



# ILN-ENERGY

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## PART ONE

### ***PEAK OIL – Are We There Yet?***

#### ***Oil and Natural Gas Boom and Bust Cycles and Their Impact On The Practice of Law***

Houston, Texas, is considered by many as the energy capital of the world, certainly in respect to the oil and gas industry. Over the decades, this region has experienced several boom and bust cycles dictated by the ebb and flow of the supply and demand of oil and natural gas. Each cycle has in turn predictably impacted the legal profession servicing this sector. Presently, the industry is experiencing a bust cycle. While we are seeing some of the same trends during this present bust, there are also signs that history might not be as good an indicator of future trends as it once was. Part One of this article briefly discusses the business environment which was largely the cause of the recent boom in oil and gas prices and resultant increases in production, as well as some of the reasons for the current bust. Part Two will explore how this cycle is having or is expected to have an impact on the legal profession, and also examine ways in which these impacts might be different than experienced during prior cycles.

#### ***Fear of Peak Oil, and Resulting Price Increases, Spurs Innovation and Investment:***

Peak oil is based upon M. King Hubbert's theory that a point in time will be reached when the maximum rate of extraction of petroleum will be achieved followed by a long period of continued decline, all occurring while demand for hydrocarbon based energy is steadily growing, especially in the economies of the developing world.

Political and economic think tanks around the world accepted this theory as factual certainty, with many believing that peak oil was right around the corner. Recognizing that modern economies are heavily dependent upon fossil fuels including oil, most countries increased their efforts to diversify and secure their sources of supply, while also researching alternative energy sources. Recall the widely heralded book by Paul Roberts, "The End of Oil: On the Edge of a Perilous New World"

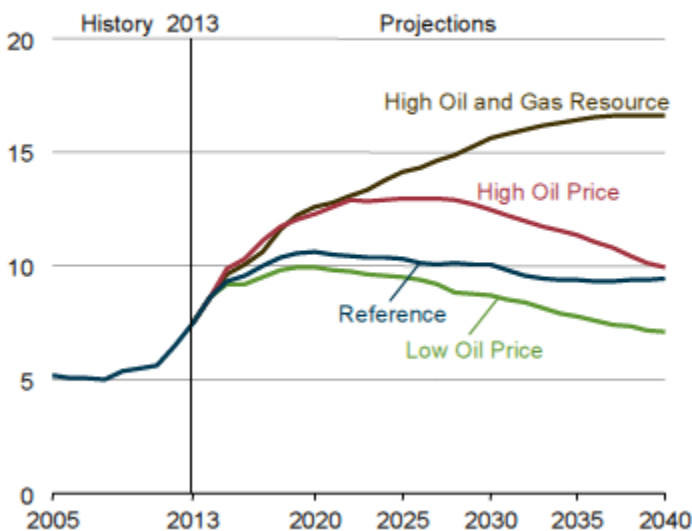
published in 2004. Recall also a June 2004 National Geographic article titled, “The End of Cheap Oil”, in which author Tim Appenzeller writes, “You’ve heard it before, but this time it’s for real: We’re at the beginning of the end of cheap oil.” These and other published studies were well researched and were very persuasive – the world is running out of oil and facing perilous times. And yet, if not incorrect, they have at least arguably been premature.

### ***Innovation and Investment Produces a Glut of Oil and Gas, Delaying Peak Oil:***

Instead of a world facing ever inadequate oil supplies and stagnating economies, the world has seen an explosion in new technologies capable of harvesting hydrocarbon reserves which were economically infeasible just short years ago resulting in, at least temporarily, declining oil and gas prices and increasing inventories. The reality is that the world’s producers are producing more oil today.

The United States, believed to have achieved peak oil production of 9.6 million barrels per day in 1970, dropping down to approximately 5 million barrels per day in the following decades, is now experiencing an oil production renaissance. Technological innovation and the risk taking spirit of the entrepreneur, driven by lucrative high prices, has increased domestic production to in excess of 9.2 million barrels per day early this year, projected to surpass the 1970 level later this year but for producers reducing their exploration and drilling efforts due to the decline in prices. Based upon some pricing models (such as the “Resource”<sup>(1)</sup> model graphed below), U.S. production is projected to be 16.6 million barrels per day in 2039, 7 million barrels per day more than the prior peak reached in 1970.

**Figure 22. U.S. total crude oil production in four cases, 2005-40 (million barrels per day)**

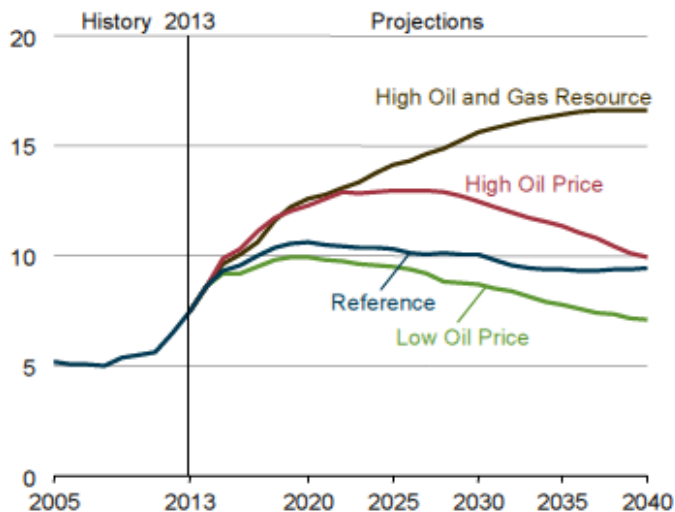


Source Graphic: U.S. Energy Information Administration (EIA) Annual Energy Outlook 2015.<sup>(2)</sup>

The current boom and future optimism is largely the result of new technologies allowing producers to effectively employ modern horizontal drilling and hydraulic fracturing (i.e., fracking) techniques

in shale formations and other tight sand reservoirs which were viewed as not being economically viable only 15 years ago.(3) In fact, according to the EIA, 83% of recent U.S. production growth comes from fracking in North Dakota (the Bakken shale formation averages .9 million barrels per day) and the Eagle Ford shale formation in South Texas, averaging almost 1.5 million barrels per day.

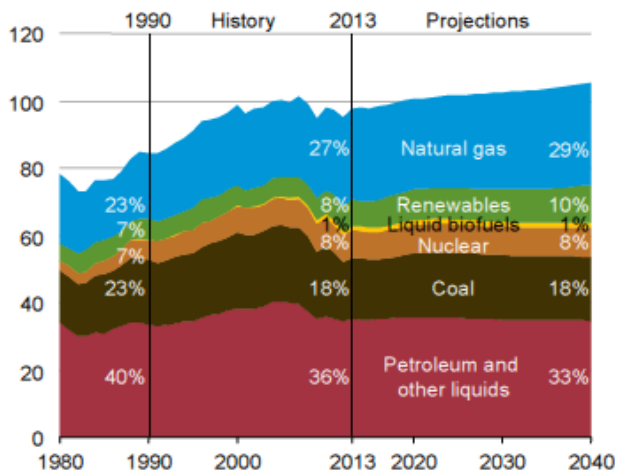
**Figure 22. U.S. total crude oil production in four cases, 2005-40 (million barrels per day)**



Source Graphic: U.S. Energy Information Administration (EIA) Annual Energy Outlook 2015.(4)

This increase in production, coupled with continued imports, has caused domestic inventory levels to reach enormous levels: approximately 450 million barrels in privately held inventories, and 691 million barrels held in the federally held Strategic Petroleum Reserves. The reserves continued to

**Figure 18. Primary energy consumption by fuel in the Reference case, 1980-2040 (quadrillion Btu)**



Source Graphic: U.S. Energy Information Administration (EIA) Annual Energy Outlook 2015.(5)

grow through the 1st quarter 2015, at times adding approximately a million barrels per day! While the consumption of oil has increased, particularly in developing countries, the rate of increase has not been as dramatic as previously projected by some. In fact, certain economies are beginning to consume less oil or at least decrease the rate of consumption increase. Consider for example the below graphic showing historic and future projected primary energy consumption in the U.S. by fuel type. Specifically, this chart shows a gradual decline in the use of petroleum and other liquids (as a percentage of total consumption) while consumption of natural gas and renewable energy increases.

Predictably, the present abundance of oil and natural gas, relative to demand and projected demand, has resulted in a dramatic drop in prices, which has in turn caused producers to reduce their budgets and planned exploration and development programs. In June 2014, the West Texas Intermediate (WTI) crude oil price reached \$107.20 per barrel (admittedly, partially driven by fears that Sunni extremists were threatening the Baghdad regime and might disrupt Iraqi oil production, and also the Ukrainian crisis). Prices then began a steady decline in 2014's 3rd quarter, accelerating during the 4th quarter, remaining at a relatively low price during the 1st quarter of 2015 (\$56.39 per barrel on April 15, 2015 (WTI). Natural gas prices experienced a similar drop, from \$4.90 per Btu in March 2014, to \$2.83 in March 2015 (Henry Hub Natural Gas Spot Price). This drop in price in turn caused producers to slow down their investment and development activities. For example, according to the Texas Railroad Commission, new drill permits issued in the 1st quarter of 2015 fell 53% from the last quarter of 2014, and were down 63% from the 3rd quarter of 2014. Not surprisingly, according to Baker Hughes, the Texas working drilling rig count has fallen from 872 in December 2014 to 492 by the end of March 2015 – a 43.6% decrease!

This reduced activity will not immediately cause production to materially decline. In fact, there is still a huge inventory of drilled wells awaiting completion, with more producing wells coming online every day. According to the EIA, Texas oil production increased to 107,290,000 barrels in January 2015, a rate of 3.46 million barrels per day, the highest production rate ever reported by the EIA for Texas. The enormous investment poured into exploration and development has generated a huge increase in domestic production which will continue to grow for some time despite the sharp decrease in new drilling activity. In fact, some producers find themselves in a catch-22. Lower oil and gas prices mean reduced cash flow which in turn requires producers to maintain if not increase immediate production in an effort to maintain cash flow. Many producers simply have little choice, continuing to produce to service debt and protect investments. In fact, some oil and gas leases contain a continuous development provision requiring the operator / producer to continue drilling and development or risk losing the lease.

For these and other reasons, a material reduction in production is not expected for some months, absent some other significant external event (e.g., OPEC's decision to curtail production, political turmoil in energy regions or otherwise impacting key oil shipping lanes). In fact, the EIA projects that domestic production will continue to climb throughout the 2nd quarter of 2015, only to see a decline toward the end of the 3rd quarter of approximately 180,000 barrels per day.

While decreases in production will not be immediate the economic impact of this reduced activity is being immediately felt in energy producing regions like Alaska, Texas, South Dakota, Louisiana, Pennsylvania, Montana and those states adjacent to federal lands and the Outer Continental Shelf in the Gulf of Mexico. Thousands of employees are being laid off by producers of all sizes, as well as by the oil and gas service industry. Drilling rigs, ranging from land rigs to sophisticated deep water drill ships and semi-submersibles are either losing contracts or having to renegotiate day rates ranging from \$30-40,000 per day (for some land rig) to more than \$600,000 per day for deep water units. Countless other vendors and contractors are parking valuable assets (e.g., well control, wireline, casing, perforating, fracking, snubbing . . . units) which were in high demand a year ago but are now stored, waiting for work. This is also having an impact on manufacturing ranging from tubulars, casing, risers, support vessels, replacement rigs, valves, meters and a wide array of drilling and production chemicals and other products. Of course, the rapid and significant demobilization of one of the largest industries in the country has a significant impact on the communities supporting that industry, unemployment, reduced tax base, reductions in construction and retail spending.

Over the last several decades, the legal profession has evolved into numerous disciplines to service clients in the oil and gas industry, including tax, commercial, litigation, land and title, casualty, royalty, lease, regulatory and many others. Historically, boom and bust cycles in the oil and gas industry have impacted each of these disciplines in different ways, albeit fairly predictably. Depending upon the cycle, its severity and duration, some disciplines experience an increase in demand while others experience flat or decreasing demand. The present cycle appears to be no different in that it is impacting each of the traditional oil and gas legal disciplines in different ways, but there are indications that the present cycle deviates from historic precedent in some potentially important respects. Our next paper will explore how the present bust cycle is impacting the legal profession, how this impact might be expected to evolve, and how its impact resembles and deviates from historic precedent.

1 The "Reference" case illustrated in the chart assumes gross domestic product growth at an average annual rate of 2.4% to 2040, that the current laws and regulations remain generally unchanged, and that the North Sea Brent crude oil prices rise to \$141 per barrel in 2040. In the "Resource" case, estimated ultimate recovery per shale and tight formations is 50% higher and well spacing is 50% closer than in the Reference case. Many analysts view these as reasonable assumptions.

2 The EIA is the statistical and analytical agency within the U.S. Department of Energy. The EIA's data, analysis and forecasts, however, are by law independent of approval of any other officer or employee of the United States Government, and are widely viewed as being well conceived and objective.

3 Shale and other tight sand formations were once viewed as obstacles by petroleum engineers, i.e., something that had to be drilled around or through in order to get to the reservoirs that could be produced in paying quantities. This was largely due to the rapid production decline curves experienced by wells located in shale formations resulting from a lack of porosity and permeability. These geological limitations have been largely overcome by a combination of horizontal drilling and advanced fracking techniques.

4 Please note the negligible production from shale and other tight sands prior to 2005. In fact, it is widely believed that the first commercially viable well, using horizontal drilling and hydraulic fracturing, was drilled in the Barnett Shale (Texas) in 2000 or 2001. The growth of drilling and production of oil and natural gas in multiple shale formations has been phenomenal since that time.

5 Most of the projected growth is in the consumption of natural gas and renewable energy. These projections are largely dependent upon anticipated pricing, future uses of natural gas, and competitive uses of oil. For example, consumption of crude oil products is expected to remain relatively flat and possibly decrease partially as a result of projections that show consumption of motor gasoline in the transportation sector declining as a result of a 70% increase in the average efficiency of light-duty vehicles (to 37 mpg in 2040) which more than offsets projected growth in vehicle miles traveled.

## *About the Author...*



[Brit Brown](#), chair of the ILN Energy Specialty Group, is the Managing Partner of [Beirne, Maynard & Parsons, L.L.P.](#), a litigation focused law firm with its main office in Houston, Texas. A large percentage of the firm's cases and transactions involve the energy industry, and more than 30 of the attorneys focus their practices in this area. They have tried many complex commercial cases touching on contract, intellectual property, gas supply, and employment issues within the energy industry as well as numerous oil-field injury cases. In addition to disputes, the firm provides advice on commercial and contractual matters. The firm also has extensive experience in alternative dispute resolution,

arbitration, and mediation, which is an increasingly important method in resolving disputes in the energy industry.

### ***About the ILN Energy Specialty Group***

***Chaired by Brit Brown of Beirne, Maynard & Parsons LLP in Houston, Texas, the Energy Group brings together energy practitioners from around the world to discuss issues of mutual interest. The group services the legal needs of a wide range of clients in the energy industry around the world, addressing almost every kind of issue confronting the energy industry today.***

### ***About the International Lawyers Network***

***The International Lawyers Network is an association of 91 high-quality, full-service law firms with over 5,000 lawyers worldwide. The Network provides clients with easily accessible legal services in 67 countries on six continents. The ILN - where lawyers become friends.***

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