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PER BARREL

THE ENERGY INDUSTRY'S
ROADMAP TO THE FUTURE

by Joe Gimenez

**FEW HEADLINES HAVE
CONSISTENTLY DOMINATED
THE NEWS MORE THAN THE
RISING OIL PRICES OF THE
LAST SEVERAL YEARS.**

**“Can Oil Return to a
‘Sensible’ Level?”**
FINANCIAL TIMES

**“U.S. Energy Chief
Pleads for More Saudi,
OPEC Oil”**
The New York Times

**“Oil’s Surge
Reshapes the World”**
THE WALL STREET JOURNAL.

AND WHILE JOURNALISTS HAVE PAINTED BLEAK PICTURES OF OIL STOCKS CAUSED BY COMPETING WORLDWIDE CONSUMER DEMAND FOR EXISTING SUPPLIES, DECLINING OILFIELD PRODUCTION RATES AND CONTINUING MIDDLE EAST STRIFE, THE BUSINESS OF FINDING AND PRODUCING OIL COULDN'T BE MORE EXCITING, LUCRATIVE OR INVITING THAN IT IS TODAY, ESPECIALLY FOR STUDENTS GRADUATING FROM LEADING BUSINESS SCHOOLS.

While exploration and production (E&P) industry challenges may seem daunting, they should probably be considered “typical” when placed alongside all the issues that have faced the industry throughout its history, from Spindletop to the Exxon Valdez to Deep Mission, the latest big find four miles below the Gulf of Mexico.

Nevertheless, the industry is ripe for the fresh ideas and enthusiasm of new business graduates, especially those wanting to join the industry’s ongoing debates, figure in the daily re-tabulations of supply and demand dynamics and manage the people and systems who pull black gold from beneath the surface. There’s no lack of need for business minds that can grapple with the industry’s direct and indirect effects on the environment — and companies’ bottom lines.

One industry analyst puts it this way: Business school graduates



who are interested in a career in oil and gas exploration and production “must fully understand the workings of both global and domestic energy markets and be able to predict trends, forecast and react.” How simply stated. How difficult to do.

INCREASING WORLDWIDE DEMAND AND GLOBAL LINKAGES

Keeping up with global supply and demand and its impacts on the business decisions of exploration requires the greatest of analytical and forecasting skills, at both macro and micro levels.

On the big picture demand side, there continue to be incredible forecasts of increasing need. The U.S. Energy Department's Energy Information Administration expects worldwide energy consumption to rise to some 118 million barrels of oil per day by 2030. The world was consuming 'just' 83 million barrels per day in 2004. India and China comprise the largest forecasted

consumption increases.

While it's no secret that oil demand is cyclical, increasing or decreasing with economic changes, what is new is the degree to which oil's recent fluctuations have been affected by worldwide stock market gyrations and best guesses of *global* economic activity. Severe declines in stock and energy markets in early 2008 demonstrate the linkages.

After hitting \$100/barrel on positive economic demand signals in early January, oil quickly retreated below \$90/barrel as concerns over the U.S. economy's underlying health — caused by troubles in the mortgage industry — troubled investors.

After global stock market sell offs of 5 percent and more in mid-January, investment analysts at A.G. Edwards & Sons, now a division of Wachovia Securities, noted how "traders believe that ... slowing growth or a recession in the U.S. could lead to slowing

growth overseas, further compounding the drop in energy demand...Energy markets are inescapably linked to the equity markets for the time being as both of them are reacting to the same worries about economic health."

Now more than ever, E&P executives will need to keep a well-tuned ear to the global economy. They will need to listen for the signals that stock markets are sending about energy prices. They will be asked to increase shareholder value, manage balance sheets and finance their operations within global frameworks.

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DECREASING PRODUCTION.

On the supply side of the ledger, the E&P industry has been in heated debate for years over whether the biggest oil fields have hit their

peak in terms of barrels extracted per year. Some contend that the oil fields that have been giving up their treasure for decades are already declining. The year-over-year comparison rates are falling anywhere from 8 to 18 percent, the peak oil proponents say.

But, in typical form for the energy industry, there are profound disagreements about the extent or likely duration of the declining production rates.

For instance, the Boston-based



OR NOT?

Cambridge Energy Research Associates' (CERA) most recent study of 811 producing fields found far less deterioration of production rates, of only about 4.5 percent per year. And optimistically, CERA now says new fields in South America, Saudi Arabia, West Africa, the Caspian Sea and the Gulf of Mexico could change the equation for the better in coming years.

The trick for economists entering the oil and gas industry will be wading through the volumes of data and the conflicting opinions about the data, and then making forecasts that profit business operations.

For instance, consider the business ramifications of CERA's upside pronouncement that, "almost two-thirds (63 percent) of remaining reserves are associated with fields that are still either in the buildup period or on plateau, and are producing 59

percent of current production." That means there's room for production rates to grow — and more corporate expenditures on E&P — as more oil is extracted from the newer wells.

Adding even more optimism to the supply ledger, CERA will add newer projects to its future survey. Of the 350 projects CERA deems worthy of adding to future surveys, only 120 will come from OPEC fields to more accurately reflect the geographic diversification of energy sources as oil demand grows and prices rise. Newer fields will likely change previously dire predictions of production rate declines and the E&P industry humming.

POLITICAL RISK HEADACHES— DIVERSIFY AND CALL IN THE MORNING

Broader energy source diversification and the U.S. domestic industry's call to come home will also change how tomorrow's business school graduates perform their jobs. Analysts at the Independent Petroleum Association of America (IPAA) and the American Petroleum Institute (API) want the industry to rethink where the United States gets its energy.

"Wouldn't it be prudent to reduce our exposure to Middle East instability, civil unrest in Nigeria, political uncertainty in Venezuela, and accidents or natural disasters anywhere in the world?" asks Aaron Bernstein, a public information manager with the IPAA, the 79-year-old representative of independent oil and gas producers. The group advocates on behalf of U.S. E&P companies who develop 90 percent of U.S. domestic oil and gas wells, and produce 68 percent of domestic oil and 82 percent of domestic natural gas.

Analysts at API, who represent more than 400 corporations, from the largest major oil company to the smallest of independents, acknowledge IPAA concerns but think the train has already left the station in some respects.

API recommends that the United States strive to achieve 'energy security' rather than 'energy independence,' a concept the organization doesn't believe possible when this country already imports some 65 percent of its oil. API defines 'energy security' as moderation of demand, expanding and diversifying domestic energy supplies, strengthening global energy trade and increasing investments in emerging energy technologies.

The high price of oil is actually helping the U.S. E&P industry retreat from some of its international pursuits. The ratings firm, Moody's, reported in September that E&P companies are decreasing their exposure to international assets, to reduce geo-political risks. Technology and higher oil prices are increasing the chances for profitability of extracting oil for oil sands and shale, as well as the deep waters of the Gulf of Mexico. Whether public policy will further encourage this trend — or whether a collapse of the price of oil reverses it — remains to be seen.





\$100,000
PER YEAR

“The current shortage has produced record high starting salaries — at or near \$100,000 per year — for entry level geoscientists.”

BOOMERS, BOOMERS, EVERYWHERE

Perhaps the biggest threat to tomorrow's energy supply could be the lack of people who are qualified and experienced in finding and extracting oil and gas.

While virtually every U.S. industry is planning for members of the Baby Boomer generation to begin retiring en masse in coming years, the exploration and production industry may be particularly hard hit, industry analysts say.

“What is now a problem could become a crisis as 50 percent of the energy workforce will become eligible for early retirement in the next ten years,” states Will Green, president of the American Association of Petroleum Geologists (AAPG).

The industry term “Big Crew Change” depicts a story that goes like this: Many Boomers have worked for a single E&P company their entire career, and they are strongly considering taking their retirement when they turn 55. The oldest Boomers, born in 1946, are now 62 years old. Because the oil industry had a period of extreme cyclical downsizing in the 1980s, many think there aren't enough people in the middle layers of E&P corporations to take the reigns when Boomers ride off into the sunset. The retirements could affect every E&P business at all management, operations and production levels.

Since 2001, the API, AAPG, and the Society of Petroleum Engineers have been developing programs to encourage more young people to enter

the engineering, geology, operations, and crafts training work needed for exploration and production. For the purpose of ensuring business operation continuity, management and information technology consulting firms like IBM, Booz-Allen, Capgemini and Schlumberger have been developing programs to assist their multinational oil industry clients in capturing the knowledge of outgoing workers while bringing younger workers up to speed with competency programs. Quickly.

To stop the knowledge departures, companies are also scrambling to attract new workers the old-fashioned way, with excellent compensation and benefits packages.

“The current shortage has produced record high starting

THE POLITICS OF NON-PRODUCTION

New industry entrants will not only have to consider supply, demand and workforce issues, but also the

game-changing laws that politicians and regulators frequently develop to tackle environmental issues. In many ways, policy makers are working to discourage production by discouraging consumption.

For instance, in late 2007, Congress passed the Energy Independence and Security Act of 2007, a set of laws that require Detroit carmakers to raise the mile-per-gallon achievements of the entire fleet of cars and trucks they manufacture by 2020. The Act also sets mandatory requirements for alternative fuel production. In signing the bill, President Bush said that the bill would reduce U.S. demand for oil, and by extension, reduce pollutants and contributors to climate change.

Will Green, president of the AAPG, thinks the bill will have little effect on the oil and gas industry because of the dominance of oil as a fuel source.

"The demand for hydrocarbon fuels will continue to rise as long as the economies of the developed countries remain at least stable and growth continues in the developing economies — especially China and India. Conservation and efficiency will tend to slow the growth in demand at best," Green said.

salaries — at or near \$100,000 per year — for entry level geoscientists," confirms the AAPG's Green.

And, as reported in *Oil & Gas Investor* magazine, the human resources consulting firm Mercer saw a 5.8 percent rise in base pay for energy workers in 2007, compared to 3.8 percent for all industries.

Business school graduates who venture to work in the E&P field will find themselves smack in the middle of one of the greatest corporate efforts in history to transfer knowledge and experience from one generation to another as they work to meet production goals for rising demand.



CLIMATE CHANGE AND E&P

Future industry leaders will be required to react to the global concern that too much supply encourages consumption and adds to the problems of climate change. Companies will need to go beyond the effects of calculating the dampening effects of conservation and develop business operations profit and loss models that include entries for carbon sequestration, allowances for carbon taxes and funds for research and development of biofuels.

But sometimes overlooked are the effects that climate change will have on the practical needs for energy.

While not committing to one side of the climate change debate, IPAA's Bernstein similarly speculates on the effects on energy choices.

"The most likely scenario is that natural gas will be a beneficiary of global climate proposals if the supply is made available in the Gulf of Mexico and Intermountain West," Bernstein says, pointing out that natural gas is a vital component of alternative and renewable energy production like ethanol.

The most realistic and pragmatic approaches to addressing climate change will continue to involve E&P companies in one way or another.

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NEW CHALLENGES NEED NEW PEOPLE

The slate of external issues facing E&P companies may seem daunting, but they offer opportunities for advancement and professional growth like few other industries. The world will continue to need energy long into the future.

And while external challenges grab the headlines, it may be the internal dynamics of the industry's companies that need the most change. Not only are companies planning for the Big Crew Change at their operating levels, they are also considering calls for new types of leadership and governance.

A Moody's report published late last year found that most E&P company boards have directors with deep oil and gas industry experience who are well-suited to the challenges of domestic and international E&P activities. But, the report noted, the potential for "provincialism" and "group think" should spur companies to rethink the make-up of their board directors. Too many similarities in directors' experience may not be up to future challenges of rising project costs,

volatile commodity prices and environmental reputation risks, according to Moody's. The need for new blood, new thinking and new experience could be the right formula going forward.

As the next generation of business school graduates step into the new positions at E&P companies, the opportunities for new achievements in excellence abound.

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