The End of Scarcity?
Measuring the Impact of the Oil Price Collapse on North American Natural Gas Markets

Presentation to:
NAIFA Annual Day on the Hill
Denver, CO

By:
John Harpole

March 2, 2016
The Big Question

- What issues will have the greatest impact on North American natural gas prices in the next 5 years?
The Big Four Issues to Watch

1. Global Oil Price Recovery
2. Marcellus and Utica Shale Production
3. Industrial Demand
4. U.S. LNG Exports
The Big Four Issues to Watch

1. Global Oil Price Recovery
What Happened?
A Global Perspective

• US oil supply rose
• Unexpected large supply growth out of Iraq
• Surging oil supply from Saudi Arabia
• Possible removal of EU sanctions on Iran
What Happened?
A U.S. Perspective

- Thanks to hydraulic fracturing, horizontal drilling and private property ownership of minerals, the world should no longer live under the threat of energy insecurity.
- Energy once scarce, is now super-abundant and that reality will continue to change the world as transportation issues are remedied.
Horizontal Drilling

Traditional Wells

Horizontal Drilling

Hydraulic Fracturing
Pumping fluid under high pressure to fracture formation

- Creates fracture “highway” for gas to be rapidly produced from formation

Fracturing Application Exploded

North American Frac Horsepower

Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13
10-fold growth in 10 years

Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13
NATURAL GAS PRODUCTION ON FEDERAL VS. PRIVATE AND STATE LANDS, PERCENT CHANGE FROM FY2010

Source: “Oil and Natural Gas Booms on Private and State Lands,” Institute for Energy Research, April 14, 2015
Saudi Arabia to Erect a 600 Mile “Great Wall” to Fend off ISIS
Saudi Arabia Builds Giant Yemen Border Fence – 1,100 miles
The House of Saud’s Motivation

2009-2014 Global Liquids Supply Growth Breakdown (MMbpd)

Supply Growth (09-14): 8.06 MMbpd

- US Liquids, 4.42 (55%)
- OPEC Oil, 1.55 (19%)
- OPEC NGLs, 1.74 (22%)
- Non-OPEC, Ex-US Supply, -0.07 (-1%)
- Other*, 0.41 (5%)

Source: IEA, Raymond James research
*Includes processing gains and biofuels

Is it a production war or demand destruction or both?

• On November 27, 2014 at an OPEC meeting in Vienna, the Saudis said,

  “Yakfee!”

  or

  “Enough!”

• They resisted calls from OPEC members Iran, Iraq and Venezuela to reduce the production target of 30 million barrels per day.
Major Takeaways

• Crude oil prices are depressed due to the current global oversupply.
• The crude oil oversupply will take between 1 to 2 years to correct, unless a major structural event takes supply out (OPEC, etc.)
• Marginally economic areas across the U.S. will be negatively impacted. Geography and crude quality can tip the sales either way.
• Natural gas drilling that was dependent on the value of natural gas liquids has been negatively affected.
• North American LNG exports could also be affected.
• Is this the end of energy scarcity?

Source: The Outlook for U.S. Crude: Implications for Colorado, Bernadette Johnson, Ponderosa Advisors
The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources.

U.S. tight oil production
million barrels of oil per day

U.S. dry shale gas production
billion cubic feet per day

Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through April 2014 and represent EIA’s official tight oil & shale gas estimates, but are not survey data. State abbreviations indicate primary state(s).

Source: U.S. oil and natural gas outlook, Adam Sieminski, EIA Administrator, Presentation to IAEE International Conference, June 16, 2014
Growing tight oil and offshore crude oil production drive U.S. output close to historical high

Source: EIA, Annual Energy Outlook 2014 Reference case

Source: U.S. oil and natural gas outlook, Adam Sieminski, EIA Administrator, Presentation to IAEE International Conference, June 16, 2014
Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
Daily Oil Production: Permian Basin, Eagle Ford and Bakken
January 2007 to January 2015 (est.)
Source: Energy Information Administration

Permian Basin
Eagle Ford
Bakken

Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
What is the Motivation for Saudi Arabia?

- Is this a shot across our bow?

- Are we victims of our own success?

- Who is the real target of their price war?
“In 2016, when OPEC completes this objective of cleaning up the American marginal market, the oil price will start growing again,” said Fedun, who’s made a fortune of more than $4 billion in the oil business, according to data compiled by Bloomberg. “The shale boom is on a par with the dot-com boom. The strong players will remain, the weak ones will vanish.”

- Leonid Fedun, VP and Board Member at OAO Lukoil (LKOD)
# OPEC Member States

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Africa</td>
<td>1969</td>
<td>33,779,668</td>
<td>2,381,740</td>
</tr>
<tr>
<td>Angola</td>
<td>Africa</td>
<td>2007</td>
<td>12,531,357</td>
<td>1,246,700</td>
</tr>
<tr>
<td>Ecuador</td>
<td>South America</td>
<td>2007[^A_1]</td>
<td>13,927,650</td>
<td>283,560</td>
</tr>
<tr>
<td>Iran</td>
<td>Middle East</td>
<td>1960[^A_2]</td>
<td>75,875,224</td>
<td>1,648,000</td>
</tr>
<tr>
<td>Iraq</td>
<td>Middle East</td>
<td>1960[^A_2]</td>
<td>28,221,180</td>
<td>437,072</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Middle East</td>
<td>1960[^A_2]</td>
<td>2,596,799</td>
<td>17,820</td>
</tr>
<tr>
<td>Libya</td>
<td>Africa</td>
<td>1962</td>
<td>6,173,579</td>
<td>1,759,540</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Africa</td>
<td>1971</td>
<td>146,255,300</td>
<td>923,768</td>
</tr>
<tr>
<td>Qatar</td>
<td>Middle East</td>
<td>1961</td>
<td>824,789</td>
<td>11,437</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Middle East</td>
<td>1960[^A_2]</td>
<td>28,146,656</td>
<td>2,149,690</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>Middle East</td>
<td>1967</td>
<td>4,621,399</td>
<td>83,600</td>
</tr>
<tr>
<td>Venezuela</td>
<td>South America</td>
<td>1960[^A_2]</td>
<td>26,414,816</td>
<td>912,050</td>
</tr>
</tbody>
</table>

**Total**  
369,368,429  
11,854,977 km²

It’s About Geopolitical Power & Market Share for the Saudis
## A Game of Chicken?

<table>
<thead>
<tr>
<th>Nation</th>
<th>Oil price per barrel required to break even or balance budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>US producers</td>
<td>$38-$77</td>
</tr>
<tr>
<td>Qatar</td>
<td>$58</td>
</tr>
<tr>
<td>Kuwait</td>
<td>$59</td>
</tr>
<tr>
<td>UAE</td>
<td>$90</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>$92</td>
</tr>
<tr>
<td>Angola</td>
<td>$94</td>
</tr>
<tr>
<td>Russia</td>
<td>$101</td>
</tr>
<tr>
<td>Iraq</td>
<td>$116</td>
</tr>
<tr>
<td>Venezuela</td>
<td>$117</td>
</tr>
<tr>
<td>Algeria</td>
<td>$119</td>
</tr>
<tr>
<td>Ecuador</td>
<td>$122</td>
</tr>
<tr>
<td>Nigeria</td>
<td>$124</td>
</tr>
<tr>
<td>Iran</td>
<td>$136</td>
</tr>
</tbody>
</table>

According to data compiled by Bloomberg, “*prices have dropped below the level needed by at least 9 OPEC member states to balance their budgets.*”


*Survival of fittest as oil tumbles below $65*, Bloomberg News, December 1, 2014
Source: Nasdaq.com, End of day Commodity Futures Price Quotes for Crude Oil WTI (NYMEX)
Global Supply/Demand Balance
Lower Prices A Function of Global Oversupply

Supply is nearly 1.5 MMb/d over demand. Supply has been higher than demand briefly in the past without price drops (inventory build), however the current oversupply is at a time where demand is also at its peak.

Chart Title

Sources: The Outlook for U.S. Crude: Implications for Colorado, Bernadette Johnson, Ponderosa Advisors
IEA Global Supply/Demand Crude NGLs, Non-Conventional Oils
Global Crude Oil Over-Supply
‘Pain Period’ Will Last 1 to 3 Years

If lower prices force natural declines in high cost producing countries, global production could fall by 1.5 MMb/d by 2016.

Sources:
The Outlook for U.S. Crude: Implications for Colorado, Bernadette Johnson, Ponderosa Advisors
EIA International Energy Outlook
Survival of the Fittest?

Saudis have staying power; $750 billion in foreign country reserves

Impact of Lower Prices in U.S.

Despite a rig count drop...
Ratio of vertical to horizontal rigs

Source: Falling rig counts drive projected near-term oil production decline in 3 key U.S. regions, March 17, 2016
Despite a price drop

Historical NYMEX Henry Hub Index Prices (1996-Current)

Source: NYMEX – Average last 3 days of close as reported in Platts Gas Daily Report, A McGraw Hill Publication
The seven regions shown below account for 92% of domestic oil production growth and all domestic natural gas production growth during 2011-14.

Indicated monthly change in gas production (Mar vs. Feb)

million cubic feet/day

Indicated monthly change in oil production (Mar vs. Feb)

thousand barrels/day

Bakken Region
Natural gas production
million cubic feet/day

Eagle Ford Region
Natural gas production
million cubic feet/day

Gas -158
million cubic feet/day
month over month

Niobrara Region
Natural gas production

million cubic feet/day

Permian Region
Natural gas production
million cubic feet/day

Gas -6
million cubic feet/day
month over month

Utica Region Natural gas production
million cubic feet/day

Gas +32
million cubic feet/day
month over month

Is There Hope?

• Despite headwinds production volumes were tenacious for 18 months

• Volumes are starting to rollover.

• They have held in there but now they are down nearly half a BCF per day in the top 7 producing basins.
Let’s talk about demand…
China Gambles

• From 2005 – June 2013, $430.4 billion invested worldwide “with energy as the focus”
• Those investments were predicated on the scarcity of energy.
• It was the wrong bet.

China Sleeps?

That miscalculation may impact the hoped for growth in oil demand that the world expected China/Asia to realize over the next 5 years.
China

- Without significant demand in China, it is doubtful that world oil prices will strengthen in the near term (2015-2020)
- Combined with an aging population, China’s GDP growth will slow
- That will obviously affect world/U.S. oil prices and natural gas liquid values
Four Grandparents, Two Parents, One child. 4-2-1

Source: “The Age Curve: How to Profit from the Coming Demographic Storm,” Kenneth W. Gronbach, October 2015
China Abandons One-Child Policy

Will future historians consider the elimination of the “one-child-only” policy in China as the end of the Malthusian inspired “era of perceived scarcity”?

---

*Medium variant of U.N. projections. Note: Projections don't account for the change in China's one-child policy.
Sources: U.S. Census Bureau's International Database (population); United Nations (working age); Chinese official media; WHO (male/female ratio)"
Storing it Away

• For the first 11 months of 2015, we calculate that China purchased approximately 430 MBbls/d of oil that was either stored in commercial or SPR inventories

• Continued filling of their SPR could add approximately 200,000 barrels/day of additional demand

• Continued gasoline demand growth and SPR storage builds will hold up 2016 Chinese demand

Source: Chinese Demand Outlook; Consumer Class Shifts Growth to Gasoline from Diesel, Raymond James, February 29, 2016
Source: Bloomberg, IEA, National Bureau of Statistics of China, Raymond James
Quarterly Chinese Gasoline Demand (Million Bpd)

10.5% Average Y/Y growth since 2012

Source: Bloomberg, National Bureau of Statistics of China, Raymond James
The Lesson for China, Free Markets?

“Consider for a moment that any one person can only know a fraction of what is going on around him. Much of what that person believes will be false rather than true…”

Free Markets

“It is because every individual knows so little and, in particular, because we rarely know which of us knows best that we trust the independent and competitive efforts of many to induce the emergence of what we shall want when we see it.”

Source: Nasdaq.com, End of day Commodity Futures Price Quotes for Natural Gas (NYMEX)
The Big Four Issues to Watch

2. Marcellus and Utica Shale Production
Marcellus wellhead production is expected to increase by 28.1 Bcfd between 2014 and 2024.
Supply growth in the Northeast combined with pipeline capacity constraints drove pricing dynamics in that region in 2014. By 2019, capacity additions should ease the constraints, but continued supply growth puts pressure on prices again by 2024.

Source: ICF International, KM analysis

Source: Kinder Morgan, 2015 Business Meeting: West Region Gas Pipelines, November 2, 2015
U.S. and Canada: Natural Gas Production vs. Consumption

Source: BP Statistical Review, Raymond James research
The Big Four Issues to Watch

3. Industrial Demand
## Additional 20,950+ MMlbs/yr. Ethylene Capacity Planned or Under Construction

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Date</th>
<th>MMlbs/yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westlake</td>
<td>Lake Charles</td>
<td>March 2016</td>
<td>250</td>
</tr>
<tr>
<td>LyondellBasell</td>
<td>Corpus Christi</td>
<td>June 2016</td>
<td>800</td>
</tr>
<tr>
<td>Aither</td>
<td>Charleston</td>
<td>January 2017</td>
<td>600</td>
</tr>
<tr>
<td>ChevronPhillips</td>
<td>Cedar Bayou</td>
<td>January 2017</td>
<td>3,300</td>
</tr>
<tr>
<td>Dow</td>
<td>Freeport</td>
<td>January 2017</td>
<td>3,300</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Baytown</td>
<td>January 2017</td>
<td>3,300</td>
</tr>
<tr>
<td>OxyChem/Mexichem</td>
<td>Ingleside</td>
<td>January 2017</td>
<td>1,200</td>
</tr>
<tr>
<td>Sasol</td>
<td>Lake Charles</td>
<td>January 2017</td>
<td>3,300</td>
</tr>
<tr>
<td>Sasol</td>
<td>Lake Charles</td>
<td>January 2017</td>
<td>3,300</td>
</tr>
<tr>
<td>LyondellBasell</td>
<td>Channelview</td>
<td>January 2017</td>
<td>550</td>
</tr>
<tr>
<td>Indorama</td>
<td>Lake Charles</td>
<td>December 2017</td>
<td>850</td>
</tr>
<tr>
<td>Formosa</td>
<td>Point Comfort</td>
<td>January 2018</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Source: Ponderosa Energy
The Big Four Issues to Watch

4. U.S. LNG Exports
## North American Natural Gas
### Demand Ranges by Selected Sector

Significant demand growth is possible in the LNG, transportation/HHP and power sectors through 2020 in Bcf per day.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Lower Demand Range</th>
<th>Middle Demand Range</th>
<th>Upper Demand Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>2.5</td>
<td>4.5</td>
<td>10.0+</td>
</tr>
<tr>
<td>LNG Export</td>
<td>2.4</td>
<td>6.0</td>
<td>12.0+</td>
</tr>
<tr>
<td>CNG/LNG Vehicles</td>
<td>0.5</td>
<td>2.5</td>
<td>5.0+</td>
</tr>
<tr>
<td>Industrial (U.S. and Oil Sands)</td>
<td>2.5</td>
<td>4.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Mexico Exports</td>
<td>0.5</td>
<td>1.5</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: Encana Corporate Presentation, August 2013; Industrial Energy Consumers of America; Bentek Energy; Raymond James; Michael Smith, Chairman & CEO Freeport LNG, Industry Sources
First LNG Cargo out of Louisiana
## US LNG Export Projects Under Construction

<table>
<thead>
<tr>
<th>Projects</th>
<th>Uncontracted Capacity (bcf/d)</th>
<th>Contracted Capacity (bcf/d)</th>
<th>Nameplate Capacity (bcf/d)</th>
<th>Percent Contracted</th>
<th>Online Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabine Pass T1-4</td>
<td>0.3</td>
<td>2.1</td>
<td>2.4</td>
<td>89%</td>
<td>Feb-16 – Sept 17</td>
</tr>
<tr>
<td>Cameron LNG T1-3</td>
<td>0.0</td>
<td>1.7</td>
<td>1.7</td>
<td>100%</td>
<td>Early/Mid/Late -18</td>
</tr>
<tr>
<td>Freeport LNG T1-3</td>
<td>0.1</td>
<td>1.7</td>
<td>1.8</td>
<td>97%</td>
<td>Sept-18 – Aug-19</td>
</tr>
<tr>
<td>Cove Point T1</td>
<td>0.1</td>
<td>0.7</td>
<td>0.8</td>
<td>92%</td>
<td>Dec-17</td>
</tr>
<tr>
<td>Corpus Christi T1-2</td>
<td>0.2</td>
<td>1.0</td>
<td>1.2</td>
<td>86%</td>
<td>Jun-19, Apr-20</td>
</tr>
<tr>
<td>Sabine Pass T5</td>
<td>0.1</td>
<td>0.5</td>
<td>0.6</td>
<td>83%</td>
<td>19-Jan</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>0.7</strong></td>
<td><strong>7.8</strong></td>
<td><strong>8.4</strong></td>
<td><strong>92%</strong></td>
<td><strong>NA</strong></td>
</tr>
</tbody>
</table>

US LNG Export Projects Under Construction

• Nameplate US export capacity to total 8.4 bcf/d by YE 2020 with just over 8 bcf/d exportable 2020.

• >90% or 7.8 bcf/d of the capacity is contracted.

• What does this mean? The off-takers pay ~$3/MMBtu for any contracted LNG volumes they defer/cancel. Buyers could then buy LNG on the spot market for ~$7.00/MMBtu or all in cost of ~$10.00/MMBtu (including the cancellation fee).

• All in US LNG landed in Asia likely runs $7.50-$9.50 depending on US gas price and transports costs.

• There are 5 major US LNG export projects under construction (assumes Sabine Pass is one project).

• There are another >4 bcf/d of LNG export projects that are ~fully contracted, which we would consider close to FID (e.g. Lake Charles, Golden Pass).

LNG Export Economics…and its effects

- US LNG to Asia: $2.00 Henry Hub + $3 liquefaction charge + $2.25 shipping = $7.25/MMBtu
- US LNG to Europe: $2.00 + $3 liquefaction charge + $1 shipping = $6.00/MMBtu

- The liquefaction charge is how Cheniere earns a return on capital for the contracted portions of its facilities, but the actual liquefaction cost is much cheaper than $3/MMBtu. We estimate the actual cost to liquefy the gas is ~$0.50.

- Thus, at today’s pricing and transport costs, a facility owner could ship US gas to Europe for a variable cost of ~$4/MMBtu, sell it for ~$6/MMBtu and net $2/MMBtu in gross profit.

World LNG Estimated October 2014 Landed Prices

World LNG Estimated January 2016 Landed Prices
($U.S./MMBtu) - update


Note: Includes information and Data supplied by IHS Global Inc. and its affiliates (“IHS”)
It’s a buyers market

“The 7-8 BCF of U.S. LNG exports that is expected by 2020 is equal to 20% of the total world LNG import market of 32.1 BCF.”
One Rig In the Haynesville

5 months after drilling restarts, previous production level exceeded

6 Month Drilling Curtailment

The “Ferrari” Affect Substantially Reduces The Likelihood Of Price Spikes

Source: Ponderosa Advisors LLC
## Impact on Colorado

<table>
<thead>
<tr>
<th>Producer</th>
<th>October 1, 2014</th>
<th>February 26, 2016</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whiting Petroleum Corporation</td>
<td>$73.85</td>
<td>$4.01</td>
<td>$69.84 ↓</td>
</tr>
<tr>
<td>SM Energy Company</td>
<td>$75.72</td>
<td>$9.04</td>
<td>$66.68 ↓</td>
</tr>
<tr>
<td>Pioneer Natural Resources Co.</td>
<td>$189.82</td>
<td>$123.37</td>
<td>$66.45 ↓</td>
</tr>
<tr>
<td>Anadarko Petroleum Corporation</td>
<td>$99.26</td>
<td>$38.02</td>
<td>$61.24 ↓</td>
</tr>
<tr>
<td>Noble Energy</td>
<td>$66.79</td>
<td>$29.50</td>
<td>$37.29 ↓</td>
</tr>
<tr>
<td>Antero Resources</td>
<td>$54.03</td>
<td>$22.85</td>
<td>$31.18 ↓</td>
</tr>
<tr>
<td>EOG Resources, Inc.</td>
<td>$96.85</td>
<td>$67.50</td>
<td>$29.35 ↓</td>
</tr>
<tr>
<td>Linn Energy</td>
<td>$29.58</td>
<td>$0.44</td>
<td>$29.14 ↓</td>
</tr>
<tr>
<td>WPX Energy, Inc.</td>
<td>$23.32</td>
<td>$4.26</td>
<td>$19.06 ↓</td>
</tr>
<tr>
<td>Encana Corporation</td>
<td>$21.38</td>
<td>$4.29</td>
<td>$17.09 ↓</td>
</tr>
</tbody>
</table>
Impact on Colorado

<table>
<thead>
<tr>
<th>MLP</th>
<th>October 1, 2014</th>
<th>February 26, 2016</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Transfer Partners LP</td>
<td>$64.53</td>
<td>$26.67</td>
<td>$37.86 ↓</td>
</tr>
<tr>
<td>DCP Midstream Partners LP</td>
<td>$53.91</td>
<td>$19.41</td>
<td>$34.50 ↓</td>
</tr>
<tr>
<td>Kinder Morgan, Inc.</td>
<td>$38.20</td>
<td>$17.76</td>
<td>$20.44 ↓</td>
</tr>
<tr>
<td>Enterprise Products Partners LP</td>
<td>$39.62</td>
<td>$23.37</td>
<td>$16.25 ↓</td>
</tr>
<tr>
<td>Tallgrass Energy Partners, LP</td>
<td>$43.68</td>
<td>$33.46</td>
<td>$10.22 ↓</td>
</tr>
</tbody>
</table>
# Impact on Colorado

<table>
<thead>
<tr>
<th>Company</th>
<th>Numbers of Jobs, Locations</th>
<th>Date of Announcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPX Energy Inc.</td>
<td>142, Denver</td>
<td>March 2, 2015</td>
</tr>
<tr>
<td>Noble Energy Inc.</td>
<td>80 in Denver, 20 in Greeley</td>
<td>April 7, 2015</td>
</tr>
<tr>
<td>Linn Energy</td>
<td>52, Denver</td>
<td>April 15, 2015</td>
</tr>
<tr>
<td>Pioneer Natural Resources</td>
<td>102 in Trinidad, 75 in Denver</td>
<td>May 5, 2015</td>
</tr>
<tr>
<td>Bayou Well Services</td>
<td>250, Weld County</td>
<td>May 15, 2015</td>
</tr>
<tr>
<td>Newfield Exploration Co.</td>
<td>91, Denver</td>
<td>May 28, 2015</td>
</tr>
<tr>
<td>Baker Hughes Inc.</td>
<td>124, Adams County</td>
<td>August 12, 2015</td>
</tr>
<tr>
<td>Baker Hughes Inc.</td>
<td>17, Adams County</td>
<td>September 30, 2015</td>
</tr>
<tr>
<td>Bonanza Creek Energy</td>
<td>“15 percent” of its staff</td>
<td>“late September” 2015</td>
</tr>
<tr>
<td>Fidelity Exploration &amp; Production Co.</td>
<td>About 75 in Denver</td>
<td>November 4, 2015</td>
</tr>
<tr>
<td>Noble Energy Inc.</td>
<td>45 in Denver, 25 in Greeley</td>
<td>November 11, 2015</td>
</tr>
<tr>
<td>Bill Barrett Corp.</td>
<td>“Less than 20 percent” of staff</td>
<td>February 24, 2016</td>
</tr>
</tbody>
</table>

The solution to low oil prices is low oil prices.

According to Raymond James, 2016 WTI will average $50, rising to $75 in 2017, settling at $70.
Conclusions

- Energy companies face sustained pain – “The next few months may be as bad as they were in the 1980’s.” – Tom Petrie
- World oil prices (Brent) will be range-bound for at least 2 more years in the $35-$45 per barrel.
- China (Asian) demand will not rebound – expect slow GDP growth in Asia
- Watch for dry natural gas production in the U.S. to decline in the 4th quarter 2016. A new ceiling target of $3.50 per MMBtu could become the new “norm” for the next 3 years.
Citations for Report

All of the information utilized for this report is a compilation of information pulled from the following data sources:

Energy Information Administration (EIA)
Bentek Energy, Jack Weixel
Ponderosa Advisors LLC
Office of Energy Projects
Bloomberg
U.S. Department of Energy
Raymond James and Associates, Inc.
Wikipedia
LNG Blog
American Enterprise Institute
Oilprice.com
Ruters
LNG World News
George Wayne
Chevron
Encana Corporation
Waterborne Energy, Inc.
King & Spalding
Midwest Energy Logistics, LLC
National Energy Board
NERA Economic Consulting
LNG Business Review
Antero Resources
Tea Party Command Center
Tudor Pickering Holt & Co.
Kinder Morgan

Mercator Energy
Contact Information

John Harpole
President
Mercator Energy
26 W. Dry Creek Circle, Suite 410
Littleton, CO  80120
harp@mercatorenergy.com
(303) 825-1100 (work)
(303) 478-3233 (cell)