0	1.3	-1.0	2.6
Low-Density Polyethylene (LDPE)	3.6	1.8	3.3	2.5	0.9	8.6	12.1	6.0	6.0	4.0	1.4	-1.1	2.6
Linear Low-Density Polyethylene (LLDPE)	1.2	-0.1	0.9	0.6	-1.0	6.5	9.4	3.9	3.0	0.9	-1.4	-3.4	-0.3
Polyethylene (Weighted Average)	3.6	2.1	3.4	2.9	1.6	9.2	12.1	6.5	5.1	3.0	0.5	-1.8	1.7
Polypropylene (PP)	6.9	6.8	6.8	6.4	5.6	7.5	5.8	6.3	2.7	0.7	0.7	-0.7	0.8
Polystyrene (PS)	29.3	30.6	29.1	30.4	28.8	35.0	44.9	34.8	32.4	28.8	28.9	28.8	29.7
Polyethylene Terephthalate (PET)	-0.4	-1.8	-0.8	-2.1	-3.6	-2.0	0.8	-1.7	-1.3	-1.4	-1.3	-1.8	-1.4
Polyvinyl Chloride (PVC)	7.4	6.1	7.0	8.5	8.6	17.0	25.5	14.9	19.5	18.0	16.3	13.2	16.8
Integrated Ethylene/PE Margin	15.1	11.9	14.2	13.8	12.8	24.9	28.4	20.0	8.8	9.5	7.6	5.2	7.8

Source: CMAI, Banc of America Securities LLC estimates

**Commodity Chemicals**  
**Monthly Price and Margin Trends, 1Q08 - 1Q09E**  
(¢/lb, unless otherwise noted)

	1Q08	Apr	May	Jun	2Q08	Jul	Aug	Sep	3Q08	Oct	Nov	Dec	4Q08E	Jan	Feb	Mar	1Q09E
<b>Building Blocks</b>																	
Ethylene	60.5	63.0	65.5	70.5	66.3	74.5	66.5	63.0	68.0	51.0	38.0	29.0	39.3	29.0	31.0	31.0	30.3
Propylene	61.2	65.0	69.0	75.5	69.8	85.0	85.0	65.0	78.3	60.0	30.0	20.0	36.7	20.0	25.0	30.0	25.0
Styrene	72.5	75.0	78.0	83.5	78.8	85.5	85.0	86.5	85.7	81.3	47.3	38.0	55.5	33.0	35.0	37.0	35.0
Benzene (cents / gallon)	365.3	375.0	387.0	431.0	397.7	417.0	445.0	446.0	436.0	424.0	160.0	107.0	230.3	91.5	108.2	125.0	108.2
Chlorine (\$ / short ton)	300.0	275.0	275.0	275.0	275.0	265.0	265.0	265.0	265.0	250.0	240.0	230.0	240.0	220.0	220.0	220.0	220.0
Caustic (\$ / short ton)	453.3	515.0	530.0	575.0	540.0	710.0	790.0	860.0	786.7	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
ECU (\$ / ECU short ton)	909.6	951.5	973.5	1,017.5	980.8	1,156.0	1,244.0	1,318.3	1,239.4	1,438.0	1,428.0	1,418.0	1,428.0	1,408.0	1,408.0	1,408.0	1,408.0
<b>Resins</b>																	
High-Density Polyethylene (HDPE)	85.0	88.0	91.0	96.0	91.7	103.0	105.0	96.0	100.7	85.0	65.0	55.0	68.3	54.0	54.0	57.0	55.0
Low-Density Polyethylene (LDPE)	88.0	91.0	94.0	99.0	94.7	106.0	106.0	99.0	103.7	88.0	68.0	58.0	71.3	58.0	58.0	61.0	59.0
Linear Low-Density Polyethylene (LLDPE)	80.0	83.0	86.0	91.0	86.7	98.0	98.0	91.0	95.7	80.0	60.0	50.0	63.3	50.0	50.0	53.0	51.0
Polypropylene (PP)	86.8	90.5	95.0	101.5	95.7	112.0	111.0	95.0	106.0	86.0	55.0	44.0	61.7	43.0	47.0	51.0	47.0
Polystyrene (PS)	104.5	107.5	107.5	112.5	109.2	117.5	122.5	122.5	120.8	117.5	97.5	84.0	99.7	70.0	68.0	69.0	69.0
Polyethylene Terephthalate (PET)	88.3	90.8	91.8	95.0	92.5	100.5	96.0	91.5	96.0	82.5	70.0	65.0	72.5	62.0	61.0	63.5	62.2
Polyvinyl Chloride (PVC)	54.3	56.0	60.0	60.0	58.7	64.0	64.0	64.0	64.0	58.0	51.0	44.0	51.0	41.0	41.0	41.0	41.0
<b>Cash Margins</b>																	
<b>Building Blocks</b>																	
Ethylene (Wtd Avg.)	10.8	12.3	12.0	9.3	11.2	11.6	19.4	16.0	15.7	29.1	14.1	5.7	16.3	3.1	4.1	4.0	3.7
Styrene	11.6	11.6	11.8	10.5	11.3	12.7	14.1	16.3	14.4	17.5	16.3	13.9	15.9	10.0	9.5	10.0	9.8
ECU	482.0	496.5	482.8	519.5	499.6	628.5	787.0	879.3	764.9	1,013.5	1,023.4	1,001.8	1,012.9	975.6	978.4	981.1	978.4
<b>Resins</b>																	
High-Density Polyethylene (HDPE)	4.7	4.5	4.1	2.4	3.7	6.1	16.4	11.4	11.3	16.5	14.3	11.1	14.0	7.5	4.5	6.1	6.1
Low-Density Polyethylene (LDPE)	2.5	2.0	1.3	-0.5	0.9	2.9	14.0	9.1	8.6	14.4	12.5	9.2	12.1	7.5	4.5	6.2	6.0
Linear Low-Density Polyethylene (LLDPE)	0.6	0.0	-0.7	-2.3	-1.0	1.6	11.7	6.3	6.5	12.3	9.9	6.1	9.4	4.5	1.6	3.1	3.0
Polypropylene (PP)	6.4	5.6	5.7	5.5	5.6	6.2	6.0	10.3	7.5	6.6	6.1	4.8	5.8	3.5	2.8	1.8	2.7
Polystyrene (PS)	30.4	30.8	27.9	27.7	28.8	31.0	37.2	36.7	35.0	37.6	51.8	45.2	44.9	35.7	30.7	30.7	32.4
Polyethylene Terephthalate (PET)	-2.1	-3.6	-4.0	-3.3	-3.6	-3.9	-0.9	-1.3	-2.0	0.6	1.9	0.0	0.8	-1.5	-1.2	-1.3	-1.3
Polyvinyl Chloride (PVC)	8.5	8.7	9.2	7.8	8.6	11.0	18.7	21.2	17.0	25.8	27.3	23.5	25.5	20.3	19.1	19.1	19.5
Integrated ethylene/PE Margin	13.8	14.8	14.0	9.6	12.8	15.5	33.8	25.2	24.9	43.8	26.6	14.8	28.4	9.7	7.7	9.1	8.8

Source: CMAI, Banc of America Securities LLC estimates

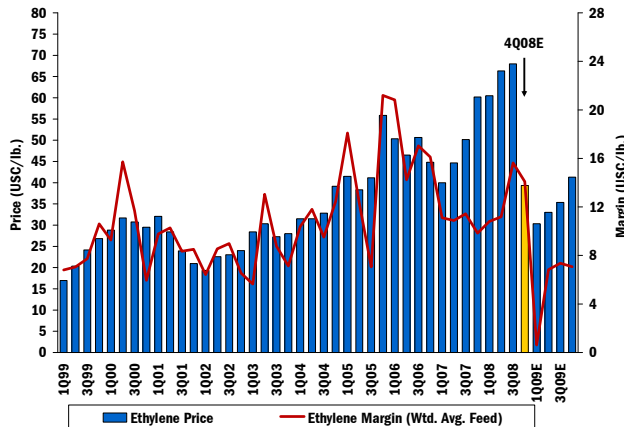
## Ethylene

### Overview

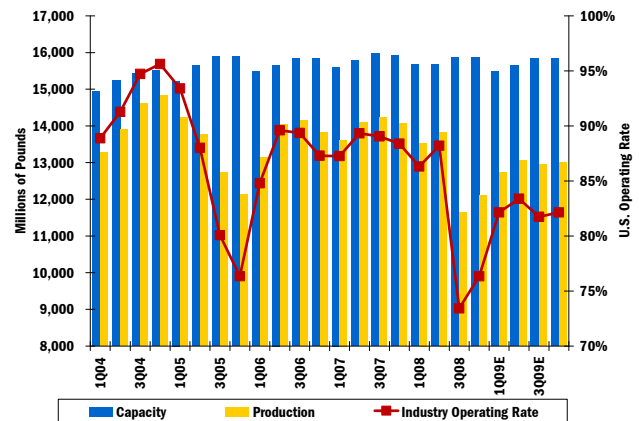
Ethylene is the most common building-block chemical. As one of the largest-volume commodity chemicals produced worldwide, it is used to produce plastics, fibers and other organic chemicals for the packaging, transportation, construction and other industries. As a monomer, it is polymerized to form polyethylene, the most common plastic in the world. Global ethylene production has grown ~4% per year since 1998 to ~120 million metric tons in 2006, with an estimated value of over \$100 billion. Production is expected to grow fastest in the Middle East at 14%+ per year, followed by Asia at 5% per year. On a global basis, we expect demand to grow at an average annual rate of 3% through 2010.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Dow	U.S.	10,249	8%
2	SABIC	Saudi	8,338	7%
3	Exxon Mobil Corp.	U.S.	8,070	6%
4	Royal Dutch/Shell	Netherlands	6,515	5%
5	SINOPEC	China	4,930	4%
<b>Sub-total</b>		<b>38,102</b>	<b>30%</b>	
Other		88,542	70%	
<b>Total</b>		<b>126,644</b>	<b>100%</b>	

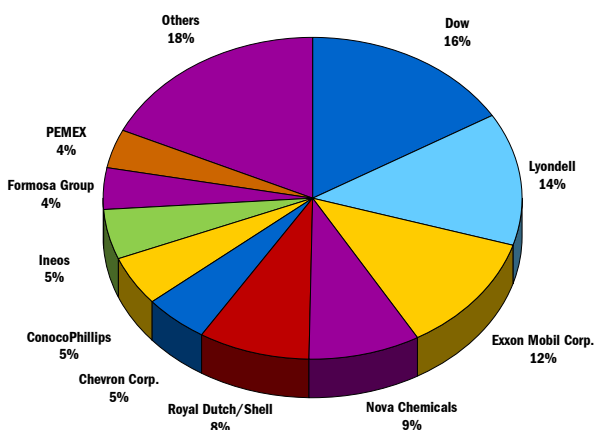
Ethylene Price and Margin, 1999 - 2009E



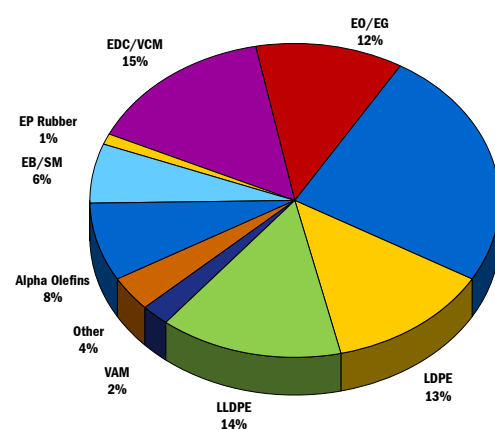
Ethylene Industry Capacity Utilization, 2004 - 2009E



Ethylene Market Share, 2008E



Ethylene Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices

Source: CMAI, SRI, Banc of America Securities LLC estimates

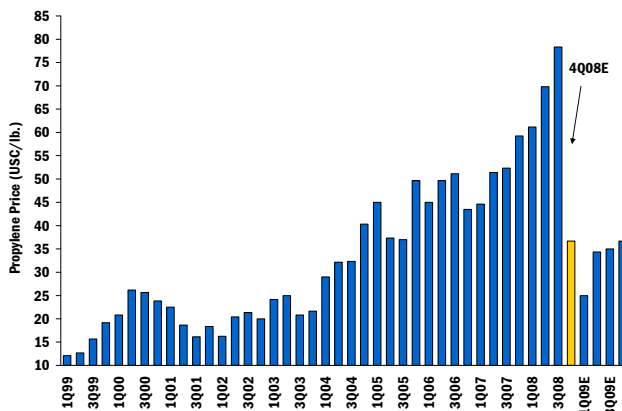
## Propylene

### Overview

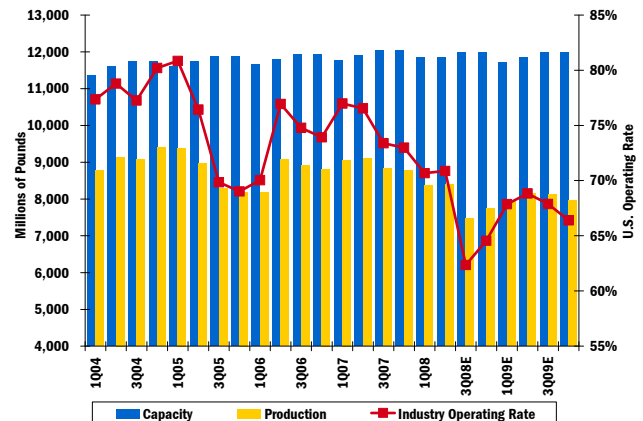
Propylene is a common building-block chemical. As a monomer, it is polymerized to form polypropylene. The manufacture of polypropylene accounts for over half of the world's propylene consumption, which consequently drives the demand. Other markets include acrylonitrile, oxo chemicals, propylene oxide, cumene, isopropyl alcohol and polygas chemicals. In 2006, we expect worldwide production of propylene to reach 67 million metric tons. Consumption of propylene worldwide is expected to grow at an average annual rate of 4% through 2007. Sources of propylene to meet this demand include FCC splitters, propane de-hydrogenation facilities and ethylene co-product streams.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Royal Dutch/Shell	Netherlands	4,319	6%
2	Exxon Mobil Corp.	U.S.	4,312	6%
3	SINOPEC	China	3,812	5%
4	Total	France	3,200	4%
5	Dow	U.S.	3,153	4%
<b>Sub-total</b>		<b>18,796</b>	<b>24%</b>	
Other		58,846	76%	
<b>Total</b>		<b>77,642</b>	<b>100%</b>	

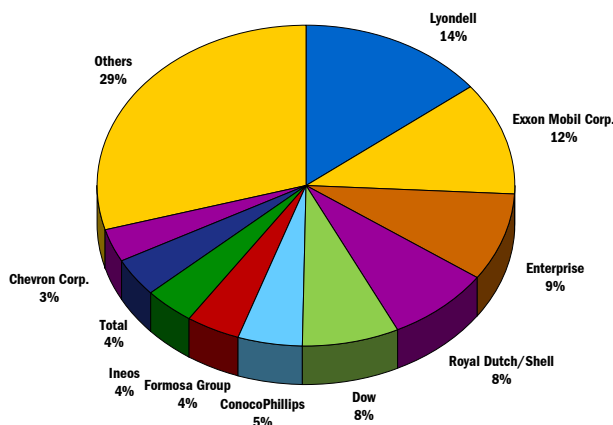
Propylene Price, 1999 - 2009E



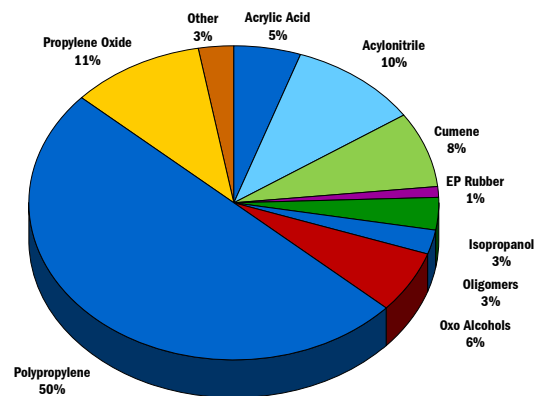
Propylene Industry Capacity Utilization, 2004 - 2009E



Propylene Market Share, 2008E



Propylene Demand, 2008E



Note: Data shown graphically is for North America Domestic Market Polymer Grade at Contract Prices

Source: CMAI, SRI, Banc of America Securities LLC estimates

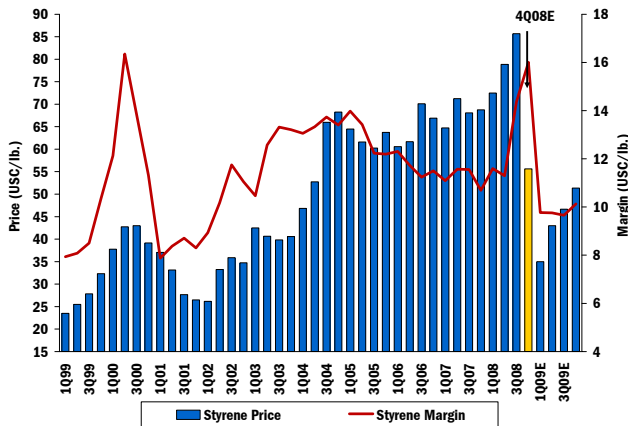
## Styrene

### Overview

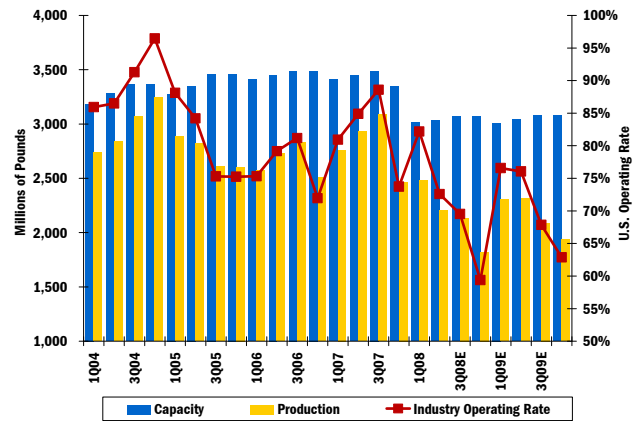
Styrene is a common, aromatic building-block chemical derived from ethylbenzene, which is derived from benzene, a derivative of crude oil. Styrene monomer can be polymerized to form polystyrene, the fourth most common polymer in the world after PE, PP and PVC. Polystyrene accounts for nearly two-thirds of styrene demand. Other uses include styrene-butadiene (SB) latexes, acrylonitrile-butadiene-styrene (ABS) resins and SB rubber. U.S. styrene demand is expected to exceed 10 billion pounds in 2006. Styrene is produced via two methods, the conventional ethylbenzene-styrene monomer (EB/SM) method and a newer propylene oxide/styrene monomer (PO/SM) method, which accounted for about 20% of global styrene production in 2005.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Royal Dutch/Shell	Netherlands	2,516	8%
2	Dow	U.S.	2,244	8%
3	BASF AG	Germany	2,031	7%
4	Total	France	1,873	6%
5	Lyondell	U.S.	1,747	6%
<b>Sub-total</b>		<b>10,410</b>	<b>35%</b>	
Other		19,364	65%	
<b>Total</b>		<b>29,774</b>	<b>100%</b>	

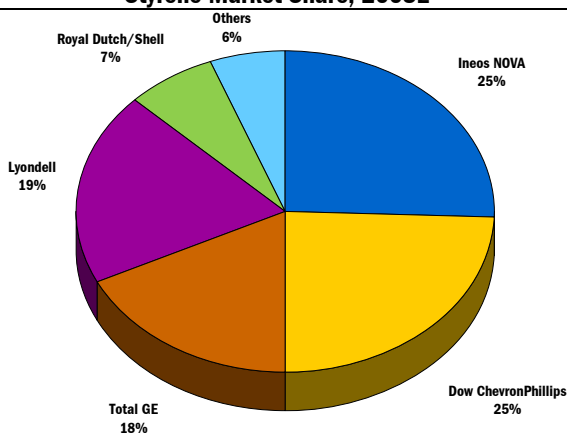
Styrene Price and Margin, 1999 - 2009E



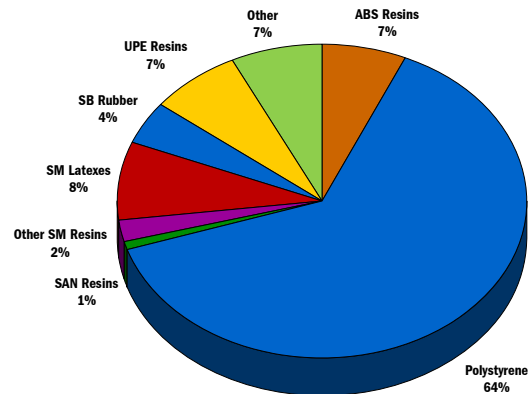
Styrene Industry Capacity Utilization, 2004 - 2009E



Styrene Market Share, 2008E



Styrene Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices

Source: CMAI, SRI, Banc of America Securities LLC estimates

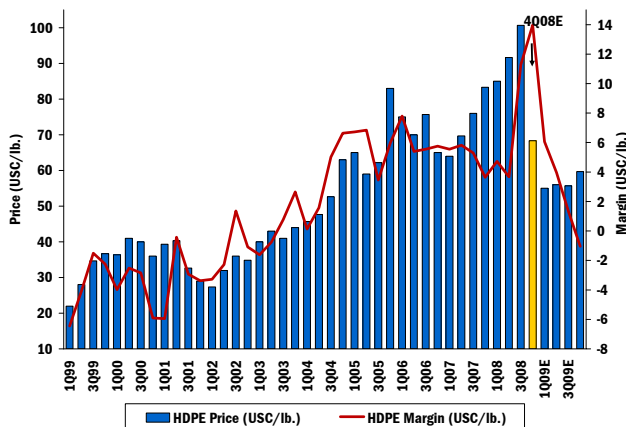
## High Density Polyethylene (HDPE)

### Overview

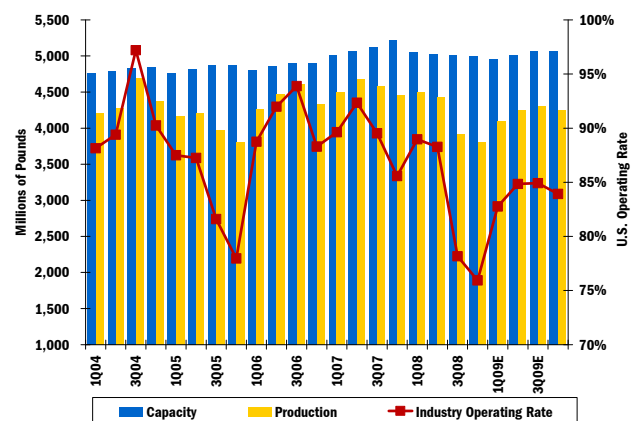
In terms of volume, HDPE is the third-largest commodity plastic material in the world after PVC and PP. HDPE is a global business with an estimated value of \$34 billion based on 2005 U.S. prices. In 2006, U.S. demand for HDPE is forecast to be over 18 billion pounds. Packaging accounts for roughly 75% of the world HDPE demand, followed by Construction (10-15%) and other applications (10-15%). Net exports account for less than 1% of global demand. HDPE demand is highly cyclical. The industry has undergone consolidation and restructuring, as HDPE becomes further commoditized.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent
1	Exxon Mobil Corp. U.S.	2,531	7%
2	Ineos Belgium	2,061	6%
3	Dow U.S.	1,825	5%
4	SABIC Saudi	1,755	5%
5	Access Industries U.S.	1,523	4%
<b>Sub-total</b>		<b>9,732</b>	<b>28%</b>
Other		25,030	72%
<b>Total</b>		<b>34,762</b>	<b>100%</b>

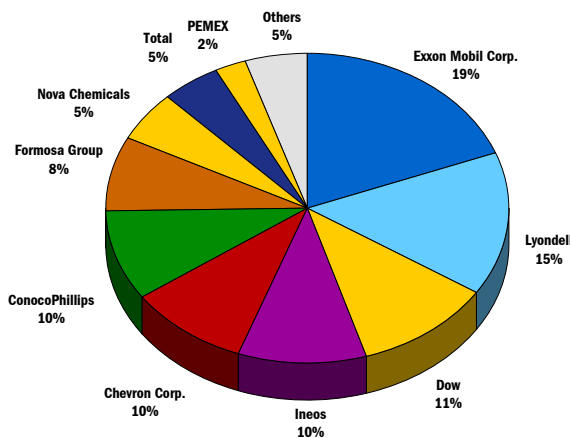
HDPE Price and Margin, 1999 - 2009E



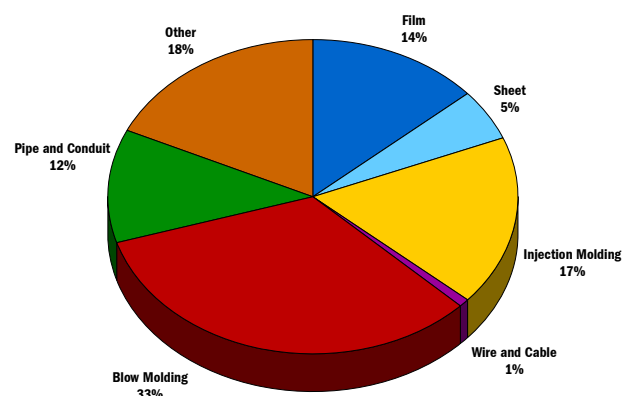
HDPE Industry Capacity Utilization, 2004 - 2009E



HDPE Market Share, 2008E



HDPE Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices  
Source: CMAI, SRI, Banc of America Securities LLC estimates

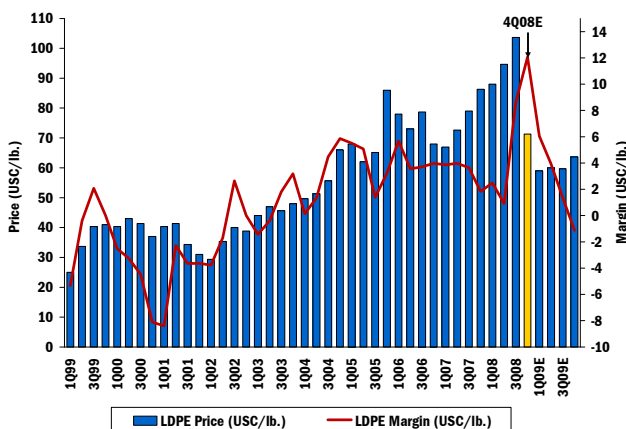
## Low Density Polyethylene (LDPE)

### Overview

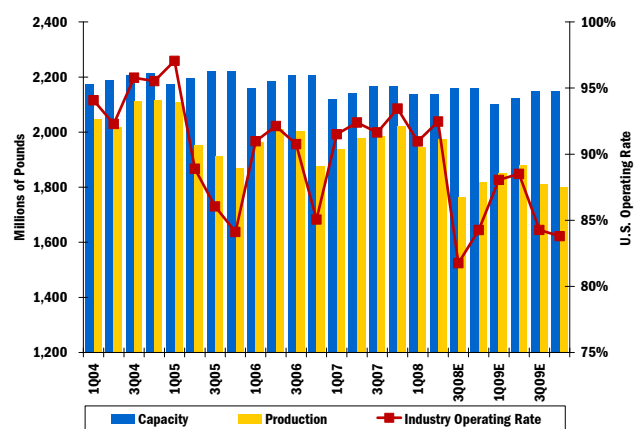
In 2006, North American demand for LDPE is forecast to exceed 8 billion pounds. Consumption of LDPE is expected increase 2-3% per year through 2007. Film applications (45%) are by far the largest market for LDPE, split roughly 50/50 between packaging and non-packaging uses. Typical packaging applications include food containers, industrial liners, and grocery bags. Typical non-packaging uses include household wrap, garbage bags, industrial sheeting and diapers. The second largest market (17%) is extrusion coating, where typical applications include coating on paper and paperboard, and other moisture barriers.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Dow	U.S.	1,748	8%
2	Exxon Mobil Corp.	U.S.	1,509	7%
3	Access Industries	U.S.	1,013	5%
4	SINOPEC	China	956	5%
5	Ente Nazionale Idr	Italy	837	4%
<b>Sub-total</b>		<b>6,063</b>	<b>29%</b>	
Other		14,727	71%	
<b>Total</b>		<b>20,790</b>	<b>100%</b>	

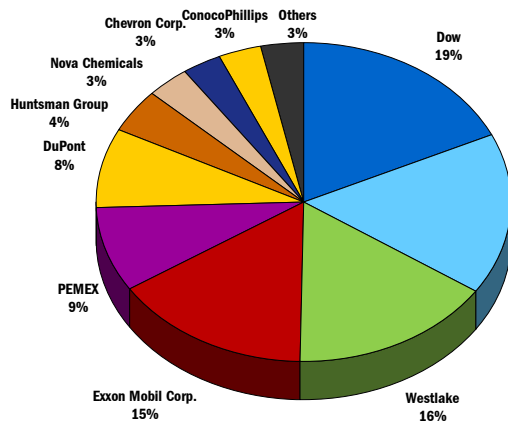
LDPE Price and Margin, 1999 - 2009E



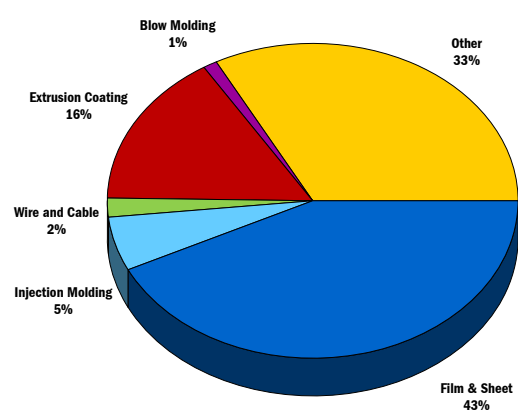
LDPE Industry Capacity Utilization, 2004 - 2009E



LDPE Market Share, 2008E



LDPE Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices  
Source: CMAI, SRI, Banc of America Securities LLC estimates

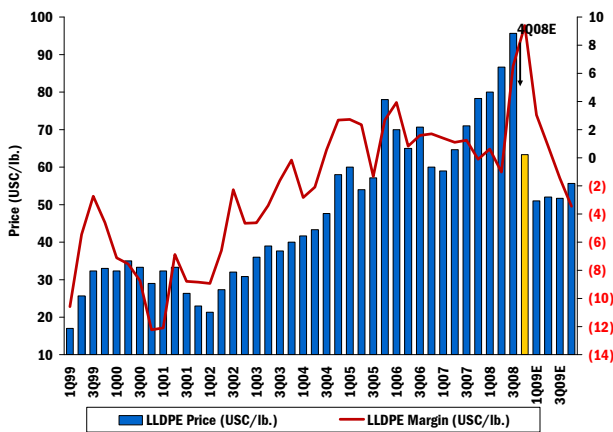
## Linear Low Density Polyethylene (LLDPE)

### Overview

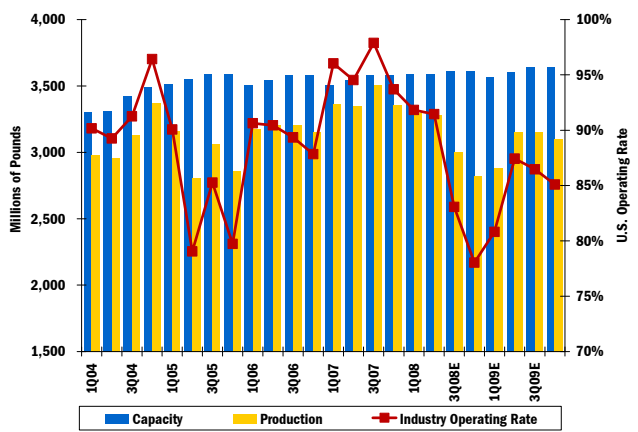
LLDPE is produced in low-pressure, “swing-capacity” plants capable of alternatively producing high-density polyethylene (HDPE). In 2006, U.S. demand for LLDPE is forecast to exceed 12 billion pounds. Compared to LDPE, LLDPE has a higher melting point, lower clarity, increased tensile strength and better puncture and tear resistance. This has allowed LLDPE to gain market share in many packaging end-markets at the expense of LDPE. The major uses for LLDPE are: Film (67%), injection molding, rotomolding, wire and cable, and other uses including extrusion coating, adhesives and sealants, and blow molding. LLDPE's most important market, film, is growing at 3 percent. Film is used in packaging (food, stretch film, shrink film) and non-packaging (trash bags, other bags, diapers) applications.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Dow	U.S.	4,477	20%
2	Exxon Mobil Corp.	U.S.	2,964	13%
3	SABIC	Saudi Arabia	1,590	7%
4	SINOPEC	China	996	5%
5	Nova Corporation	Canada	880	4%
<b>Sub-total</b>		<b>11,051</b>	<b>50%</b>	
Other		11,038	50%	
<b>Total</b>		<b>22,089</b>	<b>100%</b>	

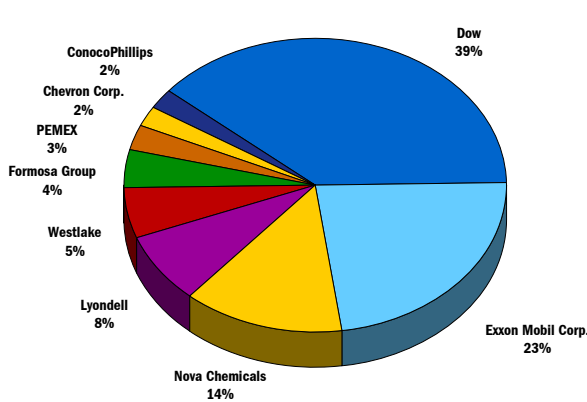
LLDPE Price and Margin, 1999 - 2009E



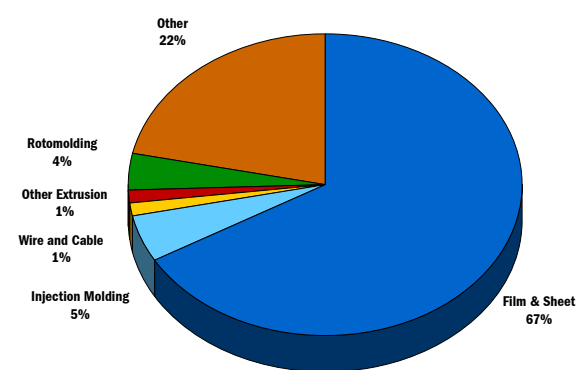
LLDPE Industry Capacity Utilization, 2004 - 2009E



LLDPE Market Share, 2008E



LLDPE Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices  
Source: CMAI, SRI, Banc of America Securities LLC estimates

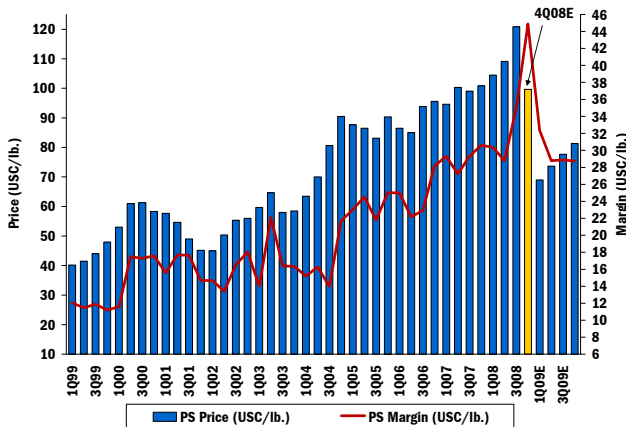
## Polystyrene (PS)

### Overview

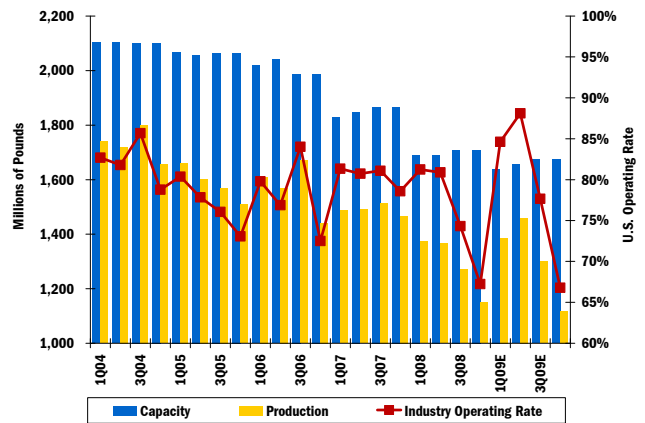
Polystyrene (PS) is a thermoplastic resin. Because of its low cost and easy processability, PS is used in many applications including packaging, toys and construction. There are three basic types of PS: crystal (general-purpose), impact and expandable beads. In 2006, we expect U.S. demand to reach almost 7 billion pounds. Demand is expected to grow at an annual rate of 2% through 2007. The largest use of PS is in packaging applications (48%), followed by expandable beads, consumer and institutional, electrical, and construction.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent	
1	Dow	U.S.	2,003	13%
2	BASF AG	Germany	1,393	9%
3	Total	France	1,368	9%
4	Nova Corporation	Canada	1,143	8%
5	Chi Mei	Taiwan	675	4%
<b>Sub-total</b>		<b>6,580</b>	<b>44%</b>	
Other		8,473	56%	
<b>Total</b>		<b>15,053</b>	<b>100%</b>	

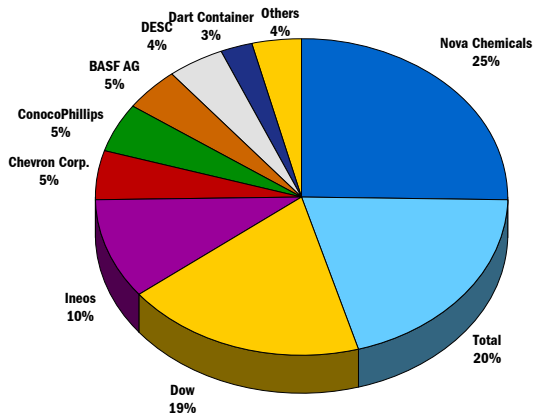
PS Price and Margin, 1999 - 2009E



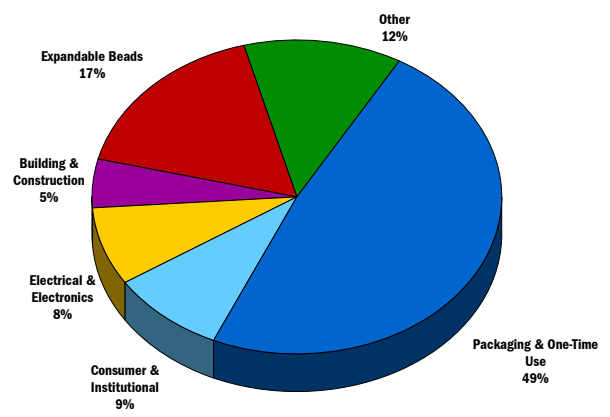
PS Industry Capacity Utilization, 2004 - 2009E



PS Market Share, 2008E



PS Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices

Source: CMAI, SRI, Banc of America Securities LLC estimates

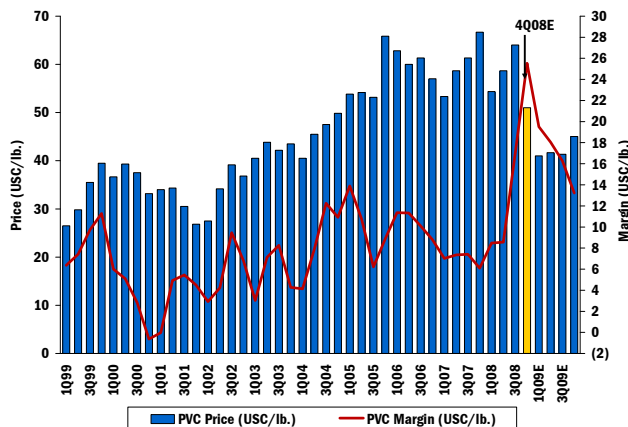
## Polyvinyl Chloride (PVC)

### Overview

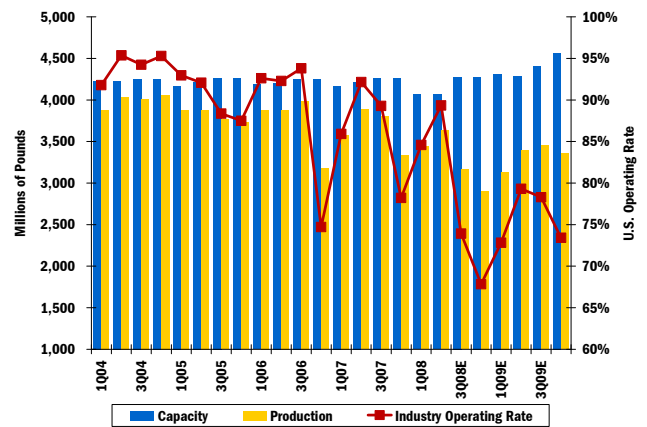
PVC is the second-largest commodity thermoplastic produced in the world after PE. It is highly versatile, able to be converted into rigid products of strength and hardness or flexible products. About 50% of world consumption is used in construction. U.S. PVC consumption in 2006 is forecast to reach almost 16 billion pounds. Demand is expected to increase 3-4% annually through 2007. Health and environmental issues are of concern. Production cost depends primarily on the price of ethylene and chlorine, two raw materials used to produce vinyl chloride monomer (VCM). PVC is a very competitive business; capacity continues to be rationalized.

Leading Global Producers, 2008E		Capacity (000 MT)	Percent
1	Shin-Etsu Japan	3,065	7%
2	Formosa Group U.S.	2,963	7%
3	Solvay Belgium	2,106	5%
4	Ineos Belgium	1,990	5%
5	Occidental U.S.	1,920	4%
<b>Sub-total</b>		<b>12,044</b>	<b>28%</b>
Other		32,139	72%
<b>Total</b>		<b>44,183</b>	<b>100%</b>

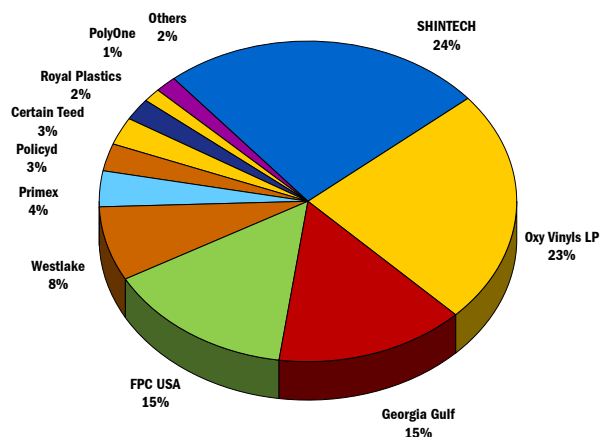
PVC Price and Margin, 1999 - 2009E



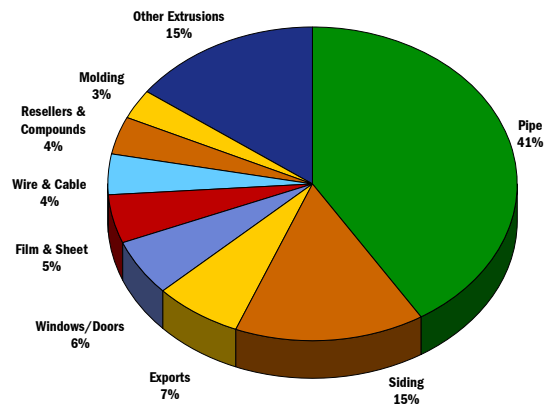
PVC Industry Capacity Utilization, 2004 - 2009E



PVC Market Share, 2008E



PVC Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices  
Source: CMAI, SRI, Banc of America Securities LLC estimates

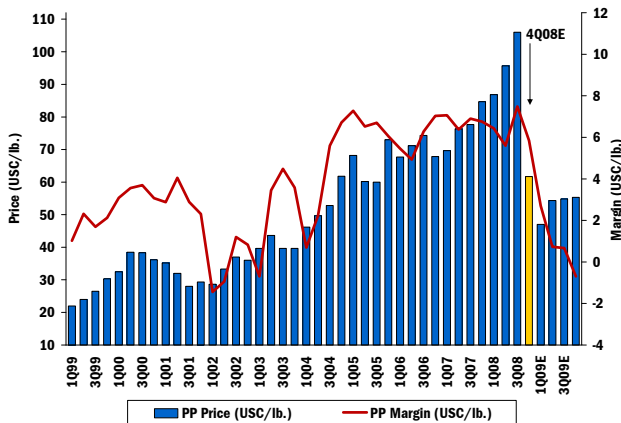
## Polypropylene (PP)

### Overview

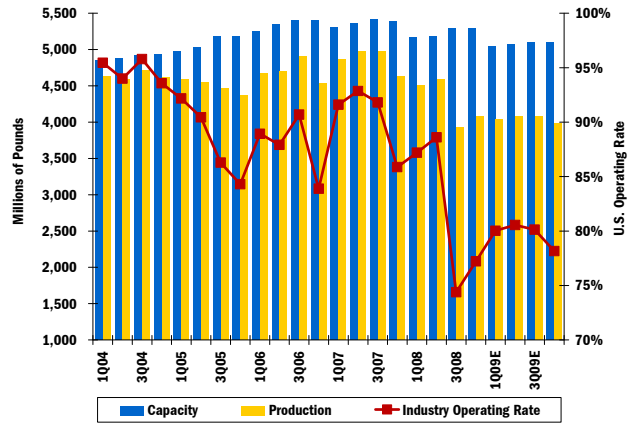
Polypropylene (PP) is the fastest-growing commodity resin in the world. In 2006, U.S. consumption is forecast to be 20 billion pounds. Consumption of PP is expected to grow by 3-4% annually through 2007. Growth will be highest in Asia as the region continues to industrialize. Transportation uses (e.g. automotive bumpers) are the major end-market for injection-molded PP. Other uses include container caps and closures, appliance parts, disposable syringes and a variety of household items. In the fiber area, PP is used in carpet backing and has a growth market in carpet yarn. PP films provide optical clarity and low moisture transmission in food packaging and labels.

Leading Global Producers, 2008E			Capacity (000 MT)	Percent
1	Access Industries	U.S.	5,637	12%
2	SINOPEC	China	3,215	7%
3	Ineos	Belgium	2,535	5%
4	Total	France	2,390	5%
5	Exxon Mobil Corp.	U.S.	2,095	5%
<b>Sub-total</b>			<b>15,872</b>	<b>34%</b>
Other			30,299	66%
<b>Total</b>			<b>46,171</b>	<b>100%</b>

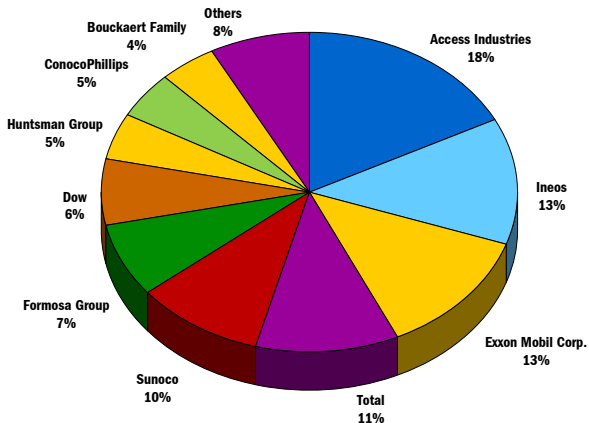
PP Price and Margin, 1999 - 2009E



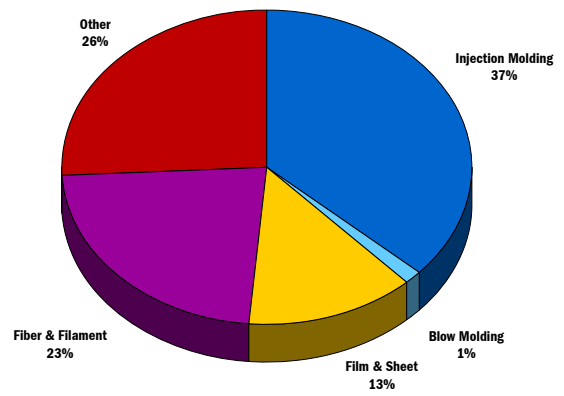
PP Industry Capacity Utilization, 2004 - 2009E



PP Market Share, 2008E



PP Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices  
Source: CMAI, SRI, Sunoco Chemical, Banc of America Securities LLC estimates

## Polyethylene Terephthalate Resin (PET)

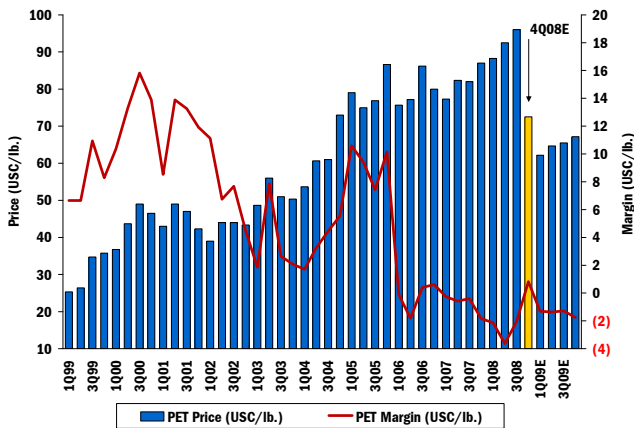
### Overview

In 2006, U.S. PET resin consumption is expected to be around 6 billion pounds. Packaging is the most common use for PET. The largest global use for PET resins is in stretch blow-molded bottles, primarily as containers for carbonated soft drinks and water. PET resin has been very successful at replacing glass in most applications. Consumption of PET resin is expected to grow at an annual rate of 5% through 2007. North America PET prices and margins are improving. Asian imports have declined amid higher raw material and energy costs leading to erosion of their cost advantage. In 2007, capacity utilization is expected to drop, as significant new capacity is coming online (estimated at 19% of 2006 capacity).

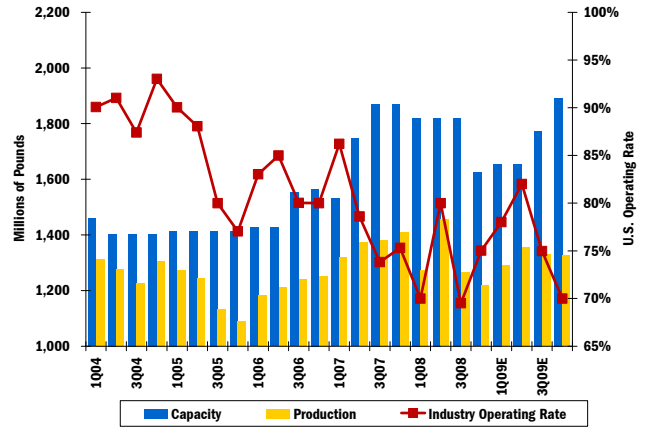
### Leading Global Producers, 2008E

		Capacity (000 MT)	Percent
1	Eastman Chemical U.S.	1,715	9%
2	Mossi & Ghisolfi Italy	1,520	8%
3	Koch Industries U.S.	1,405	8%
4	Far Eastern Group Taiwan	930	5%
5	SINOPEC China	883	5%
<b>Sub-total</b>		<b>6,454</b>	<b>36%</b>
Other		11,720	64%
<b>Total</b>		<b>18,174</b>	<b>100%</b>

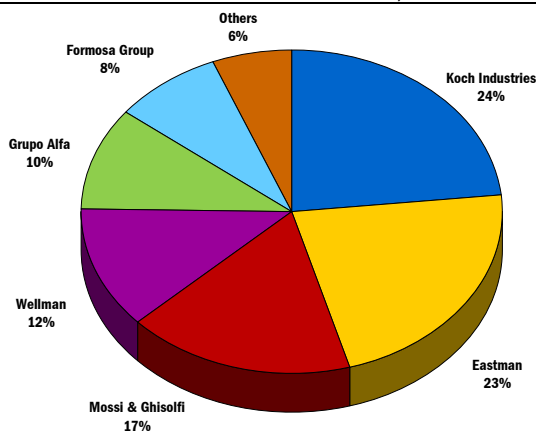
PET Price and Margin, 1999 - 2009E



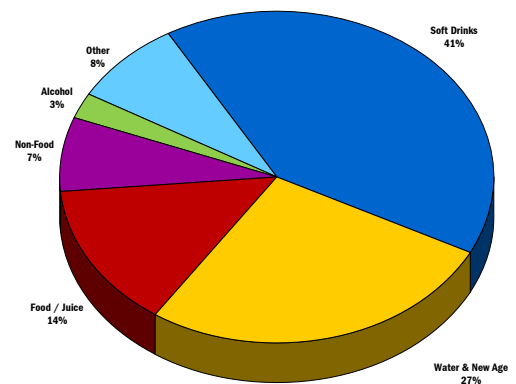
PET Industry Capacity Utilization, 2004 - 2009E



PET Bottle Resin Market Share, 2008E



PET Bottle Resin Demand, 2008E



Note: Data shown graphically is for North America Domestic Market at Contract Prices

Source: CMAI, SRI, Banc of America Securities LLC estimates

**Commodity Chemical Industry  
Valuation Matrix**

TMR	Price	Rating	Analyst	Target Price	Total Return Target	Equity market Cap. (Bil.)	Div. Yield	2007 EPS	2008E EPS	2009E EPS	Normalized EPS	LT Growth Rate	2007 P/E	2008E P/E	2009E P/E	Normalized P/E	2007 EV/EBIDA	2008E EV/EBIDA	Normalized EV/EBIDA	S&P500? - Vol	
DuPont	\$26.61	Neutral	KM	\$29	15%	23.6	6.3%	3.27	2.75	2.25	3.52	9%	8.1	9.7	11.8	7.6	0.8	5.5	5.7	5.5	Yes
Monsanto Company	\$69.73	Buy	KM	\$150	116%	41.1	1.3%	2.06	3.81	4.70	3.81	20%	33.8	18.3	14.8	18.3	0.9	20.0	12.0	20.0	Yes
Praxair	\$55.78	Neutral	KM	\$62	14%	17.9	2.7%	3.62	4.15	4.00	4.15	11%	15.4	13.4	13.9	13.4	1.2	8.8	7.7	8.8	Yes
Air Products & Chemicals	\$48.59	Neutral	KM	\$74	56%	10.6	3.6%	4.51	4.98	5.01	4.98	10%	10.8	9.8	9.7	9.8	1.0	6.6	6.2	6.6	Yes
Rohm and Haas	\$68.33	Neutral	KM	\$78	17%	13.2	2.4%	3.41	3.30	2.90	4.26	10%	20.0	20.7	23.6	16.1	1.6	10.5	10.7	10.5	Yes
Alrgas	\$34.79	Buy	KM	\$51	48%	2.9	1.8%	2.46	3.26	3.28	3.26	11%	14.1	10.7	10.6	10.7	1.0	7.0	5.9	7.0	No
Albemarle Corporation	\$20.28	Buy	KM	\$36	80%	1.9	2.4%	2.40	2.60	2.70	1.64	10%	8.5	7.8	7.5	12.4	1.2	4.2	4.1	4.2	No
RPM International	\$13.29	Neutral	KM	\$15	19%	1.7	6.0%	1.68	1.65	1.58	1.65	10%	7.9	8.0	8.4	8.0	0.8	5.6	6.1	5.6	No
<b>Average, Specialties</b>					<b>46%</b>	<b>14.1</b>	<b>3.3%</b>					<b>11%</b>		<b>14.8x</b>	<b>12.3x</b>	<b>12.6x</b>		<b>11</b>	<b>7.3x</b>	<b>8.5x</b>	
<b>Median, Specialties</b>					<b>34%</b>	<b>11.9</b>	<b>2.6%</b>					<b>10%</b>		<b>12.5x</b>	<b>10.2x</b>	<b>11.2x</b>		<b>1.0</b>	<b>6.1x</b>	<b>6.8x</b>	
<b>Average, Specialties, ex Monsanto</b>					<b>36%</b>	<b>10.3</b>	<b>3.6%</b>					<b>10%</b>		<b>12.1x</b>	<b>11.4x</b>	<b>12.2x</b>		<b>1.1</b>	<b>6.6x</b>	<b>6.9x</b>	
<b>Median, Specialties ex Monsanto</b>					<b>19%</b>	<b>10.6</b>	<b>2.7%</b>					<b>10%</b>		<b>10.8x</b>	<b>9.8x</b>	<b>10.6x</b>		<b>1.0</b>	<b>6.6x</b>	<b>6.1x</b>	
Dow Chemical	\$19.71	Neutral	KM	\$23	25%	18.3	8.6%	3.75	2.80	1.40	3.89	7%	5.3	7.0	14.1	5.1	0.7	3.8	4.4	3.5	Yes
PPG Industries	\$43.89	Buy	KM	\$68	60%	7.1	5.0%	5.15	5.20	5.25	5.20	9%	8.5	8.4	8.4	8.4	0.9	6.6	5.5	5.5	Yes
Eastman Chemical	\$29.54	Neutral	KM	\$36	28%	2.2	6.1%	5.06	4.80	2.90	5.43	7%	3.3	6.2	10.2	5.4	0.8	3.2	3.4	2.7	Yes
Celanese Corporation	\$11.24	Buy	KM	\$17	53%	1.8	1.4%	3.43	3.05	1.35	2.35	7%	3.3	3.7	8.3	4.8	0.7	3.4	3.5	3.7	No
FMC Corporation	\$44.47	Buy	KM	\$58	32%	3.2	1.2%	3.09	4.35	4.55	2.87	8%	14.4	10.2	9.8	15.5	1.9	7.0	5.6	6.9	No
<b>Average, Hybrids</b>					<b>40%</b>	<b>6.5</b>	<b>4.5%</b>					<b>8%</b>		<b>7.5x</b>	<b>7.1x</b>	<b>10.1x</b>		<b>1.0</b>	<b>4.8x</b>	<b>4.5x</b>	
<b>Median, Hybrids</b>					<b>32%</b>	<b>3.2</b>	<b>5.0%</b>					<b>7%</b>		<b>5.8x</b>	<b>7.0x</b>	<b>9.8x</b>		<b>0.8</b>	<b>3.8x</b>	<b>4.4x</b>	
Nova Chemicals	\$4.97	Neutral	KM	\$8	69%	0.4	8.1%	3.87	0.30	-0.50	2.88	6%	1.3	16.6	NM	1.7	0.3	2.4	2.7	2.8	No
Westlake Chemicals	\$15.25	Neutral	KM	\$17	13%	1.0	1.4%	1.70	1.40	0.50	2.95	7%	9.0	10.9	30.5	6.0	0.9	4.7	5.0	3.9	No
Georgie Gulf	\$1.55	Neutral	KM	\$4	158%	0.1	0.0%	-1.20	-2.85	-1.70	3.33	6%	NM	NM	NM	0.5	0.1	6.4	8.3	3.1	No
<b>Average, Commodity Petrochemicals</b>					<b>80%</b>	<b>0.5</b>	<b>3.2%</b>					<b>6%</b>		<b>5.1x</b>	<b>13.7x</b>	<b>30.5x</b>		<b>0.4</b>	<b>4.5x</b>	<b>5.3x</b>	
<b>Median, Commodity Petrochemicals</b>					<b>69%</b>	<b>0.4</b>	<b>1.4%</b>					<b>6%</b>		<b>5.1x</b>	<b>13.7x</b>	<b>30.5x</b>		<b>0.3</b>	<b>4.7x</b>	<b>5.0x</b>	
<b>Average, Universe</b>					<b>50%</b>	<b>9.2</b>	<b>3.7%</b>					<b>9.3%</b>		<b>11.1x</b>	<b>10.8x</b>	<b>13.0x</b>		<b>0.9</b>	<b>6.8x</b>	<b>6.0x</b>	
<b>Median, Universe</b>					<b>40%</b>	<b>3.1</b>	<b>2.6%</b>					<b>9.0%</b>		<b>8.5x</b>	<b>9.8x</b>	<b>10.4x</b>		<b>0.9</b>	<b>6.0x</b>	<b>5.6x</b>	

Notes:  
All estimates are shown on a calendar year basis. MON fiscal year ends in August, APD fiscal year ends in September, ARG fiscal year ends in March, and RPM fiscal year ends in May  
Stocks are priced as of the close of trading for December 12, 2008  
Normalized data reflect trough to peak average

Source: Company reports and Banc of America Securities LLC estimates

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Volatility		Ratings		
		Buy	Neutral	Sell
Low	0%-25%	11%+	10.9%-0.1%	0% or worse
Medium	25%-35%	15%+	14.9%-(2.9)%	(3)% or worse
High	35%-55%	20%+	19.9%-(6.9)%	(7)% or worse
Extreme	55%+	32%+	31.9%-(14.9)%	(15)% or worse

Source for volatility: Bloomberg.

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Coverage Universe	Companies	Pct.	Investment Banking Clients	Companies	Pct.**
Buy	297	44	Buy	188	63
Hold	359	53	Hold	216	60
Sell	18	3	Sell	13	72

#### Diversified Industries Sector

Coverage Universe	Companies	Pct.	Investment Banking Clients	Companies	Pct.**
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Hold	68	63	Hold	44	65
Sell	6	6	Sell	4	67

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As of 12/01/2008.

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BAS (United States)  
Banc of America Securities LLC

One Bryant Park  
New York, New York 10036  
Tel. Contact: 888.583.8900

600 Montgomery Street  
San Francisco, California 94111  
Tel. Contact: 800.227.4786

214 North Tryon Street  
Charlotte, North Carolina 28255  
Tel. Contact: 800.432.1000

BASL (United Kingdom)  
Banc of America Securities Limited

5 Canada Square  
London E14 5AQ, United Kingdom  
Tel. Contact: +44.20.7174.4000

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BASAL (Hong Kong)  
Banc of America Securities Asia Limited

42<sup>nd</sup> Floor, Two International Finance Centre  
8 Finance Street, Central Hong Kong  
Tel. Contact: +852.2847.5222

Bank of America Singapore Limited (Singapore)  
Republic Plaza  
9 Raffles Place #18-00, Singapore 048619  
Tel. Contact: +65 6239 3888

