ETP 1: THREE SIGNS THE END OF OIL EXPORTS IS COMING

Issue: The first sign of the end of oil exports has already happened. The second is expected in about six years and the third in twenty years, by which time **the price of oil will have dramatically increased and worldwide oil exports will have effectively ceased.** Broad systemic change involving new technologies has historically taken longer than twenty years to reach maturity. We must respond to this energy challenge now.

THE FIRST SIGN

The first sign of the end of oil exports occurred in 2002-2004. Great Britain had been a net oil exporter due to its North Sea fields. Over time, North Sea oil production passed the peak of the Hubbert curve[1] and began to decline (Fig. 1). (The "Hubbert curve" provides a statistical approximation of production rate over time.)

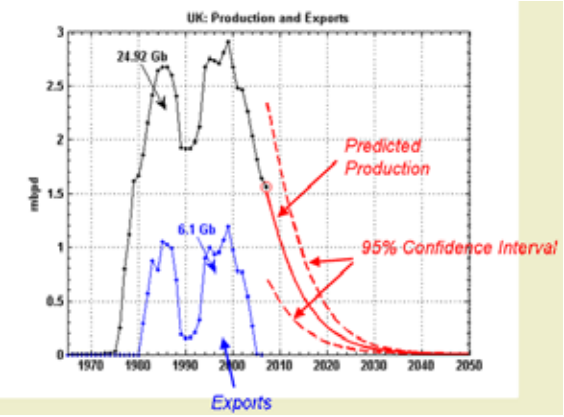

Figure 1. Great Britain's Oil Exports[2]

Domestic consumption greatly increased after 1980 as the UK embraced automobiles and a suburban lifestyle. By the close of 2003, oil exports ceased entirely and Britain again became a net importer of oil .[2] When internal consumption rises above internal production, a country will stop exporting and, on balance, become an oil importer.

THE SECOND SIGN

The second sign was reported by *Scientific American (SA)* in a Special Issue in September, 2010.[3] According to their calculation, they forecast the expected peak of the Hubbert curve in 2014. World production is expected to sharply decline after the peak, falling from 100 ±10 million barrels per day (MBPD), to about 10 MBPD by 2060. According to the article, this prediction is unique in the sense that the model accounts for multiple waves of technological advances.

We expect the world will react once the decline in global production has been confirmed several years after the peak. For this reason, we deem the second sign will have occurred when the decline in oil production is generally accepted in the years 2016 to 2020.[4] During this period, it is expected the price of oil will rise more rapidly[5].

THE THIRD SIGN

Considering the world's top 5 oil exporters (Saudi Arabia, Russia, United Arab Emirates, Iran, and Norway) and estimating their internal production and consumption, we can determine the point where the consumption curve crosses the production curve as shown in Fig. 2. At this point, oil exports would effectively cease.[6]

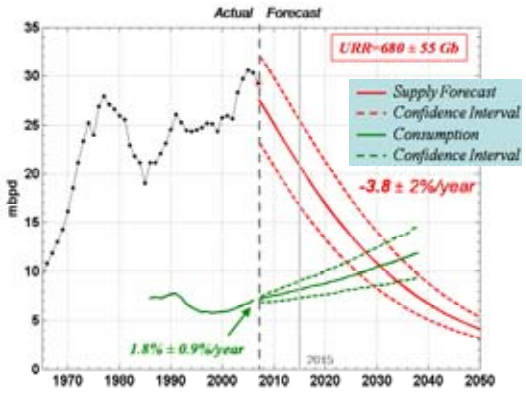

Figure 2. Top 5 Exporters – Production and Consumption[2]

Figures 2 and 3 show three estimated production curves, for maximum, minimum and expected cases, and the same for consumption. The intersections of these lines bounds a window for the appearance of the third sign over a range of years. With the sole exception of Saudi Arabia, all the other large oil exporting countries will cease exports between 2025 and 2030. If present trends continue, Saudi Arabia itself would effectively cease all exports in the time range around 2025 to 2038. (Fig. 3). During this period, we expect *dramatically higher oil prices*[5].

By the time this third sign is observed and understood, about 2035, the first sign (the British example) will be over thirty years past, and, the Hubbert curve for world oil production should clearly show decline from its peak around twenty years earlier, 2014.

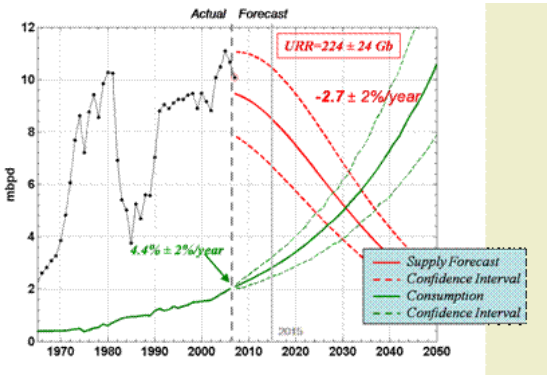

Figure 3. Saudi Arabian Estimated Production and Consumption[2]

SUMMARY

Study of *the first sign* shows that oil-exporting nations will cease exports when their entire oil production is absorbed by satisfying their internal consumption. *The second sign*, in 2014-2016, will be the confirmation that the global Hubbert Curve will have peaked and that worldwide oil production will be well into a decline. *The third sign*, around 2025-2035, will be when exports from the traditionally largest oil-exporting nations effectively cease. This will place an enormous strain on those countries that are highly dependant upon oil imports, such as the USA, India, and China. The number of people wanting cars continues to increase rapidly, especially in China and India. These two countries are among the largest, and most dynamic, fast-growing economies on Earth, not just in the developing world. Fueling the growth of these economies drives increased global competition for a vital but limited basic resource, thus we can expect the price of oil to rise sharply.

All this is expected to happen within the next twenty years. Fundamental technological shifts, such as are called for in energy, historically have taken longer than twenty years to mature.[8] There is an urgent need to prepare today for our future energy needs by formulating and implementing a national plan for energy security that is based on sound science, engineering, and economics.

SOURCES AND REFERENCES

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