Forecasts for Future Oil Supplies Are Unrealistic

Contributed by Charles Cresson Wood
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Editor's note: the author published a version of this article elsewhere online, but revised it for Culture Change. It was originally titled "The Peak Oil Downside Will Be Steeper Than The Upside." - Jan Lundberg

From many credible and highly placed sources we are today hearing about the dire energy situation that industrialized civilization faces. Industrialized countries have remained dependent on petroleum, and the destructive industrial practices that it fuels, for way too long.
As evidence of this consider that fully 50% of the energy consumed in the United States still comes from petroleum. Petroleum is the dominant fuel in the United States, and it was the same story in 1950. The US imports more than 60% of this oil, and between 50% and 60% of that imported oil comes from OPEC countries.

Even though the notion of peak oil is now frequently discussed in newspapers, magazines, TV shows, we the industrialized nations are not moving to new sources of energy, and new simplified low energy lifestyles, fast enough to avoid serious and painful adjustment problems. Dr. Fatih Birol, chief economist with the International Energy Administration, accurately summed it up when he recently said: "We must leave oil before it leaves us." Leaving oil will not only involve adopting alternatives such as wind and solar, it will involve dramatically changing our way of life so that we consume considerably less energy. The lifestyle changes that we must go through are dictated because there is no good substitute for petroleum, and because we just don't have the time to alter the petroleum-based energy infrastructure that has been built over the last 150 years.

According to statistics from the United States Energy Information Administration, the worldwide production of conventional oil has been on a plateau for the last several years (about 73 million barrels per day). In spite of a dramatic run up in prices culminating with the price of $147 per barrel in July 2008, producers were unable to bring more oil to market. This fact defies a widely-held but erroneous belief advanced by traditional economists, that producers will bring more oil to market as the price goes up. That of course makes sense if there is an unlimited supply of oil, but as the worldwide production statistics indicate, we seem to have reached peak worldwide production, and it is only down from this point forward. It's time that the economists started adjusting their theories to incorporate the real world of resource constraints.

Those readers who have some passing familiarity with the concept of peak oil have no doubt seen a picture of the traditional statistical distribution known as a "bell shaped curve." These bell shaped curves make sense to people, because in a world with finite resources, what goes up, must come down. These symmetrical bell shaped curves are however lulling us into an attitude of complacency, leading us to believe that we have decades to move off of oil. This is just not so, and this article discusses five serious reasons why this erroneous perception needs to promptly be abandoned.

The bell shaped curve customarily applied to peak oil was popularized by the late geophysicist Dr. M. King Hubbert. He predicted the total United States production of oil would peak on or about 1970. His prediction was accurate, and this type of curve did relatively well when it came to describing the total production of oil in the United States. But total world production of oil does not have another source that it can draw upon when worldwide supplies dwindle, as the United States did back in 1970. Social and economic panic and upheaval were avoided when the United States hit its internal peak oil because it could easily purchase additional supplies from the world marketplace. The social and economic upheaval that worldwide peak oil will bring about will be marked by hoarding, stockpiling, speculators cornering the market, long-term contracts pushing spot market buyers out of the market, government corruption, widespread rationing, and a host of other problems. These maneuvers will rapidly remove oil from the marketplace, and the intensifying

competition for the remaining supplies will cause the price to rapidly go up.

The second reason why the drop off in world oil supplies will be steeper that the increase was involves exports. A very large percentage of the remaining oil supplies, perhaps half, is controlled by countries in the Persian Gulf (Iran, Iraq, Kuwait, Saudi Arabia, and United Arab Emirates). These countries are rapidly industrializing and in the process, as you might expect, their consumption of oil is rapidly increasing. As their production is declining in the years ahead, an increasing proportion of their production will go to meet domestic needs. This means that a decreasing proportion of their already declining production will be offered for export. At some point, there will be no more exports, as these countries will use all available supplies for internal consumption purposes. Countries such as the United States, that are big importers of oil, stand to be quickly cut off from their oil supplies. Thus the available exports of oil will come to a much more rapid end than total world production of oil, which in turn will be much more rapidly decreasing than the symmetrical bell shaped curve would lead us to believe.

The third reason why world supplies of oil will drop off more rapidly than anticipated involves rapidly developing countries, most notably although certainly not limited to India and China. These countries are working hard to be able to support something like an American lifestyle, including high levels of energy consumption. World oil demand has recently been increasing at about 2% per year, but to fuel the recent economic development of these countries, there will be a markedly increasing worldwide demand for oil. For example, Time magazine reports that China's oil imports have doubled over the last five years (about 12% compounded each year). Thus the world will soon be drawing down remaining oil supplies at a faster rate than we were drawing down supplies in the recent past. This accelerated demand for, and the accelerated consumption of oil means that the downside slope of the peak oil curve is going to be much steeper than we currently anticipate.

The forth reason why world supplies of oil will decline far more rapidly than we anticipate involves modern technology. We are now able to drill for oil in the Artic, more than 10,000 feet below the sea, and in other inhospitable places that we could not economically drill in some fifty years ago. This fact reflects advancements in modern technology, such as computers to model geological deposits of oil. The fact that we have to go to these inhospitable places to get more oil is another indicator that we're running out of it. But this impressive new technology allows us to accelerate our extraction of oil, in an effort to meet the accelerating demand mentioned in the last paragraph. Imagine the bell shaped curve except it is going to be pushed out on the upper right side. In other words, we will be producing slightly below peak levels for a brief while, on a plateau of sorts, and this will be a plateau created by this modern technology. Using elementary calculus, which assumes that the area under the curve remains the same, in other words assuming we have only so much oil available in the world, we can readily determine that when this area is pushed out, another area must be pushed in to compensate. Since everything to the left of this current peak moment is history, and therefore cannot be changed, the only thing that can be changed is the height of the curve (production) in the future. Said a different way, by sustaining our high-energy consumption lifestyle, we are prematurely consuming the oil that would otherwise be left for future generations. In other words, the bell shaped curve will in reality look more like a wave moving to the right (through time), and the wave is just about to come crashing down.

The fifth reason why world oil supplies will decline considerably faster than we now generally believe involves the fact that we produced the least expensive oil first. It is simply common sense, that oil producers would initially focus on the removal from the ground of the oil that was easiest to get to, that was the least expensive to refine, that was the easiest to handle, and that was the least expensive to pump. Reflecting this reality, we now see producers mining the "tar sands" of Canada in an effort to cook the oil out of these sands. Not only is this effort tremendously environmentally destructive, but it consumes a great deal of energy in order to produce oil. Thus the cost of producing each barrel of oil is going up. At the same time, the quality of each barrel thereby produced continues to go down. Combining these two trends, we see that the world will reach a point where it is no longer economical to produce any oil. Mind you, this occurs considerably before the point where the world runs out of oil, and so the curve of world oil production does NOT reflect the relationship that individuals have with the gas tank in their cars. We can't just keep going until we run out. A lot of oil will be left in the ground because it simply won't make sense to produce it. Certain locations will meet this point sooner than others, but as more and more locations do reach this point, they will remove themselves from the roster of the remaining oil producers. This in turn will hasten the descent of available oil supplies.

As these five points argue, the day of reckoning is a lot sooner than many of us would like it to be. We do not have decades to transition to alternative energy. It appears as though we have only a few years. We need to get underway

with very serious efforts to transition away from petroleum immediately. Government agencies, businesses, non-profit organizations, families, and individuals should all be thinking hard about what their transition to a post-petroleum world looks like, and then promptly get into action with this transition.

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Additional pressures on, or hindrances of, future oil supplies, in Comments:

Editor's comment: Another reason post-peak supplies will not be conforming to a mirror-image of the ascent of oil extraction and consumption is that when supply constraints hit the wall, from both depletion and market disruption due to supply crisis, the damage to the consumer economy will be massive. After that it will be very hard for oil industry activity to persist as before. The oil industry is not set up for contraction and minimizing itself, even in an orderly fashion assuming society planned an evergy descent. More on this is in my coming book Petrocollapse: the Basis of Crash and Culture Change. - Jan Lundberg, former oil-industry analyst.

David Shipway in British Columbia added this perspective:

I think the author has forgotten one more very important factor that will steepen the downside: the enormous amount of fossil energy it will actually take "to leave oil before it leaves us", to make any realistic conversion to non-fossil-fueled sources of energy. In other words, the massive construction efforts now getting underway to build "green energy infrastructure".

A case in point in my neck of the woods in British Columbia is Plutonic Power-General Electric, now building a series of large scale "run-of-river" hydro projects in remote inlets of the BC coast. This "clean and green" construction is all conventional, requiring frequent massive barge loads of fossil fuel to feed heavy earth-moving equipment, lots of floatplane and helicopter traffic for corporate bosses, work crews government inspectors and media, transnational shipments of heavy penstock, generator and turbine equipment from the US, China and Austria, the dynamiting of hillsides to make penstock routes and also to make gravel for concrete (faraway oil-fired kilns make the portland cement and steel rebar) and all the logging to permanently clear hundreds of miles of new transmission line corridors to deliver this new "green" electricity to customers as far away as California.

In many ways this is like building a nuclear reactor in a remote location without the risks associated with uranium. All we need is falling water, in this case fed by melting glaciers. And we know why those glaciers are melting, don't we?

As to the net-energy cost of creating alternative energy, the book Beyond Oil: the Threat to Food and Fuel in the Coming Decades (Gever, et al) had this graph:

Nate Hagens of TheOilDrum explained it to Culture Change:

The chart shows that if we make full scale change to renewables, that MORE energy will be needed in interrim (like your friend suggested) leaving less (much less) for non-energy sectors of society. We currently need most of the oil flows just for business as usual - we can't have business as usual AND scale renewables to necessary levels at same time.

Not to mention that many of these projects have very low energy returns, especially when one uses wider boundaries.

Holy cow.

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