

Guessing games



The dawn of a shale gas ‘revolution’ – and the feedstock advantage it touts – has the US polyethylene market dreaming big, but it is hard to plan ahead when you have more questions than answers, argues Benjamin Morse

To say the impact of the North American “shale gale” on the polymers market has been widely talked about in the markets is like saying Brazil has produced some quite good soccer players. One cannot go to a single industry event without seeing a presentation on the “game-changing” advent of shale gas.

And with reason – as everyone can see the yawning margins integrated producers are reaping and the vast supply of shale gas and they wonder how its development will impact their particular corner of the industry. For exporters, many questions arise as to how shale and upcoming industry expansions will impact the trade flow of polyethylene. But so far, given that it is only the dawn of the shale gas plays, there are more questions than answers.

How much capacity will actually be built? How much will North American and global demand grow? And what will be the “sweet spot” for production versus profitability for producers? These were among the nagging questions that producers, traders, and other industry participants have been trying to address.

Before the global financial crisis of 2007, the US regularly exported about 25% of its polyethylene production. Exports were seen as a way for producers to maintain operating rates and sell whatever the domestic market could not absorb. The exports were both spot and contract volumes, but after the economic meltdown and ensuing recession, the US PE export market took on a different shape. At first oil prices marched to \$140/barrel and beyond and PE prices were following the climb. PE producers

could increase prices from crude’s cost push but when the market began to crash from July 2008 to January 2009, market participants lost so much money that it forced change upon the industry.

From a peak spot export HDPE blow molding price of about \$1,874/mt (85 cents/lb) FAS Houston in July 2008, to the trough of \$670/mt FAS Houston at the end of December 2008, according to Platts data, losses mounted for everyone in the industry, and producers realized they had to change.

They began to talk about a “new normal” way of doing business, which was to produce only what they could sell in the forward month in order to carry as little inventory as possible.

Traders and converters were told to put in their orders a month in advance and if they did not they risked not being able to secure material.

THE SHALE GAS EFFECT

At the same time producers were becoming more disciplined in their production, ethane fractionation capacity increased and the influence of relatively cheap natural gas emerged. This became evident when NYMEX crude bottomed out at just under \$40/barrel in December 2008 and subsequently began its steady increase back over \$100/b, where it is in early March 2012. At the same time natural gas, which had previously followed crude prices, diverged from oil and took on a pricing direction of its own. Henry Hub natural gas, for example remained range bound between about \$3.50-\$5/MMBtu as crude once again went higher. In the early March WTI crude surged to just over \$105/b, natural gas was down to \$2.355/MMBtu.

Ethane has been tracking natural gas prices and given light feedstock steam cracker operators tremendous margins for the last several years. The ethylene cash cost to HDPE blow molding spread has averaged nearly 30 cents/lb (\$661/mt) from April 2010-March 2012.

With such a wide margin, traders hoped that any additional capacity in the US would bring more business to them.

“[US] producers have the lowest costs in the world. They can be competitive on exports. The question is do they want to?” a polymer trader asked.

The trader was alluding to the fact that even now with their low costs and good margins, there is hardly any spot polyethylene available for export.

“Producers are keeping rates down to maximize profits in the domestic market. If they export, they have to reduce the price and that will impact their larger domestic business,” the trader added.

LLDPE, for example, was offered in the last week of February at \$1,554/mt FAS Houston, which was just about on par with the CFR offers into South America, one of the highest-priced import markets in the world. US offers were being undercut from high-cost naphtha producers in South America, South Korea as well as gas feedstock producers in the Middle East. Clearly, then, lower costs does not necessarily translate to more exports.

North America remains long in nameplate capacity of polyethylene. The US produced about 37.42 billion lbs (17 million mt) of polyethylene in 2010, about 670 million lbs more than it did in 2009. The US had for most of the first decade of

2000 exported about 25% of its production, but when feedstock costs rose through 2007 until the crash of 2008 profits suffered and plants were closed. Dow Chemical was the most aggressive in shutting unprofitable plants, shuttering roughly 782 million lbs/year (350,000 mt/year) of capacity from 2006-10. Dow, along with Flint Hills Resources, LyondellBasell, and Westlake, closed about 1.7 billion lbs/year of capacity in that period. While Formosa in the US and Nova in Canada brought on a little over half a billion pounds of PE production, overall North America production fell just under 3%, according to industry reports.

The loss of that production hit the export market the hardest as producers reduced spot volume to traders to concentrate more on the domestic market. One impact this had on the market was to open up South America to imports from Asia.

A DIFFERENT APPROACH

One lesson learned from the meltdown in 2008 was that when producers began their “produce-to-demand” strategy they got better intelligence on just how much resin a buyer would need and could more easily manage production rates. The results have been great for maintaining volume and price discipline in the domestic market. As demand began to recover from the lows of 2008 to now, nameplate operating rates have steadily risen from close to 80% in 2008 to nearly 90% by the end of 2010, according to a Nova Chemicals company presentation.

In the same presentation, Nova said the effective rate (ie, net production given there are always plants completely shut for a planned or unplanned maintenance) would hit 95% in 2011. With an estimated compounded annual growth rate of 2.2%, the report estimated effective rates would close in on 100% by mid-2015.

If this trend is correct, traders expected to have to continue to source material from outside the Americas as spot volumes from the US simply would not be enough to satisfy demand.

This is where the prospect of shale gas is tantalizing to exporters, because nearly every producer in the US Gulf announced it was looking into building an ethane-fed steam cracker. If all the companies who said they would build a plant actually built one it was expected length would return pre-crisis levels and demand. (See page 16 for a status update of the progress on the announcements versus reality.)

Talking to Platts recently, one polymer distributor certainly doubted how many would actually be built. The announcements have been so lacking on details that sources polled really had no consensus on what the market would like in 2015 let alone 2017 when many of the proposed projects were expected to be completed. “They all announce to try and prevent others from building, but there’s no way to tell how many will actually be built,” a polymer distributor said. “And anyone who says they know what the market will look like next year let alone in 2017 is [...],” the trader added – meaning unlikely to be correct.

One scenario was that if Shell Chemicals builds a steam cracker in the Marcellus Region of the US, an area that consumes about 6 million mt/year of PE, or roughly 45% of US and Canadian consumption, producers who have previously sold into the region will have to find other buyers. Assuming Shell builds a world-scale PE plant of between 500,000-1 million mt/year and takes advantage of its location to sell directly to customers in the Marcellus area, the market could expect to see some of that displaced PE in the export market.

“We also don’t know what plants will likely be shut down,” a PE producer said. “It could be we see two or three new plants and older plants get shut for a very slight net gain and that new capacity would then be consumed through US growth,” he added.

MAKING THE GRADE

Participants also wondered which grades of PE would be built. So far only Formosa has formally declared it would make a 300,000 mt/year LLDPE plant.

In general, LDPE and HDPE film have been the highest-priced PE grades in the US, which makes them attractive for new plants to make. However, if too many new plants are built to make LDPE or HD film then those grades could become the lowest priced and HDPE blow molding, currently the lowest, could become the highest priced. Without formal plans, participants had little to go on as to the product mix the market may have in five years.

Average FAS Houston spot export prices from January 2010-March 2012 (mt)

LDPE	\$1,576-1595
LLDPE	\$1,347-1,365
HDPE blow molding	\$1,332-1,350

For the trading community in Houston, many wanted the US to become a world beater in exports but in the end traders believed as long as there are trade imbalances, there would be business for them. “We’ll take material from wherever is long to where it’s needed,” a trader said in his ambivalence regarding whether the US becomes an export center.

China and South America had the largest net-deficit of material. One industry report held that China would be short nearly 10 million mt in 2015, dwarfing the next largest importer, South America, which was forecast to be short about 1.5 million mt. Imports would also be necessary in Africa, India, and potentially Europe. Europe was a curious case as the amount of imports in PE would be dependent on how many heavy crackers are forced to close for economic reasons.

The following is a breakdown of US production 2011 for LDPE, LLDPE, HDPE and to what region exports have gone over the past year.

2011 production (mt)

HDPE	7.76 million
LDPE	3.04 million
LLDPE	6.08 million

Total exports to region %

China	6.6
Asia (not China)	15.9
Latin America (not Mexico)	25.2
Europe	6.2
NAFTA	23.7
Other	23

Thus far the shale gas revolution has given integrated producers a windfall of profits, but too many questions remain as to whether shale gas will generate more robust exports from the US. For the most part traders look at the market on a day-to-day or week-to-week basis for how they’ll decide what to bid or offer for material. Looking out five years is interesting to talk about, but there are no plans revealed to develop a trading strategy based on what might happen so far down the road. In the meantime, participants will have to keep their eyes on the horizon to look for clues as to how the future of their industry will unfold.

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