

# O s p n e n c e - r



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We are seeing oil and gas prices dropping—perhaps more sharply than some of us expected. Where do you see the market going in the next six months to a year?

The structure of the energy marketplace is really unchanged. Patterns depend on seasons; the fall is a perfect example. The driving season, at least in North America, is very summer focused, and as it comes to an end, there's a reduction in fuel consumption. Because of temperate climates, people don't have large usages of either air conditioning or home heating during September and October. People tend to forget that a year ago they had similar patterns and two years ago and so on. But the underlying structure hasn't changed, and that is why both the United States and the world marketplaces are challenged.

We have seen such a dramatic increase in demand worldwide over recent years, and that increase has translated into very tight markets because the supply side doesn't react quickly to changes on the demand side. In addition to the glacier-like pace that new production usually proceeds at, you also have regulations and not-in-my-backyard attitudes about energy production. My suspicion is that we are going to see a trend—particularly in oil and gas markets—toward higher prices than we have historically had.

There is very little spare oil production capacity in the world today and very little spare refinery capacity, so that makes a tight market likely. Without much spare capacity, you're at the mercy of any type of fluctuation. On the gas market side, you have the challenge that North America doesn't produce any kind of gas excess anymore. We quickly consume all that is produced here, so we depend on imports. We have only four

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receiving terminals at the moment, which is going to make *that* marketplace likewise tight and very vulnerable to events that could make the situation even worse.

## Do you see much chance that the supply balance is going to change?

We put a lot of impediments in the way of the supply side. There are the not-in-my-backyard challenges to new production. We've seen this most visibly with the debate over Alaska oil that has gone on for decades, but we also see it in the offshore moratorium on gas development. We see a lot in terms of infrastructure issues, and that is why we don't have new refineries and have a hard time building new transmission lines. We have the impediment of the environmental regulations that have sharply increased the challenge of building new facilities, and we have safety concerns because of the war on terror. We also have energy-producing countries that seem quite willing to use oil or gas as a political tool. Then we have natural disasters, which we saw with Hurricane Katrina, that threaten the delicate balance. It is going to be very hard on the supply side to ever create the kind of spare margin that we used to have.

You've been quoted about the need to further integrate the U.S. gas market with the world gas market—inevitably that means liquefied natural gas, LNG. What do you see as the challenges of market integration?

A survey conducted by the National Petroleum Council while I was Energy Secretary concluded that by the year 2020 to

2025, the United States will find itself importing as much as 25 percent of its natural gas from beyond North America. That is a staggering number because we are a country used to being self-sufficient in terms of natural gas supply. Deploying new nuclear plants will take a long time, if we can even move in that direction; there is still strong environmental resistance to coal, and it is hard to imagine a sharply increasing number of renewable energy sources. So gas is going to, over the next couple of decades, really become the pressure point in terms of the market for demand. How do we satisfy that?

We have to build new LNG facilities in the United States, and we need to see a world marketplace for gas develop so that the ample supply in places like Russia and Qatar can get to the U.S. market. It is going to be challenging. In the Gulf of Mexico, we will be OK because a number of facilities are well on the way to development there. But we need West and East Coast regasification facilities. Politically, it is going to be very hard to get those sited and built. The costs may result in a little more public acceptance, because if home heating bills keep going up and if people start finding their electricity bills unacceptably high, they are going to demand action.

We have also seen some efforts to try to move toward coal gasification or clean coal resources and perhaps nuclear power. How do you see the contribution of either coal or nuclear resources?

Building more nuclear facilities is going to take time because of the political concerns, because we don't have an acceptable way to dispose of nuclear waste, and because we haven't licensed a third-generation reactor through the Nuclear



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Regulatory Commission. Although I think the chances are pretty good that we can see a new fleet of nuclear power plants begin to be deployed, we are still talking 10 to 15 years.

With coal, it can happen a little quicker. The government during my tenure put a substantial investment into a new-generation coal plant called FutureGen, which not only would be a gasification facility but also would engage in carbon sequestration technology and would prevent most emissions. The good news is that a huge amount of activity is going on in emission-control technology development. You're going to see some very exciting new technologies available to coal-fired power plants that can help reduce emissions dramatically and technology that can address carbon emissions.

One of the interesting aspects of looking at energy use in the United States is how much liquid fuels still control the transportation sector. Can we increase supply of the transportation sector, or do we need to move toward tightening efficiency standards of automobiles?

The public is going to be inclined toward more fuel-efficient vehicles. The problem is that if you make cars more fuel efficient, driving is cheaper, which means you probably get more driving, which means you don't have a direct one-to-one offset in oil consumption. We are seeing the emergence of new types of fuels that are likely to play bigger and bigger roles in the marketplace. You're going to see a real movement toward biofuels, and that may be speeded up by some of the programs the Department of Energy is launching.

In the next 10 to 25 years, you're going to see the development of not only ethanol products but also more advanced E-85 ethanol. I was at a conference recently where we learned about some advanced ways that ethanol and biofuel products may be available in the future. The longer-term hope is that hydrogen fuel cells can become the propulsion system for vehicles, but that is multiple decades away.

Some have argued that the transition to a hydrogen economy is, as you say, several decades away, and the transition period we're going through is also burdened by the issue of greenhouse gas emissions and the carbon level in the atmosphere. How do you see that sort of situation working out?

We now have three strong arguments in favor of investing in and incentivizing research and technology to address the challenges. First, we have the price signal: Because prices are

going up, you have a lot of pressure to develop new technologies, find alternative ways of doing things, and enhance efficiency. You have the environmental signal: People are looking for new methods of generating electricity and motor vehicles that emit fewer pollutants into the environment. And you have the national security element as well: The desire broadly shared in the United States and many industrial countries is to reduce dependence on imported energy. I am optimistic that we will have the fortitude to spend the necessary money required for the transition as well as the consumer acceptance of new alternatives.

The carbon area that you mentioned requires us to address not only the transmission or the transportation side of the equation but also the power side. As I said earlier, we are seeing new technologies both in terms of how we manufacture and operate the plants and facilities and in how to capture and contain the carbon. The work now is going to result in some real forward progress, but it is all going to be a function of technology.

Given the strength of the pricing, do we still need additional governmental intervention in terms of greenhouse gas controls or standards?

I think that regardless of which approach you take in terms of framework—the approach that Kyoto has suggested, the approach being recommended by some members of Congress, or the approach that has been embraced by the Bush administration in terms of carbon intensity in the economy—any of these require not government so much as technology. Countries will never meet the Kyoto standards that have been set; in fact, they are already failing in their efforts because the choice right now is a weaker economy or an increase in greenhouse gases. No country is going to undermine its own standard of living to meet a Kyoto standard.

We tend to think of energy-saving technologies only in terms of “Can you manufacture hydrogen cars?” or “Can you gasify coal?” or “Can you just build enough nuclear plants?” But many other ways can be effective. By constructing green buildings, you can substantially reduce the energy demands of commercial properties, for example.

The issues important to the readers of this publication—creating greater energy efficiency in buildings, removing energy standards, creating sustainable buildings—how do you see that information getting out to developers, operators, managers?

I have heard complaints from many associates in the develop-

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ment sector about how the price of energy has dramatically altered the cost of commercial real estate. Some of the work the Green Building Council and the Department of Energy have done to provide better information hopefully can be better received now that the bottom line is starting to be influenced. Unlike, for example, in terms of fuel efficiency in motor vehicles, a building will be used under any conditions.

One of the issues we touched on earlier in talking about the energy markets globally is the potential vulnerability of tight markets to disruptive events. What is your view on how current foreign policy issues are impacting this market?

The world's problem, not just America's, is that you have a very substantial concentration of energy assets in the hands of governments that either are interested in using that leverage to influence other countries' behavior or are perfectly willing to collaborate with terrorists. If, for example, Venezuela stops selling oil to the United States and starts selling to Country B, then the supplier of Country B can start selling to the United States. The problem you have is if Venezuela says it's just going to cut back on production to teach somebody a lesson, or Iran says that, or they say it together—and all they would need is a one-third reduction in each of their output, which would be about 2 million barrels a day—that would throw the market into a huge dilemma because of the very tight market. Prices would be driven up immediately, and those countries would probably end up with a net revenue outcome because the price would go up enough to offset their reduction in terms of output. But the political points they would score and the harm they could cause our economy and the economies of other countries would be quite devastating.

Terrorist groups will recognize the same situation, realizing that the slightest upheaval in the energy marketplace, an attack on a major energy asset or assets could likewise cause prices to spiral out of control. The greatest security threats are to energy assets and to the energy marketplace because if you undermine the energy balance that we have in the world today, even slightly, you will cause immense pain not just to the United States but also to almost all the countries of the world.

In addition to unfriendly countries or those that are in collaboration with terrorist groups and that have major energy assets, some countries are simply unstable. It is a fur-

ther indication that we need to diversify the fuel supplies, address some of these questions about consumption, and develop some new technologies, new kinds of fuels, to try to dramatically reduce the intense dependence we have on a few countries.

Given the integrated world market, the United States will never be energy independent in oil and gas, but can we increase security?

If you don't build a nuclear power plant for 30 or so years, as we have not done; if you don't build new refineries; if you make your offshore areas inaccessible for development; if you don't open up a tiny part of Alaska for oil development—and you don't have a commensurate reduction in demand—then you put yourself in a much more vulnerable position. We must have sources of energy, and we still would need to import energy; it just would be nice not to have such large percentages to import, and it would be nice to be able to trade with more countries, to have access to gas from all parts of the world. The failure to build a West Coast gas receiving facility means that huge amounts of natural gas in Australia are not coming to the United States.

About 70 percent of electric generation in France is nuclear. We produce about 20 percent. By not building nuclear plants, we have ended up making natural gas the fuel of choice for power generation.

That is exactly right. By not building new nuclear plants, we have put ourselves in a situation where in a few years, the percentage of our power generation provided by nuclear energy is going to decline substantially. By 2020, if we don't build a new plant, it will be about 14 percent, and then it will start going down from there because plants that have been in existence a long time will slowly age to the point where they can't continue. How do you make that up? Right now, almost all of it is being made up by natural gas, but demand is so high, we can no longer produce enough gas ourselves, so we have to go somewhere else to get it. That means we have to build stations to receive it, but we haven't built any of those either, and that is going to drive the cost of natural gas ever higher. These individual decisions then lead us again in the direction of greater dependence on foreign energy assets and higher prices.

The readers of this magazine are people who invest in real estate. Are there things the investment community ought to be focused on in terms of developing supply, renewable resources or conservation?

I think you are going to see a growing investment in new fuels and renewable-energy-producing facilities, whether it is in the area of biofuel, ethanol refineries, etc. or in the area of wind farms and other similar kinds of production facilities. People would be very wise to invest in funds or specific projects that are low-energy-using facilities, buildings, sites, where the bottom line will be improved because of these kinds of technologies. Investing in properties that will have lower energy consumption is a great way to hedge against the very same uncertainties and potentially skyrocketing energy costs that could emerge if you had a geopolitical or another energy disruption. You are also going to see a lot of investment in new technology development: emission-control technologies, other forms of energy conservation technologies, and enhanced-recovery technologies where we can get more from existing energy sources. I strongly believe there is a great opportunity here particularly in the real estate sector, and I am currently working with the Bond Companies on the development and implementation of investment strategies targeting the utilization of sustainable building materials and technologies.



Are there simple fixes in terms of control systems and buildings and things of that sort that people ought to be looking at?

Certainly, homeowners can do some things to help themselves. Programmable thermostats are not very expensive, and they can help save a lot of money. In some communities, local utility companies provide customers with information on how to reduce their net energy usage by moving certain functions they perform to off-peak times. In the construction of new projects, the ability to capitalize on already-existing energy-efficient technologies—windows and lighting and even just the shapes and architecture of buildings—is already available. There are new and more efficient heating and air conditioning systems available and tax incentives to obtain some of them. People may not be aware, but there are tax savings in replacing a furnace or an air conditioning system. The Energy Star appliance programs provide information as to which appliances have the lowest energy costs.

If the energy markets are going to remain tight, do building owners and investors need to hedge against the risk of tightening supplies and higher prices?

Yes, I guess I look at it this way. Within the next five years, there is an extremely high probability, if not a certainty, that one or more severely disruptive events, whether natural disasters, terrorists acts, or actions taken by governments with huge energy assets, will occur that will cause the energy markets to skyrocket. And what we have seen in energy is that the numbers go up pretty quickly but come down much more slowly, even if the initial problem goes away. If it is a terrorist act, the numbers won't come down at all. If your investment is in a specific energy asset itself, like a power plant, or in something that has very substantial energy price sensitivity, like a commercial real estate project, the best way to hedge against it is to try to make sure you are finding the most energy-efficient process, tools, materials, or other assets in your investment.

Given the risks in the next five to seven years that there will be disruption and given the way markets react to those events, are we wise to continue to move electric markets toward a more market-oriented structure?

I think what is needed in terms of the electricity market is a more realistic understanding of where the world is today. It is not the 1930s; it is 2006, and a lot of things have changed. One thing that has changed is that nuclear power is safer. New-generation reactors will be more proliferation resistant, and they will be very competitive in the financing sense. Another thing that has changed is that better emission-control systems are on the way, and the cost of emission controls is not as high as scrubbing equipment was in the past. The regulatory arena has to be prepared to facilitate changes in emission-control technology to accommodate the new technologies and innovations. And you have to be willing to be flexible about the marketplace to allow some new investment to come in. I think the strong resistance to any changes in local utility companies' management or ownership and so on has a high probability of being counterproductive.

I appreciate your time today. Do you have any last comments you'd like to make?

I think the good news is that there are a lot of things people can do in the short term, particularly the people reading this interview. I urge them to be very scrupulous in identifying ways they can ensure their own investments do better and at the same time contribute to the solutions for the energy challenges we face.

Thank you. ■