



The Problem: Natural Gas Management Today

- Flaring or Venting
- Re-injection

Why not?

- Local Electricity Generation
- Pipeline
- LNG
- GTL
- GTC



Negative product value



\$10-20/MMBTU



Energy Cost of Global Gas Flaring

World Bank Estimates

- Over 100 billion cubic meters of natural gas flared or vented annually ~ 30.6 billion US \$
- Equal to the combined annual gas consumption of Germany and France
- Twice the annual gas consumption of Africa
- 3/4 Russian gas annual exports
- Enough to supply the entire world with gas for 20 days

Gas Reaction Technologies (GRT)



1998 Jeff Sherman (Avista Resources) -- Galen Stucky (UCSB) New TM *zeotypes** -- syngas catalysts?

- **Alternative solution for stranded natural gas**
- **Alternative to syngas natural gas conversion**
- **Research started**

1999 GRT formed. Sponsored Research Agreement between GRT and UCSB.



2000 - 2004 Expanded research at UCSB on alternative to syngas process (Galen Stucky, Xiao Ping Zhou, Peter Ford, Eric McFarland, Jeff Sherman, Mike Doherty)

2004 - 2008 Off-campus technology development (Jeff Sherman, Eric McFarland)

* *references at end of file*

SANTA BARBARA, Calif. - July 18, 2008 -- GRT, Inc., a Delaware corporation, announced today that it has entered into agreements with Marathon GTF Technology, Ltd., a wholly-owned subsidiary of Marathon Oil Corporation, to cooperate on the advancement of technology for the conversion of natural gas into transportation fuels. In addition, Marathon has acquired a 20 percent interest in GRT.

"GRT is working on developing cost-effective technology that utilizes natural gas at sites where it is presently flared or otherwise stranded from the energy market," said Eric McFarland, Chief Executive Officer and President of GRT.

About GRT

GRT's mission is the development and commercialization of new fuel and chemical production processes based on its core technology. GRT aims to commercialize processes in both the fuels and the chemicals markets. Founded in 1999, GRT is headquartered in Santa Barbara, California. For further information, please visit www.grt-inc.com.

205. Low temperature synthesis of hydrated zinco(beryllo)-phosphate and arsenate molecular sieves, T. E. Gier and G. D. Stucky, *Nature* 349, 508-510 (1991)
DOI 10.1038/349508a0

354. Hydrothermal syntheses and structural characterization of zeolite analogue compounds based on cobalt phosphate, P. Feng, X. Bu, and G. D. Stucky, *Nature* 388, 735-741 (1997)
<http://www.nature.com/nature/journal/v388/n6644/abs/388735a0.html>

365. Large cage zeolite structures with multidimensional 12-ring channels, X. Bu, P. Feng, and G. D. Stucky, *Science* 278, 2080-2085 (1997)
DOI: 10.1126/science.278.5346.2080

386. Synthesis and organization of zeolite-like materials with three-dimensional helical pores, T. E. Gier, X. Bu, P. Feng, and G. D. Stucky, *Nature* 395, 154-157 (1998)
DOI:10.1038/25960