Abstract

Process Economics Program Report 169A

INTEGRATED REFINERY/PETROCHEMICAL PROFITABILITY

(August 1995)

This study presents projected profitabilities (1995-2010) of petroleum refining/petrochemical integration for light low-sulfur and heavy high-sulfur crude oil in the U.S. Gulf Coast, Rotterdam, and Singapore. Four crude oil price scenarios are considered. The integrated plant profitabilities are compared with those of stand-alone refineries and stand-alone ethylene plants based on feedstocks that are prevalent in those regions.

The integrated refinery/petrochemical plants consistently show higher profitability than the corresponding stand-alone refineries in all regions. Singapore plants are the most profitable, the U.S. Gulf Coast plants are moderately profitable, and the Rotterdam plants range from break-even profitability with the heavy crude oil (Arabian Heavy) to reasonable profitability with the light crude oil (Brent Blend). In contrast, a stand-alone ethylene plant is consistently profitable only on the U.S. Gulf Coast based on ethane/propane feedstock.

The profitability of the incremental investment for integration of an ethylene plant with a refinery depends on the location and crude oil type used. Integration with light low-sulfur crude oils is a more attractive investment than operating stand-alone ethylene plants in all regions when Arabian Light crude oil prices are below about $30/b. In contrast, integration with heavy high-sulfur crude oil feedstocks becomes attractive compared to stand-alone ethylene plants when Arabian Light crude oil prices are above $30/b. Also, the incremental profitability of integrated plants in Rotterdam and Singapore is higher than that for stand-alone ethylene plants processing naphtha.
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<td>Arabian Heavy Crude Oil</td>
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<td>Singapore Refinery/Petrochemical Plant Profitability</td>
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