Fischer-Tropsch Gas to Liquids Report

Introduction

By converting natural gas into liquid fuels, the technology greatly reduces high transport costs which in the past has prevented its access to distant markets. This technology is destined to provide an important element in the future landscape of the energy industry. Every major oil and gas company is now energetically participating in further research and development of the technology.

The Report outlines the principal versions of the F-T GTL technology, describes the contributions of the main players, and evaluates and discusses the economic, commercial and financial factors affecting GTL. The Fischer-Tropsch Gas-to-Liquids report assesses the potential impacts of the new technology, not only on the oil industry itself both upstream and downstream, but also on the issue of climate change and on worldwide geopolitical relationships.

Published September 2000, 145 Pages
Available for $1195 USD Acrobat/PDF version, $895 USD in print
Fischer-Tropsch Gas to Liquids Report

Table of Contents

Executive Summary : Introduction

- Overview
- Outline description of the Fischer-Tropsch Gas-to-Liquids (F-T GTL) process and the present status of its development

Chapter 1 : Why the development is important

- to substitute the low costs of liquids transport for the high costs of gas transport
- to commercialise otherwise unmarketable natural gas
- to increase future supplies of liquid hydrocarbons in face of long-term rising crude oil costs: thus to provide an alternative to OPEC dominance of future energy supplies
- to supply environmentally friendly automotive fuels to meet governments post-Kyoto targets
- Which are the principal companies and governments participating in the development
- oil & gas companies
- contractors & consultants
- governments & international organisations
- How soon will the development become commercially significant in the international energy business

Chapter 2 : Brief History

- Research in the 1920s in Germany by Drs. Fischer & Tropsch. Use of the process to produce liquid fuels from coal in Germany during World War 2 and by SASOL in South Africa during the embargo years.
- Mobil’s GTG (gas-to-gasoline) process used commercially in New Zealand in a plant which went on stream in 1985
- Shell’s SMDS plant based a on natural gas which went on stream at Bintulu in Malaysia in 1993
- SASOL’s development and implementation of its processes based on natural gas
- Mossgas plant in South Africa on stream in 1992
- current international projects and alliances
- Exxon builds process development units at Baton Rouge La. in 1989/90 leading to ExxonMobil’s present highly patented AGC-21 technology
- BP Amoco/Arco
- after BP’s intermittent research on F-T GTL over many years, in 2000 following the acquisition of very large gas reserves and additional technology by its takeover of Amoco and hopefully of Arco, BP could become the front-runner for future F-T GTL developments focussing on Alaska and the Far East
Chapter 3 : Syntroleum

- agreements with Federal and W.Australian governments in February 2000
- Sweetwater project in February 2000
- Major current R & D activity
- two ongoing projects in ceramic membrane research
- Synetix/Methanex synthesis gas research
- catalysts research
- research backed by the US Department of Energy
- research backed by the EU
- other current R & D projects
- The impact of methanol developments
- in 1999/2000 conversions of methanol plants to F-T GTL
- investments by Methanex
- Rentech initiatives

Chapter 4 : Description of principal F-T GTL processes (for the non-technical reader)

- Broad outline of the principal steps to convert natural gas to synthetic crudes, to liquid hydrocarbon fuels, waxes, lubricants and other products using the F-T GTL processes
- Alternative products slates and products qualities of the F-T GTL processes
- Shell's SMDS fixed bed process
- ExxonMobil's process
- SASOL's slurry phase distillate process
- Syntroleum's air-based process for synthesis gas production
- Distinguishing features of other publicised processes
- Activities of companies working in the field
- Oil & gas companies : Shell, ExxonMobil, BPAmoco/Arco, Chevron, Texaco, Phillips, Conoco, Statoil, BG, Marathon, Murphy, RepsolYPF, Methanex
- Technology companies : Syntroleum, Rentech, Haldor Topsoe, Syncrude Technology, Energy International, Synetix, Air Products
- Contractors : Foster Wheeler, Kvaerner, Jacobs, Bechtel, Others
- Alliances : Sasol/Chevron, Rentech/Texaco et al.

Chapter 5 : Economic, Commercial and Financial Factors

- Capital costs of existing and proposed GTL plants
- economies of scale
- infrastructure and costs outside battery limits (OSBL)
- breakdown of capex inside battery limits (ISBL)
- Operating costs
- feedstock costs
- other opex
- Potential profitability
- key factors
- published assessments
- Commercial incentives for companies
- potential rewards for otherwise unrecoverable exploration expenditures
- profitable solution of problems in disposing of associated gas
• cost-efficient means to meet stringent automotive emissions legislation
• arguable possibility of premium prices for products
• Incentives for governments of natural gas exporting countries
• revenues from otherwise unmarketable natural gas
• enhancement of the value of major natural gas reserves offering revenues from natural gas in distant petroleum products markets which are more broadly-based than markets for LNG

Chapter 6: Environmental incentives

• elimination of gas flaring
• faced with rising volumes of diesel consumption for road transport, the reduction of emissions to meet government regulations in the EU and USA at acceptable costs

Chapter 7: The financing of projects

• the normal criteria for limited recourse financing
• experience for F-T GTL so far
• F-T GTL versus LNG
• F-T GTL versus NGH (natural gas hydrates)
• Summary of the commercial prospects for F-T GTL

Chapter 8: Implications
Discussion of the extent and timing of potential impacts of the F-T GTL technology on:

• the upstream oil and gas industry
• the downstream oil and gas industry
• the LNG business
• climate change
• worldwide geopolitical relationships

APPENDIX

• Table A1 Some potential natural gas sources for F-T GTL projects
• Table A2 F-T GTL commercial and pilot plants and projects: July 2000-05-02
• REFERENCE SOURCE
Order Form – Fischer-Tropsch Gas to Liquids Report

To order, select an electronic or print version of the report below and fax this form to +1 713 349 8380

**Formats Available**

<table>
<thead>
<tr>
<th>Electronic Version in PDF Acrobat (available within 24hrs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Single User License</td>
<td>$1195 USD</td>
</tr>
<tr>
<td>[ ] Unlimited User License</td>
<td>$3950 USD</td>
</tr>
</tbody>
</table>

**Print Version** (allow 5-10 days delivery)

<table>
<thead>
<tr>
<th>Print Version</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Print Version</td>
<td>$895 USD</td>
</tr>
</tbody>
</table>

**Deliver to**

Name ____________________________ Position ____________________________

Organization ___________________________________________________________

Address ___________________________________________________________________

City ____________________________ State/Province ____________________________

Postal Code ____________________________ Country ____________________________

Phone: ____________________________ Fax: ____________________________

Email: ____________________________

**Payment Method**

[ ] Credit Card: [ ] AMEX   [ ] MC  [ ] VISA

Card Number ____________________________ Expiration __________________

Name on Card ____________________________ Signature ____________________________
Contact Info Update

Since this document was published, Emerging Markets Online has moved.

Please refer to the following contact details to call, email of fax

**TEL:**
+1 202 337 2627
(Washington, DC)

**FAX**
+1 202 742 2813

**EMAIL:**
services@emerging-markets.com

**MAILING ADDRESS:**
Emerging Markets Online
4858 Macarthur Blvd NW #202
Washington, DC 20007 USA
Customized Consulting Services

Introduction

Emerging Markets Online (EMO) provides customized market research and consulting services for the energy, telecommunications and utilities sectors worldwide. EMO specializes in providing each customer with personalized market research and business development support. Our global team of consultants specializes in management consulting, marketing and distribution strategies, project finance, tender and bid support, supplier strategies, and partner facilitation.

Research and Consulting Services

When you are preparing for a specific project, EMO’s team can help. We will work with you to identify and assess emerging market opportunities and challenges. EMO helps clients to:

⇒ Develop research initiatives with direct surveys of markets, competitors, prospective suppliers and government regulatory and procurement entities;
⇒ Perform due diligence and investigative research on specific companies;
⇒ Identify new business opportunities in regional and local markets;
⇒ Facilitate Joint Venture activities and identify prospective partners;
⇒ Provide assessments of sales and distribution channels;
⇒ Track competitor’s activities;
⇒ Forecast market growth potential for products and services;
⇒ Analyze new trends in the industry;
⇒ Acquire strategic information on utility markets deregulation, liberalization and privatization initiatives;
⇒ Develop strategies for competitive tenders and bidding scenarios

For more information, send a Request for Proposal with your specific information requirements, scope of work, and deadline to services@emerging-markets.com
Customized Consulting Services

Recent Consulting Projects
EMO has helped dozens of clients worldwide assess emerging market challenges and identify new growth opportunities. Here are a few examples of recent projects EMO has completed for our clients:

⇒ EMO advised the M&A director for a major multinational E&P corporation on how current LNG projects are structured and financed. This included an analysis of the mix of private finance, commercial finance, ECA and multilateral finance, and engineering finance in current projects. The assignment included a matrix of how current LNG projects are financed by participant and percentage. EMO also provided details of how key LNG projects were structured and financed in Egypt, Trinidad, Qatar, Oman, Baja Mexico, and Nigeria. Finally, we identified three major trends in the financing of LNG projects.

⇒ Consulted a major Russian oil and gas company on the practices of U.S. refinery operating companies. Performed a survey of refinery companies, detailing management practices, investment and purchasing activities, refinery manager roles and responsibilities, and downstream operations. Produced a report of recommendations for applying western practices in refinery management and operations to Russian firm.

⇒ Supported a major law firm with an in-depth assessment of South Africa's natural gas market. Produced a survey and a report of key players, existing operations, exploration activities, pipeline developments, major contracts, pricing mechanisms, and the outlook for downstream natural gas markets.

⇒ Consulted a major U.S. pipeline company in its transition from an energy utility to a broadband telecom services and trading company. Activities include due diligence, competitor assessments, supplier surveys, and regulatory analysis.

⇒ Produced a due diligence assessment on a major electric and natural gas company’s operations in Latin America.

⇒ Created a market assessment for a major European utility regarding the market for power generation, transmission and distribution in eastern Europe.

⇒ Identified prospective buyers for a cellular license for a Latin American country in support of a big-five consulting firm’s representation of a Latin telecommunications operating company.

Proposal Requests
For more information, send a Request for Proposal with your specific requirements, scope of work, and deadline to services@emerging-markets.com