The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

George Will misunderstands the abundance of fossil fuels

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Last Sunday George Will wrote about the abundance of fossil fuels in his column for the Washington Post. He began by surmising that Titusville, PA might have a claim to being most responsible for the modern world through the contribution of oil to world wealth. He then went on to list some of the many folk that have predicted (falsely) the arrival of a peak in oil production and the amount of reserves that are available.

> In 1977 . . . Jimmy Carter predicted that mankind "could use up all the proven reserves of oil in the entire world by the end of the next decade." Since then the world has consumed three times more oil than was then in the world's proven reserves.

He does not see that America, or the world for that matter, can wean themselves from a dependence on hydrocarbons, and quotes Keith Rattie, the chief executive of Questar, from a commencement speech as well as Edward Morse, from a story in Foreign Affairs in which Morse states that there is plenty of natural gas available – perhaps a hundred years at the present rate of consumption, and that the deep water fields just beginning to be exploited are significantly larger than thought. And he includes Daniel Yergin as stating that" the resource base of the planet is sufficient to keep up with demand for decades to come."

From all this he concludes that it is only the environmentalists that are going to ensure scarcity for the planet. So where does one begin to disassemble what would appear, at first sight, to be a rational argument based on the utterances of three prominent individuals?

To pick the last first, it has unfortunately not been that long since I last wrote about Dr Yergin and CERA. Earlier this month I noted, after giving a number of occasions in the past that CERA had been wrong, that some of the assumptions that they were currently using to project future oil production were likely to be wrong also.

The most obvious immediate reason is the collapse of the oil industry in Mexico. Having fallen from the projected 4 mbd to potentially only 2.7 mbd next year, global supply is going to have to find another source for that 1.3 mbd. Bear in mind that Mexican production has been falling as fast as 100,000 bd per month at Cantarell and the magnitude of this problem becomes apparent. The current hope of seeing 10 mbd from Iraq by 2020 is, I would suggest, also perhaps more than a little optimistic.

So let's tick Dr Yergin from the list, and move on to Edward Morse and the prediction of natural

gas production from fields such as the Marcellus and from the deep waters of the world. This case is a little more tricky to argue, but only in the sense that there are considerable resources in both these regions of the world and that they will continue to produce significant quantities of fuel for some considerable time. The questions that are being raised are, however, more along the lines of how much and for how long will they produce and at what cost?

Evidence to date (that I am trying to explain in the tech talks, but haven't got to the downside talks yet) is that by using new technologies these fields can be produced with very high initial yields from slickwater, multi-frac'ed horizontal wells, but that these wells have a much shorter life and faster decline rate than was predicted when the production from these fields were estimated. The deepwater fields require dramatically higher investment costs and while the technology and equipment is available, to some limited degree, there aren't that many rigs that can be mobilized to drill in these conditions. Further continued production from some of the weaker rocks that the oil lies in, at these depths, is going to continue to be a technical challenge, driving costs higher and higher and further limiting levels of production available. Yes there will be oil, but it will be more expensive and there won't be nearly as much as one might think at any one given time (the production rate) to even maintain current levels of production very much longer.

Which brings me to look at Mr Rattie's speech, which is one that I have considerable agreement with. Except for the assumption that we can continue to grow our way into the future in terms of increasing supplies to meet an increase in global demand for energy that will increase by 30 – 50% over the next two decades. He lists some of the anticipated growth:

> The Salt Lake Tribune recently celebrated the startup of a 14 MW geothermal plant near Beaver, Utah. That''s wonderful! But the Tribune failed to put 14 MW into perspective. Utah has over 7,000 MW of installed generating capacity, primarily coal. America has about 1,000,000 MW of installed capacity. Because U.S. demand for electricity has been growing at 1-2 % per year, on average we've been adding 10-20,000 MW of new capacity every year to keep pace with growth. Around the world coal demand is booming – 200,000 MW of new coal capacity is under construction, over 30,000 MW in China alone. In fact, there are 30 coal plants under construction in the U.S. today that when complete will burn about 70 million tons of coal per year.

Mr Rattie also points out something that is sometimes missed in the debate about coal and natural gas fired power plants:

> America has about one million MW of installed electric generation capacity. Forty percent of that capacity runs on natural gas – about 400,000 MW, compared to just 312,000 MW of coal capacity.
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> But unlike those coal plants, which run at an average load factor of about 75%, America's existing natural gas-fired power plants operate with an average load factor of less than 25%. Turns out that the market has found a way to cut CO2 emissions without driving the price of electricity through the roof – natural gas's share of the electricity market is growing, and it will continue to grow – with or without cap and trade.

That is surely true in the short term, but the questions about natural gas production, and the fact that if natural gas were, for example, to be used at double the current rate (i.e. to produce 50% of the nation's electricity) then even if the current prediction of 100 years of gas at current levels of consumption were true, then at double the rate, the lifetime of the reserve would be cut to 50 years. Given the questions on production referred to above, it may, be quite likely that estimates are at about twice reality, and thus there might be 50 years of supply, but this is likely to be consumed at somewhat higher rates than current, so that the effective lifetime is going to be closer to 25 – 30 years, I would suspect. (And don't forget that Questar is one of the largest natural gas producers, who may be vulnerable in the fight to retain market share as the increased availability of natural gas from conventional sources struggles against supplies from the gas shales and from LNG supplies - in the short term).

Oh I anticipate that there will be adjustments in the fuel mix in the future, the decline in oil's share of the market will have to be replaced with some alternate fuel, and natural gas will have to carry some of this burden. I tend to see that there will be problems in getting an adequate amount of energy supplied from renewable sources, as the scale of their use grows, and the realistic availability of good sites for development of new farms reduces. (It is all too easy to just say we need the equivalent of say half of Utah, without recognizing just what percentage of Utah is actually available – just to pick some numbers for the sake of discussion).

Put this all together, and in an ideal world, when gold, oil and natural gas production could continue to increase in availability every year, then George Will's suggestions might well come to pass. Unfortunately when there is a realistic limit to the actual volumes available, as we are now seeing with gold, so shall we soon see with oil, and before then I would suggest that Mr Will seek additional advice from elsewhere – perhaps here?