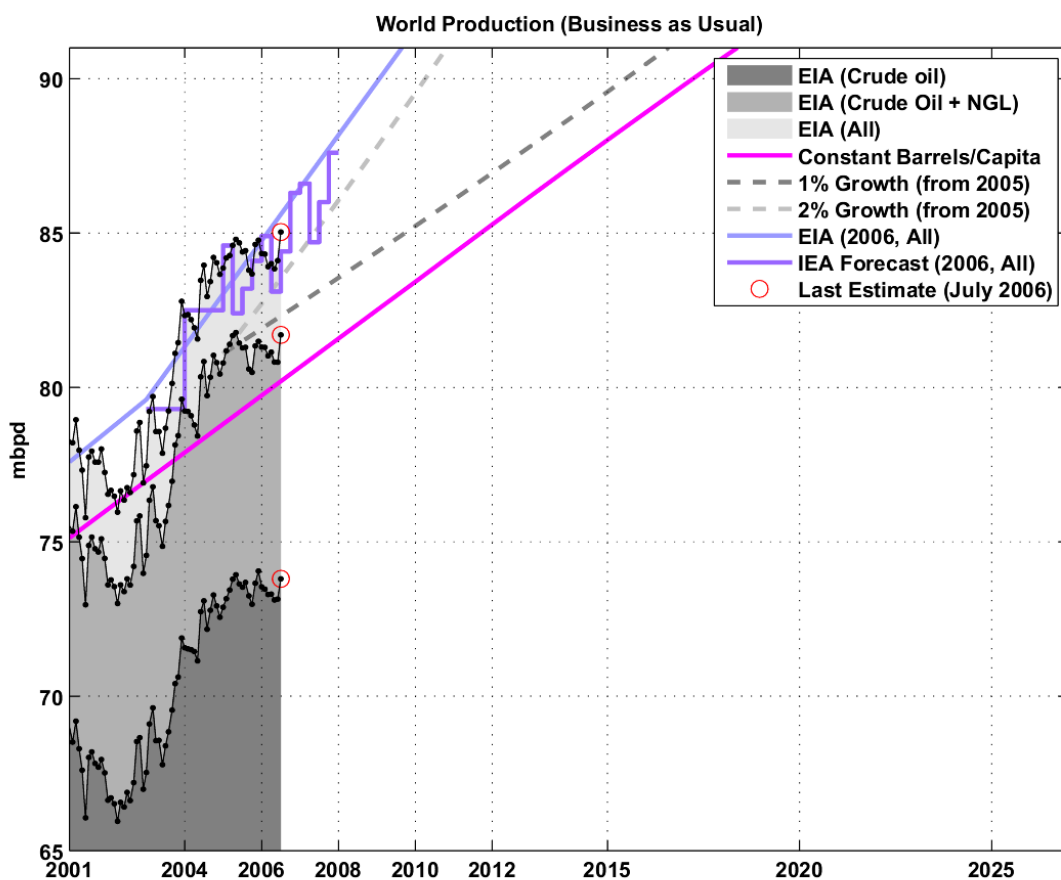


## Why confusion exists over when the oil peak will occur

Why do opinions still differ on the important issue of when the oil peak will occur, with estimates ranging from "anytime now" to "in about thirty years"? The oil industry banker Matthew Simmons has been saying for some time that the world will only know for sure when the peak has happened by looking "in the rear-view mirror" months after it has taken place. Commenting last October after the release of figures showing that the world supply of crude oil had declined to 83.98 million barrels per day in the second quarter of 2006 after hitting 84.35 million bpd in the fourth quarter of 2005. Simmons said: "If you basically have another six to ten months of that decline lasting, then I think for certain we would look back and say, 'Guess what? We actually reached a sustainable peak in crude oil production in December 2005.'"



*Illustration 1: World production of crude oil is represented by the darker grey area above. The lighter grey area is the contribution made to the global oil supply by natural gas liquids, the light oil produced as a bi-product of natural gas production. It will be seen that world oil production reached a peak sometime early in 2005 and has since been on a plateau despite the very high prices. Production is certainly not increasing at the rate required to keep up with the expansion of the world's population (the constant barrels per capita line) nor the forecasts made by the International Energy Agency and the US government's Energy Information Agency. Source: <http://www.theoil Drum.com/story/2006/10/3/104458/751>*

What is definite is that one peak has already occurred. This is the peak in the world production of light, sweet oil, the type found in the North Sea and elsewhere which is the best oil for petrol production. As its output is already in decline, the debate has now switched to when the peak in heavy sour oil might happen. Sour oil is the high sulphur type found in the Middle East which needs special refining capacity to get the sulphur out.

Illustration 1 shows how total world production of all types of oil has run recently. At present, sweet and sour oil make up the bulk of this production. The graph makes it clear that, while output is not yet falling, it is certainly not increasing. Could the resulting plateau be the peak itself and the prelude to an imminent decline? Only the rear-view mirror will enable us to tell. However, the graph does show that it will be very difficult for the oil industry to increase production enough for world oil consumption to expand at even 1% a year from its 2005 level, a rate indicated by the shallower hatched grey line. If oil consumption does not increase, world economic growth will be constrained.

The main reason for the wide range of estimates about when oil peak will happen is one of definition. Dr. Colin Campbell is careful to say that the peak he predicts is one for conventional oil which Dr. Roger Bentley, Senior Research Fellow at the University of Reading says is defined fairly generally as “oil produced by primary or secondary recovery methods (specifically: own pressure, physical lift, water flood, and water or natural gas pressure maintenance.) In other words, conventional oil can be extracted and brought to the refinery at a relatively low cost in terms of the energy required to do so. Bentley adds, however, that his definition is not universally accepted.

On Bentley and Campbell's definition, conventional oil currently accounts for about 95% of all current oil production, with some 1-2% coming from enhanced recovery, and a further 2-3% from heavy oils, and tar sands. There is broad agreement about how much conventional oil there is left in the world by this definition. The table below was published in November 2006 by Cambridge Energy Research Associates, a US consultancy. It shows the amount of oil that has been produced so far (“Cumulative Production”) and what it thinks remains to be produced. The sum of “OPEC Middle East” and “Other Conventional” gives the total amount of conventional oil which is thought to be available by Bentley's definition. At 1,066 billion barrels, it is very slightly less than the amount that has already been produced.

The columns on the right of the table, from “Deepwater” onwards, are all estimates for what would be non-conventional oils by Bentley's definition because they would require special, highly capital- and energy-intensive extraction techniques.

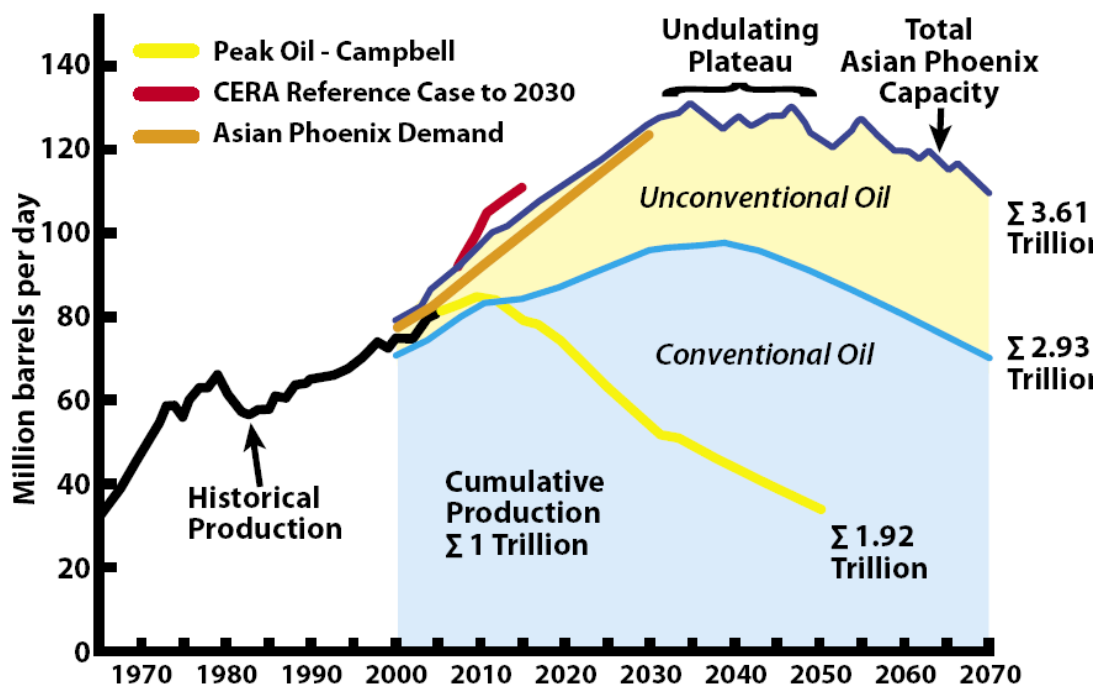
**Global Resources, Conventional and Unconventional, CERA Projection**

(billions of barrels)

	Cumulative Production	OPEC Middle East	Other Conventional	Deepwater	Arctic	Enhanced Oil Recovery	Extra Heavy	Oil Shale Extract	Exploration Potential	Totals
Rest of the World	813	662	378	50	110	510	277	200	660	3,660
United States	234	—	19	8	5	76	—	500	83	925
Canada	31	—	7	3	3	6	167	4	15	236
<b>Total</b>	<b>1,078</b>	<b>662</b>	<b>404</b>	<b>61</b>	<b>118</b>	<b>592</b>	<b>444</b>	<b>704</b>	<b>758</b>	<b>4,821</b>

Source: United States Geological Service, World Petroleum Assessment 2000, Cambridge Energy Research Associates, National Energy Board Canada.

CERA, however, has argued over the years that a peak in the production of conventional oil is not imminent. It has only been able to do so because it departs from the Bentley definition and regards deepwater, Arctic and oil which has still to be found ("Exploration Potential") as conventional oil. Illustration 2 is a CERA graph which shows that it expects the production of conventional oil by its definition to peak around 2035 and that it expects total production to amount to around 2,930 billion barrels by the time it stops. This figure compares with the 1,920 billion barrels expected by Campbell and the 2,066 billion barrels of conventional oil shown in the first three columns of the table. If CERA adopted the Bentley and Campbell definition, it would have to show a peak occurring at around the same time that Campbell does.



Source: Cambridge Energy Research Associates

*Illustration 2: The difference between the two extreme views about when conventional oil production will peak. The yellow line shows Irish-based expert Colin Campbell's projection that conventional oil production will peak about 2010 and then drop by 2050 to 30 million barrels a day, a figure which compares with production of about 84 million barrels daily at present. This contrasts with a peak at about 100 million barrels a day in 2035 forecast by Cambridge Energy Research Associates, a US consultancy. In short, one expert thinks that three times as much conventional oil will be produced in 2050 as the other because of differing definitions of what conventional oil is.. Source: CERA*

In the Press Release which accompanied Illustration 2, CERA justified its inclusion of oil which has still to be found under the conventional definition by saying “Those who believe a peak is imminent tend to consider only proven remaining reserves of conventional oil, which they currently estimate at about 1.2 trillion barrels. In the view of many petroleum geologists, this is a pessimistic estimate because it excludes the enormous contribution likely from probable and possible resources, those yet to be found.”

CERA summarises its position by saying that it “believes the global inventory is some 4.8 trillion barrels, of which about 1.08 trillion barrels have been produced, leaving 3.72 trillion conventional and unconventional barrels, an order of magnitude that will allow productive capacity to continue to expand well into this century.”

Chris Skrebowski, the editor of the *Petroleum Review*, a monthly magazine published by the Energy Institute in London, who originally opposed the peak oil theorists but then became convinced that they were correct, accepts CERA's estimates for conventional oil in columns 2 and 3 but describes the table as a whole as “a motley collection of the known, the unknown, the possible and the plain unlikely.”

“The right half [of the table], although technically possibly, is only of interest if [the oil] can be discovered, mobilised and marketed within a reasonable time period” he writes. “This, in essence, is the entire debate – can all the unfound and unproven resources be exploited quickly enough to more than offset the peaking and decline of the known and proven reserves? If not, they simply guarantee that some sort of oil industry will be around for a long time but one that will be unable to meet the requirements currently placed on it.”

Skrebowski and Matt Simmons both doubt whether the industry could keep pace with rising world demand even if the the CERA resource estimates are correct. They point out that the move from developing a few, large oil fields to having to exploit many more smaller ones requires more rigs and more workers and that both are scarce. Suitably skilled/qualified geologists and petroleum engineers are already in short supply and a report in an autumn 2006 issue of *Petroleum Review* stated that 50% of all workers in the global oil and gas industry are due to retire in the next 10 years.

These shortages have caused several large, new oil fields to miss their target start-up dates by several years. For example, the original target start up date for the Kashagan field (offshore Kazakhstan) was 2005. In 2003, the date was set back to 2007. Last year, 2006, it was set back to 2009 at the earliest. Most yet-to-be-discovered conventional oil is expected to come from those countries where delays are the worst, including Iraq, Russia and Iran, where the development of two of the largest oil fields has been delayed by many years. Moreover, Simmons has recently suggested that the leaking BP oil pipelines in Alaska are not atypical and that the world's oil and gas infrastructure is getting old. Refurbishment will take time and require the same human resources required to find and produce new oil.

In an open letter to CERA's Director of Oil Industry Activity, Peter M. Jackson, Skrebowski goes through the table item by item, looking at the time likely to be taken to bring the resource into use. On the exploration potential he says "You define an exploration potential of 758 billion barrels. It is a large number. According to IHS Energy [CERA's parent company], for the last ten years new field discovery has averaged a little over 11 billion barrels a year. At that rate your exploration potential will take over 66 years to materialise." He concludes his analysis by saying "Using all the latest data from MegaProjects [a survey Skrebowski carried out of all oil projects planned to produce more than 40,000 barrels of oil a day], I find that Peak Oil occurs in 2011 plus or minus one year".