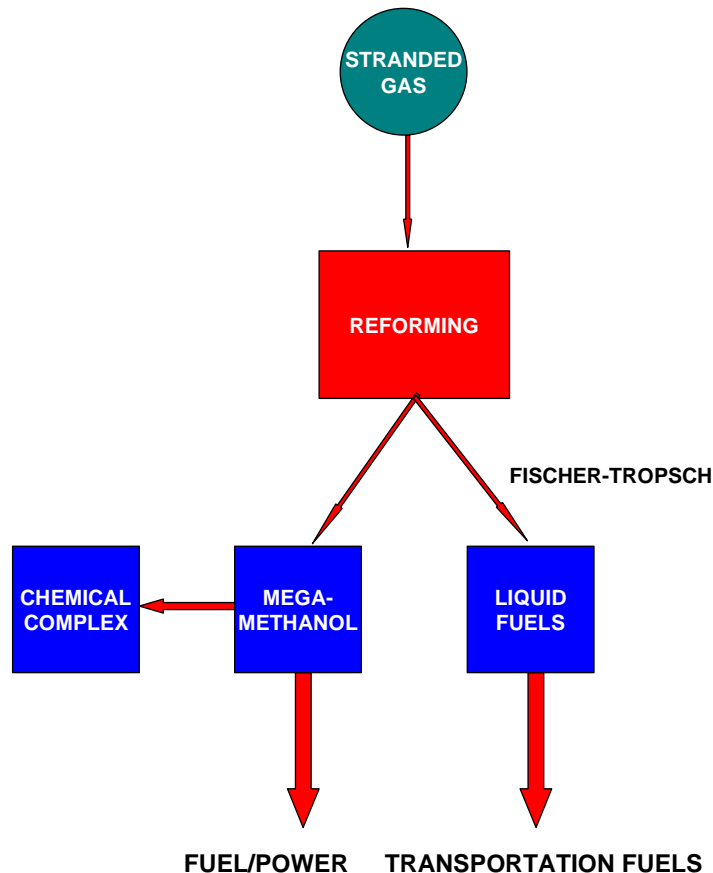


Chem Systems' Process Evaluation/Research Planning program has published a new report, ***Methanol to Olefins (00/01S9)***.

Almost 60 percent of the roughly 141 trillion cubic meters (5,200 trillion cubic feet) of proven natural gas reserves in the world can be categorized as remote or stranded gas. This massive global resource is largely untapped, and conventional means of development face major logistical and economic barriers.

Recent process improvements in methane reforming technologies, fuel grade methanol production (large-scale plants), developments in improved Fischer-Tropsch processes for conversion of Gas-to-Liquids, and the production of olefins from methanol are some of the more important areas of research and development that are expected to increasingly spur future use of stranded gas in what can be viewed as methane or natural gas refineries.

STRANDED GAS: METHANE REFINERIES OF THE FUTURE



Just as petrochemical complexes have grown alongside petroleum refineries and have leveraged the huge economy of scale of the refineries, C₁-based chemicals production complexes have the potential to take advantage of large gas-to-liquid facilities. Methanol to Olefins (MTO) is an obvious and potentially attractive technology to start the gas to chemicals value chain.

The UOP/HYDRO Methanol to Olefins (MTO) process represents an advance over previous processes mainly due to the development of a new catalyst based on SAPO-34. Further refinements of the SAPO technology have produced the current MTO-100 catalyst. The original catalyst, SAPO-34, is a silicoaluminophosphate molecular sieve, which is highly selective for conversion of methanol to ethylene and propylene. That is, the pores of the sieve are such that only lighter and smaller molecules can easily diffuse from it. The newer MTO-100 catalyst, is 80 percent selective for ethylene and propylene.

Lurgi has also developed a MTO process, but unlike the UOP/HYDRO process, the Lurgi process makes mostly propylene (MTPTM). The availability of low cost methanol along with the rise in propylene demand makes this process viable. Low cost (advantaged) gas regions generally support ethane cracking rather than heavy liquids cracking, hence such regions have ample supplies of ethylene, but insufficient propylene supply. The MTP technology allows the development of C₃ based petrochemicals in the low cost gas areas without the need for propane or naphtha. Lurgi claims that a 5,000 metric ton per day methanol plant could produce 500 thousand metric tons per year of propylene.

Economics for both the UOP/HYDRO and Lurgi processes have been compared to conventional and developing routes to ethylene and propylene. USGC pricing and stranded gas pricing scenarios are given. Notional retrospective economic analyses looking back ten years are also presented.