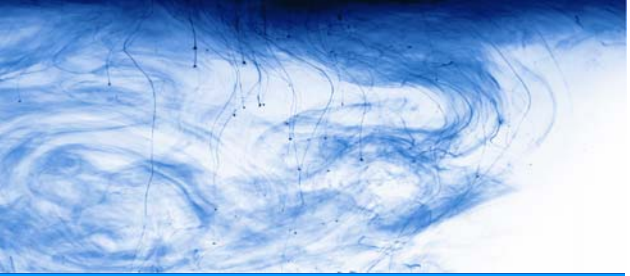


CHEMSYSTEMS

PPE PROGRAM

Report Abstract

Petrochemical Profitability Forecast

Petrochemical Profitability, Price Projections and Margin for Olefins, Polyolefins, Vinyls, Aromatics, Styrenics, Polyester Intermediates and Propylene Derivatives. Analysis for the United States, Western Europe, Middle East and Asia

September 2009

Nexant

CHEMSYSTEMS PPE PROGRAM

Report Abstract

Petrochemical Profitability Forecast

September 2009

Nexant

www.chemsystems.com

Griffin House, 1st Floor South, 161 Hammersmith Road, London W6 8BS, UK
Tel: +44 20 7950 1600   Fax: +44 20 7950 1550

Nexant, Inc. (www.nexant.com) is a leading management consultancy to the global energy, chemical, and related industries. For over 38 years, ChemSystems has helped clients increase business value through assistance in all aspects of business strategy, including business intelligence, project feasibility and implementation, operational improvement, portfolio planning, and growth through M&A activities. Nexant has its main offices in San Francisco (California), White Plains (New York), and London (UK), and satellite offices worldwide.

Nexant's "Petrochemical Profitability Forecast" reports analyse long term outlook for production economics and pricing of commodity petrochemicals and polymers in Western Europe, United States, Asia Pacific and now also the Middle East. Three alternative scenarios are developed to explore how the industry could evolve form its present strong position under a range of macro-economic environments. The reports are published as part of the ChemSystems Petroleum and Petrochemical Economics (PPE) Program. For further details please contact chemsystems@nexant.com.

PETROCHEMICAL PROFITABILITY SLOWDOWN - TROUGH IN 2010?

The last year has seen a considerable swing in the fortunes of petrochemical producers, with a sharp downturn in revenues and profitability being felt by all petrochemical producers. Fundamental weakness in the world economy has severely restricted consumption of petrochemicals, with the industry enduring a downturn of unprecedented severity from the second half of 2008.

The outlook for the petrochemical industry depends upon many factors beyond producer's control: What is the outlook for crude oil price? How will the global economy develop? How will the strength of the dollar impact regional competitiveness? Nexant's latest petrochemical profitability forecasts present long-term projections of regional petrochemical profitability and pricing to demonstrate how the global industry could evolve under alternative self consistent scenarios.

Crude Oil and Economic Growth Projections

The price of crude oil and the growth rate of the global economy potentially have the greatest influence on the future performance of the petrochemical industry, yet they are amongst the hardest measures to predict. The price of crude oil is of critical importance to petrochemical producers, as the prices of the majority of petrochemical feedstocks directly track crude oil. The price of crude oil thus heavily influences the raw material costs of production of petrochemicals. Meanwhile, the strength of the global economy is a fundamental driver of demand for petrochemicals, with strong economic growth yielding robust consumption of petrochemicals. Strengthening demand generally allows producers to raise prices to support higher margins.

After achieving strong growth over the last four years, the global economy stalled last year, with major regions reporting technical recessions. The slowdown has been particularly hard hitting in the United States, with industries such as the automotive and construction sectors deeply impacted by a dramatic reduction in demand. Regions such as Japan, Germany and China also suffered steep falls in export volume, although a massive infrastructure stimulus package in China has helped to support activity in Asia.

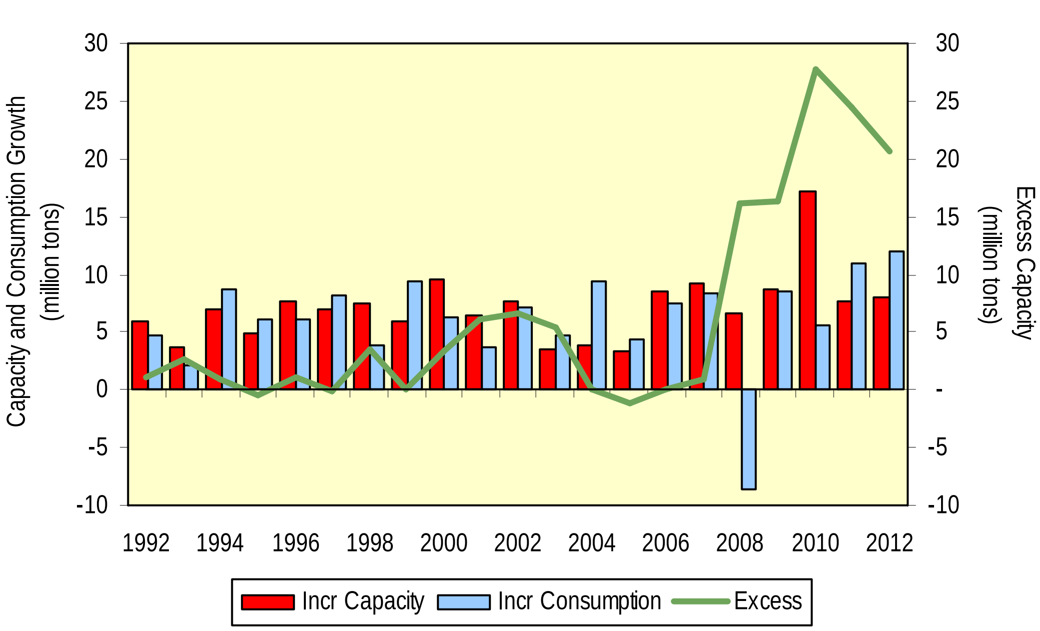
Given the extreme volatility and hence uncertainty in crude oil prices, Nexant has continued to model a wide range of crude oil scenarios to allow clients to understand the impact this key feedstock has on petrochemical prices. The medium oil scenario which assumes that crude oil prices will remain around $75 per barrel, while a high case sees oil maintained above $100 per barrel through supply restrictions. A low case at around $30 per barrel is also defined to bracket the likely trajectory of crude oil prices in the coming years.

Nexant's revised growth outlook sees major markets contracting in 2009, with key regions only achieving flat growth in 2010. GDP is then expected to grow rapidly again, as industries rebuild inventories and confidence returns.

Supply Demand Outlook

2008 saw a dramatic reduction in global olefins demand, with full year consumption estimated to be ten million tons down on that seen in 2007. The considerable investments in supply occurring in Asia and the Middle East meanwhile raise concerns for a considerable downturn for petrochemical producers. The abrupt slowdown and contraction of the global economy has fundamentally reduced the consumption of olefins, and even with renewed GDP growth, will take a number of years to recover lost demand.

Global Ethylene and Propylene Balance

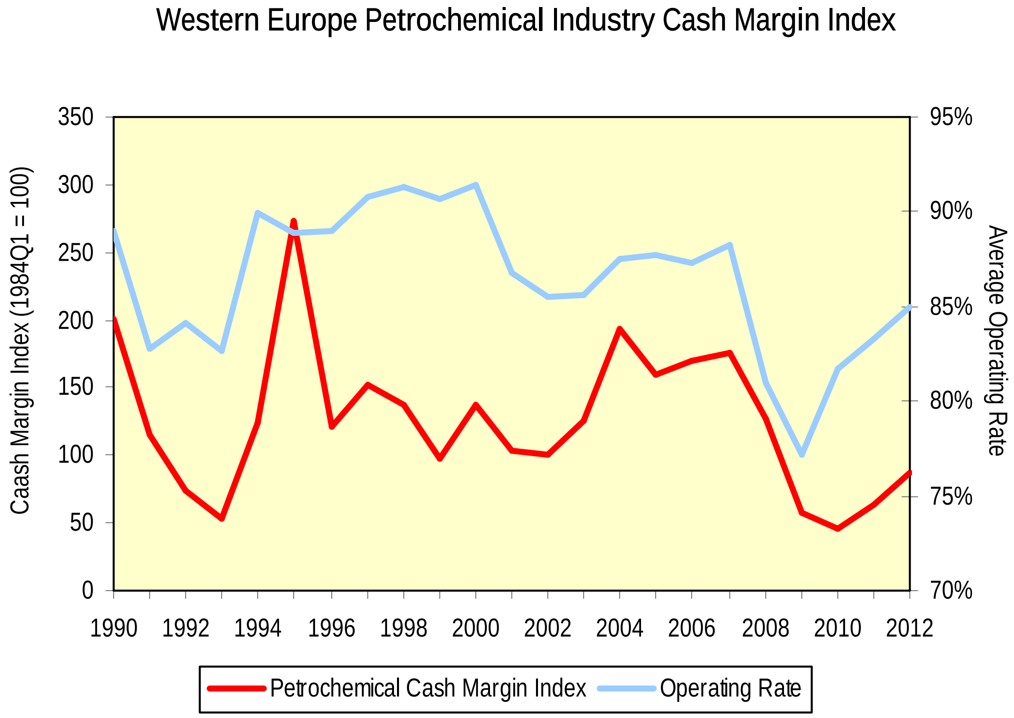


Whilst consumption growth is much beyond the control of the industry itself, the supply side, over which it has direct influence, presents an alarming divergence. The commissioning of new capacity, will deliver unprecedented growth in olefin supply, at a time when existing units have already been mothballed due to weak demand.

Profitability Projections

The profitability of petrochemical production has historically been heavily influenced by the amount of excess production capacity, typically measured by the industry average operating rate. Higher operating rates have generally supported stronger production margins.

A period of modest investment in new capacity following the 2002 downturn revived operating rates, lifting profitability from a trough. Strong growth on consumption in the last few years has largely been balanced by new capacity investments, maintaining steady average industry operating rates and supporting profitability at a broad peak.

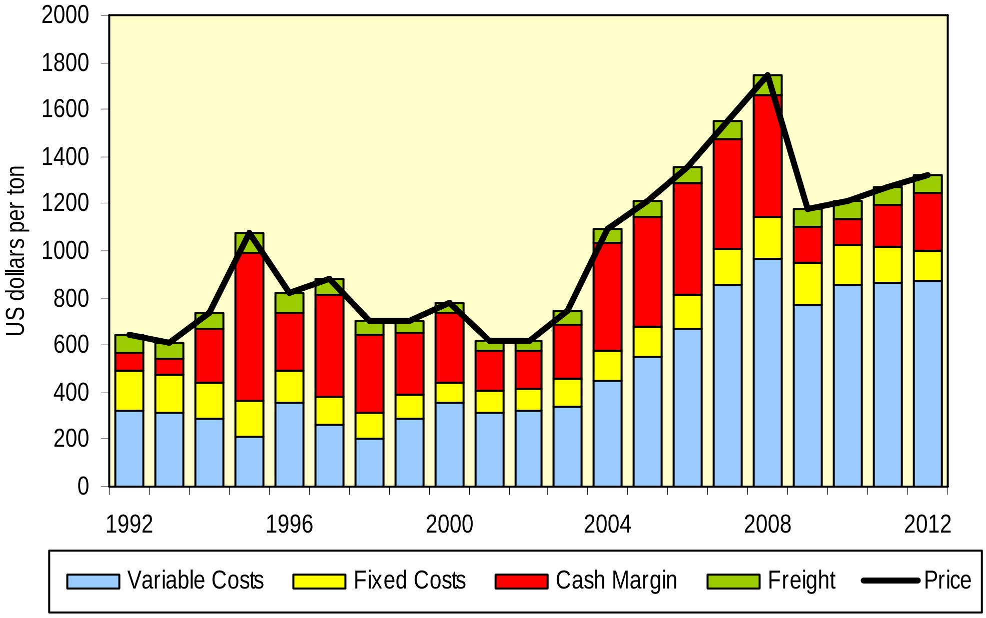


The start up of major new capacity built at low feedstock cost locations in the Middle East, and major consumption centres in Asia, will depress global operating rates to the end of the decade. Producers in Western Europe and the United States will come under considerable pressure, and uncompetitive units may be forced to close. The excess supply will have a marked impact on profitability in all markets, exacerbated by the abrupt downturn seen in the last quarter of 2008.

Price Projections

Petrochemical prices are determined by adding the production costs of typical producers to the margin sustained by the market. Production costs are heavily influenced by the raw material costs which themselves tend to track crude oil markets. The magnitude of the margin is strongly influenced by the regional market balance, with tight markets supporting higher margins. The chart below demonstrates how the LLDPE price has been built up from these different components over time. The cost and margin breakdown is based on integrated LLDPE production with ethylene valued at cash cost from a naphtha cracker.

West European LLDPE Price Build Up *(Contract delivered NWE)*

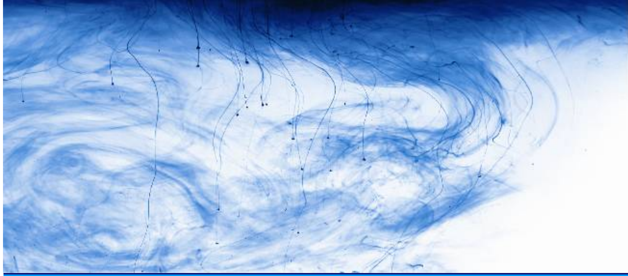


Crude oil prices were relatively low and stable in the decade between 1992 and 2002. Steady production costs during this period meant that price changes directly translated to profitability. LLDPE prices peaked in the mid 1990s as the tight market supported margins. LLDPE prices then slipped to bottom out in 2002 as margin eroded and competition started to be felt from Middle East producers. Prices then surged to record highs, driven by a combination of escalating feedstock costs and strengthening margins, Late 2008 however saw costs and prices collapse as demand evaporated, and the outlook shows profitability greatly reduced from the healthy levels seen in recent years.

Conclusion

The petrochemical industry did a very reasonable job as it negotiated the rapid surge in crude oil prices experienced over the last five years right up until the middle of 2008. The high prices however did finally cause demand to fall, which was then exacerbated by widespread fear of holding inventory in a falling market. This inventory affect has impacted throughout the manufacturing sector and has been further impacted by credit constraints on consumer expenditure. The outlook to the end of the decade is one of many threats which are expected to result in a very weak industry outlook.

Nexant's "Petrochemical Profitability Forecast" reports analyse long term outlook for production economics and pricing of commodity petrochemicals and polymers in Western Europe, United States, Asia Pacific and now also the Middle East. Three alternative scenarios are developed to explore how the industry could evolve form its present strong position under a range of macro-economic environments. The reports are published as part of the ChemSystems Petroleum and Petrochemical Economics (PPE) Program. For further details please contact chemsystems@nexant.com.



Nexant, Inc.

San Francisco
London
Tokyo
Bangkok
New York
Washington
Houston
Phoenix
Madison
Boulder
Dusseldorf
Beijing
Shanghai
Paris

www.chemsystems.com