Western Energy Resources

Natural Gas and Oil: Shale Basins and Plays

Coal Fields

Solar Potential

Wind Potential
Abundant Supply

Estimates of U.S. Recoverable Natural Gas (trillion cubic feet)

- **Proved Reserves**
- **Non-shale Gas Resources**
- **Potential Shale Gas Resources**
- **Total Resource (Uncategorized)**

<table>
<thead>
<tr>
<th></th>
<th>Potential Gas Committee</th>
<th>EIA</th>
<th>CERA, MIT</th>
<th>NPC, INGAA</th>
<th>ICF</th>
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<tbody>
<tr>
<td>'00</td>
<td>1,268</td>
<td>1,235</td>
<td>1,286</td>
<td>1,200</td>
<td>1,202</td>
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<tr>
<td>'02</td>
<td>1,414</td>
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<td>'04</td>
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<td>1,578</td>
<td>1,424</td>
<td>1,443</td>
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<tr>
<td>'08</td>
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<td>2,543</td>
<td>2,170</td>
<td>1,981</td>
<td>2,102</td>
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<td>'10</td>
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<td>2,100</td>
<td>3,600</td>
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<td>'12</td>
<td>2,688</td>
<td>3,350</td>
<td>3,545</td>
<td>3,545</td>
<td>3,545</td>
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</tbody>
</table>

America's Natural Gas Alliance
Volume and Cost

U.S. & Canada Supply Curve

Fewer Rigs, More Production

Source: EIA - 12 Month Rolling Average of Production and Demand,
Baker Hughes - 12 month Rolling Average of Rig Count
Technology Advancement

-62%  +82%  -14%  +807%  +317%

Days to Drill  Lateral Length (feet in length)  Well Cost ($ in millions)  F&D Cost ($ per Mcf)  Production (in Bcf)  Reserves (in Bcf)

2007  17.5  2.067  $2.9  33.3  1,545
2008  13.5  3.619  $3.0  134.3  3,117
2009  11.7  4,190  $2.9  243.5  4,345
2010  10.9  4,806  $2.8  430.2  4,345
2011  7.5  4,833  $2.8  350.2  485.5
2012  6.7  6.7  $2.5  $1.11  716

- Continuous improvement in our Fayetteville Shale operations – completed lateral length has increased 82% over the last four years while total well costs have decreased 14%.

- Vertical integration and contiguous acreage position allow us significant economies of scale and operating flexibility.

Source: Fayetteville Play, Southwestern Energy
Natural Gas Production (TCF): Reference

Source: Annual Energy Outlook 2014, Reference Case
Long-term Price Stability

Henry Hub Spot Natural Gas Price
(2011$/MMBtu)

Henry Hub Spot prices (Actual prices: 2000 to 2012)
Natural Gas Consumption

U.S. Natural Gas Demand
(billion cubic feet per day)

Historic
Projected

Electric Power
Industrial
Commercial
Residential

Projected Data Source: EIA Annual Energy Outlook: 2014
Historic Data Source: EIA Natural Gas Monthly, April 2014
### Additional Employment Impacts from Natural Gas Uses

#### Domestic Jobs Impacts of Alternative Uses of Natural Gas per 1 additional BCF/d Production

<table>
<thead>
<tr>
<th></th>
<th>Upstream &amp; Midstream Jobs</th>
<th>Construction Jobs</th>
<th>Operations Jobs</th>
<th>Total</th>
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<tbody>
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<td>Gas to Liquids Plants</td>
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<td>4,000</td>
<td>900</td>
<td>18,000</td>
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<tr>
<td>Liquefied Natural Gas Plants</td>
<td>13,000</td>
<td>1,700</td>
<td>200</td>
<td>15,000</td>
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<td>Methanol Plants</td>
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<td>3,000</td>
<td>1,800</td>
<td>18,000</td>
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<tr>
<td>Ammonia Plants</td>
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<td>4,200</td>
<td>3,400</td>
<td>21,000</td>
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</table>

Source: ICF, “Tech Effect: How Innovation in Oil and Gas Exploration is Spurring the US Economy”, October 2012
Since 2008, US NGL production has increased by 600,000 barrels/day. By 2020, NGL production is expected to reach 3.8 million barrels/day. This is almost double current production levels.
Low natural gas prices are creating an advantage for the U.S. and Canadian ethylene production.

U.S. net exports of products created from ethylene are expected to rise significantly by 2025.
U.S. NGL Supply Potential

* Current reduced by 200 – 250 MBPD due to ethane rejection.

Source: EPD
Fundamental Shift in Outlook

Natural Gas Net Imports
(trillion cubic feet)

Actual

Imports

Exports

AEO 2005

AEO 2014 ER

Source: EIA, Annual Energy Outlook 2005 & 2013 Early Release
Meeting Global Demand

1. ICF estimate for year end 2011.
2. FTA & non-FTA Applications to DOE as of Mar 31, 2014
3. Dec 2012 ICF estimate based on current worldwide project list.

~Poten, BG Group, Credit Suisse, Facts Global
Source: API, ANGA
LNG Exports

- **Sabine Pass** (Cheniere)  
  DOE: Approved  
  FERC: Approved  
  Capacity: 2.2 BCF/d

- **Freeport LNG** (FLEX Quintana Island)  
  2 Separate Filings  
  DOE: Conditionally Approved  
  FERC: Filed  
  Capacity: 1.8 BCF/d

- **Lake Charles**  
  (Truckline/Energy Transfer Partners, BG Group)  
  DOE: Conditionally Approved  
  FERC: Filed  
  Capacity: 2 BCF/d

- **Cameron** (Sempra)  
  DOE: Conditionally Approved  
  FERC: Filed  
  Capacity: 1.7 BCF/d

- **Cove Point** (Dominion)  
  DOE: Conditionally Approved  
  FERC: Filed  
  Capacity: .8 BCF/d

- **Coos Bay** (Jordan Cove)  
  DOE: Conditionally Approved  
  FERC: Filed  
  Capacity: 1.2 BCF/d

- **Astoria** (Oregon LNG)  
  DOE: Under Review  
  FERC: Filed  
  Capacity: 1.2 BCF/d

- **Elba Island** (Southern LNG)  
  DOE: Under Review  
  FERC: Filed  
  Capacity: .5 BCF/d

- **Lavaca Bay** (Excelerate Liquefaction Solutions)  
  DOE: Under Review  
  FERC: Filed  
  Capacity: 1.4 BCF/d

- **LNG Exports**

- **Shale Plays**
  - Prospective Plays
  - Current Plays
  - Basins

- **Map**: Shale Plays and LNG Exports locations

- **Notes**: Approved by DOE, Waiting DOE Approval