

## Prepared Testimony

# **ENERGY AND OIL MARKETS: GLOBAL REDESIGN**

*Testimony by James Burkhard, Managing Director of IHS Cambridge Energy Research Associates, before the US Senate Committee on Energy and Natural Resources, Washington, DC, February 3, 2011*

It is an honor to speak on the energy and oil market outlook before the US Senate Committee on Energy and Natural Resources of the 112th Congress. It is very timely for the Committee to assess the current situation. I hope to provide a framework that will help to understand what we are seeing in world oil markets—and why. It was just two and a half years ago that oil surged to over \$140 a barrel and just two years ago that it sank close to \$30 a barrel. These swings had great impact on the economy and on the American people. Prices that were in the high \$80s and low \$90s have surged once again on the upheaval in Egypt. Once more there are questions about the impact of oil on the overall economy—and why we are seeing these kind of prices. The turmoil in Egypt has raised anew the concerns about the geopolitical stability of world oil supplies. Egypt is an important transit point for delivering Middle East oil to the global market via the Suez Canal and the Sumed pipeline. In recent years, combined oil flows from the canal and the pipeline have ranged from 1.7 million barrels per day (mbd) to 3.3 mbd. The high end of this range is equivalent to about 3.8 percent of world oil production.

The pace and distribution of economic growth is affecting the global balance of economic, political, and military power—all at a time when the world faces extraordinary questions about macroeconomic management, security, energy, and the environment. The world is in the midst of what we refer to as a “Global Redesign”—a period of change for the formal and informal mechanisms that shape and manage international relations.<sup>1</sup> Oil demand, supply, and price are key variables that will shape this redesign—as will energy overall.

Oil prices are in a range considerably higher than in the past. There are many reasons, but the most important reason of all is the change in the world economy and rise of major new, dynamic growth centers. Oil is our largest source of energy—about 37 percent of total US energy—and is essential to personal mobility, commerce, and trade. Its price reflects the global economy—the ups and downs, the surprises, and shifting expectations about geopolitics, technology, and economic growth.

## **US ROLE IN THE OIL AND GAS INDUSTRY**

The United States plays a major role in the oil and gas industry. We are the largest consumer of oil and gas in the world, but what is perhaps less recognized is the key role on the supply side. The United States is the world’s largest producer of natural gas, the third largest for oil, and number two for coal. The United States is also a big producer of renewable energy. It is the largest biofuel producer in the world and has a growing portfolio of wind and solar power generation capacity. Oil and gas production plays an important role in the economy of producing areas of the United States. For example, in four states along the US Gulf of Mexico—Louisiana, Texas, Alabama, and Mississippi—the offshore oil and gas industry accounts for nearly 400,000 jobs that generate \$70 billion in economic value. This does not include the jobs created in

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1. See the Multiclient Study *IHS CERA Energy Scenarios*.

Pennsylvania, Connecticut, Ohio, and a number of other states that provide equipment and services to the offshore industry.

Domestic energy production is dynamic—its size is not simply a legacy of past investments. A recent “game-changing” development is the revolution in unconventional gas production in the United States. The unlocking of “shale gas” was led by the innovation and risk-taking of American companies. Innovation in gas extraction has also resulted in higher oil production. In 2009 the US recorded the largest increase of oil and gas production in the world—a growth trend that continued in 2010.

Another striking development of the past few years is the increasing integration of the US and Canadian energy markets. Canada leads development of the oil sands—an important component of global oil supply growth. The oil sands have made Canada the largest supplier—by far—of foreign oil to the United States, and this source has become part of the fabric of our continental energy security. Since 2000 Canadian oil sands output has more than doubled—from 600,000 barrels per day (bd) to 1.4 million barrels per day (mbd) in 2010. Total Canadian oil exports (crude oil and refined products) to the United States are 2.5 mbd, about double the number two supplier, Mexico. Canadian oil accounts for 21 percent of our total oil imports.

## **WHAT SHAPES OIL PRICES?**

The US energy industry is a substantial investor, supplier, and employer, but it is also part of a larger and increasingly global market. Oil is the most global of energy markets and exemplifies a dynamic, flexible, and competitive trading system. The price of oil—and particularly of gasoline—is highly visible. We see it every time we fill up at the pump. But the factors that shape the price are often not as readily visible as the brightly lit signs listing the price of a gallon of gasoline.

Electric power bottlenecks in China have, at times, contributed to greater use of oil in that country for backup power generation, boosting oil demand. This was one of the reasons that pushed oil demand up 9.7 percent in China last year. This created a volume gain of 810,000 bd, which was one of the largest recorded gains in a single country in the past several decades. Rising global steel costs for the petroleum industry—up 122 percent since 2003—are an example of what may appear to be an obscure industrial trend, but one that has contributed to much higher costs to develop new oil fields. China’s demand dynamics and the trend in steel costs are just two of many examples of how developments around the world influence what Americans pay at the pump, but which don’t come to the attention of most consumers.

Crude oil is fungible. This means, for example, that a barrel of oil produced in Africa can be refined anywhere in the world into gasoline, diesel, and jet fuel. Price signals help determine where to ship more or less oil. Nearly all the world’s oil sales are directly linked or influenced by one of two “benchmark” crude oils: West Texas Intermediate (WTI) in Cushing, Oklahoma, or Brent in the United Kingdom. The price of a specific crude oil will vary from these benchmarks by as little as a few pennies or by as much as a number of dollars, depending on its quality and the cost of transporting it to a refinery. The futures markets for both WTI and Brent are well developed with large daily trading volumes.

Flexibility and capability to allocate supply in response to price signals are the foundation of the oil market—and explain how it has withstood economic shocks, demand spikes, and supply

outages. But with flexibility and responsiveness comes exposure to a broad array of forces of change around the world. These forces can both lower and increase the price of oil. A very recent example is the unrest in Egypt. While not a major producer itself, Egypt is a key oil transit point and an influential country in the world's most important oil producing region.

## **Dawn of a New Age**

The past decade was an exceptional time in the oil market. For a generation—up until 2003—oil prices generally hovered from \$10 to \$30 per barrel. A \$5 to \$10 shift in the price of oil was an extraordinary development. But this all changed over the next several years as oil prices rose from an annual average of \$26 in 2002 to an all-time annual average high of nearly \$100 in 2008. The period of 2003 to 2008 was the “dawn of a new age” in oil and energy markets. The driver was the unprecedented increase in income and gross domestic product in Asia, Latin America, the Middle East, and other emerging markets. Rarely, if ever, have living standards risen for so many across the globe in such a short time. Per capita economic output in China soared 235 percent between 2000 and 2010. India's per capita output rose 176 percent.

Poverty reduction, rising income, and aspirations for higher living standards mean more oil demand—and this is what we have seen over the past decade. Oil demand increased 42 percent in emerging markets from 2000 to 2010—a volume increase of 12.2 million barrels per day.<sup>2</sup> This is roughly equivalent to the entire production capacity of Saudi Arabia. But in contrast to emerging markets, demand in developed markets—Europe, North America, and OECD members in Asia—was lower in 2010 than in 2000.<sup>3</sup> The contrasting demand patterns reduced the developed markets' share of world oil demand from 63 percent in 2000 to 53 percent by 2010. But the volume growth in emerging markets more than offset the decline in developed markets. World oil demand in 2010 stood at 87.3 mbd—an all-time high. After two years of falling world oil demand, 2010 registered the second largest gain in more than three decades. Emerging markets were, again, the main driver of this growth.

## **Oil Supply: Law of Long Lead Times**

Demand trends are a critical piece of the oil price story, but there are others as well. On the supply side the oil industry is ruled by the law of long lead times. The time it takes to explore for and discover oil, develop a field, and deliver the oil to market can range from several years to more than a decade, depending on the size and location of the resource base, the reservoir characteristics, and the business environment. Rising oil prices encourage more investment in oil production, but long lead times mean there is often a mismatch between a surge in demand and when investment in a new oil development leads to additional supply. New fields cannot be developed overnight.

## **Higher Industry Costs**

As oil prices rose and investment in new supplies increased for much of the past decade, so did demand for the people and equipment needed to find, develop, and produce oil. But the previous

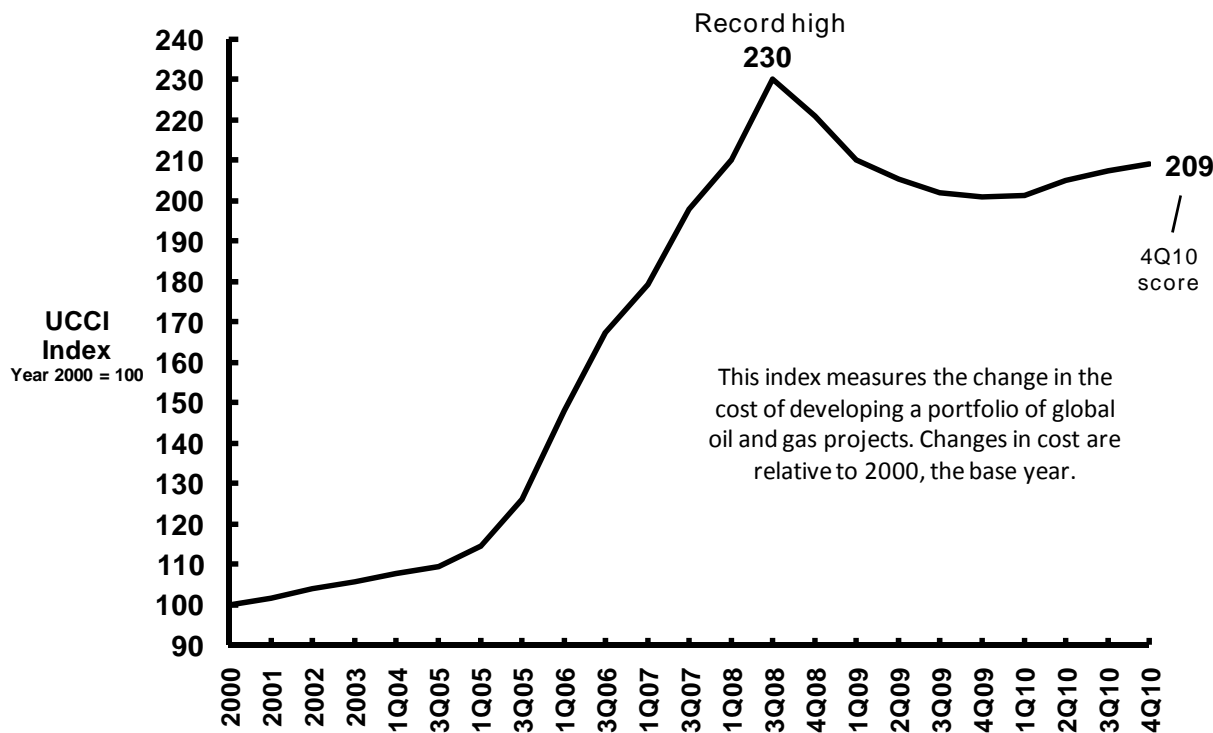
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2. Emerging markets are generally defined as countries outside of North America, Europe and OECD members in Asia (Japan, South Korea, Australia and New Zealand.)

3. The OECD is the Organization for Economic Cooperation and Development.

legacy of more than two decades of low oil prices and industry consolidation meant a “missing generation” in the energy chain—a generation of engineers, scientists, and others who skipped entering the petroleum industry. As a result, shortages of equipment and personnel dramatically raised the cost of developing an oil field. The IHS CERA Upstream Capital Costs Index—sort of a “consumer price index” for the global oil industry—illustrates the cost pressure. From 2005 to 2008 our cost index doubled. In other words companies had to budget twice as much in 2008 as they did in 2005 to develop a barrel of oil. Adding to the cost pressure were increasingly heavy fiscal terms on oil investments in the form of higher taxes and greater state participation globally in oil projects. Costs did decline slightly in the aftermath of the Great Recession and subsequent fall in oil prices; but since the middle of 2010 costs have been on the rise again and currently stand close to the cost peak of 2008 (see Figure 1).

**Figure 1: IHS CERA Upstream Capital Cost Index (UCCI)**



Source: IHS CERA

## The Role of Global Financial Dynamics

Oil has long figured into the workings of financial markets. Since the 1978 launch of the first heating oil contract on the New York Mercantile Exchange, it has been possible for investors to buy and sell oil contracts without being an active participant in the physical oil business. Such “noncommercial” market participants are essential to any futures market. In exchange for providing price certainty to a producer or consumer of oil, a trader has the opportunity to turn a profit—or a loss—from future price changes.

Financial market investors—including those in oil futures—represent a broad spectrum of investors with different time frames and motivations. They allocate capital based on current and expected global demand for oil and other commodities. Also, since oil is priced in US dollars, changes in the value of the dollar can and do influence the price of oil. Oil has become “the new gold”—a financial asset in which investors stake positions based on their expectations of the value of the dollar, inflation, and global demand and supply of oil. The role of noncommercial investors can accentuate a given price trend. However, the primary reasons for price movements in recent years are rooted in the fundamentals of demand and supply, geopolitical risks, and industry costs.

## **THE PRICE OF OIL: A REFLECTION OF THE WORLD**

The story of the price of oil over the past decade is a reflection of the changes in the world. At the core is the breathtaking spread and success of market-based decision making in nearly every corner of the world that has allowed hundreds of millions of people to benefit from expansion of trade and investment. In the future historians may look back at the early part of the 21st century as an extraordinary period of wealth creation in today's emerging markets. To be sure, the Great Recession revealed that some of the growth of the past decade was based on misplaced exuberance—and we are still grappling with the painful aftermath. But the broad trend of rising prosperity around the world is still intact—a trend borne out by the impressive performance of the Chinese and Indian economies since 2008.

### **The Outlook: A Boom in the Global Middle Class**

Financial market dynamics, industry cost trends, innovation, and the pace of investment will continue to influence the price of oil. But ultimately the level of oil demand is likely to exert the greatest impact.

In the past two decades the population of countries with per capita income of less than \$10,000 was booming. Now many of those countries are well on the way to entering the ranks of the global middle class. In IHS CERA's latest energy outlook, we project over that the next 20 years an unprecedented number of people will enter the global middle class—countries with per capita incomes above \$10,000. The global middle class will rise from less than a billion people in 2010 to between 2.7 and 3.5 billion in 2030. More people will be able to purchase a car, travel by plane, and consume electricity generated by coal, gas, nuclear, and renewable sources. When it comes to rising economic power, China and India garner much of the attention—and rightfully so given their massive populations. But this story will also unfold elsewhere in the world in parts of Africa, Latin America, and the Middle East.

Does this mean that rapidly rising oil prices are inevitable for years to come? There is a strong case for historically high oil prices continuing for a number of years to come. But higher fuel economy standards, demographics, and oil substitutes will soften and perhaps even offset some of the upward pressure on oil prices. For example, IHS CERA believes that aggregate oil demand in developed markets peaked in 2005 and will not exceed that level again. Higher fuel economy standards adopted in American, European, and Japanese markets will steadily soften demand as more efficient vehicles enter the fleet. Also biofuel mandates will continue to displace oil products—principally gasoline. Lastly, aging populations in many countries—including China—is another factor that will tend to slow the pace oil demand growth. Looking further ahead, electric vehicles hold promise and may become increasingly competitive with conventional cars powered by internal combustion engines.

On balance world oil demand will continue to increase, but not necessarily at breakneck speed. Oil prices are likely to remain well above the levels seen during most of the past 30 years, but it will reflect a continued rise in global prosperity and also foster efficiency and innovation. There is no blueprint for the Global Redesign. There will, of course, be times of tumult. Energy prices, and especially for oil, will continue to reflect the shifting fortunes of the global economy and geopolitics.