



FEEDSTOCK, PETROCHEMICAL AND POLYMER COST, PRICE AND MARGIN FORECASTS THROUGH 2030 – 2017 EDITION

- Globally Linked U.S. Gulf Coast Forecasts
- Internally Consistent Models and Data
- Four Energy-Economic Scenarios

Key Questions Addressed by Probe's Price Forecasting Study:

Will crude oil prices stay low, or will they rise in response to market forces? Is OPEC finished, or will it create artificially high oil prices once again?

How will President Donald Trump's policies affect the energy and chemical industries? Will chemical exports be impeded? Energy imports taxed?

How will chemical technology choices be changed by shale oil gas? by the fall in oil prices? How will these developments affect the prices of chemicals and polymers?

What kinds of price distortions or changes in by-product availability will be caused by the fluctuations in oil prices? Will propylene always be more expensive than ethylene?

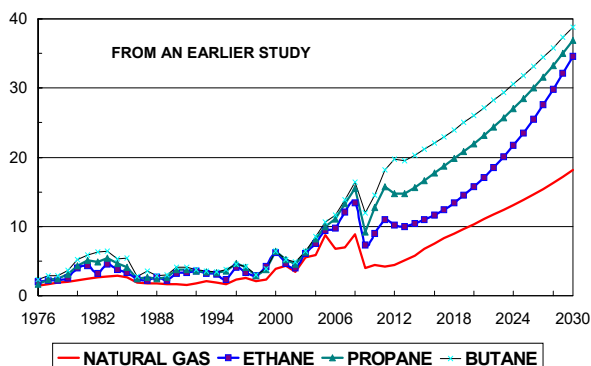
Cheap natural gas is bringing ammonia and methanol production back to the U.S. Will the U.S. see investments in other gas-based technologies, like GTL? MTP?

Natural gas, ethane and propane are very cheap now thanks to fracking technologies. Which of these molecules will rise the fastest in price over the next decade?

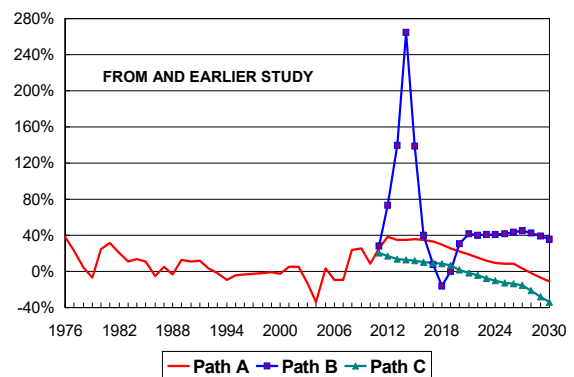
What evidence is there that the U.S. is regaining its manufacturing competitiveness and seeing manufacturing returning to its shores?

Which is the stronger determinant of chemical and polymer prices – feedstock costs or demand? Is capital cost relevant, even in China?

C1 - C4 PRICE BOUNDARIES
PATH A (DOLLARS PER MMBTU)



ROI ADVANTAGE OF PROPANE OVER NAPHTHA
(ROI PERCENTAGE POINT DIFFERENCE IN MAKING ETHYLENE)





The Probe Approach: Global, Strategic, Consistent, Eclectic

Petrochemical and polymer pricing remains as volatile as ever. Supply is very long right now, as the economy sinks, oil prices collapse and buyers shed inventory. Chemical prices will stabilize soon and then remain generally soft -- but for how long? Prices could turn around in a heartbeat, given their sensitivity to plant outages, oil prices and geopolitical events. How will these forces resolve themselves in the future, and what are the implications for petrochemical pricing and margins?

Probe's latest edition of **Feedstock, Petrochemical and Polymer Price and Margin Forecasts** answers these questions clearly and concisely. To find the answers, Probe has developed the perfect hybrid approach: powerful industry modeling, tempered by two decades of advising and forecasting in the chemical and energy industries. Probe's insights will help you, whether you are deciding about a capacity expansion, purchasing contract or marketing plan.

This is how the Probe approach differs from more traditional analyses:

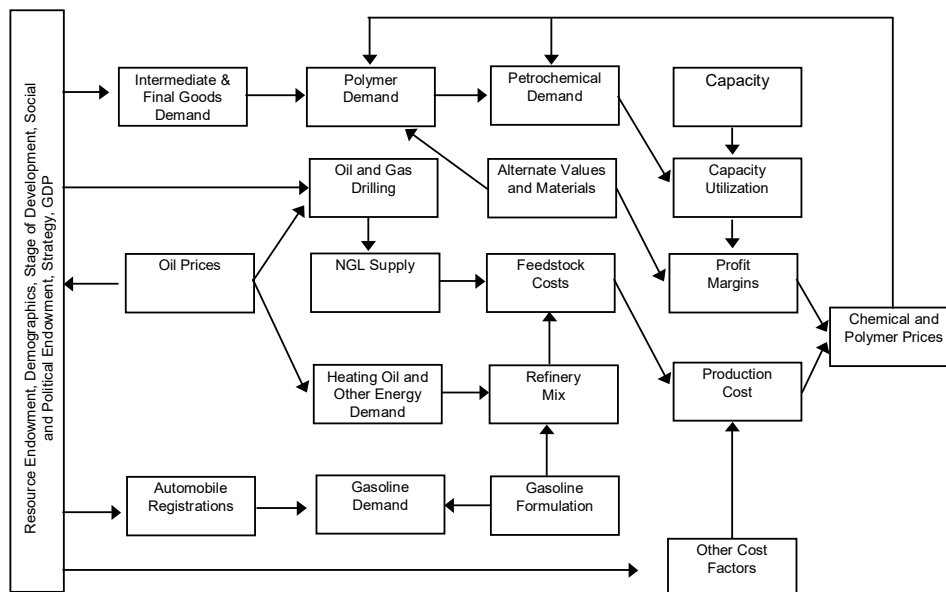
It is Global. Probe made its mark with its extensive global assessments of the world chemical industry. We understand the underlying fundamentals of global economics and trading patterns for chemicals like methanol, styrene and polyethylene, and know how to simplify analyses so you can see the big picture -- one you can act on -- instead of page after page of superfluous detail.

It is Strategic. Decisions to build an ethylene unit or sign a long-term contract take years to play out. Companies must live with their mistakes well into the future, so they need a strategic analysis that does not just use past trends and conventional wisdom to forecast volumes, prices or margins. Companies that do not look further and deeper during a time of structural change are asking for trouble.

It is Consistent. When you trace back the logic of many studies, they are simply not consistent. With scores of interacting variables, only a comprehensive economic model can separate cause from effect and balance competing forces. Probe's world chemical, energy and general economic model includes all external factors and sectoral interactions. Our forecasts consider a range of possible environmental regulations, energy policies, and economic scenarios.

It is Eclectic. Economic models that are not tempered by experience and common sense can be misleading. Probe never falls into that trap. Probe has been forecasting energy and petrochemical markets for three decades, and the authors of this study have many years of experience in the field. We bring an eclectic mixture of skills and insights to this report that is not easily duplicated by other consultants or planning staffs.

PROBE FEEDSTOCK/CHEMICAL/POLYMER PRICING LOGIC





**FEEDSTOCK, PETROCHEMICAL AND POLYMER
COST, PRICE AND MARGIN FORECASTS**
(FOUR ENERGY-ECONOMIC SCENARIOS, U.S. GULF COAST PRICING)

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OVERVIEW (PDF FILE, ABOUT 70 PAGES)

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GDP Scenarios
Crude Oil Price Scenarios
Inflation Scenarios
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Summary of Forecasts
Forecast Graphs

**FOUR EXCEL FILES WITH SCENARIOS
(PATHS A, B, C AND MOST LIKELY)**

Assumptions and Refinery Prices

Unemployment Rate
Labor Cost, Chemicals
GDP Price Deflator
Price Index (PPI) for All Commodities
Price Index (PPI) for Chemicals
WTI, Brent and U.S. RAC Crude Price
Low Sulfur Resid Price
#2 Heating Oil Price
Unleaded Regular Gasoline Price
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Paraxylene
Propylene, Chemical and Polymer

Monomers and Intermediates

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Acrylonitrile
Cyclohexane
Ethylene Glycol
Phenol
Phthalic Anhydride
Purified Terephthalic Acid
Styrene
VCM

Polymers

HDPE
LDPE
LLDPE
Polypropylene
Polystyrene
Polyvinyl Chloride
PET Bottle Resin

Appendix Tables

Prices
Price Indexes
Returns on Investment



PROBE ECONOMICS LLC

ABOUT PROBE

Probe Economics LLC has provided chemical industry forecasting and consulting services since 1976. Probe combines state-of-the-art industry models with many years of industry experience. Our professionals have held senior operating, staff or teaching positions in industry, government, academia and consulting. For more information, visit our website, at www.probeeconomics.com. Key personnel working on this study include:

John E. Johnson has analyzed world energy, feedstock, and petrochemical markets for more than 35 years. Before joining Probe, he served Union Carbide as Manager of Hydrocarbon Supply Planning, and held various policy and engineering positions. John received an M.S. in Chemical Engineering from University of Wisconsin, and was a guest researcher at Oak Ridge National Laboratories.

Frederick M. Peterson has 35 years of experience with chemical industry forecasting, strategic analyses and consulting. Prior to serving on the staffs of the President's Council of Economic Advisers and Council on Environmental Quality, he was a sales representative with Stauffer Chemical. He received a B.S. in Chemical Engineering at Berkeley, earned a Ph.D. in Economics at Princeton, and taught at University of Maryland.

ORDER FORM

_____ Four Excel™ files and Adobe (pdf) file, 2017 **Feedstock, Petrochemical and Polymer Price and Margin Forecasts through 2030** (\$3,400 for company-wide license)

(In some cases, excerpts of the study can be made available.)

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