

The price of oil has been swinging for a number of years. Alarmist talk about resource depletion and overpopulation is coming back into fashion after an earlier peak in the 1970s. However, the Earth contains all the resources required to produce oil (synthetic oil, if need be) in any quantity demanded. Economic logic indicates that lack of demand, rather than of supply, will cause oil production to decline, with no particularly harmful impact on our standard of living. Let's take a look at what could well be the non-event of the century.

According to peak oil theory, the volume of oil production is already in decline or will be soon, and this could result in serious economic consequences, up to and including famine. Two ideological camps stand opposed: on one side are the pessimists encompassing certain "experts"¹ and their many disciples. On the other side are the optimists who favour laissez-faire; many are economists who may know little about geology, which tends to

discredit them, but wrongly so since scarcity is above all an economic rather than a geological problem.

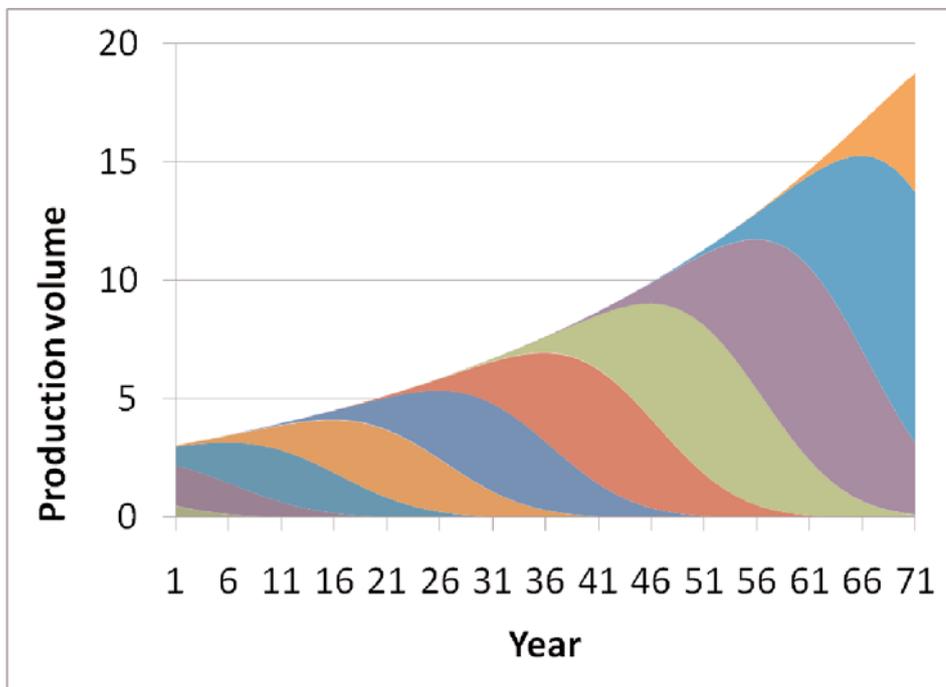
The operation of a free market in natural resources

At the heart of the debate is an issue common to many minerals: will a free market in non-renewable resources leave enough for future generations? The answer is yes, as long as private players are allowed to

discover, develop and exchange deposits freely, without threat of confiscation and with no obligation to exploit them hastily.

Some of the pessimists are wrong in stating that geological reality is not manageable by the private sector or that it creates market failure. Geology cannot "trump" the market because investors have access to all available geological information and because the free play of speculation provides incentives to conserve resources. Even in the unusual case of a mineralogical barrier (when there is a need to go from extracting very rich deposits to very poor ones, with nothing in between), pricing takes this into account well ahead of time, encouraging the efficient use and recycling of a resource and attracting capital and labour. When a barrel of oil sells for up to \$150, even though it may cost perhaps only \$5 to produce, this actually shows that the market understands its high replacement cost, a good reason to be optimistic in the long term.

Effect of continuous reinvestment in a non-renewable resource



The depletion of each "frontier" creates a peak that is steeper than the one before. However, the volume is mathematically required to grow indefinitely as long as there remains at least one frontier and reinvestment is sustained.

Economic growth and physical limits

If stated oil reserves typically remain at around 40 years, this

1. We have in mind here certain geologists (for example, Kenneth Deffeyes, *Hubbert's Peak: The Impending World Oil Shortage*, Princeton University Press, 2001); but also some financiers (for example, Matt Simmons, *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*, Wiley, 2005).

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does not point to a physical limit. It simply indicates that oil production is planned over a 40-year period. In fact, reserves are not finite but grow through exploration of new frontiers to include deposits that are smaller, more remote, deeper, more viscous and sour, etc. As each frontier is opened, we see a peak in previously conventional production, and non-conventional sources that have become conventional are relabelled. Then the cycle starts over. What was regarded as oil in 1930 may have peaked in 1970. What was regarded as oil in 1970 may peak in 2010. But new forms of oil may not peak until 2050. Thus, the oil peak is actually a recurring phenomenon that we have already got used to.

The ultimate frontier is that of synthetic petroleum, which can

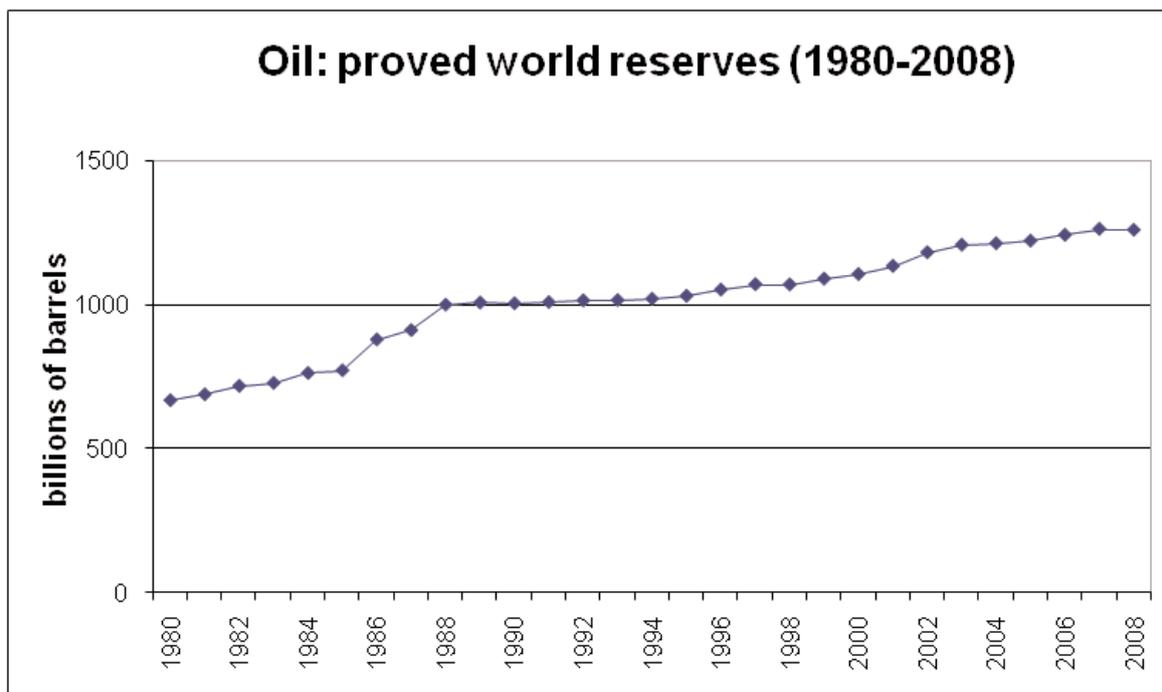
be produced with any source of carbon and any source of heat. It is impossible to run out of carbon because it is a basic component of limestone. When oil is burned, this is carbon that can be taken back out of the atmosphere. With heat from nuclear fission, oil production can increase a hundredfold and be maintained for thousands of years by fast-breeding seawater uranium, and then moving on for a few million years using deep geothermal energy, and after that for billions of years using solar energy or nuclear fusion. The growing exploitation of tar sands indicates that we are already headed toward increasingly synthetic oil, with the next step being the GTL (gas-to-liquids) and CTL (coal-to-liquids) processes. To produce as much non-polluting synthetic oil as we want, all that is needed is to put in the required

investment and effort.

Oil from depleted frontiers may look "easy" today, but it was not "easy" at the time it was developed. On the contrary, to characterize future oil as "difficult," as the pessimists do, it has to be shown that this would require a high proportion of total labour, which is not at all the case. In this sense, a long-term oil shortage is thus impossible.

A supply peak or a demand peak?

According to our analysis of supply, it will always be technically possible to produce oil as long as it is in demand. It is possible, though, that supply could drop simply by following the spontaneous evolution of demand, with or without any sharp price rise. A number of phenomena could explain



Reserves grow as long as there is demand. They are taken from a practically unlimited resource, as soon as justified by the anticipated price.

Source : British Petroleum, *Statistical Review of World Energy*, 2009.

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this sort of peak:

- Technological change could make other energy sources preferable in transportation. For example, compressed natural gas could soon carve out a chunk of the automotive sector fuel demand. The invention of a new battery could facilitate electric-powered transport.
- Changes in consumption habits could result in people preferring to alter their behaviour rather than pay the price of oil. For example, telecommuting could grow in popularity. People could choose cars with smaller engines, giving them the means to go to the movies more often or to repay their debts.

- Demographic change also has a direct influence on long-term demand for resources such as oil, while the price of oil may in turn affect demography by altering individual choices such as the number of children per family.

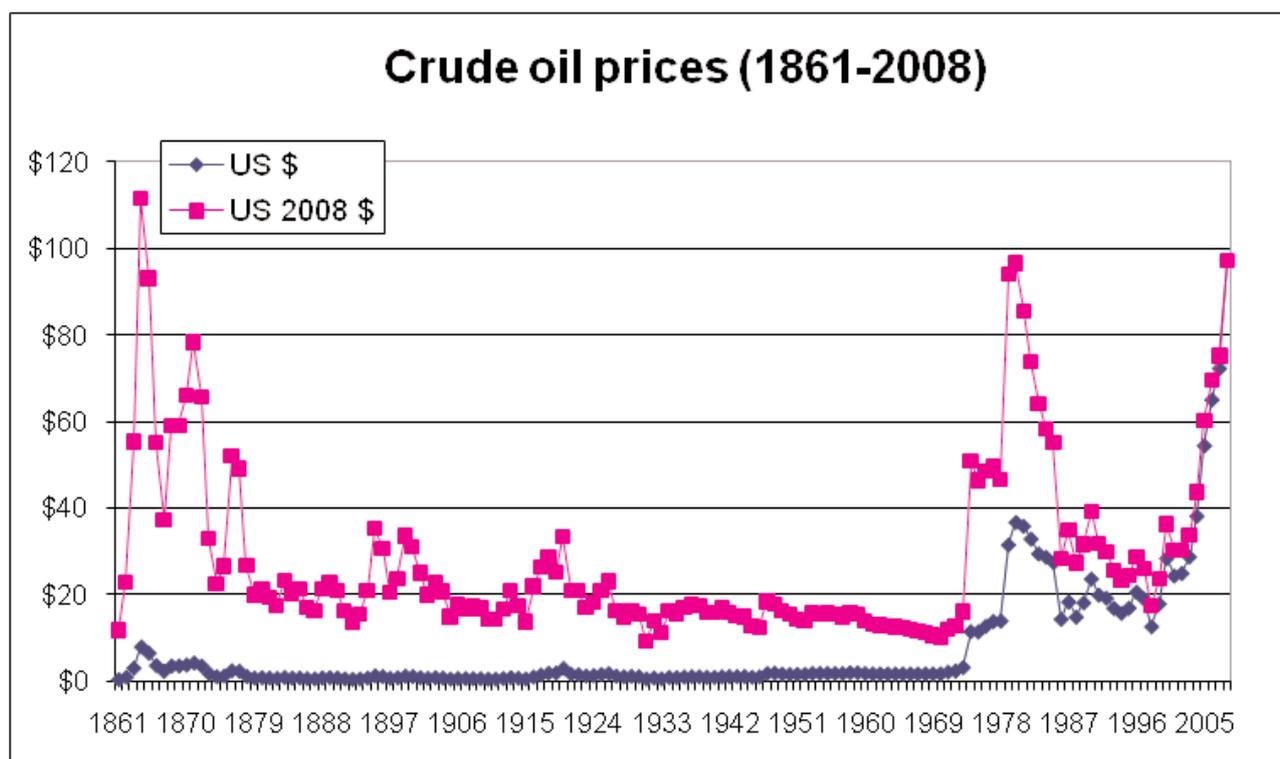
- Government incentives may deter the use of oil products and encourage the use of alternatives.

Thus, a peak in oil supply could be just a reflection of lower demand, just as the peak in the supply of horses followed a decline in demand as cars quickly led to greater mobility and thus to higher standards of living. Moreover, quality of life does not depend on the quantity of accessible energy but rather

on satisfying individual needs, which may adapt to the available resources. We could be optimistic even if energy growth were physically impossible in the long term, which is not at all the case.

The role of governments

What is more to be feared in the medium term is misguided government intervention. A country can always block private investment by taxing extractive industries at prohibitive rates, stirring doubts about the confiscation of equipment or even using the pretext of creating wildlife preserves. Too often, a country's oil is monopolized by a technologically backward state corporation that is obliged to finance social programs with income that should be



For the last 35 years, oil prices have been as often above \$45/barrel as below. The long term tendency is for oil prices to rise more slowly than wages, indicating a growing affordability.

Source : British Petroleum, *Statistical Review of World Energy*, 2009.

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reinvested internally. These actions make oil more expensive than it would otherwise be, another reason for being optimistic about the real long-term availability of the resource.

In contrast, some countries may be inflating their official oil reserves, motivated by the OPEC mechanism for quota allocation. But to make this pessimistic argument valid, investors would all still have to be naïve with respect to these figures.

There is also reason to fear the cycle of oil crises caused by governments, with the 1970s providing the most eloquent example of this. Its stages are well known:² 1) excessive growth in the money supply; 2) higher market prices; 3) media agitation against producers; 4) establishment of price ceilings; 5) shortages caused by price ceilings; 6) rationing. As with all

goods and services, it is important not to create artificial prices distortions because they send producers a signal on the real value of a resource, which in turn serves to justify investment in this industry.

What is to be done?

With all this uncertainty, further price fluctuations can be expected. In a market economy, price fluctuations are a natural phenomenon that is part of the process of adapting to the growing scarcity of resources. This occurs naturally and automatically, with no need for constant government intervention in the form of awareness campaigns, much less in price controls. People do not need to be persuaded to change their behaviour because common sense will make them adjust intelligently — through carpooling, telecommuting and teleconferencing, or by

combining airplane trips, shipping certain goods by train rather than by truck, slowing ships by a few knots, and so on. The best ideas are imitated, and changes emerge spontaneously among millions of possibilities, without centralized planning. By taking part in this process, each individual makes a contribution without even realizing it.

In contrast, a government torn between various pressure groups, even with the best of intentions, could never achieve as much. By imposing arbitrary restrictions, it would risk creating a self-sustaining energy famine. When bread prices rise, there remains a popular reflex to set bakeries ablaze. In a democracy, it is always tempting to use government force to institutionalize this type of counter-productive reflex. This is what must be avoided at all costs.

2. See Chapter 4 of the excellent *Energy: The Master Resource* by Robert Bradley and Richard Fulmer (Kendall/Hunt Publishing, 2004), http://www.instituteforenergyresearch.org/pdf/bradley/Bradley_ch_4.pdf.

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