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As in each of the last 11 seminars that preceded it, the XII Repsol YPF-Harvard Seminar, held during July 2001 in Palma de Mallorca, Spain, brought together an outstanding group of participants representing governments, industry, and academia from over a dozen countries for two days of informal presentations, discussion, and reflection on changes in world energy markets and the implications for public policy and corporate strategies.

But unlike earlier gatherings which have largely revolved around oil and gas developments, *Energy Liberalization and Regulation Revisited* focused on electricity restructuring, with particular emphasis on the recent crisis in California. In addition to two keynote speeches, the Seminar was organized around three panels, each launched by several short, invited presentations and followed by general discussion and debate among all attendees.

And once again, one of the participants was given the responsibility of serving as both rapporteur and guest editor responsible for
making sense of and memorializing what had transpired, first orally at the end of the Seminar, and later in these published Proceedings.

The participants are indebted to Repsol YPF and Harvard University, in particular to Alfonso Cortina, Chairman and CEO of Repsol YPF, Jose Luis Diaz Fernandez, President of Fundación Repsol YPF, and Professor William W. Hogan of the Kennedy School of Government at Harvard University for their efforts this year, and each year, in assembling a distinguished group to debate challenging topics in magnificent surroundings in Spain, and last year, in Argentina.

Of course, many others at Repsol YPF and Harvard devote time and energy to the Seminar, including Juan Bachiller, Eduardo Garcia, Nuria Henche, Susan Meyers, and Sylvia Pilath. Kim Pederson of EditHeads, Marblehead, Massachusetts, converted the presentations into clear and concise text. The staff at Puritan Press expertly converted text into print.

Needless to say, what appears in these Proceedings reflects the views of the speakers and not necessarily those of the entities with which they are associated or of the organizers of the Seminars.

On a final note, there can be no greater proof of the accuracy of the ongoing theme of these gatherings, that energy markets change with blinding speed and unexpected consequences, than two developments that have occurred since we met in Palma de Mallorca. Enron, a frequent participant in the sessions and a leader in the battle for energy deregulation and the creation of new markets, collapsed under the weight of its accounts, though the markets it helped launch have survived the demise of their creator. And Argentina has found it impossible to maintain its dollar peg, with consequences for investors, including our host Repsol YPF, that are still to be determined. These and other developments are subjects for further consideration at our 2002 meeting, where we will “think the unthinkable.”

Bijan Mossavar-Rahmani Constance Burns
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ENERGY LIBERALIZATION AND REGULATION REVISITED
It is a great pleasure to welcome you to the XII Repsol YPF-Harvard Seminar on Energy Policy, with its focus on *Energy Liberalization and Regulation Revisited*. Last year, in December 2000, we held the Seminar outside Spain for the first time. Those of us who took part in the memorable sessions in Buenos Aires remember the warm welcome we received from Argentina’s government, energy industry, and media. This year we are enjoying the equally cordial hospitality of Palma de Mallorca, a city and an island whose unique culture reflects the civilizations that have ruled here: the Roman, the Moorish, the Catalan, and the Spanish.

Mallorca’s strategic location at the center of the Mediterranean civilization and commerce allowed its citizens to accumulate great wealth from trading. In the late Medieval and early Renaissance centuries, the city achieved particular prominence, as Palma’s magnificent buildings—including the Cathedral and the Lonja—attest. Not surprisingly, this wealth attracted attack from the various warring powers in the area, but the city and the culture endured.
In more recent centuries, Mallorca has discovered a new source of wealth. Its strategic location and splendid natural beauty have made it a major attraction for tourists from Europe and around the world. More than 16 million travelers pass through its airport every year. Mallorca serves as Spain’s representative to the constant flow of international visitors even as it maintains much of its traditional way of life. I know we will find the island a pleasant setting for our deliberations over the next two days.

Energy sector liberalization has been growing worldwide, in scope and importance, for more than a decade. It has had a major impact on national governments and economies, of course, and also on energy companies. But the crisis that has erupted in California’s liberalization program points out the need for a review of the process and progress of liberalization. We structured the XII Repsol YPF-Harvard Seminar to offer such a review. We have centered our discussions on a micro focus—what has happened in California—and a macro focus—what is happening around the globe. We also have included a discussion of how liberalization has affected the energy industry/media relationship.

The California model had been presented as a perfect example of liberalization, and it has been adopted in local formats by many countries, including Spain. Now, a few years on, the failure of this system leads us to question the reliability of theoretical models when applied to difficult economic realities. Its current difficulties make it a case for study and a source of concern for many governments, regulatory bodies, and power companies worldwide.

The main features of the California power deregulation included a retail rate cap, compulsory use of the spot market, free choice of supplier, and vertical de-integration of utility companies to separate the traditional activities of power generation, transmission, distribution, and marketing. California’s new system appeared to work adequately from March 1998 to May 2000, a period when there was an excess supply of power.

From the summer of 2000 onward, when the supply-demand balance broke down, wholesale electricity prices in the state shot to
record highs. At the same time, a decline in the available generation capacity resulted in skyrocketing prices, shortages, and rolling blackouts. Until a few years ago, most Americans had never heard the term “rolling blackout”; today, everyone in California is familiar with it, and many in other U.S. regions wonder if similar events will become a day-to-day occurrence in their own states. Furthermore, as a result of the rate freeze and price caps, several major California utilities face a worsening financial situation, including bankruptcy.

According to the experts, structural problems are at the heart of the California crisis. Among the most important are the following:

• New generation capacity and facilities for natural gas and power transmission were lacking. This gap was caused by environmental restrictions, long and complicated site approval procedures, and inadequate regulatory legislation that failed to stimulate investment.

• The energy market was structured in such a way that companies were forced to separate their activities and divest generation plants, thus weakening their business structure.

• A system of price caps prevented normal market mechanisms—for example, a demand response mechanism to price increases—from operating.

Even as we consider the events in one particular corner of the globe, we should not forget the larger issues that are raised by liberalization. Companies and their shareholders take on the risk of developing energy markets through their investments in new infrastructure and production plants. Large investments are also required to ensure the renovation and efficiency of existing energy facilities. These may only be financed if there is a close, flexible relationship between companies, financial institutions, and capital markets.

We speak of the advantages of the free market, but governments and regulators have shown great reluctance to giving freer rein to markets and their agents. In fact, these bodies often attempt to direct the market by imposing price and supply policies, even to
the point of controlling investment, employment, and diversification strategy. Such actions increase regulatory-induced risk and reduce the opportunities for developing financially viable projects.

As we hear about liberalization elsewhere, we should keep in mind the following valuable lessons from the California crisis:

- The creation of truly open markets, where operators and agents may trade freely, is essential.
- The vertical integration of companies should be preserved in order to reduce transaction costs, provide risk coverage, and optimize investment.
- The building of new facilities should be encouraged through better coordination between companies and government agencies and a shortening of the time involved in granting permits.
- Operators in a deregulated market must receive a sufficient return on their investments.
- Market forces should be allowed to work freely, that is, end-users should be charged realistic prices.

One clear lesson to be learned from government intervention in markets, one that no doubt will be discussed vigorously in our sessions, is that excessive regulatory intrusion may provoke tightness in the energy market, to the inevitable detriment of consumers.

While oil is still the fuel of primary importance to the Seminar audience, this year, for the first time, our Seminar will not concentrate on oil markets. Rather, the electric power market dominates the agenda. This gives the Seminar a “pan-energy” focus that reflects the current preoccupation of the global energy industry. We will, however, in keeping with tradition, open our proceedings with a review of the international oil market before launching into our discussions of the progress of liberalization in the energy industry.

We are honored to have Chakib Khelil, Algeria’s Minister of Energy and Mines and President of the OPEC Conference, as our opening speaker. Dr. Khelil will discuss OPEC policy in recent years, stressing the organization’s search for price stability.
For our other keynote speaker, we will again have the privilege of welcoming Kenneth L. Lay, Chairman of Enron Corporation, who will speak on the “Progress and Challenges for Electricity Liberalization.” Dr. Lay is a familiar participant at these Seminars. His presentation at the 1997 Seminar in Seville was notable for the prescience of his remarks about natural gas and power liberalization. No one in the industry has a wider perspective on worldwide trends and developments affecting these markets.

The initial panel of our Seminar will provide a detailed analysis of the energy crisis in California. William W. Hogan of Harvard University, a noted authority on liberalization in California and around the world, will chair the session. To stimulate a lively debate, Professor Hogan has assembled a panel of experts with a variety of perspectives: we will hear from a regulator from the U.S. Federal Energy Regulatory Commission, an executive of a major California utility, an independent power producer, and an advocate for smaller consumers.

The second panel of the Seminar has been organized to compare and contrast the California experience with the liberalization process in Europe, Latin America, and elsewhere in the world. An eminent member of the energy community, José Luis Díaz Fernández, will chair this session. Mr. Díaz Fernández is President of Fundación Repsol YPF and President of the Board of Directors of the Repsol YPF Higher Institute of Energy. The panel will include representatives of the World Energy Council, the Venezuelan Ministry of Energy, the Latin American Energy Organization, the European Commission, and the Spanish Power Exchange.

Not surprisingly, the media worldwide have dedicated much space to the current energy crisis in California. Our third panel will focus on the recurring issue of the relationship of the industry and the media. Anthony B. Hayward, Group Vice President-Finance for BP, will chair this session. The speakers represent both the trade press and the general press: Energy Compass, Prensa Española, and Financial Times Energy.
In the Closing Session, Bijan Mossavar-Rahmani, Chairman of Mondoil Corporation, will take on the challenging task of summarizing the discussions and offering some final comments of his own. Mr. Mossavar-Rahmani has been one of the major forces behind the Seminar since its inception.
Thank you for this opportunity to share some of my thoughts on OPEC—which is the organization I am proud to represent as President of the Conference. The theme of this Seminar is energy liberalization and regulation. Although I will touch on those topics in my address, my main focus will be on OPEC and its role in the oil market, especially in recent times. OPEC’s main aim, as I am sure you know, is achieving oil market stability. We work for the benefit of both producers and consumers, and we encourage non-OPEC nations to join with us in this effort.

OPEC’s activities deal with the physical side of the oil market, that is, attempting to balance oil supply and demand through adjustments in output. As you know, OPEC members have relatively little refining capacity, so we restrict ourselves to adjusting crude production. Our concern in doing so is twofold: first, we want to ensure that refiners have enough crude to make all the products the world needs; second, we also want to make sure the market is not flooded with excess supply.
Let me now outline OPEC’s significant market-related decisions of the past several years to show how they embody the principles and aims of our organization.

In recent months, we have witnessed relative stability in the oil market—so much so that it is easy to forget the disastrous slump of 1998 and early 1999 when prices plunged. The whole industry suffered during that period. Not only did the revenues of the OPEC members take a battering, but the majors were also forced to respond to the price slide by merging, mothballing facilities, and slashing exploration and production spending.

In 1999, however, OPEC managed to turn around the market’s psychology. January and February saw prices reach new lows, but the key to the recovery was our decision in March to cut output by 1.7 million barrels per day (mbd). In addition, four non-OPEC countries—Mexico, Norway, Oman, and Russia—withdraw another 400,000 barrels per day, taking the total cuts to 2.1 mbd. It was at this point that prices began their steady recovery. They climbed to robust highs by March 2000, which led OPEC to begin a series of output increases.

In 2000, prices remained strong even as OPEC continued to raise output—the increases eventually totaled around 3.7 mbd—during the course of the year. The final increase in October drew much media attention because it was the first, and so far, the only, time that OPEC’s price band mechanism was triggered.

At the halfway mark in 2001, OPEC has adjusted supply downwards twice. At our 113th conference in January 2001, we decided to cut production by 1.5 mbd, and then at the following conference in March, we made a further reduction of 1 mbd. In addition, those non-OPEC countries that have worked with us in recent years to stabilize the market also pledged their cooperation. Angola joined in this time, in addition to Mexico, Norway, Oman, and Russia.

These cuts took into account various factors. One of them was, of course, the seasonal variation in demand: the second quarter is traditionally one of the weakest for oil demand. We also carefully
looked at the world economy, especially in the United States, the world’s largest oil consumer. The somewhat gloomy global economic outlook will surely translate into lower oil demand growth, and hence it is vital to make sure the market is not flooded with oil. That is why we have cut output twice already this year, and we will not shrink from further reductions if they are needed.

Nobody in the oil business wants to see a repeat of the price slump of 1998. Likewise, nobody wants to see a market insufficiently supplied with oil, which might cause a price spike. For this reason, another factor that concerns us is the current uncertainty regarding the level of supply in the market. Therefore, at OPEC’s most recent meetings, we have generally agreed that the prudent course is to refrain from taking any hasty decisions when the supply situation is still somewhat unclear. The market has not reacted strongly to this uncertainty. One reason is that the level of crude and refined product stocks in the major consuming countries is continuing to ease.

The price of the OPEC basket has remained within our target range of $22–$28 per barrel, which indicates a stable market and the absence of any panic to secure supplies. It is too early to say how the current situation might evolve, so I will simply remark that OPEC will follow developments closely and work to ensure adequate supply.

Let me stress that OPEC does not take these actions out of pure self-interest. It is certainly true that the OPEC statute specifies that one of our principal aims is to ensure a steady stream of hydrocarbon revenues for member countries. But in fact, a stable oil price is healthy not just for OPEC and other oil-exporting countries, but for the rest of the world economy, too.

To see why stable prices are good for the global economy, one needs to approach the question from a broader, longer-term perspective. The oil industry requires constant upstream investment, in OPEC and non-OPEC countries, to meet the world’s ever-growing demand for oil. Therefore, the nations that produce oil need sufficient financial resources, not just to meet the needs of their populations, but also to plow huge investments back into maintaining,
developing, and expanding production. Since OPEC members have three-quarters of the world’s oil reserves, they most likely will have the greatest need for upstream investment in the years to come.

What are the alternatives to maintaining oil price stability? We had a glimpse of one alternative in 1998 and early 1999, when prices hit rock bottom and upstream investment began to grind to a halt. Fortunately, as I noted, OPEC’s March 1999 output cut swung the market around. But what would have happened if the organization had not done so? What would have happened if prices had remained dangerously low and if cuts in upstream investment had become permanent? Rapidly rising demand for oil, in a few short years, could have outstripped supply. The world would then have been facing an energy crisis that would make the current situation in California look like a stroll on a summer afternoon.

That brings me to the subject of California’s energy crisis. There are some striking lessons from that market’s failure to provide sufficient electricity to meet the needs of the “Golden State” for the oil industry. Energy prices must be sufficiently stable to attract investment. If they are not, investors will put their money elsewhere, and the energy sector—whether electricity or oil—will suffer as a consequence.

I do not mean to say that energy providers should be allowed to charge consumers whatever they like. That would be wrong. What I mean is that energy prices should be fair for producers and consumers and, at the same time, stable enough to attract enough investors into the industry to secure its future. Naturally, energy consumers will always look for lower prices, while producers and investors seek the opposite. Nevertheless, it should be possible to agree on a price range that everyone can live with, such as the OPEC price band mechanism.

On the subject of prices, it is important to distinguish between crude prices, which can be impacted by OPEC’s actions, and the prices of refined products like gasoline or heating oil in the consuming countries, over which we have virtually no control. The reason for
the price differential is simple: the high end-user prices for such refined products are not the result of a shortage of crude, but the direct consequence of the heavy tax burden imposed on refined products by the governments of consuming countries.

In some of the countries with the highest tax burdens, principally those in Western Europe, a public debate has recently been sparked over the high levels of taxation. We have even seen a flurry of protests and blockades in countries where such things were previously unheard of. The end-users, after having been fleeced for so many years by their governments, are at last getting fed up and expressing their outrage. The governments of the consuming countries have the right to tax refined products, but their citizens also have the right to protest against the level of these taxes.

Let us now turn to the outlook for the world economy and the effect it will have on oil and natural gas demand. The rate of global economic expansion is set to decelerate this year, largely due to increasing uncertainty about the prospects for the world economy as a whole, and notably those for the United States and Japan. World GDP growth is expected to slow from 4.8 percent in 2000 to 3 percent this year, according to the latest OPEC figures. This compares with an initial forecast of 3.5 percent growth for 2001.

The economic slowdown in the United States is of particular concern, since it is the world’s biggest economy. Any reduction in economic activity there is bound to have considerable impact elsewhere. This is visible in OPEC’s latest figures for world oil demand, which increased by just 0.64 mbd to 75.76 mbd in 2000, a rise of less than 1 percent. The demand picture for 2001 is somewhat healthier: oil demand is expected to rise by just over 1 mbd, or 1.4 percent, to 76.83 mbd. However, these growth rates are still considerably lower than those we have seen in recent years. They could also be subject to downward revision if the world economic outlook worsens.

Finally, I cannot leave the subject of the United States without mentioning the recent developments in that country regarding the Kyoto Protocol. For many years, OPEC has argued that implementing
the treaty would cause serious economic damage to its member countries. Let me simply note here that the global environment is of great importance for all of us, and ways and means must be found to preserve it for future generations. At the same time, we must not sacrifice the economic growth that provides the only realistic way out of poverty for many developing nations, OPEC members included.

It is difficult to overstate just how important oil and natural gas are for modern society, since they not only fuel a huge part of the world economy but also form the backbone of growth for petroleum exporting nations, whether they are OPEC members or not. Allow me to use my own country, Algeria, as an example. The oil and gas sector is crucial for us: it accounts for more than 50 percent of budget revenues, 25 percent of GDP, and 97 percent of export earnings. As Algeria pushes ahead with economic reforms and privatization plans, it is also aiming to maximize exports of oil and natural gas over the next few years to finance these changes. A new legal framework for the energy sector is also being put in place, with new laws on power generation and transmission, on natural gas and power distribution, and on hydrocarbons.

You can easily understand, therefore, that we—and of course, many other natural gas exporting nations—are naturally worried by possible changes to the European natural gas market. What concerns us most, quite apart from the specific proposed alterations, is that natural gas consuming nations can sit down and discuss these proposals without even bothering to involve the producing nations; matters that will drastically affect our economies are being discussed without our participation.

With this in mind, it is hardly surprising that natural gas exporting nations met recently in Tehran to consider how their interests might be affected by these developments and how best to protect those interests. The next meeting will be held in Algiers in 2002. I use this example to emphasize that we are seeking greater cooperation. In an increasingly interdependent and interlinked world, this is the right way forward. Globalization cannot be reversed or ignored. It must be embraced, and the opportunities and rewards it offers must be seized.
Let me conclude by stressing once again that the future of the global energy industry can only be secured by increased cooperation among all parties. Thus, OPEC has made strenuous efforts to ensure that its voice is heard in a wide variety of diverse forums, including meetings of the World Trade Organization, the ongoing climate change negotiations, the dialogue between oil producers and consumers, the recent UN Conference on LDCs in Brussels, the meeting of African Energy Ministers in Algiers, and the gathering of natural gas exporting nations in Tehran.

In this era of globalization and liberalization, with the increasing degree of economic interdependence that binds all regions and all nations, no country or group of countries has anything to gain by trying to go it alone. Producers need consumers just as much as consumers need producers. We all need each other, so let us all strive to work together to secure the future of our industry, the future of world energy supplies, and the future of our common home, Planet Earth.
My talk today focuses on the challenges to and progress of energy market liberalization in the United States and Europe. The many challenges we face have been emphatically highlighted by the recent crisis in California. For that reason, I will first review the events in that state and identify the lessons that California, the United States, and other countries engaged in energy deregulation can glean from the painful experience.

The events in California have created enormous uncertainty about the direction, and even the advisability, of liberalization. This concern will no doubt influence the future decisions of regulators and business executives in the United States and Europe as to the speed and shape of further deregulation efforts. However, in spite of some loss of confidence, liberalization will continue to progress. To give you an idea of how far we have come to date, I will summarize the progress of natural gas and electricity liberalization in the United States and Europe in the second part of this analysis. I will conclude with some thoughts on what we need to do to complete the liberalization process.
Enron has been strongly interested and involved in energy market liberalization around the world. In most energy forums, Enron is a market maker, providing reliable product delivery to our customers at predictable prices. One of our strengths is risk management. We are the largest provider of retail and wholesale risk management services around the world. We manage about $40 billion of long-term retail energy outsource contracts, primarily in the large commercial and light manufacturing areas. We use our risk management capabilities, as well as financial structuring capabilities, to benefit our customers, many of whom are in California. In fact, a little-told part of the California story is that Enron’s customers there have had fixed prices through the turmoil and consequently are in relatively good shape now.

Many Californians, including government officials and journalists, have accused Enron, together with a select few other companies, of benefiting from their crisis and their pain. I respond to this charge by pointing out that before the California meltdown, Enron was already doing quite well. As Figure 1 illustrates, our stock price was robust before California’s electricity prices began to skyrocket in the early summer of 2000.

Figure 1

Since the California crisis hit its peak, our stock price has gone down by about a third. We do not benefit from chaotic, dysfunctional markets. Enron did not profit from California’s problem; rather, we shared the pain.

With the clarity of hindsight, we can identify three primary causes of the California problem, which appeared in successive, interlocking stages:

• First, devastating changes in supply and demand took place (climaxed by the summer 2000 “perfect storm”).
• Second, the plan for industry restructuring (not “deregulation”) was politically compromised.
• Third, when problems appeared, politicized responses to the distorted market caused the troubles to spiral and generated “bad will” among the parties involved.

One of the primary causes of the energy emergency in California was a supply-and-demand relationship that grew dangerously out of balance. On the demand side, the changes were straightforward and beyond anyone’s control. During the late 1990s, the economies in California and the West in general took a sharp, unexpected turn out of a slump into robust growth; this produced a corresponding increase in energy demand. At the same time, weather added another sharp spike to demand. The late 1990s had seen unusually mild conditions, but that all changed in 2000. The summer of that year saw record high temperatures throughout the West, which sent electricity demand soaring. Then the early winter, usually a time of slackened demand, was the coldest in a century. It was also the driest in a century, which significantly reduced hydropower supplies and increased California’s dependence on imports from other western states just as those states were themselves falling short of excess capacity.

Supply constraints that emerged over the same period had more complex causes. First, almost no new generation capacity was added during the previous decade (perhaps only enough to supply 10 percent of the unprecedented demand growth). In part, the absence of
new generation stemmed from the state’s notoriously time-consuming siting process and the strength of local opposition, characterized by the “NIMBY” or “not in my backyard” attitude, to construction of new capacity. In addition, environmental regulations—particularly in the Los Angeles region—mandated tight emissions limits and required permits for usage that increased the time, the cost, and the complexity involved in bringing new generation on line. In the short run, permit requirements drove up the price in periods of tight supply.

The paucity of new construction meant California had to rely on old, inefficient plants. Approximately 60 percent of fossil fuel plants in California are over 30 years old; a third of these facilities are over 40 years old. These antiquated units are subject to breakdown, particularly when they run continuously. Using such plants, which burn more fuel than newer models, also increases emission costs and natural gas costs.

As the culminating event, prices for natural gas shot up in early winter 2000 when inventories were already low in California. The natural gas price increase affected the entire nation but hit California especially hard, adding to the electricity supply problems during the crucial early winter period just as the weather was keeping demand unseasonably high.

The market at the core of the newly restructured California electricity industry was designed over a multi-year period through acrimonious negotiations—first between regulators and stakeholders under the auspices of the California Public Utilities Commission (CPUC), and then between politicians and constituents in debates in the California legislature. The final design that emerged from this process, already compromised by promises offering “something for everyone,” was signed into law by Governor Pete Wilson in December 1996 and became effective on January 1, 1998. The major flaws that appeared as demand increased were the retail price caps, (un)competitive rules that made it difficult for independent providers to enter the market, and a provision that kept utilities and other power buyers from hedging price risk through long-term contracts.
At the retail level, liberalization did not occur. Retail prices were reduced by 10 percent and frozen there for four years. This step was taken to allow utilities to recover stranded costs and to guarantee small consumers their share of the savings that deregulation was expected to bring. With the price caps in place, however, the utilities had no way to recoup their costs when wholesale prices went sky high, and consumers had no incentive to reduce their demand.

Although customers were offered their choice of electricity service provider (ESP), the formulas for retail rates were such that new ESPs trying to win new customers away from utilities lost money on every one they attracted. Enron and other independent ESPs protested this setup, but the formula was never changed. Consequently, Enron pulled out of residential and small commercial markets in California not long after the system opened up. Meanwhile, the established utilities continued to serve the bulk of the retail load at capped prices. Under the deregulation plan, they had to buy in the open wholesale market. When this requirement was instituted, prices were expected to fall.

California’s new wholesale power market was an open one. The major utilities were ordered to sell their thermal generating units and then buy their power in the open wholesale market for retail distribution. This new wholesale market had two separate but related institutions to implement purchasing within the state: the Power Exchange (PX) as the primary market, and the California Independent System Operator (CAISO) to balance out ancillary and other needs.

By CPUC regulatory fiat, nearly all purchases had to be made in the spot market, including day-ahead or day-of transactions. When the utilities and other marketers talked about long-term contracts or other hedging arrangements, CPUC strongly discouraged these actions. As a result, the utilities had to buy in a volatile wholesale market and sell in a controlled retail market. This situation totally exposed them to spot price fluctuations.

By May 2000, tight supplies, increased demand, and continued reliance on the spot market began to produce shortages, blackouts,
and skyrocketing wholesale prices. Prices in the competitive wholesale electricity market increased by 500 percent between the second half of 1999 and the second half of 2000. Retail prices remained fixed, of course. The two largest utilities, Southern California Edison (SCE) and Pacific Gas & Electric (PG&E), were buying their power at soaring wholesale prices and selling at fixed retail prices. They became increasingly uncreditworthy, and as their fiscal problems mounted, wholesale power suppliers began to stop selling power to them for fear of nonpayment.

The wholesale/retail price disparity appeared first in May 2000. It became serious through the summer, but Governor Gray Davis did nothing. Nor did he act in the fall, nor in the early winter when the cold spell sent demand and prices to record highs. Finally, in mid-December the governor had his first meeting on this problem with legislative leaders. At that point, when it was clear he had to do something, he chose a politically popular response rather than an economically responsible one. There would be absolutely no rate increase, he proclaimed. Nor would he grant any environmental waivers, which meant that the high cost of emission credits and increased emissions stayed in place. He maintained this stance from mid-December to mid-March, and it produced no relief.

Rather than take meaningful action, the political leadership chose to play the blame game. Their favorite scapegoats were the five independent generators that sold power to the wholesale market—and Enron. Enron was singled out for culpability even though we are not a generator in California. We are a significant energy supplier to California, particularly of natural gas and electricity, but we do not generate it. Governor Davis laid blame in particular on “the Texas companies” to establish guilt by association with the Bush administration in Washington. However, only three of the six companies involved are headquartered in Texas. Politicians went so far as to accuse us of legal misconduct. The state attorney general threatened to throw generators and others in jail. There have been no formal charges, of course, because they never had a case.

The independent generators on whom the governor and others laid most of the blame provide only about 12.5 percent of the total
electricity supply in California. Over 87 percent of the supply comes from other sources, and many of these, including the publicly owned Los Angeles Department of Water and Power, demanded and received the same high prices through this period.

The blame game was counterproductive economically. It created massive financial uncertainty, particularly in capital markets. The electricity market for one decided that California’s leadership did not understand the problem and was not going to resolve it. As a result, the forward price curve moved up instead of down. That development spelled more bad news for California. The two largest utilities, PG&E and SCE, became insolvent by January 2001, and the state had to step in. In order to prevent massive blackouts, it ordered the Department of Water Resources (DWR) to buy power to guarantee supply to utilities. This arrangement was legally formalized in the spring, and between January and May 2001, the state spent $8 billion on electricity.

The state contracts were executed at the height of the crisis. Today, if you look at forward curves, those contracts are about $20 billion out of the money, or about $15 to $16 billion on a net present value basis. Today, the same contracts on the same terms would have a net present value of $14 billion less. That amount is almost double what the stranded costs in California were when we started the process four or five years ago.

As we review the wreckage that a year produced, we can agree that if important lessons are learned, something will have been gained. Let me identify the lessons that I see as important.

Looking back, the most obvious conclusion is that liberalization did not cause California’s problems. They stemmed from a series of miscalculations, mis-regulations (including regulatory barriers to expanding infrastructure, using hedges and other financial tools, and establishing retail competition), and missed opportunities. Of course, everything was exacerbated by unfavorable supply and demand shifts that no one could control.

Looking ahead, complete liberalization may be an important part of the answer to California’s problem. Even as we speak, people in
Sacramento are working very hard to craft a solution that will keep SCE out of bankruptcy, and the result could be applied to PG&E as well. The proposed solution includes direct access—that is the only way the political leadership can get the necessary votes. Legislators are also aware of the need to give customers choice.

As we consider how to proceed with liberalization, it is useful to refer back to California’s experience in deregulating natural gas. That law set up core and non-core customers and decreed that the core customers—all the large natural gas buyers in California—should arrange their own energy sources via direct access to their own suppliers. We might see this path being taken in the electricity sector. This would mean moving away from a system with very limited choice in competitive supply to one with a great deal of choice. It may take a year or two to accomplish such a transition, but this approach presents a significant possibility.

The California crisis pointed out another lesson: if markets get tight or if they get out of balance, then the sooner decisive action is taken, the less the cost will be. We all think back ruefully to Governor Davis’s golden “what if.” Governor Davis in March of this year remarked, “If I wanted to raise rates, I could have solved this problem in 20 minutes.” Indeed, if rates had been allowed to go up last fall to even half the level they ultimately reached, California would certainly not have as serious a problem as it does. Again, the sooner action is taken, the better.

Here is another example. In June 2000 when problems started to appear, Enron and other suppliers were offering California utilities longer-term power for 5.5 cents per kilowatt-hour (kWh). CPUC refused to let them buy. Convinced in its wisdom that prices would come down, CPUC was sure that the utilities would lose money with long-term contracts. As it turns out, if a significant part of the state suppliers had bought 5.5-cent power last June, they would have saved perhaps $35 billion over the last 12 months.

Electricity “socialization” or “nationalization” through the state’s proposed purchase of transmission grids makes absolutely no sense
for California. Of course, there are pros and cons to public power, but most analyses show that, on an apples-to-apples basis, public power is less efficient. In any event, when the whole world is moving toward privatization, it seems ironic for California to shift toward public power. Corporate leaders may push for the state to buy assets like the transmission grid for reasons of their own, but this strategy does not make any public policy sense. Furthermore, the state’s record as a procurer of power for most of this year does not inspire confidence in politicians and regulators as managers of such a complex system. For example, as I noted earlier, the long-term contracts the DWR entered into in recent months have cost the state millions, if not billions.

The prevalence of the NIMBY attitude combined with strict environmental constraints have impeded siting and construction of new power plants in California. The supply crisis clearly showed the flip side of not building more modern technology over the last several years. The use—in some cases, over-use—of some very dirty plants made pollution much worse. The following is a sample from the recent Bush administration energy policy report:

The short-term cost in increased pollutant emissions of these emergency measures has been stark. Preliminary figures from California’s South Coast Air Quality Management District indicate that emissions have doubled in the first three months of the year compared to last year.

The contrast in emissions from old and new electricity generation plants is dramatic, as Figures 2 and 3 show. For nitrogen oxide (NOₓ) emissions, shifting from old oil plants to old gas boilers cuts emissions by 83 percent. Shifting to the new natural gas-fired combined-cycle plants cuts another 87 percent. In other words, the old natural gas plants produce eight times as much NOₓ emissions as the new ones. Gas burners of any vintage do not generate much sulfur dioxide (SO₂), the major air pollutant, so there is not much difference there. But in the case of particulates (PM₁₀), there is again a significant difference: shifting from oil to old gas technology cuts 80 percent, and from old to new gas technology cuts another 60 percent.
Figure 2
Emissions Comparison—California Power Generation (Pounds/MWh)

Nitrogen Oxides

| Source: Energy and Environmental Analysis, Inc. |

Sulfur Dioxide

| Source: Energy and Environmental Analysis, Inc. |

Figure 3
Emissions Comparison—California Power Generation (Pounds/MWh)

Particulates

| Source: Energy and Environmental Analysis, Inc. |

Carbon Dioxide

| Source: Energy and Environmental Analysis, Inc. |
For carbon dioxide (CO$_2$), shifting from oil to the old natural gas generating plants reduces emissions by about 30 percent; moving to the new combined-cycle gas plants cuts another 30 percent or more.

California’s outlook is getting better. It started improving before the Federal Energy Regulatory Commission (FERC) stepped in with its price mitigation rule. Supply and demand were coming back into balance in the state and throughout the Southwest. In fact, by this September we should have about 7,000 megawatts (MW) of new supply in the West. We will also have about a 7,000-MW reduction in demand; demand has already dropped between 11 and 12 percent in May and June. This decrease will come from conservation spurred by higher rates and from some very aggressive demand buydown programs. The savings will be offset somewhat by a decrease in hydroelectric supply of about 5,000 MW due to the dry weather. Nevertheless, we will still be 9,000 MW better off than we were about a year ago.

Looking further ahead, we expect by 2003 to have another 20,000 MW of generation capacity come onstream. One caveat: such predictions always assume that price mitigation rules or some other new regulation will not start making people nervous about putting capital into these plants.

Liberalization has been underway for a decade—and it has worked. Look at the industries in the United States that have liberalized so far. Look at long-distance telecoms, at airlines, at natural gas, at trucking, at railroads—in almost every case, we have seen 15 to 20-percent cost and price reductions over three to five years. Over a ten-year period, the figure is more like 30 to 40 percent. This translates into impressive savings. In the case of natural gas, up until the last 12 months we were saving about $10 billion per year as a result of deregulation. Long-distance telecoms saved about $5 billion per year, airlines about $20 billion, trucking about $20 billion, and railroads about $10 billion. This adds savings of between $55 and $60 billion per year in those industries because of competition and deregulation.
Open markets do more than lower prices; they improve quality. Liberalization has produced innovation and creativity in financial services, local telephone service, and mail and package overnight service. Many would argue that we would not have the present Internet or cell phones without competition in their respective industries. There is no reason to think that we cannot have the same results with electricity.

Natural gas provides a fine example of how liberalization has worked in practice. When prices peaked last December at $10 per MMBtu, they reached the level, adjusted for inflation, of 1984 prices (just at the end of a decade of regulation). In 2000, prices peaked at the end of the year, and they have declined again to around $3 per MMBtu. In the time between 1984 and 2000, the U.S. economy saved about $175 billion from the deregulation of wholesale natural gas.

Similar savings have been documented in the United Kingdom. Since May 1999, all domestic electricity customers in the United Kingdom have been able to choose which companies supply their electricity. The 6.5 million customers who changed their electricity supplier by June 2000 saw their bills fall by £299 million (or 15 percent). The 19 million customers who have not switched suppliers could save up to £674 million, or 31 percent of their annual bills, were they to do so, according to a recent study by the UK Office of Gas and Electricity Markets.

In the wake of all the news about the power crisis in California, it is doubly important that we take a broad view of the progress that liberalization is making worldwide.

California aside, the nationwide energy story grows better and stronger. The figures for new capacity are impressive. In 1999, the United States added about 13,000 to 14,000 MW of new power capacity. In 2000, 32,000 MW came onstream. In 2001, we expect about 59,000 MW, and in 2002 about 96,000 MW, of new power plants (and some distributed generation). Again, a caveat: this assumes no new uncertainty in the market that discourages people from building these plants. That adds up to about 200,000 MW of
new capacity across the country. For a 400,000 to 500,000-MW market, that is a lot of capacity. We may even have surplus capacity in the next year or so.

A specific deregulation story that deserves highlighting is the one in Texas. Texas has deregulated wholesale electric power since 1995 and will open retail markets on January 1, 2002. During this period, Texans brought on 60 new power plants of varying sizes, totaling 20,000 MW. The Texas market, a 55,000 to 60,000-MW peak market, is comparable to California. With all the new capacity, today you can sign five-year contracts in Texas for about 3.5 cents per kWh. As the Texas economy and population continue to grow, the state is generating a larger percentage of its power from natural gas than ever before. Yet this summer we will burn less natural gas than we did last summer due to the improved heat rates of new generation. This trend should continue for at least the next several summers.

State by state, we expect that 57 percent of the electricity market will be deregulated by 2004. In Nevada, Arkansas, West Virginia, and Montana, the process has slowed down. However, these states account for only 5 percent of the country’s total load. All the other states are on the path to deregulation. As noted, Texas is starting to open its retail markets this year. The electricity market in Texas will be totally open in 2002. We can also report good progress throughout the Northeast and parts of the West. Most of the states that were on course to deregulation are moving ahead.

The picture for natural gas liberalization in the United States is much the same. Plans to deregulate have changed very little. For the most part, the industrial markets across the country have already been deregulated.

Regarding the progress of natural gas and electricity liberalization in Europe, positive developments have occurred throughout the European Union, and many countries have experienced faster-than-expected change. Certainly, the Florence and Madrid processes have added new impetus to what Europe is trying to do. Undoubtedly,
some in France are using California as a reason to go slower, but for the most part, liberalization seems to be moving ahead on schedule, looking toward a target date of 2004.

In the natural gas market, the United Kingdom has mandated 100-percent deregulation and has achieved that goal. Germany has mandated 100-percent deregulation but has realized close to zero. In between, there is quite a mix. As Figure 4 indicates, Spain is moving ahead, as are several other countries. Many other European nations are still struggling. The plans are there, however, for all these markets to be open by 2003 or 2004.

Figure 5 shows a similar situation for electricity liberalization. Finland authorized 100-percent market deregulation and achieved it. Again, Germany authorized 100-percent deregulation but has achieved only about 10 percent. In Spain, 55-percent deregulation was authorized and probably half of that has been achieved. But, again, these countries are moving significantly in the right direction.

Some of the obstacles confronting these nations and others as they move toward deregulation include cross-border access problems for natural gas and electricity, lack of attention to wholesale markets, resistance to the proposed energy directive, negotiated third party access (NTPA) and unbundling problems, market concentration from integration and/or mergers, and the long-term contract structure present in the continental natural gas market.

As Europe moves ahead, it is important to always remember the lessons from California. Specifically, I would emphasize the following:

- Let the market work to reveal supply-and-demand imbalances rapidly and connect wholesale and retail markets.
- Avoid political/regulatory “favors” to privileged market parties.
- Safeguard the efficient functioning of the natural gas market.

In the United States and Europe, we have made significant progress in liberalizing electricity and natural gas markets but we still have much more to accomplish. The key for further progress is to
Progress and Challenges for Electricity Liberalization

Figure 4
Natural Gas Liberalization in Europe

- EU Directive Not Yet Effective
- Very Limited Competition in Practice
- Some Competition on the Way to Full Liberalization
- Fully Liberalized

Figure 5
Electricity Liberalization in Europe

- EU Directive Not Yet Effective
- Very Limited Competition in Practice
- Some Competition on the Way to Full Liberalization
- Fully Liberalized
stress the importance of regulation to establish the right competitive rules. As we liberalize and make markets competitive, it still takes a strong hand, an independent regulator, to make sure that the parameters are set right and that all parties have access to transmission, transportation, and markets.

It sounds ironic, but we need a strong, independent regulator more than ever as we move toward deregulation, competition, and liberalization. For example, experience has shown that when negotiated contracts or negotiated access routes are put in play without oversight by a strong regulator, the plans will not work. No matter how good the intentions, companies with a monopoly like to keep that monopoly. That is true in Europe, in the United States, and around the world. Consequently, a strong independent regulator to make firm, fair rules is critical to creating and maintaining competitive markets.
By the early summer of 2000, it was clear that the California energy crisis had grown worse than anyone had predicted—worse even, as I have written, than anyone imagined. The situation has been devastating from all perspectives. It casts doubt on the ongoing process of electricity restructuring in the United States. It sets a terrible example for leaders in Europe, Australia, Japan, or any of the many places planning for the same restructuring process. It is costly for the economic health of California. It ruins the credibility of the regulators and politicians who have to deal with it.

On the other hand, I will stress again that the California fiasco is not to be blamed on restructuring. This devastating situation was produced by political and regulatory decisions that, unfortunately, have had ramifications beyond California. It was distressing to hear Alfonso Cortina characterize the liberalization approach in many countries, including Spain, as having been built on the California model. It was particularly distressing for those of us—including some panelists and
myself—who argued years ago, when restructuring was first designed, that the California model was “seriously flawed.” The fact that the model’s flaws turned out to be even more serious than anyone anticipated does not change the fact that people knew, before it was implemented, that there would be problems with the California plan.

Although it has been a well-kept secret, then and now, the California model was in trouble well before June 2000. The troubles began when the market opened in January 1998, and the problems snowballed from there. By the end of 1999, Commissioner William L. Massey and his colleagues on the Federal Energy Regulatory Commission (FERC) found the basic structure of the market design “fundamentally flawed” and directed California officials to undertake a major redesign. This redesign process started in early January 2000 but was not complete when summer arrived—and we ran out of time. Events took over in a devastating fashion—as you will hear from our panelists today.

When we were planning this Seminar, we knew that utility executives and regulators in Spain and in Europe would want to hear about the California experience and the lessons to be learned from it. Hence we focused the Seminar on this topic and were careful to select our speakers from among the relatively few people who understand the California situation and can analyze it well. Our opening speaker this morning, and our four speakers on this panel, I am proud to say, include those rare individuals. They are the stars.

In fact, I am a bit worried about capturing so much talent here in Mallorca while important decisions about restructuring are being made in Sacramento, even as we speak. Having brought so many experts here may not be a public service for California. However, we do have them here, so we should take the opportunity to benefit from their knowledge and experience.

Let me introduce our distinguished panelists.

The first speaker is Stephen L. Baum, Chairman of Sempra Energy Corporation in San Diego. Some of you may know Sempra better through its affiliate companies, San Diego Gas and Electric and
Southern California Gas. Both firms are major participants in California’s electricity market, and Steve was heavily involved in the discussions when the market structure was first being debated. For the record, I can say that the plans and recommendations his company put forward were rejected. Events have shown how correct his ideas were.

Our second speaker, Michel P. Florio, is a California attorney who has been working for many years with The Utility Reform Network (TURN). This organization represents small consumers in energy matters; large consumers tend to be well-represented on their own. Mike and TURN have been involved in the California discussions from the start, and I know from personal experience that Mike is both wise and well informed. In January 2000, he led the Reform Coalition—composed of consumers, a large utility, and several producing groups—in an attempt to propose alternatives to the flawed but still operating California market. The reform attempt failed, and we can see the results.

Jan Smutny-Jones has also been working on electricity restructuring in California since the early days. He has had multiple responsibilities, most recently serving as head of the Independent Energy Producers Association in California, the new class of non-utility energy producers. Previously, he did penance for several years as Chairman of the California Independent System Operator (CAISO) Board of Directors. I worked with CAISO many times, and I had the opportunity to watch Jan try to manage the stakeholder process. I was always grateful that it was not my job. Dealing with the multiplicity of pressures involved—economic, technical, political, social—is not easy.

Our final speaker is Commissioner Massey of FERC, who is familiar to many participants in this Seminar from our previous gatherings. He has been involved heavily in all aspects of electricity restructuring from the federal government’s perspective. In the process, he has been forthright in exercising his responsibilities. Bill is well versed in everything that is happening in California and is deeply involved in the search for remedies. Given his position on restructuring, he has felt a little lonely for the last few years, but he has also been highly
influential. As the federal government wrestles with the economic problems, the market design problems, and the political problems, Bill's wisdom has been increasingly evident.

These speakers will review the events and decisions that led to the California electricity crisis, will identify the steps being taken to alleviate it, and will suggest the lessons you might take from California's experience as you and your countries make your way forward with energy liberalization.
Like many other Californians, Sempra Energy has struggled with the consequences of the energy tsunami that hit our shores just 12 short months ago. The people of California have met many challenges over the years, including earthquakes, wildfires, and riots, but the events of the past year surely deserve a place in that pantheon of disasters.

The current crisis has gripped everyone’s attention, and there is no shortage of people willing to offer opinions on how to solve the problem.

Much of the world outside of California has been tempted, when discussing the state’s energy crisis, to invoke the spirit, if not the words, of the Scottish poet William Edmonstoune Aytoun: “Yours is the grief, as well as the blame.” Few doubt Californians are suffering tremendous grief over the energy situation in the western United States. Agreement about who is responsible for the blame comes less easily.
The truth is tough to take: everyone involved in this public policy fiasco is to blame. More importantly, we are also all part of the solution—and focusing on blame does not produce a single kilowatt-hour of electricity.

Let me begin with some information on how Sempra relates to the California energy market. Sempra consists of energy distribution companies in California of course, and also has energy distribution companies in Mexico, Chile, Argentina, and Peru. We have about 9 million customers worldwide, with about $13 billion in annual revenue. In addition, we have a robust trading operation that deals in energy commodities, oil, and refined products in the United States, Europe, and Southeast Asia.

In California, we are on both sides of the energy “fence”: on the regulated side, we provide extensive distribution to electric consumers and operate a large natural gas company; on the “unregulated” side, we participate in power production, sales, and trading.

For several decades, especially in the early 1990s, California manufacturers protested electric rates that were as high as 40 percent above the national average. The regulatory system did not allow these large customers to switch to other providers; they were tied to the local distribution utilities. Such high rates made it impossible for these large consumers to compete against businesses in neighboring states, particularly in the economic stagnation of the early 1990s.

The increasing clamor reached the California Public Utilities Commission (CPUC) and then-Governor Pete Wilson. The proposed solution—a free market at the wholesale and retail levels—appealed to both the regulators and the governor. After several years of study, planning, and debate, a plan for deregulating electricity markets was submitted to the California legislature as Assembly Bill (AB) 1890. The bill passed in September 1996, was signed by the governor, and was to come into effect on January 1, 1998.

AB 1890 restructured the electric industry in California based in a general way on the successful English experience. However, it was
a badly politicized effort. AB 1890 had something for everyone; as *The Economist* put it, “the politics of pork prevailed.” To wit:

- Overall, electric customers were free to choose the cheapest supplier, rather than their usual utility distributor. For those who did not take this option, a four-year, across-the-board rate cap of about 9 cents per kilowatt-hour (kWh) was put in place.

- For small business and residential customers (100 kilowatts and below), a 10-percent rate reduction, in addition to the rate cap, was instituted.

- Utilities were given the chance to recover their stranded costs based on the difference between the retail rate cap and their actual costs for buying power in the wholesale market.

- Politicians were able to deliver a much-touted rate decrease to voters.

- Independent energy-producing companies gained a chance to enter the heretofore-closed California market on terms that substituted marginal price for the average cost of wholesale electricity.

- Wall Street investors scored an opportunity to underwrite billions of dollars in state bonds sold to finance the rate reduction and spread its costs into the future.

And, if all wonderful promises did not come to pass, surely FERC would step in to make sure prices were just and reasonable.

As noted, AB 1890 passed unanimously and with great fanfare in September 1996. It went into effect in January 1998. However, during the long period of discussion and debate, neither policymakers nor stakeholders looked closely at some of the critical underlying assumptions, listed below, on which the new market was to rest:

- Supply was, and would continue to be, adequate to meet demand. The state’s restructuring plan ignored the fundamental growth in demand for electricity and the effects of an economic and demographic upswing.
Panel I

- Marginal pricing, which was expected to be higher than the average historical costs in the wholesale market, would create an early excess of new power production.

- A robust, competitive retail market would develop, relieving utilities of their obligation to provide default electricity to large numbers of customers.

- Natural gas prices would continue to be low.

- Perhaps most importantly, the wholesale market would be workably competitive, and wholesale prices would decline.

The result of AB 1890 was a system designed to work as long as excess capacity was available—but which became a nightmare when demand for power surged ahead of supply.

Within three years, the nightmare scenario described above was a reality. In the absence of excess capacity, and with a limited number of retail market participants owning must-run facilities, a marginal price regime became a license to charge whatever the market would bear. And the market bore almost any price because the retail price caps kept retail consumers from receiving a real price signal. Consequently, demand did not decrease, which kept wholesale prices high. Worse, the generators and marketers learned to “game” the system, taking advantage of flaws in the market design.

The skyrocketing prices and rolling blackouts that marked the last six months of 2000 and continued into the next year brought grief to all segments of California—consumers, producers, politicians—and they brought a particular kind of grief to the three major utilities. With a fixed retail price and prices soaring in the wholesale market, the difference between the buying cost and the selling price had to be absorbed by the utilities, which had no choice but to borrow very large sums of money to do so. Two utilities—Pacific Gas & Electric (PG&E) and Southern California Edison (SCE)—still had stranded costs and so kept their retail rate caps. More on their plight later.

By contrast, San Diego Gas & Electric (SDG&E), a Sempra subsidiary, satisfied the conditions of the restructuring law. It had paid
off all its stranded costs and was able to lift its retail rate cap in July 1999. Consequently, the San Diego retail market was exposed to real time prices. They were tolerable for the next year, until the summer of 2000. Figure 1 shows the contrast, presenting 1999 prices and 2000 prices for electricity on the California Power Exchange (PX), that is, the spot market.

Figure 1
Daily California PX Prices—1999 and 2000

Electricity prices in June, July, and August 2000 were four to five times higher than the year before. The average electric bill in San Diego went from $60 per month to nearly $135. As Table 1 illustrates, no appreciable change in demand occurred between these two periods. In fact, demand in 1999 was higher. Yet prices in 1999 on that day were 2.1 to 2.7 cents per kWh; in 2000 they were 10.8 to 19.5 cents per kWh. Obviously, these changes were not caused by increased demand; rather they came about because the retail price cap was no longer in effect for SDG&E customers, who had to pay actual costs.
A full pass-through of a retail price change of this magnitude is not tolerated for long. It soon became clear that San Diego customers would not stand for such a rush into real time pricing. Life in San Diego in the summer of 2000 was not easy; it was like living in a war zone. In September 2000, the California legislature passed a new law, AB 265, for the San Diego market. It capped retail electricity prices at 6.5 cents per kWh at a time when “real” prices were in the 20-cent range.

While the law was well intentioned, AB 265 did nothing to address the serious structural problems and dysfunction in the wholesale electric market, and it brought back all the ills of a retail price cap—notably the killing of any demand reduction in response to rising prices. But it offered a textbook example of how elastic electricity demand can be: demand in San Diego fell by almost 10 percent when the retail price cap was lifted but rose to its previous level almost immediately when the cap returned.

The retail price cap restored by AB 265 required SDG&E to pay the market price for electricity but sell it at a fixed price below market. The result was a huge undercollection of nearly $747 million for the utility. The law does allow companies to recover undercollections (they are set as assets on the books), but these deficits can bankrupt a firm when they reach a certain point.
Although SDG&E did not reach that point, California’s other two major utilities did. PG&E has gone bankrupt under the burden of its undercollection, and SCE is insolvent, teetering on the brink of financial ruin. As we speak early in July 2001, it has not gone bankrupt yet, but it could at any time.

By January 2001, after six months of increasing financial desperation, two of the state’s major utilities were nearing bankruptcy. The PX could no longer function because power generators would not sell to the utilities, fearing non-payment. The state government had to step in to assume the financial risk.

This step was formalized in early spring of 2001, when the California legislature passed a bill that allows the state, through its Department of Water Resources (DWR), to purchase power on behalf of electric utility customers throughout the state. In this role, California now incurs an average cost of $73.2 million per day for power, adding to the $6 billion bill it has run up since the two major utilities ceased to be creditworthy. The average price of power continues to increase, even as the state has begun to enter into long-term contracts with suppliers.

The original design of deregulation in California had discouraged utilities from entering into such contracts. At the time, the belief was that a robust retail market would develop where customers would choose providers other than their local utilities. Thus, if the utility entered into additional long-term supply contracts, a second wave of stranded costs would be created because those contracts would have been for customers that were switching to other suppliers.

The retail market never developed, however. Consequently, the regulation that prevented utilities from engaging in long-term contracts had an adverse effect on prices and on supply availability. Now the state itself must face the dilemma.

With the California debacle at its center, energy has become a storm cloud over the national economy. Concern about America’s reliance on energy, and on fossil fuels in particular, has lately taken on an urgency not felt since the late 1970s. I would suggest that the
solutions to this crisis center on three fundamental aspects of the energy equation: demand, supply, and infrastructure.

Nationwide, total U.S. electricity demand increased almost 10 percent between 1995 and 1999, but total electric generation increased only 1.6 percent, according to President Bush’s recent national energy report. Worse, investment in electric transmission—the mechanism that moves power from generators to customers—actually declined.

According to the California Energy Commission, supply and demand in the electric market were balanced as recently as 1995. Since then, however, demand has surged upward at an annual rate of 4.5 percent, while supply has lagged behind with only a 1-percent growth. Given this situation, the western United States needs to focus on conservation in the short term through economic incentives and technology improvements. Efficiency has to become a way of life for homes and for businesses wanting to add to their bottom line.

On the economic incentive front, efforts are underway in California to implement a program giving California ratepayers a 20-percent rebate on their summer electric bill if they reduce their electricity use by 20 percent (15 percent in San Diego) over last summer’s levels. This effort is one of many potential strategies designed to help the state avoid rolling blackouts this summer and to reward customers who significantly conserve energy.

Another economic tactic to encourage conservation would be setting “cost of service plus” rates, in other words, by increasing retail rates. As noted earlier, basic economics suggests a strong correlation between demand and cost. While customers must be provided with tangible incentives to conserve energy, there should also be financial penalties for those who do not.

On the technology front, outdated buildings and factories have to be upgraded or replaced to consume less and pollute less. For residential consumers, one possible approach to encouraging conservation is installing “smart” electric meters that can tell homeowners in real time how much energy they are using and what it is costing. Energy
companies like Sempra are looking at rushing to market other technologies that would help consumers make intelligent energy choices.

Such technological improvements take more than good ideas, however. They also require capital investment. Commendably, both Governor Davis and President Bush have recognized this need and proposed underwriting research and development costs to get innovative solutions to market quickly.

The passage of economic incentives and the installation of improved technology will not happen quickly, however. In the meantime, we need temporary price controls in the wholesale market. On June 18, 2001, FERC adopted round-the-clock price limits (market mitigation rules) on electricity in the West. By unanimous vote, the commissioners made a significant step toward restoring sanity to wholesale power markets.

As a matter of practical politics, this order and the refund procedure are probably the best remedies available right now, and the relief they will provide from out-of-control spot market prices is most welcome. FERC’s decision will not only ease financial pressure on the state and on utility customers, it may also reduce the likelihood of blackouts this summer. FERC’s action removes the incentive for suppliers in short-term power markets to withhold supplies to elevate prices, since they will have nothing to gain from such behavior. That should improve the availability of power this summer, especially during periods of peak demand.

The key lesson from the energy crisis plaguing California is that the western region has not brought online the supplies needed to meet growing demand. California is the second most energy-efficient state in the union, but it has not built a major new power plant in a decade. Not even the most admirable conservation effort could keep pace with the state’s demand for electricity. California needs four new power plants—or 2,000 megawatts—every year just to stay even.

It is time to get moving on this problem. The first step involves facing some hard facts about natural gas, the fuel of choice for most new power generation projects. President Bush’s recent report on the
national energy situation projects that natural gas consumption will rise rapidly as electric utilities make even greater use of this environmentally friendly fuel. For example, every one of the 50 electric generating plants on the books to be built in the Southwest will use natural gas. To accommodate this demand as well as increased residential and industrial use, we need new pipes to move larger quantities of natural gas—up to 38,000 new miles of pipe and 263,000 miles of distribution lines. For this to happen, we need to overcome two significant obstacles.

First, our nation and our hemisphere are rich in natural gas resources, but our ability to develop them has been hampered by restrictions on exploration. Second, although rising natural gas demand has prompted companies to begin building transportation pipelines at an accelerated pace, our ability to deliver natural gas to consumers is still being hindered by opposition to such construction. We need to pass legislation that encourages exploration, production, and transportation to bring the needed supplies to market, while improving pipeline safety and safeguarding the environment.

In addition to building new natural gas-fired electric generation facilities and making sure they have sufficient fuel to operate, we also need to repair, upgrade, and expand America’s power transmission grids. California’s electric transmission grid illustrates the problem. The grid is a picture of congestion. Even if we had enough power to satisfy demand, we could not get it where it is needed because the transmission capability simply does not exist. At this time, there are only a few projects in the planning stages to fix these problems.

Demand for electricity is vast, but it varies from place to place and from season to season. An expanded grid system would allow us to meet demand as it arises, sending power where it is needed from where it is not. If we put these connections in place, we will go a long way toward avoiding future blackouts.

As with conservation, expanding supply and transmission capacity alone is not the whole answer to solving California’s problems. It
is not just the delivery systems that have fallen behind. Another part of the problem is that our transmission system has not been opened up to competition. Consequently, the capital incentive to invest in the system does not exist.

One proposal the state has made to help solve the financial woes of utilities is to purchase their electric transmission systems for a significant amount of money. Those funds could then be used to pay off the undercollection debts the utilities have incurred.

What should we make of state ownership of an electric transmission system? While it may seem strange for me, as CEO of an investor-owned utility, to advocate state ownership of privately held utility property, I believe it makes sense for California to purchase these facilities at the offered price of 2.3 times the book value. Why?

- The state would operate the entire grid and would be motivated to eliminate bottlenecks, thus decreasing higher wholesale prices caused by congestion.
- The state could regain some control over the wholesale market, now governed by the slow-to-regulate FERC. While I would not suggest that the state be discriminatory in its access provisions, it could, by setting a pricing regime and including nodal pricing, allocate rent between generators and consumers.
- The state could—for practical purposes—finance the purchase price from existing rates and revenues associated with the facilities because it could raise the entire amount through low-cost revenue bonds, avoiding equity costs and taxes in the process.
- The state could finance new transmission construction more cheaply for the same reasons.
- Finally, no one is likely to argue that operation of the transmission grid is not a natural monopoly. In California, electricity is already dispatched by a government agency—the ISO—and there are many other examples of efficient government-controlled grids.

The proceeds from the grid sales will go a long way toward restoring the financial health of SCE and PG&E, allowing them to pay
debts now owed to independent generators and marketers and restoring needed power to the market. For Sempra and SDG&E, the sale of our transmission system to the state of California will eliminate the $750 million in undercollection owed by our customers. This development represents important progress, under terms that are very fair for customers and shareholders, toward restoring fiscal stability and reliable supply to California’s energy market.

My message today departs from conventional wisdom. Despite what “everybody knows” or thinks they know, deregulation has not been a total failure. It is easy to forget that the California deregulation was far from “total.” Many of us would be tempted to assert that therein lies much of the present woe. The results of partial deregulation as manifested in California have been dismal. As politicians like to say in this era of non-accountability, “mistakes were made.”

We have to face the fact that key policymakers made overly optimistic assumptions regarding how fast new electric generation capacity would come on line, how fast population would grow, and at what rate Californians would increase their use of power. This past year has been one memorable ride, a real life “California Adventure,” and it is not over. Electricity prices are still high, transmission bottlenecks still exist, and blackouts, which can still occur, will be painful, expensive, and potentially dangerous to public safety.

There is, nevertheless, more good news than bad news. New capacity is coming on line at a good rate. The state is easing unreasonable regulatory barriers to construction of new generating plants. Power prices are trending down. The state’s entry into the long-term power purchase market has stabilized prices, although at higher levels than in the past.

This may not be the time for exuberance, but we have more confidence in the future now than we have had this past year. Under these circumstances, I believe we will see a return to some kind of energy stability in California. Nevertheless, the fundamental problems of the wholesale market still need to be resolved.
Crisis in California: A Consumer Advocate’s Perspective

Michel P. Florio
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I would like to share our unfortunate energy experiences in California of the past three years with the hope the lessons may help the rest of you avoid our errors. I will begin by briefly reviewing some of the changes in California’s wholesale and retail prices and then move on to describe some of the causes behind these changes. I will conclude with reflections on the efforts the California government is making to remedy the situation.

Let me start with a graph that makes a dramatic point about the extent of price increases in California wholesale electricity in 2000 and 2001. The point deserves a striking presentation. For about two years, from the time the market opened in April 1998 to the spring of 2000, wholesale electricity prices were low—so low, in fact, that little incentive existed for new investment in generation capacity. In 1999, prices spiked occasionally to as high as $225 per megawatt-hour (MWh) during warm spells, which drive peak demand in California. However, such prices were seen only for two or three days during the hottest afternoon hours.
In 2000, prices remained stable through April, but as Figure 1 indicates, the spikes started in May and then extended through June and into July. That year they did not peak briefly as before; instead they remained high even in the off-peak months.

*Figure 1*

_Daily Average California Power Exchange Prices for 1998 to 2001_

Then in November and December 2000, usually an off-peak period in California, another factor kicked in to drive prices into the stratosphere. Prices for natural gas, the fuel used for incremental generation in California, skyrocketed nationally. In California, this surge drove wholesale electricity prices past the summer peaks to as high as $1,500 per MWh. By early 2001, prices reached hourly peaks of $2,500 per MWh. Under such financial pressure, the Power Exchange (PX) went bankrupt and ceased to function at the end of January, and two of the major investor-owned utilities, Pacific Gas & Electric Company (PG&E) and Southern California Edison (SCE), became insolvent. At this point, the state had to step in and purchase power, in lieu of the bankrupt PX, for distribution by the utilities.
In terms of total costs, electric bills for Californians in 1999 totaled about $7 billion. In 2000, that quadrupled to about $28 billion. Expectations for 2001 were originally as high as $70 billion. With some improvements in the market, those estimates have been revised down to $50 billion, but this is still far in excess of the record levels of last year and roughly seven times the cost in 1999.

To a large degree, retail customers in California were insulated from the effects of exorbitant wholesale prices because of the rate freeze imposed by Assembly Bill 1890. However, there was an exception in San Diego, where the rate cap ended early. In 1999, when San Diego Gas & Electric (SDG&E) paid off its stranded costs and its rate freeze ended, the retail price of electricity was allowed to rise and fall with the market, with about a week's lag. So wholesale prices began to flow through to end-use customers in the San Diego area, unlike the rest of the state. In the summer of 2000, as Figure 2 shows, the price began escalating—from about 4 cents per kilowatt-hour (kWh) at the beginning of the summer to about 21 cents per kWh by late August.

Figure 2
Residential Electricity Price in San Diego, March–November 2000
At that point, in response to surging public outcry, the state government was forced to step in and reinstate a rate cap. Many questioned the economic wisdom of this action, but you can imagine the political implications of retail electricity prices, especially to residential and small business customers, increasing almost five-fold over three months. For those of us who visited San Diego during that period, it felt like a war zone. There were no weapons, of course, but there was a crisis atmosphere unlike anything I have ever experienced.

What went wrong? “Murphy’s Law”—if anything can go wrong, it will—aptly sums up what happened in California. During the lead in to restructuring, unrealistic expectations had been created for everyone: among customers about the savings they would see, among generators about the profits they would reap, and among politicians about how their constituents would benefit. We started out with a situation where people expected only benefits—without any costs—and, of course, those expectations could not be met.

Everyone wants to know what lies behind the incredibly high wholesale prices. Everyone also has an answer of some kind. Figure 3 presents one party’s analysis of what caused the wholesale price rise. The California Independent System Operator’s (CAISO) Department of Market Analysis looked at the price increases in the wholesale market and tried to determine what portion of the rise was driven by market fundamentals and what portion was caused by other factors.

The gray area (bottom portion) of the bars in Figure 3 reflects CAISO’s calculation of the production price in a perfectly competitive market. Note that, in the latter part of 2000, market fundamentals alone drove prices to very high levels. The middle part of the bars (diagonal stripes) shows the portion of the price increase that CAISO attributed to scarcity, that is, the run-up in prices when there was simply not enough electricity to go around. The black (top) section of the bar—and this segment is obviously very controversial—shows the portion of the increase that, according to CAISO, comes from the exercise of market power by certain companies to inflate the price above competitive levels. That is the critical issue.
How much of the price increase reflected market power and how much reflected market fundamentals has been a much debated topic in California and in Washington, D.C. The answer is not yet in. The situation is much more complex than is suggested by the graph. I will list a few of the more important factors here, in no particular order.

- The retail market was not sustained. When California launched wholesale market competition in electricity, it also offered retail competition. Through much of 1998 and 1999, the industrial sector was fairly active in the retail market: 25 to 35 percent of the industrial load came from non-utility sources. The number was lower for other sectors: 15 percent for the commercial sector, 10 percent for agriculture, and below 5 percent for residential and small business. Going into 2000, about 15 percent of

![Figure 3](image-url)

*Source: Department of Market Analysis, California Independent System Operator.*
total system load and about 35 percent of industrial load was being served by non-utility suppliers. Thus, initially retail competition was not a complete non-starter. When the crisis hit full bore in the winter of 2000-2001, however, direct access to non-utility suppliers was constrained because of chaos in the market. In the later months, it dropped close to zero. Now, there is very little retail competition.

- Out-of-state power supplies dwindled. California is interconnected with the rest of the western United States and has typically imported 15 to 20 percent of its electricity, often surplus power from coal or hydro plants elsewhere in the West that could be obtained for very low prices. As California moved into its deregulated regime, that surplus began to dry up, partly due to the very rapid growth in demand in other parts of the West and partly due to the lack of rain and snow in the region. The scant precipitation led to low availability of hydroelectricity throughout the West in 2000, a situation that became even worse in 2001.

- Natural gas prices went sky high. As noted earlier, natural gas fuels much of the incremental electricity generation in California. Prior to the crisis, the nation had enjoyed 15 years of very low natural gas prices following deregulation in that market in the 1980s. That ceased to be true late in 2000. Prices went through the roof, driving wholesale electric costs higher.

- California had faith in spot markets. The California reliance on the natural gas spot market is worth noting. For 15 years, natural gas was very cheap on the spot market, and it seemed that low spot prices would last forever. This fact may partly explain California’s fascination with, perhaps addiction to, spot markets. Marketers did attempt to sell longer-term contracts, but customers were not interested, and the California Public Utilities Commission (CPUC) discouraged their use, fearing utility dependence on higher prices in long-term markets would create new stranded costs.
• No requirement for sufficient reserve generation existed. In its plans for restructuring, the California organizers did not set up an installed capacity market where load-serving entities were required to contract in advance for enough generating capacity to meet their needs. So there was no mechanism to motivate the development of new generation facilities to maintain adequate reserve margins. The only incentive was the spot market price signal, which initially was too low to spark any interest in building more generation capacity.

• No effective demand-side mechanism existed to offset growing demand and dwindling supply. California's deregulation program did not address the demand side of the market. Some traditional interruptible programs existed, but these had not been used for many years. Retail rates were capped in advance.

• The utilities' divestiture of generating plants may have given the new suppliers market power. CPUC encouraged utilities to divest their natural gas-fired plants that served at the margin as price-setting units in order to prevent utilities from gaining market power. These units were bought by independent generators that, at least as circumstances developed, may themselves have had the ability to influence prices.

• California's market design was very complex and, many of us believe, dysfunctional. Its many sequential auction systems provided perfectly legal opportunities for gaming by sellers, who could withhold supply in one market in order to sell into another market. The design also did not encourage stability or price transparency.

• The utility distribution companies accepted the financial risk of serving their customers at a fixed retail rate. In return for this, they would be reimbursed for their stranded costs. Like everyone else, utilities did not expect the risk to be great. However, PG&E and SCE are now in great financial distress because the danger turned out to be much greater than anticipated.
During this policy and economic fiasco and the desperate search for solutions, the state legislature has been polling constituents. The list below identifies what policymakers in Sacramento think their constituents want as part of a solution to the energy crisis:

- Re-regulation (to restore balance to system).
- Very small, if any, rate increases.
- Supply reliability (no more blackouts).
- No permanent damage to the environment; more emphasis on renewable sources.
- Penalties for those who gouged the state.
- A guarantee that it cannot happen again.

The public’s impossible expectations account for part of the panic in state government. Voters hold politicians responsible for what goes on during their watch, no matter what they may have done or not done to contribute to the state of affairs. In California, the governor and the legislature bought into the euphoria surrounding deregulation. By the time deregulation began to pose problems, we had a new governor and mostly different legislators. The new team has had this huge problem thrust upon them, but neither the governor nor the legislature is expert in energy matters. By any account, their response has produced very mixed results.

One step they have taken is to stop the divestiture of utility-owned power plants and to keep these plants under cost-of-service regulation. This marks a 180-degree turn from the earlier encouragement of divestiture. The legislative details are not complete, but the general intention appears to be to create a state entity responsible for assuring an adequate reserve margin; to provide financing for new generation development if such is not forthcoming from private capital, possibly in partnership with private developers; and as a last resort, even to construct generation facilities. This new agency has not been authorized yet, and if it is authorized, there certainly will be a great deal of struggle about how active a role it will take in the electric industry in California in the future.
The state also has appropriated $800 million for energy conservation programs—a substantial investment on top of existing programs—to reduce energy use. These efforts appear to be bearing fruit. Recent estimates show demand down 10 percent or more from levels that would otherwise have been predicted from historical trends.

The big question in California is the future of retail competition. In January 2001, as we noted, the state stepped into the role of power buyer on behalf of the insolvent private utilities, and it continues in that role. So the state has an interest in making sure there is a market for the electricity it is buying. California has entered into the very long-term agreements that the utilities and generators had been discouraged from undertaking earlier in the restructuring experiment.

The state has contracted for large quantities of power for ten or more years out. This will leave very little room for retail competition because if customers choose other suppliers, the state will be left with an excess of power. There have been efforts to find a solution that would retain retail competition, at least for large users, but these appear to be foundering on the large overhang of long-term contracts the state signed when it became the buyer of last resort. These contracts were signed, of course, at a time of very high prices.

What is ironic, and saddening to some, is that with the state-purchased long-term contracts, we seem to have come back to where we were in 1994. We face a surplus of resources at high prices and a market that now, just in the last month, has shown indications of receding to historically normal levels. Forward prices quoted for 2002 are down to $58 per MWh, which is still roughly twice the level of 1998 and 1999 but less than the energy costs included in customer rates before the restructuring. The forward prices for 2003 have been as low as $42 per MWh.

The good news is that California may be coming out of the crisis, if the forward market is an accurate predictor. The bad news, however, is that consumers will not see the benefit of those prices because we are now locked into long-term power supply contracts.
California will probably find a way to survive. It will be a rocky road, though, and certainly a far different energy world will emerge from what was envisioned at the outset of deregulation.
I appreciate the opportunity to share with you my perspective of what has happened with California’s deregulation. Even as I do so, however, let me say that what happened in California was not inherent in the liberalization process. I want to emphasize this because it has been distressing to hear Seminar colleagues from Europe and North Africa tell me that the California experience has had detrimental impacts on efforts to restructure markets in their countries.

The energy crisis in California resulted not from liberalization but rather from a convergence of unanticipated circumstances and inadequate responses. I will focus my remarks on three factors that combined to bring about the disaster: resource inadequacy, market design flaws, and the political failure to respond quickly and adequately to problems as they developed. And I will conclude with some conjectures about the future of the electricity industry in California.
Much of our problem came from a major shift in supply and demand. California is a very large state—it just passed France as the fifth largest economy in the world. But California is not an island when it comes to electric power. Rather, it interconnects with 11 western U.S. states, two Canadian provinces, and two states in Mexico. From that integrated grid, California imports 20 to 25 percent of the power it uses on any given day. A large portion of that resource base comes from hydroelectricity, generated primarily in the Northwest. In addition, as we have heard, the Southwest has some coal-based resources. When we started to plan for restructuring, we were in a period of economic slowdown with sluggish demand growth. At that same time, a huge capacity surplus existed. Many of us believed, obviously incorrectly, that supply would remain adequate for quite some time. By mid-decade, however, California’s economy turned around and grew sharply, as did economies throughout the West, and the capacity surplus disappeared very quickly.

We had a similar supply and demand shift with natural gas, which is the marginal generation fuel in California. For 15 years, natural gas prices throughout the United States had been low, and consequently, little exploration for the fuel was undertaken. However, a price run-up occurred in California (and elsewhere in the nation): a growing economy consumed more natural gas; utility demand in particular expanded because of new natural gas units coming on line; and high oil prices caused dual-fired power generators to switch to natural gas. Not surprisingly, the skyrocketing natural gas prices pushed wholesale electricity prices even higher.

In addition, California’s electric infrastructure is showing its age. More than two-thirds of the power generation facilities are over 30 years old. These units require significant maintenance, especially when heavily used. As we saw this past winter, many need to be retrofitted with air quality control equipment. The weak infrastructure played its part in tightening the supply-and-demand balance in the wholesale electric markets.

It is not really correct to say that California “deregulated” its electricity market. To get a better sense of what the process entailed,
Imagine going down to the marina and seeing a man trying to keep one foot on the fixed dock while putting the other foot on a bobbing boat. The boat starts to leak because it was badly built—with the result that the boat sinks and the man falls in the water, almost drowning. This vignette symbolizes what took place in California: that badly-built boat symbolizes the flawed market for electricity trading, while the fixed dock represents the regulators of the California Public Utilities Commission (CPUC).

Many of the market design flaws stemmed from the fact that regulators just did not want to let go. For example, California regulators would not allow utilities to purchase long-term contracts; the regulators believed the spot market would provide better price terms. Thus by relying on what turned out to be an unpredictable and volatile spot market, they denied utilities an important means of protecting themselves against rising prices. By contrast, in the eastern United States, 85 to 90 percent of the transactions that go through the independent system operators (ISOs) are forward, longer-term contracts.

Even as late as June 2000, when the power crisis became very evident, our regulators would not allow utilities to purchase long-term contracts. Rates for longer-term contracts at that time were reasonable—between $40 and $50 per megawatt-hour (MWh). The state subsequently has reversed its position and entered into long-term contracts itself. More on this later.

Another problem with the California electric market design was the absence of any demand response mechanisms. Rising wholesale prices almost never got through to smaller consumers, who were protected with a rate cut and a price cap. Demand stayed high.

Then we come to the politics of the California experience—or, what happened when the law of supply and demand collided head-on with political agendas. It is a truism that politicians everywhere want to keep their constituents happy at almost any cost. In California in 1996, that meant promising that deregulation would bring low prices, increased reliability, clean air, an unrestricted electricity supply, and on and on.
In 1996, AB 1890, the bill that authorized California's deregulation, passed the legislature unanimously. Usually, California's legislature is not able to agree even on the color of gold, yet somehow it enacted this legislation with absolutely no dissent. At that time, I would have told you how brilliant we were for being able to please everybody. In retrospect, we made it impossible to maneuver when the unforeseen occurred.

When wholesale prices began to soar, utilities said, “Wait a minute. We do get a chance to recover all our costs, right?” Customers, on the other hand, said, “Don’t mess with our rate freeze.” As noted, small consumers were protected with a retail rate decrease and price cap. In addition to keeping demand high, the rate freeze had other very adverse market consequences. The freeze, although a political necessity and acceptable when wholesale prices were low, made it almost impossible for utilities to remain solvent once wholesale prices soared. Obviously if you cannot recover in retail charges what you are paying out in wholesale costs over an extended period, you are headed for bankruptcy.

No provisions were made in the law to allow the state to move rapidly to address such conflicts effectively. And the political leadership was faced with choosing among the mutually unacceptable alternatives of high prices, blackouts, retail rate hikes, or air quality relaxation. Nothing was done. At the time of the first serious spikes early last summer, we still could have controlled the situation with a rational response. Instead, we took a developing problem and turned it into a crisis of historic proportions. We have been living with that ever since.

California's latest political initiative is to have the state buy the power transmission system. This is a smokescreen for the state's attempt to keep utilities solvent. Purchasing the transmission wires might look as if California is buying an asset, but in reality the state is bailing out Pacific Gas & Electric and Southern California Edison. Though not totally, I should add, since we still have to make up the difference between wholesale prices and retail rates somehow.

Putting the California legislature in charge of regulating in-state power commerce while it operates and maintains the distribution
system is not a good thing. Recent experience has left me with a very negative view of the state’s regulatory and political ability to respond to energy problems.

Having recounted all this negativity, I do not want to leave you thinking we are going to throw ourselves off a cliff in despair. Let me note some positive trends. California has seen energy crises before. In the 1970s, we had a significant predicament driven by high oil prices, but we became stronger from that experience. We have instituted stringent building standards and appliance efficiency standards. We have been committed to building a diverse resource portfolio for energy production in California. In fact, many of the wind, geothermal, and solar technologies being deployed internationally were tested and proven in California. Those developments have been positive.

As a result of the electricity crisis, we are getting stronger yet again. We have an ISO that, when it gets out of rate making and politics, has learned to run the transmission system much more efficiently than in the past. In addition, a significant amount of new private investment capital has come into California. Nine new power plants have been licensed and are under construction; another 15 or 20 are starting the licensing process. This equates to roughly $10–$15 billion of private investment capital. This trend should continue—providing, of course, that investors are not driven away by future political rhetoric.

A substantial amount of political attention is now being given to infrastructure development. For example, most politicians now understand that the power transmission system needs to be expanded and upgraded, as well as the interstate and intrastate natural gas infrastructures. There has been much discussion about creating liquefied natural gas plants in Mexico to serve the market in California, and several of these facilities have been proposed.

The demand response capability is growing as well. Many companies have invested significantly in new Internet technology that
allows them to control their energy use on a basis much closer to real time.

We should get through this summer without crisis conditions. Not long ago, we were projecting 200 or more hours of blackouts for the season, but this situation probably will not develop. I attribute this to California’s “faith-based” energy policy: we pray for cool weather. So far, those prayers have been answered.

More specifically, we will probably see a re-setting of market rules, which has been a controversial issue in California recently. Wholesale market prices have stabilized for a number of different reasons, but how that situation will affect any long-term market mitigation measures remains to be seen. Some are concerned that lower prices may send adverse signals to investors. On the other hand, such prices may reduce the political pressure on policymakers, which would be very important.

However it plays out, we are not going to go backwards. The “good old days” did not exist. Whenever people ask me if things were better before restructuring, I tell them, “No.” Had we not set out on restructuring, we would be facing similar problems anyway. We were not building power plants before restructuring; we were not investing in infrastructure.

The California experiment was not designed purposely to fail, and there was no elaborate conspiracy to raise prices. Many really good people have tried hard to move things in the right direction. But the deregulation structure just was not nimble or flexible enough for us to react in a timely manner to unanticipated problems as they surfaced.

In conclusion I believe a major lesson to be learned is the need to build sufficient flexibility into any market reform structure to allow industry and government to respond quickly and efficiently to unforeseen developments. This observation is not profound, but recent experience confirms its absolute importance. California’s inability to act in that way took us from what would have been a relatively minor problem into the crisis mode of the last two years.
In the United States, the discussion of moving to market solutions for energy has been set in terms of “regulation” versus “deregulation.” However, I find the term “liberalization” much more appropriate than “deregulation.” If recent events in California have demonstrated anything, it is that regulators still have a significant role to play in making the transition to markets that discipline price and provide good service. Thus, I tend to think of this shift in terms of liberalization of regulatory oversight, not deregulation.

I speak as a member of the U.S. Federal Energy Regulatory Commission (FERC), which has jurisdiction over the rates, terms, and conditions of transmission service—the high voltage wires, not the local distribution wires, which are governed at the state level—and wholesale electricity sales in the United States. The recent California experience has brought home three important lessons I would like to share with you today:
• First, we must insist on good market design.
• Second, putting regional grid operation and planning in the hands of independent regional transmission organizations (RTOs) is essential to good market operation.
• Third, FERC must sharpen its regulatory intervention tools and use them quickly and decisively when markets malfunction. If we are going to rely on markets to discipline price, we ought to make sure we have markets that actually do this.

I will discuss these lessons in turn.

We must insist on a good market structure if we are to have reasonable prices. A functional retail market requires a functional wholesale market. Over the last year in the United States, we have become painfully aware of what works and what does not in market design, and we have learned that several key elements are necessary to create a well-structured, smooth-operating wholesale market.

The California electricity market was defined by a state policy that promoted over-reliance on the spot market. California policy required suppliers to sell to, and purchasers to buy from, the hourly markets. Yet, spot markets are volatile by nature. Imagine the chaos and high prices, for example, if airline passengers could only purchase tickets at the gate as they board the plane. Advance purchasing, long-term contracts, and hedging instruments such as futures and forward contracts are key components of a functional market. Regulators must insist that these market design elements are in place to allow purchasers to assemble a balanced and necessary portfolio of supply instruments.

Another element of good market structure is an ex ante assurance of adequate generating capacity, including a reserve margin requirement. The California market design did not call for any capacity obligations. Presumably, the market’s invisible hand was expected to make sure capacity emerged when needed. Given that electricity cannot be stored, however, relying solely on market signals for capacity can result in significant fluctuations of price and capacity availability as supply and demand adjust. The fundamental role that
electricity plays in the social, economic, health, and public safety components of society requires that substantial variations in availability and price should be minimized. One way of guarding against these fluctuations is to place an ex ante reserve requirement on the load-serving entities, which they could meet however they see fit. This is the current practice in the Pennsylvania-New Jersey-Maryland (PJM) market. The abundance of generation capacity additions planned there suggests that suppliers have confidence in that market approach. I think it is the best market design in America.

To realize such a design, new capacity will be needed. New capacity means new site approval, and in the United States, each state is responsible for the siting approval of all new generation. The California process is unusually slow and cumbersome, a fact that has deterred creation of new generation resources in that state. Such impediments must change. States must site necessary new generation in a timely manner to keep supply and demand in reasonable equilibrium.

For a market to function well, market players must be able to respond to price signals, and increasing supply is a critical response that must be made as easy as possible. For that, we need uniform standards and processes across markets for connecting new generators to the grid. New generators should make their location decisions based on market economics, not on which regions have the easiest interconnection processes. In the United States, the patchwork of interconnection processes and standards creates unnecessary obstacles for generators desiring interconnection. This problem must be solved, and the interconnection process must be sharply streamlined.

Recent events have also driven home the reliability and price-signal value of good, market-based congestion management. While FERC does not require a specific congestion management method, I find great value in the locational marginal pricing (LMP) model. By recognizing the incremental cost of generating power at various points on the grid, LMP sends the correct price signals for optimal use of existing generation and transmission resources. LMP also encourages efficient siting of future generation and transmission expansion. The value of LMP is highlighted by the world-class
achievement story in the PJM/ISO implementation of LMP. The many new generation projects that are queued up to participate in PJM are a strong indication of LMP’s success. The PJM congestion methodology works, and my agency should aggressively promote it across the United States.

All of the previously mentioned market design elements focus on the supply side. But markets also need demand responsiveness to price. The traditional means of moderating prices in most markets is generally absent from electricity markets. When prices for other commodities reach high levels, consumers can usually respond by buying less, thereby putting the brakes on price run-ups. If the price, say, for a head of cabbage spikes to $50, consumers simply do not purchase it. However, if end-use consumers cannot respond to price, suppliers can fetch virtually unlimited prices when shortages occur. The market monitors in California told us repeatedly that there were hours when the price the market would bear had absolutely no limit. Yet consumers saw the exorbitant bill only after the fact. This structure does not make for a functional market.

The need for demand responsiveness is a complex issue, one that poses a particularly difficult problem in the United States because jurisdiction is split between FERC at the federal level and the states at the retail level. Nevertheless, we can and should make sure this element is built into market design. Creating demand responsiveness in electricity markets requires two conditions: first, significant numbers of customers must be able to see prices before they consume, and second, consumers must have a reasonable means of adjusting their use in response to those prices. Accomplishing both of these objectives on a widespread scale requires technical innovation. The investment is worthwhile, however. A modest demand response can make a significant difference in moderating price whenever the supply curve is steep.

Once a market includes a significant degree of demand responsiveness, consumers should be allowed to bid demand reductions, or “negawatts,” into organized markets along with the megawatts of traditional suppliers. This direct bidding would be the most efficient way to include the demand side in the market.
To repeat, however it is accomplished, market design simply cannot ignore the demand side without suffering painful consequences, especially during shortages. The deregulated California market had virtually no demand responsiveness, which left customers with no effective means of reducing their demand when prices soared.

My next point may be one of the more controversial ones I make. California has shown us that electricity markets can be very volatile and that prices can increase by orders of magnitude in the blink of an eye. Given that experience, it is obvious that some mechanism must be in place to help prevent, or at least mitigate, such a price run-up, especially if it is created through the exercise of market power. The most common mechanism used in U.S. markets mitigates bids to some pre-defined reference price if certain conditions exist. Those conditions can be structural, such as locational market power, or based on percentage increases in bids compared to a reference price, which is often based on some average of past bids. Whatever the method, it is critical for some type of circuit breaker to be in place. Such a device protects consumers best and avoids the unwieldy processes needed for after-the-fact price mitigation and refunds. FERC recently approved such a device for the New York ISO.

The one absolutely critical element needed to create functional electricity markets is a reliable, efficiently managed transmission grid to which all players can gain access on a fair basis. The grid is the highway over which all electricity commerce must travel. Yet in the United States, problems in the way the grid is organized and managed present major impediments to good market performance. The U.S. electricity industry remains vertically integrated; that is, the utilities that own the transmission grid also have merchant interests in generation facilities. Those utilities thus have a conflict of interest in providing access to the grid, and there are constant allegations of market power and discriminatory conduct against those grid operators. To avoid this, a sharp separation of transmission from generation is necessary.

A second problem is the fractured nature of grid management. The operation and planning of the U.S. grid is splintered among well
over a hundred operators. Yet, the grid is now being used to support broad regional markets and must accommodate an increase in the number and complexity of transactions. Reliability and efficiency suffer as a result. The fractured grid management also keeps wholesale power markets artificially small because traders must pay multiple transmission rates to move power over systems owned by separate corporations. These multiple rates make the power too expensive, and deals are killed.

The current grid management in the United States is not conducive to an adequate reliable supply of energy or to reasonable consumer prices. FERC’s strategy for addressing these inadequacies is to call for the creation of regional transmission organizations (RTOs). The Commission’s goal is to have a functioning RTO in every U.S. region by December 15, 2001. An RTO is a grid manager for a large region, operated independently of merchant generation interests and responsible for short-term reliability, regional planning, and market monitoring. RTOs are absolutely essential for smooth-functioning electricity markets. RTOs will eliminate the conflicting incentives that vertically integrated firms now have in providing access. RTOs will streamline interconnection standards and help get new generation into the market. And RTOs will ensure access to regional power markets; improve transmission pricing, regional planning, and congestion management; and produce consistent market rules across a region. Resources will trade into the market most favorable to them; decisions will be driven by true economics, not the idiosyncrasies of differing market rules across the region.

One of the most critical RTO issues is scope and configuration, that is, how large these organizations should be geographically. To realize their many potential benefits, RTOs must be truly regional in scope because markets are regional in scope. This was made clear in 2000 as prices over the entire eleven-state Western Interconnection rose and fell with events in California.

Unfortunately, the voluntary RTO proposals made in the United States have been way off the mark. While the proposal for RTO West is an excellent start, the remaining proposals, shown in Figure 1, are
far too small in scope. Although these organizations themselves promise to smooth the market, the boundaries separating RTOs still present unnecessary bumps in the trading road. Thus, the larger the RTO, the better.

I would propose a target of six RTOs for the United States. This set of consolidated RTOs, shown in Figure 2, better represents trading realities than the proposals of the transmission owners. Better trading and the improved means of planning and access will greatly help the United States meet its current energy challenges. But FERC must take bold, decisive action soon if we are to realize the full RTO potential. As part of that action, we must insist upon well-designed RTOs.

There is one additional requirement to ensure the grid needed to support efficient and reliable electricity markets in the United States: transfer of the authority to site new transmission lines to the federal level. Now, siting authority is splintered among many state and local authorities. An adequate transmission grid is essential to support
regional interstate electricity markets, yet necessary new facilities are often blocked or delayed due to parochial local interests. To solve this problem, Congress must pass legislation to move authority for transmission siting to the federal level.

Even with our best efforts to put in place well-structured electricity markets, there undoubtedly will be times when those markets fail to do their job. When this happens, regulators must be prepared to step in aggressively to ensure that consumers continue to see reasonable prices. After all, the whole point of liberalization is to benefit electricity consumers.

In the new liberalized markets, the task of ensuring reasonable prices must be addressed differently from the way it was done under the old regime. The challenge is much more complex now. Our regulatory mission is moving quickly from reviewing cost-based prices charged by individual sellers to ensuring good performance by markets. Our focus is shifting, and our analytical tools must track this new responsibility. Our tools must also account for the unique complexities of electricity markets. Supply and demand must be balanced
simultaneously—yet market conditions vary significantly over relatively short time intervals, and some aspects of supply can come only from generators with certain technical characteristics. Market performance is significantly affected by these characteristics, which require sophisticated analysis. Since we cannot expect electricity markets to attain and maintain perfect competition, introducing the standard of “workable competition” might prove useful in market analysis. Workable competition has been defined as competition that leads to a reasonable, or socially acceptable, performance in the circumstances of a particular industry. It is a pragmatic standard that takes into account the unique conditions of an industry. Let me suggest the kinds of factors that might be appropriate to consider in deciding whether a market is workably competitive:

- **Supplier Concentration.** This must be defined accurately by considering energy prices, transmission capacity, and transmission prices—all factors that can affect the scope of trade. We must also take into account the time dimension of supply and demand. By that, I mean analyzing horizontal slices of the supply curve at various load levels—such as peak, super peak, off peak, and shoulder—to measure supplier concentration. Even more sophisticated approaches may be needed for assessing concentration in today’s electricity markets.

- **Market Rules.** While concentration is a useful statistic, market power analysis goes beyond supplier concentration issues. We should also determine if market rules create any perverse incentives or obstacles to competitive, efficient behavior by market participants. We must look to see if the rules in the market promote the elements of the functional market discussed earlier.

- **Computer Simulation Modeling.** Such models are becoming essential for determining if markets are workably competitive because they can take into account the interaction of market structure, market rules, and other market conditions such as demand responsiveness to estimate supplier and customer behavior, and the effect on consumer prices. After all, it is market results we are interested in.
• Historical Behavior. As a last step in market analysis, we should look at past behavior, which could give us clues to market flaws undetected by the other areas of inquiry.

In addition to sophisticated market analyses, regulators need to develop clear standards of acceptable market behavior. We cannot expect players to follow rules that have not been posted. We must also ensure that markets are adequately monitored, and that the monitoring and policing task force is equipped with the right data and sufficient staffing to do the job. And when market monitors—in California and elsewhere—tell us that market power is being exercised, we must respond forcefully rather than ignoring their pleas.

Finally, FERC must aggressively intervene when the markets are not producing reasonable prices. We waited too long in California, and prices got out of control. Events there almost destroyed the consensus for moving forward with a market-based approach in the United States. We must not allow that to happen. I remain convinced that markets featuring the appropriate design elements I have underscored today will produce reasonable prices and substantial consumer benefits.

It is important to remember that new electricity markets need constant monitoring throughout the liberalization process, but particularly in the transition period. These industries are just emerging from almost a century of monopoly regulation. The unique characteristics of electricity make it exceptionally vulnerable to market power and to breathtaking price run-ups when supply is short. Billions of consumer dollars are at stake, so we must be tough-minded in our monitoring, investigations, and interventions. In particular, we must be willing to impose timeouts on dysfunctional markets. Electricity is not alone here; all of the world’s most sophisticated commodity markets engage in this practice.

The past year in the California electricity market has been painfully instructive. We must heed the many lessons learned and apply them going forward. In particular, we must focus on creating a functional market design, establishing RTOs, and stepping in quickly
with regulatory action when markets do not produce reasonable prices. If we fail, electricity market liberalization may well stop in the United States.
During the last decade, as the liberalization and privatization of energy markets have progressed throughout the world, many countries have based their actions on the California model. Thus, there has been great interest in learning why the process failed in that state. In addition, experience with the process overall has raised important questions, for example about price volatility and supply security.

We appreciated the candid analyses of the California experience presented by the speakers in Panel I. In Panel II, we will review liberalization initiatives elsewhere in the world and learn of their successes and failures. Before I introduce our panel, I would like to present a few comments that may help frame our discussion.

First, I question whether vertical de-integration, carried out as completely as in California, is an indispensable ingredient for competition. Is it not more likely that vertical integration would produce a
more competitive market and optimize investments and assets to produce, in the end, better prices and a greater guarantee of supplies?

Horizontal de-integration within the energy sector, however, is a different matter. It acts positively by impeding the consolidation of excessive market power. Corporate vertical integration is compatible with sectoral horizontal de-integration so long as both are linked with common carriers for transmission and distribution. Of course, the natural monopolies that may be involved in transportation and distribution must be accessible to all firms under universal and transparent conditions.

This leads to my second reflection, which deals with the role of planning and regulation in competitive markets. Today, planning is not in vogue, even for transition purposes. It has become fashionable to assume that the market’s “invisible hand” will solve all our ills. A related supposition is that if the market is really open, market forces will automatically create a competitive energy sector. I question these assumptions. The problem of reconciling independent entrepreneurial initiatives with an electric system (and perhaps also a natural gas system) that guarantees quality, quantity, and price of necessary supplies is a topic we cannot afford to overlook.

Third, I wonder about the occasionally confused thinking of some environmentalists. For example, as we saw in California, the strong push for cleaner air is linked to resisting the construction of new generation plants. This policy keeps older, less-efficient, dirtier units in operation. The CO$_2$ output of modern combined-cycle power plants is about a third of what we get from conventional coal plants. The shortage of new generation facilities caused by bureaucratic regulations and environmental demands has not only affected current supply problems but, if CO$_2$ proves to be responsible for the greenhouse effect, it also has exacerbated global climate change problems.

Another topic of continued interest is the regionalization of markets, a subject we discussed at the XI Repsol YPF-Harvard Seminar in Buenos Aires in December 2000. At that time, Roberto Monti strongly decried South America’s “Chinese walls,” the government-erected
barriers that impede the development of regional markets. We see the same phenomenon in Europe, partly due to resistance from the monopolies or oligopolies that have until recently dominated the domestic markets of many European countries. Nevertheless, we must continue to push for integration because regionalized electric and natural gas markets can offer current supply guarantees at lesser cost or greater guarantees at the same cost.

Let me now introduce our panel, a group of speakers who are well qualified to give us a broad view of liberalization and regulation based on perspectives that range around the world:

• Our first speaker, Gerald Doucet, has been Secretary General of the World Energy Council (WEC) since 1998. As leader of the WEC with its 90 member committees, Mr. Doucet has an unusually comprehensive view of world energy markets. Before assuming his post at WEC, Mr. Doucet held various positions in government, industry organizations, and international relations, most recently as President and CEO of the Canadian Gas Association.

• Julio Herrera, the Executive Secretary of the Latin American Energy Organization (OLADE), is our second speaker. Dr. Herrera was Uruguay’s Minister of Industry, Energy, and Mining from 1996 to 2000 and also President of the Uruguayan Committee of the World Energy Council. He writes and speaks widely on energy issues, privatization, and the role of the public sector in business. Today, he will review the progress of liberalization in Latin America.

• Dominique Ristori, Director of General Affairs for the European Commission’s new Directorate General for Energy and Transport, will review liberalization in the European Union. At the Commission, Mr. Ristori oversees general policy about liberalization and inter-institutional relations; all aspects of the internal market, including competition and public service; and international affairs.
• María Luisa Huidobro is unusually well qualified to tell us about electricity liberalization in Spain. Mrs. Huidobro is President of the Spanish Power Exchange (OMEL) and a member of the Board of Directors of the Spanish National Electricity Transmission Network (REE). During the 1990s, she was Director General of Energy in the Ministry of Industry and Energy, where she played an important role in laying the groundwork for liberalization in the Spanish energy industry.

• Our final speaker, Álvaro Silva Calderón, is Venezuela’s Minister of Energy and Mines and a member of his nation’s National Energy Council. As such, he is well positioned to review recent developments in liberalization in his energy-rich country.
The World Energy Council (WEC) has over 90 member committees worldwide and works on global energy issues in a multi-energy context. This means I do a great deal of traveling and have the opportunity to discuss energy issues with people everywhere. Of late, no matter where I travel or with whom I speak, the three questions I invariably am asked are “Can California happen here?,” “Should Kyoto be saved?,” and “Is reliable energy cheap?” My answer to all three is “No.”

Our concern today centers on the first question: “Can California happen here?” In response, I will discuss the worldwide energy goals of WEC, look briefly at some examples of energy crises, and then conclude by examining electricity market design and pricing issues. The last topic relates well to today’s wider discussion.

In its recent publication *Energy for Tomorrow’s World—Acting Now!*, WEC identifies three specific worldwide goals that provide a basis for electricity market reform.
The first goal is to provide accessibility. At this time, one-third of the world’s population does not have access to adequate supplies of commercial energy. This fundamental problem is a government issue and a business issue, and thus an issue we all have to address. The manner in which we resolve the problem is closely linked to questions of market reform and pricing.

The second WEC goal for energy is to guarantee availability. Once a society gains access to energy, its members then want to have available, dependable energy, and so issues of reliability of supply and of quality move to the forefront.

Finally, the third WEC goal is to ensure the acceptability of how energy is produced and delivered. In other words, we want to deliver commercial energy to create a sustainable economy, but we want to do so in ways that respect local, regional, and global social considerations and environmental requirements.

At WEC, we believe all three of these goals will be best achieved through market reform.

Before turning to market reform, let me mention a few examples of critical situations for energy. When I look at California, I cannot bring myself to use the word “crisis.” “Choice” might be a better term, since what happened there came about as a result of deliberate decisions. If you want to see a real crisis in energy, go to India. I know some of you are there already and may be regretting the fact. That nation needs 25,000 megawatts (MW) of new installed capacity by 2005, which presents a formidable challenge. But problems with the current system are also daunting. For example, 51 percent of installed capacity in India today is lost through non-technical means. That is about 45,000 MW—an enormous loss to the system. So on the one hand, India needs new installed capacity even as the nation gives potential investors a good deal of grief in terms of setting investment rules. On the other hand, India has a huge crisis regarding the technical and non-technical losses in its existing electricity system.

In Latin America, market integration is moving ahead fairly well. However, Brazil offers an example of another kind of crisis in the
making: the unmet demand for a huge amount of electricity. Brazil has been too slow in opening up its electricity market to private investment. It is willing to renegotiate gas contracts with Bolivia, but it does not want to take on the huge challenge of speeding up deregulation to open the electricity market. Instead, the government has begun reducing electricity supplies on the basis of quotas. This form of rationing looks to decrease demand by 20 percent.

In Africa, we see another kind of crisis, a much more fundamental one. We are working with African governments to address issues in electricity market design, but the fundamental obstacle is lack of basic data. We do not really know what the energy base is; we cannot link the supply side with the demand side. Nothing at all exists in the energy database for Africa. We are starting to build that database, but the continent is really just beginning to create an electricity system.

When we consider how to proceed with market reform, it is clear that appropriate regulation is the primary prerequisite for a successful outcome. If the California experience has taught us anything, it is the danger of raising false expectations by using the terms “privatization” or “deregulation” to define what we mean by market reform. Such terms conjure up the expectation that somehow we are moving into a world of totally free markets. This is far from the case. Creating strong, independent regulation is as high a priority as establishing market rules or moving toward customer choice. Blending market features and regulation will simplify market reform in many circumstances and will deliver benefits similar to more complex market designs.

Another prerequisite for market reform is keeping energy options open, particularly in terms of portfolio diversity. California provided a useful, if painful, example of the importance of this issue. California cannot happen in Europe because European-style liberalization includes a diversification of energy portfolios. In California, the spot market was virtually the only energy option available. In the United Kingdom and other parts of Europe, energy companies rely on diversified portfolios. We stress this for the rest of the world as well.
The simplest approach will often achieve the desired benefits. Do not try to do everything at once. Privatization, for example, need not be part of the initial package. In many markets, equating privatization totally with the concept of market reform causes a great deal of confusion. To use one example, Romania has to move toward rapidly privatizing its natural gas distribution system to build the financing it needs for modernizing the rest of its system, including its electricity infrastructure. But Romania is privatizing just part of its natural gas system.

I am not overly concerned about how soon companies privatize. Privatization is an issue more closely linked to financing. For market reform, the issue really is how companies function in a market. Success in this regard involves setting appropriate rules, making sure they are transparent, and empowering customers. When considering liberalization, WEC’s fundamental emphasis is focused on ensuring transparency and customer choice.

The vertical de-integration of companies is also a lower priority issue. In global markets, very large companies often need to be allowed to operate across frontiers in order to lead reform in what have been closed local markets. If corporate size is coupled with open markets and customer choice, large companies can achieve positive effects within the market. In other words, vertical integration should not be seen simply as a negative.

As many government officials and industry executives moving toward deregulation have already discovered, market design is critically important. For examples of specific work on electricity market design, a recent WEC study, *Electricity Market Design and Creation*, provides specific examples of work on energy market design. This study focuses on nine markets in Asia Pacific and includes the lessons we have learned as deregulation has unfolded. What are the study’s main conclusions?

The key conclusion stresses a cautionary balance when considering markets. On the one hand, introducing competition into electricity markets can deliver real benefits for cost efficiency, downward
pressure on prices, and customer focus. However, the costs of market introduction and reliability can be high. Net prices could rise. The reality—one that California politicians and policymakers did not face—is that the market involves risks. Such issues as long- and short-term price volatility, or who pays for capacity, or who pays for system reliability have to be faced. It is necessary to undertake a rigorous cost-benefit analysis of intended market measures to ensure benefits are commensurate with costs.

Another, perhaps more complex, conclusion is that the competitive potential at each stage of the energy chain must be examined when designing an appropriate market—not just the initial stage of electricity generation, for example, or that of end-users. For some industry players, the discussion of natural gas-electricity convergence focuses principally on the end of the chain, that is, on the issue of customer choice. This perspective looks on energy supply as a service, not a commodity. It assumes that for converged natural gas-electricity companies or natural gas-electricity renewables companies, providing the service aspect is all that is needed.

However, if you look at the electricity generation system without considering the natural gas system—or the reverse—you will face serious problems. Our studies demonstrate that competition at one stage, for example in generation, may compromise objectives at another, for example, investment in capacity construction. Introducing competition in generation may lower asset sales values and the ability to repay debt. This is a reality that politicians and policymakers need to take into account as they introduce reforms and design the regulatory process. Market modification may be needed to achieve social and national goals. Pure competition and a responsible energy policy are not likely to be compatible.

A third conclusion emphasizes the fundamental importance of pricing and revenue collection for establishing and maintaining commercial energy systems. Countries that face huge problems of accessibility also face problems of knowing what the cost structure for energy delivery is. Including full fuel-cost recovery and an adequate cost-of-service determination are among the key principles for pric-
ing energy in developing countries. Marginal cost pricing and opportunity cost pricing are two features that are not well developed because of their cost base.

Many developing countries do not believe that pricing energy in the home country below opportunity cost—that is, below the price they could get for exporting it—is a true subsidy. They also feel that any advantages for their resource base or the methods by which they have developed it should first and foremost benefit their own people. Yet when we examine subsidies in many developing countries, we find that subsidy capture has perverse effects. In most instances, the subsidies offered are captured by the wrong groups. In other words, those for whom the subsidies are intended are not gaining from them.

Metering, billing, and collection are very primitive systems in economies in transition and in developing countries. As I noted, non-technical losses and non-collection rates in many developing countries are far too high. Until we get the pricing right and the collection system well established, we will not succeed in addressing the problem of accessibility, and we will not ensure that commercial energy can be delivered. Reliable and adequate electricity is not cheap.

Intelligent, efficient electricity market design and pricing are absolutely critical to providing accessibility, ensuring availability, and gaining social and environmental acceptability for energy production and transmission worldwide. From our work on benchmarking power plants around the world, I can affirm that these factors not only drive the issue of efficiency and savings in terms of the investment required for new capacity, but they also drive carbon emissions management and other environmental concerns in a very fundamental way. It is these issues, not the future of the Kyoto Protocol, that go to the heart of effective management of greenhouse gases in every corner of the world.
NEW DIRECTIONS FOR LIBERALIZATION AND REGULATION IN LATIN AMERICA

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A spreading world economic and political trend—identified by the term “globalization” and with international trade as a major component—has reached the shores of Latin America and the Caribbean. Many countries in these regions have decided to work to join the globalized world to benefit from its positive aspects and mitigate any adverse impacts. In this new environment, how markets develop will determine, to a large extent, the future of the people who live there.

Latin American and Caribbean countries are abandoning the nationalism that has characterized them since the 1960s. During that decade, energy was viewed as a strategic resource for national security and sovereignty. Now, the perception has changed substantially; energy has become a strategic element in the efforts to achieve international economic competitiveness and improve the general quality of life. The new approach has replaced economic and energy self-sufficiency with integrated economies and energy markets. In this process, the region is striving to develop its resources in keeping with its new interests.
In the following discussion, I will briefly describe the state of energy market integration in Latin America and the Caribbean, speak to the future of energy liberalization in the region, and offer some conclusions and proposals.

In 1997, overall investments in Latin America and the Caribbean reached $23 billion, a record high. Investment in the energy sector represented 42 percent of total investments made in the area. However, despite these impressive gains in energy investment, there is still much to be done in terms of fostering energy consumption in Latin America.

Total energy consumption in Latin America and the Caribbean rose by 2.6 percent annually over the last decade. This continues to be low, relatively speaking, and growth is uneven among the region's countries. The uneven growth indicates differences in relative development of national economies. The low overall energy use growth rate stems from widespread poverty and low per-capita income within the general population. Annual per-capita income grew only 1.2 percent in this period, preventing any significant expansion of goods and services markets.

Given this situation, the region is unlikely to close the consumption gap with the industrialized countries, making it more difficult to become fully integrated within a globalized world, absent a more aggressive development process. And an aggressive development process must include energy market integration and liberalization.

Several interregional organizations in Latin America have played a primary role in the progress of energy market liberalization. These include, among others, the Latin American Energy Organization (OLADE), Mercosur, and the Andean Community of Nations. Countries in Central America and the Caribbean have also banded together to promote the energy liberalization and integration process.

OLADE, which has focused on integrating energy markets in its 26 member countries since its establishment in 1973, has now included globalization in its mission. In addition, OLADE reaffirmed
its commitment to work for a more human dimension to energy, one that would ensure a decent life for people everywhere in these regions. The results of reform efforts have been encouraging. For example, under the auspices of OLADE, three countries—Colombia, Ecuador, and Peru—agreed to interconnect their electric power systems and harmonize their standard-setting frameworks.

Mercosur has sponsored activities linked to electric power, natural gas, and oil, including natural gas pipelines between Bolivia and Brazil and interconnections between Argentina and Chile via various border passes in the Andes, electric power and natural gas interconnections between Uruguay and Brazil, and trade of crude and refined products among the region’s various countries.

In the renewed Andean Community, efforts to develop their abundant natural gas reserves are underway to allow member countries to depend less heavily on the volatile international oil market. In the region, significant developments include the massive expansion of natural gas in Colombia, the new natural gas use diversification policy in Venezuela, possible interconnections between both countries with a prospect for extending them toward Central America, the natural gas pipeline connecting Bolivia to Brazil, and the multipurpose pipeline between Bolivia and Peru. In electric power activities, the interconnections from Venezuela, first with Colombia and afterwards with Brazil, as well as the interconnection project among Peru, Ecuador, and Colombia, which is under way, should be emphasized.

In Central America, agreement has been reached for an integrated electric power operation, with prospects for incorporating natural gas from both tips of the isthmus. The SIEPAC projects, the natural gas lines from Mexico and Colombia, and the liquefied natural gas (LNG) project in Trinidad and Tobago offer supply alternatives that had never before been envisioned as possible. Additional support has come from Venezuela and Mexico to Central America via the San José Accord and through the Caracas Energy Cooperation Agreement.
In the Caribbean, the growing concern is finding new energy substitutes such as compressed natural gas (CNG) and LNG to supplement or even replace LPG, diesel, and fuel oil. The aforementioned LNG plant in Trinidad and Tobago already exports to Europe and the United States. To further the integration of these new resources and others into regional energy markets, the Caribbean Hydrocarbons Cooperation Commission was recently established.

The decision to introduce energy reforms in Latin America means many changes. The old model featured centralized command-and-control economic policies, where the state had a monopolistic, preponderant role in energy activities. Now the region is making major efforts to create competitive markets and to modernize institutional structures and national norms.

One example of change involves the Hemispheric Energy Initiative (HEI), which was established by the Summit of the Americas in December 1994. Working groups were set up to develop topics involving energy and social development, energy and the environment, energy and integration, and energy and regulation. OLADE, as part of its role as provider of technical cooperation, participates in the HEI as a member of the Coordinating Secretariat. OLADE has also played an important role in the development of the Caribbean Hydrocarbons Cooperation Commission.

As such reforms become more widespread, a trend toward market liberalization has become more apparent, leading to a considerable expansion in business opportunities and the active participation of new players. For example, the natural gas and electric power markets have experienced structural and regulatory changes over the past decade. Privatization was introduced, regulatory institutions were created, electric power activities were broken up, and open access to transmission was introduced. Regulatory mechanisms were introduced to set reasonable tariffs, to attract private investment, and to guarantee supply at reasonable costs for consumers.

As noted earlier, a bright spot in the investment picture is the influx of capital from outside the region. The United Kingdom,
Germany, and especially Spain have been large energy-sector investors in Latin America and the Caribbean. Repsol YPF has been a leader in this area, taking on a very large risk-capital exposure. The firm has been intimately involved in the region’s energy successes over the last decade, establishing a presence in upstream or downstream activities in almost all the member countries of OLADE: Argentina, Bolivia, Brazil, Colombia, Ecuador, Peru, Venezuela, Trinidad and Tobago, and Guyana.

Energy markets in Latin America and the Caribbean are gradually opening up and becoming more competitive. In spite of these efforts, however, monopolies still exist in the public and private sectors. This generates undesirable impacts that distort the market. The most important effects include restriction of investments; resistance to innovative, efficient practices; hindrance of the market integration process; and creation of higher energy costs.

Another important challenge for energy development in the region is eradicating our systemic poverty. In truth, economic and physical hardship is the worst social problem for the majority of our countries. This situation is implicit in many regions in the type of energy available and the manner of consumption: accessible fuels such as firewood or even dung are labor-intensive, low quality, highly inefficient, and heavily polluting. The lack of efficient, readily available, easily accessible energy sources sustains depressed living conditions and creates a major obstacle to joining the globalized economies.

Pollution is another important consideration in the drive for modernization of Latin America’s energy resources. Currently the region contributes less than 5 percent of global CO$_2$ emissions. Creating higher standards of living for our population through increasing accessibility to, and use of, energy resources, whatever the type, could increase this percentage. Thus we will need to focus on soliciting international cooperation in transferring and applying clean technologies under conditions that are feasible for our people.

There is no question that Latin American and the Caribbean need to move ahead in terms of energy liberalization and market
integration to improve our general quality of life and economic well being in the shortest time possible. We are looking for energy sources that will benefit all our people, not just elite society or certain industry or economic sectors. This concept of energy solidarity must be put into practice for the good of all citizens.

The region has already started to integrate markets. This makes it possible to share energy resources among neighboring countries in a way that can offset any imbalances in availability or accessibility. This development has been referred to as “energy complementarity,” which converges with the concept of energy solidarity. Without active cooperation among countries in terms of energy—as well as in terms of goods, services, and technology—energy solidarity lacks substance.

There is yet much to be done with regard to liberalization. One particularly important goal is consolidating reforms. Achieving this step will help ensure the continued growth of foreign investments and safeguard those that have already been made. Another important element in our energy future is international cooperation, both multilateral and bilateral. Such cooperation, whether it involves technology transfer or the joint development of business opportunities, will provide a foundation for the region’s continued economic expansion and social advancement.

The primary driver of our efforts toward liberalization and integration, however, must be the elimination of poverty. Focusing on energy sources, on economic growth, on sustainable development, on globalization, or on the many other concepts that have dominated international financial and political forums is futile if we end up still having underdeveloped and depressed people living in poverty, using firewood or dung as their primary energy source, and having no access to a decent human destiny.

Integrating the region’s countries economically is the key to developing their people and their interests as a region. In particular, Latin America and the Caribbean are striving, and should continue to strive, to develop their resources in keeping with their interests.
Taking the above into consideration and in keeping with the concept of strategic cooperation, future plans for nations and regional organizations should focus on the following goals:

- Backing the region’s efforts to integrate in order to develop its countries for the benefit of their inhabitants.

- Establishing a regional energy strategy that recognizes the differences among the subregions and countries of the continent and contributes to the sustainable development of the population.

- Participating in the development and expansion of knowledge for the benefit of the population through the use of modern, efficient equipment and tools adapted to the different realities of the region.

- Facilitating access to new technology, achieving international competitiveness, improving management and organizational capacity, modernizing ways of marketing, and providing consumers with a greater freedom of choice.

- Promoting the development of energy reserves and resources to supply and diversify the energy mix of countries so as to supply people with low-cost, reliable energy, thus contributing to reducing poverty levels and providing a decent life for everyone.

- Giving incentives for the development of new, clean, and renewable sources of energy on the basis of shared technologies for the benefit of the region’s inhabitants.

These points highlight the new approach to energy that OLADE has pledged to support. It is an approach in which energy issues transcend the limited realms of the economy, the environment, technology, and merely operational aspects in order to view man as the center of attention and the ultimate beneficiary of energy resources. All of us who are involved in energy activities are obliged to give such a human dimension to energy.
The creation of an internal European market for electricity and natural gas is a key objective of the European Commission, and all its members continue to support the Directorate General of Energy and Transport’s efforts to implement this market. The Commission recently proposed accelerating the liberalization process, foreseeing the completion of the internal market, with full market opening to all customers, by 2005. It also recently confirmed the need to address energy market distortions.

The Commission plans to pursue four main areas of development in the coming months:

- Making progress toward full market liberalization or “opening.”
- Ensuring that both quantitative and qualitative openings take place.
- Creating a real integrated internal market rather than 15 separate national liberalized markets.
Achieving essential objectives such as maintaining supply security, providing public service, lessening impacts on employment, and preserving the environment.

An integrated internal European market requires new forms of regulation and a consistent approach. Therefore, one of the important characteristics of the European model is the ongoing cooperation between the market players, which include European institutions, member states, regulators, transmission system operators, natural gas and electricity companies, traders, consumers, and so on. Such cooperation will need to be monitored and strengthened as the internal market project progresses. Market opening does not mean that the need for regulation will disappear. On the contrary, many countries have found that open markets require just as much regulatory effort as regulated ones.

The first steps in creating an internal energy market were taken in 1996 and 1998 with the adoption of the Electricity and Gas Directives. Our experience to date with these directives has been very positive: 65 percent of electricity demand and 70 percent of natural gas demand are already open to Europe-wide competition. Our initial expectations have been greatly surpassed, and electricity prices have dropped in almost all member states and for all consumer groups.

At the same time, however, a few member states have limited their market opening to the legal minimum. In addition, two countries have yet to implement the Gas Directive fully. Consequently, the difference between the unexpectedly high level of market opening in many countries and markets where member states chose to limit themselves to the legal minimum has raised concerns about distortions in competitive conditions among European Union companies. This situation applies to electricity and natural gas companies and to energy consumers.

Some argue that certain operators are using a dominant position in their own national market to help them expand into other markets, while at the same time enjoying competitive advantages in their
own market because of restrictions on foreign operators. The “reciprocity clause” in the existing directives is not adequate to resolve this discrepancy, and the Commission judges it urgent to establish conditions for fair competition.

This is why the Commission believes that progress toward full market opening is imperative. All companies should have the right to choose their electricity suppliers by 2003 and their natural gas suppliers by 2004, and all citizens should enjoy these rights in 2005. Indeed the Commissioners are so concerned with this issue that they are considering implementing these measures using Article 86 of the Treaty.

The transition period has also demonstrated that distortions can arise from divergences in quantitative and qualitative aspects of market openings. Some member states have fully opened their markets, but the record shows, for example, that new competitors have difficulty in entering the market and that only a few customers have switched suppliers. This indicates that qualitative aspects of the market opening process—the laws and rules that set the framework for a level playing field for all participants—are lacking.

These qualitative aspects are as important as, if not more important than, quantitative, technical aspects of market opening. For example, operators must be granted non-discriminatory access to transmission and distribution networks and a cost-reflective tariff structure. This is why the Commission proposes that operation of transmission and distribution networks be independent and legally separated from other functions such as generation or sales, that network access tariffs be supervised by national regulators, and that independent regulators have a minimum number of common, comparable responsibilities across Europe.

European Union legislators must guarantee that companies can develop their business strategies, whether they involve multiple utilities or international expansion, in the best possible business environment and that equal treatment and opportunities are given to all companies.
The European Council at Stockholm asked the Commission to evaluate the situation in the natural gas and electricity sectors for the spring European Council in 2002 to enable further steps to be taken. The Commission intends, therefore, to produce a “benchmarking” report comparing the different approaches adopted by member states in terms of market regulation to ensure fair competition; realization of environmental and social objectives; prices and conditions for network access, including storage and balancing; development of wholesale markets for electricity and natural gas; cross-border transactions and interconnector management; movements in price and service to final customers and consumer response to market opening; and the effect of market opening on employment.

The report will describe the different regulatory regimes in place in each of the member states under the current directives and show any consequences these differences have on the functioning of existing or expanded single markets for eligible customers. The report will also set out what the Commission considers to be best practice in regulation and access arrangements.

For the European Union internal market in natural gas and electricity to become a reality, intra-community trade needs to be facilitated. The aim is not to create 15 open national markets, but one real integrated internal market. All companies must have free access and be able to develop markets across the European Union as easily as they can within their own member states.

Obviously, the availability of infrastructure connecting the different member states is important in achieving this aim. The Commission is reviewing the situation regarding infrastructure capacity, and it will shortly put forward a European-wide plan seeking to eliminate existing bottlenecks and build missing connections.

In addition, developing the internal market requires a set of trading rules. The Commission’s draft regulation addresses the issues of tariffs for cross-border transactions based on the principles of simplicity, non-discrimination, transparency, and reflection of costs. It also deals with the allocation and management of interconnector
capacity. These trading rules for cross-border transactions in electricity also need a permanent harmonized system for cross-border transmission tariffs and consistent rules for allocating and managing interconnector capacity.

The Commission did not reach final agreement regarding the necessity of a provisional mechanism to set electricity tariffs before September 2001 at the last meeting of the Florence Forum, even though the overwhelming majority of member states had agreed on the principles of rates based on actual costs and absent import or transport charges. For natural gas, it is necessary for the Madrid Forum to continue its efforts to establish transparency in interconnection capacity and to construct a cost-reflective tariff system at the European level. The Commission will keep working closely with regulators, member states, and transmission system operators to develop this very important set of rules for governing European markets for electricity and natural gas.

The need for state regulation does not disappear with market opening. Providing essential services, meeting public service obligations such as universal service, protecting vulnerable customers, preserving customer rights, maintaining supply security, service quality, and reasonable prices, and protecting the environment are basic social needs that governments must ensure are met through regulation, although without outright state ownership. And it is always important to remember that regulatory standards must be clearly defined, transparent, non-discriminatory, and subject to enforcement.

Establishing and maintaining supply security is a key objective of our energy policy. This issue has been debated in the European Union thanks to our Green Paper published late in 2000. Ignoring the European Union’s growing dependence on primary energy imports would be a major mistake. Europe now imports half of its energy, and this figure will increase to 70 percent within 30 years.

The California crisis gives us a sharp warning about the problems Europe could face if we do not give enough attention to supply security. However, the other errors made in California are not relevant
to Europe since they relate to obstacles to constructing new generation in a rapidly growing market, to the lack of appropriate arrangements with neighboring states, and to the creation of an obligatory electricity pool.

The Commission has also sought to encourage strong regulation over all aspects of the new market arrangements. For example, the Electricity Directive and the new Commission proposals do not prevent governments from giving incentives to generation companies to maintain reserve capacity sufficient to avoid blackouts and other risks. This is a public service obligation. Such issues can be taken into account by national regulators in designing trading rules. Furthermore, we also propose strengthening the provisions of the existing directives by obliging member states and the Commission to monitor the balance between demand and supply and by launching tenders for new generation capacity whenever necessary. The Commission’s proposals will avoid the difficulties created in California concerning supply security since they seek to integrate and interconnect European markets.

We also need to pay continued attention to supply diversification in terms of products and sources. In this context, promoting renewables is key. The intensification of our efforts to increase energy management, energy efficiency, and conservation involves supply security and environmental objectives. For example, we need to maintain our nuclear generation. This source represents one-third of the European Union’s electricity generation, but it also plays an important role in reducing CO₂ emissions.

High standards of public service are another major feature of our European model. These are by no means incompatible with an open market. Indeed, a detailed benchmarking exercise carried out by the Commission has shown that in countries that have fully opened their markets, such as the United Kingdom, standards have risen to become the highest in the European Union. This comes from effective regulation. Our new proposal builds on this progress. It maintains existing safeguards and adds new ones: the obligation for all member states to ensure universal service for electricity, the obligation to adopt
appropriate measures for consumer protection, and the introduction of an ongoing benchmarking process regarding public services. European citizens already enjoy the highest standards of public service protection in the world; these proposals will guarantee this position and improve it.

Attention must be paid to the impact of market opening on employment. As the existing electricity and natural gas monopolies are forced to compete, they will reduce employment levels. Some have already done so. However, a recent study by the Commission has shown that so far these firms have been able to accomplish this without serious layoffs, using early and voluntary retirement and retraining. Furthermore, as stressed by the European Council in Lisbon, competitive energy prices help maintain and increase community competitiveness in industries employing millions. To date, therefore, results in terms of employment have been satisfactory. Nonetheless, we must remain active in this area, collaborating with member states to introduce appropriate assistance regarding retraining, for example, and encouraging permanent contact between employers and trade unions.

Our studies regarding environmental protection have shown that market opening to date has reduced greenhouse emissions through the rapid replacement of old, inefficient generating capacity. This is encouraging, but lower energy prices raise issues regarding the competitiveness of renewables and energy efficiency. Member states have the freedom to impose public service obligations for environmental reasons and can dictate priority dispatch for electricity from renewables.

The Commission is complementing the existing environmental measures by proposing a directive on electricity from renewables. This directive would set targets for each country for the percentage of its entire electricity supply to be generated from renewable sources and for energy savings in buildings. The main goal is to create in Europe the most environmentally safe electricity generated from renewables in 2010. This clean electricity we are proposing would account for around 22 percent of world production. Further
actions, for instance on emissions trading and emission standards, are at different stages of development. Improving environmental standards is a key objective of European energy policy, and evidence to date proves that environmental standards can continue to advance in open markets.

What we are now proposing is nothing less than creating the world’s largest and most open, but secure, electricity and natural gas markets. This accomplishment will give European consumers and industry more choice and greater efficiency than what is available to consumers anywhere else in the world. As we continue down this path, we can draw several conclusions from our experience:

- Market opening in natural gas and electricity has led, and will continue to lead, to important changes. These changes have to be managed properly in a smooth and balanced manner.

- Total market deregulation is not on the agenda. This would not be in the interests of consumers because it enhances the possibility of monopoly power. It would also put at risk other policy objectives such as protecting the environment and ensuring supply security.

- The new situation creates new regulatory challenges for member states and the Commission as they strive for consistency and general market integration. With the co-operation of all key actors, we are confident of meeting these challenges and, in the end, reaching a good balance between market forces and regulation.

- Since market opening requires a certain degree of consistency in approach, an additional important characteristic of the European model is the intense, ongoing permanent cooperation required between all the different actors, including European institutions, member states, regulators, transmission system operators, natural gas and electricity companies, traders, and consumers.

- Finally, it is evident that increasing international cooperation is also necessary. We have already begun negotiations with other countries, and the first group of new member states will join the
European Union at the beginning of 2004. In addition, we have established an energy partnership with Russia, and we are developing new paths to cooperation with China. In the future, we will work on establishing an energy dialogue with the United States and developing our relationship with Latin America and the Mediterranean countries.
Organized markets for electricity play an important role in the continuing movement toward energy industry liberalization in the European Union and around the world. Organized electricity markets can promote international transactions while providing the necessary liquidity and other conditions that buyers and sellers need. In addition, cooperation among national market operators can contribute to the creation of more trading opportunities across borders in Europe.

In this discussion, I will focus on the impact of investment decisions on electricity markets and security of supply, the progress of energy market liberalization in Europe, the relationship between electricity markets and transmission systems in the region, and the structure of the Spanish electricity market. I will conclude by offering a few thoughts on how the situation in Spain differs from that of California.

As market liberalization moves steadily forward, there are concerns about its effect on security of supply. Let me emphasize my
conviction that market liberalization and supply security are compatible. Both benefit from common factors: the building of new power plants as needed; a realistic treatment of reserve capacity (electricity cannot be stored, which makes excess capacity absolutely necessary); appropriate development of transmission and distribution networks; and the value of international connections to a country's commercial capacity. Similarly, we are aware that infrastructure bottlenecks, whether in generation or in transmission, hinder supply security and impede the development of competitive markets.

An energy market that works properly gives appropriate price signals to market participants. Such signals encourage new investments in power plants and transmission infrastructure in an unregulated system or guide changes in transmission infrastructure in regulated systems.

In such a context, an organized market offers important advantages because it provides equal access to a variety of trading contracts for all participants, as long as prices are set correctly. To get prices right, the market must have liquidity, offer transactions with different terms and time horizons, and have a sufficient number of buyers and sellers. Whatever the market structure, the essential aspect is providing access under equal conditions to all the market participants.

All liberalization schemes must resolve several hard issues in order to offer genuine competition to all participants and maintain supply security and reliability. I will mention two. The first deals with how much unbundling should be mandated. Which function or functions should be considered a natural monopoly and thus subject to regulation? And what are the advantages and disadvantages of corporate integration versus de-integration?

Ensuring supply when transmission and generation are both unregulated activities poses important challenges. For vertically integrated companies, development of both transmission and generation facilities can be done by the same company, but this does not provide the same efficiency for the electrical system. The investment
decisions might be made in the company’s own interest without taking into account what is best for the electrical system overall. Non-integrated companies, on the other hand, pursue separate transmission and generation activities in a competition scenario, which again can lead to inefficient results. This is especially the case for transmission where there are highly meshed network systems.

When generation is considered a competitive activity and transmission is regulated, other questions must be addressed. Vertically integrated companies must find a means to make compatible and coherent investment decisions taking into account that some of them, having built new power plants, will obtain their compensation on these investments as mandated by the market while network investments will be paid at regulated tariffs. Non-integrated companies, too, will rely on market signals to provide for power plant development and on regulated planning for new transmission infrastructures.

A second critical issue relates to the use of long-term power supply, or capacity reservation contracts, to guarantee supply or capacity. This is particularly relevant in the European Union today because of the long-term contracts signed years before liberalization was proposed. The commitments made under such contracts can create problems as countries attempt to negotiate the terms of liberalization.

As Figure 1 shows, the progress of energy liberalization in Europe has not been uniform, and the commercial capacity provided by international interconnections is also very different.

Some nations are more advanced in practice—the United Kingdom, the Scandinavian countries, and Spain—and some are less advanced—Germany, France, Italy, and Eastern Europe.

The United Kingdom, which has been liberalized for more than a decade, offers a valuable model. Its market began as an obligatory pool that did not allow direct participation or physical bilateral contracts. This structure has produced increased investment and has given both large industrial consumers and smaller domestic consumers their choice of suppliers. Recently, this structure has changed
into a system of organized and bilateral markets, including forward markets of as much as two to three years and as little as three hours.

The Nordic countries also have more than a decade’s experience with electricity liberalization, and their experience, too, offers a useful model. Their system is also based on an organized market that from the beginning has included bilateral contracts as well as spot and forward trading. Norway created its market in 1993 and its success prompted Sweden and Finland to join. Denmark is the most recent country to come on board. Norway, Finland, and Sweden have already liberalized 100 percent of supply, and Denmark will liberalize electricity completely in 2003. The retail sector, more recently deregulated, is also increasingly active. In the last two years, about 10 percent of domestic consumers have switched suppliers.

The liberalized market in Spain is much newer, having been launched in 1998. We expect to reach complete supply liberalization in 2003. This is an ambitious goal. We are encouraged, however, by the fact that a significant number of qualified customers have already changed suppliers.
Among the other European nations, some have advanced liberalization programs in law but not in practice. In Germany, for example, total deregulation has been mandated in accord with the European Directive, but only 2 to 3 percent of domestic consumers have changed suppliers. In practice, Germany’s market is not very open and has technical difficulties and transit obstacles. However, two organized markets are now being created in Frankfurt and Leipzig.

Throughout the European Union, organized power markets are usually managed by an independent market operator, while the technical aspects are managed by the system operator. Contracts in European markets include spot market transactions, adjustment markets that allow transactions until a few hours before real time, transactions in zones across other European states, and transactions in forward and future contracts. These markets are public in the sense that anyone can participate if they follow the same ground rules of independence, objectivity, and transparency.

Table 1 shows the contract types existing in various power exchanges in Europe.

Table 1
Power Exchanges in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Started Operations</th>
<th>Company</th>
<th>Spot Market</th>
<th>Forward/ Futures</th>
<th>Zonal Prices</th>
<th>Balancing Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordic Countries</td>
<td>1/93</td>
<td>NORDPOOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spain</td>
<td>1/98</td>
<td>OMEL</td>
<td>Yes</td>
<td>Planned</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Holland</td>
<td>5/99</td>
<td>APX (NL)</td>
<td>Yes</td>
<td>Planned</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Germany</td>
<td>6/00</td>
<td>LPX</td>
<td>Yes</td>
<td>Planned</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UK-UKPX</td>
<td>6/00</td>
<td>ULPX</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Poland</td>
<td>6/00</td>
<td>Gielda Energi</td>
<td>Yes</td>
<td>Planned</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Germany</td>
<td>7/00</td>
<td>EEX</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>UK-NETA</td>
<td>3/01</td>
<td>ELEXON</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>UK-APX</td>
<td>3/01</td>
<td>(Settlement) APX (UK)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Spain is part of the single European Market, but we can foresee difficulties in achieving a real integration. What are the barriers to free international transactions within an integrated European network? Despite the efforts of the Florence Forum, a regulators’ forum created by the European Commission, the transmission system operators continue to follow criteria that are not conducive to increasing commercial electricity exchanges. The European Association of Transmission System Operators is making proposals to facilitate greater international participation, but these may not be adequate. For example, efforts to avoid pancaking—a series of successive payments resulting from existing tariffs for the use of transmission and distribution networks—may act as a negative levy on exports and imports. Auctions relating to capacity also represent a payment at the border and would be an extra charge on exports and imports. These and related issues need further study.

Other barriers are technical. Experience shows that it is extremely difficult to operate technical parts of a highly meshed network as separate national electrical systems and, at the same time, increase transactions and transits across borders. Transactions through organized markets and bilateral contracts need to happen in a context of coordinated technical operations and common ancillary services. Central Europe has particular problems in this respect, given its highly meshed network of interconnections and lack of necessary technical coordination. This situation makes freedom of exchange difficult and highlights the need for increased technical coordination between transmission system operators.

We are keenly interested in the plans of the U.S. Federal Energy Regulatory Commission to require large regional transmission organizations (RTOs) to coordinate transmission networks across that nation. These large RTOs may offer suggestions to Europe for integrating its transmission grids.

In Spain, as in most European nations, there is an official electricity market that provides free access for all producers, retailers, qualified consumers, and external agents. The Spanish market began
operation in January 1998. Current annual volume is 6,000 million Euros for 180,000 gigawatt-hours. Transactions total more than 3.5 million annually, and the market price serves as a reference for many commercial transactions.

The growing amount of energy that is negotiated under free transactions in the market indicates that most eligible customers have decided to abandon regulated tariffs in favor of supply deregulation.

The daily market is managed by the market operator. Then the system operator and the market operator together resolve constraints, and the system operator auctions ancillary services. Then there are intra-day markets, at present six, which operate up to three hours before real time. Finally, the system operator balances offer and demand at all times by means of ancillary services and energy from secondary and tertiary generation. Our system has an efficient financial interrelationship: market participants receive a single invoice with all the charges and payments.

The market is thus concerned with measurement and billing. The meter results sent to us by the system operator are compared with the settlement, aiding in the transparency of the final settlement. The charges and payment resulting from the settlement and invoicing are done through a bank account that has money only during one half hour a month. This is the time when those market participants that are debtors deposit their payments. Later, that money is sent to net producers. All this takes place under an important system of guarantees.

Spain, as other European markets, allows a wide range of contract possibilities outside the organized market. These include bilateral contracts between producers and consumers, international bilateral contracts, bilateral contracts between producers and retailers, and bilateral contracts between retailers and consumers. The last type of contract is currently the most numerous.

The dramatic collapse of the liberalized California electricity market caused Europeans to consider whether our markets might also face such an experience. We found that there are significant differ-
ences between the California and Spanish markets in several important aspects.

Spain, like California, is committed to a system of separated functions, but with significant differences. In California, distribution utilities sold their thermal generation facilities, the bulk of their generation facilities. For this, they were rewarded with the recovery of stranded costs.

In Spain, we focus less on company structure and more on the distinction between deregulated and regulated activities. During the transition to complete liberalization, the transmission network activities must be unbundled, but vertically integrated utilities may retain ownership of the network companies. At the end of the process, when all customers have supply choice, the distribution network will become a regulated activity focusing solely on transmission. The electric companies, with their generation and retail facilities, can choose between creating two subsidiaries—one for retailing and one for generation—or performing both functions in a single company.

In Spain, the reimbursements for stranded costs go to producers rather than to the distributors as in California. Further, recovery of stranded costs in Spain is linked to market prices instead of the sale of generation plants.

There are also clear differences in the organized market design. The California market featured a mandatory pool, essentially a spot market that offered no possibility of longer-term bilateral contracts. In Spain, we allow bilateral contracts, especially contracts between producers and customers. These last transactions have not developed here as they have in other countries in Europe, but not because of any legal restriction.

Spain does not have nodal pricing and also has fewer technical constraints; large bottlenecks are not present inside the Spanish network, but they are present at the borders, especially in the interconnection between Spain and France.

The Spanish system does not have an independent system operator as was the case in California, but a transmission system owner
that also acts as system operator. The market operator is concerned with economic management of the market. If it became clear that there was an abuse of market power, as evidently there was in California through manipulation of bids for ancillary services, the market operator would have been able to step in to notify the proper authorities. The abuse would have been halted.

Aspects of reserve capacity are different in Spain simply for reasons of historical development. For example, combined fuel-gas units represent 53 percent of the reserve capacity in California, whereas in Spain they constitute only 15 percent of the reserve capacity. Therefore, the influence of high natural gas prices in Spain is smaller than in California.

In Spain we have a capacity payment that will be earned only by the available units, thereby promoting generation availability. During the worst part of the California crisis, the number of unavailable generation plants was unreasonable by any standard.

The transmission networks also differ in significant ways for historical reasons. Spain has a highly meshed, adequately sized network versus California’s highly loaded grid, with many bottlenecks.

In our opinion, further analysis should be made to clarify the factors that have had greatest influence in the California electricity crisis.
Our panel’s purpose is to review and evaluate recent developments in energy liberalization. Making such an evaluation is always a useful activity. In any wide-ranging activity like liberalization, it is important to take time out to see where developments are taking us and what we may want to change. Since liberalization is not an abstraction but rather a series of important developments that affect regions and countries, we need to focus our review on specific areas. My focus will be on Venezuela’s energy situation, particularly on the nation’s objectives and initiatives regarding liberalization.

Venezuela is a country rich in energy resources, including both hydrocarbon reserves and hydroelectric generation potential. Our oil reserves are significant: conventional oil reserves total nearly 78 billion barrels; bituminous oil reserves in the mid-Orinoco are estimated at 270 billion barrels.

Our extensive natural gas resources, estimated at 143 trillion cubic feet, have not been developed as extensively as oil. About 90
percent of the natural gas obtained at present is associated with oil production. We would like to complement our traditional use of oil by increasing our use of natural gas both as a primary energy source and as a raw material for other uses, especially for power generation. Our objective is to build a natural gas system that meets domestic and regional demand by completing our natural gas pipeline system. We also plan to build a petrochemical industry and to export natural gas by pipeline as liquefied natural gas (LNG).

As I note below, as part of the liberalization process in the natural gas sector, we are beginning a program to encourage private development of onshore and offshore natural gas fields. At the end of June, we concluded a tender in Caracas with encouraging results.

Our electricity system uses hydro and thermal power for generation, with hydro currently providing 70 percent of the national supply. Our total potential hydro resources are about 46,000 megawatts (MW). At present we have a total installed capacity of 18,900 MW in power plants across the nation. By 2003, we expect to have another 2,800 MW available. Of this amount, the public sector will install 2,200 MW and the private sector will install another 600 MW.

Venezuela has two major electricity systems. The larger one is in the southwestern part of the country and capitalizes on the Caroni River’s potential of 26,000 MW. The current generation facilities have about 12,500 MW of installed capacity. Another plant under construction will provide an additional 2,100 MW.

The public sector is responsible for exploiting the gigantic energy potential of the Caroni River, as well as other smaller hydro resources in the western region. At the same time, it has constructed thermal generation plants and built an extensive infrastructure of transmission and distribution networks. Smaller private investments have been made as well.

Energy has a vital impact on our entire society, including public welfare, economic growth, and the security of the state itself. In Venezuela, energy resources are reserved for the state. This Seminar has confirmed our belief that natural gas and electricity are essentially
public services to be managed by the government. The state cannot and should not abandon this responsibility. It should not only regulate the energy industry but also be the provider of last resort. However, the private and public sectors can coexist within this industry for the nation’s benefit. We are committed to liberalization, and we have passed several laws establishing private participation.

The Electricity Service Law (September 1999) began the transition to a new economic regime for electricity in Venezuela that, among other things, allows open access for large consumers (steel, aluminum, oil, and others), focuses on creating a national transmission network, and establishes independent distribution companies.

The law also stresses the need to promote competition in sectors where this would bring about greater efficiency. Thus, it mandates a wholesale electricity market for large consumers that allows competition between public and private generators, while establishing market benefits and incentives that guarantee user interests with regard to security, quality, and price. In addition, the law calls for the rationalization of the price and tariff system, setting appropriate compensation for each activity while guaranteeing appropriate profits.

The state will continue to play a major role in the electric sector. In particular, it has reserved the hydroelectric generation activity in the basins of the Caroni, Paragua, and Caura Rivers for itself. The state also will continue to be the industry’s principal planner, regulator, and supervisor. The Ministry of Energy and Mines will do the planning while guiding the efforts of the private sector and the state toward adequate satisfaction of demand.

For natural gas, the basic law for liberalization continues the existing government ownership of all natural gas fields on land and offshore, which “belong to the Republic and are, therefore, of the public domain, and are inalienable and imprescriptible.” But it goes on to create the conditions that allow for the participation of domestic and foreign private entities in exploration and development of the fields.
The law also establishes a regulatory authority to oversee this newly liberalized sector. The authority, Ente Nacional de Gas (Engas), is an autonomous organization within the Ministry of Energy and Mines with a wide-ranging slate of objectives. These include the long-term guarantee of the nation’s natural gas supply, which involves, among other things, developing non-associated natural gas, developing the transportation and distribution infrastructure and industrial capacity, and coordinating the payments of the various participants.

The law also encourages the participation of national and foreign private capital. Incentives to private investment include licenses for 35 years, extendable for 30 years; the right to explore and exploit non-associated natural gas in areas with resources yet to be discovered and developed; opportunities to explore for associated gas; optional take-or-pay production for seven years; and additional 10-percent incentives for foreign investments.

The law establishes clear rules encouraging development of the sector through competition and efficiency. It facilitates the recovery of investments through reasonable profits while assuring the lowest cost for consumers. It mandates that Venezuelan capital should be incorporated in licenses given for areas of proven reserves. In addition, Venezuelan management and labor are to be encouraged through the creation of operating and service companies.

To ensure competition and avoid the exercise of market power, the law requires the separation of production activities from transport, distribution, and marketing. However, vertical integration will be allowed in those cases where a project would only be viable if managed by an integrated organization.

Natural gas prices and royalties are spelled out in the law. Features include an annual price review and the possibility of approval of agreements on methane prices different from those established by the Ministry of Energy and Mines. Other features include royalties on non-associated natural gas of 20 percent; a new income tax level of 34 percent; and creation of a royalty scheme for
each field according to costs, natural gas characteristics, and market conditions.

The announced tenders of natural gas fields have highlighted our commitment to liberalization. The most recent tender, in Caracas on June 29, 2001, had notably positive results. An international consortium won rights to the Yucal Placer North and South fields. The consortium members—France’s TotalFinaElf, Spain’s Repsol YPF, and two Venezuelan firms, Inepetrol and Otepi—plan to invest $380 million to produce up to 300 million cubic feet per day (MMcf/d) of natural gas from these fields. In the initial phase, the consortium will invest $80 million, producing 70 MMcf/d by 2004. In addition, Repsol YPF, bidding alone, won rights to the Barrancas field, where it plans to invest $10 million for development.
Let me open Panel III by stating a blunt truth: energy companies are generally perceived by the public as being too big, powerful, secretive, arrogant, and exclusive. This negative image is paradoxical when you consider that energy companies provide heat, light, and mobility to the modern world. Energy companies are the engines of growth and development. The third of the world that does not have access to adequate energy is the poorer for it. Perhaps we have done such a good job that many people assume energy to be an inalienable right, much like air or water. But the negative public image persists.

Before I introduce our speakers, I would like to make a few comments on the public’s perception of energy companies and how we might respond to that view.

What does the press in the United Kingdom say about BP as we work to provide electricity, petroleum products, and natural gas? Figure 1 presents a few examples.
These headlines show how the majority of the United Kingdom’s population perceives BP. Anyone who has taken a black cab in London in the last six months will have probably heard much of this from a friendly driver. The protests emblazoned here cover everything—human rights, ethics, profits, the environment, and, fundamentally, size. I would like to include some positive examples to balance this negative barrage, but they do not exist, at least not in the popular press.

Of course, BP is not the only target. Figure 2 presents a cross-section of media clips referring to our competitors. I was careful not to include anything referring to Repsol YPF or Enron, but I could have found some quite easily.

Should we worry about the public’s perception of energy companies? The answer is yes. But what can we do? Before I look at how
we might respond, let me first note the differing roles of governments, companies, and non-governmental organizations (NGOs). Companies such as BP can achieve a positive image only if they are conscious of, and sensitive to, the world stage on which they operate, and if they are absolutely clear about their role on that stage.

The role of governments is very broad: nothing less than promoting the common good of entire societies. Governmental responsibilities range from defense and education to sewage systems. Government leaders must balance all these obligations and be responsible to and for their citizens.

In contrast, the role of companies is much narrower. Firms concentrate on a few specific activities in line with their skills. They are primarily responsible for performance to their shareholders. Of course, to succeed in that effort, they need to implicitly assume a
much larger role. They need to be aware of and relate to the customers and the communities they touch. Companies fundamentally depend on people choosing to do business with them. For BP, and probably for most companies, recruiting and retaining customers is a long-term, continuing activity. The profits we declare this quarter are from investments made 10 and 20 years ago. This long-term emphasis both requires and demonstrates our direct interest in the health and success of the communities in which we work.

The role of NGOs is, of course, different again. Their function varies enormously from organization to organization, but they have one common characteristic: they exist to advocate a cause or argue a case. They are responsible principally to themselves.

The public’s negative image of the industry is based on a series of broadly held, negative perceptions. Some of these negative views are accurate, and the industry should strive to change the realities behind them. But some of the perceptions are just wrong; the public should be educated as to the true reality of these situations.

Why do people dislike us so much? In large measure the rancor derives from our size—a distrust of scale and a perception of power beyond public control. Our size is not something we can or should change. But the importance of size is something we need to explain. Scale is essential. It allows us to be more competitive, especially against closed local markets. Scale helps make the world’s markets work. Energy problems principally occur when markets do not function, as we have heard throughout the course of this Seminar.

Another misperception we need to explain is the belief that alternative sources of energy are or will be available in the short term—and that energy companies are resisting that change. We know that no options to conventional energy sources are available in the medium term. Alternative energy sources are too small to meet demand.

Solar energy is a fine example. BP is committed to solar energy; we have the largest solar company in the world. Only last week, we announced the building of a new 60-megawatt plant in Madrid that
will more than double our worldwide capacity. Yet the reality is that solar energy today provides only 0.02 percent of the world’s electricity demand. If it continues to grow at 25 to 30 percent per year and world electricity demand grows at 2 to 3 percent per year, solar will comprise 0.15 percent by 2015. Overall, for the foreseeable future, the world must depend on the conventional energy sources we have today.

Another misconception relates to our use of technology. Our industry is perceived as being committed to outmoded technology. We all realize this is not true, but we need to let everyone know that we use leading-edge equipment. To cite an important example, one of the biggest levers for reducing CO$_2$ emissions is today’s new power generation. A conventional power plant is 25-percent efficient, while a new combined-cycle gas turbine power plant is 90-percent efficient. That difference provides an extraordinary lever for reducing emissions. BP is committed to using this technology as widely as possible as we deliver natural gas to countries worldwide—to China, for example.

Some of the public’s negative perceptions are true, however, and these are areas where we need to change. One such perception involves our reputation for arrogance. We need to recognize that we do not always have all the answers. We need to work with others to create strong and enduring relationships built on mutual, long-term advantage.

Another area that needs to change relates to acknowledging our environmental responsibility. BP has been quite vocal in this area. For example, we have recognized the impact humanity is having on the climate, and in response we have set internal CO$_2$ reduction targets. Thus far, we have reduced these emissions by 5 percent relative to the 1990 baseline, and over the next three years, we will reduce them by another 5 percent. We have also set up a global emissions trading system within BP, in partnership with the Environmental Defense Fund. In addition, we have established a clean air program in 70 cities worldwide, including Valencia and Castellón in Spain. By 2005, at the cost of a billion dollars, 40 percent of everything we produce will meet the same emissions standards as required in California. What is important
to note is that the corporate benefit from this goes beyond improving our public image. Rather than just incurring incremental costs, our efforts in this respect have created new business opportunities.

A third area needing change involves assuming our social responsibility. At BP we describe this as working for, providing service to, and being part of every community where we operate. For us, sustainable development is about the advancement of human capabilities in all the societies in which we work.

A fourth area where the industry can and should make changes involves our exclusiveness. I have responsibility for recruitment at BP, and I have had some interesting conversations with recent college graduates. They see us as an industry without a future, as old, male-dominated, hierarchical, and relying on outdated technologies. A recent graduate told me we are an industry of “men in black who wear white shirts.” Recently I asked a group of 150 senior executives whether they would encourage their sons and daughters to join BP. The response was revealing: only 30 percent said they would counsel their sons to join BP, and only 10 percent said they would advise their daughters to do so.

So we need to build a more inclusive culture, working on the basis that a good idea is a good idea, wherever it comes from. If we continue with the exclusive style of the past, we will lose access to a great amount of talent. Another important consequence of not changing our style is implicit in this lesson from history: societies ultimately crush exclusive clubs.

From the examples I have shown here, it is obvious that the energy industry’s public image is very poor. In the United States, it may be even worse than that of the tobacco industry. This negative perception is something we should be worried about. If we do not resolve the paradox between the vital services and products we provide to the world and the public’s negative view of us, society may ultimately remove our license to operate.

Those things that we can change, we need to work on: arrogance, environmental performance, social responsibility, and inclusivity. And I advocate doing this work quietly, without a big song and dance.
We also need to make several important realities clear:

• The industry is committed to developing and using innovative technology.

• There are no near or medium-term alternatives to conventional energy sources.

• Scale is a real benefit because it makes for greater competition, increased efficiency, and ultimately, lower prices to the consumer.

Now that I have gotten the discussion started, I will pass the baton to our panel of experts from the media world. These individuals come from a variety of backgrounds, and I expect that each will offer a perspective rather different from my opening remarks.

• Our first speaker will be Jane Collin, Editor of the London-based Energy Compass magazine, which deals with the interface between oil and politics. As a member of the Energy Intelligence Group, she has surveyed the oil markets from both sides of the Atlantic and from the Middle East.

• Nemesio Fernández-Cuesta, our second speaker, is a familiar participant at these Seminars. Now President of Prensa Española, he has had a very distinguished career in the public and the private sector of the Spanish energy world, as Executive Vice President of Repsol Comercial and as Secretary of State for Energy and Mineral Resources in Spain’s Ministry of Energy and Industry.

• Wayne Greenberg will conclude the panel. He is an executive with Financial Times Energy and has had extensive experience in the technology and information industries.
The subject of this panel is the public image of energy companies, but I will limit my focus to oil companies. Some of what I say may hold future relevance for the broader energy industry as markets liberalize, competition heats up, and companies wonder how a favorable public image might help their bottom line. But this is speculative. By contrast, the public image of oil companies is a very real topic, one that has been an issue practically since the industry’s start.

The public’s relationship with the oil industry is a love-hate one. Despite the industry’s record as an engine of economic growth—and one that enables the U.S. public, in particular, to continue its long-running love affair with the automobile—the sector’s power and size inspire equal amounts of loathing.

In my talk, I will explore some of the more prominent aspects of the public’s view of the petroleum industry. I will also discuss different approaches to public relations taken by oil companies, and their
results, before ending with a brief discussion of whether there is such a thing as a “best” way to handle public image in the oil business.

Oil industry critics have been around almost from day one, when the first oil well was drilled in Pennsylvania nearly 150 years ago. In the space of two decades, John D. Rockefeller became one of the most hated businessmen ever, anywhere, and his Standard Oil Trust the subject of intense scrutiny. Rockefeller largely ignored his critics. And that, for the next hundred years, was the stance copied by most other oil companies.

It was not until the oil price crisis of the 1970s that companies started making more conscious efforts to win over public opinion, particularly on environmental issues. The emergence of OPEC, of the worldwide move to nationalize energy resources, of boycotts, and of volatile prices changed the oil industry landscape permanently. Memories of past business practices—centering on allegations of price fixing, collusion, and political influence—resurfaced, and new grievances focusing on pollution and allegations of racism and sexism appeared.

While outrage over the high cost of gasoline has subsided since last year, there are lingering suspicions that companies are trying to “gouge” the American gasoline-buying public through price fixing and collusion, despite investigations showing the contrary. Such inquiries—along with greater scrutiny from antitrust authorities—may become a fact of life for energy companies. But until the complaints translate into action, companies can afford to brush them off.

In Europe, public suspicions—nurtured, it has to be said, by the media—also focus on price fixing and a belief that oil companies fail to lower gasoline prices as quickly as they raise them. As in the United States, investigations have generally exonerated the firms. Most recently, seven Italian oil companies successfully appealed fines levied last year for alleged price fixing.

In the United Kingdom, tabloid papers recently seized on the stellar first-quarter profits of oil companies as proof of greed rather
than business acumen, as they would be in most other industries. “Big Profits Here,” said the Mirror. “Drivers Taken for a Ride by Big Petrol Giants,” said the Express. Both papers did point out, albeit well down in the articles, that a major reason for soaring gasoline prices was the government’s hefty tax take, one of the highest in the European Union. In fact, pre-tax gasoline prices in the United Kingdom are the lowest in Europe.

More protests against high fuel prices erupted across the continent last autumn. In England, farmers and truckers blockaded refineries and depots in protests that brought much of the country to a halt and led to calls for windfall taxes on North Sea oil companies. However, companies succeeded in deflecting public anger on to the government, partly through ads that contrasted their earnings with the government’s huge tax revenues.

Although the protests have fizzled out, they do highlight another phenomenon: the growing trend toward direct action, whereby advocacy organizations bypass government representatives and established lobby groups to seize the initiative. Some of the groups are willing to break the law on what they deem matters of conscience. The recent boarding of tankers by Greenpeace to protest President George W. Bush’s stance on climate change and their clambering on to oil company property to prevent drilling are just two examples.

The oil industry has long been the target of environmental groups and legislation, sparked by arguments over pollution, oil spills like the one from Exxon Valdez, and the debate over the impact of drilling in places such as Alaska and the Gulf of Mexico. One of the latest disputes concerns the best way of combating the growth of greenhouse gases in the atmosphere. Exxon, for example, advocates a voluntary approach to cutting emissions similar to that of President Bush. Exxon’s perspective is so similar to the President’s, in fact, that some nongovernmental organizations (NGOs) hold the company responsible for the administration’s decision to turn its back on Kyoto.

Anger at the decision prompted a star-studded cast, including human rights activist Bianca Jagger, to kick off a campaign in April
urging British motorists to boycott Exxon retail stations. The following month, center-left MPs urged European motorists to do the same. This week, The Body Shop, a health care and beauty shop in the United Kingdom, announced it would order its trucks to shun Exxon stations and publicize the boycott in all its 200-plus shops. Such actions underline the level of public anger confronting the oil industry.

Another spotlight that Exxon cannot shun at the moment is the public perception that it and other oil companies are getting preferential political treatment. Like the rest of the U.S. oil industry, Exxon is facing public scrutiny over ties to the White House. On President Bush’s inauguration, many oil companies regarded the new administration as an oily “Dream Team” that would recognize their interests and concerns.

Maybe the administration does, but lawmakers and the public do not necessarily feel the same way. President Bush’s energy plan, designed to deal with a looming energy crisis, was received negatively by a large swath of the American public, who regard it as environmentally unfriendly. Opening up parts of Alaska to drilling may well be doomed. Moreover, the General Accounting Office, Congress’s investigative arm, is trying to probe the links between oil companies and the White House. It is threatening to take the administration to court over its refusal to provide more details of the private meetings it held in drawing up the energy strategy. The aim is to determine whether energy task force members met secretly with major campaign contributors, including energy companies.

Some Democrats are suggesting that oil companies tried to “buy” the administration. They brandish figures from the Center for Responsive Politics, a Washington-based group that tracks election spending, showing that oil and gas companies handed over around $33 million during the 1999-2000 election campaign, of which nearly $26 million went to Republicans.

Other signs of public mistrust of the industry can be read into jury decisions in cases involving oil companies. In America, the jury, rather than the judge, tends to decide punitive damages, and juries
tend to be less conservative than judges. Exxon, for example, is already appealing nearly $10 billion in punitive awards—$5 billion stemming from the Valdez spill, plus $3.4 billion from the underpayment of natural gas royalties in Alabama and more than $1 billion from contaminating land in Louisiana with radioactive materials. It is also one of a number of companies facing lawsuits over alleged water contamination from the gasoline additive methyl tertiary butyl ether (MTBE), a possible carcinogen.

Given the American penchant for litigation, it is possible that the health-related cases against oil companies could escalate into a rerun of the tobacco wars that began in the mid-1990s, with big oil, rather than big tobacco, as the villain. Although the four big tobacco makers settled with 46 states for $206 billion in 1998 to help pay for smoking-related illnesses, about 1,500 suits are still pending.

Yet despite the damages, tobacco companies are not really hurting financially. Global leader Phillip Morris was the best performer on the Dow last year, rising 91 percent. R. J. Reynolds Tobacco and British American Tobacco—numbers two and three, respectively—also saw profits reach new heights. It might be the same story for big oil. Current stock market valuations for oil majors are respectable, and long-term supply-and-demand fundamentals suggest a very promising outlook. In other words, they may have deep enough pockets to prevent any environmentally related awards from having much effect on their bottom lines—or, possibly, their policy.

For oil companies right now, the big question is whether they should try to create trust among their customers and the wider public. Corporate reputations are fragile, as well as highly subjective. Shareholder definitions of responsible companies can be very different from those of consumers. Even a good image among consumers does not necessarily translate into more business. Studies seem to prove that trust, once lost, is hard to regain. Many Americans continue to give Exxon a poor grade for environmental responsibility 12 years after the Exxon Valdez disaster, despite its subsequent good environmental record. TotalFinaElf seemed to have learned few
lessons in 1999, when it responded very slowly to an oil spill off the French coast that provoked intense criticism from environmentalists and the wider public.

Yet Exxon, despite the Valdez incident and the controversy over its stance on climate change, remains one of the best-performing companies in financial terms and continues to outstrip its peers, such as the more image-conscious BP, on stock markets. BP has been actively publicizing its policies designed to forestall, or at least address, criticism of the oil industry. As we heard in the introduction to this panel, the company deals proactively with issues like the environment and human rights, promising to reduce emissions, invest in renewable energy, and engage environmental NGOs. But the policy does not always work to BP’s advantage. The more it pokes its head above the parapet, the more flak it seems to attract. As a result, I wonder whether BP might not adopt a lower profile—that is, continue with the same strategies but in a less vocal fashion.

One of the problems is that opponents such as NGOs view companies like BP as more open and environmentally responsible than some of their peers, and hence more susceptible to persuasion. For many of the lobby groups, it is a question of resources and effectiveness, of going where they think they make a difference. Taking on a monolith like Exxon risks wasting resources.

As funding becomes less of an issue for environmental groups, it may become more difficult for oil firms to lie low. The Internet, in particular, provides oil industry opponents with an inexpensive, far-reaching means of rallying support. For example, the campaign against Canadian Talisman’s activities in Sudan has relied heavily on email and the Internet.

Exxon, the world’s biggest publicly traded oil company, rarely engages its critics. It limits interaction to placing views and other information on its website. These question scientific arguments linking carbon dioxide emissions to global warming, and state Exxon’s opposition to the Kyoto Protocol on the grounds that ratification of the protocol would damage the U.S. economy and encourage big
increases in oil and gas taxes. Despite the protests noted above, there are few signs of any radical change in Exxon’s approach to public relations.

This contrasts with the BP approach described earlier, as well as Shell’s response to the consumer boycott and controversies in Europe that followed the Brent Spar oil platform debacle, and the execution of human rights activists in Nigeria in the 1990s. Shell acted to head off criticism, while seeking to change its broader corporate culture over the longer term. Exxon, apparently, does not care. Why? It may have something to do with the arrogance born of size and of its stellar financial performance. When it comes to shareholder pulling power, Exxon is a bigger draw than the more image-conscious BP and Shell. It may also feel that, once it starts to respond to such pressures, it will—like Shell and BP—become a target for all protests.

When it comes to image management and strategy, Exxon and BP are at either end of the spectrum, with most other companies—in the United States and Europe—falling somewhere in between. In a gross oversimplification, the Exxon approach to public relations involves burying its head in the sand and refusing to engage, while concentrating on ruthless implementation of its business plan. The rewards on financial markets are clear. The BP approach is one of engagement—polishing up the image and addressing social concerns. But this is not allowed to get in the way of good business. BP has, for example, periodically challenged Greenpeace, ensured that renewable energy makes financial sense, and kept both oil and natural gas at the core of its strategy, despite its slogan of “Innovations Beyond Petroleum.”

Which approach is better? Image is ephemeral. BP’s careful cultivation of a caring persona quickly became worthless when it tried to take over Atlantic Richfield a couple of years ago. U.S. trustbusters portrayed it as a manipulative company deliberately exporting American oil to push up gasoline prices for American drivers, and it was forced to make large divestitures before the takeover could go
through. BP still has not fully recovered in the United States. Moreover, when it comes to big business decisions, such as the award of contracts in the landmark openings in Saudi Arabia, a positive public image does not count for much. In Saudi Arabia, Exxon picked up two of the three operatorships on offer, thanks to its technological and business prowess.

There are many reasons for taking different approaches, internal and external. Some reflect the views of senior management or other influential people within the company. Occasionally, they reflect increasing shareholder activism. But at their heart, the difference in public relations strategies may say more about the political cultures in which the companies operate. Exxon belongs to the same culture as Microsoft, another company that does not appear to care how it is perceived. BP and Shell have to operate in a more liberal and socially conscious Europe. But in the long run, can Exxon afford to continue on the same course? Look at what has been happening to Microsoft as the U.S. government attempts to break it up for alleged market abuse. And going back to the beginning of this discussion, look at what happened to Rockefeller and Standard Oil.
Before liberalization began, energy markets in most countries were regulated, forming a “solar system” where each national government was the sun. This sun radiated its heat toward, and had a strong gravitational effect on, the planets revolving around it. The major planets in this solar system were energy companies, of course, but there were also the lesser bodies formed by consumers, the media, and the financial community. These elements all orbited the sun in an orderly, regulated fashion. Then liberalization came, and the familiar system ceased to function.

With the advent of liberalization, the “regulatory” sun in each of these solar systems lowered its temperature and reduced its size. In one sense, it ceased to be a sun, becoming simply a larger planet. It lost much of its gravitational effect on the other planets and with it the ability to establish and keep order in the system. Consequently, all the original planets began to leave their orbits, repelling and attracting each other indiscriminately as they moved about erratically.
The once-integrated system began to disintegrate as each planet began to develop its own objectives, which often opposed the purposes of other planets, and consequently their orbits began to cross. Confusion resulted.

Given this reality, energy firms should now be designing strategies that allow the planets to realign themselves in a deregulated market. This process is complicated and difficult, and requires patience, perseverance, and some luck. So how should the planets in this system deal with each other? In the sections that follow, I will consider this new situation. I will focus on the most important planets—the government and consumers—and then I will mention the financial community and the media.

In the new, liberalized energy solar system, governments form the most complicated planets—because they are not really planets at all, but dormant suns. In liberalized countries, each government reduced its power and control, but these diminished entities can easily decide to rekindle themselves into suns again. If this happens, energy companies could get burned. The California crisis provides a stark example of how a government can regain its power when it believes it to be necessary. It is clear that the solutions to California’s energy problems will come from the government and politicians. This should not be a surprise. All governments have as their first obligation the protection of the social welfare, and all elected officials have as their first priority the winning of the next election.

For energy firms to operate successfully in this new environment, they must realize that a government’s first obligation is to guarantee the social welfare. For energy matters, the government’s first priority is maintaining a reliable supply of energy to the public; a second priority is keeping prices low; and a third is preserving the environment. If any of these societal goals is threatened, the government will move to reinstate more stringent market regulation. Therefore, energy firms working to adjust to deregulation in the most effective, efficient manner must allow for, perhaps even propose, mechanisms that protect the government from such threatening situations.
The liberalization process involves ongoing negotiations between energy companies and governments. For this process to succeed, all parties must give the others viable options that address their particular goals and concerns. For example, as I noted above, the government’s first priority is reliability of supply. The new Spanish market design contains a “power guarantee” element to ensure excess capacity and thus reliability within the electricity price components—an element set by the government. When the element was proposed, energy firms protested; they believed it was a market-related element, and in a liberalized market, the government should not have that power. However, it is important to realize that the element reflects the governmental priority of supply reliability.

The policy offers benefits to the companies as well. For example, in electricity as in other industries, there must be some long-term fixed costs. Since the electricity pool works with a price based on short-term variable costs, it is good to have an element that represents long-term fixed costs, even if the government sets it. And there is another virtue. The government cannot increase the power guarantee component at random, but it can raise it every four years. This means that although it cannot increase prices now, the government can help guarantee profitability for future investments.

Deregulation models that take government completely out of the picture can have, and usually do have, many problems, sooner rather than later. It is important for energy firms to accept the need for some government participation in market operations and to accept that the shape of markets is subject to permanent, ongoing negotiations with regulators.

Companies engaged in this ongoing process benefit from a longer-term, comparative perspective. Companies need to remind themselves that they are better off now than before. They are in a freer market now, and resources are being used in a more effective, efficient manner. Thinking in such longer-term, relative terms is more useful than maintaining an absolute goal that insists on a completely liberalized, deregulated market. As noted, achieving such a goal often produces problems.
Companies need to make clear that they understand and accept the government’s need to protect its priorities, and they should work to be sure that the government has options that satisfy such concerns. The government needs political options for politically unpredictable events in the same way that companies need economic options for economically unpredictable events. Companies realize that they cannot know how much it will rain in five years, or whether the economy will grow 4 or 5 percent in five years, or whether power consumption will increase by 6 percent, 7 percent, or just 4 percent, and they take such uncertainties into account when planning.

Governments face the same uncertainties. In addition, they are measured by political results, just as firms are measured by financial performance. Approaching liberalization with an eye toward melding these two disparate positions is the best way to keep deregulation moving forward.

In the new energy solar system, consumers are among the most important planets, and companies must recognize this reality. Consumers now have the means to show their pleasure or displeasure with their suppliers and, indeed, with the industry. Hence, it is important that they have the information necessary to understand the complexities of an energy world they too easily take for granted. It takes money and time to explain such things to consumers, but it is important to do so.

They need to understand, for example, that when they turn on a light, a kilowatt of electricity must be instantly generated somewhere because electricity cannot be stored. They need to understand that turning on their kitchen gas range is not the simple action it appears to be. They need to realize that it is based on a complex, international infrastructure—one, for example, that might start in Trinidad and Tobago, where a plant liquefies the methane; then special tankers transport the product to Spain, where regasification plants return it to the gaseous state; and then hundreds of kilometers of natural gas pipelines at different pressures deliver it to markets and finally to consumers.
Consumers also need to know that energy companies pay attention to their concerns. The companies should make it clear that they consider consumers as the providers of their business, not just as revenue sources. We know that companies have many worries—about government, the environment, social responsibility, and so on. But consumers need to know that companies worry about them, too.

There are many ways to do this. For their industrial and commercial customers, energy firms can, for example, offer discounts for greater monthly consumption. They can make sure that these customers understand and can take advantage of the most economical rates available. For all consumers, small and large, retail and commercial, companies can make clear their desire to guarantee a reliable energy supply at reasonable prices. Again, it costs money to inform consumers about what companies are doing to address their issues, but it is a vital task.

As to the environment, consumers have mixed emotions about this issue. They are concerned about air pollution and global warming, but they are also quite aware that they are polluting the air when they start their car or turn on their heat or their lights. When an energy company spends too much effort stressing its concern for environmental matters, consumers may interpret this as a ploy to mask other, possibly unfavorable, practices. Of course, companies will comply with the law and work to alleviate climate change, but I would not put these actions at the forefront of their customer relation activities.

The media and the financial markets planets are also very important in the energy solar system. Energy companies must deal with these groups with humility and perseverance. Perseverance is particularly important because energy firms have to insist, and keep insisting, on a strategy wherein the government maintains a certain degree of regulation. This regulation can be used to good purpose by the companies.

Energy company relations with the media are tricky. Too often they are based on a flawed assumption: the energy industry expects
that all its problems should be completely understood by, and per-
fectly reflected in, the media. This is impossible. Journalists have an
intermediate education; they are half financial analysts and half con-
sumers. For energy companies to achieve a satisfactory working rela-
tionship with journalists and other media people, they need to
provide information, exercise patience, and create mechanisms that
promote an understanding of the energy industry’s problems and
concerns. Given the media’s power to shape public opinion, this
effort is worth making.

I have not given you a solution for the complex issue of fitting
yourselves into the new solar system, nor did I intend to. I hope,
however, that these reflections will prove useful to you in your day-
by-day struggle with the conflicting goals that exist within this indus-
try. Your most important concern should be to establish and maintain
an image as a solid, reliable company that guarantees supply. An-
other important goal is achieving the best prices for your company
and for your consumers without compromising competition or vio-
lating the law. To establish and maintain these goals, patience and
perseverance are critical, and in the end will help create an image
that resonates well with governments, consumers, the media, and
financial markets.

However, given the volatility of the energy industry and the ever-
present possibility of an accident or natural disaster that can change
the public’s perception of your company in the blink of an eye, it is
extremely important to keep all the planets—governments, con-
sumers, financial markets, and the media—constantly informed in
such a way that promotes their confidence and reinforces their trust
at all times.
We live in a “disaster-addicted” society. People have a penchant for catastrophe. The media thrive on calamity—the bigger, the more horrific, the better. Unfortunately, the energy business is prone to spectacular disasters. The emblematic one is probably the Exxon Valdez oil spill of 1989. But the Exxon Valdez has company: Three Mile Island, for example, or most recently, the rolling blackouts in California. These occurrences etch themselves indelibly onto consumer minds because they are large in scope and because the energy industry’s presence in society is so pervasive. It is not surprising, then, that energy firms are concerned about their public image, given their high visibility and the immediate effect industry actions and events have on customers and regulators.

I will spend the first part of this talk considering how the newly deregulated segments of the industry have gone about setting their image and how the public has reacted to these efforts. I will conclude by looking ahead to a new social reality that emphasizes greater responsibility and to how the industry might react to that reality.
In the energy business, we operate in an environment where all of our actions are magnified beyond what is reasonable. In truth, however, we affect people’s lives directly, which means they pay close attention to what we say and what we do and are quick to note any disparity between the two. We have heard about the oil industry’s long, well-documented adversarial relationship with the public and its resulting image problems. The oil industry, however, has been largely unregulated and market-oriented. By contrast, I will focus instead on the industry segments that have been highly regulated and have enjoyed monopoly status: natural gas and electric power. From this point on, when I use the term “energy industry,” I am referring only to natural gas and electricity.

For decades, these two sectors have been buffered from public opinion by intervening governmental regulatory institutions and have been protected from market vicissitudes by their status as regulated monopolies. With the advent of restructuring—a better term than deregulation—these industries now must establish their own public images and must contend with competitors. This is a harsh new reality.

We have heard what the media say about energy companies. I want to reverse the perspective and ask what energy companies are saying about themselves through advertising.

Traditionally, energy companies have advertised in trade publications, not in mass media outlets. With the advent of restructuring, which brought competition and increased public awareness, this has changed. Now, magazines like *Forbes*, *Fortune*, or *Business Week* carry dozens of elaborate, expensive ads placed by energy companies. Around the world, public relations firms, advertising agencies, and internal public relations departments are hard at work trying to create brand images for energy companies coming out of monopoly-based environments. The results of all this effort are worth reviewing.

These firms appear to be striving to create two major impressions—both designed to correct negative stereotypes held by the public. The first stereotype is that most energy companies are not
socially conscious, and in particular are not environmentally conscious. The second is that energy companies are monolithic, hierarchical, slow moving, and old fashioned. Hence, we have seen a series of ads from energy companies that suggest they are either environmental saviors or a bunch of cool, with-it twenty-somethings out kayaking and running with the bulls. This appears to be the essence of current energy industry branding strategy. Problems emerge, however, when the branding meets reality.

For example, Savannah Electric, a part of Southern Company, one of the largest utilities in the United States, uses a humorous Ogden Nash poem (“Behold the duck / It does not cluck / A cluck it lacks / It quacks”) in one print advertisement to create positive sentiment. The ad then emphasizes how Savannah Electric is attempting to preserve the environment. In my view, this ad does not speak well to the public, however, because the audience cannot easily see how the company is living up to its claims.

Another print ad from Pacific Gas & Electric (PG&E) is my candidate for least effective. It shows a marbled salamander juxtaposed with a front-end loader and the text “Who Wins?” The ad also poses the question, “Must humankind’s expanding energy needs come at the expense of the environment?” The salamander example given is meant to show that the answer is “No,” that PG&E is responsive to “the country’s demand for energy solutions that respect the environment.” This statement lacks credibility given how the company was portrayed in the movie Erin Brockovich just two years ago.

Reliant Energy stresses another kind of social responsibility in one of its print advertisements. Reliant is one of the independent generators involved in the price spikes in the California electricity market. In this particular ad, the company stresses how it has proposed “an innovative solution to the problem of summertime blackouts in the West” to federal and state officials. The proposals were rejected, yet in the ad, Reliant tries to build a “good guy” image by having at least offered a remedy. The company goes on—this is a two-page ad—to state that it is “helping California keep the lights on.” “The facts tell
the story. Reliant Energy is committed to California.” The discontinuity between these statements and the public perception of Reliant’s actions is striking.

Another theme for energy industry advertising is countering the public’s stereotype of energy companies as monolithic, hierarchical, slow-moving, old-fashioned entities. An ad from Dynegy provides one example. In it, large, bold text equates Dynegy’s energy market activities to “Running with the Bulls in Pamplona” and “Kayaking Class V Rapids.” Dynegy is one of the more progressive energy companies in the United States, so there is more similarity between this advertisement and the company’s methods of doing business. However, nothing in the ad suggests how Dynegy’s actions demonstrate environmental or social responsibility.

The same is true of Carolina Power and Light, a mid-sized utility that merged with Florida Progress to make Progress Energy. In one of its print advertisements, the new company equates itself with a sumo wrestler on a skateboard and offers the slogan “Strength Meets Spirit,” implying that the company is strong, agile, quick, and “with it.” A companion ad shows an elephant galloping with gazelles. This image of energy company pachyderms attempting to run with gazelles is perhaps the most appropriate one we will see today, although our perception of it may be different from what Progress Energy intended.

I will turn now to what customers want from their energy companies. Survey research from E-Source—a company that focuses on retail markets in the United States and Europe—shows that large commercial and industrial customers are reasonably comfortable with their energy providers, but—and this is a large “but”—only as energy companies.

“Convergence” has become a buzzword in the United States at energy conferences, at marketing meetings, and in business conversations. But note that the convergence under discussion is not of oil and natural gas companies, nor of natural gas and electric companies; rather, it is the union of electricity, telecom, cable, and security—in
other words, all the wires that come into a business or a home. That convergence will become a reality soon, but consumers do not trust their energy companies to be part of that development. In fact, consumers rank telecommunication companies far higher for bundled services than energy companies. It is ironic that energy firms have to see another monolithic industry placed higher in public and consumer esteem than they are.

When it comes to operations, maintenance, or outsourcing services, energy companies do not even make the list of notable performers. Considering the service direction these firms are taking, this is not a comforting portent.

So what do customers see as the differentiators? Flexibility, quick response, and service orientation are the most important factors for commercial and industrial consumers. However, we also see signs that whether a company has an image as a socially responsible institution is having an increasing effect on buying decisions. Accumulating evidence shows that more and more consumers base their purchases on, for example, quoting Fortune magazine, “who made their Nike shoes or where Exxon Mobil got its gasoline or what McDonald’s does with its waste paper.” This is the new reality that energy companies have to confront going forward. Now, where do we go from there?

For a growing number of consumers, the image question increasingly comes down to capitalism versus social responsibility. According to Milton Friedman, business subscribes to only one social responsibility: “to use its resources and engage in activities designed to increase its profit so long as it stays within the rules of the game.” This suggests that social responsibility and profit are mutually exclusive. In no way is that the case. There is an alternative.

Paul Hawken, Amory Lovins, and L. Hunter Lovins describe “natural capitalism” in their book of the same name. The fundamental precept of natural capitalism is that “corporate balance sheets do not take into account the costs of natural capital.” The authors define natural capital as “the natural resources and ecosystem services that make possible all economic activity, indeed all life.” The journey
toward natural capitalism involves four stages: dramatically increasing the productivity of natural resources; redesigning industry on biological models with closed-loop processes that produce zero waste and/or toxins; delivering services rather than products (for example, lighting services instead of lighting, comfort instead of air-conditioning); and reinvesting in natural capital to restore, sustain, and expand the ecosystem.

The November 13, 1999 issue of *The Economist* had this to say about the book: “Much of what these authors argue for is sensible and certainly desirable. But what makes this book worth reading is the fact that they have taken as first principles for their Utopia the harsh truths of Darwinian capitalism: ‘individuals and companies act in their self interest, and markets guide that impulse through prices.’”

Natural capitalism is an idea whose time will come: profits and social responsibility are not mutually exclusive. The Domini Social Equity Fund, for example, has realized a 25.4 percent return over the last three years. There will be governmental and institutionalized barriers to this approach to overcome along the way. Technology, particularly distributed tech, will provide many of the answers. No matter what develops in terms of business practices, however, the drive for profits will prevail in the near term and probably in the long term as well.

Let me conclude with a quote from Jack Kroll, Chairman of Dupont: “Our abilities to continuously improve the inherent properties of our films enable this process of developing more productive material at lower costs and higher profits to go on indefinitely.”

Continuous improvement through technological advances will solve many of the environmental and social problems that the energy sector and other industries face today. I also believe that energy companies can enhance their services and their environmental and social performance while maintaining a sustainable business model. If they succeed, the resulting corporate personae will be appropriate for the watchful marketplace. They will also authenticate the claims and images displayed in the corporate advertisements.
About every third year comes my turn to serve as rapporteur and summarizer of these Repsol YPF-Harvard Seminars on Energy Policy. And while each Seminar is held in a wonderful and enticing city in Spain—and last year, in Buenos Aires—it seems to me, at least, that the greater the opportunity for recreation, the nicer the climate, and the closer the beach, the more likely it is that I am prevailed upon to take on this task. Besides keeping me indoors for the two full days of our meeting, this assignment requires me to attend all the sessions, carefully listen to and reflect upon each presentation, take note of your interventions during the discussions, reflect on and try to make sense of what transpired, and then convey to the Seminar my version of a summary and my attempt at connecting the dots to see whether I can draw some larger, perhaps even coherent, picture of a corner of the global energy scene as we have described it.

It is a challenging but also, in many ways, rewarding assignment.

Let me begin.
This XII Repsol YPF-Harvard Seminar, *Energy Liberalization and Regulation Revisited*, also the twelfth I have had the privilege of attending, has differed from previous Seminars in important respects. The most obvious difference is the shift in focus away from oil markets. Shift focus we did, notwithstanding the opening address by Minister Chakib Khelil, President of the OPEC Conference, which centered on OPEC, and to use his characterization, its “oil price stabilization policies.” And notwithstanding the fact that the majority of the participants in this meeting continue to have a predominantly oil and gas background. Indeed, Chakib Khelil wondered aloud, “Why is an essentially oil and gas company hosting what is essentially a meeting on electricity?”

Part of the reason is intellectual curiosity: to learn about the work underway at Harvard University, under Bill Hogan’s direction, on electricity markets in the United States and around the world. Another explanation is that the oil and gas business intersects more and more with the electricity business as the importance of oil and natural gas-fueled generation continues to grow by leaps and bounds. Many companies are now engaged in both businesses. Enron, represented here by its chairman, Ken Lay, is an example of a company that has famously combined natural gas and electricity production, transportation, and trade, as it has continued to transform itself. This is a business model that our host, Repsol YPF, too, has contemplated but perhaps on a different scale and in a different form.

So the focus of this year’s gathering is not altogether unobvious. What is not so obvious is why anyone, having sat through a discussion on California, would want to remain in this increasingly chaotic and politically charged business, at least as it is played out in parts of the western United States.

Deregulation of the electric sector was supposed to have the opposite result from the carnage in California, so ably described by our panelists yesterday. As we have been mischievously reminded by several of our European friends, including Alfonso Cortina in his introductory remarks, over the course of the past few years the American participants in this Seminar—including Bill Hogan, but also
some other Seminar alumni here today, Vicky Bailey, Ira Jolles, Ken Lay, and Bill Massey—have preached that injecting competition into the last monopoly industry in the United States would, in some combination, increase electricity supply, enhance consumer choice, and probably even lower consumer prices. Instead, we have seen huge price spikes, at least at the wholesale level, and rolling blackouts beginning in California, a state, I should note, that in terms of climate, temperament, physical beauty, and, increasingly, language, is more like Mallorca than Michigan. And while I just noted some of the similarities between California and Mallorca, in electricity terms at least, California, which has faced more than half a dozen rolling blackouts this year, is more reminiscent of Brazil, even Nigeria—two countries facing similar shortages in electricity, albeit caused by other reasons.

I quote from a recent front-page article in a San Francisco daily newspaper warning of another rolling blackout and offering the following instructions to its readers:

- Have a flashlight and radio with fresh batteries available.
- Tell children who are home alone to remain calm, to turn off computers and TV, and to not use candles.
- In a blackout, unplug all appliances and leave one light on to warn you when the power comes back on.
- Don’t plug a generator into the wall. When the power returns, it can send a high-voltage current through the system that could electrocute power workers.

I say an “intriguing” thought because here it is, American style, do-it-yourself capital punishment that can be applied to those at the periphery of the process that brought down the old, predictable, cheap, reliable, and, I add, regulated electricity regime in California. This, of course, was not the solution favored by our speakers in Panel I, who, at least to my surprise, and notwithstanding their different
backgrounds, affiliations, and interests, seemed to agree on what went wrong with deregulation in California, and why, and therefore, what to try to avoid.

Perhaps less surprising was that the speakers in Panel II, particularly the Europeans, seemed to suggest that they have already figured out what went wrong in California, and why, and declared that they have already maneuvered to avoid the disastrous California model. More on Europe and Europeans later.

What happened in California, in the words of Bill Hogan, was “the worst electricity restructuring failure ever seen or even previously imagined.” Steve Baum called it “an energy tsunami,” or tidal wave. Mike Florio said what went wrong in California was nearly everything, a comment that seems to have amused José Luis Díaz Fernández. Jan Smutny-Jones called it “the perfect storm” after a recent Hollywood movie about a violent storm that sank a Massachusetts fishing boat some years ago, killing all on board, including George Clooney.

The only person with anything positive to say about this fiasco was Minister Khelil, who, in his own words, goes around telling his constituents or “social partners” that he wished Algeria were California.

I said the speakers in Panel I agreed on what went wrong, and why, and how to avoid it. I will not catalogue the entire conversation. I think we all would agree that this was as coherent, articulate, intelligible, and thoughtful a panel as we have heard at these Seminars, as Bill Hogan promised it would be.

But it is worth repeating that there appeared to be a consensus that in California the deregulation experiment was flawed from the outset, that the early expectations were unrealistic, that installed generation capacity was insufficient to meet demand growth, that unexpectedly high natural gas prices upset the cart, and that not only politicians, but nearly everyone at both ends of the transmission system, and those in between, mismanaged the process. Jan Smutny-Jones noted that despite these obvious failures, Californians blithely
blame their problems on Washington, D.C., and, among others, on people like Bill Massey, at least before his price mitigation rule. Californians also blame, and I quote Governor Gray Davis, “the price-gouging, market-fixing friends of the President in the Texas energy industry,” referring, I expect, to none other than our keynote speaker, as Ken Lay himself admitted. We also saw that Ken Lay gives as good as he gets. In Steve Baum’s words, “there is enough blame to go around,” and Steve was quick enough to include himself. But he also noted that blame does not produce a single kilowatt-hour of electricity.

Help may be on the way. The law of supply and demand, as Bill Massey and Jan Smutny-Jones reminded us, is already at work in California and appears to be bringing, among other things, new investments in generating capacity. Kathleen Brown, the daughter and sister of previous California governors, who has also been personally engaged in California politics and presumably has a nose for these things, reminded us, hopefully, that in times of crisis, Californians come together. Adrian Lajous offered help from Mexico in the form of LNG terminals in Baja California. And Gwyn Morgan offered help from Canada in the form of natural gas storage and additional natural gas supplies.

Speaking of crises in California, several participants recalled that the state has had its share of crises in the form of earthquakes, fires, landslides, and riots, among others, though Gerald Doucet objected to the use of the term “crisis” in the context of California’s electricity debacle. For a real electricity crisis, he said, go to India.

Gerald Doucet spoke in Panel II, which was really an extension of Panel I, in that the speakers touched on the lessons in California for Europe, and, importantly, Spain, as well as for Latin America and East Asia. “Can California happen here?” Gerald Doucet quoted many as asking him as he travels around the world. And his answer, he told us, is always “No.” California’s experience, he implied, was unique to California’s particular—or peculiar—conditions. Other countries are, or if they followed the World Energy Council’s guidelines, should be diversifying their supply portfolios, establishing different regulatory
regimes, and putting into place more effective public-private partnerships. He also reported that when asked whether reliable energy is also cheap energy, he answers emphatically, “No.”

The Europeans, too, have always held that there is a link between energy costs and prices, but that part of these costs include, in the words of Dominique Ristori, security of supply considerations, and environmental, employment, and even renewable energy development costs. Indeed, to him, the lesson of California is about security of electricity and energy supply. That fiasco could occur in Europe too, he warned, if the European Commission does not pay sufficient attention to mandating or facilitating the construction of and access to excess generation and reliable transmission systems.

Total deregulation of the energy markets is not in the cards in Europe, although progress is being made, he reported optimistically, toward a single open market in the continent, though properly regulated. He did not elaborate on a slight hiccup: when it comes to opening up national electricity and natural gas markets, what the European Commission proposes, his own country, France, opposes, or at least ignores. Luis Javier Navarro picked up on this point and expressed healthy skepticism about the Commission’s ambitious calendar for achieving a single, truly open and competitive energy market. Dominique Ristori, true to Eurocratic form, assured us that the Commission “has launched the analysis.”

María Luisa Huidobro reported that Spain has moved beyond analysis in the deregulation of its electricity market, that some similarities, but also some important differences, exist between the California and the Spanish models, that Spain is cognizant of the tension between market liberalization and security of supply, and, importantly, that there is a recognition here of the importance of successfully removing bottlenecks in generation and transmission infrastructure.

The two panelists from Latin America, Minister Álvaro Silva Calderón and Julio Herrera, gave us the message that their continent, too, is undergoing a major transformation, away from the closed and
protected energy sector of the past to one that is open for business both to the domestic private sector and to outside investment. Julio Herrera noted that Repsol YPF has been a major participant in Latin America’s more privatized, more liberalized, and more globalized energy markets. And, as we saw in Álvaro Silva Calderón’s video presentation, other players from other countries are similarly attracted to opportunities in Venezuela, though apparently in numbers not large enough to satisfy Humberto Calderón Berti.

Ken Lay’s message to all of these panelists was to ignore the mess in California and to push ahead with full energy liberalization. In fact, his message to California was to ignore the mess and push for full liberalization. What happened in California, he said, was not liberalization and deregulation, but merely politically compromised industry restructuring.

In his introductory remarks, Alfonso Cortina wondered about the impact of the media on government policy and also on corporate strategy. Panel III, The Public Image of Energy Companies, touched on this question, the first time a session in this Seminar has been dedicated to the topic. The popular press has rediscovered, with a vengeance, energy companies and energy policy in the wake of the run-up in the past year and a half or so of oil and natural gas prices and, of course, in the wake of the carnage in California. In the United States, and as we heard from Tony Hayward, in the United Kingdom as well, energy companies have launched a public relations and media campaign to explain why the prices of oil, natural gas, and electricity have risen as much as they have, awkwardly but not surprisingly, in tandem with record corporate profits.

Often the message is that consumers in a particular country are not alone in having to pay more for energy and that this is a global phenomenon. Also, that the blame lies not with the energy companies but with complex factors that have led to higher oil prices: a potent mix of strong demand, tight supply, high taxes, bottlenecks in availability of different gasoline blends required to meet regional environmental regulations, and last but not least, cuts in production by key OPEC countries. Of course, Chakib Khelil put the best possible
face on OPEC production cuts, calling them efforts by OPEC to stabilize the world oil markets in the interest of producers and consumers alike. I doubt many U.S. consumers would be easily persuaded that high oil and high gasoline prices are in their best interests, short term or long term.

Meanwhile, the message of the U.S. energy companies is bolstered by the Bush administration, which itself has declared the onset of an energy crisis in the United States, passing the blame onto its predecessor, the Clinton administration, for fostering policies leading to under-investment in infrastructure, rigid environmental standards, and botched deregulation.

How well is the energy companies’ message received? How successful are they in shifting consumer attention away from robust balance sheets to broader supply-and-demand, public policy, and geopolitical considerations? Tony Hayward suggested that the industry should go beyond this immediate public relations problem and make more conscious efforts, both in substance and in form, to re-position itself as consumer- and society-friendly. Another speaker in Panel III, Jane Collin, reminded us that the public image problem of the oil companies is as old as the industry itself. Perhaps this is the nature of the beast, she suggested. The oil companies would be hard-pressed to take up a kinder, gentler image and probably should not even try.

Nemesio Fernández-Cuesta spoke of the interplay between energy companies and governments, investors, consumers, and the press—and suggested that the companies need to be more sensitive and attentive to all these constituents.

Wayne Greenberg gave us a flavor for the media messages and ads run in U.S. publications by natural gas and electricity companies and suggested that these companies are largely responsible for their own bad press, not only because of their actions or inactions on societal and environmental issues, but also because of poor ad copy.

I started my remarks by noting that this year’s Seminar differed from previous ones in several important respects. Let me give one more example.
Our calm and beautiful surroundings notwithstanding, we have this year reflected a greater sense of pessimism and crisis than in prior years. Luis Mañas noted that as a trendsetter, California could set back efforts at deregulation and liberalization of electricity markets elsewhere in the world. Humberto Calderón Berti warned, as he did last year in Buenos Aires, that OPEC has already forgotten the lessons of the 1980s and will keep oil prices too high, too long, thereby triggering lower demand for its oil until current price levels become unsustainable and crash again. He is right, although neither he nor anyone else in this room can call the timing of the cycle with any certainty. It could take one year, or five.

But the Bush administration is not waiting to find out. In response to today’s high oil prices and other disruptions in energy markets, the United States is lurching towards some form of national energy policy and when it gets one, the impact on Europe, Latin America, Africa, and other continents and countries represented here will be considerable.

“America in the year 2001 faces the most serious energy shortage since the oil embargo of the 1970s,” according to the energy plan unveiled by the administration in mid-May. The plan emphasizes boosting the country’s energy supply by supporting the opening up of some hitherto protected federal lands, including the Arctic National Wildlife Refuge, to oil and natural gas exploration. It calls for lifting the output of coal and nuclear power, and putting a great deal of effort into removing bottlenecks in America’s energy infrastructure, including barriers, many environmental or regulatory, to the construction of power plants, refineries, and transmission lines. While it also, in fairness, contains recommendations focusing on energy efficiency and renewables, it has been criticized as a plan mostly engineered by and for the energy companies.

Clearly the long-term health of the U.S. economy, the engine of the global economy, will be affected by the resolution of America’s domestic energy problems. As the world’s largest consumer of fossil fuels and its largest emitter of greenhouse gases, what the United States does to resolve its tension between energy and the environment will impact, arguably, global climate change. The United States
is the world’s largest importer of oil and the country most prone to use energy as a weapon of foreign policy; already it has used sanctions to keep its oil companies out of at least three major oil-producing countries—Iran, Iraq, and Libya—and some lesser ones like Myanmar and Sudan.

The United States has also tried, though less successfully, to keep other countries’ oil companies out of these sanctioned areas as well. Higher oil prices have led to renewed calls, including one by a Seminar alumnus, Irvin M. Stelzer, to intercede with Mexico, Kuwait, and Saudi Arabia to open their oil spigots to increase production and lower prices as a condition for continued U.S. support for, or favored relations with, these countries.

Presidents Bush and Cheney have already signaled that they want a comprehensive national energy policy that addresses the full range of market and national security issues. Getting this plan through Congress intact has now been complicated by the hijacking of the Senate by Democrats, in response, in part, to the earlier hijacking of the White House by the Republicans. Still, one can reasonably expect that some sort of national energy plan will be in place by the time we meet again next year and that it will not be to the liking of all who have attended this Seminar or will attend the next.

I was amused to read recently in an editorial in the conservative U.S. daily, the Wall Street Journal, a defense of the administration’s proposed energy plan that noted that the United States now consumes some 100 quadrillion Btus of energy a year—that is a long string of zeros—and went on to state that this fact simply describes the daily lives of the American people in the twenty-first century. “It is who and what we are.”

To now conclude, I have referred several times to how this Seminar has differed from the 11 gatherings that have preceded it. What has not changed, though, has been the elegant hospitality of our host, Repsol YPF, and the efforts at preparation and organization of the meetings by Repsol YPF, Fundación Repsol YPF, and Harvard University.
I would like to extend our thanks to Alfonso Cortina, José Luis Díaz Fernández, and Bill Hogan, and their respective teams, for bringing us together in this wonderful location for two days of lively discussion but also quiet reflection on a wide range of energy issues that affect us in our roles as producers and/or consumers of energy, as policymakers, as corporate decision-makers, and as academics.

Finally, on behalf of those of us who have come from abroad, I thank all our Spanish colleagues and hosts for your gracious welcome, for your warm friendship, and for sharing with us, for a few days each year, another corner of your beautiful country.
Stephen L. Baum is Chairman, President, and Chief Executive Officer of Sempra Energy, the San Diego-based energy corporation that provides electricity, natural gas, and value-added products and services internationally to more than nine million customers. Mr. Baum has been a leader of Sempra since its founding in 1998, serving originally as Vice Chairman, President, and Chief Operating Officer. Earlier, from 1996 to 1997, he held executive positions in Enova Corporation, the predecessor company of Sempra, and from 1993 to 1997 he was Executive Vice President of San Diego Gas and Electric Company (SDG&E), one of the principal subsidiary companies of Sempra. Mr. Baum has been, in effect, a Director of Sempra all through the period of electricity restructuring in California. In addition, he has been actively involved in leading the development of Sempra Energy’s international operations, including spearheading...
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successful negotiations to build, along with other partners, natural
gas distribution systems in Mexicali and Chihuahua, Mexico. Before
joining SDG&E in 1985, Mr. Baum was active in utility law on the East
Coast, including serving as Vice President and General Counsel of the
New York Power Authority from 1982 to 1985. Mr. Baum is a grad-
uate of the University of Virginia Law School and Harvard University.

Jane Collin is Editor of the London-based Energy Compass, a weekly
publication that examines the global interface between oil and poli-
tics. This journal is one of the publications of the Energy Intelligence
Group (EIG) that include, among others, Petroleum Intelligence
Weekly. Before returning to London in 1999, Ms. Collin worked in
EIG’s American offices for a decade, editing The Oil Daily and con-
tributing articles to other EIG publications. Before joining EIG, Ms.
Collin worked for Middle East Economic Digest in London. She has a
B.A. from Lady Margaret Hall, Oxford University.

Alfonso Cortina de Alcocer has been Chairman and CEO of Repsol
YPF since July 1999. Prior to the merger of Repsol and YPF, the
Argentine oil company, he was Chairman and CEO of Repsol, S.A.
from 1996 to 1999, and has been a member of the YPF Board of
Directors since February 1999. From 1984 to 1996, Mr. Cortina
served as Vice Chairman, Chairman, and Managing Director of
Portland Valderrivas, S.A., as well as Chairman of the firm’s Delegate
Commission. He has had extensive experience in the banking indus-
try, including executive positions at Banco de Vizcaya Group,
Hispano Hipotecario, Sociedad de Crédito Hipotecario, S.A., and
Banco Zaragozano. His professional activities have included chair-
manship of the Asociación Hipotecaria Española and membership on
the Executive Committee of the European Mortgage Federation. In
1995, the Madrid Official Chamber of Commerce and Industry hon-
ored him as Businessman of the Year. Mr. Cortina earned degrees in
advanced industrial engineering and in economics from ETSII and
Madrid University, respectively.

José Luis Díaz Fernández has been President of Fundación Repsol
YPF since it was created in January 1996 to coordinate Repsol YPF’s
promotion of educational, cultural, and research activities relating to
energy and society. He is also Vice President of Fundación YPF. After serving in the public sector as Director General for Energy in Spain’s Ministry of Industry, Mr. Díaz Fernández moved to the private sector in 1975 and joined Repsol after its founding in 1987. He has served Repsol YPF in many roles, including Chairman and CEO of Repsol Petróleo, S.A., and Chairman and CEO of Campsa. Mr. Díaz Fernández is a member of the Board of Directors and of the Executive Committee of CLH and Petronor, S.A. He received his Ph.D. in mining engineering from the Polytechnic University of Madrid, where he serves on the faculty of the School of Mines. He is a member of the Spanish Engineering Academy.

Gerald Doucet became Secretary General of the World Energy Council (WEC) in September 1998. Established in London in 1923, the World Energy Council now has 90 member committees and focuses its work on a broad range of energy issues, including energy scenarios, energy market structures, the environment, and energy poverty. Prior to assuming his position at WEC, Mr. Doucet held various positions in government, industry organizations, and international relations. He began his career with the government of Canada in economic and policy roles, and moved on to become Senior Vice President of the Retail Council of Canada from 1982 to 1987. From 1988 to 1992, he served as the Agent General for Ontario in Europe. He was a Founding Director and served as President of the Europe-Canada Development Association from 1992 to 1994. From 1994 to 1998 he served as President and CEO of the Canadian Gas Association. Mr. Doucet holds an M.A. in economics from Carleton University.

Nemesio Fernández-Cuesta y Luca de Tena is President of Prensa Española, a large Spanish publishing group that produces the influential daily ABC. Before moving to journalism, Mr. Fernández-Cuesta held leadership positions in Spain’s energy industry, in both public and private sectors. In the 1980s, he held several governmental positions, including Deputy Director of Petroleum, Gas, and Water. He moved to the Instituto Nacional de Hidrocarburos (INH) and then to Repsol at the time of its founding. He served as Executive Vice
President of Repsol Comercial from 1991 through 1996. In 1996 he returned to government service as Secretary of State for Energy and Mineral Resources in Spain’s Ministry of Industry and Energy. Mr. Fernández-Cuesta received graduate degrees in economics and in business administration from the Autonomous University of Madrid. He is a member of the Spanish Group of the Trilateral Commission.

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Wayne Greenberg was President of Financial Times Energy (FTE) from July 1999 through September 2001. In that capacity, he oversaw the business operations of the several energy-related journals published by the group. Since leaving FTE, Mr. Greenberg has continued his involvement with the energy industry as a venture capitalist and a board member of several companies. Previously, Mr. Greenberg had a series of varied responsibilities in publishing, including serving as President of E Source and also as President of Shepard’s/McGraw-Hill, the legal publishing arm of the McGraw-Hill companies. Before moving to Shepard’s, he held management positions at Lexis-Nexis, the world’s largest provider of online information for professional markets. Mr. Greenberg also spent ten years as Associate Dean at Tulane University Law School. Earlier in his career, he was involved in various entrepreneurial ventures. Mr. Greenberg earned a J.D. from Tulane
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**Chakib Khelil** was appointed Algeria’s Minister of Energy and Mines in 1999, with a mandate that includes developing Sonatrach’s international business strategy. This appointment climaxed Dr. Khelil’s three decades of work in the international energy field. Beginning with jobs at Shell and Phillips Petroleum in Oklahoma in 1968, he returned to Algeria in 1970 as head of Sonatrach’s petroleum engineering department. He became President of Sonatrach and served in that capacity until 1976. He wrote an influential study on the development of the natural gas industry in Algeria that examined ways of enhancing the production and export of Algeria’s under-marketed gas resources. Later, Dr. Khelil joined the World Bank in Washington, D.C., where he focused on upstream problems in oil and gas exploration and production. Dr. Khelil served as President of the OPEC Conference in 2001. He earned a Ph.D. in petroleum engineering at Texas A&M University.

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