New Enabling Technology for Converting Flares to Fuel

Alan Richards
Founder Methion Limited

Alan.Richards@Methion.com
(772) 708-5917

www.methion.com
Goal: Tools to Economically Monetize Associated Gas Producing Two Income Streams
Why is Associated Gas Still Flared?
Flares to Cooking Fuel
Contents

- Why is Associated Gas still Flared?
- Total Cost of World Flaring
- Drawback of Syngas
- Why the Methion MSA Enabling Technology can do what others can’t. High Margin Product Fungibility
- Current Progress
- Modular “Flare Gas” Plant
- Proposed Gross Sales Economics
- Request from Operators, Need Field Flares
World Flare Economics Using MSA Technology to DME (Estimate)

<table>
<thead>
<tr>
<th>Quantity</th>
<th>DME Produced</th>
<th>Amount $/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>mcf/day</td>
<td>gal/day</td>
<td>$/gal</td>
</tr>
<tr>
<td>14520500</td>
<td>159725500</td>
<td>1.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CO2</th>
<th>$/tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons/day</td>
<td>12</td>
</tr>
</tbody>
</table>

Total Daily Gross Revenue

$223,653,660

World Bank GGFR
5.3 Trillion Cubic Feet of Associated gas flared annually
390 million tonnes of CO2 Produced from Flares annually
Drawbacks of Syngas for Small Sites

- Needs Extensive Utilities
- Large Infrastructure
- Need Economies of Scale
- Large NG Reserves >3 TCF
- Complicated Process, many unit operations
- Waste Problem
- Product Efficiency 55-65%
- Carbon Efficiency 65-75%
- Oxygen Plant is an explosive hazard, especially with offshore production
Oxygen Plant and Hydrocarbons
Not an Offshore Solution

T2 Labs Jacksonville, FL *Methylcyclopentadiene and O2*
Benefits of MSA to DME Enabling Technology

- High Product Efficiency, >90% Theoretical
- High Carbon Efficiency, >95%
- Exothermic First Step,
  - Does not require “Economies of Scale”
  - Minimal Utilities and Infrastructure, No Steam
  - No Oxygen, Suitable for Offshore Applications
  - Simple Process for Remote Locations
  - Much lower Capital Cost and Operating Cost
- Dimethyl ether Product
  - Not tied to Natural Gas Pipeline Markets
  - Uses existing LPG infrastructure
  - Fungible in Propane, Diesel and Natural Gas Markets
Bond Breaking and Making

• Syngas Breaks all 4 H Bonds to Carbon
  – Endothermic Reaction Requires Extremely High Heat and Compression
  – Large Infrastructure, Cost, Large Reserves, High Risk
• MSA Technology Breaks only 1 H Bond to Carbon
  – 3 Remaining H Bonds of Methane remain in Product
  – Broken H Bond goes off with Oxygen as Water
• Exothermic First Step
  – Little Required Infrastructure, Low Capital Cost
  – Closed System, ideal for Remote and Offshore Flares
  – Low Risk, Profit from Waste gas to DME & CO2 credits
First Reaction runs at 80 Degrees Centigrade!
Methion Continuous Pilot
MSA to DME
Supervisory Control and Data Acquisition
MSA to DME
### Typical Nigerian Well - Flare Income Estimate

<table>
<thead>
<tr>
<th>Gas Quantity Flared</th>
<th>4,000 mcf Per Day</th>
<th>Revenue Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>DME Produced Per Day</td>
<td>44,000 Gallons Per Day</td>
<td>Cost Per Gallon $1.32</td>
</tr>
<tr>
<td>CO2 Tonnes Per Day</td>
<td>262.8</td>
<td>Cost Per Tonne $12.00</td>
</tr>
</tbody>
</table>

**Total Revenue Produced Per Day by Eliminated Flare**

$61,233.60
Low Cost NG High Pipe
Number Up not Scale Up
Request for Demonstration Flare

- Request to bring Enabling Tools to Market
- Goal: Enable Operators to Monetize Waste Flares and Provide Revenue Streams
- Request, Participation from Oilfield Operators
  - Participation in Development
  - Joint Ventures
  - Licensing
  - Partnerships
- Investment Opportunities Available
If you would like to see the Pilot Video, Please Contact Me

THANK YOU!

Further Offering & Information on MSA Technology Available.

Alan.Richards@Methion.com
USA (772) 708-5917