In for the Long Haul

Why Lower Oil Prices will be Good for You!

CO2-EOR Institute, 16 July 2015
Lower oil prices will...

• Build demand

• Reduce competition to oil from non-oil alternatives (high performance combustion engines)

• Complicate climate politics

• Impact supply competition

*Could lower prices also enhance the value of legacy assets?*
China "Coming Out" Party, 2006-08

Desert Storm, 1990

Asia Financial Collapse, 1997-99

Iraq War, 2003-06

U.S.-Europe Financial Collapse, 2008-09

USD Neutral

USD Neutral

USD Rising

USD Rising

USD Falling

USD Falling

USD Rising

USD Falling

USD Rising

Spread: WTI minus Brent, $/BBL

Saudi Market Share Strategy I, 1985-86 to 2000

Saudi Market Share Strategy II, 2014......
Change in Oil Price, Y

World GDP, Oil Consumption, Y-Y

1980-1981
Iraq Crude Oil Expansion Project
4.5 MMBPD
Basrah Terminal

Second Strategic Pipeline
Adds 900 MBPD

Export Pipeline to Saudi Arabia
(closed)
1.65 MMBPD

Akkas Gas Field
(2.1–5.6 TCF)

Mansuriyah Gas Field
(3–4.5 TCF)

Import Pipeline from Iran
(880 MMCFD)

Siba Gas Field
(0.1–3.3 TCF)

Shell LNG Project
600 MMCFD

Iraq Crude Oil Expansion Project
4.5 MMBPD

Proposed Gas Export
(to Syria, Turkey, Europe)

Iraq-Syria pipeline (closed)
700 MBPD expand to 3MMBPD

Iraq-Turkey Pipeline
Current – 1.0 MMBPD
With 2nd Strategic Pipeline – 1.6 MMBPD
Possible expansion – 2.85 MMBPD

Export Pipeline to Saudi Arabia
(closed)
1.65 MMBPD

To Nabucco (delayed)

Iraq-Kuwait (closed)
(400 MMCFD)
Upstream Matters

<table>
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<th>Year</th>
<th>High Cost Producer</th>
<th>Average</th>
<th>Low Cost Producer</th>
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<td>2013</td>
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<td>2014</td>
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- 3-Yr MA FD Costs/3-Yr MA Additions ($/BOE)
- Annual Cash Costs per Bbl of Production ($/BOE)
It Takes an Industry

An industry leader with an early shift to liquids

A successful gassy player

An Equivalent Barrel

Cost Stack with FD Capex Return

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2014 to Now: Who’s Minding the Store??

2014 results for Bernstein covered companies:
• $203 billion in total capex
• About 4.9 billion BOE production
• About $42 per BOE capex on average
• About $101 billion in opex
• About $21 per BOE
• Capex of $42/BOE compares to about $30/BOE in operating cash flow

BUT (there’s always at least one)........
• Companies have mostly been cash flow negative since 1Q04! Operating CF is now well below organic capex.

Based on 2014 full year review for companies under coverage by Bernstein Research. Proprietary report.
What Gives??? The Brute Force Method

• Vertical to horizontal
• “Core of core” (bias in reporting)
• More proppant, more pressure (the oil service money maker)
  – “Super fracs”
• Longer laterals
• But (again!):
  – “Shale efficiencies have improved a remarkable 21% CAGR since 2012 in oily basins;
  – Drilling efficiency (wells/rig) grew 13% CAGR but has slowed and will plateau;
  – Variable cost efficiency (longer laterals spreading fixed costs across more 'rock') grew 7% CAGR but lateral lengths now stand at ~7,400 feet, will grow only modestly from here;
  – Production efficiency (liquid rate per unit length) grew 0%.” (All from Bernstein Research proprietary report.)
What the U.S. is Producing

Central Oklahoma

- Blaine 46.53
- Kingfisher 42.63
- Canadian 43.22
- Garvin 49.32
- Stephens 55.36
- Cushing
Comparison of Crude Qualities

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<th>Crude Types</th>
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<td>Bakken</td>
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Source: NDPC Study
Contract Terms

• Quality penalties associated with higher gravity are creeping into contracts.

• $.02 cents per every one-tenth of a degree of gravity higher than 60 deg

• In addition there are volumetric deductions for higher gravity-
  -60.1-64.9 deg API equals a 3% deduction
  -65.0-79.9 deg API equals a 6% deduction
  -80.0 and above equals a 20% deduction
More Contract Terms

• Quality penalty to be deducted from price at rate of $0.02 per 0.1 degree of gravity above 45 deg.
• If gravity exceeds 59.9 degrees, volumes will be reduced by an additional 2% loss allowance.
Where Does this Leave Things?

• No reason to expect a fast or steep oil price recovery
  – Desire by core exporters to sustain demand
• Shale plays will continue to contribute somewhat but add more value on the natural gas side
  – Business models need to improve across the board
  – Past is not prologue
• Legacy production needs to continue to be developed
  – “BS” (Before Shale), base production 9.5-10.5 MMBD
  – 50%+ import dependence, still ~40%
  – Quality shifts from onshore – downstream consequences
## The Missing Part of the Story

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