

## **“Will This Oil Tsunami Ever End?”**

This presentation was given at the monthly meeting of the Denver International Petroleum Society (DIPS) on December 11 by Gary Stewart, CEO of Melange International, LLC. Mr. Stewart worked as an exploration geologist for Exxon Co, USA prior to starting Melange 25 years ago, and was a member of President Clinton’s Energy Advisory Team for 8 years. He earned an M.S. degree in geology from the University of Oklahoma and a B.S. degree in geology from Arizona State University.

The following was provided as an abstract for the talk: *“Saudi Arabia and other members of OPEC have been increasing oil production, reaffirming their plan to “defend market share”. As the result of this strategy, oil prices have fallen from \$106 per barrel in mid-2014 to the current \$44 per barrel, causing U.S. producers to drastically cut expenditures; oil rig counts have dropped from 1609 rigs operating in October 2014 down to fewer than 580 operating today. Growth in U.S. crude oil production has stopped and production is expected to decline next year by 1 MMBOPD. The Global Oil Supply Study produced by Melange has reviewed every oil producing country around the world and projected each country’s oil production for 2016 and 2017. In addition, the Study evaluated global spare oil capacities, OPEC FX reserves, and oil consumption growth. Following along a series of assumptions (i.e. U.S. oil rig count remains less the 600, and Libyan production remains essentially offline for 2016) the Study concludes that oil prices can be expected to rise in .....”*

Mr. Stewart talked about an internal forecast he had produced in September of 2011. At that time there was about 4 MMBOPD of excess oil capacity, mainly in OPEC, but he anticipated a future shortage of oil followed by a slug of excess capacity in 2014 lasting until 2016. Iraq was the big uncertainty, because if the government collapsed, there would be no excess production.

Regarding the methods behind his forecast, in 2011, Mr. Stewart had used the annual Oil and Gas Journal feature titled “Major Upstream Projects Data”, which provided a sense of potential projects planned in the next 3-5 years and their expected production. However the O&GJ author has since retired and it is now necessary to utilize a general decline curve analysis, which is a much less accurate tool. The world currently produces 95 MMBOPD and there has been an average growth in demand of 1.1 MMBOPD for the last 30 years, apart from a period during the 2008 financial crisis. If there is no drilling worldwide, production drops at 4.5% per year. To meet demand new production needs to come online at 5.4 MMBOPD per year. If the world’s spare production capacity drops below 2 MMBOPD, there are swings in oil price as shortages of certain grades of oil develop.

US oil production growth and decline lag behind the Baker Hughes Rig Count. Production peaked at 9.5 MMBOPD and has been relatively flat for the last 12 months. However, 600 rigs are not enough to maintain this level of production, which is

expected to start dropping in 2016, falling by 1.1 MMBOPD by the end of the year. Generally, when US oil inventories rise, the price drops and vice versa. This correlation broke down in the Arab Spring of 2011 when inventories rose and prices remained high.

The world's major oil producers are affected by a combination of price, geology and geopolitics. Canada is similar to the US and it is expected that production there will be curtailed by 200 MBOPD. The North Sea province is constrained by geology and production is predicted to be flat. Mexican production topped in 2005 with the peak of the giant Cantarell Field; the decline should continue with a drop of 200 MBOPD in 2016. From the Former Soviet Union, Russia is producing 11 MMBOPD and is expected to remain stable. Kazakhstan's production continues to grow but is constrained by pipe capacity; it is anticipated that growth will be limited to 40 MBOPD.

China is the only major producer in South East Asia and an increase of 80 MBOPD in 2016 is projected. Brazil has numerous problems, but its projects are large and growth is expected.

Thirty percent of the world's oil production and 60% of the reserves are in the Middle East. Saudi Arabia produces 12 MMBOPD. Most oil production in the country is in the Shi'a areas, while the Saudi Royal Family is Sunni, which creates some geopolitical difficulties. Also, the ruler, King Salman, is experiencing health problems. It is indicative of Saudi Arabia's financial situation that both Halliburton and Schlumberger have not been paid for two months and Chevron and Exxon have been notified of late payment. Saudi Arabia has acted as the swing producer to maintain price stability for a long time. However in 2014, they ramped up production at a time of high oil prices in order to regain market share.

Iraq production has been largely unaffected by the conflict with ISIS and continues to grow. It is expected that an additional 300 MBOPD will be produced from Iraq next year. Iraq has limited access to the Persian Gulf and has built new Al Basrah offshore oil loading facilities to increase their export capabilities.

Iranian oil production is currently 800 MBOPD below capacity. Following the Iran nuclear agreement, the country is expected to add 400 MBOPD to the world's oil supply in 2016 and the same again in 2017. Iran currently has 40 MMBO stored in tankers.

Yemen's production is expected to be negligible and its status as a failed state is adding to the region's difficulties.

After President Bush dropped sanctions in 2004, Libya increased production to 1.7 - 1.8 MMBOPD. With the fall of Ghaddafi, the country collapsed into civil war and production fell dramatically. Mr. Stewart believes this situation will continue in 2016. Nigeria produces a similar type of oil to that of US shale operation and has lost market share in the USA. But the market for its product is returning as US shale production drops, and it

is expected to increase by 50 MBOPD in 2016. The Venezuelan political situation is expected to lead to a drop of 50 MBOPD in 2016.

Saudi Arabia requires an oil price of about \$100 per barrel in order to avoid a government deficit. It is expected to run a \$140 million deficit in 2015. Other OPEC countries are in a similar situation. At the current rate of depletion, OPEC countries' foreign reserves will last an average of 3 years, with Saudi Arabia's continuing a little longer. By contrast, shale oil can be produced profitably at \$50-60 per barrel.

Mr. Stewart estimates that OPEC has about 5 MMBOPD of excess capacity, of which 1.8 MMBOPD is curtailed forcibly, leaving 3.2 MMBOPD available. A sum of the worldwide oil production declines totals 1.6 MMBOPD. Production increases from select countries amount to 1.05 MMBOPD, so there will be a net 500-600 MBOPD loss in production in 2016. If this is subtracted from the 3.2 MMBOPD excess capacity and the 1.1 MMBOPD growth in consumption is considered, the world will be below the critical 2 MMBOPD excess capacity required for price stability. Thus, a price rise in the 4<sup>th</sup> quarter of 2016 is expected.

Mr. Stewart reiterated the requirements for his forecast to be accurate: OPEC does not cut production; Iran splits its excess export capacity of 800 MBOPD between 2016 and 2017; Iraq adds 300 MBOPD in 2016; the US rig count remains at 600, and most importantly, Libya and Syria remain offline (if they do not, it's time to retire!)

An audience member asked what will happen when the price recovers and US shale producers begin completing wells. Mr. Stewart replied that there is a time lag between completion and production. However in his opinion the oil price spike in late 2016 will be short-lived. He pointed out that there have not been any billion barrel oil discoveries in the past few years and in the long term we are heading for a crisis.