# Capture the Market of Flaring in Oil Production

## Create a new revenue stream with RTI's Modular Partial Oxidation System

### Value Proposition

Allows for **centralized or distributed right-in-time deployment**

**Increases the utility** of geographically isolated natural gas reserves

**Aligns feed rate** with market needs (<50,000 scfd)

Reduces business risk with **low CAPEX and fast replacement times**

**Reduces greenhouse gas emissions** related to flaring

**Converts syngas into various value-added products:**

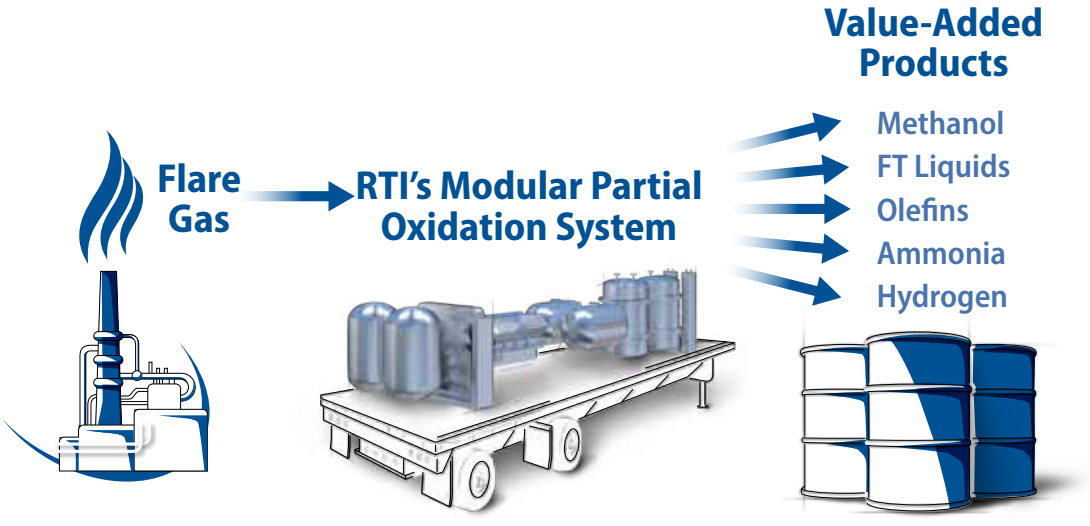
- Methanol
- Ammonia
- Dimethyl Ether
- Fischer-Tropsch (FT) Liquids
- Hydrogen

### The Problem

The United States is the fourth-largest natural gas–flaring country in the world, at nearly 320,000 million standard cubic feet (MMscf) in 2017; this is expected to increase 4% annually to nearly 420,000 MMscf in 2021. North Dakota and Texas account for almost 80% of the flaring and have 250,000 isolated wells flaring an average of 50,000 scf per day (scfd). In addition to the large number of small flares, a large volume of the flared gas comes from well pads flaring between 50,000 and 600,000 scfd. The current available solutions for flare reduction and capture do not address isolated wells; newly drilled wells lacking pipeline infrastructure; or wells with a maxed-out, mature pipeline.

### The Solution

RTI International has developed and is currently testing an engine-based syngas generation system that can **convert 50,000–60,000 scfd of natural gas to 8 barrels per day of methanol**. Multiple units can easily be combined to address large wells. RTI's modular technology can enable an economically competitive and efficient use of flared gas that other solutions—such as gas reinjection, compressed natural gas, and liquefied natural gas—cannot.



## Presentations and Conferences


Carpenter, J. (2017). "Compact Micro-Reformers for Distributed GTL." Presentation presented at Energy Frontiers International: Gas Flare Monetization Forum, Denver, Colorado.

Carpenter, J. (2015, 2016, and 2017) . "Compact Micro-Reformers for Distributed GTL." Poster session presented at ARPA-E Technology Innovation Showcase, Washington, DC.

Carpenter, J. (2016). "Compact RTI MicroReformer™ for Distributed GTL." Presentation presented at Gasification Syngas Technologies Conference, Vancouver, Canada.

Carpenter, J., Lesemann, M. (2016). "Compact Inexpensive Reformers for Natural Gas." Paper presented at Industrial Energy Technologies Conference, New Orleans, Louisiana.


## The Technology

RTI's Modular Partial Oxidation System is composed of a standard, mass-manufactured 9-liter engine that runs on natural gas and has been coupled with a generator. The engine produces syngas for synthesis of value-added products and power. In the current pilot system, the power is dissipated to an electrical load bank. In a commercial unit, that power will be integrated into the system operation. RTI is on the second generation design with over 250h of testing, incorporating initial learnings for improved robustness and wear.

RTI has demonstrated this process utilizing an internal combustion engine as a syngas generator in conjunction with methanol production. Using mass-manufactured internal combustion engines exemplifies substituting economies of scale with economies of mass production, advancing the concept of viable distributed fuel production.

This technology will enable an economic distribution of small-scale conversion of natural gas across many platforms. Advantages of small-footprint direct conversion technologies, consisting of mass-produced process components, are as follows:

- Elimination or reduction of a significant portion of the capital and operating costs associated with conventional gas processing and dedicated pipelines
- Reduction of capital requirements associated with world-scale crackers or gas-to-liquids (GTL) plants
- Alleviation of long-term supply agreements for large blocks of ethane or natural gas
- Creation of a significant number of jobs in the local region of the natural gas extraction.

*Current pilot located in Research Triangle Park, NC.*

**We are presently seeking co-development and partnership opportunities for RTI's Modular Partial Oxidation System, the solution to small-scale modular gas conversion.**

# More Information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