

---

## On Oil Peak or Peaks?

*Robert Mabro*

The oil peak theory first advanced by Colin Campbell more than 25 years ago is influencing market expectations about the medium-term supply/demand balance in the world petroleum market. In the same vein, Matt Simmons has focused on the scarcity issue, arguing in his book – *Oil Twilight in the Desert* – that Saudi Arabia has much less oil than generally thought, and that its super-giant field, *Ghawar*, is seriously suffering from natural decline. These theories

and views provide additional ammunition to those who have been consistently arguing that this supply/demand balance will increasingly become tighter because of oil consumption growth in China, India and in oil-exporting countries, and the failure of OPEC member countries and the international oil companies to invest as much as may be required in the exploration, development and production of crude oil.

The peak oil theory has its promoters, some of whom seem

to be driven by missionary zeal, and detractors who usually fail to convince those who have espoused the theory, stock and barrel, on the ground that it is self evident.

The proposition taken as self-evident is that the *growth* in oil production cannot be sustained forever. A peak is bound to be reached for the simple reason that oil is an exhaustible resource. This is self evident.

One critical question is about dating the emergence of the peak. The promoters of the peak oil theory did not do much good to their cause by predicting early occurrences – in the 1980s, then 1990s, then in 2005 for example. All these dates are behind us and oil production is continuing to grow. Although a few still believe that the peak was attained in 2005 (really!), the most common view today is that we shall face it in 2020 or much more optimistically in 2030.

The question ‘When?’ is of fundamental importance. I referred once to the classic syllogism:

All men are mortals  
Socrates is a man  
*Ergo* Socrates is mortal.

This is not a prediction but a self-evident inference. And Socrates is not interested in being told that he is mortal; he knows that in any case. He may like to know however when he is going to die. Similarly, we know that we cannot enjoy forever growing production from an exhaustible resource. We need to know the date at which a peak will be attained.

The second important question relates to the nature of production peaks. It is useful to distinguish between an *absolute* peak and *temporary* peaks. An absolute peak is one that is irreversible. Once such a peak is attained oil production will never grow again.

The impression given by those who argue in favour of peak oil is that the one that will emerge pretty soon is an absolute peak, an irreversible state of affairs. Yet such an absolute peak can only occur when a number of the following drastic conditions are satisfied:

1. All existing oil resources in our globe have been discovered, developed, and produced with maximum efficiency.
2. The technologies that maximise the recovery rate are used in all those fields where the geology allows their application.
3. Technological progress in exploration, development, production and recovery enhancement has reached an absolute constraint and cannot therefore proceed any further.

Those who predicted an emergence of the production peak at a date that is behind us seem to have ignored, among many things, the existence of vast discovered reserves in Iraq that were not developed at the time of their prediction. How can we then reconcile the presumed early emergence of a peak with a later entry of the vast Iraqi oil potential in the supply equation?

Some authors also seem to have ignored, or played down, the phenomenon of future reserve growth. Our knowledge of existing reserves in a field increases as production proceeds.

The extraction of oil from a field generates new data about its boundaries and size, and other critical variables relevant to the estimation of its reserves. Thomas S. Ahlbrandt of the US Geological Survey stated that there is ‘a multiplier of the original reserve estimate (of a field) and it is generally in the 4 to 9 times range’. True, most reserve growth occurs in the earlier years of a field production. But there are recent fields where the reserve growth potential is yet to be realised.

Furthermore, the estimates of global oil reserves fall within a very wide bracket. Low estimates put the ultimate recoverable endowment of a petroleum commodity (oil or gas) at less than or equal to 2 trillion barrels of oil equivalent (tboe); moderate estimates are those between 2 and 4 tboe; and high estimates are those greater than 4 tboe. The high estimates are wildly optimistic and should be discarded. Still the 2–4 tboe range that may be retained is extremely wide. Clearly, the view taken about the likely date at which a peak would emerge crucially depends on the choice of a particular estimate within this wide range. The point is that uncertainties are at the heart of the matter and they are too significant to be ignored in the interpretation of the results.

Let us now assume that a production peak occurs at a time when one or several of the conditions listed above to identify it as irreversible are not satisfied. In this case, production growth would be able to resume when new fields are discovered and developed and/or technology takes a leap ahead.

I believe therefore that the likely scenario is one in which we may face in the years to come more than one oil production peak that will prove to be temporary in nature and will be reversed. Of course, oil prices will rise, perhaps significantly, if such a production peak occurs when *ex ante* demand then exceeds available production. At this point the issue of adjustments arises. These are neither immediate (there are always response lags, some of which can be long). Adjustments can be imperfect. They rarely bring the situation affected by the price shock to its previous state. Still, adjustments do obtain.

Higher oil prices will reduce demand. They are likely to induce greater investments in the oil upstream sector and in technological R&D. Policies may be introduced to curb demand, provide subsidies for relevant investments, to accelerate the search for liquid fuel substitutes for oil. In any case one may recall that necessity is the mother of invention.

The economists err in their belief that adjustments fix problems. The promoters of peak oil err in the opposite direction by attributing little importance to the possibility of adjustments taking place. Furthermore, they seem to have little faith in technical progress. Yet the history of the modern world is one in which life has been transformed in many ways and in many fields by remarkable inventions and technical changes. Why then profess a total pessimism in the possibility of progress in the energy field?

All this does not mean that temporary peaks will not cause economic difficulties. They will surely cause them over an initial period of time. If the peak attained is followed by negative production growth at a time when *ex ante* demand is exceeding the achievable production level the world will inevitably face an oil price shock. The larger is the production deficit relative to *ex ante* demand, the greater will be the

initial oil price increase. A significant price shock will affect seriously the state of the world economy, and in extreme cases will cause social tensions and conflicts. Yet a price shock does not endure forever. The economic situation after a time lag will begin to improve.

We also should recall that the transport sector even in the absence of a revolution in the design of vehicles' engines does not need conventional oil but liquid fuels. A fall in conventional oil supplies can be compensated for by an increase in the output of unconventional oil from Venezuela, Canada and other places. It can be compensated for by a number of other substitutes such as ethanol, GTLs (gas to liquids) or CTL (coal to liquids), CNG (compressed natural gas) and so on. In all these cases, there are production difficulties yet real opportunities. It is legitimate to worry about the problems that would arise after the emergence of a temporary peak in conventional oil production. It is wrong to believe that such a peak would cause a final eschatological catastrophe.

A message of the peak oil theory is that the era of cheap oil is ending. Both supply costs and prices are bound to rise for a while. This is more than plausible. We would then need to ask about the implications of such a development. To say

that temporary peaks are not without negative impacts is certainly correct. And my preferred scenario is one in which a temporary peak is likely to emerge again and again in some sequence in which the heights of the successive peaks tend to become lower and lower.

Given that the adjustment lags tend to be long the wise policy recommendation is to keep a watch on the development of oil production and on the progress being achieved in relevant R&D, upstream investments, technological changes in motorised vehicles, supplies of alternative liquid fuels. The questions to ask then are: first, about the forthcoming (realistic) date of a temporary production peak, and secondly, whether the time is approaching when precautionary measures need to be taken.

Media hysteria is of no use on this issue. The peak oil theorists are distracting attention from what needs to be done at an appropriate time to solve a problem should it arise. Hype is not the friend of wise counsel. Unfortunately hype is not a stranger in the current oil discourse. It only serves particular vested interests rather than helping the solution of real problems.