Natural Gas Resource Development
February 19, 2014
Shale Gas 101
**What is the Marcellus Shale?**
- Geological formation formed by accumulation of sediment into a sea almost 400 million years ago
- Compressed to produce an organic-rich black shale.
- Starts at NY, Catskills, stretches across toward Marcellus, New York then southwest to PA, West Virginia, Kentucky, and Ohio.

**Why Now?**
- Success of other shale plays has allowed companies to transfer horizontal drilling and technology to other areas.
- Proximity to high-demand markets along the East Coast make it an attractive target for energy development.
Shale Gas – Global Opportunity

An Elusive Prize | Many nations are believed to have large shale deposits

North America
1,931 trillion cubic feet

CHINA
1,275 trillion cubic feet

Note: Data are shown only for countries included in the survey. Figures are estimates. Source: U.S. Energy Information Administration
Shale Gas Revolution Across the U.S.

Source: Energy Information Administration
Marcellus Shale: Geographic Footprint
Utica Shale

- Below the Marcellus
- Bigger, deeper, denser
- One of the latest U.S. unconventional energy fields
- Particularly attractive in OH
- Success in the Marcellus has led to success in the Utica
**Industry Segments**

**UPSTREAM**
- Gas Field Exploration
- Well Drilling and Hydraulic Fracturing
- Gas Recovery and Production

**MIDSTREAM**
- Gas Collection and Transportation Systems (Gathering Pipelines)
- Gas Processing (Dehy, Separation, Fractionation)
- Compression (Well Head, Gathering)

**DOWNSTREAM**
- Interstate and LDC Transportation Systems (Transmission and Distribution Pipelines)
- Compression (Transmission)
- Regulation
- Metering
### Segments of the Oil and Gas Industry

**Exploration and Production (Upstream)**
- Oil, Gas, Water
- Separation
- Oil, Gas, Water
- Well
- Water Injection Well
- Oil and/or Gas Reservoir
  - 5,000 - 16,000 ft deep

**Gathering, Compression, Treating, Processing, Transportation (Midstream)**
- Gathering Pipelines
- Compression
- Gas Treating, Processing and Fractionation
- Natural Gas (Methane)
- Propane, Butanes, Gasoline's
- Petrochemical Plants
- Propane
- Ethane
- Butanes
- Water Injection Well
- Interstate Oil Pipelines
- Oil Refineries

**Petrochemical and Refining (Downstream)**
- Home Heating/Cooking
- Electric Power
- Industrial Boilers/Furnaces
- LNG (Liquefied and shipped)
- CNG (Fleet Fuel, Buses, etc)
- Glad Baggies
- Plastics
- Styrofoam
- Alcohols
- Other Chemicals
- Unleaded Gasoline
- Diesel
- Jet Fuel
- Asphalt
- Other

*Source: MarkWest Energy Partners*
Exploration/Production, Midstream, and Downstream 101
Land Acquisition/Site Preparation

• Obtain rights from landowner.

• Educated landowner is an ideal partner.

• “Production unit” - contiguous parcels of land combined for development.

• Production unit incorporated into a company’s drilling program.

• Site is prepared for drilling activity.
Steps in Drilling

Horizontal Drilling

• More efficient production, smaller footprint.

• Conductor, surface casing protect drinking water source.

• Well is drilled vertically and horizontally as much as 5,000 feet.

• Wellbore is approximately 20 inches in diameter at its widest.

• 5 ac vs. 24 ac = 1 acre when done
Well Casing

- Multiple layers of steel and cement to ensure redundant protection
  - 1 – through fresh water aquifer
  - 2 – to depths of ~1,500 feet
  - 3 – to final depths

- Cementing to surface at each layer provides stability and protection, preventing the crossflow of hydrocarbons

- 25 PA Code, Chapter 78 rules have further strengthened standards
Hydraulic Fracturing

- Permits from state regulatory agencies for water withdrawal.
- New technologies allow producers to recycle most water.
- 30 State and federal agencies monitor hydraulic fracturing.
- Industrial process; properly encased well, along with proper containment at the surface is critical.
Steps in Completion

**Hydraulic Fracturing (HF)**

- > 60 years: more than 1 million wells in 27 states
- 90 percent of oil and gas wells use HF technology
- 99.5 percent water/sand mix
- 3 to 5 million gallons of water fractures the shale.
- Well casing protects water supply
- PA Chapter 78 upgrades reflect best practices in well casing
Transparency in Completion

MSC Commitment to FracFocus.org Bolsters PA Requirements

FracFocus.org is a Project of the Groundwater Protection Council and the Interstate Oil & Gas Compact Commission
Center for Rural PA Study

- Comprehensive research over two years, published in 2011
- Suggested private water well standards are needed
- Pre-drill testing by natural gas companies – a public service
- Regulations require testing of all water supplies within 2,500’ of proposed gas well.
- >40% of 1.2 million private water wells do not meet safe drinking water standard, separate from industry activity
- Another 20% percent of wells contained pre-existing methane
Steps in Production

Site Restoration

• Involves landscaping and contouring the property as closely as possible to pre-drilling conditions.

• Property owners generally see:
  – Small wellheads on a level pad
  – Small amount of equipment
  – Two to three water storage tanks
  – Metering system to monitor gas production

Courtesy: Range Resources
Developed in collaboration with:
PA Federation of Sportsmen’s Clubs
Ducks Unlimited
National Wild Turkey Federation
Wildlife for Everyone Foundation
The Nature Conservancy
Ruffed Grouse Society
Western PA Conservancy
PA Outdoor Writers Association
American Chestnut Foundation
Focus on Midstream

- Gathering Line defined in PA state law as a pipeline used to transport natural gas from a production facility to a transmission line
  - Along the way, the lines can lead to a compressor station and possibly a processing plant (in wet gas areas)
- Location of pipelines are subject to negotiation between property owner and pipeline company
- Right of Way Agreements between property owner and pipeline company recorded with county
- Right of Way can contain multiple pipelines and can range from 50-75 feet in width
  - Additional width for construction

Source: MarkWest Energy Partners
Focus on Midstream

Gathering and Transmission Pipelines

• Critical link between production and consumers
• Pipelines can transport gas before or after processing
• Designed and constructed to the latest pipeline safety standards
• Utilize new construction methods to minimize the environmental impact
• New coating technologies mean pipelines will last even longer
• Geographic Information Systems allow for efficient layout and accurate tracking of pipeline systems
• Subject to regulatory inspection (PAPUC, DOT PHMSA)
Pipeline Safety

• Pipelines are considered the safest mode of transportation for natural gas and hazardous liquids
  – Does not mean that other modes are not safe
  – State and federal regulation of pipelines and safety

• Federal Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011
  – Pennsylvania Gas and Hazardous Liquids Pipelines Act of 2011
  – Pennsylvania Underground Utility Line Protection Law (PA One Call Law)
  – Pennsylvania Act 13 of 2012

• Third party damage is the greatest threat to pipeline safety
  – Pipeline Placement report recommendation for mandatory One Call participation
**Compression Systems**

**Compressor Stations**
- State of the art sound attenuation
- Built to the highest welding, fabrication, and material standards
- 24/7 monitoring and control
- Automatic safety systems
- Annual inspections by regulating entities

**Compressor Packages**
- High tech integrated control systems (engine and compressor)
- 24/7 monitoring and control
- Produced and packaged in the USA
- Operated and maintained by local workers
Marcellus Shale Coalition
About Us

– Approximately 300 members strong
– From producers to midstream to suppliers

Our Focus

– Long-term development of resource
– Protecting the environment and responsible use of water resources
– Addressing landowner, government and public issues
– Benefits to our region’s future
Highly regulated. Highly sophisticated.

- Transparency in permitting
- Staffing, permit fee increases
- Advances in water recycling and reuse
- Protective well casing standards
- Focus on best practices
- FracFocus.org
Regulatory Framework

Site Construction
- 12 PA Regulations

Drilling Phase
- 18 PA Regulations

Hydraulic Fracturing
- 18 PA Regulations

Midstream
- 11 PA Regulations

Reclaimed/Completed Site
- 10 PA Regulations
Environmental Regulation – Midstream

• Various environmental permits and clearances may be required for the construction of pipelines
  – Erosion and Sediment Control Permits under the PA Clean Streams Law
  – Stream Crossing Permits under the PA Dam Safety and Encroachments Act
  – PA Natural Diversity Inventory clearances to protect threatened and endangered species
  – PA State Programmatic General Permits (PA DEP- US Army Corps of Engineers) under the Federal Clean Water Act

• Other midstream facilities, such as compressor stations and processing plants, require multitude of permits and clearances
Land required (acres) to produce fuel to generate enough electricity to serve 1,000 households for one year

Source: CONSOL Energy
Air Quality Standards

- Short-term monitoring in Northeastern, Southwestern, and North Central PA:
  - “Did not identify concentrations of any compound that would likely trigger air-related health issues associated with Marcellus Shale drilling activities.”

- Air quality standards tightly-regulated:
  - Gas Processing Plants: Plan approval/air permit
  - Compressors: Covered by GP-5

- Companies exploring “bifuel” rigs to reduce use of diesel
Environmental, Public Health Benefits of Natural Gas

• When used to generate electricity, natural gas emits just over half of the CO₂ per megawatt-hour (MWh) of a traditional power plant.

• Natural gas combined-cycle turbines emit 60 percent less CO₂ per MWh than a typical coal plant.

• Natural gas vehicles emit 25% less CO₂ than vehicles that run on traditional fuels.

• According to the Congressional Research Service, if U.S. doubled the utilization of combined cycle natural gas capacity to 85%, we could displace approximately 636 million metric tons of CO₂. This amounts to an 8.8% reduction of all CO₂ emissions in the U.S.
PA Jobs, PA Workers

• PA Department of Labor and Industry
  
  - 231,969 employees in Marcellus and related industries as of 2013 Q1*
  
  - Core industries were 35.0% higher in 2013 Q2 than in 2010 Q2*
  
  - Core Industry occupations
    
    • Crude Petroleum & Natural Gas Extraction ($110,119)
    • Natural Gas Liquefied Extraction ($100,841)
    • Drilling Oil and Gas Wells ($84,862)
    • Support Activities of O&G Operations ($70,401)
    • O&G Pipeline & Related Structures ($82,127)
    • Pipeline Transportation of Natural Gas ($85,747)
  
  - $83,300 average core industry wage ($34,800 higher than PA avg.)*

*Source: Marcellus Shale Fast Facts, September 2013, PA Department of Labor and Industry
PA Department of Labor and Industry

Ancillary Industries

- Non residential site preparation contractors ($53,191)
- Trucking (general freight, specialized freight) ($42,582-$51,771)
- Commercial & industrial machine and equipment repair ($54,323)
- Water Supply, Sewage treatment facilities, and infrastructure construction ($45,560-$66,741)
- Engineering Services ($79,147)

-$65,000 average ancillary industry wage ($16,500 higher than PA avg.)*

*Source: Marcellus Shale Fast Facts, September 2013, PA Department of Labor and Industry
Statewide Job Opportunities

- Department of Labor and Industry: 3,730 Marcellus job postings statewide
- Most found at MSC job portal
- Support for ShaleNET
- Training network responds to market demands
Increases in Production

Annual natural gas well starts and production in Pennsylvania

- Wells started:
  - 2005: 2,500
  - 2006: 3,000
  - 2007: 2,700
  - 2008: 3,500
  - 2009: 2,000
  - 2010: 2,500
  - 2011: 1,500
  - 2012: 1,000

- Gas production:
  - 2005: 0.5
  - 2006: 0.5
  - 2007: 0.5
  - 2008: 1.0
  - 2009: 1.0
  - 2010: 1.5
  - 2011: 2.0
  - 2012: 2.5

- Production in billion cubic feet per day:
  - 2005: 0.0
  - 2006: 0.0
  - 2007: 0.0
  - 2008: 0.0
  - 2009: 0.0
  - 2010: 0.0
  - 2011: 0.0
  - 2012: 0.0

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Economic Impact for Our Region

- More than 4,500 wells drilled between 2010 and 2012, an investment of approximately $31.5 billion

- 2013 projection: $13.5 billion
  - Leasing and bonuses
  - Exploration
  - Drilling and completion
  - Pipelines and processing
  - Royalties

Source: Survey of Marcellus Shale Coalition Board Member Companies
<table>
<thead>
<tr>
<th>Paid by Natural Gas Industry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall taxes since 2006¹</td>
<td>&gt; $1.8 billion</td>
</tr>
<tr>
<td>Road construction investments since 2008²</td>
<td>&gt; $700 million</td>
</tr>
<tr>
<td>Royalty payments to state in 2011³</td>
<td>$177 million</td>
</tr>
<tr>
<td>Permitting and enforcement fees to increase DEP personnel since 2009⁴</td>
<td>$40.5 million</td>
</tr>
<tr>
<td>Impact Fee in first two years⁵</td>
<td>&gt; $400 million</td>
</tr>
</tbody>
</table>

¹ – Fox News, July 23, 2013
² – On-going Survey of Marcellus Shale Coalition Members
³ – Pennsylvania Department of Conservation and Natural Resources, 2013
⁴ – Pennsylvania Department of Environmental Protection, 2013
Impact Fee Revenue Allocations

Impact Fee Allocations 2011 & 2012
$400MM+

- Local Government $216,409,200
- Marcellus Legacy Fund $144,272,800
- Natural Gas Energy Development Program $17,500,000
- Department of Environmental Protection $12,000,000
- County Conservation Districts & Conservation Commission $7,500,000
- Fish and Boat Commission $2,000,000
- Public Utility Commission $2,000,000
- Department of Transportation $1,500,000
- PA Emergency Management Agency $1,500,000
- State Fire Commissioner $2,000,000

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Revenue to Local Government

Impact Fee Payment 2011 & 2012
County and Municipal Government
$200MM

- Boroughs & Cities: $12MM
- Counties: $75MM
- Townships: $112MM

Excludes Housing Affordability and Rehabilitation Fund
Impact Fee Top 10 Earning Counties

Impact Fee Allocations 2011 & 2012
$96.8MM

- Allegheny, $2.3MM
- Philadelphia, $2.6MM
- Fayette, $2.8MM
- Westmoreland, $3.3MM
- Greene, $6MM
- Susquehanna, $8.1MM
- Lycoming, $8.4MM
- Washington, $9.1MM
- Bradford, $15.8MM
- Tioga, $9.1MM
- All Other, $29.3MM

* Includes Impact Fee and MLF payments in 2011 & 2012
Savings for Consumers

• Heating
  • EIA: Family of four in an 1,800 sq. ft. home can save about $1,500 a year, or 60%, by switching to gas.

• Electricity

• Natural gas vehicles

• Consumer products

Source: Philadelphia Inquirer, May 19, 2013
Pre-drilling (Exploration)
- Geologic studies, permitting, water management, engineering/design, site preparation, environmental and safety compliance

Drilling (Extraction)
- Pipeline, compressor, well facilities construction, Hydraulic Fracturing & completions, water management, environmental and safety compliance

Production/Reclamation
- Engineering, site reclamation, environmental and safety compliance

Delivery to Market (transport, storage, marketing)
- NG Marketers, commodity traders, logistics, storage, accounting, risk management
Fast Facts

- $7+ million investment to produce each well
- 400+ individuals within nearly 150 different occupations needed to complete and produce gas from a Marcellus well (MSETC, 2010)
Know the Law

Act 13, §2316 – Small business participation

• Producers shall provide maximum practicable contracting opportunities for diverse small businesses, including minority, women and veteran-owned businesses.

• Producers shall do the following:
  − Maintain a policy prohibiting discrimination in employment and contracting based on gender, race, creed or color
  − Use the Department of General Services’ Internet database to identify certified diverse small businesses
  − Respond to a survey conducted by the Department of General Services
  − Survey shall be sent to all producers within one year to report the producers’ efforts to provide maximum practicable contracting opportunities related to unconventional natural gas extraction for diverse, small business participation
The Economics of Shale Gas
"Decoupling" of Oil and Gas Prices

Source: FactSet Research Systems
Clean, Abundant, and Versatile

1. Electricity generation, heating

2. Combined heat and power applications

3. Light and heavy duty transportation applications

4. Feedstock for industries and other liquids use

5. Exports
Energy Consumption Overview

Quadrillion Btu

1. Electricity generation, heating

2. Combined heat and power applications

3. Light and heavy duty transportation applications

4. Feedstock for industries and other liquids use

5. Exports
Monthly coal- and natural gas-fired generation equal for first time in April 2012
1. Electricity generation, heating

2. Combined heat and power applications

3. Light and heavy duty transportation applications

4. Feedstock for industries and liquids use

5. Exports
<table>
<thead>
<tr>
<th>Source</th>
<th>Sites</th>
<th>Capacity (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>135</td>
<td>3,276,430</td>
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<tr>
<td>Boiler/Steam Turbine</td>
<td>54</td>
<td>1,929,075</td>
</tr>
<tr>
<td>Combined Cycle</td>
<td>5</td>
<td>1,156,400</td>
</tr>
<tr>
<td>Combustion Turbine</td>
<td>10</td>
<td>97,715</td>
</tr>
<tr>
<td>Fuel Cell</td>
<td>3</td>
<td>580</td>
</tr>
<tr>
<td>Microturbine</td>
<td>14</td>
<td>4,290</td>
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<tr>
<td>Other</td>
<td>1</td>
<td>231</td>
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<tr>
<td>Reciprocating Engine</td>
<td>47</td>
<td>85,139</td>
</tr>
<tr>
<td>Waste Heat Recovery</td>
<td>1</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Source: ICF International, 2011
1. Electricity generation, heating

2. Combined heat and power applications

3. **Light and heavy duty transportation applications**

4. Feedstock for industries and other liquids use

5. Exports
<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>U.S. NGV Population</th>
<th>U.S Market Penetration (by vehicle count)</th>
<th>U.S Annual NGV Fuel Use (thousand DGE)</th>
<th>U.S. Market Penetration (by fuel use)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Transit Buses</td>
<td>8,500&lt;sup&gt;b&lt;/sup&gt;</td>
<td>12,200&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.82%</td>
<td>17.43%</td>
</tr>
<tr>
<td>Refuse Trucks</td>
<td>1,300&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1,500&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.95%</td>
<td>1.09%</td>
</tr>
<tr>
<td>School Buses</td>
<td>1,360&lt;sup&gt;d&lt;/sup&gt;</td>
<td>2,300&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.27%</td>
<td>0.46%</td>
</tr>
<tr>
<td>Medium-Duty Trucks/Vans</td>
<td>10,000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>22,000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.35%</td>
<td>0.76%</td>
</tr>
<tr>
<td>Other Heavy-Duty Trucks</td>
<td>1,600&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3,651&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.02%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Light Trucks/Vans</td>
<td>41,000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>71,500&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.05%</td>
<td>0.09%</td>
</tr>
<tr>
<td>Passenger Cars</td>
<td>31,000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>31,000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.02%</td>
<td>0.02%</td>
</tr>
<tr>
<td>Total</td>
<td>94,760</td>
<td>144,151</td>
<td>0.04%</td>
<td>0.06%</td>
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</tbody>
</table>

<sup>a</sup>Energy Information Agency, Alternatives to Traditional Transportation Fuels 2008, 2010
<sup>b</sup>Yborra, S., Growth of the NGV Market: Lessons Learned Roadmap for Infrastructure Development, 2008
<sup>c</sup>Cannon, J., Greening Garbage Trucks: Trends in Alternative Fuel Use, 2006
<sup>d</sup>Monahan, P., School Bus Pollution Report Card 2006, 2006
<sup>e</sup>American Public Transportation Association, 2010 Public Transportation Fact Book, 2010
<sup>f</sup>U.S. Census Bureau, Vehicle In Use Survey, 2002
SEPA Natural Gas Equivalency Prices
Neighborhood Air Emissions
Base Case (Diesel) vs. CNG Case

- **NOx**: 42% Reduction
- **CO**: 88% Reduction
- **SO2**: 91% Reduction

Lbs/year
1. Electricity generation, heating

2. Combined heat and power applications

3. Light and heavy duty transportation applications

4. Feedstock for industries and other liquids use

5. Exports
Legend
Marcellus Shale Formation
Wet Gas Region
"Wet Gas" Region

Sources: Pace Global; Equitable Resources, MarkWest, Atlas Energy, Range Resources, and Caiman Energy.
Composition in Wet Gas Region

Methane, 74.2%
Ethane, 15.6%
Propane, 5.5%
Iso Butane, 0.7%
Normal Butane, 1.4%
Iso Pentane, 0.5%
Normal Pentane, 0.5%
Hexanes+, 1.1%
Liquids, 25.3%

Source: Pace Global; NiSource Gas Transmission and Storage Presentation to WVONGA Spring Meeting May 6, 2010 p.5
1. Electricity generation, heating

2. Combined heat and power applications

3. Light and heavy duty transportation applications

4. Feedstock for industries and other liquids use

5. Exports
International joint venture investment in U.S. shale plays (2008-12)

- 2008: Other plays 1 billion dollars
- 2009: Wolfcamp 2 billion dollars, Barnett 1 billion dollars
- 2010: Utica 2 billion dollars, Eagle Ford 2 billion dollars, Marcellus 1 billion dollars
- 2011: Haynesville 1 billion dollars, Niobrara 1 billion dollars
- 2012: Woodford 1 billion dollars, Eagle Ford 2 billion dollars

Source: EIA, April 8, 2013
International Interest

North American LNG Import/Export Terminals
Proposed/Potential

Import Terminal
PROPOSED TO FERC
1. Robbinston, ME: 0.5 Bcf/d (Kestrel Energy - Downeast LNG)
2. Astoria, OR: 1.5 Bcf/d (Oregon LNG)
3. Corpus Christi, TX: 0.4 Bcf/d (Cheniere - Corpus Christi LNG)
POTENTIAL U.S. SITES IDENTIFIED BY PROJECT SPONSORS
4. Offshore New York: 0.4 Bcf/d (Liberty Natural Gas)

Export Terminal
PROPOSED TO FERC
5. Freeport, TX: 1.0 Bcf/d (Freeport LNG Dev/Freeport LNG - Expansion/FLNG Liquefaction)
6. Corpus Christi, TX: 2.1 Bcf/d (Cheniere - Corpus Christi LNG)*
7. Coos Bay, OR: 0.9 Bcf/d (Jordan Cove Energy Project)*
8. Lake Charles, LA: 2.4 Bcf/d (Southern Union - Trunkline LNG)
9. Hackberry, LA: 1.7 Bcf/d (Sempra - Cameron LNG)*
10. Cove Point, MD: 0.82 Bcf/d ( Dominion - Cove Point LNG)*
11. Astoria, OR: 1.30 Bcf/d (Oregon LNG)
12. Lavaca Bay, TX: 1.36 Bcf/d (Exelgrade Liquefaction)
13. Elba Island, GA: 0.35 Bcf/d (Southern LNG Company)
14. Sabine Pass, LA: 1.3 Bcf/d (Sabine Pass Liquefaction)
15. Lake Charles, LA: 1.07 Bcf/d (Magnolia LNG)
16. Plaquemines Parish, LA: 1.07 Bcf/d (CE FLNG)
17. Sabine Pass, TX: 2.1 Bcf/d (ExxonMobil - Golden Pass)

PROPOSED CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS
18. Kitimat, BC: 0.7 Bcf/d (Apache Canada Ltd.)
19. Douglas Island, BC: 0.25 Bcf/d (BC LNG Export Cooperative)
20. Prince Rupert Island, BC: 1.0 Bcf/d (Shell Canada)
POTENTIAL CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS
21. Brownsville, TX: 2.8 Bcf/d (Gulf Coast LNG Export)
22. Pascagoula, MS: 1.5 Bcf/d (Gulf LNG Liquefaction)
23. Cameron Parish, LA: 0.16 Bcf/d (Waller LNG Services)
24. Ingleside, TX: 1.09 Bcf/d (Rangea LNG (North America))
25. Cameron Parish, LA: 0.20 Bcf/d (Guzin Development)
26. Cameron Parish, LA: 0.67 Bcf/d (Venture Global)
U.S. - MARAD/COAST GUARD
27. Gulf of Mexico: 3.22 Bcf/d (Main Pass - Freeport-McMoRan)
POTENTIAL CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS
28. Goldboro, NS: 0.67 Bcf/d (Petrelive Energy Canada)
29. Kitimat, BC: 2.0 Bcf/d (LNG Canada)
30. Melford, NS: 1.8 Bcf/d (H-Energy)

As of June 3, 2013

Office of Energy Projects

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THANK YOU!
Some Takeaway Thoughts....