

Running Out of Oil - and Time

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Panic will strike if we're not prepared with new technologies. By Paul Roberts, Paul Roberts writes about the energy industry for Harper's Magazine and other national publications. His new book, "The End of Oil: On the Edge of a Perilous New World," will be published in May.

SEATTLE — The news last month that the vast Saudi oil fields are in decline is a far bigger story than most in the media, or the United States, seem to realize. We may begrudge the Saudis their 30-year stranglehold on the world economy. But even the possibility that the lords of oil have less of the stuff than advertised raises troubling questions. How long will the world's long-term oil supplies last? As important, what will the big importing nations, like the U.S., do the day world oil production hits its inevitable peak?

For more than a century, Western governments have been relentlessly upbeat about the long-term outlook for oil. Whenever pessimists claimed that supplies were running low — as they have many times — oil companies always seemed to discover huge new fields. It's now an article of faith among oil optimists, including those in the U.S. government, that global oil reserves won't run out for at least four decades, which seems like enough time to devise a whole suite of alternative energy technologies to smoothly and seamlessly replace oil.

But such oil optimism, always questionable, is now more suspect than ever. True, we won't "run out" of oil tomorrow, or even 10 years from now. But the long-term picture is grim. In the first place, it's not a matter of running out of oil but of hitting a production peak. Since 1900, world oil production — that is, the number of barrels we can pump from the ground — has risen in near-perfect step with world oil demand. Today, demand stands at about 29 billion barrels of oil a year, and so does production. By 2020, demand may well be 45 billion barrels a year, by which time, we hope, oil companies will have upped production accordingly.

At some point, however, production simply won't be able to match demand. Oil is an exhaustible resource: The more you produce, the less remains in the ground, and the harder it is to bring up that remainder. We won't be "out of oil"; a vast amount will still be flowing — just not quickly enough to satisfy demand. And as any economist can tell you, when supply falls behind demand, bad things happen.

During the 1979 Iranian revolution, the last time oil production fell off significantly, world oil prices hit the modern equivalent of \$80 a barrel. And that, keep in mind, was a temporary decline. If world oil production were to truly peak and begin a permanent decline, the effect would be staggering: Prices would not come back down. Any part of the global economy dependent on cheap energy — which is to say, pretty much everything these days — would be changed forever.

And that's the good news. The term "peak" tends to suggest a nice, neat curve, with production rising slowly to a halfway point, then tapering off gradually to zero — as if, since it took a century to reach a peak, it ought to take another 100 years to reach the end. But in the real world, the landing will not be soft. As we hit the peak, soaring prices — \$70, \$80, even \$100 a barrel — will encourage oil companies and oil states to scour the planet for oil. For a time, they will succeed, finding enough crude to keep production flat, thus stretching out the peak into a kind of plateau and perhaps temporarily easing fears. But in reality, this manic, post-peak production will deplete remaining reserves all the more quickly, thus ensuring that the eventual decline is far steeper and

far more sudden. As one U.S. government geologist put it to me recently, "the edge of a plateau looks a lot like a cliff."

As production falls off this cliff, prices won't simply increase; they will fly. If our oil dependence hasn't lessened drastically by then, the global economy is likely to slip into a recession so severe that the Great Depression will look like a dress rehearsal. Oil will cease to be viable as a fuel — hardly an encouraging scenario in a world where oil currently provides 40% of all energy and nearly 90% of all transportation fuel. Political reaction would be desperate. Industrial economies, hungry for energy, would begin making it from any source available — most likely coal — regardless of the ecological consequences. Worse, competition for remaining oil supplies would intensify, potentially leading to a new kind of political conflict: the energy war.

Thus, when we peak becomes a rather pressing question. Some pessimists tell us the peak has already come, and that calamity is imminent. That's unlikely. But the optimists' forecast — that we don't peak until around 2035 — is almost as hard to believe. First, oil demand is climbing faster than optimists had hoped, mainly because China and India, the sleeping giants, are waking up to embrace a Western-style high-energy industrialism that includes tens of millions of new cars. Second, even as oil demand is rising, oil discovery rates are falling. Oil can't be produced without first being found, and the rate at which oil companies are locating new oil fields is in serious decline. The peak for world discoveries was around 1960; today, despite astonishing advances in exploration and production technology, the industry is finding just 12 billion new barrels of oil each year — less than half of what we use. This is one reason that oil prices, which had averaged \$20 a barrel since the 1970s, have been hovering at \$30 for nearly a year.

Oil companies, not surprisingly, are getting anxious. Despite the fact that the current high oil prices are yielding massive company profits, companies are finding it harder and harder to replace the oil they sell with newly discovered barrels. On average, for every 10 barrels an oil company sells, its exploration teams find just four new barrels — a trend that can go on only so long. Indeed, most Western oil firms now say the only way to halt this slide is to get back into the Middle East, which kicked them out during the OPEC nationalizations of the 1960s and '70s. This has, in fact, become the mantra of the oil industry: Get us back into the Middle East or be prepared for trouble. And the Bush administration seems to have taken the message to heart.

Now, of course, the Middle East is looking less and less like the Promised Land. Western analysts have long feared that the Saudis and other oil-state leaders are too corrupt, unstable and bankrupt to step up their oil production fast enough to meet surging world demand. Last week's revelations, in which some Saudis themselves expressed doubt over future production increases, have only heightened such concerns.

Put another way, we may not be able to pinpoint exactly when a peak is coming, but recent events suggest that it will be sooner than the optimists have been telling us — perhaps by 2020, or even 2015 if Asian demand picks up as fast as some analysts now expect. What this means is that we can no longer sit back and hope that an alternative to oil will come along in time. Such complacency all but ensures that, when the peak does arrive, our response will be defensive, costly and hugely disruptive. Instead, we must begin now, with every tool at our disposal, to find ways to get "beyond petroleum" if we are to have any hope of controlling the shift from oil to whatever comes next.