VIRTUAL PIPELINES &
MOBILE NATURAL GAS FUEL SOLUTIONS

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INTRODUCTION

• Virtual pipelines are scheduled shipments of energy between two points - delivered by road, rail or sea without a fixed pipeline.

• Virtual pipeline (“VP”) operations have long been used by the military for troop fueling logistics and to supply mobile army surgical hospitals.

• Commercially, VP operations are generally utilized in areas where the market is too small or remote to justify the capital costs of a pipeline, or as a means to deliver to off-grid, large-scale natural gas customers.

• In North America, VP operations have been in place for decades in areas such as Canada, New England and the Northwest to bring energy services to these types of markets on both a temporary and permanent basis.

• Abundant natural gas supply from the recent shale revolution has created increased opportunities and uses for VP operations in many regions.
ADVANTAGES OF A VIRTUAL PIPELINE

- FAST – Pipelines take years to permit and build whereas a VP solution and application can be mobilized and setup for service quickly (~6 - 18 months).

- AFFORDABLE – natural gas VP service compares favorably to delivered fuel oil and propane. Domestic production of natural gas in the shale regions has led to lower commodity pricing, as well as long term price discovery and hedge capability.

- SAFE – VP service uses proven, decades old technology. VP operations work closely with the local Authorities having jurisdiction and adhere to the guidelines outlined by the National Fire Protection Association (NFPA) and Department of Transportation (DOT).

- “BRIDGE” UTILITY – Allows a utility to start servicing a remote customer(s) and while developing the demand over time until it reaches a point where a permanent pipeline solution becomes economically viable.
COMPRESSED NATURAL GAS (CNG) VERSUS LIQUIFIED NATURAL GAS (LNG)

- In order to maximize the amount of energy delivered and stored onsite for natural gas virtual pipeline operations, natural gas is either compressed (CNG) or liquefied (LNG) and loaded into specially designed transport trailers.

- The choice between CNG or LNG depends on many variables including; proximity to the supply source, regional commodity pricing, local permitting requirements, customer usage patterns and storage requirements, customer pressure and flow requirements, and equipment footprint restrictions.

<table>
<thead>
<tr>
<th></th>
<th>CNG</th>
<th>LNG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIESEL GALLON EQUIVALENT (DGE)</strong></td>
<td>3.8</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>MMBTU PER LOAD (80,000 GVWR)</strong></td>
<td>350</td>
<td>826</td>
</tr>
<tr>
<td><strong>PRESSURE DURING TRANSPORT (PSI)</strong></td>
<td>3000+</td>
<td>10</td>
</tr>
<tr>
<td><strong>ODORIZED</strong></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td><strong>SIZE OF FOOTPRINT</strong></td>
<td>Larger</td>
<td>Smaller</td>
</tr>
<tr>
<td><strong>TRUCK TRAFFIC</strong></td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td><strong>COMPRESSION/LIQUEFACTION COSTS</strong></td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td><strong>TRANSPORTATION AND STORAGE COSTS</strong></td>
<td>Higher</td>
<td>Lower</td>
</tr>
</tbody>
</table>
OVERVIEW OF CNG VIRTUAL PIPELINE ROUTE

A NATURAL GAS DELIVERY SOLUTION

Compressor site on pipeline

Full trailer (150-550 Mcf)

24/7/365 Monitoring

Empty trailer returns for refilling

Customer decompression station
CNG STORAGE AND DECOMPRESSION

THE CNG SYSTEM CONSISTS OF PRESSURIZED TRANSPORT TRAILERS, WHICH SERVE AS ONSITE STORAGE; A DECOMPRESSION SKID, WHICH SERVES AS THE TRAILER CONNECTION POINT, GAS HEATING SYSTEM, PRESSURE REDUCTION & REGULATION SYSTEM, CUSTODY TRANSFER METER, ESD AND SYSTEM CONTROLS (TEMPERATURE, PRESSURE, AND VALVE POSITION)

- Steel, Aluminum or Composite Storage Trailers (Type I to IV)
- Decompression skid can be trailer-mounted or fixed to a foundation
- High pressure piping & valves rated for 6000 psi and temperatures lower than -70F
- Flows up to 150 MCF+ per hour
- Outlet pressure range of 30-500 PSIG.
- Designed to operate in a Class 1 Division 2 electrical classification area
- Two stage decompression for fixed installations where more stable discharge pressure is desired
CNG Tube trailer

Off-load Regulator Skid

Skid-mounted Compressor
USES OF VIRTUAL PIPELINES HAVE BEEN INCREASING BOTH IN TERMS OF FREQUENCY & RANGE OF USE

DRIVERS:
• ABUNDANT NATURAL GAS SUPPLY
• LOWER COMMODITY PRICING AND STABILITY
• ENVIRONMENTAL REQUIREMENTS & CONCERNS
• REGULATIONS AND LAWS
• IMPROVING TECHNOLOGIES
• PIPELINE CONSTRUCTION CHALLENGES
• GRID ACCESS (REMOTE AND ISLANDS)

APPLICATIONS:
• STRANDED NATURAL GAS FIELD PRODUCTION
• OFF-GRID CUSTOMERS
• FUEL SWITCHING FOR PROCESS AND FLEET OPERATIONS
• TEMPORARY FUEL SUPPLY DURING CONSTRUCTION
• ELECTRIC GENERATION AND BACKUP
• EVOLVING MARKETS, INCLUDE RENEWABLE NATURAL GAS AND PORT OPERATIONS
VIRTUAL PIPELINES ARE BEING INCREASINGLY USED BY UTILITIES IN SUPPORT OF GROWTH AND OPERATIONS

- **Pipeline Integrity** requirements have been evolving resulting in utility operations and contractors making greater use of VP/mobile fuel supply to maintain system pressures and supply to customers during pipeline testing.

- **Emergency repairs** have been making greater use of VP/mobile fuel supply to avoid customer interruptions and system “re-lights”.

- Use of VP/mobile fueling has allowed **early customer attachment** (“CNG hold”) by being able to provide fuel supply prior to bringing new pipelines in-service.

- VP/mobile fueling can provide **peaking** supply for the utility and C&I industrial customers to avoid interruptions and the need for backup fuel switching (i.e. propane, diesel, jet fuel, etc.).

- C&I industrial customers that have **specific gas quality requirements** can be met by customizing the gas supply.
CNG & LNG HAVE LOWER PRICE VOLATILITY DUE TO A SMALLER COMMODITY PORTION OF THE DELIVERED TO THE PUMP FUEL PRICE

- CNG prices vary greatly based upon a number of factors, including regulatory requirements, ownership structure, age and cost of the station, competing gasoline and diesel pricing, pipeline access and pricing, etc.
- For conversion purposes, 1 MMBTU is equal to 7.7 gasoline gallons equivalent (GGE) and 6.8 diesel gallon equivalent (DGE).
- The current range of prices averages approximately $2.25 per GGE, with prices as low as 99 cents per GGE.
- If natural gas commodity pricing doubles in price to $6 per MMBTU, the CNG price per gallon only increases by approximately 40 cents per GGE, or to a price of approximately $2.65 per MMBTU.
- This pricing works for the transportation market, but is not competitive in other uses of natural gas ($17+/MMBTU).
- The negotiation of a special contract or station ownership is required for non-transportation applications, which more closely resemble C&I customer contracts.
THE CNG PRICING IS LOWER AND LESS VOLATILE

<table>
<thead>
<tr>
<th>NATURAL GAS AT $3/MCF</th>
<th>NATURAL GAS AT $6/MCF</th>
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<tr>
<td>NATURAL GAS (DIVIDE BY 7.7)</td>
<td>NATURAL GAS (DIVIDE BY 7.7)</td>
</tr>
<tr>
<td>$0.39</td>
<td>$0.78</td>
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<tr>
<td>TRANSPORT COSTS &amp; FEES</td>
<td>TRANSPORT COSTS &amp; FEES</td>
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<tr>
<td>$0.20</td>
<td>$0.20</td>
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<tr>
<td>ELECTRICITY COSTS PER GGE</td>
<td>ELECTRICITY COSTS PER GGE</td>
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<tr>
<td>$0.10</td>
<td>$0.10</td>
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<tr>
<td>MAINTENANCE PER GGE</td>
<td>MAINTENANCE PER GGE</td>
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<tr>
<td>$0.20</td>
<td>$0.20</td>
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<tr>
<td>FEDERAL AND STATE TAXES</td>
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<tr>
<td>$0.25</td>
<td>$0.25</td>
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<tr>
<td>FUEL CARD FEES PER GGE</td>
<td>FUEL CARD FEES PER GGE</td>
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<tr>
<td>$0.05</td>
<td>$0.05</td>
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<tr>
<td>RETAILER PROFIT MARGIN</td>
<td>RETAILER PROFIT MARGIN</td>
</tr>
<tr>
<td>$0.80</td>
<td>$0.78</td>
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<tr>
<td>CNG AT THE PUMP</td>
<td>CNG AT THE PUMP</td>
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<tr>
<td>$1.99</td>
<td>$2.38</td>
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<table>
<thead>
<tr>
<th>Natural Gas costs ($/mmbtu)</th>
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<tbody>
<tr>
<td><strong>$/GGE</strong></td>
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<tr>
<td>$0.26</td>
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<tr>
<td><strong>$/DGE</strong></td>
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...Not including electricity cost for compression
RENEWABLE NATURAL GAS (RNG) OPPORTUNITIES ARE REQUIRING MOBILITY SOLUTIONS TO TRANSPORT FUEL

- RENEWABLE NATURAL GAS (RNG) IS THE CREATION OF PIPELINE QUALITY NATURAL GAS FROM WASTE STREAMS, INCLUDING ANIMAL AND HUMAN SLUDGE, FOOD WASTE, WOOD WASTE, ETC.
- CALIFORNIA AND EUROPE HAVE EXPRESSED ASPIRATIONS OF THE REPLACEMENT OF “FRAC GAS” WITH RNG.
- A EUROPEAN STUDY INDICATED THE POTENTIAL TO USE RNG FOR 75% OF ITS NATURAL GAS REQUIREMENTS BY 2050.
- CALIFORNIA IS PROVIDING INCENTIVES TO DRAW ADDITIONAL SUPPLIES AND SUPPORT INFRASTRUCTURE AND CNG TRUCKS.
- THE AGRICULTURE MARKETS ARE IN THE PROCESS OF GARNERING SUPPORT THROUGH INCENTIVES AND NUMEROUS PILOT PROJECTS.
- A KEY MARKET IS THE CHICKEN MARKET CENTERED IN THE SOUTHEASTERN U.S. - GEORGIA HAS OVER 4,000 CHICKEN FARMS (16% OF U.S. CHICKEN PRODUCTION), AND WHEN INCLUDING MISSISSIPPI, ALABAMA, NORTH AND SOUTH CAROLINA, THE SOUTHEAST MAKES UP 50% OF THE U.S. CHICKEN PRODUCTION.
- INSTALLATION OF ANAEROBIC DIGESTERS IS A FULLY DEVELOPED TECHNOLOGY, WITH SIGNIFICANT IMPLEMENTATION AND USAGE IN EUROPE.
- THESE MARKETS REQUIRE TRANSPORTATION TO MARKET AND HAVE DIFFICULTY SUPPORTING THE SIGNIFICANT PIPELINE NETWORK AND ASSOCIATED COST - SO, THE MARKET HAS TURNED TO MOBILE TRANSPORTATION SOLUTIONS.
FLORIDA IS THE EPICENTER OF U.S. SHIPPING AND THE LEADER IN THE USAGE OF LNG AS TRANSPORTATION FUEL

- Florida has 14 ports, more than any other state, and 3 of the top 10 container ports in the United States.
- Florida is first in marine fuel consumption, and is 3 times the amount of any other state.
- With the widening of the Panama Canal there has been an increase of shipping to the East Coast ports, projected at 30%.
- The EPA issued a rule on April 30, 2010 that adopted standards reducing emissions for all ships within 200 miles of the U.S. shoreline, amended in 2011 to include Puerto Rico and USVI.
- These standards require use of .01% low sulfur fuel, installation of scrubbers or use of LNG to meet the reduced emission standards.
- This is resulting in the TOTE and Crowley container operators ordering the first LNG fueled vessels in the United States.
- This has also resulted in the construction of 3 small scale LNG plants, which also supports the introduction of LNG for use in railroads, trucking, mining, industrial and power applications.
- Transportation is typically by truck.
GLOBAL MARINE MARKET MAKES A TRANSFORMATIONAL SHIFT TO .5% LOW SULFUR DIESEL FOR MARINE VESSELS

- THE INTERNATIONAL MARITIME ORGANIZATION (IMO) ESTABLISHED REGULATIONS LOWERING SULFUR CONTENT OF MARINE FUEL FROM 3.5% (BUNKER FUEL) TO .5% (MARINE GAS OIL) EFFECTIVE JANUARY 1, 2020.

- THE PROBLEM IS THAT THE OIL REFINERY BUSINESS HAS NOT MADE THE INVESTMENT IN THE REQUIRED ADDITIONAL CAPACITY TO ABSORB THE SIGNIFICANT INCREASE IN DISTILLATE USAGE (TYPICALLY MORE THAN $1 BILLION AND 5+ YEARS PER QUALIFYING REFINERY).