

Special Advertising Section

# BUILDING A NEW ENERGY FUTURE: CERAWEEK® 2010

## To Readers

As the global economy recovers from the Great Recession, new energy strategies are emerging in anticipation of the next wave of investment. After two years of turmoil, decision makers are taking initial steps that will lead to a renewed building cycle in the energy business around the world.

In this week's special sections, *Building a New Energy Future: CERAWEEK 2010*, we seek to address the opportunities and challenges facing the global energy industry as the world enters the next phase of the economic cycle.

One key theme is the range of new forces reshaping the role of oil in the global energy mix. Another is how scenario planning can help decision makers to navigate the shoals during turbulent times. We will also examine the opportunities presented by energy efficiency — the search for "investment grade" projects and the hurdles that must be surmounted if efficiency's potential is to be realized. Finally, we look at two key aspects of today's energy picture: growing demand for electric power and the vast new supplies of natural gas recently made available by unconventional extraction techniques in North America over the past few years and possibly in Europe and Asia in the future; and how these forces may intersect.

We are pleased to partner again in these special sections with the *Wall Street Journal* and to offer its readers thinking and analysis on the challenges ahead, as we embark on the 29th CERAWEEK conference in Houston, Texas. CERAWEEK is recognized as the most prestigious annual meeting for the global energy industry. This year's conference will feature sessions by more than 200 senior executives, officials, and thought leaders from the global energy, financial, environmental, and policy communities. We anticipate over 2,200 delegates, representing more than 50 countries, to be in attendance.

A major innovation for 2010 is our enhanced CERAWEEK Online service, designed to enable those who are not physically present in Houston to participate on a virtual basis.

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We invite you to join us in the CERAWEEK dialogue about the energy future through the insights our experts offer in these pages.

**Daniel Yergin**  
IHS CERA Chairman  
and Chairman of CERAWEEK



## The New Prize in World Oil

By Daniel Yergin

**T**he oil business is in constant change, which is a big challenge for an industry with such long-time investment horizons. Every three or four years, it seems, the outlook shifts, and the world rushes to catch up. This became especially apparent to me when I sat down to do the new edition of *The Prize: The Epic Quest for Oil, Money and Power*. I had to think hard about the basic themes and defining changes since the first edition.

The first is the globalization of world oil demand. Of course, the oil industry has been a global business almost from its beginning, going back to 1861 when the first cargo of kerosene was sent from Pennsylvania — the Saudi Arabia of 19th-century oil — to Britain. Before the end of the 19th century, oil from Baku, on the Caspian Sea, was making its way over land and water to China.

But that is supply. 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. But now, the growth is in China, India, other emerging markets, and the Middle East. Almost 85 percent of the growth in world oil demand between 2000 and 2007 was in emerging markets. This shift continues. The United States reached "peak demand" — the high point in gasoline consumption in 2007 — and it will likely never be that high again. That is hardly the case for the emerging markets. As economic recovery takes hold again, what happens to oil demand in such emerging countries will be crucial. Already, we are seeing in 2010 how what is happening to the Chinese economy — and expectations for the Chinese economy — are affecting the oil price.

This globalization of demand is bringing geopolitical realignments. How could it not? China was previously self-sufficient; now it is the world's second largest oil consumer, even as it becomes the second largest economy in the world. It is inevitable that China would become increasingly important in the world market. But it is not inevitable that there will be a 19th century-style zero-sum competition for resources. After all, oil is only one element in a global economy in which the United States and China are highly connected, both by trade and finance. China — and India and other emerging markets — have the same stake as other consumers in an adequately supplied world market that is part of the larger, G-20-style global economy. Disruption of that economy, as the last year so vividly demonstrated, does not serve any of their purposes.

Moreover, the global petroleum industry is not a go-it-alone business. Because of the risk and costs of large-

scale development, companies work in consortia with other companies, as is evident with the new contracts in Iraq.

The potential flash points in this new world of oil will arise not from standard commercial competition, but rather when oil (along with natural gas) gets caught up in larger foreign-policy issues — most notably, today, with the potential crisis over Iran's nuclear program.

A second defining change is how in recent years oil has developed a split personality — not only as 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. With that comes the vast trade in "paper barrels" and crude oil futures that introduces a new element of volatility into prices.

That's why, as I worked on the new edition, the word "volatility" kept springing to mind. How could it not? On July 11, 2008, West Texas Intermediate, the benchmark for world oil prices, hit \$147.27. 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.) Lately, it has stayed in the \$70-80 neighborhood.

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 suspicion. Volatility also affects the ability to make long-term investments, both in oil and gas and in renewables 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.

Today's global oil game now includes pension funds, endowments, and hedge funds, as well as individual investors and day traders. In their asset allocations, the

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Special Advertising Section

# What is the Next Surprise for World Energy?

## Scenarios can help decision makers be prepared

By James Burkhard

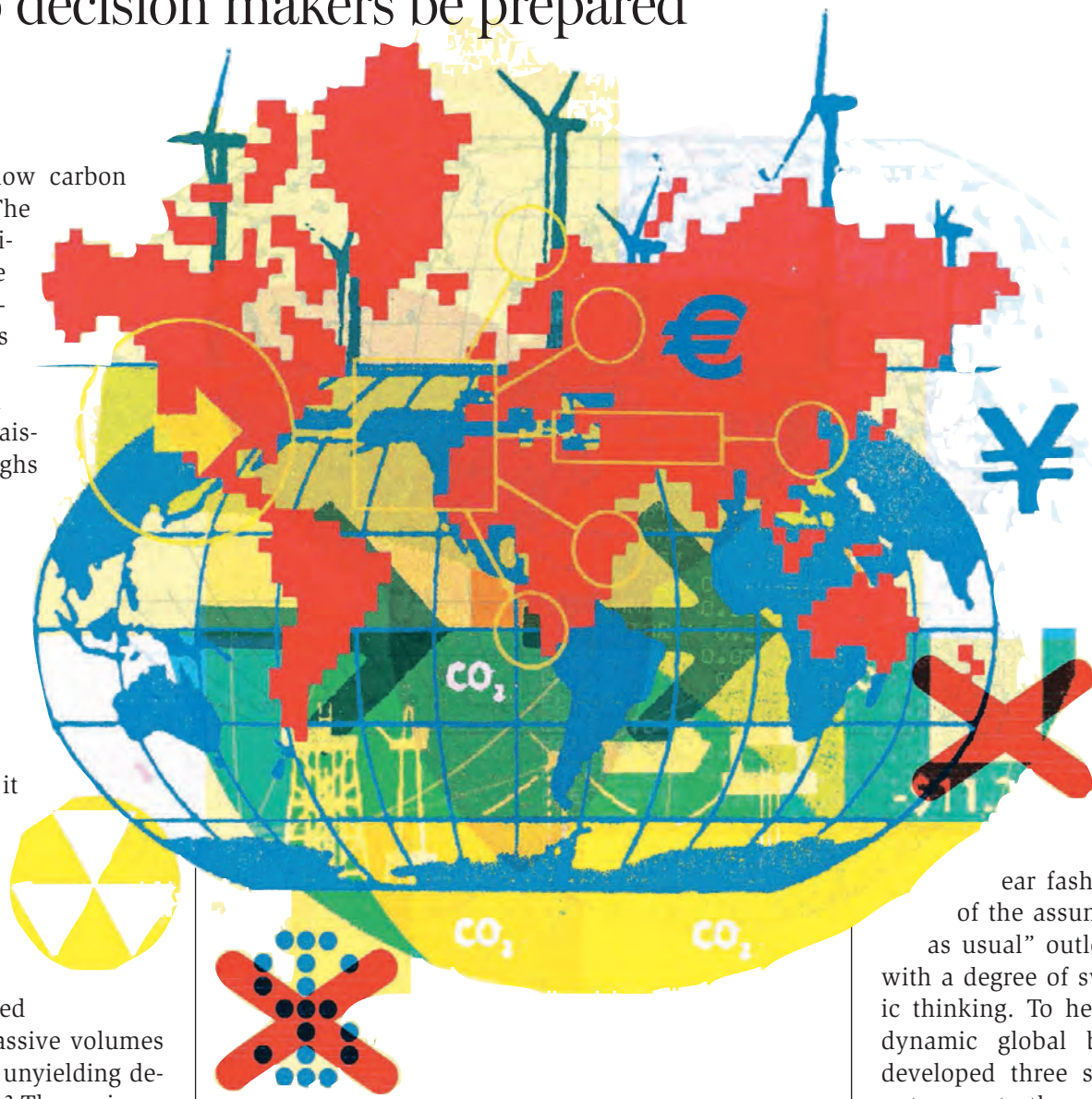
The year is 2030 and the low carbon economy has arrived. The wild success of electric vehicles has changed the psyche of the oil market. Instead of fear of running out amid \$500 oil prices, oil has slipped out of the headlines — except for stories that speculate when oil will hit \$10 per barrel. The surprising renaissance of nuclear power and breakthroughs in the mass storage of electricity have broken the link between fossil fuel consumption and economic growth. All this happens without a significant price on carbon emissions. But 2030 is not angst-free. The nuclear weapons club numbers 20 countries, compared to eight back in 2010.

Is this all fanciful? Or not? Could it happen? History is full of the fanciful becoming reality. Remember, way back in 2003, when many thought the oil price could not go over \$40 per barrel without destroying global economic growth? Or, in the ever-distant year of 2007, when the United States was going to need to import massive volumes of liquefied natural gas because of the unyielding decline in North American gas production? These views, along with the idea that financial crises only happen in emerging markets and that central banks have everything under control, have been upended.

How is it that we can continually be surprised by developments that turn conventional wisdom on its head? When developments occur that surprise us, it is often because our assumptions about the present — not to mention the future — have turned out wrong. The consequences can be severe, as demonstrated by the Great Recession.

That is what brings us to scenarios and why they can be so helpful — not as forecasts, which they are not, but to test our thinking and build flexibility into how we look at the world. The scenario process provides a methodology for “thinking the unthinkable” — especially important when the “unthinkable” has a habit of becoming a reality. For instance, half a decade ago, IHS CERA’s “Global Fissures” scenario laid out the dynamics of a deep world recession at a time when recessions were supposedly a thing of the past. Scenarios provide a way to get beyond the “conventional wisdom” of the moment, to test the official “doctrine,” whether of a country or a company, and to put aside prestige and position in order to ask big, fundamental questions. Identifying key questions and then developing alternative outcomes to these questions is at the heart of the scenario process.

So what are the big questions that will shape the global economy, politics, security, and energy? As part of our project to develop new global scenarios, over the past year we gathered questions from people on four continents that represented a range of industries and perspectives. We collected nearly 400 specific



### IHS Global Energy Scenarios

IHS CERA, along with IHS Global Insight, IHS Jane’s, and IHS Herold, is developing new global scenarios for the energy and automobile industries. For more information, contact Dalton.Perras@ihscera.com.

questions that covered economic, political, security, technology, environmental and energy issues. There are many that could be the basis of valuable scenarios. But we consolidated them into three “Big Questions” the world faces.

■ *Will major powers cooperate to enhance global prosperity — or will cooperation fail?* International affairs are increasingly complex because more actors — compared with the preceding 60 years — are exerting influence on the global economy, politics, and security. How will global cooperation on security, greenhouse gas emission limits, and international trade and investment be shaped by a complex mosaic of national interests? Under what conditions might widespread cooperation take place? Will major powers cooperate to enhance global prosperity?

■ *How quickly and to what degree will the world shift to a low carbon economy?* The interplay and links between fossil fuel consumption, global warming, economic growth, and national security have grown in prominence. The potential move to a low carbon future is among the most far-reaching issues for the global economy as well as individual businesses. The

pace of change, however, is highly uncertain — more uncertain than many may think — and will vary under different conditions.

■ *How successful will major powers be in avoiding a reoccurrence of economic turbulence and a weakening of the global economy in the coming decade and beyond?* The Great Recession of 2008-09 raised fears about the future stability of financial markets, capital flows, and trade patterns. Will abrupt and severe change in economic growth and consumption patterns occur with greater frequency than in the past? And what role will the state play in shaping the economy?

There is no single “right” answer to these questions — nor will they unfold in a nice, linear fashion.

What is certain is that many of the assumptions that underpin a “business as usual” outlook will become outdated — and with a degree of swiftness that will overwhelm static thinking. To help make sense of a complex and dynamic global business environment, we have developed three scenarios that provide alternative outcomes to these big questions in order to enhance the robustness of decision making.

The new scenarios, on which we are still working, have the following themes at their heart:

■ One scenario explores an anxious, difficult transition from a world of concentrated power to broader distribution of wealth and influence. Alignment of interests among major powers occurs when crisis hits, not before.

■ Testing just how fast the world could move toward a low carbon economy is the anchor of another scenario. What is striking is how this becomes a world of difficult trade-offs.

■ In another scenario, the dominant characteristics are severe volatility in economic growth and poor global cooperation. Disorder emerges as security vacuums propagate.

Again and again, we are taught that no one can predict the future with any high degree of clairvoyance. But through the development and use of scenarios, we can challenge our assumptions and be better prepared for the unexpected when it, inevitably, occurs. The future holds promise of higher living standards and greater prosperity, but crises will materialize and disrupt. Security shocks, economic maelstroms, and geopolitical tension will occur, but they need not come with total surprise. It is possible to be prepared — and thus to react more swiftly and with greater flexibility. And that is far better than being caught by surprise.

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## The New Prize

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managers at the pension funds and the university endowments seek to hedge risks and diversify to protect retirees’ incomes and faculty salaries. There is also a recurrent pattern in which the oil price moves in relation to currencies. “Momentum” trading among financial players can carry prices beyond — and sometimes far beyond — the dynamics of supply and demand. In the spring and early summer of 2008, the price of oil kept going up at a time when the United States was already in recession and demand was going down!

Climate change policy has certainly become another defining feature of the new age of oil. Global warming was already on the world agenda when *The Prize* first came out. But it only really gained traction as a political issue in the last half decade. Despite the uncertain outcome from December’s Copenhagen summit, the debate over carbon regulation is now part of oil’s future.

But how does the world at once meet both the challenges of climate change and 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 the fourth defining change for the new *Prize* — 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 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 disruptive technology entrepreneurs and venture capitalists.

But the focus today on technology — all across the energy spectrum — is of unprecedented intensity. And it will only be further stoked by further substantial increases in government support for energy R&D. Much of that spending and effort is aimed at managing the environmental consequences of energy use and developing alternatives. Yet the challenge is not just to find alternatives but also to develop alternatives that can be competitive at the massive scale required.

What will those alternatives be? That will certainly be among the major questions at *CERAWEEK* this year. But we do know that the much higher levels of support for innovation — along with considerable government incentives and subsidies — will inevitably drive technological change in energy production and use.

Indeed, the biggest surprises may be on the demand side, through conservation and improved energy efficiency. I would add this new, global focus on energy efficiency as yet the fifth of the defining changes. The United States is twice as energy efficient as it was in the 1970s. Perhaps we will see a doubling once again.

*The focus today on technology — all across the energy spectrum — is of unprecedented intensity.*

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, pent-up demand for “demand,” a shift into oil as a “financial asset” — some combination of these could certainly send oil prices up again in the next several years. Yet, the quest for stability is also a constant for oil, whether in reaction to the boom-and-bust world of north-west 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. A result will likely be greater transparency and better understanding of who the players are in the rapidly expanding financial oil market. 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.

Regulatory changes cannot eliminate market cycles or repeal the laws of supply and demand in the world’s largest organized commodity market. For those cycles and “laws” tell us about major changes in the global economy and in technologies. Thus, they are inescapably part of the new world of oil and will define the global landscape for the new *Prize* in the years ahead.

*Daniel Yergin received a Pulitzer Prize for *The Prize: The Epic Quest for Oil, Money and Power* (Free Press, 2009), now in a new edition. He is chairman of IHS Cambridge Energy Research Associates.*