FP Foreign Policy

It's Still the One

Oil's very future is now being seriously questioned, debated, and challenged. The author of an acclaimed history explains why, just as we need more oil than ever, it is changing faster than we can keep up with.

BY DANIEL YERGIN | SEPT. / OCT. 2009

On a still afternoon under a hot Oklahoma sun, neither a cloud nor an ounce of "volatility" was in sight. Anything but. All one saw were the somnolent tanks filled with oil, hundreds of them, spread over the rolling hills, some brand-new, some more than 70 years old, and some holding, inside their silver or rust-orange skins, more than half a million barrels of oil each.

This is Cushing, Oklahoma, the gathering point for the light, sweet crude oil known as West Texas Intermediate -- or just WTI. It is the oil whose price you hear announced every day, as in "WTI closed today at ...." Cushing proclaims itself, as the sign says when you ride into town, the "pipeline crossroads of the world." Through it passes the network of pipes that carry oil from Texas and Oklahoma and New Mexico, from Louisiana and the Gulf Coast, and from Canada too, into Cushing's tanks, where buyers take title before moving the oil onward to refineries where it is turned into gasoline, jet fuel, diesel, home heating oil, and all the other products that people actually use.

But that is not what makes Cushing so significant. After all, there are other places in the world through which much more oil flows. Cushing plays a unique role in the new global oil industry because WTI is the preeminent benchmark against which other oils are priced. Every day, billions of "paper barrels" of light, sweet crude are traded on the floor of the New York Mercantile Exchange in lower Manhattan and, in ever increasing volumes, at electron speed around the world, an astonishing virtual commerce that no matter how massive in scale, still connects back somehow to a barrel of oil in Cushing changing owners.

That frenetic daily trading has helped turn oil into something new -- not only a physical commodity critical to the security and economic viability of nations but also a financial asset, part of that great instantaneous exchange of stocks, bonds, currencies, and everything else that makes up the world's financial portfolio. Today, the daily trade in those "paper barrels" -- crude oil futures -- is more than 10 times the world's daily consumption of physical barrels of oil. Add in the trades that take place on other exchanges or outside them entirely, and the ratio may be as much as 30 times greater. And though the oil may flow steadily in and out of Cushing at a stately 4 miles per hour, the global oil market is anything but stable.

That's why, as I sat down to work on a new edition of ***The Prize*** and considered what had changed since the early 1990s, when I wrote this history of the world's most valuable, and misunderstood, commodity, the word "volatility" kept springing to mind. How could it not? Indeed, when people are talking about

volatility, they are often thinking oil. On July 11, 2008, WTI hit $147.27. Exactly a year later, it was $59.87. In between, in December, it fell as low as $32.40. (And don't forget a little more than a decade ago, when it was as low as $10 a barrel and consumers were supposedly going to swim forever in a sea of cheap oil.)

These wild swings don't just affect the "hedgers" (oil producers, airlines, heating oil dealers, etc.) and the "speculators," the financial players. They show up in the changing prices at the gasoline station. They stir political passions and feed consumers' suspicions. Volatility also makes it more difficult to plan future energy investments, whether in oil and gas or in renewable and alternative fuels. And it can have a cataclysmic impact on the world economy. After all, Detroit was knocked flat on its back by what happened at the gasoline pump in 2007 and 2008 even before the credit crisis. The enormous impact of these swings is why British Prime Minister Gordon Brown and French President Nicolas Sarkozy were recently moved to call for a global solution to "destructive volatility." But, they were forced to add, "There are no easy solutions."

This volatility is part of the new age of oil. For though Cushing looks pretty much the same as it did when *The Prize* came out, the world of oil looks very different. Some talk today about "the end of oil." If so, others reply, we are entering its very long goodbye. One characteristic of this new age is that oil has developed a split personality -- as a physical commodity but also now as a financial asset. Three other defining characteristics of this new age are the globalization of the demand for oil, a vast shift from even a decade ago; the rise of climate change as a political factor shaping decisions on how we will use oil, and how much of it, in the future; and the drive for new technologies that could dramatically affect oil along with the rest of the energy portfolio.

The cast of characters in the oil business has also grown and changed. Some oil companies have become "supermajors," such as ExxonMobil and Chevron, while others, such as Amoco and ARCO, have just disappeared. "Big oil" no longer means the traditional international oil companies, their logos instantly recognizable from corner gas stations, but rather much larger state-owned companies, which, along with governments, today control more than 80 percent of the world's oil reserves. Fifteen of the world's 20 largest oil companies are now state-owned.

The cast of oil traders has also much expanded. Today's global oil game now includes pension funds, institutional money managers, endowments, and hedge funds, as well as individual investors and day traders. The managers at the pension funds and the university endowments see themselves as engaged in "asset allocation," hedging risks and diversifying to protect retirees' incomes and faculty salaries. But, technically, they too are part of the massive growth in the ranks of the new oil speculators.

With all these changes, the very future of this most vital commodity is now being seriously questioned, debated, and challenged, even as the world will need more of it than ever before. Both the U.S. Department of Energy and the International Energy Agency project that, even accounting for gains in efficiency, global energy use will increase almost 50 percent from 2006 to 2030 -- and that oil will continue to provide 30 percent or more of the world's energy in 2030.

But will it?

From the beginning, oil has been a global industry, going back to 1861 when the first cargo of kerosene was sent from Pennsylvania -- the Saudi Arabia of 19th-century oil -- to Britain. (The potential crew was so fearful that the kerosene would catch fire that they had to be gotten drunk to shanghai them on board.) But that is globalization of supply, a familiar story. What is decisively new is the globalization of demand.

For decades, most of the market -- and the markets that mattered the most -- were in North America, Western Europe, and Japan. That's also where the growth was. At the time of the first Gulf War in 1991, China was still an oil exporter.

But now, the growth is in China, India, other emerging markets, and the Middle East. Between 2000 and 2007, the world's daily oil demand increased by 9.4 million barrels. Almost 85 percent of that growth was in emerging markets. There were many reasons that prices soared all the way to $147.27 last year, ranging from geopolitics to a weak dollar to the impact of financial markets and speculation (in all its manifold meanings). But the starting point was the fundamentals -- the surge in oil demand driven by powerful economic growth in emerging markets. This shift may be even more powerful than people recognize: So far this year, more new cars have been sold in China than in the United States. When economic recovery takes hold again, what happens to oil demand in such emerging countries will be crucial.

The math is clear: More consumers mean more demand, which means more supplies are needed. But what about the politics? There the forecasts are murkier, feeding a new scenario for international tension -- a competition, even a clash, between China and the United States over "scarce" oil resources. This scenario even comes with a well-known historical model -- the rivalry between Britain and "rising" Germany that ended in the disaster of World War I.

This scenario, though compelling reading, does not really accord with the way that the world oil market works. The Chinese are definitely new players, willing and able to pay top dollar to gain access to existing and new oil sources and, lately, also making loans to oil-producing countries to ensure future supplies. With more than $2 trillion in foreign reserves, China certainly has the wherewithal to be in the lending business.

But the global petroleum industry is not a go-it-alone business. Because of the risk and costs of large-scale development, companies tend to work in consortia with other companies. Oil-exporting countries seek to diversify the countries and companies they work with. Inevitably, any country in China's position -- whose demand had grown from 2.5 million barrels per day to 8 million in a decade and a half -- would be worrying about supplies. Such an increase, however, is not a forecast of inevitable strife; it is a message about economic growth and rising standards of living. It would be much more worrying if, in the face of

rising demand, Chinese companies were not investing in production both inside China (the source of half of its supply) and outside its borders.

There are potential flash points in this new world of oil. But they will not come from standard commercial competition. Rather, they arise when oil (along with natural gas) gets caught up in larger foreign-policy issues -- most notably today, the potentially explosive crisis over the nuclear ambitions of oil- and gas-rich Iran.

Yet, despite all the talk of an "oil clash" scenario, there seems to be less overall concern than a few years ago and much more discussion about "energy dialogue." The Chinese themselves appear more confident about their increasingly important place in this globalized oil market. Although the risks are still there, the Chinese -- and the Indians right alongside them -- have the same stake as other consumers in an adequately supplied world market that is part of the larger global economy. Disruption of that economy, as the last year has so vividly demonstrated, does not serve their purposes. Why would the Chinese want to get into a confrontation over oil with the United States when the U.S. export market is so central to their economic growth and when the two countries are so financially interdependent?

Not a Threat: Chinese workers at a construction site in Africa.

Oil is not even the most important energy issue between China and the United States. It is coal. The two countries have the world's largest coal resources, and they are the world's biggest consumers of it. In a carbon-constrained world, they share a strong common interest in finding technological solutions for the emissions released when coal is burned.

And that leads directly to the second defining feature of the new age of oil: climate change. Global warming was already on the agenda when *The Prize* came out. It was back in 1992 that 154 countries signed the Rio Convention, pledging to dramatically reduce CO_2 concentrations in the atmosphere. But only in recent years has climate change really gained traction as a political issue -- in Europe early in this decade, in the United States around 2005. Whatever the outcome of December's U.N. climate change conference in Copenhagen, carbon regulation is now part of the future of oil. And that means a continuing drive to reduce oil demand.

How does that get done? How does the world at once meet both the challenge of climate change and the challenge of economic growth -- steady expansion in the industrial countries and more dramatic growth in China, India, and other emerging markets as tens of millions of their citizens rise from poverty and buy appliances and cars?

The answer has to be in another defining change -- an emphasis on technology to a degree never before seen. The energy business has always been a technology business. After all, the men who figured out in 1859, exactly 150 years ago, how to drill that first oil well -- Colonel Drake and his New Haven, Conn., investors -- would, in today's lingo, be described as a group of disruptive technology entrepreneurs and venture capitalists. Again and again, in researching oil's history, I was struck by how seemingly insurmountable barriers and obstacles were overcome by technological progress, often unanticipated.

But the focus today on technology -- all across the energy spectrum -- is of unprecedented intensity. In the mid-1990s, I chaired a task force for the U.S. Department of Energy on "strategic energy R&D." Our panel worked very hard for a year and a half and produced what many considered a very worthy report. But there was not all that much follow-through. The Gulf War was over, and the energy problem looked like it had been "solved."

Today, by contrast, the interest in energy technology is enormous. And it will only be further stoked by the substantial increases that are ahead in government support for energy R&D. Much of that spending and effort is aimed at finding alternatives to oil. Yet the challenge is not merely to find alternatives; it is to find alternatives that can be competitive at the massive scale required.

What will those alternatives be? The electric car, which is the hottest energy topic today? Advanced biofuels? Solar systems? New building designs? Massive investment in wind? The evolving smart grid, which can integrate electric cars with the electricity industry? Something else that is hardly on the radar screen yet? Or perhaps a revolution in the internal combustion engine, making it two to three times as efficient as the ones in cars today?

We can make educated guesses. But, in truth, we don't know, and we won't know until we do know. For now, it is clear that the much higher levels of support for innovation -- along with considerable government incentives and subsidies -- will inevitably drive technological change and thus redraw the curve in the future demand for oil.

Indeed, the biggest surprises might come on the demand side, through conservation and improved energy efficiency. The United States is twice as energy efficient as it was in the 1970s. Perhaps we will see a doubling once again. Certainly, energy efficiency has never before received the intense focus and support that it does today.

Just because we have entered this new age of high-velocity change does not mean this story is about the imminent end of oil. Consider the "peak oil" thesis -- shorthand for the presumption that the world has reached the high point of production and is headed for a downward slope. Historically, peak-oil thinking gains attention during times when markets are tight and prices are rising, stoking fears of a permanent shortage. In 2007 and 2008, the belief system built around peak oil helped drive prices to $147.27. (It was actually the fifth time that the world had supposedly "run out" of oil. The first such episode was in the 1880s; the last instance before this most recent time was in the 1970s.)

However, careful examination of the world's resource base -- including my own firm's analysis of more than 800 of the largest oil fields -- indicates that the resource endowment of the planet is sufficient to keep up with demand for decades to come. That, of course, does not mean that the oil will actually make it to consumers. Any number of "aboveground" risks and obstacles can stand in the way, from government policies that restrict access to tax systems to civil conflict to geopolitics to rising costs of exploration and production to uncertainties about demand. As has been the case for decades and decades, the shifting relations between producing and consuming countries, between traditional oil companies and state-owned oil companies, will do much to determine what resources are developed, and when, and thus to define the future of the industry.

There are two further caveats. Many of the new projects will be bigger, more complex, and more expensive. In the 1990s, a "megaproject" might have cost $500 million to $1 billion. Today, the price tag is more like $5 billion to $10 billion. And an increasing part of the new petroleum will come in the form of so-called "unconventional oil" -- from ultradeep waters, Canadian oil sands, and the liquids that are produced with natural gas.

But through all these changes, one constant of the oil market is that it is not constant. The changing balance of supply and demand -- shaped by economics, politics, technologies, consumer tastes, and accidents of all sorts -- will continue to move prices. Economic recovery, expectations thereof, the pent-up demand for "demand," a shift into oil as a "financial asset" -- some combination of these could certainly send oil prices up again, even with the current surplus in the market. Yet, the quest for stability is also a constant for oil, whether in reaction to the boom-and-bust world of northwest Pennsylvania in the late 19th century, the 10-cents-a-barrel world of Texas oil in the 1930s, or the $147.27 barrel of West Texas Intermediate in July 2008.

Certainly, the roller-coaster ride of oil prices over the last couple of years, as oil markets and financial markets have become more integrated, has made volatility a central preoccupation for policymakers who do not want to see their economies whipsawed by huge price swings. Yet without the flexibility and liquidity of markets, there is no effective way to balance supply and demand, no way for consumers and producers to hedge their risks. Nor is there a way to send signals to these consumers and producers about how much oil to use and how much money to invest -- or signals to would-be innovators about tomorrow's opportunities.

One part of the solution is not only enhancement of the already considerable regulation of the financial markets where oil is traded, but also greater transparency and better understanding of who the players are in the rapidly expanding financial oil markets. But regulatory changes cannot eliminate market cycles or repeal the laws of supply and demand in the world's largest organized commodity market. Those cycles may not be much in evidence amid the quiet tanks and rolling hills at Cushing. But they are inescapably part of the global landscape of the new world of oil.

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