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A Perspective on the Houston Economy

Refining and Chemicals on the Gulf Coast: The Mature Industries

(Part 2 of a two-part series)

...In recent years, the defining feature of the regional chemical industry has been recurrent bouts of construction followed by excess capacity. Meanwhile, the Clean Air Act and other environmental legislation have forcefully shaped new refining construction.

Three key industries make up the downstream oil operations along the Gulf Coast: natural gas processing, refining and petrochemicals. The February *Houston Business* discussed the evolution of these industries from the 1901 Spindletop oil discovery to their present dominance in the Gulf Coast economy. The issue also described the economic and technical synergies among these industries that create this vast industrial complex.

This article looks at the modern refining and petrochemical industries as they have developed in Texas and Louisiana along the Gulf Coast. In the 1970s and early 1980s, oil-price controls led both industries into bad decisions about their capacity needs. Even in recent years, the defining feature of the regional chemical industry has been recurrent bouts of construction followed by excess capacity. Meanwhile, the Clean Air Act and other environmental legislation have forcefully shaped new refining construction.

PETROCHEMICALS

By the 1970s, the petrochemical industry had matured. It had made no fundamental discoveries since the early 1950s, despite much process innovation and product development. From World War II through the 1960s, the growth rate of petrochemical demand had been twice that of gross domestic product (GDP). In the 1970s and 1980s, chemical growth slowed and barely matched GDP, and this

was at a time GDP growth also slowed sharply. Further, by 1970 producers had exhausted economies of scale. The 1960s, for example, brought the advent of ethylene units that pushed production beyond a billion pounds per year.

The lesson learned from these units was that lower production costs were no longer attainable by further expanding the scale of operations. The industry thus lost a major driver of price reductions for ethylene, as well as for products such as styrene and polyvinyl chloride.

The energy-price spikes of 1973 and 1979 raised many questions about the long-term viability and competitiveness of petrochemicals. Despite the turmoil and uncertainty in oil markets, however, petrochemical firms enjoyed strong profits, and capacity expansion continued throughout the decade.

The industry missed many signals that it was time to retreat. Domestic price controls on oil gave the chemical industry significant competitive advantages over European and Japanese producers, resulting in strong profits on exports. Further, both major oil-price spikes brought panic buying and inventory accumulation by customers, accompanied by record chemical profits and more announced construction.

With the 1982 recession, the industry plunged into a wave of closings and restructurings due to serious overcapacity. Except for Du Pont's purchase of Conoco, the chemical industry mostly pulled back from petrochemicals. Among the big companies dropping some or all of their oil-based intermediates or thermoplastics were Hercules, Monsanto, Hoechst, Union Carbide and ICI. Meanwhile, many of the oil companies took advantage of buying opportunities to integrate further downstream and diversify their chemical holdings.

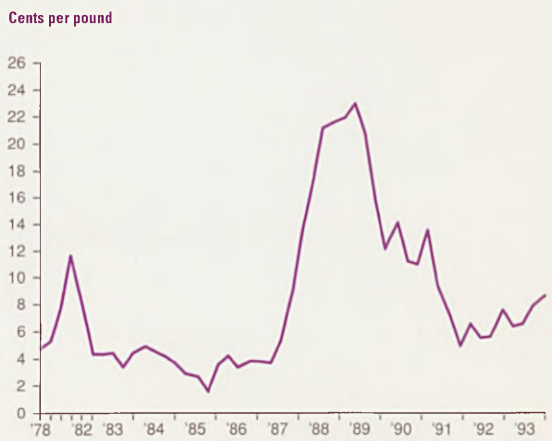
New players emerged to join the traditional oil and chemical companies. Leveraged buyouts became common in the 1980s, as corporate raiders and investment bankers found they could break up companies and sell the pieces for more than the price of the whole. Often, raiders or other disenchanted owners sold chemical units for as little as 25 percent of replacement value, and systematic purchase of these corporate pieces resulted in the emergence of large, previously unknown companies, such as Huntsman, Aristech, Vista, Sterling and Cain.

Corporate restructuring, falling prices for oil and natural gas feedstocks and a global economic expansion restored health to the industry by the mid-1980s. Figure 1 shows the margins on ethylene, or the difference between the selling price of ethylene and the price of its feedstocks. Profits soared after 1985, and the industry again reacted with billions of dollars in new plant expansions around the world. New capacity worth $8 billion was announced for the Texas Gulf Coast alone from 1986 to 1991, and many plants came on-line just in time for the 1990–91 recession. The industry now has come full circle in the past decade, as it is again struggling with excess capacity, poor profits and ongoing restructuring.

Overcapacity presents a difficult problem for the petrochemical industry, and the current situation is no exception. Many chemical producers can't slow their continuous production processes by more than a fixed amount. In integrated, multiproduct plants, completely closing a unit may create domino effects on other products within the plant. Further, the size of the financial commitment represented by a chemical unit presents management with psychological and financial barriers to closings. Continued pain along the Houston Ship Channel for another year or two is a likely result.

Current overcapacity aside, the longer run future of the Gulf Coast industry remains bright. Global growth in chemicals continues to shift away from the Gulf Coast, but primarily because global economic growth has shifted to other regions. Natural-gas-based imports from Canada and the Middle East have not proved a viable

Figure 1
Cash Margins for Ethylene
(Ethane and propane feedstock)



NOTE: Pre-1983 data are annualized; data for other years are quarterly.
SOURCE: *Oil & Gas Journal*, various issues.

threat to domestic markets, and the Gulf Coast remains a secure home for one of the nation's most basic industries.

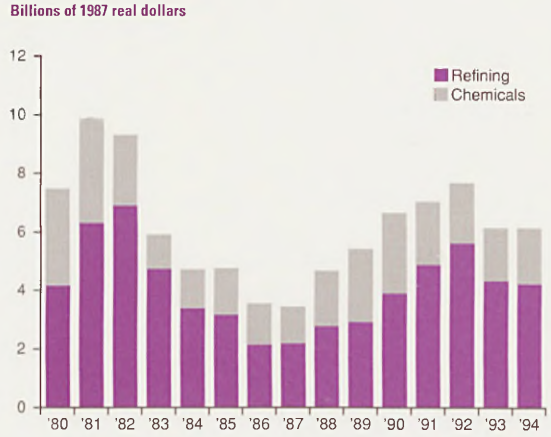
REFINING

The refining industry was also led astray by price controls in the 1970s, as price ceilings were imposed on so-called "old oil," or oil produced from fields developed before 1973. This cheap oil was then allocated to refineries in proportion to their activity level. The regulations specifically included a highly profitable provision exempting many small refineries from the allocation scheme, regardless of the source of their oil. The result was the construction of 65 small, unsophisticated refineries in the 1970s, many of which promptly closed as the government lifted price controls in 1981. Even worse, the allocation schemes discouraged investment in more sophisticated refineries, as the allocation rules allowed the pass-through of higher oil costs but not higher capital costs. The industry entered the 1980s with too much capacity but had failed to build the complex refineries needed to produce more light products, such as gasoline and jet fuel, and was unable to produce these products from heavy or high-sulfur grades of crude.

In early 1981, there were 324 refineries operating in the United States. By 1986, the elimination of price controls had closed more than 100 refineries, and distillation capacity slipped from 18.6 to 15.5 million barrels per day. Utilization rates, depressed by the many small refineries, rose to healthier levels for the industry, and capacity has remained constant since 1986. As small refineries have continued to close in recent years, the lost capacity has been replaced through additions at large and sophisticated refineries. As the 1990 amendments to the Clean Air Act continue to make small refineries less profitable, this trend will continue.

Because of oil conservation measures such as auto fleet mileage standards, it is a matter of some debate whether the industry will ever need additional distillation capacity. The U.S. Department of Energy, however, forecasts a growing demand for oil products. If oil prices remain low, the United States could return to 1981 levels of oil consumption by the mid-1990s. Highly specific environmental requirements for oxygenates and reformulated gasolines will probably reduce product imports, as will the formidable logistics of importing refined products rather than crude oil.

Figure 2
Domestic Capital Spending on Refining and Petrochemicals, 1980–94



SOURCE: ***Oil & Gas Journal,*** **annual capital expeditures issues.**

Capital spending for domestic refineries has run at high levels in recent years (*Figure 2*). This spending has been partly for additional processing to deliver more light products to the market, and to produce these products with lower quality crude oil. However, the dominant factor has been—and remains—new environmental regulations imposed on refineries and on the quality of their products. The Clean Air Act of 1970, for example, required the control of refinery emissions, as well as a shift to unleaded gasoline. In 1989 and 1992, the Environmental Protection Agency imposed regulations on summertime gasoline vapor pressure, and so less butane was blended into gasolines. Recent amendments to the Clean Air Act require that oxygenated fuels be used in winter months and in carbon monoxide nonattainment areas, that sulfur content to be sharply limited in highway diesel fuel, and that several rounds of new regulations occur as we move to reformulated gasoline.

Environmental regulation continues to close smaller and less sophisticated refineries, to require construction of additional units to process oil into acceptable products and to complicate the delivery of oil products to market. Construction resulting from these environmental regulations will continue well into the next century and at a heavy cost to the industry.

Good news about the local economy appeared on a number of fronts during January and February. Local retail sales remained strong after the holidays ended. Automobiles, new homes and existing homes all sold at unseasonably strong rates. Real estate markets are generally stable or slowly improving, except for warehouse space, which is now almost unattainable. The negative effects of low oil prices seem to be largely offset by solid gas prices.

RETAIL AND AUTO SALES

Local retailers reported continued good results, following their excellent gains over the winter holidays. Cold weather cleared out local inventories of soft goods early and pushed many retailers ahead of last year by 5 percent or more. A good Easter is widely expected. Reported figures for auto sales were very strong through February.

OIL AND GAS PRICES

Crude oil prices were driven by fuel oil prices and frigid weather in February. The price of fuel oil for home heating rose very sharply in January because of severe weather on the East Coast, although the peak prices enjoyed this winter barely matched prices seen during last year's mild winter. Crude and fuel oil inventories have been sharply reduced by cold winter weather, but crude oil price increases over the winter have been short-lived. Once each cold front passes, they've quickly fallen back to the $14 to $15 range.

Natural gas prices also improved with cold weather. Natural gas storage has been depleted to the lowest levels experienced in many years, and gas diverted to refilling this storage over the spring and summer months should keep gas prices at favorable levels.

DRILLING AND OIL SERVICES

Exploration and the demand for oil services normally fall off sharply at the beginning of the new year, and a steeper than normal decline was feared because of weak oil prices. Reduced oil-related drilling, in fact, accounts for almost all the drop in drilling seen through February, but the overall seasonal decline has been no worse than usual as natural gas drilling held at high levels. Strong interest in natural gas has kept the Gulf of Mexico quite active, although the day-rates for rigs working in the gulf sagged badly in January and then steadied in February. A very strong gas-drilling market in Canada also helps local companies. Other international sales are reported to be stable.

REFINING AND PETROCHEMICALS

As major suppliers of oil products to the East Coast, Gulf Coast refiners were well positioned to benefit from both higher fuel oil prices and weaker crude prices. Margins improved very nicely in January and February, but the improved results were strictly driven by severe weather. Inventories of heating oil were pulled down by the cold weather and by reduced production as refiners began their seasonal swing to gasoline production for the summer driving season ahead.

Petrochemical producers reported stronger demand for products across the board. Higher prices were reported for several product lines, including polystyrene, benzene and some polymers. For other commodity chemicals, overcapacity continues to hold prices at very low levels.

REAL ESTATE

Sales of both existing homes and new homes set records for the Houston market in January, as rising interest rates pushed prospective buyers off the fence. Realtors remained very optimistic in February and reported an unseasonably strong level of continued interest by potential homebuyers. Homes in the lowest price ranges remained the strongest part of the market, attracting many first-time buyers.

Fundamentals are reported to be improving slowly in the local office market, both in the Galleria area and downtown, although downtown rents and occupancy remain particularly weak. Apartment occupancy and rents remain steady at favorable levels. Industrial warehouse space is reported to be virtually unavailable, and rents are rising very sharply. This contrasts with a growing glut of factory floorspace available in the city. Demand for retail real estate is reported to be slowing, as the number of big discounters shopping the Houston markets dwindles.

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