

“The Petroleum Industry Resets – Perspectives on the Road Ahead”

This presentation was given at the monthly luncheon meeting of RMAG on January 5 by Pete Stark and Steve Trammel of IHS. Philip H. “Pete” Stark is Senior Upstream Research Director and Advisor for IHS Energy in Englewood, Colorado. Prior to joining IHS in 1969, he was an exploration geologist for Mobil Oil. Dr. Stark holds a BS in geology from the University of Oklahoma and MS and PhD degrees in geology from the University of Wisconsin. Steve Trammel is a Research Director and Advisor for IHS. He studied at the University of Colorado and holds a Bachelor of Arts magna cum laude from Texas Tech University. Dr. Stark spoke on the situation in the oil market and Mr. Trammel dealt with gas.

The following was provided as an abstract for the talk: *“Global oil markets continue to be significantly oversupplied and U.S. gas producers seek new markets to absorb surplus gas supplies. During first quarter 2015 there was room for hope that markets would rebalance by end of the year and that oil and gas prices would begin a gradual recovery. Unfortunately, multiple factors indicate that oversupplies and price pressure will remain well into 2016. Early November 2015 WTI oil price at around \$44.00 per barrel and spot gas price around \$2.30 per Mcf, both less than half their corresponding 2014 highs, may hold for several months ahead. As a result, a fundamental restructuring of the oil and gas industry is underway as companies “reset” operations to be profitable in a lower price environment.*

Predicting when oil markets will rebalance is tricky with multiple global factors –reduced demand growth, Saudi Arabia’s decision to defend its market share, and pending revival of Iran’s production – putting the onus on U.S. tight oil producers to reduce supplies. An IHS scenario indicates that an extended period of \$45 oil could drive sufficient reduction in U.S. tight oil production to rebalance the oil market in mid-2016. It may take longer as cost reductions and performance enhancements introduced by producers have slowed the rate of projected U.S. oil production declines. Unfortunately, natural gas is not in position to come to the rescue. At this writing, it looks like U.S. 2015 gas storage levels will set a new all-time record of more than 4 Tcf on the cusp of a possible mild winter influenced by a strong el Niño pattern. If this outlook prevails, sub-\$2.00 per Mcf gas prices could return during first half of 2016. All eyes will focus on the “mighty Marcellus” to understand future trends in gas supplies. What is the breakeven price for recent Marcellus wells that may produce 2.2 to 2.8 Bcf per 1000 lateral ft. at a cost of \$860M to \$1 MM per 1000 lateral ft?”

Dr. Stark started by stating that the global economy was at a new mediocre level, with GDP growth at several tenths of a percent below normal. The price for a basket of commodities is 55% less than at this time last year. The Saudis are battling for market share and the Iranians are re-entering the oil export market. The oil price reset began in late 2014 and will continue into late 2016. The US added 4.6 MMBOPD production between 2008 and April 2015 and has lost 400 MBOPD since. Dr. Stark believes the US

needs to lose another 500 MBOPD to rebalance the market; several consecutive months of sub \$45 oil should accomplish this.

World economic growth has been below the long term average since 2014 and he hopes it will improve in 2017. World oil demand growth is not going to be robust in 2016 and 2017 due to a weaker Chinese economy. In 2014 non-OPEC liquid supply increased by 2.4 MMBOPD, while demand only went up by 0.6 MMBOPD. This situation was exacerbated in 2015 - when the call for OPEC crude was less than 30 MMBOPD, production exceeded 31.5 MMBOPD.

2016 may be the key to rebalancing the market. Demand is expected to rise by 1.2 MMBOPD and supply to drop by 200 MBOPD. This should be enough to rebalance the market by mid-2016, even with the addition of Iranian production of 400 MBOPD. However the Iranians want to export 1 MMBOPD; how this plays out could affect the timing of the rebalancing. OPEC has lost control and the market is now operating based on the cost of supply and price.

From 2010 to 2014 oil demand dropped, but starting in 2013 non-OPEC supply (mainly the US, but also from Canada and Brazil) increased dramatically. This caused OPEC to increase supply to avoid losing market share. Market balance is expected to occur in the third quarter of 2016, assuming growth in demand and an improvement in world GDP. OECD oil stocks were 3 billion barrels in 2015. OPEC's spare capacity is currently quite low, at 2 MMBOPD. The last time spare capacity was at this level in 2008, the price was \$104. OPEC also has 3.5 MMBOPD of production offline.

The US is responding very quickly to this situation with increased efficiency, cost reductions and play selectivity, all of which have already occurred in gas drilling. In 2015 there was a 65% increase in capital efficiency and the Gulf of Mexico production ramped up to offset some of the losses in shale. In the Niobrara of the Denver Basin, the average peak well production has gone from 190 to 350 BOPD. Using 2015 costs, over 60% of US tight oil production can break even (with 10% profit) at \$50 per barrel. Dr. Stark hopes prices will reach \$60 a barrel by late 2016 and he expects US oil production to exceed its 2015 peak by 2018.

Steve Trammel then gave his perspective on the gas situation. With above normal temperatures across the US due to el Nino and increased production from the Marcellus and Utica, gas is priced at \$2 per MCF and storage levels are at record highs. Most conversions of coal to gas have already occurred. He projects gas prices above \$3 in 2018 to 2020. Although the number of gas rigs has plummeted, gas production has risen due to associated gas from oil shale plays. US gas supplies have had a major impact on gas prices globally - in some cases they have dropped by half.

US potential gas resources are reaching 3,000 TCF. At \$2 per MCF about 200 TCF of this resource is viable and about 1,000 TCF can be produced at the \$4 price level. Dry gas in

the Rockies needs an \$18 per MCF price to be profitable. Projected production in the Marcellus went from 40 to 50 BCF per day in the month of September, while the Utica produces 13 BCF per day. The Eagle Ford produced 10 BCF per day of associated gas in December and there is also good growth in the Permian. Decline rates in the Marcellus have been improved from 65 to 70% in the first year to about 57%, mainly by choking back the initial production.

Power, industrial, and export sectors are the main consumers of US gas, and producers are looking for new markets. For example, the hydropower from four dams on the Snake River in the Pacific North West, which could be dismantled, might be replaced by gas power generation. The river could then be returned to a prime salmon fishing location. Mr. Trammel projects Henry Hub prices around \$2.10 for this winter. The LNG export market is expected to grow about 2.5% in 2015 after many years of stagnation. Exports from US and Australian projects are forecast to increase by 21.9 million metric tons in 2016 (one million metric tons of LNG equals 48.7 BCF of gas).

Asian prices are dragged down by oil, and the price is expected to fall below \$7 for most of 2016. LNG suppliers across the globe, particularly in Qatar, have been resilient to low prices. The US export capacity will be 5.3 million metric tons in 2016, rising to 21.2 million metric tons in 2018. The long term prospects for LNG look good, as demand is expected to double by 2040.

An audience member asked about the cost of liquifying LNG at \$7-8 per million BTU, which makes the export cost higher than current overseas prices. Mr. Trammel replied that LNG has some challenges. Another question was what the breakeven costs included. The response was that they included the well costs and some of the infrastructure, but not the lease costs. In reply to a question about the effect of Congress recently approving US oil exports, Dr. Stark replied that in the long term it was beneficial and provided flexibility. Mr. Trammel said that it was basically a wash, as US refineries are geared towards heavier crude, and exporting light crude and importing heavy is far less expensive than modifying the refinery. Another person asked why with low gas prices, we are not seeing more petrochemical companies setting up in the US. Mr. Trammel replied that this has been happening, but regulations were hampering these efforts. Shell in Pennsylvania was quoted as an example, having spent 3 years attempting to obtain permits. A final question concerned the use of CNG in vehicles. The response was that low oil prices were not providing much incentive for this application, and the conversion would not use as much gas as the replacement of coal for power generation. CNG is an important use but the conversion takes time.