“Perspective 2017 – Growth Resumes While Challenges Abound”

Pete Stark and Steve Trammel presented the IHS forecast for the oil and gas industry at the January 4 RMAG Lunch Meeting. Dr. Stark, who spoke on oil, began by reflecting on how the surge in unconventional activity in North America had upset the supply/demand balance and affected prices worldwide. If the technology revolution had not occurred, the world would be facing $6.8 billion/day higher costs or $2.5 trillion/yr, which is equivalent to the GDP of France, the world's sixth largest economy. Without horizontal drilling there would be $12/mcf gas. European gas now sells for $6/mcf, indicating that the revolution has been worldwide.

To help drive oil and gas demand, there needs to be a 2.8 percent growth worldwide. Growth in 2016 was 2.4 percent. The industry has experienced a hit in both production growth and demand growth. Demand is expected to increase in 2017, at prices greater than $50 / bbl, with moderate growth extending into 2018.

On November 30, 2016 OPEC cut production and oil markets are rebalancing from a 2-yr glut. Beginning in 2014 production increased from 31 million bbl/day to 33.8 million bbl/day. Production in 2016 was approximately 32.7 million bbl/day. OPEC has pledged a reduction of 1.2 million bbl/day. If there is even a partial reduction, prices should rise to more than $50/bbl (which they are today).

Non-OPEC countries have cut production by 558,000 bbl/day, led by Russia at 300,000 bbl/day. Russia, Canada and Brazil will be the leading countries that will drive growth in 2017 and 2018. Production decreases are ongoing in China, Mexico and Colombia.

Led by the Permian Basin, US oil production will resume growth as rig counts increase. However, the offshore sector won't bottom until this year, the slower response attributed to higher costs. Oversupply is the bottom line. The US will ramp up in 2018, and output may reach 11 million bbl/day by the mid 2020s. With improved capital efficiency, tier 2 and tier 3 wells are breaking even. The onset of peak oil demand might be as early as a decade away.

There are many unknowns. If OPEC compliance is greater than expected, prices will rise. A disruption in supply would produce a similar result. However, a quick recovery in US supply could depress prices, as could additional supply from Libya (perhaps 300,000-400,000 bbls/day) and Nigeria. The fate of global economies will also factor into demand and price structure.

The chief demand for oil will be in the field of transportation, followed by industrial use. Demand for gasoline may peak in 2028, with competition from electric cars and ethanol use. A decrease in demand of 10 million bbl/day by 2040 may result from the Paris accord on climate change.

The chief years for discoveries and wildcats were from 1965 to the 1980s. In 2016, there were 174 conventional discoveries totaling 4 billion bbl of oil, with half attributed to the Fish Creek deposit on the North Shore of Alaska. The rate of conventional discoveries is the lowest since

1952. This is due to the fact that much of the Middle East is off limits to exploration and there is a governmental hiatus on exploration in Brazil.

On the other hand, North America unconventional production added 80 percent more oil since 2000 than was discovered conventionally. In 2014 the breakeven price was $75/bbl; in 2016 it was $53/bbl. The Permian Basin, the King Kong of producers, is three quarters the size of Colorado and has 45 producing formations. Conventional production peaked in the 1960s at about 500 million bbl/yr and declined to 200 million bbl/year. Production in the basin today is about 2 million bbl/day, mostly from unconventional plays. The potential from all the zones is estimated at more than 60 billion bbls, which is 1.7 times the cumulative production to date. Similarly, there may be 780 billion bbls recoverable in other super basins worldwide.

US recovery will be driven by the Bakken, Eagle Ford, Permian Basin, and to a lesser extent, the Niobrara, all areas where capital efficiency applies. At the peak of production in 2015, US unconventional plays added 3.3 million bbl/day. The US will be above that in 2018, but will need to add 4 million bbl/day of new production to replace the decline and drive production to hit the 11 million bbl/day target. Exploration will give way to exploitation in super basins throughout the world.

Natural Gas.

There are some bright spots in the gas market, including the increase in LNG exports; export of natural gas to Mexico; and the fact that LNG and NGL are doing well in the global markets. But pipeline expansions have been delayed due to depressed prices; natural gas inventories have been setting new records; there is competition from renewable energy; and there has been gas to coal switching at some power plants as coal markets have recovered.

The gas market can be viewed as a classic commodity cycle with a weather overlay, similar to that of farming. Overall gas demand will be up to 5 bcf/day, with 4.3 bcf from the US and .7 bcf from Canada. Production is down 1 bcf compared to last winter, and the price is fluctuating between $3-$4/mcf.

US storage withdrawal will be up almost 900 bcf this winter. Gas storage will exit the winter at a surplus and will move to a deficit because of slower injections and normal summer demands. Gas storage, at 4200 bcf, is at 95 percent of working capacity. We did not hit that last summer. As of December 23, 2016 there was 3374 bcf in storage.

The stagnating supply has led to higher prices, though they are still below $4. A price between $3.25 and $3.50 will drive gas to coal switching. The market reacts quickly to weather forecasts and the necessity to meet commitments. Right now coal is priced at $1.80/mmBTU, a cost that will encourage gas to coal switching at plants that can accommodate it.

In 2020 it is forecast that gas will still be trying to inch above $4. Between 2015 and 2020 the demand growth forecast is for 3 bcf/day. Between 2020 and 2025, the forecast is or 2.4

bcf/day. The LNG future is positive, but there is excess capacity and growth far exceeds demand. The future of NGLs is a wild card. Natural gas production is dominated by Appalachia. However, production from the Hainesville and Eagle Ford can take advantage of location to supply Mexico, which has made significant investments in infrastructure to take advantage of US supply.

Wind and solar energy development will increase substantially in the next 10 yrs, particularly with the federal tax credit extensions. These energy sources will require backup from fossil fuels to deliver power during periods of non-generation. Natural gas plants provide a clean energy alternative that can ramp up quickly to meet this demand.

In the Rockies US gas faces competition from Canada, where there is a surplus, in addition to lower demand and lower price. Rocky Mtn production will continue to decline due to price and competition. Surplus gas will carry over into 2017, and it is predicted that demand will be 2 bcf/day until the late 2020s. Pipeline expansion could add 2.2 bcf/day capacity from Appalachians. The majority of Rockies demand is in Colorado and Utah, and demand will be 4.5 bcf higher this winter than last. Also, there is more demand for lNG exports. In November the total rig count was more than 40.

Gas use is expected to rise 3.2 bcf/day nationally if there is a return to normal winter weather. Exports will total 1.7 bcf /day to Mexico, but storage will cover much of this demand. Gas to coal switching at $3.30 will make the Henry Hub volatile. The gas surplus may change to a deficit in the summer of 2017.