

INSIGHTS ABOUT GASTECHNO™

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GasTechno™

Energy Efficient Recycle®

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The GasTechno™ process represents an industry breakthrough for low capital deployment of GTL facilities where feedstock costs are minimal – especially suitable for flared gas and CO2 injection for enhancing oil recovery.

The GasTechno™ process is a one-step chemical process for converting natural gas to methanol. Methanol, an extremely versatile commodity, is a liquid at ambient temperature and can be transported conventionally to market from remote locations.

The GasTechno™ process has considerable advantages over F-T technology:

- It requires only ONE chemical reaction step, not two.
- A GasTechno™ plant is considerably less complex.
- It requires far less capital investment (nearly doubling IRR).
- The chemical reaction is exothermic.
- Energy requirements are much less.
- The GasTechno™ plant size is highly scalable.

Current analysis of the GasTechno™ process points to savings of up to 50% in capital expenditures and 20% in operational expenses.



Technical and Market Analysis of Syngas Production & Applications via Multiple Feedstock Conversion Technologies
Vol. 15, No. 2
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Michigan Chemical Process Monetizes Unused Natural Gas

Gas Technologies LLC's (GTL) GasTechno™ process monetizes unused natural gas by converting it into chemicals. The single-step process converts natural gas directly into methanol, formalin, and ethanol without a catalyst. GTL is now ready to demonstrate the process in Michigan.

A small prototype plant will establish process parameters for a future, 1,500-tons-per-year-scale demonstration plant that would also be built in the state with the project breaking ground as early as fourth-quarter 2008.

"The problem in Michigan is wasted natural gas and a need for intermediate chemicals for industry," said Nathan Pawlak, process inventor. "The GasTechno process bridges the gap between supply and demand."

The gas-to-chemicals technology creates oxygenates from natural gas and process simplicity allows it to be economically viable at small scales. The product slate addresses specific industry needs using vast off-spec reserves, biogas sources and landfill gas to make chemicals.

GTL evaluated a shut-in, natural-gas condensate well that does not meet pipeline spec and it applied that information to the process as an example of what is possible in Michigan (Table 1).

Dr. Krishna K. Rao, former head, new business venture technology & technology asset management specialist, ExxonMobil Chemical, made a statement after review of process designs, reactor features and chemical reaction fundamentals.

"I can confidently state that this one step technology of converting natural gas to methanol, when verified for commercial readiness, will alter the technology view which currently exists in the major chemical and petroleum industry," he declared.

GTL's long-term strategy is to be in Nigeria, China, and Russia and has already established GasTechno West Africa Ltd. in Nigeria as well as Beijing and Russian offices.

Dr. Robert Carr, professor emeritus, University of Minnesota; Dr. Aaron Gideon, president, AGEC Solutions; Dr. Rao; and independent consultant Dr. Haiming Jin reconfirmed the process. Nexant also performed a competitiveness study.

Carr, Rao, and Jin joined GTL's board of advisors with Jason VanBuren, director, business development, Abraham Group. Walter Breidenstein, Nathan Pawlak, and Harley Luplow are in Michigan. Breidenstein is an entrepreneur with business experience in the US and 36 countries.

Pawlak has a master's degree in Chemical Engineering from Michigan Technological University. The process inventor has eight pending patents on the GasTechno technology. Luplow has a MBA from Georgetown University with 20 years of experience with startup companies.

Table 1: GTL Estimates for a Natural Gas Condensate Well

Methanol Produced	5.75 MIL gallons per year
Formalin Produced	4.06 MIL gallons per year
Ethanol Produced	0.59 MIL gallons per year
Capital Investment Required	\$17 Million
Average Annual Operational Expenses	\$4.2 Million
Average Annual Revenue	\$14.4 Million
Net Present Value (10 year project life)	\$60 Million
Internal Rate of Return	48%
Pay Back Period	26 months (includes construction)