

## Challenges for the E&P industry in the 21st Century

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### INTRODUCTION

I appreciate the opportunity to spend a short time in your beautiful city and share some of my thoughts on the *challenges facing the E&P industry in the 21st Century*. As we look into the future it is somewhat easier to predict the problems than predict the solutions. The challenges I see for our industry **include successful exploration — new relationships/changing role of the industry players — technology**. And — **constraints on the industry**, these are interrelated and they apply to majors, independents and national oil companies.

But before we look at these issues, what about prices? — I will not dwell on these too much but let me at least set the stage: the general industry forecast is for continued *volatility prices* over at least the next decade with little real growth. *Baring significant disruptions* in oil production or supplies, world oil production capacity should meet the world oil demand well into the 21st Century. What will be the average oil price? — I do not know but it is likely there will be periods when prices will be closer to \$15/barrel and periods when prices will be \$25/barrel and above — *very much like the last year*.

Gas prices are generally tied to oil prices and are an important factor in the profitability of our industry. An increasing percentage of our industry's assets are focused on gas production and its transportation to markets, often thousands of kilometers away. Gas prices depend on factors as diverse as the distance to market, the cost of alternative energy sources, and increasingly the environmental premium placed on gas as a clean fuel. Because very large investments must be made in pipelines or LNG plants, — gas sales contracts usually are capped on both the upside and the downside to dampen price volatility and ensure adequate margins.

If I had given this speech five years ago we would have spent much of the time together trying to speculate on price. Yet this industry is a price taker, it has to operate under the market conditions

for the commodity we supply. Many of our challenges surround dampening the effect of price and making the returns on investment competitive irrespective of the commercial environment. So what about the challenges?

### SUCCESSFUL EXPLORATION

Our industry is a depletion industry and unless companies replace reserves they will eventually go out of business. Not only must we replace our reserves but we must also do it in a manner which will add value. *Successful exploration* is the single most effective method for creating value and growth for oil companies, governments, and indeed the whole industry. However McKinsey's recent study on upstream performance estimates that non-government oil and gas companies have eroded shareholder value to the tune of more than \$450 billion over the last 15 years due to unsuccessful exploration and the high cost of adding and developing new reserves. In Malaysia alone the industry has spent in the region of \$1 billion dollars on exploring the post 1985 PSCS and to date none of these companies has received a return on their investments. This value erosion cannot continue if our industry is to remain healthy.

For the majors and larger independents the challenge will be to replace their current large profitable fields. For the national oil companies the challenge will be to attract continued investments in their maturing or frontier areas. For the service industry the challenge will be to provide the goods and services required to explore and produce hydrocarbons, at the lowest possible cost. Trends recognized in the past will continue however the challenges will be greater as the industry pursues ever more elusive reserves.

Outside of the Middle East and the CIS the majority of the world's basins are maturing — the field size and profitability of the recent discoveries in these basins have been declining. In the last 10 years no new hydrocarbon provinces have been discovered on the scale of *the North Sea, the Malay*

and Sarawak Basins, or the Bass Straits in Australia. One could argue the Gulf of Mexico deepwater is an exception. There have been some very significant discoveries in Columbia, Yemen, Indonesia, and west Africa, but no new basins have been opened by industry.

### The Future of Exploration

Can we expect attractive exploration opportunities will be available 15–20 years from now? Probably — but acreage in deepwater, acreage in hostile or difficult environments, acreage in disputed or conflict areas, will increasingly be the exploration playground of the 21st Century. In many areas *technology* will be a critical element for success, in others *acceptance of higher political risk* may be required. In some cases the industry may provide the catalyst to resolve long standing disputes that have kept attractive acreage off limits for many years.

Many major companies are adding to their reserve base by the acquisition of interests in large discoveries or fields. These opportunities are occurring because governments of countries as diverse as Russia, Venezuela, the former CIS republics, and Algeria, are opening up their energy industry to foreign investment. This trend will continue into the 21st Century and competition for good acreage, capital, technology, and expertise will increase. All companies are faced with more quality opportunities than money to invest; this is reality.

### Fiscal Terms

The countries that will appear most attractive to private investment will be those that are willing to provide competitive contract terms and long term stability — *politically, economically, and legislatively*. Host countries must provide a *reward commensurate with the risks undertaken*, or capital will flow to countries with more attractive prospectivity and fiscal regimes. Most fiscal regimes reward those companies that have taken risks to establish a production and income base. Companies who do not have income in a country can only maintain a presence as long as they believe that there is a good chance to show a profit. Once a company exits a country it is much more difficult to re-attract it unless a major new hydrocarbon province opens up. Because of the long lead time from exploration to first production, governments must be willing to significantly improve their fiscal regime long before production declines.

## NEW RELATIONSHIPS/CHANGING ROLES

This will call for forging new relationships between companies and countries that have had no history of working together. The companies that will be most readily acceptable to nations opening their borders will be those with *demonstrated project management skills, financial strengths, leadership, a history of technology transfer and development of local talent and a track record of environmental responsibility*. The relationships will prosper if they are *based on sound business judgment and commercial interests that demonstrate a potential win/win situation for all concerned*.

We are witnessing a constant change in the competition brought about by private companies, state monopolies, financial institutions, pipeline and service companies as they forge new business relationships and create strategic alliances. For example competitors are now viewed first as potential partners and second as the competition. The privatization of national oil companies is also likely to continue in the 21st Century.

Banks and other leading institutions are assuming a more active role in bringing governments and potential investors together. In this new role, lenders are more willing to take risks with their oil and gas company clients. Service companies are increasingly taking on roles performed in the past by the oil companies. They are forming operating alliances with their clients to focus on improving both companies technical and economic performance.

### Doing Business In A Global Environment

The upstream industry is today conducted in a truly global environment. This offers new sources of oil and gas, new energy markets, and unfamiliar economic and political systems. Unrelenting competition is forcing the industry to focus on speed and efficiency. The old ways of doing business are no longer applicable. For a company to weather the extremes of product price their asset portfolio must contain a balance of long term versus short term investments and a balance of political risk, geographic location and oil versus gas. Portfolio management will continue to be all important in this global market.

A good example of a global business is the efficient development and delivery of gas supplies to markets. Regional pipelines are the most efficient

way to distribute large quantities of gas over thousands of miles from producing areas remote from markets. However it is only in North America, Western Europe, and Russia that regional gas pipeline infrastructure exist. The challenge for the industry is to overcome the mistrust between nations and design and build an infrastructure network that can most efficiently supply a region with its energy needs. Regional pipelines will be one of the greatest challenges in the next ten to twenty years.

In the 21st Century the E&P industry will be moving further downstream as a supplier of energy rather than a supplier of oil or gas. In many cases this is the only way that companies can capitalize on significant gas discoveries in areas remote from markets or in developing countries where there is a market for electricity but insufficient expertise or financing to build the generating capacity. In the last quarter of the 20th Century the world growth in LNG has been one facet of this trend but to date all LNG is sold to industrialized nations. In the 21st Century the growth market for energy will be in developing countries where the industry will need to participate directly in the generation of electricity or the delivery of gas to the consumer. Industry leaders will increasingly be participating in the entire energy value chain — from exploration, through *production, transportation, power generation*, and finally, *delivery of energy to consumers*.

## TECHNOLOGY

Technology has shaped and will continue to shape our industry in many ways. Technology breakthroughs in recent years have enabled us to find and develop oil and gas at much lower costs than just a few years ago, to be able to recover more from existing reservoirs — and to do so while improving our environment record. Continuing to develop technology to further reduce costs of finding and producing hydrocarbons will be the primary challenge for the 21st Century. On average the industry recovers only about 25%–30% of the oil in place in a reservoir — technologies that can significantly improve this recovery factor have the potential to add huge reserves and value to the industry. Other technology challenges are:

1. To improve subsurface imaging; to be able to directly detect and differentiate fluids and rock characteristics from seismic data.
2. To improve subsurface characterization technologies to reliably characterize rock and fluid properties — to visualize the subsurface — and to reliably predict reservoir fluid flow under a variety of development schemes.

3. To extend horizontal and extended reach drilling techniques and develop multiple isolated laterals from a single vertical root well.
4. To improve subsea and floating production technology by introducing new low cost materials and designs that do not compromise safety and structural integrity.
5. To extend or redefine LNG technology to allow us to exploit small, remote gas resources. For example development of floating LNG plants that could be reused once a field is depleted or achieving economic gas to liquid conversion technology.
6. To develop technologies that reduce water production or provide advanced separation techniques for both gas and liquids.

## CONSTRAINTS ON THE INDUSTRY

There are a number of constraints that will challenge the industry in the 21st century.

### Cost Reduction and Efficiency Improvements

In order to improve margins the industry has made an unprecedented effort over the last 10 years to reduce costs in all its activities and operations. While there will always be some scope to reduce costs there is also a limit to what can be achieved. Already we have seen a significant movement in the provision of services and support from the oil companies to contractors. There are fewer areas that the oil companies consider core to their competitive edge and retain in-house. This outsourcing can be expected to continue as long as the contractors can provide acceptable services at reduced cost.

Significant cost and efficiency savings have been made by alliancing between the oil companies and the contractor industry. When properly structured alliancing rewards the companies involved in a joint project when they work together to significantly reduce costs. For alliancing to work effectively the traditional roles of the oil companies, contractors, and fabricators are dramatically changed. Alliancing and partnering have been successful in the Gulf of Mexico and the North Sea — both relatively mature areas. There is tremendous scope to achieve comparable savings around the world but stringent procurement policies, local content policies, and mistrust are all obstacles that must be overcome. It is understandable for under-developed nations to try to protect their industries from competition but as a nation develops there comes a time when this is unacceptable. The higher cost environment can deter investment or *render* discoveries uneconomic. *This results* in a great loss

of revenues to the state.

### **Environmental and Government Constraints**

Governments can also discourage investments in a number of other ways. The lack of clarity on the approval process and the long delays in obtaining approvals to proceed can render projects unattractive and increasingly deters industry investment. Our industry's environmental record in the last 30 years has been enviable — every day more than 40 million barrels of crude oil and products are produced and loaded onto ships and transported across the world's oceans safely and efficiently. Yes there have been accidents but we have shown responsibility in mitigating the effects and preventing them in the future. Mobil alone spends over \$1 billion a year on worldwide environmental programs and is committed to preserving the environment. However environmental decisions in North America and Europe are frequently made in the heat of emotion and do not consider the economic and social impact of these decisions. We are going to have to do a better job explaining our industry to environmentalists and social reformers or we will be driven away from geologically attractive areas.

One of the bigger challenges governments will give us in the next century is the use of sanctions as a foreign policy tool. Unlike the manufacturing industry, we cannot so easily choose where we do business. We go where the geology is right — sometimes to some very inhospitable places both in climate and in politics. We'd like to think that we improve our little corner of the countries we do business in, and we argue for constructive engagement rather than disengagement to resolve political differences. Unilateral sanctions will not change the situation. As an American company,

we are even more concerned by the use of secondary sanctions — that is the propensity to impose sanctions on non U.S. companies doing business in "non favored" countries. These type of sanctions create havoc on the world trading system and could cause a trade war and reprisals. We all suffer if that happens.

### **Resources (Capital and Human)**

The challenges facing the E&P industry in the 21st Century will be addressed by the capital and human resources of the industry. Capital for investment will only be available from a profitable industry. Government restrictions on the industry, excessive government take, onerous environmental regulations, and excessive red tape can all impact the capital available and the incentive to explore and produce hydrocarbons in the 21st Century.

The industry's human resources are the sole source of the technology, project management skills, field development skills, and business skills that will be brought to bear on the problems we can face in the 21st Century. The industry has experienced a decade of wrenching change with over 500,000 jobs lost in the U.S. alone. In striving for efficiency we may have eroded the human element in our business. As a result of the downsizing and lack of entry level hiring there are few members of our industry that are younger than 35, or older than 55. The industry currently has an extremely valuable resource in these people but for the continued health of the industry work force renewal will be necessary if we are to transfer the technology and skills from one generation to another. After all, it is the next generation of geoscientists, engineers, managers, and business people that will meet our industry's challenges in the 21st Century.

Thank you for your attention.

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