



IEA's Resources To Reserves - Not to Worry!

Posted by [Dave Cohen](#) on October 22, 2005 - 5:02pm

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[editor's note, by Stuart Staniford] This is a contributed post by Dave.

Readers of TOD were preoccupied with Hurricane Rita on September 22nd of this year and might have missed the release of the International Energy Agency's 130 page report [Resources To Reserves, Oil And Gas Technologies for the Energy Markets of the Future](#). Two considerations make this report noteworthy. First, the study is firmly in the Cornucopian camp and so joins the CERA report in this respect but on a much larger scale. The second consideration should interest TOD readers the most: IEA appears to have released the report partly to counter claims of the worldwide Peak Oil community.

We learn from the IEA's [Executive Summary](#) (pdf) that the share of oil and gas in the world's fuel mix is expected to increase from about 57% in 2002 to 60% in 2030 if energy policies worldwide do not change. There will be a 70% demand increase over this period. Reading on, there's this interesting bit

In addition, as output from the world's existing production sources inevitably declines, probably at a rate around 5% per year, this decline will need to be compensated with new supplies.

The hydrocarbon resources in place around the world are sufficiently abundant to sustain likely growth in the global energy system for the foreseeable future. But keeping pace with today's demand growth projections will oblige the hydrocarbon industry to take on a new, diverse set of business and technological challenges.

The 5% figure is the same one Chris Skrebowski uses in his [Megaprojects Update](#) as discussed recently [here](#) at TOD. Nonetheless, no one needs to worry about undiscovered resources or proven reserves. According to the IEA these are ample.

Measured in units of oil equivalent, roughly 10 trillion barrels of conventional oil and gas are in place, and at least as much non-conventional oil and gas. Out of these 20 trillion barrels of oil equivalent (boe), 5 to 10 trillion can be considered technically, but not necessarily economically, recoverable, depending on recovery rates, technological progress and long-term price assumptions.

Proven reserves amount to about 2.2 trillion boe, which is not so far from the 1.5 trillion boe produced so far, over more than 100 years of exploitation. Indeed, 1.5 trillion boe is also a rough estimate of what needs to be produced over the next 25 years.

I might quibble and ask why there are not "roughly" 8 or even 12 trillion boe of conventional oil and gas in place waiting to be exploited -- but what's a trillion here or a trillion there? Nonetheless, IEA says there are 2.2 trillion boe of proven reserves but we only need 1.5 trillion of those barrels out to 2030.

It doesn't seem fair to talk in terms of barrels of oil equivalent for many reasons, chief among them being the necessity to convert gas to liquids (GTL) in some cases and the problem of transporting gas from place to place (LNG or pipelines). Nonetheless, I thought I would do some back of the envelope calculations to get a ballpark estimate of what we will be producing. Taking the CERA and Skrebowski numbers (now almost the same) that daily oil production will increase by about 16.5 mbd from 2004 to 2010, I did my rough calculations based on the projected increases from 2006 to 2010 (inclusive) to see how we'll be doing by then (given that 2005 is almost over now). Doing a simple cumulative addition of the mbd numbers for this period for oil and adding in an equal amount of gas, I found that we will produce an additional 31.46 billion barrels of oil equivalent (bboe) in that period. Using a baseline of 85/mbd with a 5% depletion rate, we will produce 133.35 billion barrels of oil (bbo) in this period. Using the [BP 2005 Natural Gas Production Figures](#) (given in billion cubic metres) and converting to bboe, the total figure I got was 90.83 (= 49.77/mbd in boe from natural gas production). No depletion factor was used for gas. Adding them up, we get 256 bboe of production in the period 2006 to 2010. This leaves an additional 1.244 trillion boe to produce in the period from 2011 until 2030. Clearly we're going to have to work hard and pick up the pace a bit to meet projected demand given continuing declines, decreasing (oil) discovery rates and extraction challenges.

To get that new production, the IEA cites the usual two challenges in the future, developing the technology we will need to extract these resources or reserves and providing sufficient investment to do so. In this [graph](#), you will see that development of new resources and reserves is put in the categories Middle Eastern, other conventional, deepwater, Arctic, super deep, EOR, heavy oil and shale oil. These categories are presented solely as a function of economic price (2004 US dollars) with a total of about 4.5 trillion barrels of oil equivalent available and price rising to \$80. Frankly, I'm not quite sure how to interpret this. Is EOR (enhanced oil recovery) a supply category apart from "other conventional" oil? Similar graphs can be found at the original IEA source cited at the top.

In two articles ([part 1](#) and [part 2](#)) published by resourceinvestor.com out of Paris, Adam Porter reports

In the introductory paragraph Claude Mandil, the IEA's executive director, wasted no time in examining the subject.

He said, "soaring oil prices have again spotlighted the old question. Are we running out of oil? The doomsayers are again conveying grim messages through the front pages of major newspapers. `Peak oil' is now part of the general public's vocabulary, along with the notion that oil production may have peaked already, heralding a period of inevitable decline."

What "peak oil" supporters might find even more strange, is the use of the Hubbert Curve within the report, which is the mountain-shaped curve, showing increasing then declining production. It was created by the former Shell geologist M.K. Hubbert, to illustrate the theory of "peak oil."

In a special section entitled just "Peak Oil" the IEA actually present the theory to its clients. They sum up by saying that "The striking success of Hubbert in predicting the peak of U.S. production suggests that such conditions were more or less met in the U.S. during that time period."

They then appear to question the current relevance of Hubbert in today's oil market. Because they move on to say that "the controversies surrounding peak oil in the literature revolve around four main points. Does the Hubbert model apply to oil production worldwide? If the Hubbert model does apply, when will the peak in worldwide oil production be? What happens after the peak? How fast will the decrease of production be? What role does technology play in such models?"

So, the IEA is definitely concerned about these unfounded Peak Oil rumors. As Porter points out,

The basic counter thrust of the IEA's argument is that new technologies and increased investment can overcome any production inflection. But the level of investment that requires is truly astronomical. Repeating a figure they first used in the IEA World Energy Outlook report they estimate that the total necessary investment cost "for worldwide upstream operations and transport [of oil]" by 2030 will amount to "\$5 trillion."

That works out at roughly \$564.5 million dollars a day, between now and 1 January 2030.

That's a lot of money! Colin Campbell wastes no time debunking this report.

"It is an absolute masterpiece," he stated. " A masterpiece of telling the truth in such a selective manner so as to get the juxtapositions quite right. All in order to mislead and confuse the situation. After all the best way to lie is to tell the truth, just in a manner that creates a wholly false impression of what is actually going on."

"The report is an absolute confession of `peak oil'," he said. "But at the same time the text goes out of its way to deny it. Really, it's a brilliant document. It takes immense skill and a marvellous command of language that allows [OECD] governments and oil companies to hide like this."

And that concludes this report from the Peak Oil War frontlines.



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