Abstract

Process Economics Program Report 215
PETROLEUM REFINING PROFITABILITY
(November 1995)

Conversion of crude oil is expected to remain the principal source of transportation fuels well into the next century. This study presents projected profitabilities (1995-2010) of petroleum refining operations for light low-sulfur and heavy high-sulfur crude oils in the U.S. Gulf Coast, Rotterdam, and Singapore. Four crude oil price scenarios are considered. The gasoline plus distillate (G+D) product slates, estimated for the year 2000, are held constant within each region. The heavy oil refineries are therefore more complex and expensive than the corresponding light crude oil refineries.

This study identifies trends and differences between regions and crude oil types. Lower crude oil prices increase refinery profitability in all regions. The economic incentive to invest in upgrading facilities for heavy crude oils depends on the geographical location and crude oil price. In the U.S. market, it appears to be more profitable to build a higher investment complex refinery to run low-priced heavy crude oil, rather than build a less expensive refinery to run high-priced light crude oil. In Singapore, the heavy crude oil operation is preferred over the light crude oil only at low oil prices. The light crude oil becomes more attractive relative to the heavy crude oil with increasing crude oil price. In Rotterdam, the light crude oil is preferred over the heavy crude oil, but the refining net margins are insufficient to justify new refinery construction with either crude oil across the price range studied.

We also discuss primary refining technologies and trends in this report, and review the changing fuel regulations in each major region.
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