This report evaluates three routes for the production of liquid hydrocarbons from synthesis gas (syngas): Fischer-Tropsch (FT) synthesis with advanced design Synthol fluidized-bed reactors (as practiced by Sasol and Mossgas Ltd. in South Africa), the Shell middle distillate synthesis (SMDS) process (as applied in Malaysia), and Mobil’s methanol-to-gasoline (MTG) process in its fluidized-bed version. Mobil carried out and completed development of its fluidized-bed MTG process shortly after the implementation in New Zealand of its earlier (and economically inferior) fixed-bed process. However, the fluidized-bed MTG process has not yet been commercialized.

We present a technical review that primarily focuses on the three routes evaluated in the report. The review includes an analysis of major new developments in the areas of catalysts and reactor designs.

Our economic evaluations indicate that at the current world prices of crude oil (and those for the individual fractions), none of the three processes offers an attractive prospect for the utilization of remote natural gas.

This report will be useful to both chemical and energy-based companies (or equivalent government organizations thereof in various countries) that have a long-term interest in the potential conversion of natural gas to easily transported liquid hydrocarbons and/or to derivative chemicals.
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