

ABSTRACT

Towards the Development of an Optimal Long-term Structure and Policy for the Development of the Local Petrochemical Industry

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The primary objective of this study was to determine the optimal long-term structure and policy for the development of the local petrochemical industry. This was achieved by formulation of a mixed-integer linear programming model which was multiperiodic in nature, took into account the economies of scale and the time value of money. A multiobjective analysis was performed so as to ensure that the objectives of the various interest groups (investor, government and the populace) were taken into account. The effect of uncertainty in the technical and economic parameters was measured.

It was concluded that the optimal policy for development of the methane-based industry involves a shift towards the production of downstream petrochemicals. The current structure of this industry is already poised for downstream manufacturing. Continued upstream production was proven to be the least lucrative policy and incorporated the greatest risk. By the year 2000, natural gas production would be sufficient to support a 500,000 t/y ethylene plant. The optimal policy for an olefin-based complex involves the immediate production of a blend of basic, intermediate and end products. The ethylene plant should produce the maximum amount of

propylene possible, for which a phenol/acetone plant and a propylene oxide/glycol plant are promising.

It is recommended that government should seek/encourage investors to participate in downstream manufacturing. A more comprehensive market survey should be done to better take advantage of the multiperiodic/dynamic mathematical model. The study should be carried to a further stage utilizing more accurate technical and economic data. An environmental impact assessment as well as consideration of the sites for the proposed expansions should also be part of a further study. The entire planning process should be repeated periodically so that the long-term structure of the industry is kept in line with up-to-date data and trends.

For the eventual completion of this work, a great deal is owed to my wife

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