Is There An Energy Crisis?

LYN DEBEVOISE

REVIEW OF PETER HUBER AND MARK MILLS

The Bottomless Well: The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy

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The fear that the world is running out of oil is not new. In 1882, believing that American oil production would soon decline precipitously, an executive at Standard Oil named John Archbold started selling his shares of the trust. His concerns proved unfounded: over the next few decades, oil production in the United States and elsewhere exploded. But shortly after the end of World War I, fears of a shortage returned; the U.S. Bureau of Mines projected that peak production would be reached in the early 1920s, and the director of the U.S. Geological Survey warned of an impending "gasoline famine."

The periodic alarms of coming oil shortages over the last century and a half have been consistently been followed by greatly expanded production and a resulting glut of oil. It is no wonder, then, that many today scoff at the idea that oil will soon be scarce, viewing those voicing concern as latter-day Chicken Littles.

THE END OF OIL?

In recent years, buoyed by rising oil prices, fears of an oil shortage have reached heights unseen since the shocks of the 1970s. A wave of books has been published, including *The End of Oil, The Coming Saudi Oil Shock,* and *The Impending World Oil Shortage.* The new media have recently piled on, and there are now a dozen or more blogs devoted specifically to the issue of peak oil, the theory that world oil production is about to peak and then decline over many years.

Peak oil is largely based on the work of an oil industry geophysicist named M. King Hubbert, who accurately predicted in 1956 that U.S. oil production would peak in about 1970. Using Hubbert's methodology, a number of people believe that worldwide oil production will peak within the next five years, although others predict that it will continue rising for several more decades. Either

way, there is ample evidence that worldwide demand for oil will soon surpass supply capacity. Since oil has low price elasticity, meaning that consumers are slow to reduce use in the face of rising prices, a situation where demand outstrips supply even by a small amount will typically lead to significant and rapid price increases.

To combat these dire warnings—and the sometimes draconian policy measures they recommend—Peter Huber and Mark Mills have responded with a new book: *The Bottomless Well: The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy*. Both authors have impressive scientific backgrounds: Huber has a Ph.D. in Mechanical Engineering from M.I.T., and Mills worked for many years as an engineer for the U.S. Department of Energy. Their writing benefits from a thorough understanding of the technological issues surrounding energy policy—sadly, something that cannot be said about most books on the subject—but often their assertions are too clever by half.

Huber and Mills argue that an oil shortage is unlikely in the near future, since technological advances will continue to increase the amount of oil that can be identified and recovered. But they see this as largely beside the point. They note that energy is actually quite plentiful on Earth, and that there are many alternative fuels and technologies to other than oil and the internal combustion engine. Since even the most pessimistic forecasts don't predict dramatically lower oil production in the short term, Huber and Mills believe that there will be plenty of time to adjust the world economy to run on other fuels. They argue, for example, that as hybrid vehicles take over the U.S. auto market, drivers will be able to use grid electricity—produced by coal, uranium, or hydropower—to fuel their short trips around town.

To this point, Huber and Mills present a fairly strong argument. Peak oil won't send the world economy hurtling off a cliff—the flip side of small increases in demand for oil causing large price increases is that small decreases in demand will cause large price reductions. While oil prices may never again be as low as they were five years ago, there is little doubt that in the medium term, the world economy can adapt to rising prices and move toward using other sources of energy sources.

Unfortunately, this is one of the few things Huber and Mills get right. Filled with specious arguments and breathless odes to technology that read as if they were printed verbatim from *Wired Magazine* during the dotcom bubble, the book soars into a libertarian fantasy world, unencumbered by economic or political theory. This land of highly precise lasers and space-age plastics, lacking any externalities that might constrain individual behavior, unfortunately bears little resemblance to the world we live in. Although they correctly point out the way in which the dangers of peak oil are being exaggerated, Huber and Mills neglect its real threat: that international actors will be able to deal crippling blows to the world economy by causing a supply shock. While the world can easily handle a

gradual decline in oil production, the lack of an unused reserve of supply capacity means that producers no longer have the ability to deal gracefully with a sudden supply disruption.

THE VIRTUE OF WASTE

Perhaps the most telling argument made by Huber and Mills concerns wasted energy. They point out—quite accurately—that, due to the second law of thermodynamics, any use of energy requires that some amount of it be wasted. If we eliminate wasted energy, they argue, there is no useful energy either, and the human race is stuck in unlit caves. Having transformed the waste of energy into a virtuous and heroic effort, the authors then set their sights on the concept of energy efficiency. Pointing to how a number of successful efficiency campaigns in the United States have done little to reduce overall energy consumption, they conclude that efficiency by its nature results in increased consumption. They argue, "To curb energy consumption, you have to lower efficiency, not raise it."[1]

This is a disingenuous argument. It should be clear to anyone paying attention that the wasted energy described by the second law of thermodynamics is not the same as the wasted energy decried by conservationists. While the former concerns the portion of energy that cannot successfully be captured as useful work during an energy conversion, conservationists are simply arguing that much of the useful work derived from these conversions doesn't actually serve a useful purpose. Examples abound: people leaving lights on in empty rooms; soccer moms driving alone to the mall in their Ford Excursions, when more efficient sedans would have served the same purpose; retail stores running their air conditioners on high while leaving their doors wide open during the summer.

Regarding the notion that efficiency results in increased consumption, it should be noted that the Huber-Mills treatment neglects mention of the most important factor limiting consumption of energy: price. Energy consumption increased after the conservation programs largely because those programs resulted in consumers spending less of their income on energy, allowing them to increase their consumption of energy without spending more than they had before. Conservation programs will typically fail to reduce energy consumption by themselves, but in concert with other measures, such as a carbon tax, it's likely that they could succeed in dramatically reducing energy use while maintaining the same standard of living.

EXTERNALITIES AND FOREIGN POLICY

The Bottomless Well mentions global warming only a few times—it is presented as a relatively insignificant problem (if it is a problem), because the rate of

technological advance is so fast that humans should be able to develop the means to mitigate any unfortunate side effects. Certainly one hopes and expects that technology will ultimately provide new and better means of combating global warming, but it seems worth pointing out that technological advances created the problem in the first place, and so it is perhaps a little too optimistic to expect that future advances won't be accompanied by further problems. Worshiping at the altar of technology doesn't provide much margin for error if expected advances don't materialize soon enough.

Regarding a governmental energy policy, Huber and Mills argue, "The best thing U.S. policy makers can do is step out of the way and let the market find its own way to the extraordinary future that now beckons."[2] Their opinion of foreign governments is even lower than that of their own, as they see Europe's compliance with the Kyoto Protocol as a form of economic unilateral disarmament. They have nothing but scorn for international conventions, arguing that only the market can efficiently identify and implement the path to a cleaner and healthier environment.

It will be interesting to see if the authors still feel this way a decade or two hence, when the United States is no longer the leading greenhouse gas emitter. The externalities of fossil fuel consumption are an international problem, and can only be effectively dealt with on an international basis. Given that they seem to see economic competition as a zero-sum game, Huber and Mills presumably would oppose transfer of advanced technology to developing countries to help them reduce their carbon dioxide emissions. In dismissing international cooperation, the authors discard much of the power the United States has to combat global warming. Given the added danger of energy terrorism that will accompany peak oil, the United States is not in a favorable position to act unilaterally.

In *The Bottomless Well*, Huber and Mills do an excellent job of explaining the science underlying energy consumption and of describing some of the more exciting technologies that may emerge in the coming decades. But they really should have stopped there. Their libertarian dream world sounds like a nice place, but it's not particularly relevant to the formulation of public policy in the United States. ■

NOTES

1 Peter Huber and Mark Mills, *The Bottomless Well: The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy* (New York: Basic Books, 2005), p. 123.

2 Ibid., p. 76.