The Future of the U.S. Energy Industry

Presentation to:
GIC-DABE Economic Forum
Denver, CO

By:
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What Happened?

• 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.
What Happened?
A Global Perspective

• US oil supply rose
• Unexpected large supply growth out of Iraq
• The decline in U.S. drilling cannot unilaterally impact the world price for oil
• It is all about the global economy...China is the key
The Active Rig Count Is Down 75%

Active Rig Count By Orientation Of Drilling

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Source: Ponderosa Energy

Source: Rigdata
U.S. Active Rig Count Off 75% vs. Recent Peak in October 2014…but Offshore Activity is Up

Source: RigData

National Active Rig Counts:
- Current Week: 506
- Prior Week: 548
- Average YTD: 611

Source: Ponderosa Energy
The seven regions shown below account for 92% of domestic oil production growth and all domestic natural gas production growth during 2011-14.
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
US Crude Oil Production, January 1986 to December 2014

Barrels per day (Millions)

Source: Energy Information Administration

Carpe Diem Blog

America’s Shale Revolution

Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
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Daily Oil Production: Permian Basin, Eagle Ford and Bakken
January 2007 to January 2015 (est.)

Source: Energy Information Administration

Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
US Crude Oil Production, January 1986 to December 2014

Barrels per day (Millions)

Source: Energy Information Administration

Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015
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

OPEC’s Strategy?

“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.”

Quoted November 28, 2014

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

A Game of Chicken?

<table>
<thead>
<tr>
<th>Nation</th>
<th>Oil price per barrel required to break even or balance budget</th>
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</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>
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<tr>
<td>Saudi Arabia</td>
<td>$92</td>
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<tr>
<td>Angola</td>
<td>$94</td>
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<tr>
<td>Russia</td>
<td>$101</td>
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<tr>
<td>Iraq</td>
<td>$116</td>
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<td>Venezuela</td>
<td>$117</td>
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<tr>
<td>Algeria</td>
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<tr>
<td>Ecuador</td>
<td>$122</td>
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<tr>
<td>Nigeria</td>
<td>$124</td>
</tr>
<tr>
<td>Iran</td>
<td>$136</td>
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</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
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”? 

"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.”

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

Note: Includes information and Data supplied by IHS Global Inc. and its affiliates (“IHS”)
Prices are the monthly average of the weekly landed prices for the listed month.
2015 Job Losses By Oilfield Service Subgroup

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Loss Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore Drillers</td>
<td>-53%</td>
</tr>
<tr>
<td>Completion &amp; Production</td>
<td>-37%</td>
</tr>
<tr>
<td>Offshore Drillers</td>
<td>-24%</td>
</tr>
<tr>
<td>Diversifieds</td>
<td>-24%</td>
</tr>
<tr>
<td>Manufacturers*</td>
<td>-20%</td>
</tr>
</tbody>
</table>

RJ Coverage Average 26% Decrease

Source: Company Reports

*Manufacturers includes Cameron

Conclusions/Predictions

• Oil prices will stay in their current range of $45-$55 WTI
• The NYMEX natural gas price in calendar year 2017 will be above $4.00 per MMBtu for several months and through calendar year 2018.
• The price differential between the NYMEX and Western Colorado will be $0.25-$0.30 less than the NYMEX.
• That Western Colorado price should “resurrect” at least 5-10 Piceance Basin drilling rigs in the latter part of 2017.
• Available Western U.S. pipeline capacity and dry gas production will be a key element to future drilling in the west.
The “Ferrari” Affect Substantially Reduces The Likelihood Of Price Spikes

One Rig In the Haynesville

5 months after drilling restarts, previous production level exceeded

6 Month Drilling Curtailment

Source: Ponderosa Advisors LLC
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