



A Simpler Way to Calculate Global Oil Reserves?

Posted by [Prof. Goose](#) on September 13, 2006 - 12:14pm

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[editor's note, by Prof. Goose] This is a guest post by [Roland Watson](#), who publishes an investment newsletter based on Peak Oil and other events that will impact the global economy.

As I recently re-read some articles on the debate about global oil reserves, a thought struck about how one could arrive at a rough estimate for such a number.

The search for that magic number of total oil in place and hence an estimate of how much can be realistically recovered has been a bone of contention across the Peak Oil divide. In fact, the absence or unreliability of data provides a sufficient haze for one group to point in one direction whilst another points in a completely opposite path. Hence we will find that estimates varying from 2 trillion barrels of URR up to 3 trillion barrels are the typical of the debate. Now a difference of one trillion barrels is important. At a current global consumption rate of 85 mbpd (original was 30 bbpd, that isn't right...PG) we get another 33 years of time to get things sorted out in terms of alternate energy sources and so on (though increasing demand would pull that number back to 20-25 years).

So I was considering the oil life of the United States of America...

Here in America, we have a large region with a mature post-peak profile plus a consistent and reliable set of production statistics. From this data set we can calculate cumulative production to date and make a good estimate of its ultimate recoverable resources. Also (though I say this as a non petro-geologist) I would hazard to guess that a landmass this size has a good representative sample of the various types and distributions of oil deposits commonly found across the world. In other words, the USA is a mirror of the oil profile of the entire world.

In a moment of idle and lateral thinking, I wondered what the projected URR of the world would be if I just scaled up the projected URR of the USA to a global level? To put it another way, if you divide the land area of the world by the land area of the USA and multiply by the projected URR of the USA will you get a projected URR for the world?

Now I know this is not as subtle or complex as P5, P50, P95, Monte Carlo simulations or the work put in by analysts collating and adding up various oil projects across the world with the appropriate contingencies. It is not even as complicated as a Hubbert Linearization. But the possibility that a well-known and statistically significant area such as the USA may be a microcosm of world production intrigued me.

I needed just three numbers - the surface land area of the USA in square kilometres, the surface land area of the entire world in square kilometres and the estimated URR of the USA in gigabarrels.

The surface areas were obtained from Wikipedia and I excluded Antarctica from the total since it is effectively inaccessible.

Surface land area of USA: 9,631,420 sq km

Surface land area of World: 148,939,063 sq km minus Antarctica at 14,425,000 sq km = 134,514,063 sq km

The USA URR is taken from Colin Campbell's ASPO estimate of 195 billion barrels which can be found at this [link](#).

So doing our division and multiplication gives a first approximation for world URR of 2.72 trillion barrels of oil. Remarkably this is very much in line with estimates calculated from more complex techniques and ironically finds itself half way between the estimates of the two divides of the Peak Oil controversy.

One or two things need to be said about this number. Firstly, one may dispute the USA URR itself and come up with different numbers. One for example may go for the fanciful USGS P50 estimate of 362 billion barrels and come up with a cornucopian number of 5.06 trillion barrels. This alone should suggest that the USGS estimate is way off the mark.

However, this projected world URR may in fact be overstating the actual numbers. I say this because no region of the world has been as thoroughly explored and drilled as the USA. It is unlikely that every country in every continent is going to receive the same degree of attention as the USA has had as the wealthiest nation in the world.

Also, what about offshore oil production which technically is not part of the land surface area? I took the line here that once again the USA was a microcosm of how world offshore URR would pan out. In terms of its share of global coastline, the USA has 19,924 km of coastline and the world has 292,643 km (after deducting for the Polar Regions - see [link](#)). This gives a ratio of 14.69 which compares well with our surface area ratios of 13.97.

So what can we say about our estimated world URR of 2.72 trillion barrels based on this simple approach? I for one take it as an upper limit on global oil reserves for reasons stated above. That takes it closer to the 2.1 to 2.3 trillion barrels normally quoted by Peak Oil experts than the 3 trillion expected by more optimistic analysts.

I say take it as it is, a rough calculation, but don't dispense with the more rigorous calculations that grace the Peak Oil debate today.



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