



Shale Gas or Shell Game?

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New York Times

- Article 26 June, 2011 exposing financial anomalies of shale gas
- July 2011, SEC subpoena a number of shale gas companies
- August 2011, NY State AG subpoena shale gas companies
- January, 2012 - DOE slashes estimates of Marcellus shale reserves 66%

“Bubblenomics”

- **“U.S. Shale Bubble Inflates After Near-Record Prices for Untested Fields”** - Bloomberg, January, 2012
- **“Natural Gas Keeps Tumbling, And Even Lower Prices Could Be On The Way”** - Wall Street Journal, January, 2012
- **“Shale Gas Fate Trips Up On Politics and Bubblenomics”** - Financial Times, 29 January, 2012

Why We Should Question Shale Gas

- No doubt gas exists in shale but...
- Is production really as stable and secure as it appears?
- Will announced production cuts stabilize prices?
- Will shale gas provide energy independence?

Pattern of Hype

- Each play heavily promoted as better than the last
- Jobs creation overstated
- Taxes and Revenues overstated
- Reserves overstated

Rhetoric vs. Reality

- “...if oil is "The Prize," then natural gas is "The Gift." Nature's gift to the people of the world.” - Jim Mulva, CEO, Conoco Phillips
- "the switch from [shale] gas to [shale] oil suggests shale gas can survive only through cross-subsidization, not on its own merit. Perpetual expansion cannot forever disguise a serious problem with the bottom line.” - Platt's Oil and Gas Reporter, December 2010

Is There Really Enough?

- “Gas can enhance energy supply security through its abundance. There is enough to meet industrial, residential, commercial and power generation needs” - Jim Mulva, CEO Conoco Phillips
- “Recent frac data from the Barnett shows a play in severe decline...The Barnett’s well failure rate also continues to rise over time” - Bernstein Research, 2010
- “Companies highlight their highly productive and profitable wells...while ignoring their ‘dogs’, thereby giving the public the impression that every well is a ‘gold mine’” - EIA Analyst email, Open Records, New York Times

Production vs. Reserves

- “Gas can enhance energy supply security through its abundance” - Jim Mulva, Conoco Phillips
- Production vs. Reserves?
- Conventional gas projects decimated
- Is it really a “boom”?

Is It A “Boom”?

- Shale wells have very steep decline curves
- High initial production falls off dramatically after first few months
- Prices plunged but wells were not shut in
- Drilling to meet debt service

City of Ft. Worth

- Audited gas revenue 2008 - \$50M appr.
- Audited gas revenue 2009 - \$19M appr.
- Audited gas revenue 2010 - \$38M appr.
- Number of wells more than quadrupled between 2008-2010
- *Four times more wells cannot keep production at prior levels*

City of Ft. Worth

A Cautionary Tale

- Benzene was detected at 94% of all sites tested within the city proper - June 2011
- Other toxics of concern were found contributing to a toxic cocktail
- TCEQ confirmed that drilling contributes more air toxics than ALL cars, trucks, and airplanes in the region combined
- Childhood asthma more than double the national average

Record Capacity caused by "Drilling Treadmill"

- "Record capacity" may be for wrong reasons
- Operators response to oversupply anything but "prompt"
- How secure is our "record capacity"?

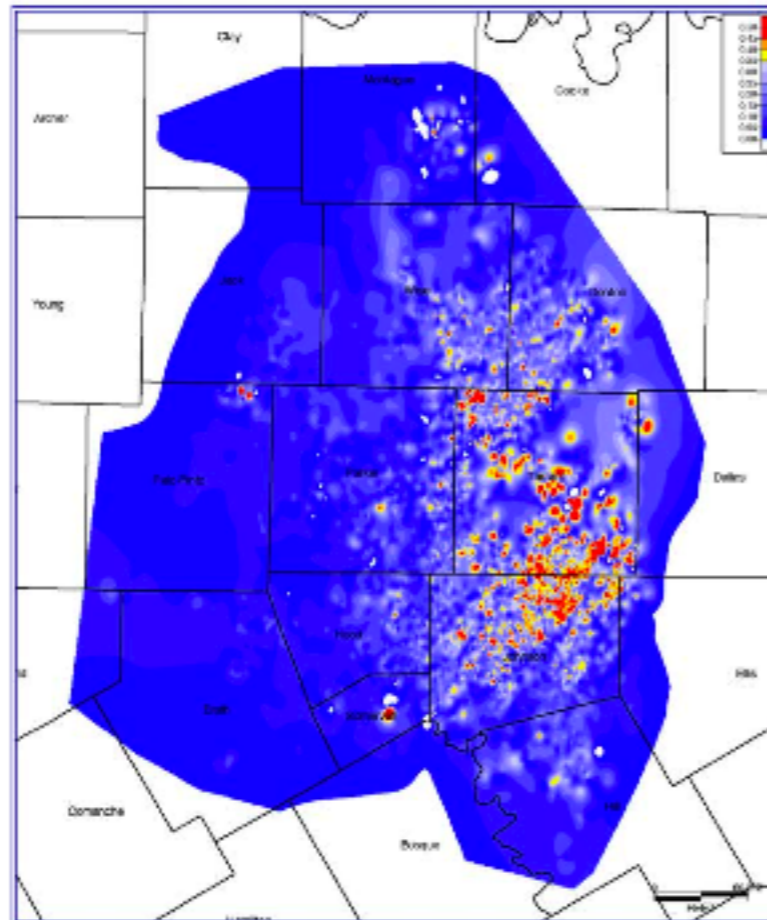
Misleading Statistics

- 100 year supply of gas?
- EIA slashed estimates by 66% in Marcellus, 40% overall
- Much of EIA original erroneous data was provided by industry
- New Marcellus estimates will provide a mere 6 years of supply at current consumption

Is Production Erratic, even in core areas?

- Examined 9,100 of 15,000 wells in Barnett (from Railroad Commission Data) and found that less than 6% of all wells meet minimum economic thresholds - Labyrinth Consulting, 2011
- “It is sometimes said...that 20% of [shale] wells carry a project; the other 80% can easily be uneconomic.” - Dr. John Lee, University of Houston, Architect of SEC Rule Change

The Barnett Shale Play has contracted to small core areas



- Less than 10% of the play has the potential to be commercial.
- Even within the core areas, well performance is uneven and considerable commercial risk exists.

First 6-month cumulative production for Barnett Shale horizontal wells. Data source: HPDI

SEC Rule Change

- Rule change adopted 2009
- Can claim reserves previously not allowed
- No independent audit necessary
- Can appear that companies are growing and finding costs are plummeting
- Is this really the case?

Reserve Claims

- “Those that select to book liberally can have extremely low finding costs, and those that book more conservatively...could have higher finding costs.” - Mark Papa, CEO, EOG Resources
- Some increased “booked” reserves by as much as 200%
- Allows monies to be borrowed on reserves that are not necessarily independently verified

Finding Costs

- “F&D costs (excluding acquisitions) decreased an average of 48% in 2009.” -
Ernst and Young, October 2010
- 5 of 7 shale companies examined
- Costs dropped significantly more than industry average
- Same companies that chose to “book liberally”

Plummeting Costs?

- PetroHawk costs declined 86% (after rule change)
- Comstock and PetroQuest - declined 75%
- Range Resources and Chesapeake - declined 66%
- EOG - declined 48% - only one in line with industry average

SEC Investigation

- "Don't know whether [SEC] staff first attempted to get documents informally" - Ryder Scott, 2011
- "SEC is looking for potential discrepancies between what shale gas companies are telling investors about the costs, profits and well performance of shale gas wells vs. "reality" - Ryder Scott, 2011
- Investigation not anticipated to close before year end 2012

SEC Questions Reserve Filings

- 44% of top 100 10-K companies were issued comment letters by SEC regarding anomalies in PUD filings - Ryder Scott, 2011
- PUDs converted at "mathematically impossible" rates
- Only 16% of companies could show with "reasonable certainty" that PUDs would be developed within 5 years - Ryder Scott, 2011

Years to Develop PUDs

according to Oil and Gas Journal, 2010

- Devon Energy 9.1 years
- Range Resources 11.8 years
- Chesapeake Energy 13.1 years
- Apache Corp. 15.1 years
- W&T Offshore 104.56
- None in compliance with SEC rules

SEC Comments on "Mathematically Impossible" PUDs

- "Therefore, at this rate of development, it will take at least 50 years to develop all of your PUDs, assuming that no additional PUDs are added during that time. Tell us how this complies with Rule 4-10(a)(31)(ii)..."

SEC Comment on Well Lives

- "All proved reserves must meet the standard of reasonable certainty. Therefore, please tell us the evidence that you have that horizontal wells in this reservoir for the properties in question will produce for fifty years and in some instances longer."

SEC Rebuttal to Operator

- "In regards to your response... as we stated...all proved reserves must meet the standard of reasonable certainty. While a few thousand vertical wells, a very small subset of the total wells that were drilled fifty or more years ago, have exhibited long lives, this would appear to support only the possibility that horizontal wells may exhibit lives of fifty years...By assuming well lives that only a small percentage of vertical wells have achieved, **it does not appear that your reserve estimate is reasonably certain to occur.** Therefore, please revise your filing to limit the reserves to well lives that are more reasonably certain to occur."

Cutting Production or Cleaning House?

- U.S. production 2011 4.5 billion cubic feet per day - Department of Energy
- U.S. demand 2011 920 million cubic feet per day - Department of Energy
- Liquids rich production still produces gas

Will Cuts Really Matter?

- "There's a portion of our portfolio which it's not going to make sense to shut in...There's probably two-thirds of it where the economics are really driven by liquids production and not natural gas prices." - Jeff Sheets, CFO, Conoco Phillips
- "...[the] bulk of our gas is associated gas and comes off with the oil. Not much I can do about cutting that back." - Steve Chazen, CEO, Occidental Petroleum

Cleaning House?

Chesapeake Energy Press Release, Jan. 2012

- “Chesapeake plans to have reduced its drilling activity in both the Haynesville and Barnett shales to six operated rigs each and to 12 operated rigs in the dry gas area of the Marcellus Shale in northeastern Pennsylvania.”
- “Chesapeake plans to defer completions of dry gas wells that have been drilled but not yet completed, and also plans to defer pipeline connections of dry gas wells that have already been completed.”

Weak Wells

- "These production cuts tend to be aimed at the weakest wells producing dry gas...This is a way to kill some of the least economic wells, and without really bringing production down." -

Analyst comment, Gelber and Asso., 2012

Why the Majors Want Shale Gas

- Two sets of economics:
- Field Economics
- “Street” Economics
- International crude pricing
- Majors have not grown reserves in over a decade

Industry's Two-Pronged Approach

- Pickens Plan - mass conversion of power plants and truck fleets to natural gas - very publicly touted
- Shale Exportation - very quietly pursued behind the scenes

Shale Exportation

- October 2011, the first export permit for terminal at Sabine Pass is granted
- Additional permits have been applied for committing nearly 20% of total gas supply thus far

Asian Markets

- “...the Chinese are willing to pay a premium to secure North American resources necessary to feed the growing Asian economy.” - Oil and Gas Financial Journal, 2011
- “Shell has placed a big emphasis on North American gas; it’s an area of growth for us. We’ve invested something like \$15B since 2004 in the onshore [sector]. What we develop here, [we’d] like to export to the rest of the world.” - Royal Dutch Shell, 2011

Exportation Benefits to Operators

- Asian gas prices tied to crude
- 2011 sets record prices for crude internationally
- Current U.S. domestic price under \$3 per million BTU
- Asian markets currently paying as much as \$16 per million BTU
- Substantial spread

Classic Consumer Squeeze

- Estimates as high as \$100 billion stimulus to US economy with gas at \$2.50/mcf
- U.S. manufacturers ramping up
- If natural gas is exported then prices will rise, EIA estimates 54%
- *Classic consumer squeeze*

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