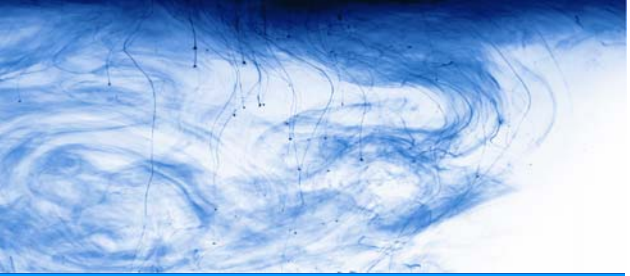

CHEMSYSTEMS

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

December 2010

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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 RECOVERY UNDER THREAT IN 2011?

Profitability of petrochemicals production in most markets improved considerably in 2010, swiftly recovering from the deep trough of 2009. Margins had previously slumped in 2009 as demand waned with major economies contracting into recession. Buoyant export markets in Asia were a key driver of the recovery and most leading economies recovered faster than expected in 2010. Despite apparently strong recent performance, many downside risks hang over the industry in the near term, threatening to stall the recovery.

The outlook for the petrochemical industry depends upon many factors beyond producer’s control. Crude oil prices have strengthened considerably, approaching $100 per barrel at the end of 2010. Production costs will remain under firm pressure as crude oil prices remain above the long term historic average. The global economy has swiftly emerged from recession in 2010, however high unemployment, and the mounting deficit in national accounts threaten to restrict demand in coming years, potentially faltering the recovery. Meanwhile, short term developments in the supply side are set to lengthen markets as major new capacity is commissioned in Asia and the Middle East.

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 and support higher margins.

Given the extreme volatility and uncertainty in crude oil prices, Nexant has modelled a wide range of crude oil scenarios to allow clients to understand the impact this key influence on petrochemical prices. The medium oil scenario assumes crude oil prices remain around $70 per barrel, while a high case sees oil maintained close to the 2009 peak at $110 per barrel through supply restrictions. A low case at around $45 per barrel is also defined which broadly extrapolates the low oil price environment seen through the 1990s.

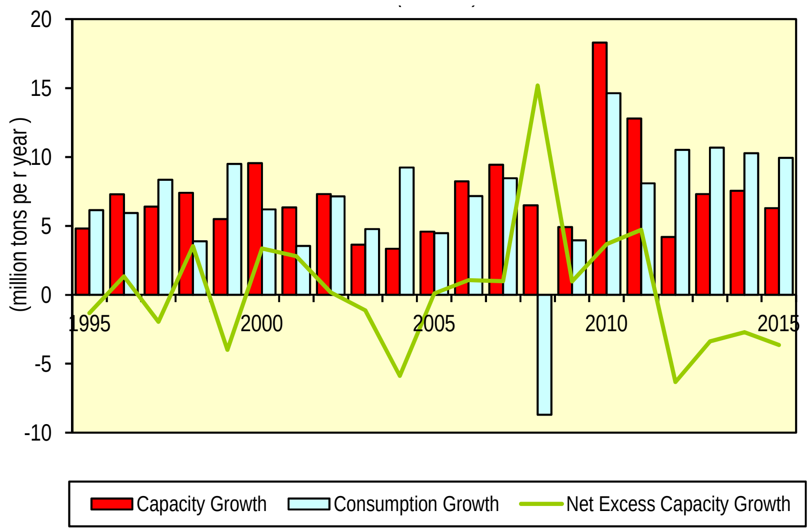
The global financial crisis caused the global economy to contract for the first time in more than thirty years in 2009. GDP of the global economy contracted almost two percent as many leading developed economies slumped into recession. Growth in developing economies offset some of the losses in developed economies, but slower exports restricted growth rates. However massive infrastructure development projects in China supported economic activity, as the economy grew by almost nine percent.

Most economies swiftly resumed growth in 2010, with restocking along the supply chain supporting firm growth. Nexant's revised growth outlook sees major markets only achieving flat growth in 2011 as short term benefits of restocking elapse. Economic growth forecasts project an eight year economic cycle with the next peak not expected until 2013.

SUPPLY DEMAND OUTLOOK

The global economic downturn in 2008 depressed global demand for principle olefins (ethylene and propylene) by almost nine million tons. Meanwhile, the squeeze in global credit markets delayed some investment in new capacity and distressed markets prompted some closure of high cost capacity. However an average of 5 million tons per year of new olefin capacity still entered the market in 2008 and 2009. The next wave of major capacity developments in the Middle East is due to come on stream over the next few years, and major petrochemicals projects continue to be commissioned at pace in Asia. Capacity addition will continue to exceed incremental demand growth through 2011.

Global Ethylene and Propylene Balance



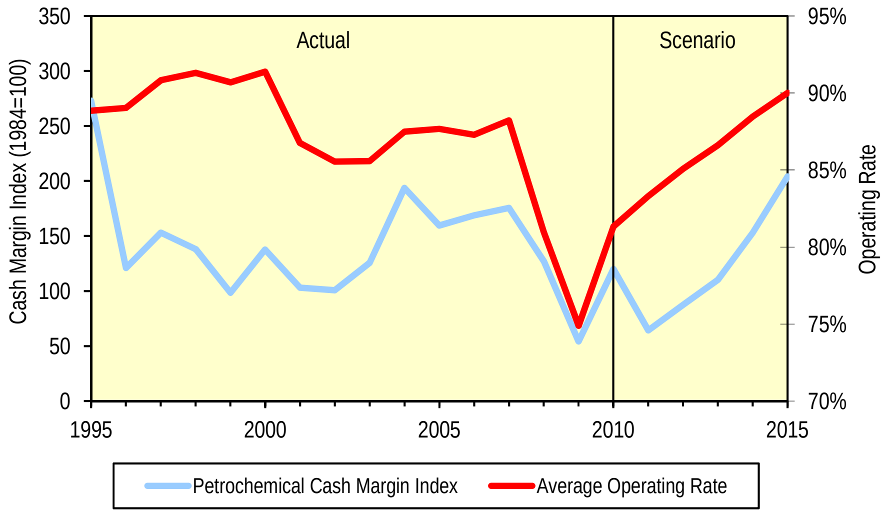
Whilst consumption growth is much beyond the control of the industry itself, the supply side, over which it has direct influence, presents an alarming divergence. The considerable cumulative excess capacity built since 2008 will take many years to adsorb and operating rates will remain heavily depressed in the near term.

PROFITABILITY PROJECTIONS

The profitability of commodity 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.

Profitability was severely squeezed in 2008 as producers were exposed to record high feedstock costs and demand slumped as Western Economies headed into recession. Extensive destocking amplified the weak underlying demand situation, depressing average production rates below 75 percent at the end of 2009. The extremely long market depressed profitability to its lowest for more than two decades in 2009. Average margins improved steadily through 2010 as capacity rationalization and firming demand lifted operating rates from their trough. Despite the steady upturn, average production rates remain well below the long term average.

Western Europe Petrochemical Industry Cash Margin Index

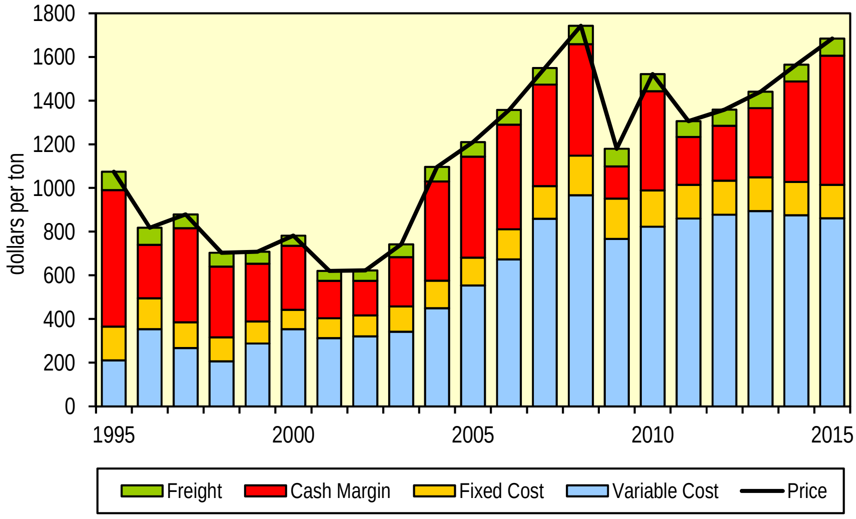


Many petrochemical producers will be exposed to a very harsh trading environment in the near term. Lengthy markets will depress margins. Global ethylene operating rates are set to remain below 90 percent until 2015. Western producers will face the dual pressures of low cost imports from the feedstock advantaged Middle East, and considerable erosion of historic export opportunities in Asia.

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)*



LLDPE prices eased from a peak in the mid 1990s as lengthening markets depressed margins. Prices and margins bottomed out in 2002, amidst growing competition from Middle East producers. Prices increased steadily through to 2004 as firm demand lifted margins to a peak. Rapid escalation of crude oil prices drove prices higher in the latter part of the decade, with simultaneous peak margins and high costs propelling prices to a record high in 2008. Rapid erosion of margins and costs into 2009 swiftly reduced prices from their peak. Costs are set to remain at the upper end of their historic range and the outlook for prices will be determined by the rate of recovery in profitability.

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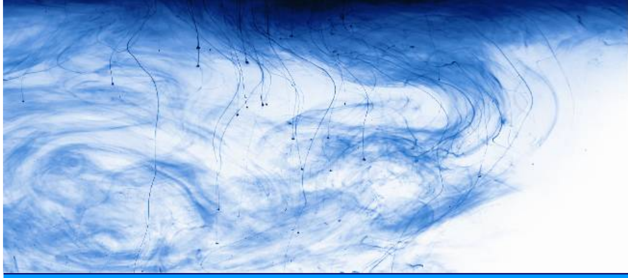

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