Abstract
This report on gas-to-liquid (GTL) technologies is a follow-up to last year’s GTL technologies report (PEP Report 247C), which was a targeted techno-economic evaluation of small-scale GTL plants. The 2015 report evaluates GTL technologies commercialized on larger scales. The purpose of this follow-up report is to evaluate the economics of large-scale GTL plants from the perspective of their capital investment and operating costs as well as their future prospects of profitability in an environment of their continuously rising cost of construction, and growing interest in the smaller-scale plants because of their lower capital costs, reduced engineering and construction complexity, ease of modularization, mobility, and so forth. The report analyzes the current difficulties with large-scale plants, which are an issue despite their economics being better than the smaller-scale plants. A brief comparative analysis of the large GTL plants is also presented relative to the economics of crude oil–derived fuel product. The report also describes the plus points of large-scale GTL plants—for example, that large-scale GTL plants have demonstrated their technological viability and capability, and established their reliability by running over long periods of time, whereas the small plants have yet to develop to the commercial levels required to demonstrate their performance capability.

The report presents a techno-economic evaluation of GTL plants that produce primary GTL products—diesel, naphtha, and liquefied petroleum gas (LPG)—at a rated capacity of 50,000 barrels/day (BPD). Plant economics are also presented for two other capacities: 25,000 BPD and 100,000 BPD. Only two licensors offer commercial technologies on that scale—Sasol Limited and Shell Global. Therefore, our techno-economic assessment of the large-scale GTL plants is based on the simulated models of these two companies’ processes. The report, in addition to technology descriptions and economic assessment, presents a comprehensive and highly detailed technical review of the factors governing syngas production, Fischer-Tropsch synthesis, and hydroprocessing processes (see Chapter 4).

Production economics presented in the report are based on the cost data for the US Gulf Coast region only. However, we have included with the report an Excel-based data module—iPEP Navigator, which is accessible on the PEP website as an attachment of the electronic report—to allow our clients to convert the economics of the above two GTL processes to corresponding economics of the same processes in five other regions (Canada, China, Germany, Japan, and the Middle East). We also included China, Germany, and Japan (who are not endowed with enough gas resources to sustain the operation of large-scale GTL plants) in order to give our readers an idea of, or a feel for, the relative change or impact on the economics of GTL plants if there aren’t enough gas resources available locally in such countries.

The iPEP Navigator can also be used as a template to calculate GTL production economics in other gas-rich areas, for example, Africa, Australia, or Russia. The data module offers details such as consumption of utilities and raw materials based on the unit weight/volume of GTL products. Clients can input their own unit prices for utilities and raw materials to work out the GTL process economics for those areas.
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