In a future world of global chemical capacity increases and potentially faltering demand, only the strongest will prosper. Will your team be prepared?

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Survival of the fittest

Consultant's corner

PAUL HODGES
INTERNATIONAL ECHEM

"WHEN SORROWS come, they come not single spies, but in battalions." The English playwright Shakespeare could have been thinking of the petrochemical industry when he wrote this famous line in *Hamlet*.

The industry is facing an avalanche of new capacity, much of it based on advantaged-cost feedstock. And this new production is coming on line just as the global economy may be turning down.

Meanwhile, gasoline markets, which are key for aromatics producers, are also in the middle of major change.

Just one of these factors would be enough to put the industry under pressure. Taken together, they represent an unprecedented series of challenges. It is no exaggeration to say that, in a worst case scenario, the survival of many companies could be under threat.

This is why we believe it is timely to take a completely fresh and integrated view of the outlook for the building block petrochemicals and their main derivatives. What are the key issues for cracker operators and polymer producers? How are aromatics and their derivatives likely to be affected? And what are the risks for end-users?

It is especially difficult to forecast demand at the moment, with the longer-term impact of the credit crunch still unknown. In order to overcome this problem, our new study, Feedstocks for Profit, presents its analysis in the light of three main economic scenarios. These are: a continuation of the 2003–2007 boom; a base case; and a global downturn situation.

The aim of these scenarios is to highlight the key sensitivities, and therefore enable companies to develop robust plans for an uncertain future.

The first major conclusion is that we do not expect recent shortages of feedstock

to continue. The two main reasons for this are that ethane usage in the Middle East will substitute much of the current naphtha demand elsewhere, while naphtha supply is set to increase significantly:

■ The arrival of new ethane-based cracker supply from the Middle East between 2008 and 2013 will reduce demand for olefins from naphtha and liquefied petroleum gas (LPG)-based crackers. The level of capacity expansion underway means that it cannot all be absorbed, even under a global boom scenario.

And as its advantaged-cost position means it will always be competitive, it is unlikely that ethane-based producers will cut back production. The burden of adjustment will, therefore, fall on more expensive naphtha and LPG-based crackers, reducing their demand for feedstock.

■ Major expansions are underway in refining capacity in all regions of the world. According to our forecasts, only half of the proposed new capacity is actually likely to be built – 12m bbl/day out of 25m bbl/day of announced projects. Even this level, however, means that recent tightness in global gasoline markets is unlikely to continue.

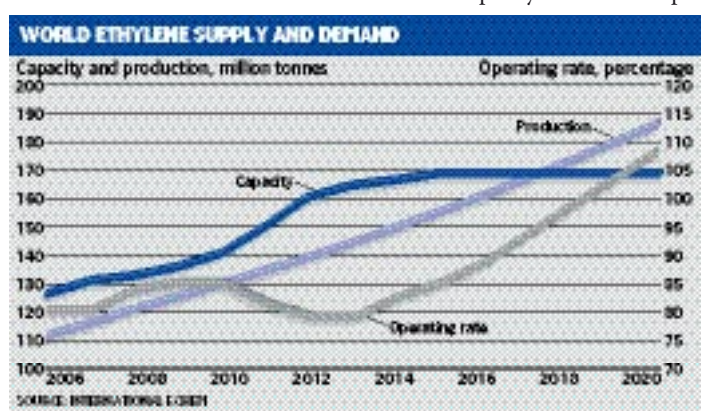
There is also another factor that needs to be considered when assessing operating rates, and that is the region. Today, three of the world's Top 10 ethylene producers come from the Middle East and Asia. These regions do not necessarily share the same outlook, or indeed the financial priorities, of Western firms.

We estimate that Middle East ethylene capacity will expand from 14m tonnes in 2006 to 32m tonnes in 2013, and propylene from 3m tonnes to 11m tonnes. Much of this will be based on "advantaged feedstock," particularly ethane, which is variously priced between $0.75–$2.00/m Btu. At $0.75/m Btu, the cash cost of ethylene production is around $200/tonne.

These plants are, of course, mainly linked to polyethylene (PE) and monoethylene glycol (MEG) plants, as ethylene movement is difficult and expensive. Based on this feedstock price for ethylene, the cash cost for high density polyethylene (HDPE) delivered to Asia is no more than around $400/tonne. It is therefore hard to see why producers should choose to cut back rates towards the anticipated global average of 85% at the trough.

Similarly, China has a different agenda from the traditional Western outlook. It went through a major restructuring exercise at the beginning of the decade, as a result of which Sinopec and PetroChina emerged as dominant players. Since then, considerable investment has been approved for new capacity. China's ethylene capacity is planned to rise from 10m tonnes in 2006 to 17m tonnes in 2013; propylene capacity to rise from 9m tonnes to 14m tonnes; benzene from 3m tonnes to 8m tonnes, and paraxylene (PX) from 4m tonnes to 10m tonnes.

This capacity is mainly integrated into major new refining complexes, which are expected to run at normal operating rates. This is partly because China remains short of most oil products, such as gasoline and diesel. But it is also due to the national policy of seeking to attain self-sufficiency.



This is a vital goal in the whole energy sector, as we have seen with the country's continuing drive to increase its ownership of oil and gas reserves around the world. Having invested so much already in the pursuit of this policy, it is hard to see why China should choose to cut back on operating rates in the petchem sector.

Thus our analysis suggests that it is misleading, and gives a false sense of comfort, to believe that individual regions will all operate at similar rates in the next few years. For example, the Middle East and China will have 49m tonnes of ethylene capacity in 2013, compared with 24m tonnes in 2006. They will account for 64% of the total increase in global ethylene capacity, from 126m tonnes to 165m tonnes, between 2006–2013. If these regions choose to maintain normal operating rates of 93%, then other producers will be forced to cut back.

A second major conclusion follows from this analysis. International eChem expects that the next few years will see a reversal of the globalization trend of the past 20 years. The rationale for this view is that overcapacity will persist into 2013–2015, even if recent global boom conditions continue. If global downturn occurs, then new capacity will not be needed until the 2015–2020 timescale.

COSTLY PRESSURES

In these circumstances, margins will be under pressure as producers move from stand-alone to roll-through economics. Freight and logistics costs will figure more strongly as a deterrent to interregional movements. The advantage will therefore lie with those regions that are either best balanced between supply and derivative consumption, such as NAFTA, Europe and China; or those that have advantaged feedstock, such as the Middle East. Other regions will find it difficult to compete in export markets, as they will be up against local suppliers who are likely to fight hard to maintain their market positions.

Petrochemical markets are therefore going to become more complex. Integration and the flexibility it provides will be the key critical success factor for producers and consumers.

And those companies who are not clearly focused on being "low cost" will find their margins are increasingly squeezed, to the point where their survival may be at risk over the medium to longer term.

The next few years will not be comfortable, even if an extended global downturn can be avoided. The era of cheap feedstocks and ever-lower costs via globalization may well be over. Companies that wish to survive and prosper need to be willing to challenge conventional thinking. Complacency in the face of the gathering storm could prove fatal. ■

» Paul Hodges is chairman of UK consultant International eChem. Further details of the new Feedstocks for Profit study can be obtained from **phodges@iec.eu.com**.

Feedstocks for Profit was written in association with UK oil and refining consultant Wood Mackenzie. It benefits from their insiders' assessment of likely developments in gasoline and feedstock markets and contains detailed analysis of likely demand and potential feedstock availability.