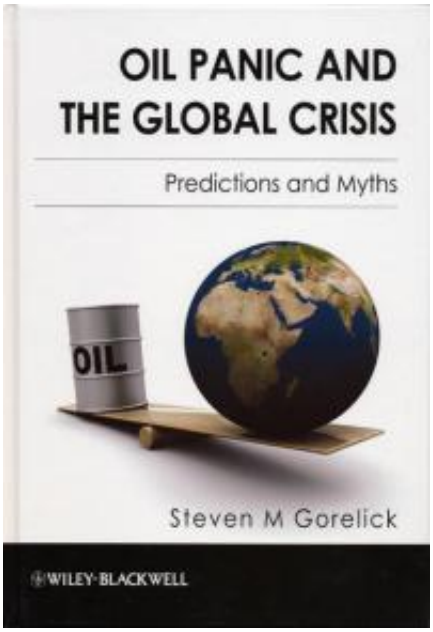
How much oil is there, how much more will we use and at what price?

November 2 2010, By Lois Bergeron



One reviewer wrote about the book: 'Gorelick weaves an intriguing story from what might have been a dreadfully boring, yet impressive collection of data and observations.'

Too often the debate over the world's use of oil has been marred by skewed information. In his recently published book, 'Oil Panic and the Global Crisis,' Stanford Professor Steven Gorelick lays out the facts about oil – its production and prospects – along with the consequences of both continued use and a shift to other energy.

Passions run high where oil is concerned. Witness the tumult over the BP drilling disaster in the Gulf of Mexico. But much of the public discussion about oil has been long on emotion and opinion while short on scientific fact, a state of affairs that Steven Gorelick, a professor of environmental Earth system science at Stanford, takes steps to rectify in his book, Oil Panic and the Global Crisis – Predictions and Myths, published earlier this year.

In Geofluids, a reviewer wrote, "Gorelick weaves an intriguing story from what might have been a dreadfully boring, yet impressive collection of data and observations."

For close to a century, there have been predictions that it is only a matter of time – perhaps just a few decades – before world oil reserves begin to run dry. The prospect seems worrisome, but with continuing advances in renewable energy, does it really matter? Stanford Report talked with Gorelick, a senior fellow at Stanford's Woods Institute for the Environment, to get answers to that and other questions.

With all the advances in renewable energy, why should we even care if the planet is about to run out of oil? It seems like we would be better off without it.

In my view, like it or not, we will be using oil for a long time. Oil makes possible the transportation of people and products. Currently, most vehicles run on liquid fuel derived from oil and cannot take advantage of energy alternatives, although this is changing. In the meantime, there is no doubt that oil presents challenges related to our environment, economy and security.

Regarding whether or not we are running out of oil, estimates of the world's oil reserves have continually increased over the past 50 years,

and global reserves are at an all-time high. From that perspective alone, the world is not running out of oil. Therefore, I don't believe it makes sense to assume that running out of oil will somehow solve the environmental problems associated with oil use.

Should government policies spur a shift away from oil?

Yes. For one, we need much stronger fuel economy standards.

I think we can do better than the newly adopted Corporate Average Fuel Economy (CAFE) standards, which will raise mandatory fuel economy rates from the current 27 to 35 miles per gallon, an increase of only 8 miles per gallon. With the original CAFE standards that went into effect in the 1980s, there was a 13 mpg increase in just four or five years. The standards should be in the 40 to 50 mpg range if we really want to make a significant dent in fuel consumption.

What about the impact of emerging economies? Even if we improve our standards, won't their increasing use of oil offset any reductions we achieve?

The emerging economies are certainly consuming their share of oil, as I detail in the book, and that share is growing. The good thing is that countries such as China are using oil more effectively and efficiently. Compared to the 1980s, China today uses about one-third the amount of oil to generate one unit of gross domestic product. So their efficiency has gone up.

Actually, it is a bit of a race between economic growth in these industrializing countries and how much more efficiently the entire world can use oil. If we ultimately have vehicles that can get 50 to 100 miles

per gallon, that would offset a lot of the increasing use in the developing world.

Would you elaborate a little about the true cost of oil use?

First, the recent BP disaster was a wake-up call. There are obvious environmental costs associated with extracting and burning oil. Beyond those, the major cost is insuring the global provision of oil, given that most reserves are in politically unstable, or potentially unstable, regions. The U.S. alone spends about $50 billion per year for a military force able to defend the Middle East. This amounts to a hidden cost that is the equivalent of approximately $65 per barrel of oil used in the U.S. For reference, the current market price of oil is just over $80 per barrel.

Second, we will be forced to tap oil wherever it occurs, and that happens to be in more and more challenging and environmentally sensitive regions. Harsh, remote environments, such as offshore regions and the Arctic, are difficult and expensive to work in, yet vulnerable to ecological disturbances.

Third, we pay a huge cost for remaining under the strong influence of the Organization of the Petroleum Exporting Countries' production-based price controls. These controls have driven up the price of oil, and our dependence on OPEC oil is a continuing threat to our national security.

What can we do to limit OPEC's influence on our oil supply and mitigate the effects of sustained supply disruptions?

One way to combat a cartel is to become one. The United States should

build stockpiles of oil when oil is cheap. But we need something much greater than the existing Strategic Petroleum Reserve, or SPR, which is just for temporary emergencies. We should have a stockpile that serves as an economic petroleum reserve, where we store something like five and a half times the volume of oil in the SPR. Other nations should be encouraged to build up similar stockpiles. Collectively, we could use our stockpiles to combat fuel price increases due to untimely OPEC production-based price controls.

Are there new technologies that will contribute significantly to solving our oil problems? When?

Yes, there are renewable and nonrenewable sources of energy that can substitute for the transportation role served by oil in the long run, and I think the ultimate substitute will be electricity. We can generate that electricity from a variety of sources, such as wind, solar and nuclear energy. We can use abundant natural gas and coal resources, although their use has its own environmental problems.

As far as the timing goes, transitions in technology happen relatively quickly. At the turn of the last century, every major city in the U.S. depended tremendously on horses for transportation. The automobile rapidly replaced them in a matter of about two decades. So when a physical or technological substitute is found, it will rapidly take over. One rarely goes back to an older, less efficient product or technology.

My sense is that we will move toward more efficient vehicles. The efficiency of electric vehicles is so much greater than gasoline-combusting vehicles that a transition to electric vehicles will greatly reduce our dependence on oil, even as oil continues to be used into the future to a much lesser degree.

Even if we won't run out of oil, isn't it possible that production will peak at some point and then drop off as oil becomes more difficult to extract?

The world may very well go through a peak in oil use, but a peak and decline is far more likely to reflect a decrease in oil demand rather than production choked by perilously low global availability of oil. The line between conventional liquid oil and unconventional oil, such as that derived from Canadian oil sands, will blur. Beyond that, major consuming nations will likely shift away from using conventional oil for transportation as concerns grow over security, stability and the environment. Based on the history of other nonrenewable Earth resources, it is likely that the world will move away from oil long before our global oil resources are exhausted.

Provided by Stanford University