GLOBAL FORUM

On Flaring and Venting Reduction and Natural Gas Utilisation

Synfuels International, Inc.

Upstream GTL Solutions for Flaring

SYNFUELS INTERNATIONAL, INC.

Edward Peterson, PhD, P.E.,
Chief Engineer

Why Synfuels pursued an economical GTL & GTE process

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- **Government restrictions on flaring**
- **Global Environmental concerns**
- **Increasing demand for 'transportable' liquid fuel in emerging economies**
- Laws favouring cleaner fuels
- Need for greater utilization of resources
- Rising energy prices

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Fischer-Tropsch (F-T)
Limitations

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- F-T needs huge plants to create the necessary economies of scale
- F-T's minimum economic size is about 300 MMSCFD
- Primary F-T product has wide molecular weight distribution – lots of waxes and light ends
- Of 15,000+ gas fields outside North America's pipeline network, less than 200 can support mega-scale F-T plants

"Smaller fields need smaller plants that require much less capital than Fischer-Tropsch demands."

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NEW

- Innovative new approach – Not a F-T modification
- Lower operating pressure than F-T. Therefore, lower cost and easier fabrication
- Near 0% recycled gas. This reduces operating costs
- Demonstrated effective down to 30 MSCFD
- Most economical between 10 and 250 MMSCFD

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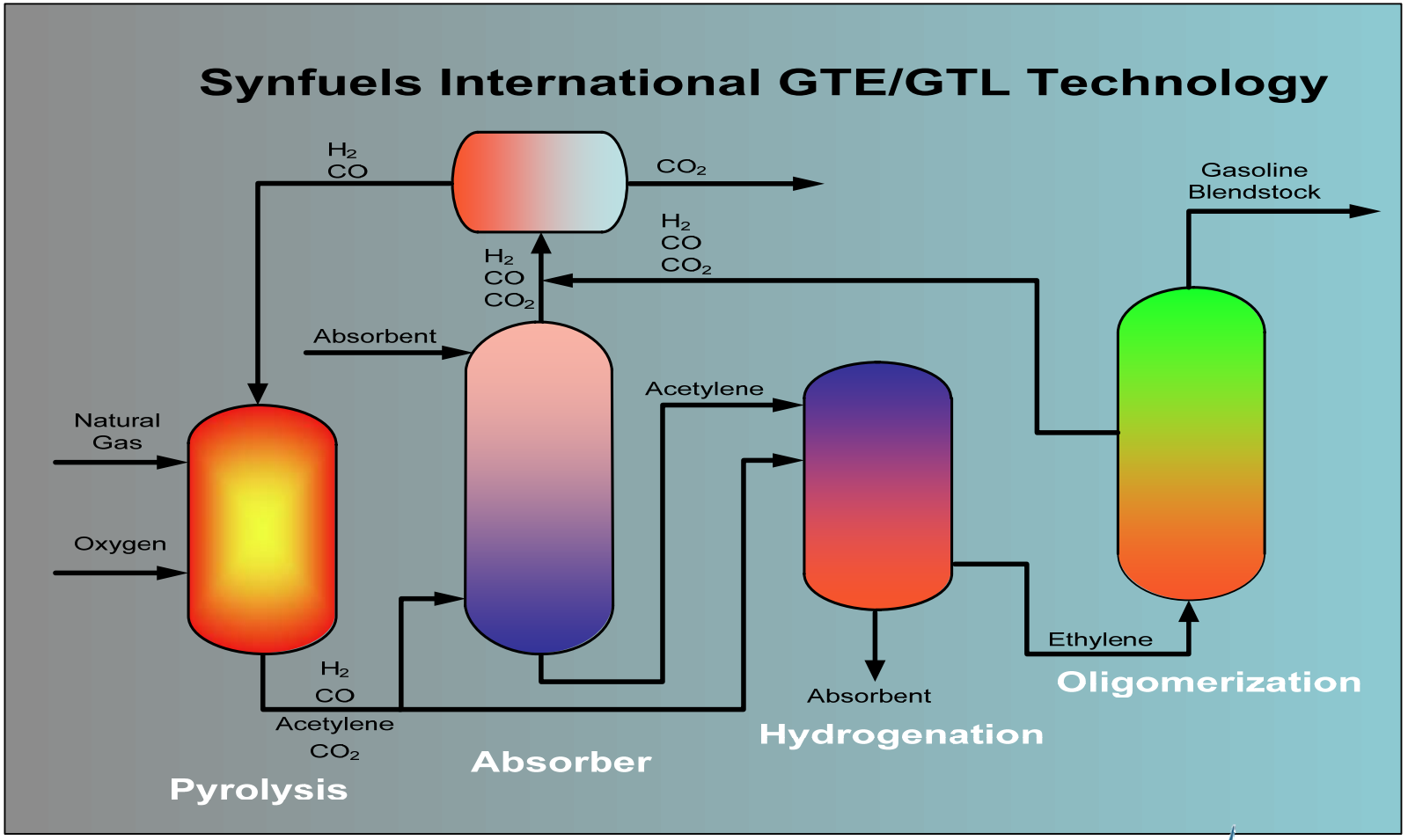

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50 MMSCFD Plant Design

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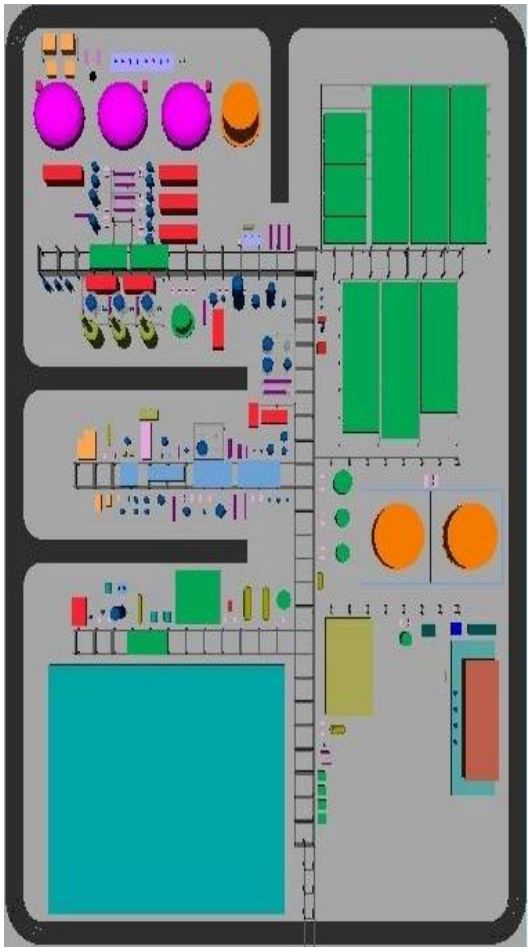

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Clean Gasoline from Methane

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Synfuels GTL Product Properties

Specific Gravity	0.7599 (Water=1)
°API Gravity	54.71 @ 60°F
Molecular Weight	100.422
Weight	6.33 Lbs/Gal
Gross Heating Value	124190 BTU/CF

Synfuels GTL Product Composition

	vol%
Paraffins	12
Iso-paraffins	35.9
Olefins	1
Naphthenes	9.8
Aromatics	38.5

Gas-Phase Hydrogenation Problems

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- Must limit acetylene concentration for reaction and temperature control
- High temperature can lead to a “run-away” reaction
- Requires processing large volumes of diluents rich gas
- Tends toward over-conversion to ethane

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Synfuels Uses Liquid-Phase Hydrogenation of Acetylene

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- Selectively absorbs acetylene
- Rejects unwanted gases
- Greatly reduces volume of processed gas
- Operates at moderate conditions
- No thermal “run-away” reaction
- Much higher acetylene concentrations can be used

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Extended Duration Conversion and Selectivity

Lab Data

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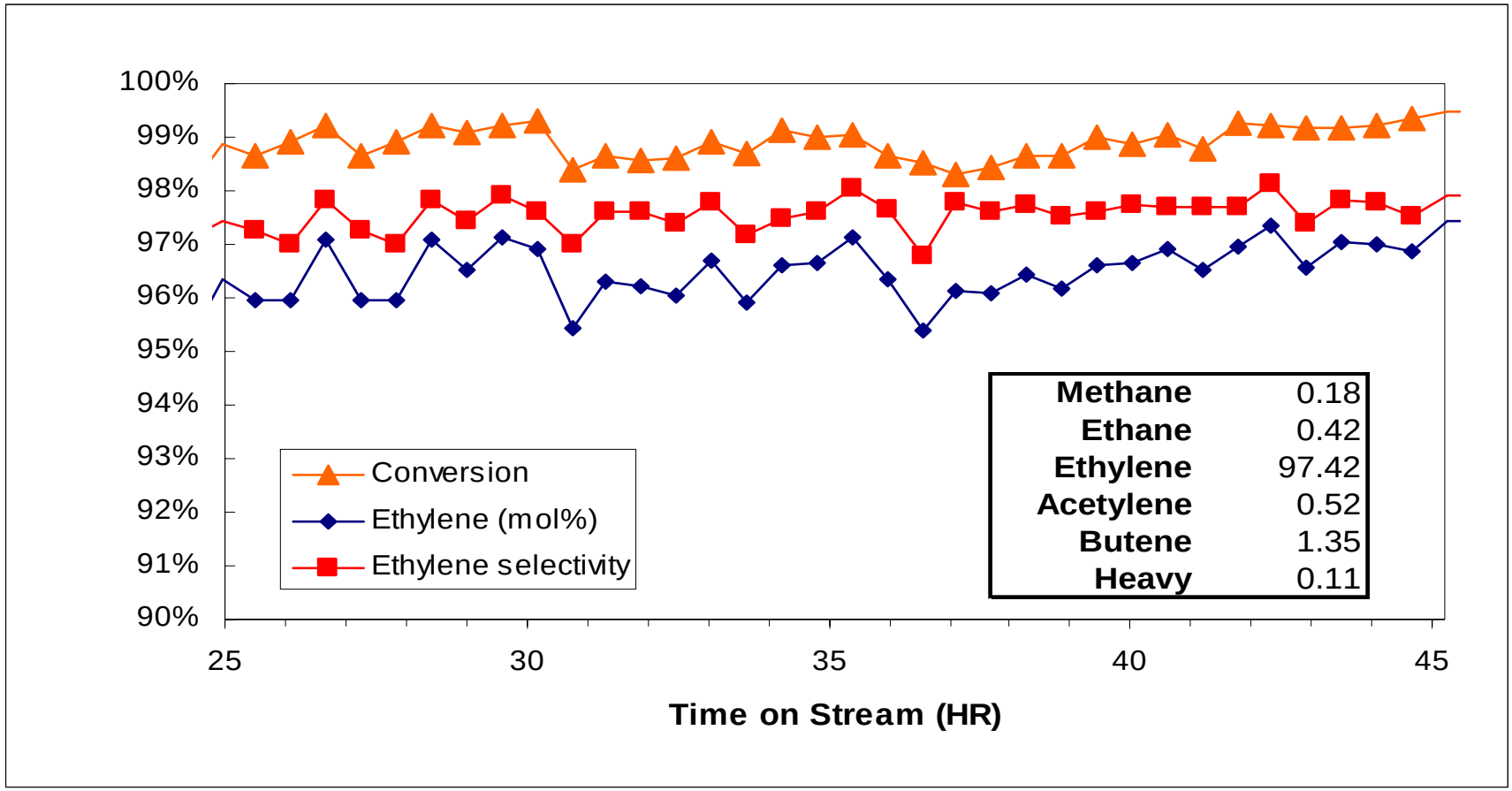

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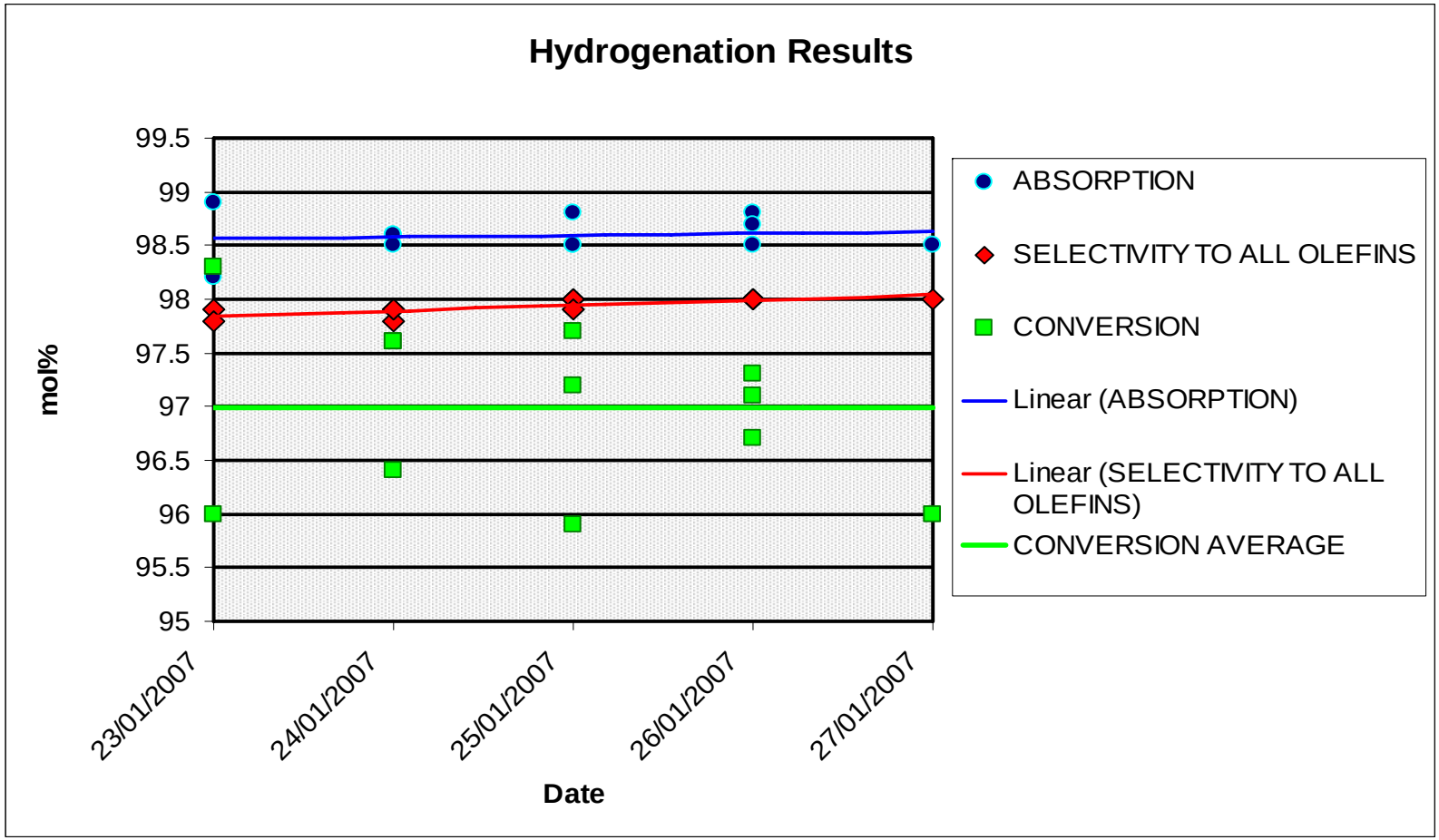
Plant Results



Intellectual Property

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Synfuels Technology is covered by 10 US Patents and dozens of patents pending:

Method for Converting Natural Gas to Liquid Hydrocarbons	Patent Number:6,130,260
Method for Converting Natural Gas to Liquid Hydrocarbons	Patent Number:6,323,247
Method for Converting Methane-Containing Gaseous Hydrocarbon Mixtures to Liquid Hydrocarbons	Patent Number:6,433,235
Method for Converting Natural Gas to Liquid Hydrocarbons	Patent Number:6,602,920
Process for Liquid Phase Hydrogenation	Patent Number:7,045,670
Method for Converting Natural Gas to Olefins	Patent Number:7,119,240
Process for Conversion of Natural Gas to Hydrocarbon Liquids	Patent Number:7,183,451
Process for Conversion of Natural Gas to Ethylene	Patent Number:7,208,647
High Temperature Hydrocarbon Cracking	Patent Number:7,250,449
Process for Liquid Phase Hydrogenation	Patent Number:7,408,091

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Summary

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- A unique, patented natural gas to gasoline or ethylene process
- Established, fully scalable, industrially proven design
- Synfuels liquid-phase hydrogenation is the technology's cornerstone
- Breakthrough technology reduces recycle, compression and system volumes resulting in low capital and operating cost and High IRR
- **Flaring problems eliminated with Synfuels Gas-to-Gasoline plants erected up-stream, on-site**

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Synfuels Top Team

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Synfuels International, Inc.

Mr. Ben Weber, CEO

Mr. Thomas Rolfe, President

Mr. Charles Matar, Managing Director, MENA

Dr. Ed Peterson, Chief Engineer

Bryan Research and Engineering

Prof. Jerry Bullin, President

Dr. Joel Cantrell, Development Engineer

Texas A&M University

Prof. Kenneth Hall, former Head of Chemical Engineering

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