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THE CALIFORNIA ENERGY CRISIS: IMPACTS, CAUSES, AND REMEDIES

HEARING

BEFORE THE

COMMITTEE ON FINANCIAL SERVICES

U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTH CONGRESS

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THE CALIFORNIA ENERGY CRISIS: IMPACTS, CAUSES, AND REMEDIES

WEDNESDAY, JUNE 20, 2001,

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON FINANCIAL SERVICES,
Washington, DC.

The committee met, pursuant to call, at 10:04 a.m., in room 2128, Rayburn House Office Building, Hon. Michael G. Oxley, [chairman of the committee], presiding.

Present: Chairman Oxley; Representatives Barr, Kelly, Weldon, Biggert, Green, Miller, Cantor, Hart, Capito, Tiberi, LaFalce, Waters, Sanders, C. Maloney of New York, Watt, Bentsen, J. Maloney of Connecticut, Lee, Mascara, Inslee, Schakowsky, Moore, S. Jones of Ohio, Ford and Crowley.

Chairman OXLEY. The hearing will come to order.

This hearing of the Committee on Financial Services is beginning—and without objection, all Members' opening statements will be made part of the record in order to permit us to hear from our witnesses and engage in a meaningful question and answer session. I'm encouraging all Members to submit their statements for the record.

The Chair recognizes himself now for a brief opening statement.

Our hearing today represents the Financial Services Committee's continuing obligation to conduct oversight on the state of the U.S. economy.

Today, we explore the impact and causes of the California energy crisis, and discuss steps this committee can take to help prevent it from being repeated.

The California energy crisis has the potential to become an American economic crisis. Already in both California and throughout the West, high prices, drought conditions, and lack of investment in infrastructure have caused serious disruption to the lives of American families and workers.

In the Pacific Northwest, aluminum mills have shut down because they cannot afford the cost of electricity. Predictably, this has led to a decline in U.S. aluminum production.

According to the Silicon Valley Manufacturing Group, its' nearly 200 members lost over $100 million in a single day of rolling blackouts in June of last year.

The State of California accounts for over 16 percent of U.S. commodity exports and nearly 25 percent of industrial equipment and computers, electronics and instruments exports.

Declines in the ability of that State to manufacture and trade these products will increase the U.S. trade deficit.

I could cite similar statistics, but they all have the same point. The California energy crisis is not only bad for California, it's bad for America.

There's no question that when a State must issue the largest municipal bond offering in history in order to purchase electricity, there is something seriously wrong with the system.

Our hearing today will explore what went wrong and provide insight into how to avoid such pitfalls in the future.

Part of the purpose of this hearing is also to remind ourselves that this is not a new dilemma. The last major energy crisis in the 1970s led to our becoming a much more energy efficient country. Energy intensity, or the amount of energy used to produce a dollar's worth of GDP, has declined some 42 percent, meaning that the U.S. has grown significantly more energy efficient over the last two decades.

This has occurred despite the fact that personal energy use has increased over that same period.

We'll hear today from the Department of Housing and Urban Development on the steps they have taken to contribute to this dramatic increase in energy efficiency, and what more there is to be done.

It has been proven time and time again that truly competitive markets, free from overly burdensome Government intrusion, supply goods and services better than any of the alternatives.

One securities law that has outworn its usefulness is the Public Utility Holding Company Act of 1935. Though not implicated in causing the current situation in California, PUHCA has nevertheless proven to be an unnecessary burden to creating a healthy electricity infrastructure.

We are honored to have with us today Commissioner Isaac Hunt, Jr., to explain why the SEC has long called for the repeal of this out-dated legislation.

This current crisis provides us an opportunity to confront the mistakes of the past and remove barriers to building a better future.

I look forward to hearing from all of our witnesses today as this committee works to do its part to ensure that America's energy infrastructure becomes increasingly healthy and competitive.

That completes the Chair's opening statement.

[The prepared statement of Hon. Michael G. Oxley can be found on page 48 in the appendix.]

I now turn to our friend, the gentleman from New York, the Ranking Member, Mr. LaFalce.

Mr. LAFALCE. I thank you very much, Mr. Chairman, for convening today's hearing.

The energy crisis, especially the crisis facing the Western States, is truly a national concern, and it is appropriate that we focus our committee's attention on it today.

And it's particularly fitting, since our committee has in fact played a most significant role on energy issues in the past, primarily through its jurisdiction over the Defense Production Act and Loan Guarantee Authority.

Notably, our House Banking Committee played the central role in the Economic Stabilization Act of 1970, which included authorities governing energy prices.

Our committee also played a central role in the Energy Security Act of 1980 that was created pursuant to the creation of a special ad hoc Energy Task Force, chaired by a member of our committee at the time, Mr. Ashley.

And that Act established the Synthetic Fuels Corporation as well as a host of other energy production guarantees. So, our committee has had a very, very important historical central role on energy issues.

Today, I would like to comment briefly on three issues: Reform of the Public Utility Holding Company Act, solutions to the short-term crisis in the West, and the need for a long-term energy plan.

I look forward to Commissioner Hunt's testimony on the Public Utilities Holding Company Act, the PUHCA, which some advocate raises difficult issues. Stand-alone repeal of PUHCA, or even granting the SEC exemptive authority, arguably amounts to a significant deregulation of the energy sector.

Yet, currently a deregulated marketplace appears to be reeking havoc on the consumers and taxpayers of California and other Western States. PUHCA may need to be revisited to reflect the realities of today's marketplace. But PUHCA reform should be a very careful effort and one that is highly sensitive to maintaining protections for energy consumers as well as investors.

More central to the current energy crisis in the West are the actions of the Federal Energy Regulatory Commission. As many of us see it, the FERC's most recent action to control prices may be a step in the right direction.

Real price caps were desperately needed in the Western States months ago, and are no less desperately needed today. FERC's action on Monday moves us closer to effective price caps and should help moderate the price spikes of the Western markets.

However, the plan also maintains a fundamental weakness by tying price controls to the production costs of the most expensive producer.

I'll be interested in hearing the views of today's experts on that issue.

If any good has come of the current energy crisis, it has been to focus public attention on the need for an effective, long-term national energy policy. The Administration has offered its own long-term plan, but some of us are troubled in that it appears, at least, to offer less to energy consumers than to energy producers.

We surely need a serious bipartisan effort to address both the short-term impact of the current energy crisis on consumers while, at the same time, developing solutions to our Nation's long-term energy problems.

And if we can make any contribution to such an effort here today, I hope it will be one driven by desire for sound policy and a balanced interest in protecting consumers, taxpayers, and the environment, while allowing for fair industry profits.

I thank the Chair.

Chairman OXLEY. The gentleman's time expires.

Are there further opening statements?

The gentlelady from California, Ms. Waters.

Ms. WATERS. Thank you very much, Mr. Chairman, for calling this hearing.

The issues surrounding the California energy crisis are extremely important to me and my constituents and the entire country, as well.

This is a very timely issue as a number of Californians are expected to experience rolling blackouts today and throughout this week as temperatures to continue to climb.

To highlight this issue, tomorrow's episode of the Tonight Show will be dedicated to energy conversation. It will be taped virtually in the dark without studio lights, TV monitors, amplifiers or other power sources.

NBC says the idea came up when the network, like most other businesses in California, was asked to turn off lights and computers whenever possible.

I hope other businesses will follow this example. The amount of power used on one episode of the "Tonight Show" equals a month's worth of power at a normal family home.

In 1999, California paid $7 billion for its energy generation. Last year, even though demand was down due to conservation, the price was $32.5 billion. This year the price for approximately the same amount of electricity is estimated to be $70 billion.

In the short space of 2 years, costs have increased tenfold. California does not have a demand problem; in fact, per capita, Californians use the lowest amount of power, and recent conservation efforts have reduced consumption even further.

What California has is an artificial supply problem, a problem caused by power generators taking power generation off-line for so-called maintenance. Over the past 6 months, the number of turbines closed for maintenance has vastly exceeded that of previous years.

For example, outage rates in March 2001 averaged almost 14,000 megawatts, four times higher than in March 2000.

In April 2000, the power generators took approximately 3,300 megawatts off-line for maintenance. In April 2001, they took almost 15,000 megawatts off-line on an average day.

This practice is currently being investigated on the State level and deserves Federal scrutiny as well. Finally, after essentially ignoring the California crisis for months, the Federal Energy Regulatory Commission—FERC—has responded to the situation and their order goes into effect today.

However, their actions were akin to putting a butterfly bandaid on a gushing wound. On Monday, FERC expanded its April 26th order to apply 24 hours a day throughout the West. The new formula will be based on the cost of fuel plus an allowance for profit. And these limits will remain in effect around the clock, a step in the right direction. While the order does close some loopholes in the April Order, such as prohibiting generators from exporting energy to neighboring States and importing it back at higher prices, there are still outstanding issues.

The prices will be determined by the most inefficient, highest cost generator. The nature of this order does nothing to discourage

generators from withholding power in order to ensure that the least efficient unit sets the market clearing price.

In addition, I am concerned that FERC has failed to order refunds of the more than $6 billion in potentially illegal overcharges. Instead, FERC has directed public utility buyers and sellers to try and reach settlement with a FERC Administrative Law Judge.

FERC is clearly abandoning its mandate to ensure that rates are just and reasonable and to order refunds when rates do not meet that standard.

This is why I'm a cosponsor of HR 1468, which was introduced by my colleague, Jay Inslee. The Energy Price and Economic Stability Act forces FERC to do its statutorily mandated job of ensuring fair electricity rates. This legislation directs FERC to establish cost-of-service-based rates for electric energy and instructs FERC to order refunds of illegal rates and charges.

I urge all of my colleagues to support this crucial legislation. This crisis is having a major effect on some of my constituents and consumers throughout the West, many of whom who have seen their utility bills triple.

Some have bills of more than $1,000; others are scrimping on food and medicine to keep their power on. And the Low Income Heat and Energy Assistance Funds, even combined with another $120 million from California, can only provide help for less than 10 percent of the 2.1 million households who qualify for energy assistance.

On the other hand, while consumers suffer, corporations are just thriving. This crisis has proven to be a boon for some. A number of executives at the largest power companies have collected tens and even hundreds of millions of dollars through stock sales driven up by the California energy crisis.

Enron Chair Kenneth Lane garnered $123 million in option transactions last year, which was ten times what he made in 1998.

Jeffrey Skilling, Enron's chief executive, netted more than $62 million in options gain last year.

Peter Cartwright, Chairman and CEO of Calpine, netted almost $12 million through the exercise of options earlier this year.

Many of these energy millionaires have found their way to Washington. This Administration has an unprecedented number of high level appointees with a background in the energy industry. Besides the President and Vice President, even Condoleezza Rice was on Chevron's board of directors for almost a decade.

Commerce Secretary Don Evans served as CEO of a Texas Oil Company.

Chairman OXLEY. Could the gentlelady sum up please.

Ms. WATERS. Interior Secretary Gail Norton began her career at a conservative think tank funded by a number of energy companies.

Mr. Chairman, I do have more, but I'm anxious to hear from our witnesses. I thank you for the opportunity to have this opening statement, and I will yield back the balance of my time.

[The prepared statement of Hon. Maxine Waters can be found on page 54 in the appendix.]

Chairman OXLEY. The gentlelady yields back.

The gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Appreciate it, Mr. Chair.

I just want to say, I'm glad we're having this hearing, because I think it's clear that the FERC action a couple of days ago, although welcome in the sense that they finally threw us a rope, they threw us a rope that's about half as long as it's going to take to save us in the West.

And I want to point out that this is not a California problem, this is a West Coast problem. In the State of Washington, we could lose 43,000 jobs this year alone, because of the 300, 500 percent price spikes that we've had in the wholesale electrical markets.

And after studying the FERC order, it's very obvious that it's going to come up short for two reasons.

Number one, in picking the highest priced electricity in the West Coast, the least efficient plant, probably the dirtiest plant, as being the bellwether for the price we're going to set. Anybody would flunk economics 100 who would want to use that incentive mechanism to the market for several reasons.

Number one, it's like saying you want to control prices of cars, but you pick the price of a Rolls Royce Silver Cloud as your benchmark.

Second, it sends a signal to the markets to start up your least efficient plants first.

Why should we send a signal from the U.S. Government to generators to generate their most expensive electricity first? It doesn't make sense.

Second, it has absolutely no action, meaningful action to bring the refunds to the consumers who have lost billions, and that's with a B, billions. California spent $7 billion a couple of years ago in electricity. Next year they may spend $70 billion to give refunds to the consumers who are owed it.

And I just want to ask FERC—I wish they were going to be here at this meeting—if these prices are wrong, if they are unconscionable, if they're illegal in July, why weren't they in January, February, March, April, May and June?

And if they were, why is the Federal Government doing nothing to get refunds for the Americans that have them coming to them?

So we think this FERC order is seriously deficient. We are going to push efforts to the floor. I hope Members in this committee will sign our discharge petition in the tone of bipartisanship. Peter Farrow, the Peter, Paul and Mary singer, sang both to the Republican caucus and to the Democratic caucus this week. I think that should bring us together on this and hopefully we'll get a vote on this.

So I just want to tell the committee we will continue to push this issue.

I also want to put in the record, if I may, Mr. Chairman, the unanimous consent to put in statements by MIT Professor Dr. Paul Joskow who is in favor of a price mitigation strategy, Seattle City Council member Heidi Wills, who has seen the devastation these prices have caused the City of Seattle, and Dr. Alfred Kahn, who also has a very important viewpoint on price mitigation.

Thank you.

[The information referred to can be found on page 169 in the appendix.]

Chairman OXLEY. Without objection.

The gentleman's time has expired. Are there further opening statements?

The gentleman from Vermont.

Mr. SANDERS. Thank you, Mr. Chairman.

Let me just pick up on some of the points that Ms. Waters and Mr. Inslee made. The bottom line is that the energy crisis in California is not only a disaster for millions of people in that State, it is a potential disaster for every single American in terms of what it will do to our national economy and our standard of living.

The bottom line is that at a time when corporate profits are soaring, when, as Ms. Waters just read, there are obscene, beyond belief, take-home pay for CEO executives of energy companies at the same time as low-income people do not know how they're going to pay their electric bills. The time is long overdue for the United States Congress to begin to stand up for ordinary people and have the guts to take on these large companies, which have acted in an absolutely outrageous way under deregulation, and have given the word "greed" a new meaning.

It is no secret that this country does not have a serious energy policy, and given all of the technology out there, all of the wisdom out there, it is an absolute disgrace what we are not doing to protect consumers and to protect our environment.

Let me just make some suggestions, which are incorporated in legislation which I will be introducing that will lead us into the right direction.

Number one. In my State, where the weather gets a lot colder than it does in Los Angeles, we have thousands of homes that are not adequately weatherized because the people don't have the money to do that. Heat goes right out the door or right out the windows.

We have got to significantly increase the weatherization programs in this country. That's a very important national investment.

Number two. We have got to significantly increase the Low-Income Heating and Energy Assistance Program, because there are millions of Americans today who cannot afford to pay their energy bill. They need immediate help and they need that help right now.

We need to provide a refundable tax credit to low-to-middle income consumers, and non-refundable tax credit to small businesses who purchase energy efficient appliances and homes through the Energy Star program.

We've got to raise, and here is it an absolutely scandalous what we have not done, the corporate average fuel economy, the CAFE standards, to at least 45 miles per gallon for cars and 34 miles per gallon for light trucks over the next decade.

It is amazing to me that while Congress puts hundreds of millions of dollars into Detroit, it is Toyota and Honda that come up with the new cars. The technology is out there for cars to get 60, 70, 80 miles to a gallon and millions of us are driving cars that get 15 or 20 miles per gallon, wasting huge amounts of fuel.

We have got to, in the immediate crisis, impose a windfall profits tax on the oil, gas and electric industry to stop these absolute ripoffs that Ms. Waters was just talking about a moment ago.

We have got to require 20 percent of the Nation's electricity to come from renewable sources of energy by 2020. New wind energy being developed in Denmark, in France, in Germany, and of course the United States is moving forward, but not fast enough.

In fact, wind energy, to everybody's perhaps surprise, is the fastest growing new source of energy online in the world. And it is nonpolluting.

We have got to require replacement tires to be as fuel efficient as the original tires on new vehicles. We've got to provide at least a $6,000 tax credit to Americans who buy ultra-efficient cars made in the United States.

These are common sense approaches which will go a long way to break our dependence on Middle East oil, develop new sources of energy renewable means. I think we are long overdue in moving in that direction.

I would yield back the balance of my time.

Chairman OXLEY. The gentleman yields back.

The gentleman from California, Mr. Miller.

Mr. MILLER. Thank you, Mr. Chairman.

I want to thank you for holding this hearing, and I really look forward to listening to the witnesses today testifying before the committee.

For the last 8 years, our Nation has failed to address our energy's outlook with a cohesive and comprehensive national policy. Instead of becoming more independent, we have increased our reliance on foreign sources to provide oil for meeting our everyday needs.

Oil imports rose from 32 percent in 1992 to 55 percent last year alone. The previous Administration was put into the unfortunate position of sending our Secretary of Energy to the Middle East to beg for greater oil output from the very countries we defended from Saddam Hussein just a decade ago.

Furthermore, special interests have seriously limited our ability to meet the growing demand that an increasingly larger population and the increased use of electronic information age technology have created.

Radical environmentalists have lobbied for years to stop the construction of any new power production facilities. They protest the use of power generators that burn fossil fuel due to the air quality standards. Furthermore, they attack the nuclear plants for inadequate storage facilities for spent fuel. They object to hydroelectric because of a presumed effect on fish populations, wind turbine facilities because of the potential hazard to birds, and solar energy generation because of the amount of habitat that is replaced by power cells.

It seems no matter the source of power, these radical environmentalists find some reason to oppose any type of electric generation.

In the balance, they hold the public general welfare hostage. In my home State of California, no new power plant has been built for over 10 years. During the same period of time, California's population has increased 11 percent to 33 million people. As well, California's become the world's hub for e-commerce which has created an even greater demand for electric supply.

Now we're facing the reality of these failed policies as Californians are forced to import energy from other States. The problems in California are precursors to many of the problems this Nation will face if a comprehensive policy is not put into place.

New and more efficient plants with environmentally sensitive technology would reduce the amount of fuel required to run them while helping meet the needs of the new economy. This, coupled with updating the infrastructure that would transmit the power, would allow California and the country to meet their energy challenges.

Recent electricity shortages have lured suppliers, while reducing political obstruction, to construct new facilities. Creating a new power surplus will drive rates down, will also force suppliers to produce energy using the cheapest, most efficient means available.

Moreover, price caps would not cap consumption into a major problem. For example, California's been able to conserve 11 percent more energy in April when compared to the same month last year, but still faces rolling blackouts. The problem is energy shortages, not prices.

As we witnessed during the mid-1980s and mid-1990s, as energy costs fall, our economy swells. I don't think we can stress that point enough. A strong energy policy which includes reliable, sustainable and cost-efficient electricity is a backbone of a strong economy.

California has continued to be a driving force in America's economy. We must make certain that the power is available to our State in the future.

I've been involved in the building industry for over 30 years, and one thing I've found is, because of regulation and the process we're put through to get entitlements to build homes in the United States, we have artificially driven the prices through the roof on housing; we've done the same thing with energy.

We had a major recession in 1990 and in 1989. In 1990, house prices in California were probably 20 percent above where they should have been, not based on the market itself, but based on the lack of adequate supplies being given to the market to deal with the impact of the people.

We are having the same situation on energy with electricity, and we need to resolve it with more, more production.

Thank you.

[The prepared statement of Hon. Gary Miller can be found on page 52 in the appendix.]

Chairman OXLEY. The gentleman's time has expired.

Are there further opening statements?

The lady from Illinois, Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman.

I appreciate that the committee agrees that California's energy situation has implications for all of us, and that the Federal Government has a role and a responsibility to participate in the process to help California and to ensure the energy problems of the West do not extend themselves to the rest of the country.

That being said, Mr. Chairman, while it's appropriate for this committee to examine the issues affecting California and the West,

I believe our discussion needs to be widened to include problems facing consumers throughout the country.

As you know, the Midwest has also experienced severe energy difficulties over the past year. This past winter, natural gas prices for consumers in my district tripled, and for the second summer in a row, consumers in the Midwest and especially Chicago are paying way above the national average for gasoline.

Like the California crisis, these issues have been ongoing for some time and discussion of ways to bring relief and prevent future problems for the Midwest are also worthy of this committee's attention.

I would like to say that I think to blame environmentalists, who for years have been pushing for sound alternative energy policies, and have met only with resistance from a Republican-dominated Congress, is really a false accusation, I believe.

And I hope now we can put these differences behind us and move forward with a rational energy policy.

I understand that our HUD and SEC witnesses will discuss the Public Utility Holding Company Act, PUHCA, as well as energy conservation efforts.

I just want to make clear my strong view that any discussion of a possible repeal or revision of PUHCA should also include our colleagues in the Energy and Commerce Committee and must include a bipartisan agreement that any proposal for change to existing regulation should include, as a priority, strong measures to ensure the utmost protection for consumers.

I'm pleased that our HUD witness is here today. However, I do not think we can have a complete discussion about conservation efforts at HUD without first addressing the serious budget shortfalls at the agency.

I have concerns that the Administration's overall request for HUD is nearly $2 billion below last year's level and that the capital improvement fund, from where conservation and efficiency improvements would be funded, is down 25 percent or $700 million below last year's level.

These shortfalls have serious ramifications for public housing in particular, and I hope our witness can address these concerns during the hearing.

Again, Mr. Chairman, I want to thank you for convening this hearing and look forward to our witnesses' testimony.

Chairman OXLEY. The gentlelady's time has expired.

The gentlelady from West Virginia is recognized for opening statement.

Ms. CAPITO. Thank you, Mr. Chairman. I appreciate you holding this hearing today and I want to thank our witnesses for being here and providing us with their testimony.

The energy crisis in California has been devastating to communities across the Western United States, but its effects are being felt across many industries and throughout the rest of the United States.

Our Nation has been blessed with an abundance of natural resources from which energy can be produced. I feel that this unfortunate situation in California is one that need not be repeated, and we must to work to ensure this.

At a time when we have the technology to produce more energy, particularly with coal, in a much cleaner more efficient way, we need to devise the long-term solutions to help prevent situations like this from reoccurring.

However, that does not address the continuing struggles in the West. We are seeing the prices of services rise, and the funds to pay for these services depleting.

Today, it costs more to operate businesses, drive our cars, and cool our homes. Unfortunately, the demand for energy is not decreasing. Companies are being forced to close and vital members of our Nation's work force are losing their jobs.

With California's economy representing 13 percent of the total U.S. gross domestic product, it cannot survive under these conditions.

A poorly thought-out deregulation plan has severely damaged the world's sixth largest economy, and I'm hopeful that hearings such as these will provide us with some insight into how we can avoid problems. I look forward to working with the Members of this committee as well as members of our panels to learn more about this situation.

Again, thank you, Mr. Chairman, for calling us here today. I yield back the rest of my time.

Chairman OXLEY. The gentlelady's time has expired.

The gentlelady from California, Ms. Lee.

Ms. LEE. Thank you, Mr. Chairman. I want to thank you and our Ranking Member Mr. LaFalce for calling this important hearing.

We know that the American economy, of course, is one of the central concerns of this committee. And the West Coast energy crisis has emerged as perhaps the most important economic issue of the year.

California, of course, is the epicenter of the crisis and it is one of the world's largest economies. Its economic well-being is critical to the financial health of the Nation as a whole.

Many consumers in California have been confronted with skyrocketing bills that bore little relationship to the alleged laws of supply and demand. The State itself, and therefore California taxpayers have been forced to spend billions of dollars to keep energy flowing into the State.

Now, when Minority leader Dick Gephardt and other Members of Congress came to Oakland, California, to my District several weeks ago, they saw the face of this crisis. They heard from small business owners who face potential bankruptcy.

They heard from school administrators who have been forced to divert money from much needed textbooks, teacher's salaries and instructional supplies to pay energy costs.

They heard from persons with disabilities for whom blackouts are really nightmares and rising bills are an impossible expense.

They also heard from the people of California who have been paying the price of this crisis for the last year.

Now, months ago, the Federal Energy Regulatory Commission officially determined that Californians had been charged unjust and unreasonable prices. It's only within the last week, though, that the FERC has begun to impose price mitigation measures. I think

that's what they call it. And even these fall short of the needed solution.

California's businesses and consumers have not only faced escalating prices, they have experienced blackouts that endanger health and safety and the regional economy.

We should be asking very hard questions about the causes of these blackouts. Considerable evidence indicates that power generators may have manipulated supply in order to increase prices. This issue really does demand full investigation.

We need national wholesale price controls. We need rebates immediately, rebates for consumers and institutions that have been forced to pay these unjust and unreasonable rates. And we need to spur our economy by investing renewable energy, and we need innovation and not stagnation.

I want to thank you, Mr. Chairman, for these hearings, and I look forward to hearing from our witnesses in terms of how they view this crisis, which is devastating California, not only California, as I said, it's the epicenter, but it's moving to the rest of our country, as we know.

Chairman OXLEY. The gentlelady's time has expired.

The gentleman from Georgia, Mr. Barr.

Mr. BARR. Thank you, Mr. Chairman.

Mr. Chairman, Washington really is a wonderful place. It never ceases to amaze me. I have a news release here dated June 18 from the Federal Energy Regulatory Commission and the thing is five pages long of single-spaced type, and it's just full of all sorts of bureaucratic gobbledegook. But only in Washington, only in the world of Washington can somebody—and I presume that FERC put this thing out probably with a straight face—in the first paragraph, they say they're instituting curbs on prices, and then in the very next paragraph, they say this is a market-oriented principle.

Well, it may be a market-oriented principle in a State-run market economy, but not in an economy such as we have always had in this country.

And then it goes on, it talks about attracting additional investment. Well, it would be very interesting to see how you attract any investment, much less additional investment, when investors already have been beat up in California, because there are no incentives for them to invest.

So, now we have additional curbs on prices or price mitigation or whatever nonsense they call it, but it is price caps, it is price control, and they think that this is going to solve the problems in California.

It's not going to solve the problems in California. The Governor of California has caused these problems and now he's coming to the President and coming to the Congress and coming to these other regulatory bodies to try and shift the blame away from himself and away from his colleagues who, for year after year after year, have taken away incentives for energy investment, have put price caps on that are unrealistic, and have placed all sorts of limitation on the development of energy sources.

Now it's fine to talk about new energy sources and alternative energy sources, but when you have limitations on the development of known energy sources, it seems kind of ludicrous to say, "Well,

let's forget about that, and let's go on to talk about new energy sources."

The problems that California is facing are immediate. They are not of the Federal Government's making, they are the making of the Government leaders in California, and I'm very sorry that FERC is now getting involved in sort of a process of let's share the misery rather than helping to really come to grips with what California has done with regard to restrictions on prices, restrictions on investment, restrictions on development of energy sources.

So this really will be an interesting hearing to begin getting into some of these issues, Mr. Chairman, and I appreciate your taking the leadership on trying to at least get some of the facts out.

Chairman OXLEY. The gentleman's time has expired.

The gentleman from North Carolina, Mr. Watt.

Mr. WATT. Thank you, Mr. Chairman. I appreciate the Chairman calling the hearing.

I've been watching this situation from a distance with a great deal of interest, because we are the United States, and even if this only affects California and the West, it would be a matter of extreme importance to us, but also because it could have some important implications for the rest of the country and could spread to the rest of the country.

One of the concerns I've had about this is if we don't do something decisive to address the situation in the West, we increase the likelihood of problems in the rest of the country and increase the probability of it having implications in North Carolina and in Georgia and other places.

One of the concerns with the FERC Order, therefore, is that to enter an order that finds that there has been substantial abuse, yet does not retroactively give people relief for the abuse that has taken place before the order was entered, would seem to me to encourage the same kind of activity possibly in other parts of the country.

And so I'm extremely concerned that even if this order were sufficient to solve the problem prospectively, what message have we sent to folks who have abused, corporations that have abused the system retrospectively.

I'm not a big supporter of price controls or Government intervention, but I do know that there are some areas of critical, essential public services and when I see the President inject himself into the airline situations, I can't imagine we would think that electricity would be less essential than airline service.

There are some essential services where the Government has a role and I think this is one of them, primarily because there has been a long history of cost-of-service-based electricity rates in California, and at least in part, the deregulation of the industry has not been properly done, so you really kind of need to step back to where you were, while you try to figure out how you move forward to better solution.

So, I appreciate the Chairman calling the hearing and look forward to any words of wisdom that our witnesses may have about retrospective remedies for people who have already been abused, and prospective solutions to this problem.

Thank you, Mr. Chairman.

Chairman OXLEY. The gentleman's time has expired, and we'll now turn to our panel of witnesses.

Appearing on the first panel is SEC Commissioner Isaac C. Hunt, Jr. Commissioner Hunt was confirmed by the Senate on January 26, 1996. Prior to being nominated to the Commission, Commissioner Hunt was Dean and Professor of Law at the University of Akron Law School, and he's also had experience with the Carter and Reagan Administrations.

Joining Commissioner Hunt is Deputy Secretary Alphonso Jackson, of the Department of Housing and Urban Development. Secretary Jackson comes to the Department after serving most recently as President of American Electric Power-TEXAS.

Mr. Jackson has also served as President and CEO of the Housing Authority of Dallas, and Chairperson of the District of Columbia Redevelopment Land Agency Board.

Thank you, gentlemen, for both appearing before the committee today. And Commissioner Hunt, we'll begin with your testimony.

STATEMENT OF HON. ISAAC C. HUNT JR., COMMISSIONER, U.S. SECURITIES AND EXCHANGE COMMISSION

Mr. HUNT. Thank you, Mr. Chairman and Ranking Member LaFalce and Members of the committee.

I am Commissioner Hunt of the U.S. Securities and Exchange Commission. I'm pleased to have this opportunity to testify before you on behalf of the SEC about the current energy problems in California and the Public Utility Holding Company Act of 1935.

As I will discuss, because neither of the holding companies that own the major California utilities is registered under the Act, and because the Act is not an impediment to the construction of new generation facilities, the SEC's administration of the 1935 Act has not had any direct impact on the California situation.

Nevertheless, the SEC continues to support efforts to repeal the 1935 Act and replace it with legislation that preserves certain important consumer protections or to amend the Act to grant the SEC broad exemptive authority.

Before discussing the current problems in California and the SEC's position on repeal or amendment of the 1935 Act, it is useful to review both the history that led Congress to enact the Act in 1935, and the changes that have occurred in the electric industry since then.

During the first quarter of the last century, misuse of the holding company structure led to serious problems in the electric and gas industries. Abuses arose including inadequate disclosure of the financial position and earning power of holding companies, unsound accounting practices, excessive debt issuances and abusive affiliate transactions.

The 1935 Act was enacted to address these problems. In the years following the passage of the Act, the SEC worked to reorganize and simplify existing public utility holding companies in order to eliminate the problems that Congress identified.

By the early 1980s, the SEC concluded that the 1935 Act had accomplished its basic purpose and that many aspects of it had become redundant with other Federal and State regulations.

In addition, changes in the accounting profession and the investment banking industry have provided investors and consumers with a range of protections unforeseen in 1935.

Because of these changes, the SEC unanimously recommended that Congress repeal the 1935 Act based on its conclusion that it was no longer necessary to prevent the recurrence of the abuses that led to the Act's enactment.

For a number of reasons, including the potential for abuse through the use of a multi-State holding company structure, related concerns about consumer protection, and the lack of a consensus for change, repeal legislation was not enacted during the early 1980s.

Because of continuing changes in the industry, however, the SEC continued to look at ways to administer the statute more flexibly.

In response to continuing changes in the utility industry during the early 1990s, then-Chairman Arthur Levitt directed the SEC staff in 1994 to undertake a study of the 1935 Act that culminated in a June 1995 report.

The report again recommended repeal of the 1935 Act or amendment of the Act to give the SEC broad exemptive authority to administer the Act. The June 1995 report also outlined and recommended that the Commission adopt a number of administrative initiatives to streamline regulation under the Act.

The SEC has implemented many of these initiatives. The utility industry has continued to undergo rapid change since publication of the report.

Congress facilitated some of these changes. Specifically, the Energy Policy Act of 1992, through statutory exemptions to the 1935 Act, allows holding companies to own exempt wholesale generators and foreign utilities, and allows registered holding companies to engage in a wide range of telecommunication activities.

Today, the electricity shortages, price increases and rolling blackouts in California represent one of the most severe problems in the electric industry.

Specifically, in California, acute supply shortages, opposition and legal impediments to new power plant construction, and high natural gas prices have driven wholesale electricity prices to extraordinary levels.

The two largest California utilities have not been allowed to pass wholesale price increases through to consumers and, as a result, are experiencing severe liquidity problems. One of the utilities has declared bankruptcy; the other has stated publicly that it may also.

Neither the 1935 Act nor the Commission's administration of the Act has had any direct impact on the situation in California. Although we have monitored the situation in California, neither of the major utilities in the State is part of a holding company system registered under the Act.

As a result, the SEC, under the 1935 Act, does not directly regulate the two companies that have experienced the most severe financial problems.

Additionally, and perhaps more importantly, a shortage of supply in electricity is undoubtedly a significant contributor to California's problems.

Since the passage of the Energy Policy Act of 1992, the 1935 Act has not been an impediment to investment in or construction of generation facilities.

The Energy Policy Act facilitated the entry of new companies and hence new sources of capital into the generating business by permitting any person to acquire "exempt wholesale generators"—EWGs—without the need to apply for or receive SEC approval.

However, a registered holding company may not finance its EWG investments in a way that may have a substantial adverse impact on the financial integrity of the holding company system.

The Energy Policy Act gave the FERC the responsibility to determine whether an entity may be classified as an EWG. After obtaining EWG status, an EWG is not considered an electric utility company under the 1935 Act and, in fact, is exempt from all provisions of the Act.

Prior to passage of the Energy Policy Act, a generation facility would have been a public utility——

Ms. KELLY: [PRESIDING]. Excuse me, Mr. Hunt. I'm going to ask if you would please sum up. You are well over your time.

Mr. HUNT. Yes, ma'am.

Although the 1935 Act has not played a significant role in California's energy problems, the SEC continues to recommend that Congress repeal the 1935 Act subject to appropriate safeguards.

And short of repeal, the SEC believes that amending the 1935 Act to provide the Agency with broad exemptive authority will ensure that the goals of the Act can be achieved without being an impediment to the development of the gas and electric markets.

Thank you, Madam Chair.

[The prepared statement of Hon. Isaac C. Hunt, Jr. can be found on page 57 in the appendix.]

Ms. KELLY. Thank you very much, Mr. Hunt.

We next go to Mr. Jackson.

Welcome, Mr. Jackson.

STATEMENT OF HON. ALPHONSO JACKSON, JR., DEPUTY SECRETARY, U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.

Mr. JACKSON. Chairman Oxley, Ranking Member LaFalce and other distinguished Members of the Financial Services Committee, thank you for the opportunity to appear before you to discuss——

Ms. KELLY. Mr. Jackson, would you please pull that microphone closer to you? It's difficult for some people to hear.

Mr. JACKSON. Can you hear me now?

Ms. KELLY. Yes. Much better. Thank you.

Mr. JACKSON. Chairman Oxley, Ranking Member LaFalce and other distinguished Members of the Financial Services Committee, thank you for the opportunity to appear before you to discuss the President's Energy Policy and specifically ways the Department of Housing and Urban Development supports the energy policy and conservation.

Housing policy and energy policy are inextricably linked. No one knows this better than I do. I served as Executive Director and Chief Executive Officer of three major public housing authorities in

this country, and lately I've served, before coming here, as President of American Electric Power.

The President's energy policy is one that I believe takes into consideration the importance of energy in this country. HUD has already taken steps to respond to the rising energy costs at HUD-assisted housing.

These include making $105 million in operating funds available to lessen the impact of higher utility rates on public housing authorities, raising payment standards for Section 8 vouchers, and reimbursing owners for increased utility costs and project-based Section 8 certificates.

The President's Energy Policy directs the Environmental Protection Agency and the Department of Energy to promote the increase of energy efficient technology in housing, especially through increased promotion of the Energy Star initiative.

HUD will work closely with the Environmental Protection Agency and the Department of Energy in implementing the President's objectives of improving energy efficiency in housing. This will not involve the establishment of any new programs, but rather the better use of existing programs.

While there have been a variety of efforts over the years to improve the energy efficiency of assisted housing, as well as older unsubsidized housing, those efforts have lacked a coherent framework and focus.

With the announcement of the President's Energy Policy, we now have the necessary framework for promoting increased energy efficiency in housing. HUD is committed to giving this issue the priority attention it deserves, ensuring that we make significant progress in conserving energy in housing.

HUD's effort to increase the energy efficiency of housing will focus in four key areas: increasing energy efficiency in HUD-assisted rental housing; expanding the use of energy efficient mortgages; providing technical assistance to non-profit, community-and faith-based organizations; and supporting the use and development of new technology.

If I may, I would like to comment on the legislation.

HUD currently provides $28 million for capacity building by organizations such as the Enterprise Foundation, LISC and Habitat for Humanity.

Secretary Martinez and I both support local flexibility, especially with Community Development Block Grant funds. Funding under the public services cap can include childcare, crime prevention and drug abuse funding.

Funding energy-efficient programs at the expense of other worthwhile programs would be a difficult decision for local communities. Increasing the cap at the discretion of local communities to pay for energy efficiency programs, however, is a good option and allows local communities to make determination of funding priorities.

Our FHA mortgage incentive for energy efficient housing proposal would implement a new type of energy efficient mortgage by authorizing the Department to reduce the premium for homes that are particularly energy efficient.

However, the Department already has an Energy Efficient Mortgage program. Before authorizing a new efficient energy mortgage

program, it is vital that we examine what lessons we can learn from the current one and carefully examine what the administrative burden of the new program variant and whether it is justified.

If the committee remains interested in this proposal, we strongly recommend that before authorizing a new type of energy mortgage, Congress and the Administration review our experience with the current program and examine whether loans secured by homes that exceed a particular threshold of energy efficient standards are in fact less risky.

The proposed legislation for higher mortgage ceilings for solar-energy properties would allow FHA to insure 30 percent higher mortgages for both single family and multifamily mortgages for property with solar power.

Currently, FHA has the authority to insure mortgages for solar-enhanced property that are up to 20 percent higher than other mortgages.

This increase, while not necessarily one that would be widely used, could have a positive impact on properties whose cost is significantly higher because of the inclusion of solar technology.

We believe that the Policy Development and Research—PD&R—that occurs in HUD is already active in research on building technology and energy efficiency.

As HUD implements the President's Energy Policy, we will reform these efforts.

We would be happy to work with the committee to determine what demonstration of energy efficient technology would be appropriate. At that time, we can opine more specifically as to whether new legislation is needed to authorize such demonstrations.

While including consideration of energy conservation and projects restructured under the Multifamily Assisted Housing Reform and the Affordability Act of 1997, is appropriate, the Department is concerned that the inclusion of this provision may require an appropriation in order to make the energy improvement that might be necessary.

HUD's 5-year energy plan was first presented in 1992. It has been updated several times.

We would be happy to provide the report and other information to the committee. The additional information requested by Congress under this proposed legislation would include, among other things, clarification of energy issues under programs created since 1990. The further requirement that HUD publish an immediate update is consistent with the requirements already made by the recent Executive Order.

Again, thank you for the opportunity to address you on this important issue. I would be happy to answer questions by any Member of the committee.

Thank you.

[The prepared statement of Hon. Alphonso Jackson, Jr. can be found on page 67 in the appendix.]

Ms. KELLY. Thank you very much, Mr. Jackson, and we will be happy to accept the report if you would like to bring it to the committee.

We move now to some questions. And I have a couple of questions for Mr. Hunt.

Mr. Hunt, in your testimony, you've stated that the—and I'm going to use the acronym PUHCA, I'm just simply going to call it PUHCA.

You've stated that the PUHCA is redundant and should be repealed. It is unusual for a regulator to suggest that its authority be ceded to some other regulator.

Why do you, at the SEC, support this reduction in that regulatory turf?

Mr. HUNT. Several reasons, Madam Chair.

First, we think that the ills that PUHCA was enacted to address have been essentially solved by action of the committee under PUHCA.

Second, we believe with the advent of better State regulation of utilities and with the enactment of the bill that established the FERC, that adequate Federal and State level regulation of utilities is essentially in place.

We would suggest some amendment of the power of FERC to give them more adequate access to the books and records of utility companies but, by and large, we think that because of FERC, because of adequate State regulation, because of improvements in accounting, because of improvements in investment banking, because of improvements in disclosure of all kinds of companies, including public utility companies under our supervision, that the 1935 Act is simply no longer necessary.

Ms. KELLY. Thank you.

I'm wondering about, as an alternative to the repeal of PUHCA, you think that we should give the SEC that same general exemptive authority that it has under the other Securities laws.

Mr. HUNT. Yes, ma'am.

Ms. KELLY. Do you want to tell us how that authority is administered under those laws currently so we can better understand what you're talking about with regard to this suggestion?

Mr. HUNT. Well, we try to use our exemptive authority flexibly within the spirit of the statutes, and keeping in mind always the primary view of protection of investors, and we would hope to use the exemptive authority under the 1935 Act in the same way.

Ms. KELLY. One final question, and then I'll move on.

I want to know why the SEC's current exemptive authority under Section 3 of PUHCA is inadequate?

Mr. HUNT. Because of changes in the industry and our need to interpret and administer the Act more flexibly with the rapid changes in the industry, we think that a broader exemptive authority is needed so that the 1935 Act does not create impediments to the development of the utility industry. We think we need either broader exemptive authority or that, as we've testified several times before this committee, that the Act should be repealed.

Ms. KELLY. Thank you.

Mr. Jackson, your biography indicates you've had experiences as the CEO of three public housing authorities. What efforts did you undertake in energy efficiency while you were in those positions?

Mr. JACKSON. It was belief that if we were going to instrument and institute energy efficiency, that we had to do it while we were developing new housing and/or renovating housing. We had to also

consider the energy efficient facilities that we used, such as the washer and dryer system and the electrical system.

And so we made every effort to make sure that the installation that was done in each one of those respective new or rehab developments was done at the highest energy efficiency level that we could.

Ms. KELLY. Mr. Jackson, I just chaired a subcommittee hearing down in New Orleans, and I understand that the Section 8 program provides an energy subsidy.

Can you tell me why the New Orleans Section 8 recipients are suing HUD over the energy subsidy? Do you know about that?

Mr. JACKSON. No, not at this time, but I will be happy to get that for you.

Ms. KELLY. If you could get that information for me, I'd be very interested in that.

We move next to Ms. Waters.

Ms. WATERS. Thank you very much.

My question is for Mr. Hunt.

Mr. Hunt, you have given testimony that really supports the SEC while the position for further deregulation in the form of PUHCA repeal.

Now you don't have oversight in California at this time, and you think the States should have more authority to regulate rather than have you involved.

If that is so, California's precisely in that position. California deregulated and we have a crisis. How do you support deregulation in the form of PUHCA repeal, given the California situation?

Mr. HUNT. Well, Madam Congressman, we think that adequate supervision does exist through State regulation, and as I said, through the Federal regulation in the form of the FERC.

I don't know all the details of the deregulation system in California and how California got to this crisis. I have read some matters about the deregulatory system there and of course lack of generating power there, but I still don't think that the SEC's role through PUHCA, given the fact that the principal utilities are intra-state and non-regulated by us, I don't see how the SEC's involvement through PUHCA could have changed the landscape in California in any way.

Ms. WATERS. Do you believe that FERC has sufficient authority to intervene in some shape, form, or fashion, when you have rolling blackouts and the situation could get worse, given that we have come to appreciate reasonable cost energy in this country, it's a way of life.

And we don't want to see a situation where the haves and the have-nots, one can have energy and the other cannot, because they can't afford to pay for it.

You heard some of the testimony today about energy bills being as high as a thousand dollars for people on fixed incomes and low-incomes and low wage jobs.

So what do we do to protect against that kind of harm and that kind of risk?

Mr. HUNT. Well, first I think that the FERC, by and large, has the authority to do what the SEC has done under the Public Utility Holding Company Act of 1935 or PUHCA, which is to review inter-

system transactions between utility holding companies and their utility operating subsidiaries.

That is our principal interaction with FERC and what FERC does. In terms of the way FERC supervises the deregulatory process in California or other States, and sees to it that other generating power facilities are established, we have very little to do with the FERC's activity in those areas.

Ms. WATERS. Do you have access to the generating company's records?

Mr. HUNT. Yes, ma'am, we do, of registered holding companies, yes, ma'am.

Ms. WATERS. Of the holding companies, that's right.

Are you able to see and make a real determination about whether or not they are operating at full capacity?

Mr. HUNT. I don't think we can see that from the books and records. What we can see from the books and records are such things as, you know, inter-system loans, upstream loans, the pass through of non-utility costs to consumers.

Ms. WATERS. Who is best able to see and know definitely whether or not these companies are operated at full capacity and whether or not, when they go off-line for so-called maintenance, it's really absolutely necessary?

Mr. HUNT. I would think it would be the State regulatory authority and the Federal Energy Regulatory authority.

Ms. WATERS. Thank you very much.

Mr. MILLER. [Presiding.] Thank you, Ms. Waters.

Ms. Waters mentioned that California deregulated, and we did that approximately 5 years ago, and she's absolutely correct. But we only deregulated the delivery side of energy in California. We never deregulated the production side.

Currently in California, the Governor has mentioned he has signed permits for 10 or 13 power plants, but the problem with that is that those power plants have all been in process for a minimum of 4½ years, because you can't get a permit approved through the State of California in less than 4½ years if it's fast-tracked, and 5 years under normal process.

In fact, I read in an article he had just signed authorization for a plant to be built in San Jose, but that plant was permitted, I believe, 3 years ago and local municipalities would not allow the plant to be located in their jurisdiction.

The problem we have in California is not only do you have to deal with the process in Sacramento of getting a permit, but once you've accomplished that and you've invested millions and millions of dollars in getting that permit, then you have to go beg the locals to allow you to locate that plant within their jurisdiction. That's the problem in California.

Mr. Jackson, you mentioned some things that are very important, I believe, and I just commend the Secretary on his approach to the housing issues. And you talked about energy efficiency and such.

Now, California has the most energy efficient program of any State in the Nation. I mean, since the 1980s, we've had Title 24 requirements which require a builder to go deal with air infiltration, the type of windows—whether it's single-glaze, dual-glaze, the

actual floor coverings in a home, material you put on a fireplace, where you draw the combustion for a fireplace from.

You have to count the load of your air conditioners so you provide the minimum requirement necessary to cool and to heat a home.

I mean, we in California go far beyond any other State in environmental policy and regulation, yet, as I stated earlier, the problem in California, due to the high prices, is the production site.

And the problem is, years ago in California, government decided that local agencies had purview and oversight over developers and builders when they came in for applications. So we decided we would create the sequel which is the California Environmental Quality Act, which applied only to government, because we thought government needed somebody to oversee them too on the environmental issues.

But what happened was radical environmental extremists again sued in court and had CEQA applied to the private sector. And as you know, prior to that occurring, subdivision map acts said that local municipalities in government had to respond and make a decision on a track map within 58 days, and if they didn't 59 days later, it was approved by law.

Now with CEQA in California, you can drag it out to 15 or 20 years and yet never make a decision on provided housing in California dealing with the demand.

We have done just the same thing with energy as we have done with housing in California specifically.

Now, Mr. Hunt, because of PUHCA, exempt companies are limited in where and how much they can invest in energy production for fear of triggering PUHCA and basically having to register.

For instance, Med-America Energy owned by Berkshire Hathaway, which is Warren Buffet, would have invested, but PUHCA was a concern, and they did not invest in energy in California.

And, Mr. Hunt, you said PUHCA had no direct impact on California, but it certainly had a chilling effect on investment within California.

Can you address that?

Mr. HUNT. Well, I think that in the instance of the company owned by Berkshire-Hathaway, which is outside of California, I think the fear was that if that company had invested in one of the utilities in California, it would have become a utility holding company subject to the jurisdiction of the SEC under the 1935 Act.

When that occurs, then the extent to which a registered public utility holding company can invest in other non-utility businesses is restricted by the provisions of the 1935 Act.

So indirectly, to the extent that some companies might have wished to invest in the now-exempt California utilities, the 1935 Act certainly was an indirect impediment to that investment.

Mr. MILLER. Ms. Waters, you expressed your anger at the prices in California for energy, and there's one thing that has a greater impact on my life than anything else, and it's my wife. And trust me. She pays our electricity bill and that is one ticked-off woman right now.

And I'm as mad as anybody about the prices in California for energy. What angers me more is the housing crisis we are facing, Mr.

Jackson, and the energy crisis we are into, Mr. Hunt, are directly associated with Government mandates, regulations, and processing.

And that's what I think we need to deal with that we have yet to deal with that we're trying to put, once again, a bandaid over the problem instead of curing the cause of the need for a mandate.

Ms. WATERS. Will the gentleman yield?

Mr. MILLER. My time has expired.

Mr. Watt.

Mr. WATT. Thank you, Mr. Chairman.

Mr. Hunt, you indicated in your testimony, I believe, that while you supported repeal of PUHCA, you thought that in connection with that, there needed to be some consumer protections implemented.

Did I misunderstand you?

Mr. HUNT. No, sir. I think I said that in connection with the repeal of PUHCA, there probably needs to be more power given to the Federal Energy Regulatory Commission so that they can have greater access to the books and records of intra-interstate holding companies to make sure that nothing is going on in that holding company with respect to inter-system transactions that would harm consumers or ratepayers.

Mr. WATT. I'm not clear on whether I misunderstood what you said. I thought you said that in connection with the repeal or amendment, there needed to be further consumer protections of some kind.

Mr. HUNT. Yes, sir. That's the access to the books and records that we would suggest that FERC be given.

Mr. WATT. OK. That was the question I was going to ask, what are those consumer protections, and you're saying——

Mr. HUNT. Access to the books and records of the utility holding companies on the part of FERC.

Mr. WATT. OK. And would you recommend that, in conjunction with that access, if some impropriety is found by FERC, that they be given enforcement authority to enforce those consumer protections if they find some impropriety?

Mr. HUNT. If they don't have it now, I would certainly suggest that they be given it.

Mr. WATT. Do you think they have some enforcement authority now?

Mr. HUNT. I really don't know that, Mr. Congressman, the extent of their enforcement authority.

Mr. WATT. You heard my opening statement. One of the concerns I expressed was that they had basically made a finding that consumers were being taken advantage of.

Presumably, if that was the case now, it was the case for at least several months leading up to now, would you think they would have the authority, under current regulations, under current law, to retroactively provide relief for the people who have been taken advantage of up to this point?

Mr. HUNT. Mr. Congressman, I really would have to defer on that.

Mr. WATT. You've got some people behind you. Are they on your staff? They are shaking their heads yes. Maybe they're not on your staff?

Mr. HUNT. No, they are, they are.

Mr. WATT. OK.

Mr. HUNT. We don't examine the FERC's enforcement authority, but our staff people who work in the utility regulatory system think that FERC does presently have the authority to do that.

Mr. WATT. And if they don't have that authority, would you think it would be appropriate if we, if PUHCA were repealed or amended to give FERC that authority?

Mr. HUNT. If PUHCA were amended or especially if PUHCA were repealed, and if FERC doesn't presently have that authority, I would think it appropriate to give it to them.

Mr. WATT. OK.

Mr. Jackson, given the substantial increase in energy costs, which I think we can kind of take legislative notice of in California all across the country, do you think it would be appropriate to increase in this supplemental appropriations bill, Emergency Supplemental Appropriations Bill, funding for LIHEAP?

Mr. JACKSON. For which now? I'm sorry.

Mr. WATT. The Low Income Heating and Energy Assistance Program.

Mr. JACKSON. That is not a HUD program.

Mr. WATT. I didn't ask you that. I said, do you think it would be appropriate to increase it, given the substantial increases in energy costs that have taken place since the last appropriation was done?

Mr. JACKSON. Well, Congressman, we have addressed that issue at HUD with our public housing authorities in the sense that we have increased it by $105 million to address the——

Mr. WATT. Where'd you get the money from to do that, Mr. Jackson?

Mr. JACKSON. From the pay reprogram.

Mr. MILLER. Your time has expired, Mr. Watt.

Mr. WATT. I'm sorry.

Mr. JACKSON. We did reprogram the money.

Mr. WATT. It would be nice to know, if he doesn't have time to answer it now, where that money came from.

Mr. JACKSON. We reprogrammed it.

Mr. WATT. Reprogrammed it from where? That's what I'm trying to find out.

Mr. JACKSON. Unspent moneys at HUD.

Mr. MILLER. We will try to come back, and I think we'll have more time when the other Members have a chance.

Ms. Capito.

[No response.]

You have nothing?

Mr. Bentsen.

[No response.]

Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you.

Mr. Jackson, the President's budget only proposes a $150 million increase in the public housing operating budget, and that money is supposed to go to addressing increased energy costs.

Some estimate that it would take at least $300 million to deal with high energy costs. What analysis has HUD done to ensure that $150 million is going to be adequate?

Mr. JACKSON. HUD basically bases its assumption on the Department of Energy, and we are very clear that might occur. But our position is that we have already allocated $105 million, and to date, just about half of that money has been used.

So we're very, very sensitive to the need that if it occurs, we will address that issue. But our assumptions are based on the Department of Energy.

Ms. SCHAKOWSKY. Well, if I could have some documentation of that, I would appreciate it.

In Chicago, the public housing authority may have to divert money from their $1.5 billion, 10-year redevelopment program to pay for higher energy costs.

I wonder if HUD has any proposal to help make up for that lost funding?

Mr. JACKSON. I think, Congresswoman, as I've said, we've reprogrammed $105 million of our money to address higher energy costs, and if we see that more are necessary, we will be very sensitive to that.

Ms. SCHAKOWSKY. What does that mean?

Mr. JACKSON. We will have to address the needs.

Ms. SCHAKOWSKY. And where will that come from?

Mr. JACKSON. That has not occurred yet, so I'm not sure I can answer that question for you.

Ms. SCHAKOWSKY. It would seem to me that one way that we could help prevent future energy crises is to make public housing more energy efficient.

The President, however, would cut the Public Housing Capital Fund by $700 million, and that comes on top of a $22-billion backlog in repairs that will prevent public housing authorities from making much needed capital improvements.

In light of these cuts, what is HUD's plan to increase public housing energy efficiency?

Mr. JACKSON. Congresswoman, I would beg to differ with you. I think that having ran three major housing authorities, I have probably the best understanding of capital budgets and comprehensive grants.

And if you remember some 8 years ago, Congress made the decision to cut $500 million out of the Capital Grant budget, and at that time it was called Comprehensive Grants.

What occurred was that the backlog was so far behind that it served as an instrument to make sure that the housing authorities began to spend their capital money.

We have the same problem with backlog today. We give them 18 months to spend the money. We have a tremendous backlog at this point in time.

It would be my position, and the Secretary's position, that if that money is expended within the next 18 months to 2 years, we would have to come back to see you.

I seriously doubt that is going to occur, because other than a few housing authorities in this country, we have a number of major

housing authorities in urban areas that are far behind in the spending of their capital funds.

Ms. SCHAKOWSKY. So I can say to my people in Chicago that they have plenty of money to make——

Mr. JACKSON. I can tell your people in Chicago right now at this point in time, the capital funds spending is behind, and we're working with them to make sure that we do it in a very efficient and effective manner.

Ms. SCHAKOWSKY. And so we have, in your view, completely sufficient money to make the kind of capital improvements that we need?

Mr. JACKSON. Yes, we do. And if we don't, I'll be happy to come back and discuss that with you.

Ms. SCHAKOWSKY. Well, I appreciate that.

Let me just ask Mr. Hunt. I was looking at your testimony, which you were not able to complete and I know a number of people have talked about consumer safeguards, and you talked about appropriate safeguards.

If I could just ask this question, you've talked about how FERC ought to have information about Federal oversight of affiliate transactions, and so forth.

But I'm wondering if you feel that—then you say, however, that the SEC would recommend either just a separate review of PUHCA or larger energy reform legislation.

If you're saying on the one hand, we have to make sure that FERC has adequate authority, and on the other hand, just a straight repeal of PUHCA would be fine with you, how do you reconcile those two things?

Mr. HUNT. Ma'am, I think what the testimony says is that we favor the repeal of PUHCA and whether it is done on a stand alone basis or done as a broad reform of the energy regulatory system is a matter for the Congress to decide.

We also say that, so that's part of the equation.

The other part is that we do think if PUHCA is repealed, that the FERC ought to be given additional authority to access the books and records of utility holding companies.

Ms. SCHAKOWSKY. But even if it were, you would support repeal?

Mr. HUNT. Yes, ma'am.

Chairman OXLEY. Mr. Ford.

Mr. FORD. Thank you, Mr. Chairman.

Mr. Watt, did you want to—I guess Mr. Watt doesn't want to, because he left.

As we speak—thank you, Mr. Chairman—as we speak, we all know that Governor Davis is on the other side of the Hill testifying before the Government Affairs Committee with Senator Lieberman. And we all know what his request is.

And for those of us not from California, I hale from Tennessee, Mr. Hunt and Secretary Jackson, we are all concerned. As Congressman Watt mentioned, I'm certain that all my colleagues on the committee as well as even those in the committee room feel that if California, as Governor Davis says so well, "contracts pneumonia," the rest of us will get a really bad cold.

In the effort of trying to avoid a really bad cold, perhaps I don't understand the testimony. A lot of these energy issues are new to

all of us in the Congress. I don't have a wife like my friend, Mr. Miller, but as the person who pays the bills in my house, I get a little ticked off having to pay higher utility bills as most Americans do.

Secretary Jackson, I understand that HUD doesn't play a role in these issues, but you will certainly be confronted with this challenge, and I appreciate the answer that you provided to the Congresswoman.

But I would remind you that we also have a responsibility to answer to those constituents, and as much as you and others at the Department may be experts in housing matters and public housing matters in particular, when constituents call us, we are expected to at least be aware of the challenges and have asked you those questions.

So I appreciate the passion in which you answered the question, but I hope you would appreciate as well the we have that charge, the same charge that you have, because we are elected, not appointed, to serve the constituents and the people of this country.

That being said, the imposition of price caps, Mr. Hunt, and perhaps you've answered this in your remarks and I just haven't heard it, but I take it you are opposed to price caps in the form that Governor Davis is asking for?

Mr. HUNT. I didn't say anything in my testimony about price caps, Congressman. That's in the purview of FERC. That's not something that the SEC has anything to do with.

Mr. FORD. The SEC has no position or thoughts on the idea of price caps as proposed by Governor Davis?

Mr. HUNT. We have not formulated an official SEC position with respect to price caps on utility rates, no, sir.

Mr. FORD. To your knowledge, are you all in the process of developing any position on the Governor's——

Mr. HUNT. No. We think that's not really within our purview either under the Public Utility Company Act, and certainly not under the other securities acts that we administer. We think that's something for the State regulatory authorities and the FERC on the Federal level to deal with.

Mr. FORD. I would assume that the Department of Housing and Urban Development has not developed a response—would be the Administration's response most likely you would adhere to, Secretary Jackson.

I have no further questions, Mr. Oxley. Thank you.

Chairman OXLEY. The gentleman yields back.

The gentleman from Texas, Mr. Bentsen.

Mr. BENTSEN. Thank you, Mr. Chairman.

Let me say at the outset, while I think PUHCA is probably an outdated piece of legislation, I'm not quite sure I understand the nexus between this and what's going on in California.

And I think you laid that out subtley in your testimony, Mr. Hunt.

But answer this for me, because I think it's interesting. In your testimony, you talk about PUHCA and you also talk about the Energy Policy Act of 1992, which allowed for exempt and non-exempt companies to acquire exempt wholesale generators.

It's interesting to me, if I understand this correctly, this would have been about the same time that then-California Governor Wilson was pushing the California Energy Deregulation Plan through the legislature. And if I understand that plan correctly, they precluded State regulated holding companies from having their own generating capacity and required them to divest of generating capacity which, if I understand correctly, is part of the problem that they have right now in California is that the utilities themselves just became conduits for power more so than conduits in generating entities.

I don't know if that's your understanding of what happened there, but I think it is a little ironic.

Mr. HUNT. We think that your characterization is correct, sir, yes.

Mr. BENTSEN. And I mean again it has really nothing to do with the SEC or the Public Utility Holding Company Act.

Mr. HUNT. That's right.

Mr. BENTSEN. But it is rather ironic that Governor Wilson would have been pursuing this, or whoever, the California legislature at the time, was sort of going in the opposite direction of where the Federal Government was going in providing that.

And I think that tells a lot about the sort of mistake that was made in part in the California deregulation scheme that only deregulated part of the market and not the entire market.

Other than that, the issue of, in the footnotes you talk about the issue of the potential for monopoly power, but I guess the question of monopoly—well, even with the repeal of the Public Utilities Holding Company Act, would the Securities & Exchange Commission have some regulatory authority over publicly held companies as it relates to their activities in the capital markets?

Mr. HUNT. Oh, certainly, sir.

Mr. BENTSEN. And FERC would have some control, and then State regulators presumably would have some control. And then with respect to monopoly concerns, I would presume that the Justice Department and the Federal Trade Commission would have some issues that they would have control.

Would that be your understanding?

Mr. HUNT. I think that's right. Clearly, we would have control over the issuance of securities and their accounting and their disclosure to their investors, as with any publicly-held company, and I would assume that as to the monopoly concerns that the agencies you mentioned would have that traditional jurisdiction.

Mr. BENTSEN. Mr. Chairman, I don't really have any other questions, although I am glad to see my fellow Texan, Mr. Jackson, is here, formally with the Dallas Housing Authority and, years back, at Texas Southern University as well—I think the Board of Trustees, Chairman of the Board of Trustees I believe at one point, which is in Houston.

And I appreciate his testimony and I will say in looking at your testimony, Mr. Jackson, that while there've been some questions about the Administration's eagerness to pursue conservation as a part of a long-range energy strategy, I do see, at least in the HUD statement, that you all look for energy efficiency in conservation, and I appreciate that.

With that, I yield back the balance of my time.

Chairman OXLEY. The gentleman's time has expired.

The gentlelady from Ohio is recognized.

Ms. JONES. Thank you, Mr. Chairman. Mr. Chairman, Mr. Ranking Member, thank you for putting this hearing together.

Like my colleagues though I'm not from California, it is an issue that significantly impacts the area that I represent.

I would like to say hi to Mr. Hunt. I know him from another life. He was the Dean of the Law School of the University of Akron when I was judging back in Ohio. It's good to see you again, Mr. Hunt.

Mr. HUNT. It's good to see you, ma'am.

Ms. JONES. Real quickly, I guess my initial questions actually are going to go to you, Mr. Jackson. Additional dollars for Section 8 housing. What about the people in public housing operated under HUD auspices that don't receive Section 8 dollars, that are not in renovated housing that has been adapted for energy efficiency?

What do we do for those folks?

Mr. JACKSON. I think that's a very excellent question, Congresswoman, because I think when you get to the Midwest and the Northeast, you have that serious problem, because they have not been renovated.

I don't think the problem exists so much in the Southwest/Southeast because most of them are very new. I think what we must do is go in, in the process, if they're not renovated, when there are serious problems, to make sure that not only do we correct those serious problems that are inside the units, but we try to make them energy efficient at the same time.

That has not always been the case. I have to be very honest with you. But I think now that many of the housing authorities in the Midwest are seeing that, especially with the high spiraling energy costs, that we must go in and not just service the area that we are required, but to make the necessary repairs around the doors, around the windows, to make sure that they are sealed well and keep the heat out and keep the cold out.

Ms. JONES. Because in reality, those are the situations where you read the story about a family burns up in a house, because they have a candle burnt sitting in the middle of the hallway or they are using kerosene lamps or doing something in order to be warm or to warm themselves when they really don't have in place long-term solutions for energy in their homes.

Am I reading correctly that you do weatherization classes for people in public housing or suggestions of energy efficiency? Is that one of the President's proposals?

Mr. JACKSON. Yes. I think that's very important. When I was in Dallas, and in St. Louis, we did that. It might sound very strange, but——

Ms. JONES. What was that thing that you provided a body with hair spray and hair dryers?

Mr. JACKSON. No. We are assuring them in many cases. For example, in St. Louis, we did not have enough maintenance people, so what we did was we took the resident counsels from each one of those respective housing authorities and said, "You can help us in this process if you would do this on a Saturday morning," and

we would send two maintenance or three maintenance persons out. They would work with them and seal the windows, especially of the senior citizens and the elderly.

Ms. JONES. You provide the supplies and the supervision then?

Mr. JACKSON. Yes.

Ms. JONES. OK. Let me back up again to Mr. Hunt.

Thank you, Mr. Jackson.

Mr. HUNT. Oh, I guess it was three, four, seven, I don't know how many, maybe in the last 7 to 10 months, Mr. Hunt, it was not electricity, but it was gasoline that was an issue in the State of Ohio and then around Indiana, Kentucky, Pennsylvania. All the gasoline was cheaper, but for in Ohio.

And the argument was that Ohio was imposing something upon the way in which gas was produced or the like that caused Ohio to be in this particular situation. I'm still waiting for the response on why Ohio, Indiana, I mean Indiana and all these other surrounding States, gas was cheaper than Ohio.

But let me impose what this suggestion upon the situation with the electricity or this example upon the situation with electricity in California.

Is it or is, if you know, electricity in the States surrounding California much cheaper than California electricity?

Mr. HUNT. Do we know that?

Ms. JONES. Anybody know that? Am I asking the wrong people.

Mr. HUNT. We think it's a region-wide problem in terms of the Western part of the country.

Ms. JONES. Sure.

Mr. HUNT. But essentially in California.

We think that—our understanding is that the generating facilities are most lacking in California.

Ms. JONES. My time is up, and if you'll forgive me, next panel, for leaving. The issue in Cleveland right now is steel and I have a steel meeting, so I've got to leave.

Thank you very much, Mr. Chairman. I yield.

Chairman OXLEY. The gentlelady yields back.

Gentlemen, thank you for your testimony. We appreciate your being here with us again. Thank you.

Could we have our second panel come forward.

Let me introduce our next panel, three professors and a market analyst.

Professor Vernon Smith is a Ph.D. Economist from the University of Arizona. With him are Dr. Jerry Ellig from George Mason University's Mercatus Center, and Dr. Frank Wolak from Stanford University. We are also pleased to have with us Mr. James Dobson, Managing Director of Deutsche Banc Alex. Brown.

Gentlemen, thank you for appearing before the committee, and Dr. Smith, please begin.

STATEMENT OF VERNON L. SMITH, Ph.D., REGENT'S PROFESSOR OF ECONOMICS; DIRECTOR, ECONOMIC SCIENCE LABORATORY, UNIVERSITY OF ARIZONA

Mr. SMITH. Good morning.

First of all, Chairman Oxley, Congressman LaFalce and Members of the committee, thank you for allowing me the opportunity

to address you on the impact and causes of the California energy crisis.

My name is Vernon Smith. I'm currently the Regent's Professor of Economics and Director of the University of Arizona's Economic Science Laboratory. I will be employed there for 4 more days.

Later next month, my colleagues and I will be moving to Northern Virginia to become affiliated with George Mason University and its Mercatus Center.

This statement is based largely on my joint work with Stephen Rassenti and Bar Wilson, also of the Economic Science Laboratory, but who could not be here today. They're back home doing the work.

I think a brief way in which I can approach my response is to have you begin by looking at Figure 1. I want to work from the figures.

I want to first say that the energy crisis didn't begin in California if, by the crisis, we mean price spikes. Those price spikes began in the summer of 1988 in the Midwest, and the East in the summer of 1999, 2000, and they are likely to come back in the summer of 2001.

Although the earlier price spikes have, to some extent, of course, attracted new capacity, and it's very hard to predict what the effect of that increased capacity is.

In Figure 1, what we see here is the normal change in the consumption of electric power over the daily cycle and over a week. Notice that the peak consumption is about twice, or a little over twice the off-peak consumption.

This graph is somewhat exaggerated by the fact that we do not, at the retail level, price hourly. We do not price on a time-and-day basis.

As a result, people do not have an incentive to conserve on-peak, they don't have an incentive to shift to off-peak, and that tends to exaggerate this cycle.

Now, in Figure 2, we see how the marginal cost of producing power varies throughout the typical day and week. This is not a recent graph. This is early 1980s. This is a hot August week in Chicago and in the Midwest. But you can pull this graph out in the 1970s or the 1960s or any time and also anywhere around the world, and you'll see a similar pattern.

Now this is the wholesale cost. This is the cost that the distributor is paying hourly throughout the day. That distributor, back in the 1980s, and as is still true today, is reselling that power at a constant rate throughout the day.

Now, in the early 1980s, the retail rate would have been in the Midwest, I think, would have been around 6 to 7 cents a kilowatt hour. About half that would be energy.

All right, now imagine in Figure 2, that you draw a line at 3 cents, a horizontal line at 3 cents. That is the price the distributor is getting from the—the regulated price the distributor is getting from the resale of that power.

That means all of those peaking costs that are above that line, in effect, are peak consumption.

The off-peak, which is much below that, people are paying more than it costs. In effect, you are taxing the off-peak user. This, I

want to argue, is the crux of the problem in electric power not only in California, but in the rest of the United States.

When you deregulate the wholesale market, you expect it, you want it to reflect the variation in costs of producing power, and that's what happened in wholesale markets. But we did not deregulate the retail price and this in California caught the utilities in a bind.

Figure 3 shows a very bad week in the week of June 26th, 2000 in California. These are the California PX prices, the spot prices, and you see they are varying all the way from about maybe $15 off-peak for megawatt hour—that's 1½ cents—up to $1100 a megawatt hour, that's a $1.10 per kilowatt hour.

But they're reselling that power for around 12 cents. They raised that now, I believe it's 13 cents on average.

And this gives you an idea of the extent to which peak users are being subsidized and off-peak consumers are being taxed implicitly.

Now the California prices were not always this high, and in fact, if you look in April 1, 1998, you'll notice that the pattern of prices varied from 25 cents per megawatt at 1:00 o'clock, zero at 2:00, 25 cents at 3:00 in the morning, and it went up to $5 a megawatt, that's a half-a-cent per kilowatt and so on, and peaked out around 25 cents.

Now why do we have these sharp changes in price? And as I say, they are not unusual to California, they occur also in Australia, New Zealand and other places around the world.

I and my colleagues were involved as consultants in the move to decentralize the electric power industry in New Zealand and in Australia.

Now I have here on Figure 5, a chart of the actual asking prices submitted by generators in the Australian electricity market, and notice the base load guys are coming in there at zero. We actually proposed that the base load guys had the opportunity to bid a negative amount.

And the reason is that the base load generators cannot be shut off. They cannot be ramped up and down as demand varies. And actually, if you have the supply of base load power exceeding the demand, you've got to shut down somebody. And if they are able to state how much they are willing to pay to the system to stay on, you have a further opportunity there for rationing among those base load units.

But notice here, this is targeting 8:00 p.m. at night, the demand there is around 7800 megawatts and that yields a price of $15 Australian per megawatt. If the demand were moved up to around 8100, notice that the price would have jumped to $45. If it goes up to around 8200, it goes to about $55 and $60 and so on.

Chairman OXLEY. Dr. Smith, could you sum up, please?

Mr. SMITH. Yes. So this is a natural sort of way in which these markets work.

All right. Now what we propose is more voluntary interruption of demand at the retail level, and the pricing at the retail level, the prices should reflect the true costs that are coming in from—in normal times at least—from the wholesale market.

Now we find that with only 16 percent of peak demand interruptible to end users in our experiments, the time of day prices can be substantially lowered and price peaks eliminated.

Basically what happens there is that whenever the asking prices are high from the generator side, the buyers interrupt how much of that demand they are going to take, and what they have. They do this by having voluntary interruption contracts with their customers.

By a rolling sort of selective voluntary power interruptions, blackouts of whole neighborhoods can be avoided except under extreme weather conditions when they are unavoidable.

The California crisis is a direct consequence of a failure to introduce time-of-day retail prices that reflect highly variable time of day wholesale prices and generator costs.

What must change is the cultural mindset of local utility managers and their customers, which has been inherited from State regulation. This mindset is that all retail demand must be served without regard to the differences in individual consumers' willingness to pay for energy.

This mindset will change, we believe, with full cost time-of-day pricing and have the effect of incentivizing customers to prioritize their use of energy.

The effect of these changes will be to create a far more efficient and smoothly functioning market that will not require Government intervention.

It will enormously benefit the environment by reducing the growth in demand for energy and transmission capacity, and thereby reducing air pollution and unsightly power lines.

Thank you, Mr. Chairman. I look forward to answering whatever questions you and your colleagues have.

[The prepared statement of Dr. Vernon Smith can be found on page 73 in the appendix.]

Chairman OXLEY. Thank you.

Dr. Ellig.

STATEMENT OF JERRY ELLIG, Ph.D., SENIOR RESEARCH FELLOW, MERCATUS CENTER, GEORGE MASON UNIVERSITY

Dr. ELLIG. Thank you. I'd like to thank the Chairman and Congressman LaFalce for the opportunity to testify today.

My name is Jerry Ellig. I'm a research fellow at the Mercatus Center at George Mason University, and I should mention my views are only my own; I'm not speaking on behalf of the University today.

As I read about what's happening in California and watch the ensuing policy debate, it really hits home in a personal way. And the reason it does is not just because I have family in California, but also because I grew up in Ohio during the natural gas shortages of the 1970s.

The school that I attended for high school in the winter of 1976-77, actually shut down for a couple of weeks, because there wasn't enough natural gas to go around.

Then something bad happened. We went back to school, but not in our school—in the area of a local department store that had previously housed their Christmas merchandise. So customers coming

in, instead of seeing inflatable Santa Clauses and tinsel, now saw a bunch of geeky high school kids talking to the walls as we practiced for debate class.

Chairman OXLEY. Where did this all take place?

Mr. ELLIG. Excuse me?

Chairman OXLEY. Where did this all take place?

Mr. ELLIG. Oh, in Ohio, in Cincinnati.

Chairman OXLEY. Oh, in Cincinnati. You were in high school in 1976?

Mr. ELLIG. That's right. I lost my hair after that.

[Laughter.]

Mr. ELLIG. Now for us this was an adventure. For a lot of families in Ohio where the principal wage earner was at home because factories were also closing down, it wasn't funny, and so I can attest to having some personal experience with the disruption you have in people's lives when you have these types of energy shortages, whether it's gas shortages or electricity blackouts.

In the time I have left, I want to mention two things, make two basic points.

First, I'll talk a little bit about the roots of the California crisis and the California wholesale market.

And second, talk about what this tells us about retail electricity restructuring and the wisdom of retail competition in electricity.

In California, the big problem in California is an imbalance between supply and demand. And on the demand side, there are really two things to keep in mind.

The first is that the utilities' demand for power is artificially inflexible. The reason it is artificially inflexible is because utilities must supply as much power as customers want at a regulated price, and it has the types of effects that Vernon Smith so eloquently just explained.

The other thing you need to remember about demand in California is that it has been steadily growing, not because Californians are wasting energy, but because the California economy has been growing, the population's been growing, and when you get population growth, economic growth, you're going to use more energy even if your State is leading the Nation in conservation.

Now, over on the supply side, we have largely, in a lot of ways, a fixed supply. You've probably heard the news reports. California's built no new power plants in 10 years, no new major transmission facilities in 10 years. Fixed supply, gradually increasing demand, summer of 2000, gradually increasing demand hits the fixed supply, you get price spikes.

Now some folks have said, wait a minute, the price spikes are not just explained by natural supply and demand. There is also artificial manipulation of the market going on because generators are withholding capacity and shutting down plants, claiming they are performing maintenance when really they're just trying to reduce supply and increase price.

Given the nature, the amount of judgment involved in maintenance decisions with power plants, I don't know if we will ever know for sure what's going on. But I do think it is worth noting that if a generating company wanted to manipulate the market,

the California wholesale market was set up in ways that would be conducive to that kind of behavior and would encourage it.

When you have artificially inflexible demand, the rewards are greater if you can jack up the wholesale price a bit, because demand is not going to drop off in response to the price increase.

In addition, we have—well, a number of other problems that I'll skip over, but are in my testimony.

Second issue. What does this tell us about the wisdom of retail competition? I think the principal thing that the California experience tells us about the wisdom of retail competition or about retail competition in electricity is that the devil is in the details and it is very easy to get it wrong and fail to create retail competition even when that is your goal.

I don't think that needs to discourage us and I don't think the lesson is that retail competition is a bad idea. If we want to see that California is the outlier, rather than the typical example of retail competition, we need look no further than Pennsylvania, which has had a very highly successful retail electric restructuring where 20 percent of Pennsylvania retail customers have opted for supplier rather than utility. In some utility territories, you have as many as a third of the customers who have switched suppliers, so it really is possible to create effective retail competition without creating the types of price spikes and blackouts that we've experienced in California.

It's also the case that California looks especially atypical if you compare it to our experience in other industries where we've undergone regulatory reform and deregulation, where again, generally the result we've gotten is lower prices, expanded supply. We haven't had shortages, we haven't had the price spikes.

So the bottom line is there are certainly problems in California's market that can be dealt with through redesign of the market, and we should not take California as a typical example of what happens when you move to retail competition in electricity.

[The prepared statement of Dr. Jerry Ellig can be found on page 109 in the appendix.]

Chairman OXLEY. Thank you, Dr. Ellig.

Dr. Wolak.

STATEMENT OF DR. FRANK A. WOLAK, PROFESSOR OF ECONOMICS, STANFORD UNIVERSITY; CHAIRMAN, MARKET SURVEILLANCE COMMITTEE, CALIFORNIA INDEPENDENT SYSTEM OPERATOR

Mr. WOLAK. Thank you very much for the opportunity to speak. I address three issues in my written testimony.

The first is the fundamental cause of the California crisis and its implications for long-term regulatory oversight of electricity markets.

The other is the likely effectiveness of FERC's recent market power mitigation policy for California.

And the last is the need for a long-term Federal energy policy.

I'll focus here just on the first two.

I think it's been well-documented that one of the major problems in California is that the vast majority of its purchases were on the day-ahead and shorter-term energy markets.

And I think that this is an important change and I want to explain the implications of this for the performance of the market.

And in particular, what also happened in California when the restructuring took place is that the assets of the incumbent utilities, at least half of the assets, were sold off without what are called "vesting contracts."

And what vesting contracts do is effectively give the seller of the plant the right to purchase back a significant fraction of the output of the plant that it sells at a regulated price for a long-term period.

What this effectively does is creates a hedge on the wholesale market, so that the firm that has a retail obligation can purchase energy, at least that amount of energy, at a fixed price.

And it is this fundamental lack of hedging that is, I think, the fundamental cause of the California crisis. In particular, one thing that I'll just go through is talk about how the forward contract obligation of a firm can exert an enormous influence on the bidding behavior in competitive markets.

And a general result from virtually all markets around the world is that in markets where generators have a lot of forward contract cover, spot prices tend to be low and price volatility tends to be low.

And in markets where generators are exposed to the spot market, meaning they have no forward commitments to supply electricity, average prices tend to be higher and price volatility tends to be higher.

And the difference in performance of the market, when you have a lack of contract cover, is certainly exacerbated by the conditions that occurred in California in the summer of 2000 where roughly 2000 to 3000 megawatts of imports disappeared as a result of hydro conditions in the Pacific Northwest.

So this only exacerbated both the level and volatility of prices in California.

And this relationship between forward market positions and spot market outcomes has essentially led to the creation of a new segment of the electricity industry, and that's called power marketers.

And what power marketers do is effectively sell commitments to electricity which impact the incentives of their affiliated generation to participate in the market.

And in the former regulated regime, the way you made money in the industry was to effectively produce your product at a lower cost and deliver it to consumers at a lower cost than the regulated retail rate.

In this new regime, the way firms make money is effectively trading on their expectations of the spot price of electricity at the date of delivery. And moreover, because the firm owns plants, it has the ability to influence the spot price that it sold these forward commitments to clear against.

And moreover, to be a successful participant in this new regime, you don't even need to own generation, you just need to know how generators will behave, in other words, how they will impact the spot price.

And a good example here is Enron, which has a very profitable business in California despite the fact that it owns no generation.

And so really what restructuring has done, if I was going to say the one lesson I'd like to get across here, is that it's changed the nature of the electricity industry to a standard commodity market like pork bellies.

And as a consequence, I think that it should be regulated in the same way as these markets. For example, the CF Commodity Futures Trading Commission model I think is far more appropriate, rather than a public utilities commission or the FERC approach of essentially looking at the cost of production.

And this perspective, I think, also implies a way to fix the California problem. The over-reliance of California on the spot market, the cost-based bid caps that the FERC has implemented create all the incentives that various of the previous speakers have alluded to.

However, regulatory intervention on the forward market will effectively set up the incentives for generators to participate in the market and not withhold capacity from the market, operate their plants in an efficient manner, and maintain their facilities in top working order.

And moreover, because there's a large contract cover that's available to consumers, they will be protected from spot price risk and realize the full benefits of competition.

Thank you very much.

[The prepared statement of Dr. Frank Wolak can be found on page 136 in the appendix.]

Chairman OXLEY. Thank you, Dr. Wolak.

Mr. Dobson.

STATEMENT OF JAMES L. DOBSON, CFA, MANAGING DIRECTOR, DEUTSCHE BANC ALEX. BROWN

Mr. DOBSON. Mr. Chairman, Ranking Member and esteemed Members of the committee, good afternoon and thank you for the opportunity to testify before you on the California energy crisis.

My name is Jay Dobson. I'm a research analyst responsible for analyzing the U.S. electric power industry for Deutsche Banc Alex. Brown.

High electricity prices have dominated the headlines in many areas of the United States over the last 12 months, most notably in California.

The energy crisis in California is the result of an incomplete deregulation plan and extremely short generating supply. The deregulation plan in California essentially deregulated the wholesale market, but left the retail market regulated with fixed electricity prices.

Further, the incumbent utilities were encouraged to sell many of their electricity generating plants. This forced the companies to purchase electricity in the wholesale market without the ability to recover their costs from consumers.

This incomplete deregulation plan might have worked in a market with adequate or excess generating supply. However, as a result of the very poor hydroelectric conditions in the Northwestern United States, and the fact that no material amount of electricity generating capacity has been added in California over the last 10

years, a shortage of supply has developed, and wholesale electricity prices have materially exceeded retail electricity prices.

This has caused a financial crisis for the incumbent electric utilities in California, and caused retail electricity prices to rise by 40 percent.

The long-term solution to this problem is the addition of new generating supply. The recent high wholesale prices of electricity have caused generators to announce almost 25,000 megawatts of new electricity generating capacity in California between now and 2006.

This is a 45 percent addition to existing generating capacity in the State and clearly indicates that the competitive wholesale markets for electricity are working.

More than half of this capacity will be available by 2003. Nationally, including California, electricity generation developers have announced the addition of 370,000 megawatts of new capacity over the next 5 years, a 49 percent addition to the existing capacity.

Although some economic impact of rising electricity prices is unavoidable, we believe that the focus should be on managing the impact in the short-term, but encouraging supply additions in the long-term.

This is an extremely precarious balance, though. The short-term desire to control prices could derail the new supply additions in certain areas of the United States. This could support higher electricity prices in the intermediate term.

In our opinion, the most critical action State and Federal legislators and regulators can take is to ensure the development of a competitive market for electricity. Avoid the temptation to cap electricity prices in the near term.

Actions to ensure the enforcement of current law should be more than adequate to control price spikes.

Importantly, avoiding the near-term temptation to cap electricity prices will deliver a much larger and longer term benefit to consumers. The economic benefit associated with the development of excess generating capacity in the United States will drive electricity prices sustainably lower.

Further, as many of the new generating resources are significantly cleaner and more efficient than existing electricity generating capacity in the United States, an environmental benefit will accrue to consumers and the Nation in conjunction with lower prices.

California is among the more than 20 States in the United States that have legislatively deregulated the electric power industry. However, California is different in several critical ways and the problems with deregulation appear most acute here.

We would point to the States of Pennsylvania and Massachusetts, among others, as examples of where deregulation of electricity markets has worked. The successes, coupled with the prospect of declining electricity prices and more efficient electricity-generating supply should keep the United States on the road to fully deregulated electricity supply markets.

Consumers do not want many of the risks the previous regulated electricity markets provided. The transition process to a deregulated market has provided its own risks, as evidenced in California.

However, full deregulation of the electricity markets will allow the wholesale and retail markets to develop remedies to these problems. The generators proposed addition of 370,000 megawatts of new generating supply in the United States over the next 5 years convinces me of this.

In summary, we believe the Federal and State legislators and regulators should continue to encourage the development of a competitive electricity market and the addition of new capital to the electricity industry. New electricity generating capacity, as well as new electricity transmission capacity will go a long way to delivering to consumers the benefit originally promised to them in electricity deregulation; significantly lower electric prices.

Thank you again for the opportunity to testify before you on this critical energy issue.

I look forward to answering your questions.

[The prepared statement of James L. Dobson can be found on page 152 in the appendix.]

Chairman OXLEY. Thank you, and thank you all, gentlemen.

Let me ask all of you, from a layman's standpoint, I've had some background in energy in the other committee I served on for several years. And was involved in the Clean Air Act and other energy issues and environmental issues at that time.

Let me start with you, Dr. Wolak. It's my understanding that in the last several years, California's supply of electric energy has actually decreased by 5 percent; at the same time there's been a 24 percent increase in demand.

Is that correct?

Mr. WOLAK. No. At most, demand has increased probably over the past 3 years about 10 percent, and there have been some supply additions coming online in the last 2 to 3 years. True, no new large facilities, but certainly a lot of smaller facilities have been coming on line.

Chairman OXLEY. And how would you quantify that? What kind of an increase have we seen in California in terms of electric energy supply?

Mr. WOLAK. The difficult part in California is the fact that we are an integrated system and effectively historically rely on between 20 and 25 percent of our consumption is imports. So there's roughly a carrying capacity into the State of on the order of 12,000 megawatts into the State, and so a lot of the energy comes in through imports.

Chairman OXLEY. Is that a policy decision made by the political leaders of California?

Mr. WOLAK. Well, it actually is just a good economic decision in the sense that if you look in the surrounding areas of California, California pays an average retail price, say in 1998, of on the order of 10 cents per kilowatt hour.

People to the North of us pay an average price of about 4½ cents. The Southwest pays an average price at that time of about 7½ cents. So you live around cheap power and they've got lots of it, so it makes sense to essentially buy what you can from them.

Now the bad news is that when they grow, for example, like Nevada on the order of 50 percent in a 10-year period, or Arizona on

the order of 20 percent in a 10-year period in population, they tend to consume all the power and leave very little for you to consume.

So in that sense, that's what got California into the position that it was in, very few imports available to sell into the State.

Chairman OXLEY. Do any of the other panelists have a different view of that discussion I just had with Dr. Wolak?

Mr. ELLIG. I think part of the reason you hear somewhat different figures is people are quoting different start years and different end years, whether it's the past 3 years or the past 10 years, but that's—I think we all pretty much agree on the trend.

Chairman OXLEY. Let me ask you, beginning with Mr. Dobson, what would be the economic impact on investment if the Congress were to enact price caps on energy costs in the State of California?

Mr. DOBSON. It would have a very negative impact. As I pointed out in my testimony and my comments, about 25,000 megawatts of new additions have been announced. Now, as you pointed out in some of your comments, these have not been sited yet, and that remains the challenge. However, I would expect more than half of that to be abandoned if, in fact, price caps were legislated by the Congress.

Chairman OXLEY. More than half would be abandoned?

Mr. DOBSON. More than half would be abandoned.

Chairman OXLEY. Dr. Smith.

Mr. SMITH. There's not only the impact on investment, but the price caps also are not going to help with the problem of conservation at the consumer level. And that's why it's very important, I think, to pass through the wholesale prices and also allow retail competition, so that you'll get an adjustment not only on the supply side, but also on the demand side.

Chairman OXLEY. Dr. Ellig.

Mr. ELLIG. Well, I know the last time we tried to do wholesale price controls in the energy industry on the Federal level, when I wasn't sitting on a department store floor trying to go to school, I was sitting in my car waiting for gas at a gas station. And in both cases, the regulated price was too low.

You know, in theory, maybe you can find some price that's lower than the current price, but high enough that it doesn't discourage investment, but I'm not convinced we know enough to figure out where that price is.

Chairman OXLEY. And so you would suggest that the market mechanism is the best way to determine that?

Mr. ELLIG. Well, I think rather than focusing on the level of prices and talking about how to cap them, we ought to be asking what is it about the way the structure of the market is set up that's led to these high prices, and then fix the market structure rather than trying to overlay price controls on top of a market structure that's messed up.

Chairman OXLEY. Dr. Wolak.

Mr. WOLAK. I guess there are several layers of the answer to the question. But the first is that during the first 2 years of the market, there was a price cap on the energy market on the order of $250 per megawatt hour, and during that time, roughly all the capacity that is alluded to came to the State of California, and was wanting to be built.

So I think that a price cap set at a high level has almost no effect whatsoever on investment behavior.

Then the next is that this sort of capping prices is in the form of saying that I'm going to put you back to cost-of-service regulation. I think it's also important to bear in mind that under cost-of-service regulation, we have a long history of gold-plating by utilities subject to cost-of-service regulation. So if anything, there's an incentive to over-invest, because of cost-of-service regulation, not an under-incentive to invest because of cost-of-service regulation.

So, effectively, the final issue is just as I think all economists would agree, capping a price at a level below the point where competitive supply crosses competitive demand certainly is going to result in a shortage. But capping a price at a level that's above where competitive supply crosses competitive demand should have no effect whatsoever on the market.

Chairman OXLEY. The gentleman's time has expired.

The gentlelady from New York, Mrs. Maloney.

Mrs. MALONEY. I ask permission to put my opening statement in the record, and also two letters that I wrote to the FERC on the energy situation in New York.

Chairman OXLEY. Without objection.

[The information referred to can be found on page 167 in the appendix.]

Mrs. MALONEY. I really would like to ask Mr. Wolak about Vice President Cheney's comments when he said that energy conservation amounts to a personal virtue, but is not necessarily critical to a national energy strategy.

Would you comment on the economic impact of successful conservation efforts? Doesn't conservation in the form of cars that use less gas, and lights that burn longer with less power centrally contributing to greater levels of economic efficiency, and why are we really investing more in new technologies to come up with other sources of energy so that we're not so dependent on other countries.

Could you just comment on conservation and efforts in that area and new technologies. We're not really looking at new ideas of ways to conserve energy or create energy.

Mr. WOLAK. I certainly completely agree.

I think that if energy was priced the same way that other products were priced, we would find that there would be very strong incentives of the form that Vernon Smith discussed of firms wanting to move away from peak periods to reduce the energy bill and effectively move their consumption to off-peak periods to essentially keep the same level of energy consumption.

And, I think, a good example of the potential for conservation and just load shifting to really work to benefit consumers is that if you take the total amount of energy that's consumed in California during the year 2000, and you divide that number by the total number of hours in the year, that gives you an average number of megawatts of capacity that you use. And that number is on the order of 27,000 megawatts.

I should also say that the amount of capacity that is located in California is 45,000 megawatts, so if somehow we could get consumers through these price signals and through these conservation measures, to shift their loads, we wouldn't need to build any new

power plants in California. The only reason to build them would be simply to replace the existing plants that we have with more efficient technology.

So, there's lots of low-hanging fruit, I think, on the conservation side, and, if you provide people with economic incentives to do it, they will benefit and we will not have to build as many power plants to serve us, and we will get the proper incentives for renewables to develop.

Because, if I face high prices, then in peak periods I may want to substitute with a renewable technology during those periods.

Mr. SMITH. May I speak to that question?

Mrs. MALONEY. I would really like to request that anybody that has any ideas of ways that we could have economic incentives for people to conserve energy, if they would submit it to the record.

But I want to get one more question to him before, and then I'll just open it up to anyone else who would like to respond.

But, one of the things that frustrates me is that I don't see any new ideas for new technologies, new conservation, a lot of things that we can do. What he said, just with certain incentives, we could have not even had this crisis.

But I want to get back to some of the FERC action. The action that they took on Monday suggests that the FERC Commissioners have at least partially gotten the message about the need for price caps, yet they chose to maintain a price control mechanism tied to the most expensive energy producer.

And could you, Mr. Wolak, explain the logic of this approach, and will this approach effectively guard against future price gouging.

And then anyone else who would like to comment.

But could you comment on that, Mr. Wolak?

Mr. WOLAK. I certainly can't comment on the logic of the approach since it doesn't make much sense to me.

But I certainly think that the same sorts of problems that occurred during the spring and winter of 2001 can once again occur because the mitigation measure also allows generators to pass through any input cost increases that it can cost justify.

So, if they somehow managed to have increases in the price of natural gas, through perhaps not prudently procuring their natural gas supplies, generators have the ability to simply pass that through in the prices that they bid into the energy market and receive those prices.

So, the mitigation plan provides little incentive for generators to wisely procure their natural gas. Moreover, it provides little incentives for them to maintain their facilities and particularly little incentive to maintain their most efficient facilities, because those are the ones that are cheap and they certainly wouldn't want those to be setting the market clearing price; instead, they would prefer to have the expensive facilities setting the market clearing price.

So in some sense, the incentive is to maintain the inefficient facilities very well so they can set the price and don't maintain the efficient facilities, because you don't want them to set the price, which is a very peculiar set of incentives to set up.

Chairman OXLEY. The gentlelady's time has expired.

Mrs. MALONEY. Thank you, Mr. Chairman.

Chairman OXLEY. The gentlelady from California, Ms. Waters.

Ms. WATERS. Thank you very much.

This may have been discussed prior to my returning to the committee. While I understand there has been testimony in opposition to so-called price controls, that it is not a good idea, it prevents investment, that's not the way the marketplace should work, all of that, all of that, I would like to know at what point do you believe there is a crisis and there should be intervention in order to protect the citizens of California or any other place who experiences the kind of crisis that we are experiencing now, protect them so that they have the ability to have access to electricity, to energy, and not have to suffer the huge increases or blackouts.

At what point would you consider Government should intervene and place real price caps on if necessary?

Each one of you?

Mr. DOBSON. I would argue, in response to the question, I am simply not convinced price caps is the appropriate intervention. The energy crisis, in my opinion, stems from a supply problem, certainly at peak periods.

Absent near-term conservation, price caps are not going to solve the problem.

Ms. WATERS. OK, I got that point, and we only have so much time. I don't want to be rude.

Do you know how the information, where the information is, whether or not we have adequate information at the State level to understand whether or not all of these plants are operating at full capacity, and have you been able or has anybody been able to determine whether or not the maintenance shutdowns are absolutely necessary, or whether or not somehow they have been created in order to force the whole question of supply as you are describing it?

Mr. DOBSON. I do believe that the Federal Energy Regulatory Commission and the State regulatory bodies of each State, including California, have the ability to acquire that information.

And yes, I do believe that——

Ms. WATERS. Is that public information?

Mr. DOBSON. Yes, I believe it is.

Ms. WATERS. Have you seen it?

Mr. DOBSON. I've seen parts of it, not all of it.

Ms. WATERS. Do you know how it is collected?

Mr. DOBSON. It is collected from the generators themselves.

Ms. WATERS. The generators supply us with that information?

Mr. DOBSON. Yes.

Ms. WATERS. I don't know a lot about how the grid works. Can you tell me if the grid crosses State lines and in the reporting, is that information in each State, is it available to California, all of the information from the grid?

Mr. DOBSON. I'm not aware if the grid information is available. I was speaking specifically of the generators availability and maintenance schedules.

Ms. WATERS. Could anybody else help me with what I'm trying to determine here about access to information that would absolutely document the needed maintenance and/or whether or not these plants are operating at full capacity and whether or not we

have access to all of the information to make a determination about these things?

Mr. Wolak.

Mr. WOLAK. I guess the thing that I would say is that the analogy to a generating facility and a sick day is quite apt. That, in other words, generating facilities are extremely complex pieces of equipment. There's no way for anyone to know if really a generating facility can run or not.

For the same reason that when you call in to your boss and you say, "I'm sick today," he knows whether you're really sick or not, or if you are going to go to the beach. And moreover, he doesn't send a doctor to your house because he knows that if he does, the human body is a sufficiently complex piece of equipment that you could fake some disease that the doctor would have no way to ever learn is really, in fact, a disease that prevents you from working.

Ms. WATERS. Do we have inspectors or monitors?

Mr. WOLAK. It's exactly the same thing with the generating facilities. You send that independent engineer and these are 30-year-old facilities. Just think if you have a 30-year-old house, which I have, everyday there's five things I could fix, but I don't fix.

And moreover, if you run the facility—and you shouldn't be running the facility; it could probably explode and create health hazards—so for the same reason that you don't make the worker work when he says he's sick, it's the same thing. You don't make the generator work when he says he's sick.

Ms. WATERS. We have to take their word for it?

Mr. WOLAK. You have to take their word for it. So what you do instead is the same thing that you would do in the case of the worker. You say, "Look, if you're going to take a sick day, then you have to replace yourself with someone else."

In other words, the risk of you calling a forced outage or you calling a sick day is that you have to replace yourself, and in the same sense that's the same way we can solve the problem with the generators, is that if a generator says that he's, "sick" today, or he's out today, then it is his obligation to supply the power that you need. And he must scramble, as opposed to the ISO scrambling, as is currently the case.

And this is something that FERC is certainly aware of, but has done nothing to solve. I mean, they still maintain that, you know, there is no problem with a verifiable forced outage.

But my viewpoint certainly is, given the economic incentives, if it's a good day to take a sick day and it allows me to raise the price, I certainly will. I mean, that's simply what I would do if I was a profit maximizing firm as certainly these firms are.

Chairman OXLEY. The gentlelady's time has expired.

The gentleman from New York, Mr. Crowley.

Ms. CROWLEY. Thank you, Mr. Chairman and thank you to the panel.

When the President announced his energy plan through the Vice President, there was a big thud that hit the table, and it really hasn't moved since then. I think it was an embarrassment to the Administration. Certainly the American people, I think, were somewhat embarrassed by it as well.

Very little discussion of better management or conservation or innovative fuel sources and more emphasis on the production and consumption of fossil fuels and use of electricity and other forms of the production of electricity.

In fact, Matthew Warburton of UBS Warburg told CNBC that the energy service providers should benefit from President Bush's energy plan while, at the same time, there were no short-term winners.

That means the consumers back in New York and especially in California, but in my home State of New York as well, the seniors or those on fixed incomes are the short-term and long-term losers, according to this plan.

The announcement from FERC on Monday that they have determined that price fixing has taken place in California, do you believe that one, the utilities that have been fixing the prices and have been gouging their customers ought to be held accountable and forced to send rebates to the consumers?

What is your position? I understand the FERC's position. What is the position of the panel?

Does anyone want to chime in?

Mr. DOBSON. It would certainly be my position that this should be investigated, as I know the attorney general and others are doing in the State of California. And if proven that, in fact, these were unjust and unreasonable prices, and the FERC has the authority to, in fact, force refunds, although I have not seen the complete data set looking at the information provided by some of the generation companies, none of that appears evident to me.

Mr. ELLIG. There are probably two things we need to keep in mind when we talk about this, because first off, when we talk about refunds, some of the power producers who might have to give refunds are sitting there saying, "What refunds? We haven't been paid yet."

Second, I think we also ought to keep in mind, when we're talking about price gouging, just and reasonable prices, that there are a lot of different ways of trying to figure out what is a just and reasonable price.

And FERC has one way, and if you go Professor Wolak's website and look at some of his research papers, there are other ways of doing it, and the figures don't always agree.

So I guess before going to the refund issue, I'd want to raise my hand and say, well, wait a minute, I'm a little bit reluctant to accept somebody, either FERC's or somebody else's determination as to exactly what's just and reasonable and what is not, as a matter of economic analysis, trying to figure out what's going on in the market.

I realize as a matter of law what they say goes, but in really trying to figure out what's going on and whether refunds or whatever are justified, I'm skeptical that the methods that they're using to calculate it make sense.

Ms. CROWLEY. Welcome to the free market and energy sector. We have limited time.

We've seen what the market has done in respect to prescription drugs to seniors, and unfortunately see the same thing happening in the energy sector.

In New York, we had a real problem when home heating oil just rocketed not last winter, but the winter before, and seniors in my district were forced to make decisions as to whether they were going to pay their rent, purchase their foods, or purchase their prescription drugs, or pay their home heating oil bill. It was a real crisis.

I support the opening this was a short term solution to help drive the market.

I'd also like to hear what your positions are on that issue, as well as the fully funding and establishing a Northeast home heating oil reserve, and what affect that could have on the market, particularly in the Northeast and other regions of the country that experience potential price hikes during the winter months of home heating oil.

Mr. WOLAK. I would just like to comment on your previous question in a sense that just to tell you that FERC has no standard for determining whether rates are just and reasonable, so it's a moot point. That's sort of the fundamental problem with the electricity market, that they sort of pushed people out of the airplane without a parachute, that we'll sort of tell you when we've seen them, but we won't tell you how we see them, see that they are.

So I think the first step would be for Government Oversight to say, "Look, you at least must specify a methodology for determining whether rates are just and reasonable," so that the monitors, such as myself, who is on one of the market monitoring committees for the California ISO, can essentially say, "Look, we've applied your methodology and here's what it yields," and so that also market participants can know what sorts of prices may be worthy of refunds at the start.

But, the sort of current plan of saying we don't specify any methodology nor do we tell you what the exercise of market power is in a market that would constitute unjust and unreasonable rates, it makes trying to find it impossible, because you don't know what it is.

Ms. CROWLEY. No positions on a Northeast home heating oil reserve?

Chairman OXLEY. The gentleman's time has expired, and we want to bring this to a close.

Gentlemen, thank you for your testimony. It's good to have you all here and the hearing is adjourned.

[Whereupon, at 12:30 p.m., the hearing was adjourned.]

A P P E N D I X

June 20, 2001

Opening Statement

Chairman Michael G. Oxley

Committee on Financial Services

"The California Energy Crisis: Impacts, Causes, and Remedies"
June 20, 2001

Our hearing today represents the Financial Services Committee's continuing obligation to conduct oversight on the state of the U.S. economy. Today we explore the impact and causes of the California energy crisis, and discuss steps this Committee can take to help prevent it from being repeated.

The California energy crisis has the potential to become an American economic crisis. Already, in both California and throughout the West, high prices, drought conditions, and lack of investment in infrastructure have caused serious disruption to the lives of American families and workers. In the Pacific Northwest, aluminum mills have shut down because they cannot afford the cost of electricity. Predictably, this has led to a decline in U.S. aluminum production. According to the Silicon Valley Manufacturing Group, its nearly 200 members lost over $100 million in a single day of rolling blackouts in June of last year. The State of California accounts for over 16 percent of U.S. commodity exports and nearly 25 percent of industrial equipment and computers, electronics and instruments exports; declines in the ability of that State to manufacture and trade these products will increase the U.S. trade deficit.

I could cite similar statistics, but they all make the same point: the California energy crisis is not only bad for California, it's bad for America. There is no question that when a State must issue the largest municipal bond offering in history in order to purchase electricity, there is something seriously wrong with the system. Our hearing today will explore what went wrong, and provide insight into how to avoid such pitfalls in the future.

Part of the purpose of this hearing is also to remind ourselves that this is not a new dilemma. The last major energy crisis, in the 1970s, led to our becoming a much more energy efficient country. Energy intensity, or the amount of energy used to produce a dollar's worth of GDP, has declined 42 percent, meaning that the U.S. has grown significantly more energy efficient over the last two decades. This has occurred despite the fact that personal energy use has increased over that same period. We will hear today from the Department of Housing and Urban development on the steps they have taken to contribute to this dramatic increase in energy efficiency, and what more there is to be done.

It has been proven time and again that truly competitive markets, free from overly burdensome government intrusion, will provide goods and services better than any of the alternatives. One securities law that has outworn its usefulness is the Public Utility Holding Company Act of 1935. Though not implicated in causing the current situation in California, PUHCA has nevertheless proven to be an unnecessary burden to creating a healthy electricity infrastructure. We are honored to have with us today Commissioner Isaac Hunt Jr. to explain why the SEC has long called for the repeal of this outdated legislation.

This current crisis provides us an opportunity to confront the mistakes of the past, and remove barriers to building a better future. I look forward to hearing from all of our witnesses today as this Committee works to do its part to ensure that America's energy infrastructure becomes increasingly healthy and competitive.

Opening Statement of Congressman Eric Cantor

Financial Services Committee Hearing on the California Energy Crisis

June 20, 2001

Mr. Chairman, thank you for holding this hearing on the California Energy Crisis and I am pleased to welcome the witnesses to our Committee today.

California is the world's sixth largest economy, and a prolonged energy crisis will inevitably have a negative affect upon the economy of the United States. In discussing this matter, it is important to consider the problems California has experienced as it restructures its electric utility industry and for the United States to prepare for the long-term economic impact of this situation. The causes of this crisis have been well documented, and I look forward to hearing the comments on this subject from our distinguished guests.

But we must also highlight the efforts of other states that have deregulated since that time that have avoided similar mistakes. As a Virginian, I am particularly pleased with the Virginia Electric Utility Restructuring Act that relies upon a long transition period with appropriate consumer price protections, as well as continuing legislative and regulatory oversight to bring the advantages of true retail competition to consumers. Virginia set up a strong system of oversight, along with appropriate checks and balances, to ensure that

restructuring was done correctly. The evolutionary approach taken by the Commonwealth of Virginia, as well as other states such as Pennsylvania, Ohio, and Texas, should serve as a model for deregulation around the nation.

In addition, it is important for the long term viability of our economy and our nation's energy policy to look beyond the mistakes of California and avoid political grandstanding on this issue at the expense of true competition in this industry. Congress needs to develop comprehensive energy policy legislation that reduces dependence on Middle East Oil and provides incentives for the development of alternative fuel sources. A workable energy strategy for the 21st Century must balance conservation efforts with new technologies and renewable sources of energy. It should attempt to improve access to domestic oil and natural gas resources, and encourage exploration and production using the best environmental technologies.

Congress should also target renewable power, like solar, wind, geothermal, and biomass, using market-based incentives for their development and use. As the Representative of Virginia's 7th District, home of one of the world's safest nuclear facilities, Dominion's North Anna nuclear power plant, I also recognize the critical role nuclear energy will play in providing safe, long-term options for our national energy policy.

Again, Mr. Chairman, I want to thank you for holding this hearing and I look forward to the testimony.

GARY G. MILLER
41ST DISTRICT, CALIFORNIA

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ASSISTANT WHIP AT LARGE

BUILDING A BETTER AMERICA CAUCUS, CHAIRMAN

HIGHWAY INFRASTRUCTURE & TRANSPORTATION CAUCUS, CHAIRMAN

Remarks of the Honorable Gary Miller
Before the House Committee on Financial Services
June 20, 2001

Mr. Chairman,

I want to thank you for holding this hearing. I look forward to listening to the witnesses testifying before this committee.

For the last eight years, our nation has failed to address our energy outlook with a cohesive, and comprehensive national policy. Instead of becoming more independent, we have increased our reliance on foreign sources to provide oil for meeting our energy needs. Oil imports rose from 32% in 1992 to 55% last year. The previous Administration was put into the unfortunate position of sending our Secretary of Energy to the Middle East to beg for greater oil output from the very countries we defended from Saddam Hussein just a decade ago.

Furthermore, special interests have severely limited our ability to meet the growing demand that an increasingly larger population and the increased use of electronic information-age technology have created. Environmental Extremest have lobbied for years to stop the construction of any new power production facilities. They protest the use of power generators that burn fossil fuel due to air quality standards. Furthermore, they attack the nuclear plants for inadequate storage facilities for spent fuels. They object to hydro-electricity because of presumed effects on fish populations, wind turbine facilities because of the potential hazards to birds, and solar energy generation because of the amount of habitat that is replaced by photovoltaic power cells. It seems no matter the source of the power, these environmental

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extremists find some reason to oppose any type of electricity generation. In the balance, they hold the public's general welfare hostage.

In my home state of California, no new power plants have been built in over 10 years. During that same period of time, California's population has increased by over 11% to 33 million people. As well, California has become the world's hub for e-commerce, which has created an even greater demand for electricity supply.

Now we are facing the realities of this failed policy as Californians are forced to import energy from other States. The problems in California is a precursor to many of the problems this nation will face if a comprehensive policy is not put in place. New and more efficient plants with environmentally sensitive technology would reduce the amount of fuel required to run them, while helping meet the needs of this new economy. This, coupled with updating the infrastructure which transmits power, would allow California and the country to meet its energy challenges.

I couldn't agree more with testimony to resist implementing price caps, which are not in the long term interest of consumers. Recent electricity shortages have lured suppliers while reducing political obstructions to constructing new facilities. Creating a power surplus will drive rates down, while also forcing suppliers to produce energy using the cheapest, most efficient means possible. Moreover, price caps would not cap consumption which is a major problem. For example, California has been able to conserve 11% more energy in April when compared to the same month last year, but still faced rolling blackouts. The problem is energy shortages, not prices.

As we witnessed during the mid-eighties and mid-nineties, as our energy costs fall, our economy swells. I don't think we can stress that point enough. A strong energy policy, which includes reliable, sustainable and cost efficient electricity is the backbone of a strong economy. If California is to continue as the driving force in America's economy, it must make certain that the power source for that economy is available.

I look forward to discussing ideas to strengthen our energy supply. I also hope that we can find common ground on reforms that lesson government's impacts on that supply and the economy.

Statement of Congresswoman Waters on the California Energy Crisis House Financial Services Committee June 20, 2001

Mr. Chairman, thank you for calling this hearing. The issues surrounding the California energy crisis are extremely important to me and my constituents and the entire country as well. This is a very timely issue, as a number of Californians are expected to experience rolling blackouts today and throughout this week as temperatures continue to climb.

To highlight this issue, tomorrow's episode of the Tonight Show will be dedicated to energy conservation. It will be taped virtually in the dark--without studio lights, TV monitors, amplifiers or other power sources. NBC says the idea came up when the network--like most other businesses in California--was asked to turn off lights and computers whenever possible. I hope other businesses will follow their example. The amount of power used on one episode of *The Tonight Show* equals a month's worth of power at a normal family home.

In 1999, California paid $7 billion for its energy generation. Last year, even though demand was down due to conservation, the price was $32.5 billion. This year, the price for approximately the same amount of electricity is estimated to be $70 billion. In the short space of two years, costs have increased tenfold.

California does not have a demand problem. In fact, per capita, Californians use the lowest amount of power, and recent conservation efforts have reduced consumption even further.

What California has is an artificial supply problem – a problem caused by power generators taking power generation off line for "maintenance." Over the past six months, the number of turbines closed for maintenance has vastly exceeded that of the previous year. For example, outage rates in March, 2001 averaged almost 14,000 megawatts, four times higher than in March 2000. In April, 2000, the power generators took approximately 3,300 megawatts off line for maintenance; In April 2001, they took almost 15,000 megawatts off line on an average day. This practice is currently being investigated on the state level and deserves federal scrutiny as well.

Finally, after essentially ignoring the California crisis for months, FERC has responded to the situation, and their order goes into effect today. However, their actions were akin to putting a butterfly band-aid on a gushing wound. On Monday, FERC expanded its April 26 order to apply 24 hours a day throughout the West. The new formula will be based on the cost of fuel plus an

allowance for profit. And these limits will remain in effect around the clock -- a step in the right direction. While the order does close some loopholes in the April order, such as prohibiting generators from exporting energy to neighboring states and importing it back at higher prices, there are issues outstanding. The prices will be determined by the most inefficient, highest cost generator. The nature of this order does nothing to discourage generators from withholding power in order to ensure that the least efficient unit sets the market clearing price. In addition, I am concerned that FERC has failed to order refunds of the more than $6 billion in potentially illegal overcharges. Instead, FERC has directed public utility buyers and sellers to try to reach settlement with a FERC administrative law judge. FERC is clearly abandoning its mandate to ensure that rates are just and reasonable and to order refunds when rates do not meet that standard.

This is why I am a cosponsor of HR 1468, which was introduced by my colleague, Jay Inslee. The Energy Price and Economic Stability Act forces FERC to do its statutorily mandated job of ensuring fair electricity rates. This legislation directs FERC to establish cost-of-service-based rates for electric energy, and instructs FERC to order refunds of illegal rates and charges. I urge all of my colleagues to support this crucial legislation.

This crisis is having a major effect on my constituents and consumers throughout the West, many of whom have seen their utility bills triple. Some have bills of more than $1,000, others are scrimping on food and medicine to keep their power on. And Federal LIHEAP funds, even when combined with another $120 million from California, can only provide help for less than 10% of the 2.1 million households who qualify for energy assistance.

On the other hand, while consumers suffer, corporations thrive. This crisis has proven to be a boon for some: A number of executives at the largest power companies have collected tens and even hundreds of millions of dollars through stock sales, driven up by the California energy crisis.

Enron Chair Kenneth Lay garnered $123 million in option transactions last year, which was ten times what he made in 1998.

Jeffrey Skilling, Enron's chief executive, netted more than $62 million in options gains last year.

Peter Cartwright, Chairman and CEO of Calpine, netted almost $12 million through the exercise of options earlier this year.

Many of these energy millionaires have found their way to Washington. This Administration has an unprecedented number of high level appointees with a background in the energy industry. Besides the President and Vice President, Condolezza Rice was on Chevron's board of directors for almost a decade;

Commerce Secretary Don Evans served as CEO of a Texas oil company;

Interior Secretary Gale Norton began her career at a conservative think tank funded by a number of energy companies;

Deputy Interior Secretary Steven Griles, lobbied on behalf of the oil, chemical and mining industries;

Deputy Energy Secretary Francis Blake was a General Electric executive;

Commerce Under Secretary Kathleen Cooper was an Exxon executive;

Army Secretary Thomas White was Vice Chairman of Enron;

Assistant Attorney General, in the DOJ's Environmental Division Thomas Sansonetti was a partner at a law firm specializing in oil and gas regulation; and

Assistant Energy Secretary Dan Brouillette was an energy lobbyist.
It is no wonder that the Administration hasn't done anything about the energy crisis. A typical cabinet meeting roster reads like a who's who of the energy industry.

On Monday, television ads opposing federal price caps began running in California. Those ads were paid for by an organization called the American Taxpayers Alliance, whose contributors include utility companies. So far, they have spent $1.5M on ads, and reportedly plan to spend up to $25 million. CNN reported that "leading Congressional Republicans have urged the entire energy industry to spend upwards of $50 million on these ads." **I have a suggestion of my own for the energy industry: Use that $50 million to resolve this crisis rather than trying to convince California consumers that there is no crisis. If these companies weren't trying so hard to protect their profits, we wouldn't have to work so hard to protect their consumers.** With that in mind, I look forward to hearing the testimony of the witnesses.

TESTIMONY OF

COMMISSIONER ISAAC C. HUNT, JR.
U.S. SECURITIES AND EXCHANGE COMMISSION

CONCERNING THE PUBLIC UTILITY HOLDING COMPANY ACT OF 1935 AND THE CURRENT ENERGY SITUATION IN CALIFORNIA

BEFORE THE COMMITTEE ON FINANCIAL SERVICES

U.S. HOUSE OF REPRESENTATIVES

JUNE 20, 2001

U. S. Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, D.C. 20549

TESTIMONY OF COMMISSIONER ISAAC C. HUNT, JR.

U.S. SECURITIES AND EXCHANGE COMMISSION

BEFORE THE COMMITTEE ON FINANCIAL SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

CONCERNING THE PUBLIC UTILITY HOLDING COMPANY ACT OF 1935
AND THE CURRENT ENERGY SITUATION IN CALIFORNIA
JUNE 20, 2001

Chairman Oxley, Ranking Member LaFalce, and Members of the Committee:

I am pleased to have this opportunity to testify before you on behalf of the Securities and Exchange Commission ("SEC") about both the current energy problems being experienced in California and the Public Utility Holding Company Act of 1935 ("PUHCA"). As outlined below, because neither of the major California utilities is registered under the Act and because the Act is not an impediment to the construction of new generation facilities, the SEC's administration of PUHCA has not had any direct impact on the California situation. Nonetheless, because much of the regulation required by PUHCA is either duplicative of that done by other regulators or unnecessary in the current environment, the SEC continues to support repeal of PUHCA. As the SEC has testified in the past, however, we continue to believe that repeal should be accomplished in a manner that eliminates duplicative regulation while also preserving important protections for consumers of utility companies in multistate holding company systems. Short of repeal, the SEC believes that amending PUHCA to provide the agency with general exemptive authority would help ensure that the goals of PUHCA can be achieved while at the same time allowing the SEC to act in situations in which PUHCA may be an impediment to appropriate development of gas and electric markets.

I. INTRODUCTION

Before discussing the current problems in California and the SEC's position on repeal or amendment of PUHCA, it is useful to review both the history that led Congress to enact PUHCA in 1935 and the changes that have occurred in the electric industry since then. During the first quarter of the last century, misuse of the holding company structure led to serious problems in the electric and gas industry. These abuses included inadequate disclosure of the financial position and earning power of holding companies, unsound accounting practices, excessive debt issuances and abusive affiliate transactions. The 1935 Act was enacted to address these problems.[1] The Act also placed restrictions on the geographic scope of holding company systems and limited holding companies to activities related to their gas or electric businesses. Because of its role in addressing issues involving securities and financings, the SEC was charged with administering the Act. In the years following the passage of the 1935 Act, the SEC worked to reorganize and simplify existing public utility holding companies in order to eliminate abuses.

By the early 1980s, however, many aspects of the 1935 Act regulation had become redundant: state regulation had expanded and strengthened since 1935, and the SEC had enhanced its regulation of all issuers of securities, including public utility holding companies. Changes in the accounting profession and the investment banking industry also had provided investors and consumers with a range of protections unforeseen in 1935. The SEC therefore concluded that the 1935 Act had accomplished its basic purpose and that many of its remaining provisions were either duplicative or

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[1] See 1935 Act section 1(b), 15 U.S.C. § 79a(b).

were no longer necessary to prevent the recurrence of the abuses that had led to the Act's enactment. The SEC thus unanimously recommended that Congress repeal the Act.[2]

For a number of reasons – including the potential for abuse through the use of a multistate holding company structure, related concerns about consumer protection, and the lack of a consensus for change – repeal legislation was not enacted during the early 1980s. Because of continuing change in the industry, however, the SEC continued to look at ways to administer the statute more flexibly.

In response to continuing changes in the utility industry during the early 1990s, and the accelerated pace of those changes, in 1994, then-Chairman Arthur Levitt directed the SEC's Division of Investment Management to undertake a study, under the guidance of then-Commissioner Richard Y. Roberts, to examine the continued vitality of the 1935 Act. The study was undertaken as a result of the developments noted above and the SEC's continuing need to respond flexibly in the administration of the 1935 Act. The purpose of the study was to identify unnecessary and duplicative regulation, and at the same time to identify those features of the statute that remain appropriate in the regulation of the contemporary electric and gas industries.[3]

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2 See Public Utility Holding Company Act Amendments: Hearings on S. 1869, S. 1870 and S. 1871 Before the Subcomm. On Securities of the Senate Comm. On Banking, Housing, and Urban Affairs, 97th Cong., 2d Sess. 359-421 (statement of SEC).

3 The study focused primarily on registered holding company systems, of which there were, at the time of the study, 19. The 1935 Act was enacted to address problems arising from multistate operations, and reflects a general presumption that intrastate holding companies and certain other types of holding companies, which the 1935 Act exempts and which now number 119, are adequately regulated by local authorities. Despite their small number, registered holding companies account for a significant portion of the energy utility resources in this country. As of December 31, 2000, the 26 registered holding companies owned 214 electric and gas utility subsidiaries, with operations in 44 states, and in excess of 1500 nonutility subsidiaries. In financial terms, as of December 31, 2000, the 30 registered holding companies owned more than $404 billion of investor-owned electric and gas utility assets and received in excess of $160 billion in operating revenues. The 26 registered systems represent over 40% of the assets and revenues of

The SEC staff worked with representatives of the utility industry, consumer groups, trade associations, investment banks, rating agencies, economists, state, local and federal regulators, and other interested parties during the course of the study. In June 1995, a report of the findings made during the study ("Report") was issued. The staff's Report outlined the history of the 1935 Act, described the then-current state of the utility industry as well as the changes that were taking place in the industry, and again recommended repeal of the 1935 Act. The Report also outlined and recommended that the Commission adopt a number of administrative initiatives to streamline regulation under the Act.

Since the report was published, the utility industry in the United States has continued to undergo rapid change. Some of these changes have been facilitated by Congress. Specifically, as a result of recently-created statutory exemptions, anyone, including registered and exempt holding companies, is now free to own exempt wholesale generators and foreign utilities and to engage in a wide range of telecommunication activities.[4] In addition, the SEC has implemented many of the administrative initiatives that were recommended in the Report.[5]

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the U.S. investor-owned electric utility industry, and almost 50% of all electric utility customers in the United States.

4 Sections 32 and 33 of the Act, which were added to it by the Energy Policy Act of 1992, permit, subject to certain conditions, the ownership of exempt wholesale generators and foreign utility companies. The impact of section 32 on the electricity industry is discussed in more detail below. Section 34, which was added by the Telecommunications Act of 1996, permits holding companies to acquire and retain interests in companies engaged in a broad range of telecommunications activities.

5 The Report recommended rule amendments to broaden exemptions for routine financings by subsidiaries of registered holding companies (see Holding Co. Act Release No. 26312 (June 20, 1995), 60 FR 33640 (June 28, 1995)) and to provide a new exemption for the acquisition of interests in companies that engage in energy-related and gas-related activities (see Holding Co. Act Release No. 26667 (Feb. 14, 1997), 62 FR 7900 (Feb. 20, 1997) (adopting Rule 58)). In addition, the Report recommended and the SEC has implemented changes in the administration of

II. PUHCA AND THE ENERGY SITUATION IN CALIFORNIA

The electricity shortages, price increases and rolling blackouts in California represent one of the most severe problems in the electric industry today. Specifically, in California, acute supply shortages, opposition and legal impediments to new power plant construction, and high natural gas prices have driven wholesale electricity prices to extraordinary levels. The two largest California utilities have been limited in their ability to pass wholesale price increases through to consumers and, as a result, are experiencing severe liquidity problems. One of the utilities has declared bankruptcy; the other has stated publicly that it may do so.

Neither PUHCA nor the Commission's administration of the Act has had any direct impact on the situation in California. First, although we have monitored the situation in California, the major public utilities in California are predominantly intrastate, and therefore are not registered under the Act. The Commission therefore does not directly regulate under PUHCA the two companies that have experienced the most severe financial problems.

Second, and perhaps more importantly, although a shortage of supply is undoubtedly a significant factor in the problems being experienced in California, PUHCA has not impeded the construction of new generation facilities in California or elsewhere in the United States. Prior to the passage of the Energy Policy Act of 1992, a company owning generation facilities would have been a public utility subject to PUHCA and thus its holding company would have been subject to the limitations imposed by the Act on the company's geographic scope and its other businesses. The Energy Policy Act

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the Act that would permit a "shelf" approach for approval of financing transactions. For example, during calendar year 2000, all eleven of the new registered holding companies received multi-year financing authorizations that included a wide range of debt and equity securities. The Report further recommended a more liberal interpretation of the Act's integration requirements which has been carried out in our merger orders. The Report also recommended an increased focus upon auditing regulated companies and assisting state and local regulators in obtaining access to books, records and accounts. Six state public utility commissions participated in the last three audits of the books and records of registered holding companies.

facilitated the entry of new companies, and hence new sources of capital, into the generating business by permitting any person (including registered holding companies) to acquire "exempt wholesale generators" ("EWGs"). Congress gave the Federal Energy Regulatory Commission ("FERC") responsibility to determine whether an entity may be classified as an EWG under the statute. A wholesale generator applies to the FERC to obtain EWG status.

An EWG is not considered an electric utility company under PUHCA, and, in fact, is exempt from all provisions of PUHCA. The only limitation that remains under PUHCA is one imposed by Congress on registered holding companies – namely, that a registered company may not finance its EWG investments in a way that may "have a substantial adverse impact on the financial integrity of the registered holding company system."[6] In short, the Energy Policy Act removed restrictions on the ability of registered and exempt holding companies to build, acquire and own generating facilities anywhere in the United States. As a result, a number of registered holding companies now have large subsidiaries that own generating facilities nationwide. Numerous other companies not subject to the Act have also entered the generation business.[7]

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6 While no Commission approval is required for the acquisition of an EWG as a result of the Energy Policy Act, Commission approval is required, for example, before a registered holding company can issue securities to finance the acquisition of, or guarantee securities issued by, an EWG. Under the Energy Policy Act, Congress directed the SEC to adopt rules with respect to registered holding companies' EWG investments. Pursuant to these requirements, in 1993 the SEC adopted rules 53 and 54 to protect consumers and investors from any substantial adverse effect associated with investments in EWGs. Rule 53 created a partial safe harbor for EWG financings. Rule 53 describes circumstances in which the issue or sale of a security for purposes of financing the acquisition of an EWG, or the guarantee of a security of an EWG, will be deemed not to have a substantial adverse impact on the financial integrity of the system. For transactions outside the Rule 53 safe harbor, a registered holding company must obtain SEC approval of the amount it wishes to invest in EWGs. The standards that the SEC uses in assessing applications of this type are laid out in Rule 53(c).

7 See, e.g., National Energy Policy: Report of the National Energy Policy Development Group at 5-11 (May 2001) (noting that "[m]ost new electricity generation is being built not by regulated utilities, but by independent power producers").

III. REPEAL OR AMENDMENT OF PUHCA

1. Repeal of PUHCA

Although PUHCA has not played a significant role in the energy problems experienced in California, based on the findings in the Report as well as the continuing pace of change in the utility industry, the SEC continues to recommend that Congress repeal the 1935 Act subject to appropriate safeguards.[8] As the Report stated, regulation under the 1935 Act that affects the ability of holding company systems to issue securities, acquire other utilities, and acquire nonutility businesses is largely redundant in view of other existing regulation and controls imposed by the market. Repealing the Act is not, however, a magic solution to the current problems facing the U.S. utility industry. While PUHCA repeal can be viewed as part of the needed response to the current energy problems facing the country -- notably, the Administration's recent report on energy policy includes a recommendation that PUHCA be repealed[9] -- repeal of the Act will not directly affect the supply of electricity in the United States. Indeed, as discussed above, in 1992, as part of the Energy Policy Act, Congress amended the Act to remove most

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8 As we have testified previously, however, there is a continuing need to protect consumers. Although deregulation is changing the way utilities operate in some states, electric and gas utilities have historically functioned as monopolies whose rates are regulated by state authorities. Some regulators subject these rates to greater scrutiny than others. There is a continuing risk that a monopoly, if left unguarded, could charge higher rates and use the additional funds to subsidize affiliated businesses in order to boost its competitive position in other markets. Thus, so long as electric and gas utilities continue to function as monopolies, the need to protect against this type of cross-subsidization will remain. In view of the sophistication of contemporary securities regulation, and analysis by the public and private sectors, the best means of guarding against cross-subsidization is likely to be audits of books and records and federal oversight of affiliate transactions. The SEC therefore continues to recommend the enactment of legislation to provide necessary authority to the FERC and the state public utility commissions relating to affiliate transactions, audits and access to books and records, for the continued protection of utility consumers. More broadly, repeal of the 1935 Act may be accomplished either separately or as part of a more comprehensive package of energy reform legislation. The SEC does not have a preference as to whether the Act is repealed on a stand-alone basis or as part of broader, energy-related legislation.

9 See National Energy Policy: Report of the National Energy Policy Development Group at 5-12 (May 2001) (recommending the reform of "outdated federal electricity laws, such as the Public Utility Holding Company Act").

restrictions on the ability of registered and exempt holding companies as well as nonutility companies to build, acquire and own generating facilities anywhere in the United States. Repeal of the Act would instead remove provisions that prohibit utility holding companies from owning utilities in different parts of the country and that prevent nonutility businesses from acquiring regulated utilities. In particular, repeal of the restrictions on geographic scope and other businesses would remove the impediments created by the Act to capital flowing into the industry from sources outside the existing utility industry. Repeal would thus likely have the greatest impact on both the continuing consolidation of the utility business as well as the entry of new companies into the utility business.

2. Exemptive Authority as an Alternative to Repeal

If Congress does not repeal PUHCA, the SEC believes that the Act should be amended to give us more flexibility in its administration. In particular, in both the Report and in prior testimony, the SEC has suggested that if Congress chooses not to repeal the Act, it could grant the agency broad exemptive authority similar to that we currently have under the other Acts that we administer.[10] Although an expansion of the SEC's exemptive authority under the Act would not achieve the economic benefits of simplifying the federal regulatory structure and would continue to enmesh the SEC in difficult issues of energy policy, it would provide the SEC with a greater ability to respond quickly and appropriately to changes in the industry and the regulatory environment.

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[10] The SEC's current exemptive authority under the 1935 Act is considerably narrower than the exemptive authority under other securities laws. A model of broader exemptive authority is contained in section 6(c) of the Investment Company Act of 1940, 15 U.S.C. § 80a-6(c), which grants the SEC the authority by rule or order to exempt any person or transaction from any provision or rule if the exemption is necessary or appropriate in the public interest and consistent with the protection of investors. See also section 206A of the Investment Advisers Act of 1940, 15 U.S.C. § 80b-6a, and section 36 of the Securities and Exchange Act of 1934, 15 U.S.C. § 78mm. Section 28 of the Securities Act of 1933, 15 U.S.C. § 77z-3, grants the Commission similar exemptive authority, but permits it to exercise it only by rule.

The flexibility afforded by broad exemptive authority would have numerous uses. For example, in recent months, questions have arisen about how the Act will impact the FERC's ability to implement its plans to restructure the control of transmission facilities in the United States.[11] Specifically, in order to "ensure that electricity consumers pay the lowest price possible for reliable service," the FERC recently implemented new regulations designed to create "independent regionally operated transmission grids" that are meant to "enhance the benefits of competitive electricity markets."[12] As a result of FERC's new regulations, many utilities will cede operating control – and in some cases, actual ownership – of their transmission facilities to newly-created entities. The status of these entities, as well as the status of utility systems or other companies that invest in them, raise a number of issues under the Act. Most prominently, it has been asserted that the limits the Act places on the other businesses in which a utility holding company can engage will create obstacles for nonutility companies that may wish to invest in or operate these new transmission entities.

The SEC believes it has the necessary authority under the Act to deal with the issues created by the FERC's restructuring without impeding that restructuring. Nonetheless, repeal of the Act would effectively resolve these issues. In the absence of repeal, however, amending the Act to give the SEC broad exemptive authority would permit the SEC more efficiently to deal with regulatory conflicts, unexpected industry problems, and other issues of this type.

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The SEC takes seriously its duties to administer faithfully the letter and spirit of the 1935 Act, and is committed to promoting the fairness, liquidity, and efficiency of the United States securities markets. By supporting conditional repeal or amendment of the 1935 Act, the SEC hopes to reduce unnecessary regulatory burdens on America's energy industry while providing adequate protections for energy consumers.

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11 See FERC Order 2000, "Regional Transmission Organizations," 65 FR 810 (Jan. 6, 2000) (codified at 18 C.F.R. § 35.34).

12 Order 2000, 65 FR at 811.

Statement before

THE U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON FINANCIAL SERVICES

June 20, 2001

Alphonso Jackson
Deputy Secretary

Chairman Oxley, Ranking Member LaFalce and other distinguished members of the Financial Services Committee, thank you for this opportunity to appear before you to discuss the President's Energy Policy and specifically ways in which The Department of Housing and Urban Development can support energy efficiency and conservation.

Housing policy and energy policy are inextricably linked. No one knows this more than I do. I have served as Executive Director and CEO of three public housing authorities and I have also served as the President of American Electric Power-TEXAS.

As the single largest housing expense after mortgage payments, energy costs have a direct impact on housing affordability for both renters and homeowners. When energy costs go up, it becomes more difficult for families to afford their housing costs. Rising energy costs also have secondary effects that could make it harder for families to become homeowners. Energy costs represent roughly 16 percent of the producer price index for finished goods and 8 percent of the consumer price index. Sharply rising energy costs can lead to higher interest rates, which translate directly into higher costs for home purchases.

The dramatic increase in energy costs has particularly burdened low- and moderate-income families. As the President's Energy Policy states:

> The energy burden on low-income households, as a proportion of income, is four times greater than for other American households. . . . Many working households can accommodate...[large] increases in energy by cutting back on other needs. However, low-income households often have more difficult choices to make...As many as 3.6 million families in eighteen states and the District of Columbia risk being unable to pay their bills and having their energy cut off because of the effects of rapidly increasing energy costs."

HUD has already taken steps to respond to rising energy costs in HUD-assisted housing. These include making $105 million in operating funds available to lessen the impact of higher utility rates on public housing authorities, raising payment standards for Section 8 vouchers, and reimbursing owners for increased utility costs in project-based Section 8 projects.

But these are only short-term solutions. In the long run, as the President's Energy Policy recognizes, we need to become more efficient with our use of energy in housing. Under the President's leadership, HUD is committed to achieving this important objective.

HUD's Implementation of the President's Energy Policy

As Vice President Cheney has stated, "conservation and energy efficiency are crucial components of a national energy plan."

One area singled out for improvement in the Policy is housing. As the Policy notes, "There are significant opportunities to improve the energy efficiency of buildings and homes through technologies and better practices."

The President's Energy Policy directs the Environmental Protection Agency and the Department of Energy to promote the increased use of energy efficient technologies in housing, especially through increased promotion of the Energy Star initiative, the energy efficiency program run by EPA and the Department of Energy.

HUD will work closely with the Environmental Protection Agency and the Department of Energy to implement the President's objectives of improving the energy efficiency of housing. This will not involve the establishment of any new programs, but rather the better use of existing programs in service of this goal.

While there have been various efforts over the years to improve the energy efficiency of assisted housing, as well as older unsubsidized housing, those efforts have lacked a coherent framework and focus.

With the announcement of the President's Energy Policy, we now have the necessary framework for promoting increased energy efficiency in housing. HUD is committed to giving this issue the priority attention it deserves to ensure that we make significant progress in conserving energy in housing.

HUD's efforts to increase the energy efficiency of housing will focus on four key objectives:

1. Increasing energy efficiency in HUD-assisted rental housing. Through information dissemination and technical assistance for Energy Star products, HUD will promote energy conservation in HUD-assisted housing. HUD will also review its regulations and the subsidy system for public housing to determine what steps we can take to promote the greater use of energy-efficient technologies in assisted housing.

Examples of such activities include promoting the procurement of energy-efficient refrigerators and other appliances by public housing authorities, and publicizing examples of innovative "shared savings" contracts in which private firms cover the costs of installing energy-efficient technologies in public or assisted housing, in exchange for a portion of the savings in utility costs.

2. Expanding the use of Energy Efficient Mortgages. FHA has an existing mortgage product that allows homebuyers to borrow up to an additional $8,000 to make energy-efficient improvements to single-family housing.

3. Providing technical assistance to non-profit, community- and faith-based organizations. HUD will extend technical assistance to non-profit and faith-based housing organizations to expand the use of energy-saving technologies in affordable new home construction, housing rehabilitation, and existing housing.

4. Supporting the use and development of new technologies. While the primary focus of HUD's activities will be on promoting the increased use of existing energy-efficient technologies, HUD will also undertake research on new products and product applications to improve the energy-efficiency of existing housing. An example from HUD's current research program is a joint project with the Department of Energy to develop and test electrochromatic windows that reduce the amount of sunlight that comes into homes, thereby reducing cooling costs.

Comments on Proposed Legislation

I would now like to take this opportunity to comment on some of the specific proposals put forth by this Committee concerning energy conservation.

Capacity Building for Energy-Efficient Housing

HUD currently provides $28 million for capacity building by organizations such as the Enterprise Foundation, LISC and Habitat for Humanity. This proposal, to include activities related to the provision of energy efficient affordable housing, seems an appropriate measure for this committee to take.

Increase of CDBG Public Services Cap for Energy Conservation and Efficiency Activities

Secretary Martinez and I both support local flexibility, especially with regard to the use of CDBG funds. Funding under the public services cap can include childcare, crime prevention and drug abuse funding. Funding energy-efficiency programs at the expense of these other worthwhile programs would be a difficult decision for local communities. Increasing the cap at the discretion of local communities to pay for energy efficiency programs, however, is a good option and allows local communities to make the determination of funding priorities.

FHA Mortgage Incentives for Energy Efficient Housing

This proposal would implement a new type of "Energy-Efficient Mortgage" by authorizing the Department to reduce premiums for homes that are particularly energy efficient. However, the Department already has an Energy-Efficient Mortgage program. Before authorizing a new Energy-Efficient Mortgage program, it is vital that we examine what lessons can be learned from the current one and carefully examine whether the administrative burden of a new program variant is justified.

As noted above, HUD's existing Energy-Efficient Mortgage program allows homebuyers to borrow up to an additional $8,000 to make energy-efficient improvements to single-family housing. The program is quite new, having expanded from its pilot phase only six years ago. In addition, FHA relaxes qualifying ratios for borrowers in houses that meet

certain energy-efficiency standards, allowing them to obtain a larger mortgage than would otherwise be permitted.

The existing Energy-Efficient Mortgage program is an important part of HUD's energy conservation efforts and the Department intends to expand its use. Nevertheless, for the following reasons, HUD cannot support the authorization of a new Energy-Efficient Mortgage program that involves reductions in premiums:

1. While energy-efficiency is an important and commendable objective, we do not know whether loans secured by homes that are particularly energy-efficient are less risky to the lender. Our experience with our existing energy-efficient mortgage program is that these loans have *not* had lower default rates than other FHA mortgages.

   We have just reduced our premiums in the FHA single-family program. To reduce them still further, without any evidence of reduced risk, would be unwise and could potentially jeopardize the health of the MMI fund.

2. The administrative burden of this proposal would also be a challenge for the Department. We are presently striving to focus on our core mission and reduce the number of HUD programs. This proposal would authorize a new program variant with significant administrative costs, including assessments of the energy efficiency of each home and the tailoring of loan products accordingly. In addition to presenting a significant administrative challenge, this could increase the cost to FHA or borrowers.

If the Committee remains interested in this proposal, we strongly recommend that, before authorizing a new type of Energy-Efficient Mortgage, Congress and the Administration review our experience with the current program to examine whether loans secured by homes that exceed a particular threshold of energy efficiency are in fact less risky.

Higher Mortgage Ceilings for Solar-Enhanced Properties

The proposed legislation would allow FHA to insure 30% higher mortgages for both single- and multifamily mortgages for properties with solar power. Currently FHA has the authority to insure mortgages for solar-enhanced properties that are up to 20% higher than other mortgages. This increase, while not necessarily one that would be widely used, could have a positive impact on properties whose cost is significantly higher because of the inclusion of solar technology.

Research and Development Programs

HUD's Office of Policy Development and Research (PD&R) is already active in research on building technology and energy efficiency. As HUD implements the President's Energy Policy, we will reform these efforts or energy efficiency in existing housing.

As PD&R already has authority to undertake demonstrations of energy-efficient technologies, it does not appear necessary to include new authorization for the "large-scale experimentation in the use of new technologies... on Federal land" included in the proposed legislation. In addition, the precise intent of the proposal is not clear.

We would be happy to work with the Committee to determine what demonstrations of energy-efficient technologies would be appropriate. At that time, we can opine more specifically as to whether new legislation is needed to authorize such demonstrations.

Solar Energy Systems in Assisted Housing

In 1978, the Housing and Community Development Act was amended to permit the installation of solar energy in Section 312, Section 202 and Section 8 housing. Including other newly authorized programs within this existing provision seems premature absent an assessment of how it is working in other programs.

Energy Conserving Improvements for Assisted Housing

While including consideration of energy conservation in projects restructured under the Multifamily Assisted Housing Reform and Affordability Act of 1997, is appropriate, the Department is concerned that the inclusion of this provision may require an appropriation in order to make the energy improvements that might be necessary.

NECPA was enacted under President Carter in 1978. Section 251 authorized $25 million in grants to "those [HUD-insured multifamily] projects which are in financial difficulty as a result of high energy costs," and required the Secretary to establish "minimum standards for energy conserving improvements" in these projects. However, no funds were ever appropriated for this program.

Five-Year Plan

HUD's five-year energy plan was first presented to the Congress in 1992 and has been updated several times. We would be happy to provide the report or other information to the Committee at any time.

The additional information requested by the Congress under this proposed legislation would include, among other things, clarification of energy issues under programs created since 1990. The further requirement that HUD publish an immediate update is consistent with the requirements already made by the recent Executive Order.

Again, thank you for this opportunity to address you on this important issue and I would be happy to answer any questions you or the members of the Committee may have.

Statement of **Vernon L.Smith**, Ph.D.
Economic Science Laboratory, University of Arizona

before the

U.S. House of Representatives Committee on Financial Services
2128 Rayburn House Office Building
Washington, D.C. 20515
June 20, 2001

Good morning. First of all, Chairman Oxley, Congressman LaFalce, and members of the committee, thank you for allowing me the opportunity to address you on the impact and causes of the California energy crisis. My name is Vernon Smith. I am currently the Regent's Professor of Economics and director of the University of Arizona's Economic Science Laboratory. Later next month my colleagues and I will be moving to Northern Virginia to become affiliated with George Mason University and its Mercatus Center. This statement is based largely on my joint work with Stephen Rassenti and Bart Wilson, also with the Economic Science Laboratory.

BACKGROUND OF THE CRISIS

The California energy crisis neither started in California nor was it special to California. The sharp increases in electricity prices (price spikes) in the hourly spot market began in the Midwest and parts of the East Coast in the summer of 1998, and were repeated in the summers of 1999, 2000 and are likely to be repeated again in the summer of 2001. Well before the California crisis these earlier spike prices reached levels of $2 to $3 per kilowatt-hour and higher (the highest, according to FERC was a transaction at $7.50 per kilowatt hour). For comparison, the average retail price is only about $0.10 to $0.12 per kilowatt-hour. These price increases have had the effect of attracting increased capacity, which will moderate future price increases to a

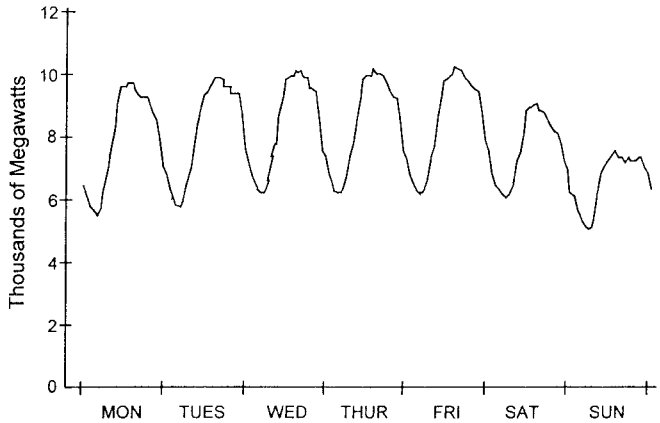
degree that is not predictable. The difference with California is only that the earlier price spikes were temporary. As in California, however, they were absorbed in the form of losses by wholesale buyers who did not pass on the increase to their end use customers, and therefore did not provide needed incentives for conservation. Hence, price spikes in California were predictable and expected by anyone who was informed of this history. Temporary shortages can be expected in any electrical market, anywhere. It is therefore essential that the market be designed to encourage demand responsiveness to price on the part of all end use customers whose circumstances do not require an uninterruptible supply of power at all times of the day, week or season. This demand responsiveness, sufficient to prevent price spikes does not have to be a large percentage of peak demand. My coworkers (Stephen Rassenti and Bart Wilson) and I have studied laboratory market experiments in which wholesale buyers who participate as demand side bidders in the spot market can interrupt 16% of peak demand. Compared with control experiments where the market is organized as a one-sided seller bid market only, as in California and elsewhere, price spikes are eliminated, average prices are greatly reduced, and price volatility is very modest.

HOW ENERGY MARKETS OPERATE

The normal consumption of electricity undergoes a cycle each day beginning in the off-peak hours in the early morning, increasing in the late morning, reaching a peak in the hours of 1-4 pm in the afternoon then decreasing in the late afternoon and evening. From off-peak to on peak, consumption can easily increase by a factor of two or more, as illustrated below in Figure 1.

Figure 1.
Actual Weekly Load Curve

An example of the demand for electricity over one week



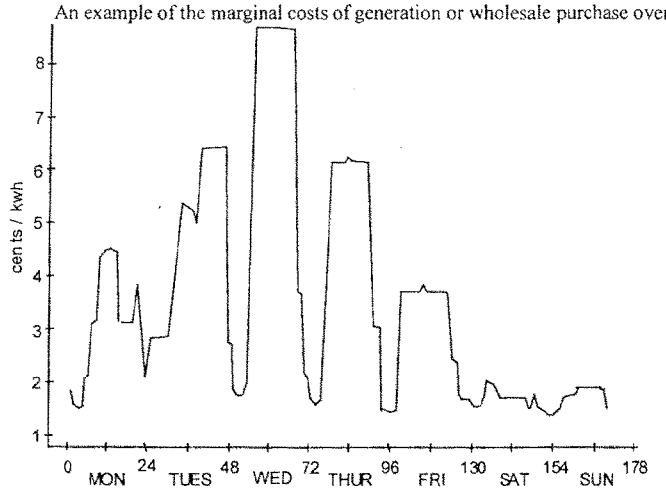
Adapted from: Power Technologies, Inc., "Technical Background and Considerations in Proposed Increased Wheeling, Transmission Access and Non-Utility Generation," contractor report prepared for the Office of Technology Assessment, March 1988, pp 2 - 3

This cycle in consumption in supplied by three types of generators: (1) low cost, base load capacity units that produce at a steady hourly rate; (2) intermediate cost, load-following generator capacity units that are able to ramp up their output as consumption increases from the low off-peak hour levels, and down from the peak hours; (3) high cost, peaking capacity generators that are only turned on for the peak consumption hours.

The marginal cost of energy supply alone during the peak hours of consumption can easily be six or more times the corresponding cost for off-peak consumption. This is shown in Figure 2 for a typical hot August week in the 1980s.

Figure 2.
Actual System Lambda

An example of the marginal costs of generation or wholesale purchase over one week



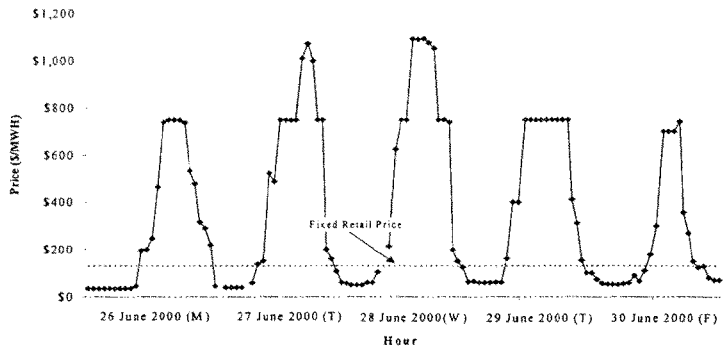
Adapted from: Bohn, R., Caramanis, M. and Schweppe, F., "Optimal Pricing in Electrical Networks over Time and Space", Rand Journal of Economics, 1984, 15:3, pp 360 - 376

Market efficiency, however, requires the capital investment cost of peaking generators and peak transmission capacity to be charged only to the peak end users, whose demand requires such investments. Hence, the on-peak energy and capital costs could easily be estimated to be ten or more times the off-peak costs.

As expected and as desired, the California market price cycles reflected this pattern of large fluctuations in wholesale cost over the daily cycle. But in days and weeks of extreme shortage (for example low reservoirs of water in the Northwest) the price cycle also became very extreme. In one particular week (26-30 June 2000) the price spikes reached as high as $1100 per megawatt hour or $1.10 per kilowatt-hour. This week of hourly prices is shown in Figure 3.

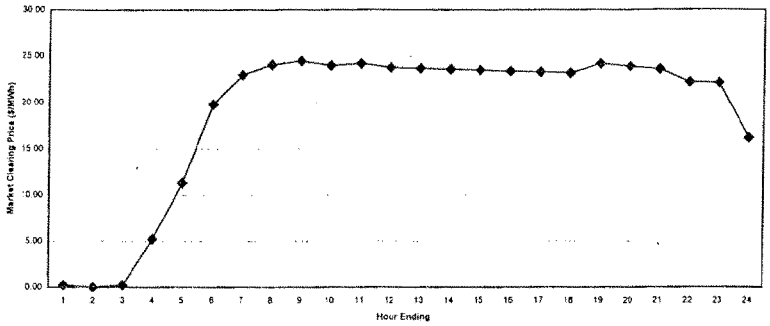
Distribution companies who purchase in this market resell the power at a fixed hourly price of about $130 per MWH. As a consequence these utilities have lost some $8-9 billion dollars according to some media reports. It is called buying high and selling low and is not a good business strategy, and it is not in the long run interest of either consumers or suppliers.

Figure 3. California PX Prices



But prices have not always been so volatile in California. Thus, on April 1, 1998, prices ranged from a low of zero at 2 am to almost $25 per MWH (2.5 cents per KWH). The hourly pattern throughout that day is shown in Figure 4. Note that a price of zero did not attract media attention, nor did it invite claims of "market failure."

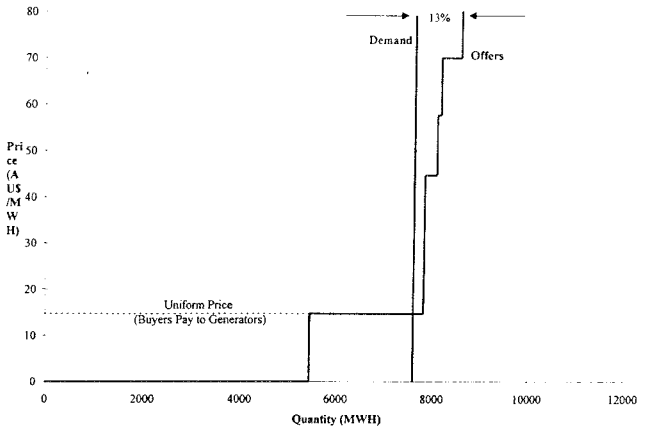
Figure 4. Unconstrained Market Prices
California PX, April 1, 1998



To illustrate the problem of price spikes, and how they occur, Figure 5 shows the generator supply bids for power in the Australian spot market for which we have compete data on a particular hour back in 1996 near the beginning of the Australian market. In this real live example most (up to 5500 MWH) bids to supply energy were at a price of zero. These zero bids are from baseload generators offering to sell at any price they can fetch. Then there is a supply step offering an additional 2400 MWH at about $15 per MWH. These are the load following generators. Next, there are small additional increments of power offered at $45, $56 and $71 per MWH. Consumption demand is about 7600 MWH yielding a spot price of $15, as indicated, which is received by all generators who bid at this price or less up to the total demanded. Note, however, that if demand had been 8000 MWH the price would be $45; at 8200 MWH the price $56; at 8600 MWH the price would be $71. Hence, small changes in consumption produce large leaps in price. Indeed, only a 13% increase from 7600 to 8600 would have cause price to increase by 273%. Finally, note that the price would have been zero if demand has been 5000

MWH. This sensitivity to large changes in price for small changes in demand explains the price spikes in California and earlier in the Midwest and East.

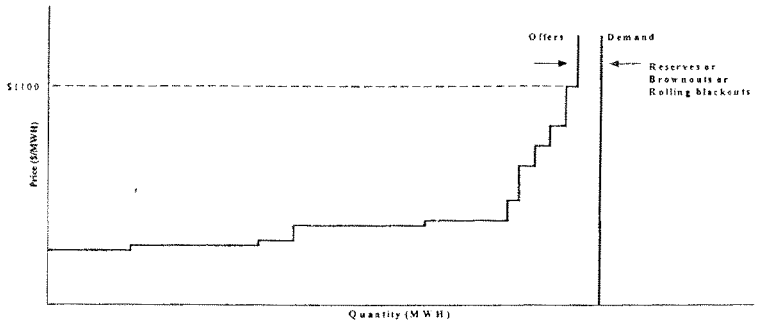
Figure 5. Price Determination in the Australian Electricity Market



Source: This graph is drawn from Hugh Outhred's presentation entitled, "Australia: Spot Trading Results and Implications for Ancillary Services," 5 January 2000. The data are for the 17 May 1996, targeting 20:00.

So what happened in California to bring the higher price level and extreme price spikes shown in Figure 3, along with occasional blackouts? Very simply, the demand was at or above the highest price supply units offered to the market. The shortfall in supply, as shown in Figure 6, was provided from (1) emergency reserves; (2) brownouts (reduced power causing lights to dim); or (3) rolling blackouts.

Figure 6. Illustration of a "Shortage" and Price Determination on the CAL PX on Peak



CAUSES OF THE CRISES

The primary rationale for deregulation is to allow the time variation in wholesale cost to be reflected in corresponding time variable prices paid by bulk buyers and received by generator sellers. This should provide incentive signals to consumers as to where and when to conserve, and to suppliers as to what forms of investment are most profitable and efficient. What has been missing are the needed market and metering mechanisms for passing wholesale price variations through to the end user. Hence, the root cause of the crisis in California and the high temporary price spikes elsewhere, has been the failure in spot market design to

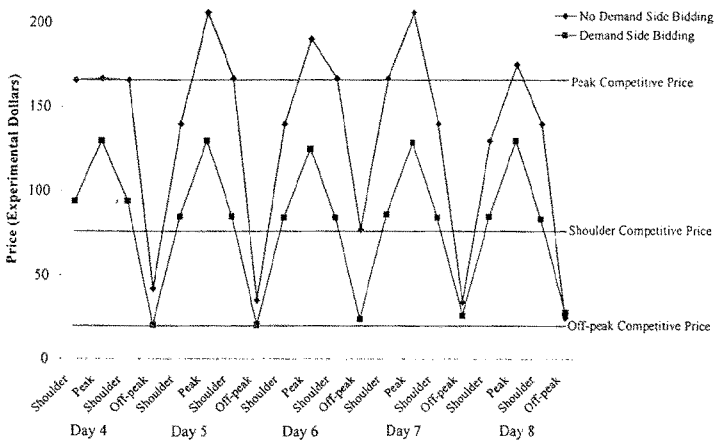
1. encourage and make explicit provision for strategic demand side bidding by wholesale buyers,
2. implement such provision by introducing time-of-day pricing at the end user's consumption points, and
3. invest in the required control switching technology for selective, voluntary reduction of the lower priority uses of electricity during peak hours. This can

be accomplished directly by the end user who invests in a load management system. It can also be provided by contractual agreements between the utility and the consumer allowing the utility to shut off selected appliances or circuits (washers, dryers, air conditioning, etc.) for limited times. In this case the utility (or a competing supplier) manages a rolling blackout of only those lower consumption priorities approved by the customer.

EFFECTIVENESS OF DEMAND RESPONSIVE PRICING TO THE END USE CONSUMER

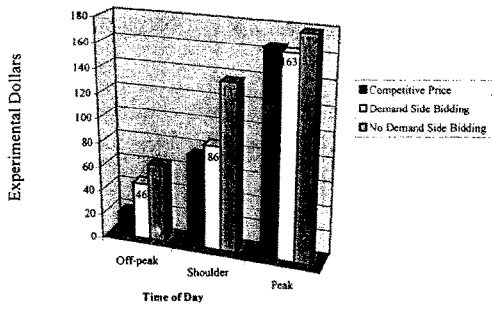
Based on our laboratory research we can compare prices over a daily cycle (for simplicity, consisting of six 4-hour block pricing periods in each experimental 'day') as shown in Figure 7. In the experiments, because the experimenter controls buyer value and seller costs we can identify competitive equilibrium prices on the 'shoulder' demands (between off and on peak), on-peak demand and off-peak demand. In the experiments, demand cycled each 'day' from a shoulder period to peak, back to a shoulder, and finally to off-peak. This cycle was then repeated. In Figure 7 we show the data for 'days' 4 through 8 for a particular week in one experiment. The price in every comparison period of each 'day' is lower with price responsive demand side bidding than when there is no demand responsivity.

Figure 7. An Example of the Effect of a Responsive Demand



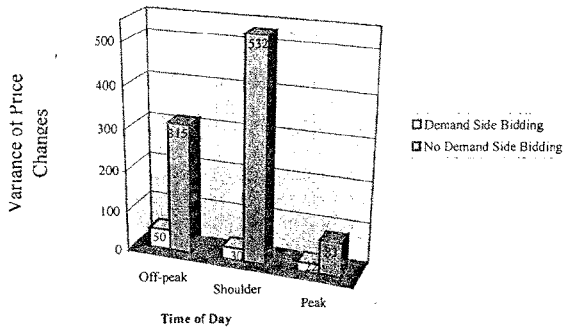
On average across all experiments prices are lower with demand side price response than without, as shown in Figure 8.

Figure 8. Average Prices



Finally, the volatility of prices, or variations in price changes from period to period is very low by comparison when demand is price responsive. This is shown in Figure 9.

Figure 9. Variance of Changes in Price from Day to Day



SUMMARY

1. With only 16% of peak demand interruptible to end users, our experiments suggest that retail time-of-day prices can be substantially lowered, and price spikes eliminated.
2. Such interruption can be entirely voluntary with consumers finding it in their interest to consume less on peak in order to capture the savings from time-of-day retail pricing. In currently structured markets elevators carrying passengers have the same high priority as porch lights left on in the daytime, and constitutes a highly irrationally structured market.
3. by rolling selective voluntary power interruptions, blackouts of whole neighborhoods can be avoided, except under extreme weather conditions when they are unavoidable.

4. The California crisis is a direct consequence of a failure to introduce time-of-day retail prices that reflect highly variable time-of-day wholesale prices, and generator costs.
5. What must change is the cultural mindset of local utility managers and their customers which has been inherited from state regulation. This mind set is that all retail demand must be served without regard to the differences in individual consumer's willingness-to-pay for energy. This mind set will change with full-cost time-of-day pricing, which will have the effect of incentivizing customers to prioritize their use of energy, making demand voluntarily responsive to prices.
6. The effect of these changes will be to create a far more efficient and smoothly functioning market that will not require government intervention. It will enormously benefit the environment by reducing the growth in demand for energy and transmission capacity, and thereby reducing air pollution and unsightly power lines.

Thank you, Mr. Chairman. I look forward to answering whatever questions you and your colleagues have.

References:

Available at http://www.econlab.arizona.edu/power/.

Rassenti, S., V. Smith, and B. Wilson. "Controlling Market Power and Price Spikes in Electricity Networks: Demand-Side Bidding," Economic Science Laboratory Working Paper, University of Arizona, December 2000.

Rassenti, S., V. Smith, and B. Wilson. "Demand Side Bidding Will Control Market Power, and Decrease the Level and Volatility of Prices," *Regulation*, forthcoming.

Rassenti, S., V. Smith, and B. Wilson. "Using Experiments to Inform the Privatization/Deregulation Movement in Electricity," *The Cato Journal*, forthcoming.

Consumer Choice Will Reduce Electricity Prices and their Volatility
Results of Experiments Conducted at the Economic Sciences Laboratory at the University of Arizona

Facts

- Deregulating wholesale electric utility prices in the U.S., including California, has involved a process in which wholesale buyers of electricity provide retail customers with a guaranteed and uninterruptible supply of energy regardless of the customer's needs or individual circumstances.
- Retail customers are commonly shielded from the normal daily and seasonal fluctuations in the cost of electricity generation by paying a flat rate. The actual cost of generating extra electricity in late afternoon can be 7-8 times as much as in early morning.
- This has caused significant stress to electricity distributors who were exposed to dramatic wholesale price spikes in the Midwest last year and in California this year. Distributing firms have sometimes paid 10 times more for electricity than they resold it at retail.

Experiment

- An alternative form of purchasing electricity service, that is typical in many other industries including long distance phone service and airline ticket travel, was tested in experiments at the internationally recognized Economic Science Laboratory at the University of Arizona. This alternative form of purchasing allows and encourages end-users to voluntarily alter their access to electricity at various times of day and year in return for significant price discounts.
- In these experiments, profit motivated buyers and sellers of electricity within a network of three major centers of consumption and generation bought and sold electricity in markets where demand moved through realistic cycles.

Results and Conclusions

- High prices and the tendency for upward price spikes to occur when supplies are tight are dramatically avoided, even in circumstances where only 16% of the peak demand can be interrupted through voluntary bids submitted by buyers.
- California and the rest of the country can avoid price shocks by redesigning their markets to provide incentives for wholesale buyers to introduce simple technologies allowing energy demand to be voluntarily reduced by customers willing to consume less, or shift to a different time in return for a discount on their electricity bills.
- Such incentives lower short run electricity prices, promote appropriate conservation, reduce the need for emergency reserves, save investment in new generation and transmission lines, and reduces the emission of airborne pollutants and the need to build unsightly facilities.

Demand Side Bidding Will Reduce the Level and Volatility of Electricity Prices[*]

by

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March 2001

With the move to deregulate wholesale electric utility prices in the United States, each state or region needed to develop a plan for restructuring their industry and defining the auction market rules that would determine the hourly wholesale price of energy. Universally, these new markets employed supply side bidding mechanisms (mostly designed by intermediaries, consultants and the supply side, with an acquiescent demand side) in which generator firms submitted offers to supply whatever quantity of energy would be demanded by wholesale buyers for resale to end-users at regulated prices. This meant that any end-user, regardless of the individual circumstances of that consumer's need for an uninterruptible flow of energy, would be guaranteed that his demand would be satisfied. This policy of meeting all "must serve" demand, as the industry likes to call it, was inherited from a rigid regulatory system that politicized the reliability of service to all consumers without regard to cost, or to differing consumer priorities for service, and corresponding differences in the willingness-to-pay for the reliability of those services. Consequently, retail consumers were shielded from exposure to the great natural variability in energy cost from nighttime lows to daytime highs and across seasons by averaging these cost variations into flat rate prices.

The driving justification for deregulation is to improve performance by exposing the industry and its customers to real time cost-based price signals, a policy that has worked well in the transportation (air, truck, rail) and natural gas industries. Unfortunately, in electricity, deregulation in wholesale markets has not been accompanied by concurrent attention to the deregulation of retail markets, and this has exposed the industry to unusual stresses comparable

[*] For a more detailed discussion, see our paper entitled, "Controlling Market Power and Price Spikes in Electricity

to the energy crunch of the 1970s. The fact that there are very limited cost effective methods for producing and storing electricity off peak, to be consumed later on peak, means that peak consumers account for the required higher energy and investment costs incurred to satisfy their demand. Efficient pricing requires on peak consumers to pay substantially higher prices than for off peak consumption, since peak unit cost can easily be 10 or more times the off peak cost.

The same need to meet instantaneous demand applies to the unregulated prices of the motel industry. Competition in that industry long ago routinely guided the emergence of variable seasonal, and time-of-week, demand responsive prices for room accommodations, with no noticeable cultural shock to alert the news media.

Beginning three years ago in the Midwest and Southern wholesale markets summer peak prices reached levels of 10 and occasionally 100 or more times the normal price of $20-$30 per megawatt hour. This was the predictable direct consequence of completely unresponsive retail demand impinging on a discretionary responsive supply. Recently, California has been plagued by similar increases in spot prices because of supply shortages, together with insufficient investment in switching technologies that allow selective interruption of low priority uses of power at high cost peaks in demand. In Figure 1 we plot a time series of hourly wholesale prices over a typical week on the California PX (spot exchange), now shut down through the intervention of Governor Davis.

The high general level of these prices and the tendency for upward price spikes to occur when electricity supplies are tight has been shown to be avoidable in markets where no more than 16% of the peak demand can be selectively interrupted through discretionary bids submitted by wholesale buyers. This new study is based on laboratory experiments using profit motivated buyers and sellers of energy in a network with three major centers of consumption and generation in which demand cycles through transitional shoulder, peak and off-peak levels. Figure 2 compares average prices and the volatility of prices, with and without demand-side bidding for each of the three demand levels in these experiments.

California and the rest of the country can avoid these price shocks by redesigning their markets to provide better incentives for bulk buyers to introduce technologies allowing energy flows to be voluntarily reduced to customers willing to consume less in return for a discount on their electricity bills. The switching technology for the temporary appliance-specific interruption

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Networks: Demand-side Bidding." The paper can be downloaded at http://www.econlab.arizona.edu/power/.

of energy deliveries to customers, by contractual agreement, has long been available. Newer technologies are available for demand management directly by households with time-of-day metering. What has been missing in utility management has been aggressive investment in the provision of customer incentives for allowing such technologies to be implemented. Trained for a century to function within a regulatory framework, it does not come naturally for such management to think in terms of profiting from the enormous savings in wholesale energy cost to be realized by buying less. Ironically, in the end, California utilities have been forced to impose involuntary area-wide brownouts and rolling blackouts on their customers, treating all with equal priority, including those stranded in elevators. A small fraction of the billions lost by the California distributors, if invested in demand responsiveness, could have stopped the hemorrhaging of their treasuries, and turned them a profit. Instead they counted on their commission to allow an increase in their average rates, which addresses neither the root problem or the need to get management to focus on prioritizing their demand instead of on their regulatory commission as a source of net profit.

Various pundits—regulators, the media and government officials—have suggested alternatives to a demand responsive spot market, such as wholesale price ceilings, and long term contracting for generation. But wholesale price volatility is entirely appropriate given the large daily variation in producer costs—the anomaly is the attempt to maintain a fixed regulated retail price. Long term contracting is simply a negotiated means of fixing (averaging) the wholesale price over the cycle for the contracting parties. It does nothing to facilitate the adjustment of time-of-day demand to cost variation. This must occur through a robust spot market.

A policy of decentralizing the demand side of the market to allow free choice is both more flexible and much less costly than allowing the utilities to recover their energy purchasing cost by a regulated new levy on all consumers. The latter policy provides all the wrong incentives for conservation as a competitive alternative to more investment in high cost peaking capacity. Empowering buyers will lower short run electricity prices, while reducing the need for emergency reserves when transmission line or generator outages occur, save investment in new generation and transmission lines, and reduce their resulting impact on the environment.

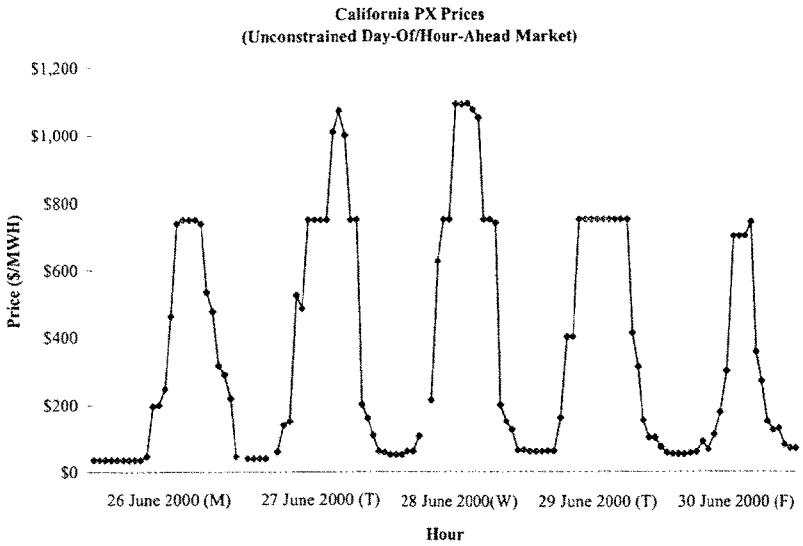
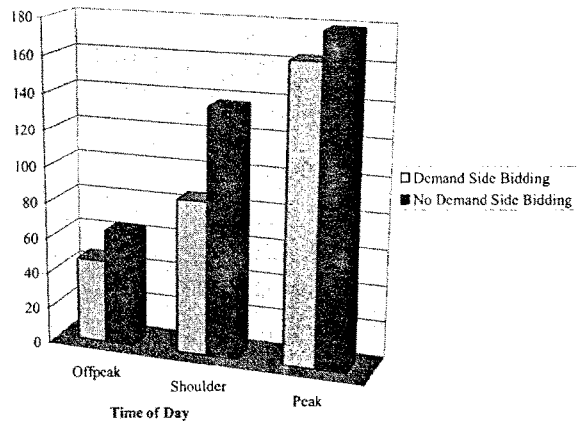

California PX Prices
(Unconstrained Day-Of/Hour-Ahead Market)
$1,200
$1,000
$800
$600
$400
$200
$0
Price ($/MWH)
26 June 2000 (M)
27 June 2000 (T)
28 June 2000(W)
29 June 2000 (T)
30 June 2000 (F)
Hour

Figure 1

Average Electricity Prices



Variance of Changes in Electricity Prices from Day to Day

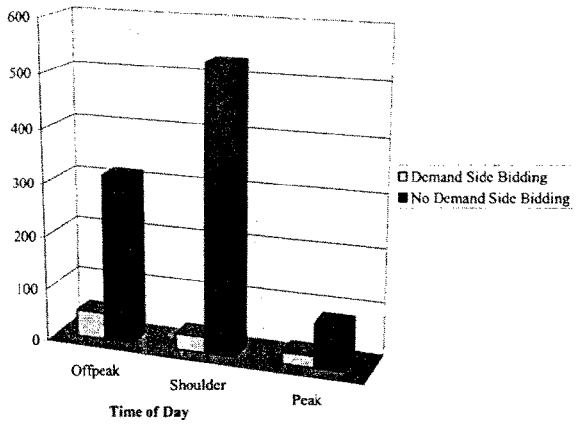


Figure 2

Discriminatory Price Auctions in Electricity Markets: Low Volatility at the Expense of High Price Levels[*]

by

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May 2001

Abstract: A 'pay-as-offered' or discriminatory price auction (DPA) has been proposed to solve the problem of inflated and volatile wholesale electricity prices. Using the experimental method we compare the DPA with a uniform price auction (UPA), strictly controlling for unilateral market power. We find that a DPA indeed substantially reduces price volatility. However, in a *no* market power design, prices in a DPA converge to the spike price of a uniform price auction *with* structural market power. That is, the DPA in a no market power environment is as anti-competitive as a UPA with structurally introduced market power.

JEL Classifications: L13, L94, C92

Keywords: electric power, deregulation, experimental economics

[*] We thank Richard Kiser and Jody Toutant for writing the *Power 2K* software for these experiments, and Prashanth Murthy and Benjamin Toff for help with running the experiments. All errors are our own. The data are available upon request from the authors.

1. Introduction

In the electricity industry, where a few points of exchange efficiency are worth tens of millions of dollars, the danger persists that policy makers design new institutional rules for a complex trading arena on the basis of testimonial conjecture. For example, in November of 2000 just prior to the demise of the California Power Exchange (CPX), CEO George Sladoje wrote an open letter announcing that, because of public pressure, a Blue Ribbon Panel had been formed to examine the PX's policy of running a uniform-price rather than pay-as-offered auction for electricity. Apparently, during the ongoing investigations into the upheaval in California prices, several parties had suggested that switching the PX to use of a 'pay-as-offered' auction would go a long way toward curtailing inflated and volatile wholesale electricity prices. Some had gone as far as suggesting that providers of electricity should retroactively be required to refund any 'profit' above their offer prices that had been accumulated because of the uniform-price rule. Meanwhile in England, one of the pioneering nations in the adoption of free-market electricity pricing, the New Electricity Trading Agreement (NETA) reflected the same dissatisfaction with a centrally managed uniform-price day ahead sealed bid market. In April 2001, the British implemented a new institutional regime: bilateral forward trading between wholesale providers and distributors,[1] combined with a voluntary 'pay-as-offered' last minute balancing market which would deal with system constraints (essentially, the new spot market). In this paper we test the chief publicized justification for implementing a 'pay-as-offered' discriminatory price auction in these electricity network markets—reducing price volatility and average price paid in trading environments with minimal demand elasticity, cyclical demand uncertainties and an absence of significant excess generation capacity.

2. Market Institution, Structure, and Design

In this paper we use the electricity network-trading environment that we developed in Rassenti, Smith, and Wilson (2000), hereafter, RSW, to examine how a discriminatory price (sealed offer) auction (DPA) affects seller behavior and market performance. We measure the DPA against the uniform price (sealed offer) auction (UPA) that we previously studied with three experimental treatment variables (unilateral generator market power, transmission line constraints, and demand-side bidding) in RSW. Comparisons of buyer-bid UPA and DPA institutions exist for simpler

[1] Olson et al. (2001) compare bilateral trading with a uniform price sealed offer spot market to find less efficiency in the former, though it may be the case that it is the preferred alternative of risk averse wholesale participants in a forced departure from a regulatory regime.

environmental contexts. In a single unit (per buyer) demand environment, Cox et al. (1985) could not distinguish a significant revenue effect with the institutional treatment. In a multi-unit stationary demand and fixed supply environment, where truthful revelation constituted a Nash equilibrium, Miller and Plott (1985) found that the DPA/UPA generated higher revenues when demand was inelastic/elastic. The RSW environment that we use has a stationary supply but cyclic demand where truthful revelation does not constitute a Nash equilibrium. Alsemgeest et al. (1999) show that in non-stationary two-unit demand fixed supply environments, a UPA produces bids above the Bayes-Nash prediction—better revelation than expected. They do not test a DPA in their environment.

2.1 Auction Institution

The primary objective of this paper is to compare the impact on spot prices of electricity market pricing rules (*Uniform vs Discriminatory*), while holding constant all other features of the system—the costs and structure of supply, and the resale values and structure of demand. Because accommodations for demand-side bidding have not been included in naturally occurring electricity markets, a computer is used to submit bids that exactly reveal the demand in all our experiments. In the *Uniform* treatment, sellers privately submit, in each (spot) pricing period, a schedule of offers or asking prices for their generation capacity. The offers and the computerized bids are then sent to an optimization algorithm to maximize the total gains from trade in the network. In essence this reduces, in this simple environment, to arranging the offers from lowest to highest and the bids from highest to lowest and finding the allocation of offers that maximizes surplus, taking into account minor losses in transmission. Where the bid-ask (reported demand and supply) schedules intersect determines how many units of electricity that each seller will sell. Any offers less than the price at which the bid and offer schedules cross will sell, but at a price equal to the submitted offer price. Tied offers (at the same node) are accepted on a first-submitted, first-served basis. At each node all generators receive the same price. This treatment parallels the energy markets in most regions that have instituted hourly spot markets, except that in our markets we make no provision for bilateral contracts, secretly priced outside the exchange; all energy transfers pass through our spot market. In the second experimental treatment, the *Discriminatory* auction, generators do *not* receive the same price at each node. Information is solicited and processed in exactly the same manner as in the *Uniform* treatment, but the owner of each accepted offer receives as his/her price the amount of his/her offer.

2.2 Unilateral Market Power

For the strongest comparison of the *Uniform* and *Discriminatory* treatments, we desired an electricity network-trading environment that strictly controlled for structural features of market power. In a UPA for a given distribution of ownership of capacity, a firm is said to be able to exert unilateral market power when it can *profitably* and *unilaterally* submit an offer schedule above its marginal costs (or equivalently withdraw some generating capacity) causing the market price to rise above the competitive level.[2] We will assume that the benchmark auction institution is the UPA. Following this analysis, we will discuss the DPA.

To see how we control for potential market power incentives, consider aggregate supply and demand arrays reported in Tables 1 and 2 and depicted in Figure 1. As discussed above, we assume and implement the condition that the buyers perfectly reveal their willingness to pay. The second and third steps of the demand in Table 1 represent interruptible units of demand, whereas the units on the first step at 226 are the so-called "must serve" or inelastic units. The interruptible demand steps of each wholesale buyer represent contracts with retail customers who allow energy flow to be interrupted if the wholesale price rises to the level of the step or greater. The level of "must serve" demand varied among 3 levels: 6 units in off-peak periods, 15 units during shoulder periods, and 21 units during peak periods.

In our three node radial network there are five generation firms (or sellers) denoted by an "S" and an identification number. In what we will call the *No Power* treatment, two sellers, *S1* and *S2* own four units of low cost (Type *A*) baseload generation capacity at opposite ends of the network. *S3* owns three units of high cost generation peak capacity (2 Type *D* and 1 Type *E*) at the center node. The final two sellers, *S4* and *S5* each have two units of baseload (Type *B*) and two units of peak capacity and are also located at opposite ends of the network. Most importantly, note that each of the five sellers also owns two units of intermediate cost (Type *C*) generation capacity at their respective nodes. Our focus will be on these intermediate units during the shoulder demand periods.

During the shoulder periods, the competitive price is equal to the marginal cost of the intermediate generators. More importantly, in this *No Power* treatment, notice that not a single seller can unilaterally withdraw (not submit offers for) any units of generation so that the price rises above the competitive level. At the competitive price of 76, *S1* and *S2* both earn a profit of 224 [(76 –

[2] In the context of Bertrand, capacity-constrained competitors, Holt (1989) defines a game-theoretic formalization of market power arising when one or more firms can deviate *profitably* and *unilaterally* from the competitive outcome.

20) × 4 units]. If any one of the five sellers unilaterally raises his offer on his intermediate units, the price will remain at the competitive level; the competitive price is a pure strategy Nash equilibrium with a UPA.

Market power, however, can be introduced merely by transferring two of *S4*'s and two of *S5*'s intermediate units to *S1* and *S2*, respectively. We will call this the *Power* treatment. With this seemingly minor reallocation of capacity at Nodes 1 and 3, either *S1* or *S2* can unilaterally increase his profit by offering his four units of intermediate cost generation capacity at supra-competitive levels in the shoulder period and consequently raise the market price above the competitive level. Both *S1* and *S2* can unilaterally withdraw (not submit offers for) four units of generation entirely so that the price rises to the third step of the supply curve (166), where four units of peaking capacity contest any further attempted increase in price (see Figure 1). Alternatively, either *S1* or *S2* can increase the offer price for his intermediate cost generation capacity so that his offer sets the market price. At the competitive price of 76, *S1* and *S2* both earn a profit of 224 [(76 – 20) × 4 units]. If either *S1* or *S2* raises his offer on his intermediate units to 166, the price-setter's profit rises to 584 [(166 – 20) × 4 units].[3] This unilateral deviation is even profitable at a price of 96, the third shoulder demand step, where *S1* and *S2*'s profit would be 384. It is important to note that it requires only one of the two sellers *S1* or *S2* to undertake this profitable action that reduces his volume sold but, in a UPA, creates benefits all other sellers. Either one of *S1* or *S2* will be even better off by not having reduced his sales volume if the other seller withholds supply to raise the price. Thus, each has an incentive to free ride on the increased offer price of the other.

Notice that in both the *No Power* and *Power* treatments no firm can exercise market power during peak demands; all unilateral deviations are unprofitable. *S1* and *S2* can exert some market power during off-peak demands by raising the offers on two units of baseload generation capacity, regardless of the allocation of intermediate capacity. The theoretical upper bound on the price during off-peak demand is 76, the cost of intermediate generation capacity. The market power incentives in the off-peak demand provide the subjects with a profit opportunity during the off-peak periods, and function as a common control across sessions in both the *No Power* and *Power* treatments.

How does the DPA affect the offering behavior of the sellers in the *No Power* design in the shoulder period? Since the sellers receive a price equal to their offer, sellers no longer have an incentive to reveal the costs of their baseload units. Sellers have an incentive to bid ε less than the

last accepted offer on *all* of their units, baseload and marginal. Moreover, the competitive price no longer has the same drawing power, even in the *No Power* design, because the incentive is to bid ε less than the last accepted offer, which may or may not coincide with the competitive price.

2.3 Experimental Design

Table 3 summarizes our experimental design. We originally planned to conduct a balanced 2 × 2 design, which would include the interaction of the *Power* and *Discriminatory* treatments, but as we discuss below, the results of the *No Power/Discriminatory* treatment were so strongly anti-competitive that there was little room to observe a significant *Power/Discriminatory* effect. We analyze the data using a mixed-effects model for repeated measures on each of several sessions using different subjects [see e.g., Longford (1993)]. The results from estimating this model by level of demand are given in Table 4. As a common metric across treatments, the dependent variable is the difference between the observed price (*Price*) and the competitive price, P^c. For each period, *Price* is defined as the production-weighted price received by all of the sellers in the network. In the *Uniform* treatment, all units generated at each node trade at the same price, but in the *Discriminatory* treatment, the sellers are paid the price of their bid for each unit. The treatment effects (*Power* and *Discriminatory*) are modeled as (zero-one) fixed effects, whereas the sessions are modeled as random effects, e_i. Specifically, we will estimate the model:

$$Price_{ij} - P^c = \mu + e_i + \beta_1 Power_i + \beta_2 Discriminatory_i + \varepsilon_{ij};$$

where the sessions are indexed by i and the repeated market days by j.

3. Procedures

To test how the behavior and market performance differs in electricity networks with UPA and DPA, we conducted twelve market experiments using students at the University of Arizona. Four sessions for each cell in Table 3 were conducted using the *Power 2K* software we developed. Each session lasted approximately ninety minutes. The combined eight sessions for the *No Power/Uniform* and *Power/Uniform* treatments were previously reported in RSW. The four new sessions for the *No Power/Discriminatory* treatment are reported here and compared with the RSW baselines.

We provided the subjects in each market with complete and full information on the market supply structure; i.e., every firm's generation capacity, marginal costs of generation, and the position

[3] The firm that does not raise his offer realizes a profit of 944 ((166 – 20) × 4 units + (166 – 76 × 4 units).

in the network were public information. Information on demand, however, was not given to the subjects.

The subjects were told that the costs and the generation capacities for each seller would not change during the experiment, but that the maximum number of units that the buyers may purchase and the willingness to pay for those units would vary by period. In particular, the subjects were informed that the buyers would have three different levels of demand during each "market day", with 'Low Demand' indicating a willingness to buy fewer units at lower prices, 'Medium Demand' indicating a willingness to buy more units at higher prices, and 'High Demand' indicating a willingness to buy the most units at the highest prices. Each session lasted for fourteen market days where each day was comprised of a four period cycle. A day began with a shoulder period, followed by one peak, one shoulder, and lastly, one off-peak period.

A subject had one minute to submit his offer each period. An offer was expressed as a step function indicating a schedule of prices and the maximum number of units at each of those prices that the subject was willing to generate.[4] A subject could at any time within the one-minute period revise his offer.

Each subject had participated in one trainer session two days earlier in the week. (The trainer session was comprised of six subjects in symmetric positions in a three node radial network that differed from the design in figure 1.) The best performers in the trainer session were used two days later to participate in the above designs, with the top performers assigned to the roles of *S1* and *S2*. Subjects were paid $15 total for showing up on time for both the trainer sessions and the sessions reported here. In addition to this show-up fee, the average earnings per subject for the data discussed here was $21.25.

4. Results

Figure 2 illustrates the production-weighted price paths for the four sessions in each of the three treatment cells. All fourteen days of data by level of demand (period) are grouped together and then sequenced by how the demand varied over a market day: shoulder 1, peak, shoulder 2, and off-peak. We evaluate the results with respect to the competitive prediction, and the value of the nearest

[4] The one-minute time frame was not binding because the subjects had prior experience with a three-minute period that was far from binding in the trainer session.

unit of interruptible demand, shown as a solid and dotted line, respectively.[5] Given that the computerized demand submits fully revealing bids, we expect ex ante that the sellers will push up their offers to the nearest unit of interruptible demand. These prices, however, are still 100% efficient.

From the figure, it is apparent that the *Discriminatory* condition affects performance markedly. For sessions conducted under the baseline *No Power/Uniform* treatment, the mean price path in the shoulder periods tends to hover within the efficient price range without much variance. Higher prices are observed in sequences conducted under the *No Power/Discriminatory* treatment. (Data at the session level will also be presented below.) Further evident from the figure is that in the peak periods prices do not differ in the *No Power/Uniform* and *No Power/Discriminatory* treatment, but differences exist in the off-peak period prices even though all 8 sessions make identical predictions under off-peak demand conditions. These latter observations provide measures of spillover or hysteresis effects on periods that are theoretically immune from all treatment effects.

In what follows, our new experimental results are summarized as a series of four findings. In addition to the qualitative results displayed in Figure 3, we employ a mixed-effects model for analyzing data with repeated measures (over 14 market days) as the basis for quantitative support. The results from estimating this model by period type (shoulder 1, peak, shoulder 2, off-peak) are given in Table 4. The sessions are indexed by $i = 1,\ldots,12$ and the days by $j = 1,\ldots,14$. We begin with our previous finding of pricing performance in the *No Power/Uniform* treatment.

***Previous Finding** [RSW]: Markets in the* No Power/Uniform *treatment quickly stabilize in the 100% efficient outcome range, but above the strict Bertrandesqe competitive equilibrium. This is true for all levels of demand, but most noticeably in the shoulder periods.*

Support: Figure 2 displays in blue the prices for all four sessions in the *No Power/No Line Constraint* treatment. Only for 7 out of 112 observations in shoulder periods (4 sessions × 2 shoulder periods/day × 14 days) does the price exceed the value of the last interruptible units of demand (96). Single sellers in each of the second and fourth sessions are unable to maintain higher prices by restricting output by four units or more. For the peak demand periods, prices are only above competitive levels on 5 occasions, save session 3, which is able to support slightly supra-competitive

[5] For brevity, the results are presented exclusively in terms of price outcomes. Results for efficiency parallel our price observations.

prices for the first 9 periods. In off-peak periods, prices are at first drawn to the competitive and zero profit level of 20, but *S1* and *S2* are successful in three of the sessions in pushing the price toward 76 ($\mu > 0$), the marginal cost of the intermediate capacity. Quantitatively, Table 4 reports that the prices in the *No Power/Uniform* treatment are statistically greater than the strict competitive predictions at marginal cost in figure 1. However, in the shoulder periods, the prices are not greater than the last interruptible unit of demand, 96.■

Consider now the effects of changing the auction institution from a UPA to a DPA. We summarize our results for this treatment.

Finding 1: *Ceteris paribus, changing the auction institution from a UPA to DPA significantly raises prices in shoulder and off-peak periods. The* Discriminatory *treatment has no effect on prices in peak periods, where relatively considerable excess capacity exists.*

Support: Panel (a) in Figure 2 clearly illustrates that for the shoulder periods market prices in the *No Power/Discriminatory* design (in brown) are greater than in the *No Power/Uniform* design. In each of the four *No Power/Discriminatory* sessions the production-weighted price starts low with two of the sessions starting at the same price level as the *No Power/Uniform* sessions. However, within two or three trading days, the price shoots up and remains stable across days. There is no discernable separation in peak period prices. Off-peak prices are initially much higher in the *No Power/Discriminatory* treatment, and remain higher on average even though two of the *No Power/Uniform* sessions experience increases in off-peak prices. These qualitative observations are supported by estimates from the mixed-effects model in Table 4. In the shoulder 1 (shoulder 2) periods, the *No Power/Discriminatory* treatment significantly raises prices above the *No Power/Uniform* level by 47.5 (50.7) experimental dollars [*p-value* = 0.0000 (0.0000)]. The total primary effect of *No Power/Discriminatory* is to raise the prices above the competitive level by 66.8 = 19.0 + 47.8 (69.2 = 18.5 + 50.7) experimental dollars. The prices in peak periods are not significantly greater in the *No Power/Discriminatory* treatment (*p-value* = 0.5067). In the off-peak period, prices are 43.8 experimental dollars greater than the *No Power/Uniform* baseline (*p-value* = 0.0014). ■

Why are the prices so much higher with a DPA than a UPA? Our third finding reports that all sellers submit substantially higher offers curves for all units, baseload and marginal.

***Finding 2**: Relative to a UPA, the revealed surplus drops considerably in a DPA as all sellers submit higher offer schedules for all of their units.*

Support: Figure 3 provides the support pertinent to this finding. This figure displays the average market offer curves for the shoulder periods for each of the 4 *No Power/Uniform* and the 4 *No Power/Discriminatory* sessions. The kth step of the average market offer curves is the average offer for the kth step across all shoulder periods in a session. Hence, there are a total of 28 observations (14 days × 2 shoulder periods per day) included in the average at each step. Notice that the *No Power/Discriminatory* offer curves are always higher for every step of the curve, save the first step of one session. While not displayed for the purposes of brevity, similar behavior is observed in both the off-peak and peak periods. ■

One dimension that is lost in Finding 2 and Figure 3 is the extent to which sellers increase their offers over the course of 14 market days. Figure 4 displays the average of the four *No Power/Discriminatory* sessions for four distinct shoulder 1 periods, Day 1, 2, 7, and 14 (early, middle, and last days). Notice that the offer curves for the 10-18th units are distinctly higher than the offers for the initial day, and that process quickly begins in Day 2. Furthermore, as the market days progress, the offers for more baseload units rise to within a few experimental dollars of the highest price received.

For some perspective in the magnitude of treatment effects, we compare the changeover to DPA pricing to the introduction of market power in a UPA.

***Finding 3**: In shoulder periods, the DPA is as anti-competitive as a distribution of ownership that creates market power in a UPA.*

Support: Panel (b) in Figure 2 plots the production-weighted prices for the *No Power/Discriminatory* sessions discussed above with the *Power/Uniform* sessions. For all levels of demand, it is evident that prices are as high in the *No Power/Discriminatory* treatment as they are in the *Power/Uniform* treatment. Quantitatively, the estimated effects for the *Discriminatory* and *Power* effects are 52.5 vs. 47.5 in shoulder 1 and 43.9 vs. 50.7 in shoulder 2, respectively (see Table 4). These economically

similar effects are statistically different using a LR ratio test (p-values = 0.0501 and 0.0150 for shoulder 1 and shoulder 2, respectively. For the peak periods, both the *Discriminatory* and *Power* coefficients are insignificant individually (p-values = 0.7202 and 0.5067, respectively) and from each other (p-value = 0.7760). A LR ratio test also indicates that the two effects are indistinguishable in off-peak periods (p-value = 0.1342). ■

Because the prices are so anti-competitive in the *No Power/Discriminative* treatment, there is little room for a *Power/Discriminative* interaction, and hence cadit quaestio, for completing a 2 × 2 design. Finally, we consider the chief publicized justification for implementing a DPA in electricity markets—reduced price volatility.[6]

Finding 4: *The variance of price changes from day to day for the same level of demand is substantially lower with a DPA than with a UPA, though in shoulder periods the variance is essentially the same, holding the* No Power *design constant.*

Support: Figure 5 presents the summary statistics for the twelve sessions presented here. We use the last 10 days of each session to allow for the convergence of the observed prices evident in Figures 2 and 4. It is clear that the DPA reduces the volatility of prices in the off-peak and peak periods. In the shoulder period, the variances are nearly the same holding the *No Power* design constant (56 for the UPA and 52 for the DPA). ■

The DPA clearly performs favorably on the dimension for which it was proposed—price volatility. However, it clearly comes at a substantial cost. Holding the *No Power* design constant, prices rise by 85% in the off-peak periods (76 vs. 41) and 56% in shoulder periods (148 vs. 95). Only in the peak periods does the volatility fall while the level of prices remains the same. We conjecture that this is due to the greater excess capacity of our peak design (6 units), but significant excess capacity is not the situation for which the DPA was proposed to solve the volatility problem.[7] The germane level of demand to consider is the shoulder period in which we find that the DPA in a *No*

[6] See, e.g., Mount (2001).

[7] This design, with generation competitive at peak demand levels, but not at intermediate levels, illustrates the important principle that market power need not be associated only with peak demand conditions. Market power is about the ownership distribution of different generators classed by marginal cost, given a fixed and unresponsive demand.

Power environment is actually as anti-competitive, with respect resulting prices, as a UPA with structurally introduced market power.

5. Conclusions

In the dynamic electricity-trading environment tested in these experiments, the DPA reduces price volatility, at the cost of producing prices that converge, not to the competitive level, but to the level of the highest prices occasionally observed in the UPA with structural market power. Average prices in shoulder and off-peak periods increase, as the DPA constantly reminds participants that whenever their offers were accepted they almost always left money on the table. Under the conditions of cyclic and revealed inelastic demand, the DPA invites sellers to coordinate their offers at the highest previously observed price in a similar period, and we observe prices evolving to those that prevail under conditions of market power in RSW.

For policy makers the lesson is clear: experiments can demonstrate what the best reasoned of arguments may not be able to forecast in such complicated exchange environments. In the present case of wholesale electricity markets, the effort to ultimately insulate retail customers from price increases and volatility by using the suggested institutional manipulation, switching from UPA to DPA, will fail (ceteris paribus). However as shown in RSW, a sure solution to price control comes from inducing significant retail responsiveness to marginal wholesale prices in order to provide otherwise risk averse wholesale buyers the ability to strategically reduce demand in the competitive spot market.

Table 1. Demand Values

	Step 1 Value = 226	Step 2 Value = 206	Step 3 Value = 96
	Quantity	Quantity	Quantity
Node 1			
Off-peak	2	0	1
Shoulder	5	0	1
Peak	7	0	1
Node 2			
Off-peak	2	2	0
Shoulder	6	2	0
Peak	8	2	0
Node 3			
Off-peak	2	0	1
Shoulder	5	0	1
Peak	6	0	1

Table 2. Marginal Costs of Generation

Generator Type (Number)	Maximum Load	Total Load	Marginal Cost
A (2)	4	8	20
B (2)	2	4	20
C (5)	2	10	76
D (4)	1	4	166
E (3)	1	3	186
	Total	29	

Table 3. Experimental Design
(No. of Sessions; No. of Trading Days; No. of Trading Periods)

	Uniform	***Discriminatory***	Total
No Power	(4; 14; 56)	(4; 14; 56)	(8; 28; 112)
Power	(4; 14; 56)	(foregone, see p. 4)	(4; 14; 56)
Total	(8; 28; 112)	(4; 14; 56)	(12; 42; 168)

Table 4. Estimates of the Linear Mixed-Effects Model of Treatment Effects

$$Price_{ij} - P^c = \mu + e_i + \beta_1 Power_i + \beta_2 Discriminatory_i + \varepsilon_{ij},$$

$$\text{where } e_i \sim N(0,\sigma_1^2) \text{ and } \varepsilon_{ij} \sim N(0,\sigma_{2,i}^2).$$

	Estimate	Std. Error	Degrees of Freedom	H_a	t-statistic	p-value
Shoulder 1						
μ	19.00	0.27	156	$\mu \neq 0$	70.92	0.0000
Power	52.48	1.65	9	$\beta_1 > 0$	31.87	0.0000
Discriminatory	47.47	1.66	9	$\beta_2 \neq 0$	28.54	0.0000
			L.R. test	$\beta_1 \neq \beta_2$	3.84	0.0501
Peak						
μ	11.64	3.69	156	$\mu \neq 0$	3.15	0.0000
Power	-2.00	5.42	9	$\beta_1 \neq 0$	-0.37	0.7202
Discriminatory	-3.61	5.21	9	$\beta_2 \neq 0$	-0.69	0.5067
			L.R. test	$\beta_1 \neq \beta_2$	0.09	0.7660
Shoulder 2						
μ	18.47	0.36	156	$\mu \neq 0$	50.96	0.0000
Power	43.88	2.15	9	$\beta_1 > 0$	20.44	0.0000
Discriminatory	50.71	1.43	9	$\beta_2 \neq 0$	35.43	0.0000
			L.R. test	$\beta_1 \neq \beta_2$	5.91	0.0150
Off-peak						
μ	17.37	6.85	156	$\mu \neq 0$	2.53	0.0122
Power	28.72	9.76	9	$\beta_1 \neq 0$	2.94	0.0164
Discriminatory	43.78	9.65	9	$\beta_2 \neq 0$	4.54	0.0014
			L.R. test	$\beta_1 \neq \beta_2$	2.24	0.1342

Note: The linear mixed-effects model is fit by maximum likelihood with 168 original observations and 12 sessions. For purposes of the brevity the session random effects are not included in the table.

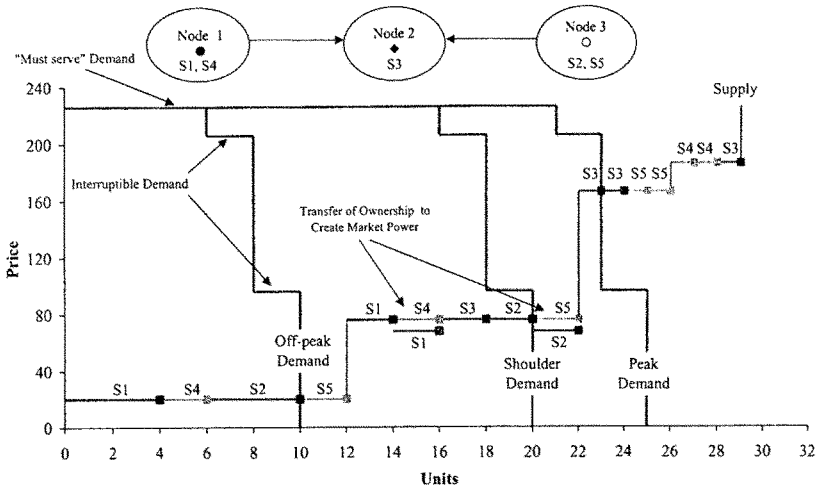
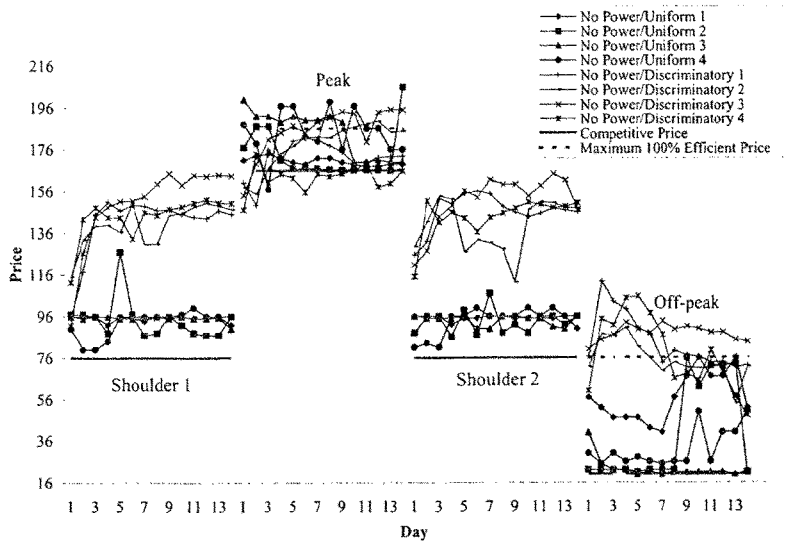
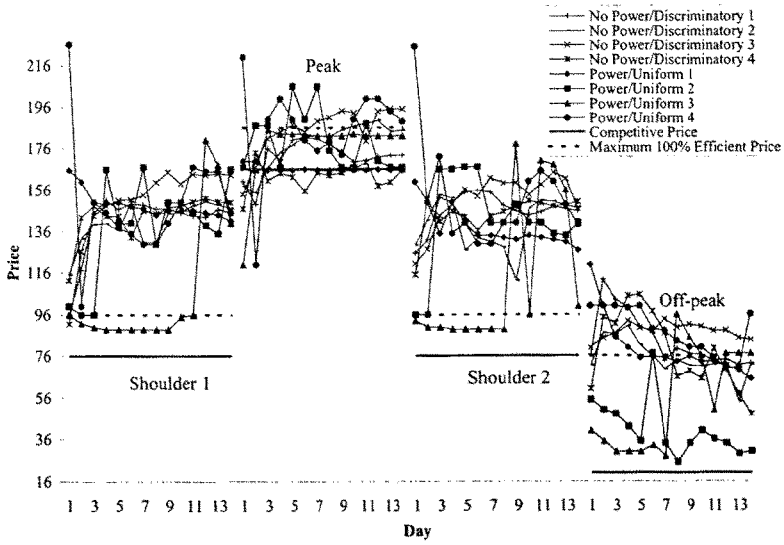


Figure 1. Market Structure and Design



(a) *No Power/Uniform* vs. *No Power/Discriminatory*



(b) *No Power /Discriminatory* vs. *Power/Uniform*

Figure 2. Production-weighted Session Prices by Level of Demand

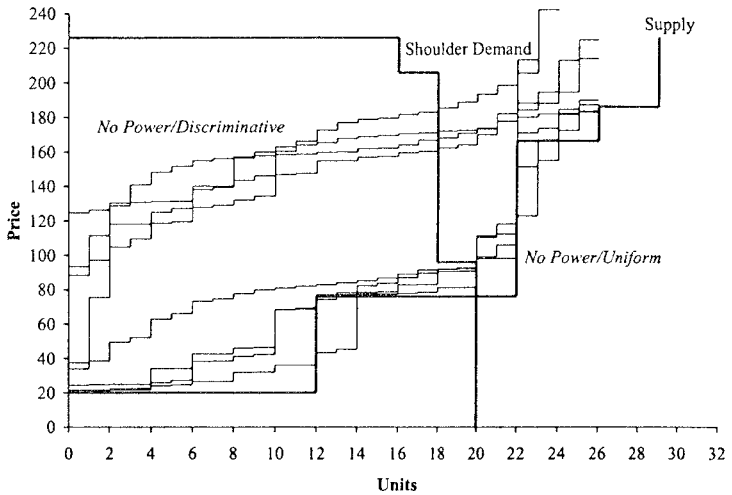


Figure 3. Average Market Offer Curve by Session

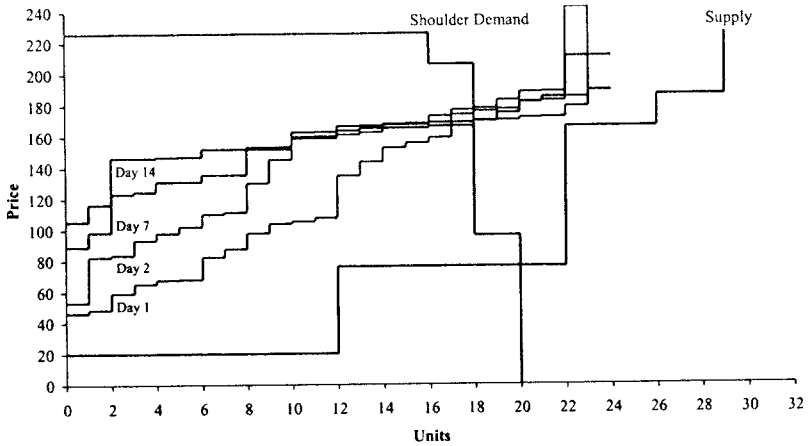
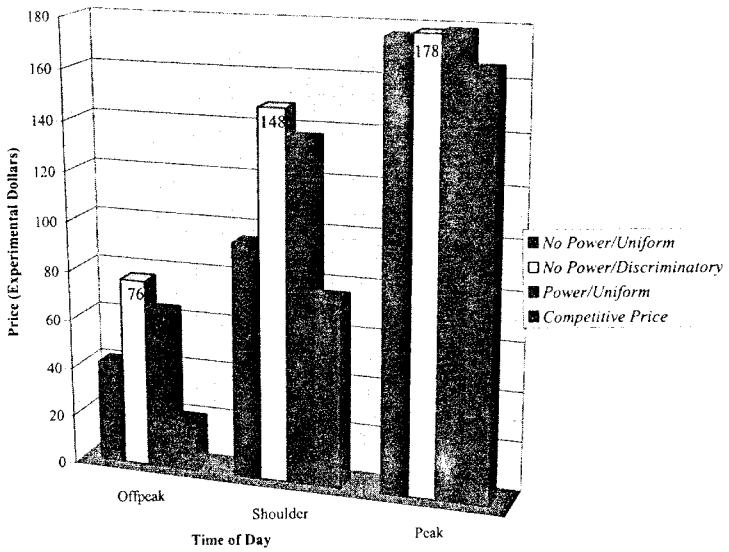
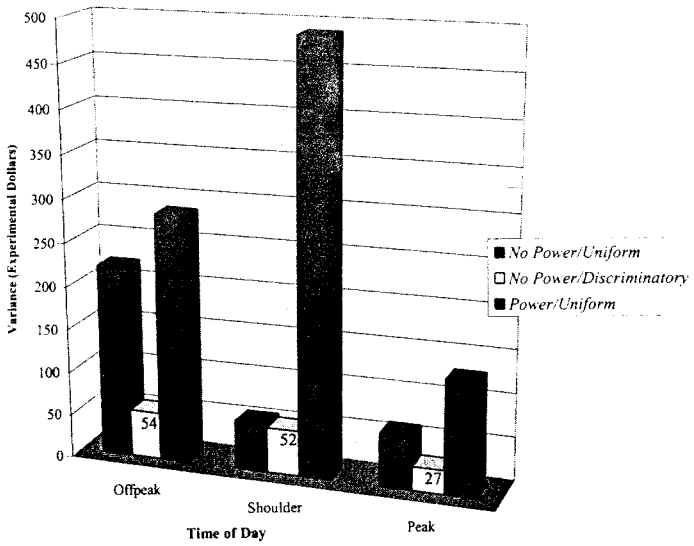


Figure 4. Convergence of Offer Curves
(Average of 4 Sessions)



(a) Average Prices



(b) Variance of Price Changes

Figure 5. Summary Results by Treatment for the Last 10 Market Days

Statement of **Jerry Ellig**, Ph.D.
Senior Research Fellow
Mercatus Center at George Mason University

before the

U.S. House of Representatives Committee on Financial Services
2128 Rayburn House Office Building
Washington, D.C. 20515
June 20, 2001

Good morning, Mr. Chairman, Congressman LaFalce, and members of the committee. Thank you for inviting me to comment on the energy crisis in California and its impact on the U.S. economy. It's also a pleasure to share the witness table with my soon to be colleague, Professor Vernon Smith. My name is Jerry Ellig and I am a senior research fellow specializing in regulatory issues with the Mercatus Center at George Mason University. It is important that I mention that my views expressed this morning are my own, and do not represent any official position of that university.

As the Committee is aware, the various states are in different stages of retail electric restructuring. Although it is too early to identify definitive results in most states, it is important to note that there are some clear successes. California has, of course, received enormous publicity as an alleged example of the "failure" of electric restructuring. Pennsylvania has received much less attention—which is unfortunate, because Pennsylvania is electric restructuring's most prominent success story.

I would like to address three topics today: The source of California's power crisis, the state's lack of success in encouraging retail electric competition, and Pennsylvania's relative success in avoiding California-style problems in both the wholesale and the retail markets.

THE CALIFORNIA POWER CRISIS AND THE WHOLESALE MARKET

California's much-publicized blackouts have actually occurred due to forces largely separate from electric restructuring. Electricity demand in California has risen by 25 percent during the past eight years, but generating capacity has increased by only 6 percent. No new power plants have been built in California for 12 years. After California's restructuring legislation was enacted in 1996, several companies applied for permission to build new power plants, but not one had been approved by the summer of 2000. Until the current crisis prompted California to speed up its approval process, the state's permitting process for power plants took three times as long as in Texas. The Los Angeles Times has reported that California's largest independent power producer plans to build a plant on an Indian reservation so it will only have to deal with federal regulations.

Investors who purchased the utilities' divested power plants at a premium foresaw this imbalance, which is why they were willing to pay such high prices for power plants that some people speculated would lose a lot of their value once competition arrived. The wholesale market price of power seems to indicate that additional capacity is needed, but no significant new power plants or transmission facilities have been built in California for more than a decade. In the meantime, the state's economy has boomed, boosting demand. Since the price spikes occurred after California claimed to deregulate the retail market, "deregulation" gets blamed for the price increases.

It is instructive to consider how California's utilities would have dealt with the supply-demand imbalance in the absence of restructuring. Instead of paying market prices for power to the owners of divested power plants, the utilities would still own the plants. But under old-fashioned monopoly regulation, neither the utilities' plants nor the independently owned power

plants would be capable of generating any more power than they currently generate under a less regulated system. At peak periods, the supply-demand imbalance would still exist. Regulators and utilities would face the same choice they face under today's system: allow retail prices to increase to cut back demand, or ration electricity through blackouts, brownouts, and mandatory consumption curtailments for large users. As economist Robert Michaels noted in the summer of 2000, "This is reality, and markets force people to face it in ways that politicians live to help them avoid. Things are tight all over the West, there isn't much demand flexibility, new plants are taking forever to arrive, and the simple choice is between high prices and shortages."

There are, of course, widespread allegations that power producers in California gamed the system by withholding power supplies in order to raise prices. Power companies maintain that they only took supplies off the markets when plants needed to be shut down for maintenance. The element of judgment involved in maintenance decisions suggests that we may never know for sure whether power producers deliberately sought to raise market prices by withholding capacity.

It is worth noting, however, that the structure of California's wholesale and retail markets may well have permitted and encouraged such strategic behavior. The power that utilities sell at a fixed price to consumers is procured in a volatile spot market. Consumers are entitled to purchase as much power as they want at the fixed, regulated price, regardless of the cost of power at the time they want to use it. As a result, utilities (and now the state government) are virtually compelled to pay almost any price for spot market power when consumer demand is strong and supplies are tight. In economic terms, wholesale demand for power is highly inelastic. A small decrease in supply can lead to large price increases in the wholesale market. In such an environment, it would not be surprising if some power producers tried to test their

ability to affect prices by withholding supply. The market was structured in a way that encouraged such behavior.

It is one thing to say that power producers might withhold supply in order to raise prices; it is quite another thing to agree on an appropriate solution. Price controls may appear to solve the problem by preventing prices from rising above some specified level. However, price controls carry their own costs and dangers that have been well-documented by economists over the course of several centuries. In addition, price controls fail to address the underlying reasons for the price spikes: artificially inelastic demand and constraints on new supply. A genuine solution to alleviate the price spikes is to restructure the market so that retail and wholesale demand are more responsive to price (as my future colleague Vernon Smith has discussed in detail) and to remove regulatory obstacles to construction of new power plants (which California has now started to do.)

RETAIL ELECTRIC COMPETITION IN CALIFORNIA

California has a reputation for being the first state to deregulate its electric market, but California's plan suffered from several significant flaws. Until late 2000, utilities had to purchase all of their power through a state-mandated, centralized Power Exchange. They could not make bilateral deals with individual generators, which would let them avoid inefficiencies or "gaming" made possible by poorly designed Power Exchange rules. They could not sign long-term contracts for power with individual generators, which might help mitigate price fluctuations. Retail competition is also distorted by mandated rate cuts, mandated rate freezes, and an accelerated stranded cost recovery schedule. These three factors have essentially prevented the development of competition in the retail market for residential and small business customers.

California ranks surprisingly low in an independent assessment of the openness of state electricity markets. The Center for the Advancement of Energy Markets (CAEM), with which I am affiliated, has developed the Retail Energy Deregulation Index -- a list of 22 attributes that measure the extent to which each state has put in place policies that will lead to a workably competitive retail electricity market. CAEM surveys state public utility commissions to ascertain their progress on each attribute and synthesizes the results into a ranking that allows each state to see where it compares nationally. (Scholars affiliated with the Mercatus Center and George Mason University have found CAEM's data extremely helpful, and I would recommend that the Committee make use of this information. It is available to representatives of the public sector at www.caem.org.)

The state ranks only 13th on the CAEM's RED Index, despite the fact that California was the first state to enact restructuring legislation. Many of the other states that restructured relatively early rank near the top, including (1) Pennsylvania, (2) New York, and (3) Maine. Even jurisdictions that acted more recently, such as Arizona (1998), Maryland (1999), New Jersey (1999), and the District of Columbia (2000) outrank California. Given this ranking, it should come as no surprise that California's deregulation effort has been plagued by problems and has resulted in relatively little customer switching in the residential market. Of course, lack of customer switching does not necessarily indicate that the market is uncompetitive. Even in a fully competitive system, the vast majority of customers might choose to take service from their familiar old utility, or its marketing affiliate, if they perceive the utility to offer the best deal. But the structural analysis underlying the RED Index suggests that the lack of switching in California is due to a poorly designed market.

PENNSYLVANIA: A RESTRUCTURING SUCCESS STORY

Pennsylvania probably provides the best example of successful electric restructuring. Since its retail competition program was enacted, more than 500,000 Pennsylvania customers have switched electricity suppliers. The Pennsylvania Office of Consumer Advocate reports that more than 444,000 of these are residential customers. In addition, Pennsylvania ranks first in the RED Index, which suggests that it has done a good job of creating an environment conducive to competition. More residential customers have switched suppliers in Pennsylvania than in all other states combined. Approximately 20 percent of Pennsylvania's customers have switched, compared to 2 percent for California.

Entry of new supply is also easier in Pennsylvania than in California. In the Pennsylvania-New Jersey-Maryland Power Pool, 1,000 mw of new generation were built in 2000, and the power pool expects an additional 15,000 mw to come on-line by 2005. The Pennsylvania Department of Revenue projects that average electricity prices in Pennsylvania will be 16.9 percent lower in 2004 than they would be if regulation had continued. Prices will be 14.6 percent lower for residential customers, 18.8 percent lower for commercial customers, and 17.9 percent lower for industrial customers. The Pennsylvania Public Utility Commission estimates that competition saved electricity customers $750 million in 1999.

A key factor affecting the success of competition is the extent to which state policies distort price relationships from those that would exist in a truly competitive market. A comparison of retail competition in California vs. Pennsylvania illustrates how price distortions can undermine competition.

In California, the state's "deregulation" legislation ordered utilities to give residential and small commercial customers a 10 percent rate cut. As a result, residential customers received a rate cut even if they made no effort to learn about competitive offers or switch to a new power supplier. The value of this "gift" becomes even greater when one considers that as long as the rate cut is in effect, residential customers who stick with their utility are also protected from increases in the market price of power. As a result, the only California residential customers who initially paid higher prices because of the price spikes were those served by San Diego Gas & Electric, which was not subject to rate caps in the summer of 2000 because it had recovered all of its stranded costs. The recovery period for utilities' stranded costs was also accelerated, so that utilities received the opportunity to recover these costs over four years. Customers who switch suppliers must still pay these costs—a fact that further diminishes their incentive to shop around.

Pennsylvania, on the other hand, adopted smaller rate cuts whose size and length were negotiated on a utility-by-utility basis. Customers who choose alternative suppliers receive a "shopping credit" representing the amount per kwh that they no longer have to pay for electricity they are no longer purchasing from the utility. The shopping credit is always less than the utility's unbundled generation rate, so customers who switch still make a contribution to cover stranded costs. According to the Federal Trade Commission, the recovery period for these investments will be approximately 10 years, which regulators believe is closer to the useful life of the assets. These policies effectively mean that the price paid by Pennsylvania customers who switch suppliers is closer to the true, free-market price than the price paid by customers who switch in California.

Residential customers in Pennsylvania can achieve savings of 13-29 percent by opting for competitive suppliers. Before the current power crisis, California customers could save 5-6 percent at most. (See Table 1.) Almost all of the alternative suppliers available to California residential customers sell various forms of renewable energy that are sometimes more expensive than power offered by the utilities. Such suppliers are competitive only because renewable power is heavily subsidized in California and because some customers are willing to pay a premium for "green" power.

California's policies significantly distort price relationships in ways that reduce the customer's benefit from switching power suppliers, and thus they discourage alternative suppliers from competing in the residential market. Pennsylvania's policies involve much less distortion. California's mandated price cuts are larger, and so are the charges for stranded costs that customers cannot escape when they switch suppliers.

Table 1: Competitive Options in California vs. Pennsylvania (Pre-CA Power Crisis)
(Utilities are italicized.)

CALIFORNIA			PENNSYLVANIA		
	Sample bill, 500 kwh	**Maximum % Savings**		**Sample bill, 500 kwh**	**Maximum % Savings**
PG&E	***$54.89***		***Allegheny Power***	***$16.22***	
Competitors, standard	$54.66-57.14	0.4	Competitors, standard	$12.97	20
Competitors, Renewable	$51.89-66.89	5.5	Competitors, renewable	$29.95-36.40	No savings
SCE	***$59.32***		***Duquesne***	***$24.00***	
Competitors,	$61.57	No savings	Competitors,	$19.20-	20

standard			standard	$23.00	
Competitors, Renewable	$56.32- $71.32	5.0	Competitors, renewable	$30.45-36.40	No savings
SDG&E	***$49.10***		***GPU Energy – Met Ed***	***$22.63***	
Competitors, standard	$51.35	No savings	Competitors, standard	$18.10-$26.75	20
Competitors, renewable	$46.10-$61.10	6.1	Competitors, renewable	$31.45-39.40	No savings
			GPU Energy – Penelec	***$22.64***	
			Competitors, standard	$18.11-26.75	20
			Competitors, renewable	$31.45-39.40	No savings
			PECO Energy	***$27.75***	
			Competitors, standard	$22.60-$27.90	18.6
			Competitors, renewable	$24.00-39.40	13.5
			Penn Power	***$27.42***	
			Competitors, standard	$19.36-$30.50	29
			Competitors, renewable	$29.95-$36.40	No savings
			PPL Utilities	***$24.28***	
			Competitors, standard	$18.52-$25.65	24
			Competitors, renewable	$31.35-$39.40	No savings
			UGI	***$21.58***	
			Competitors,	$17.27-$23.25	20

			standard		
			Competitors, renewable	$31.45-$39.40	No savings

Sources: California Office of Ratepayer Advocates Shopper's Guide for Residential and Small Commercial Customers (March 1, 2000); Pennsylvania Office of Consumer Advocate Price Comparison Charts (July 31, 2000).

Electric restructuring has the potential to create net benefits, but not all restructuring plans are equally effective at moving from monopoly to competition. In particular, California's restructuring plan has hampered the development of a competitive retail market, while Pennsylvania's restructuring plan has been the most successful at promoting competition and producing consumer savings.

Examined in the broader U.S. context of deregulation and competition, California's unpleasant experience with electric restructuring is the exception rather than the rule. Deregulation and competition tend to produce lower prices and greater nonprice benefits than monopoly regulation. The appendix to this testimony contains an extensive review of the deregulation experience in other industries, which was recently submitted to the Federal Trade Commission in response for the Commission's request for comments on electric restructuring.

Thank you, Mr. Chairman. I look forward to answering whatever questions you and your colleagues have.

MERCATUS CENTER
GEORGE MASON UNIVERSITY

REGULATORY STUDIES PROGRAM

Public Interest Comment on

The Federal Trade Commission's Notice Requesting Comments on Retail Electricity Competition Plans[1]

V010003

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP employs contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, our response to the Federal Trade Commission's request for comments on retail electricity competition does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of retail electricity competition on overall consumer welfare.

The Commission's notice requesting comments notes that substantial price increases and reliability problems have occurred in some states that have restructured their electricity markets with the goal of promoting retail competition. The Commission seeks information that will assist it in (1) assessing the advantages and disadvantages of different approaches to restructuring and (2) recommending what, if any, further federal action is desirable. We commend the Commission for seeking more information. Experience shows that restructuring can deliver benefits to consumers, but not all restructuring plans are equally beneficial. The Commission's study should play a helpful role in identifying best practices and highlighting problems to avoid.

I. SUMMARY OF MERCATUS ANALYSIS

Retail competition in electricity has the potential to produce significant price and nonprice benefits for consumers. Experience in a variety of other deregulated industries shows that competition and deregulation tend to produce price reductions of between 10 percent and 25 percent, along with service quality improvements whose value to consumers sometimes exceeds the value of the price reductions. These consumer benefits reflect both the static efficiency that results from the elimination of market power and the dynamic efficiency that results from innovation.

[1]Prepared by Jerry Ellig, Ph.D. Dr. Ellig is a Senior Research Fellow at the Mercatus Center at George Mason University. The views expressed herein do not reflect an official position of George Mason University.

The consumer benefits arise not just because prices are likely to be lower, but because deregulated, competitive markets tend to produce prices that are more accurate signals of real resource scarcities. Retail competition would facilitate innovative price structures that would reward customers for shifting consumption away from peak times. If regulation holds prices below the levels that would exist in a competitive market, then short-term price increases induced by deregulation would actually benefit consumers by channeling scarce resources to their most highly-valued uses in the short run and providing incentives to increase capacity in the long run.

Electric restructuring has the potential to create net benefits, but not all restructuring plans are equally effective at moving from monopoly to competition. In particular, California's restructuring plan has hampered the development of a competitive retail market, while Pennsylvania's restructuring plan has been the most successful at promoting competition and producing consumer savings.

II. Prospective Benefits of Retail Competition

Deregulation and competition tend to produce lower prices and greater nonprice benefits than monopoly regulation. This occurs because of both static and dynamic efficiencies. When regulation holds prices below market-clearing levels, however, deregulation could lead to price increases that are nevertheless efficient. Such price increases actually enhance consumer welfare in both the short run and the long run, by allocating scarce resources to their most highly-valued uses and providing effective signals that additional capacity is needed. Competitive and deregulated retail markets also tend to produce efficient price structures that induce customers to shift usage from peak to non-peak times, reducing costs by reducing expensive investments in peak-load capacity.

A. Static and dynamic efficiencies

1. Price effects

Proponents and opponents of deregulation often debate whether it will produce higher or lower prices than monopoly regulation. Experience shows that deregulation usually produces lower prices, for two reasons: competition constrains market power, and deregulation produces incentives for cost reduction that lead to lower cost levels than under regulation.[2] In other words, deregulation promotes both "static" and "dynamic" efficiency.

It is important to keep both effects in mind when analyzing the impact of deregulation. Because deregulation creates incentives for cost reduction, the long-run effect on prices is likely to be larger than predicted if one simply assumes that competition will drive prices down to reflect cost levels that currently exist under regulation. In addition, the potential for cost reduction implies that deregulation can produce lower price levels even in the presence of market power. Thus, deregulation can make consumers better off even if the

[2] See section III below.

resulting competition is "imperfect" by the standards of either textbook economics or antitrust practice.

2. Nonprice effects

As important and substantial as the price reductions attributable to competition are, the nonprice effects are just as, if not more, important. Deregulation in network industries has unleashed waves of entrepreneurial creativity that cut costs, improved service quality, and led to the introduction of new products and services. Such improvements, though harder to predict accurately in advance, were nevertheless substantial.

Economic projections prior to deregulation typically under-estimated the size of the price reductions and failed to account for new products and services that create substantial value for consumers.[3] If past experience in other industries is any guide, the total value of benefits to consumers from electricity competition could easily be two or three times the projected value of price reductions.[4]

B. Efficient price levels

Although deregulation usually produces lower prices than under regulation, this need not always occur. Price increases, however, do not necessarily mean that deregulation has not "worked." If regulation holds prices below the level sufficient to evoke new supply, then regulation creates inefficiencies even though it appears to produce prices lower than those that would occur in a deregulated market.

The most prominent historical example of such inefficiency was federal regulation of wellhead natural gas prices. Under regulation, interstate purchasers of gas effectively received less secure services as the reserves dedicated to serving them shrank in response to price controls. During the cold winters of 1971-1972 and 1976-1977, factories and schools in the East and Midwest closed because there was simply not enough gas available at regulated prices to serve all customers. One study estimated that the costs associated with reduced service quality actually outweighed any benefits consumers received because regulation held down the price of gas that had already been discovered.[5] In the face of scarce supply, price ceilings created shortages and impaired reliability.

Something similar could happen in the electric industry. The simplest scenario to imagine would occur in states like California, where dissatisfaction with electric restructuring could lead to the imposition of more binding price caps in the wholesale electric market.

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[3] See Clifford Winston, "U.S. Industry Adjustment to Economic Deregulation," *Journal of Economic Perspectives* 12:3 (Summer 1998): 89-110; "Economic Deregulation: Day of Reckoning for Microeconomists," *Journal of Economic Literature* 31 (September 1993), pp. 1263-1289.
[4] See Section III below.
[5] Appendix, pp. 13-14.

Another type of price regulation threatens to create inefficient signals in states that are very different from California. In some states with moderate electric rates and low-cost utilities, regulators and legislators have expressed reluctance to eliminate cost-of-service regulation because they believe free-market price of electricity would actually exceed the price under traditional cost-of-service regulation. When such states engage in retail restructuring, they often seek to retain cost-of-service regulation for the utility's "standard offer" or "default" service.[6] Like wellhead price regulation for natural gas, continued cost-of-service regulation in electricity is an attempt to redistribute "rents" from the owners of the supply to the customers. Over time, this approach could create the same types of problems created by wellhead price regulation. Construction of new capacity would be discouraged, because new capacity must compete against below-market prices established by cost-of-service regulation. In this way, policymakers' initial skepticism of deregulation creates a self-fulfilling prophecy: the cost-of-service regulation that was retained in case competition fails to develop actually prevents competition from developing.

C. Efficient price structures

In addition to the level of prices, deregulation and competition also affect the structure of prices. Regulated monopolies tend to charge average-cost prices that do not vary much by time of day or season of the year. Deregulated, competitive firms tend to give their customers the option of either paying prices that vary with supply and demand, or paying a risk premium sufficient to cover the cost of retaining sufficient peak capacity to meet customer demand at a fixed price. This is an especially important issue in the electric industry, because electricity is not storable, and so production and consumption must occur virtually simultaneously.

If customers do not see prices that reflect the relative scarcity of electricity at particular times, then they will do little to conserve during times of peak demand. Such behavior leads to two possible results: either brownouts and blackouts will occur at times of peak demand, or large investments in excess capacity will occur to ensure that there is always sufficient supply available to meet demand. Regulated monopoly has produced both types of results (though regulators and regulated firms alike tend to favor the latter whenever possible).

A significant benefit of retail competition is that creates more efficient price structures that reward customers for shifting their use of the service from peak to non-peak times. Cheap airfares to Europe in winter, free long-distance phone service on weekends, and lower transportation rates for backhauls are a few common examples. Similarly in electricity, retail competition could make some investments in new generation and transmission capacity unnecessary by shaving peak demand. Experimental evidence shows that required peak capacity is lower – and price spikes are much less severe—

[6] This has been an issue in Virginia, where the author is involved in a study of the State Corporation Commission's electric and gas restructuring initiatives. It has also been an issue in other states, as the RED Index surveys (described in Section IV.A. below) documents.

when buyers can make bids that reveal their willingness to reduce consumption in response to price increases. The investments in technology allowing customers to track and adjust electricity usage in real time may be much less costly than construction of new generation or transmission capacity.[7]

III. Lessons from Other Industries

The Commission asks whether deregulation in other industries carries implications for electricity restructuring. In the late 1970s and early 1980s, five major U.S. industries with significant economic similarities to electricity experienced either full or partial deregulation: natural gas, long-distance telecommunications, airlines, railroads, and trucking. In all five industries, deregulation led to substantial price and non-price benefits for customers.

A. Price Effects

A Mercatus Center study revealed that, in each of these industries, within the first two years of deregulation, average inflation-adjusted prices had fallen by 4-15 percent, and sometimes more for some groups of customers.[8] Within 10 years, prices were at least 25 percent lower, and sometimes close to 50 percent lower. (See Table 1.)

[7] Stephen J. Rassenti, Vernon L. Smith, and Bart J. Wilson, "Demand-Side Bidding Will Control Market Power, and Decrease the Level and Volatility of Prices," Working Paper, Economic Science Laboratory, University of Arizona (February 2001).

[8] Robert Crandall and Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric Industry* (Mercatus Center, George Mason University, 1996). The study, attached as an appendix to this comment, describes these changes in greater detail.

Table 1: Price Trends in the Years Following Deregulation

	2-year price reduction	5-year price reduction	10-year price reduction
Gas (interstate)	10-38% (1984-86)	23-45% (1984-89)	27-57% (1984-94)
Gas (retail, Georgia)	7-12% (1998-99)	N.A.	N.A.
Long-Distance Telecom	5-16% (1984-86)	23-41% (1984-89)	40-47% (1984-94)
Airlines	13% (1977-79)	12% (1977-82)	29% (1977-87)
Trucking	N.A.	3-17% (1980-85)	28-56% (1977-87)
Rail	4% (1980-82)	20% (1980-85)	44% (1980-90)

Note: The first year in parentheses is the year before deregulatory legislation or regulatory reform took effect.

Most customer classes paid lower prices in the years following deregulation—even residential or other small customers commonly thought to have less of an advantage in a competitive market. Highlights from the study include:

Natural Gas. Adjusted for inflation, wellhead natural gas prices fell by 60 percent between 1984 and 1995. Prices paid by local utilities for gas at the "city gate" dropped by 52 percent. Residential and commercial customers saw their prices fall by 32 percent and 38 percent respectively. Industrial and electric utility customers both saw their gas costs fall by about 60 percent.[9]

Similar trends have occurred in response to more recent initiatives implementing retail competition in gas supply and marketing. For example, the state of Georgia moved to retail competition for all customers in 1998. Residential customers who switched received prices 7-12 percent lower than the regulated rates offered by Atlanta Gas Light Company, the state's dominant gas utility.[10]

Telecommunications. In the 10 years following the AT&T breakup, real interstate long-distance rates fell by an average of 6 percent annually. Real intrastate long-distance rates fell less rapidly—by 5.3 percent annually—largely because states removed barriers to

[9] Appendix, pp. 10-11.

[10] George R. Hall, "Consumer Benefits from Deregulation of Retail Natural Gas Markets: Lessons from the Georgia Experience," study prepared for AGL Resources, Inc., by PHB Hagler Bailly, Inc. (March 10, 2000).

competition in this market less rapidly than the federal government opened up competition in interstate calling.[11] Residential as well as business customers received lower long-distance rates. Even the poorest Americans benefited, since long-distance service accounts for more than 40 percent of the average phone bill, even of households with incomes below $10,000.[12] Consumer equipment prices also fell; the real price of standard corded telephones fell by 65 percent in the 10 years following the AT&T breakup, and the real price of answering machines fell by 34 percent.[13] The AT&T breakup did nothing to introduce competition into local telephone service, and real local rates averaged about the same in 1994 as in 1984.[14]

Airlines. Ten years after deregulation, average real air fares were lower or unchanged even on routes served by a single carrier, low-density routes, and routes from hub airports served by a single carrier. Individuals tended to get larger fare reductions than businesses, since the biggest price cuts went to travelers who could be more flexible about their departure and arrival dates and times.[15]

Trucking. During the first 10 years of trucking deregulation, real rates for truckload shipments fell by 58 percent. Real rates for less-than-truckload shipments, which are more costly to handle, fell by 28 percent.[16]

Rail. Data from the Surface Transportation Board show that real rail rates for the five largest groups of commodities—coal, chemicals, intermodal, transportation equipment, and farm products—were all 17-44 percent lower ten years after deregulation. Shippers of coal and farm products are more likely to be served by only one railroad and have few other good transportation alternatives. Nevertheless, real coal rates fell by at least 25 percent over ten years, and real rates for farm products fell by at least 38 percent.[17]

The fact that lower prices followed deregulation does not necessarily mean that deregulation caused the price reductions. To assess the effect of competition more accurately, one must control for other factors that could have influenced prices. Studies controlling for other factors reveal that billions of dollars worth of price reductions can be directly attributed to deregulation.

Table 2 summarizes the effect of deregulation on prices over various time periods. Deregulation reduced prices by between 3 percent and 50 percent, depending on the industry and time period studied. Most estimates are in the 10-25 percent range.

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[11] Appendix, pp. 23-24.
[12] Robert W. Crandall and Leonard Waverman, *Who Pays for Universal Service?* (Washington: Brookings Institution, 2000), p. 48.
[13] Appendix, p. 26.
[14] Appendix, p. 25.
[15] Appendix, pp. 34-39.
[16] Appendix, p. 49.

[17] Calculated from data in Surface Transportation Board, Office of Economics, Environmental Analysis, and Administration, "Rail Rates Continue Multi-Year Decline" (February 1998).

Table 2: Price Reductions Occurring as a Result of Deregulation

Industry	Time Period Studied	Real Price Reduction Due to Deregulation
Gas, retail (Georgia)	1998-99	7-12 percent
Long-distance telephone	1985-86 1985-87 1985-93	26 percent 42 percent 7.6 percent annual average
Airlines	1977-79 1977-82 1977-93	8-25 percent 28 percent 19 percent
Trucking	1980-85	3 percent (LTL) 17 percent (TL)
Rail	1980-84 1980-85 1980-87 1980-88	5 percent 3 percent 16-19 percent 30 percent

Sources: Hall, "Consumer Benefits from Deregulation;" Ellig, "Railroad Deregulation and Consumer Welfare," *Journal of Regulatory Economics*, forthcoming; Crandall & Ellig (Appendix).

B. Nonprice Effects

As important and substantial as the price reductions attributable to competition are, the non-price effects are just as, if not more, important. As noted above, deregulation in network industries has unleashed waves of entrepreneurial creativity that cut costs, improved service quality, and led to the introduction of new products and services. Such improvements, though harder to predict accurately in advance, were nevertheless substantial.

In summary, the more substantial non-price effects in the five deregulated industries include:

Natural gas. In the interstate natural gas industry, deregulated pricing and open access brought major innovations on both the physical and financial sides. Gas pipelines have interconnected at a series of "market hubs" that allow individual shippers to receive gas from a much larger number of suppliers and effectively increase competition faced by individual pipelines. The industry has also seen a huge increase in the use of financial transactions that allow suppliers, shippers, and customers to hedge price risks. Free-market prices convey accurate signals about the value of gas, and a free market in

hedging transactions lets parties understand the costs and benefits of insuring against adverse price swings.[18]

In Georgia's competitive retail gas market, individual customers can choose from many different price plans to fit their own risk tolerances, including variable price and multi-year fixed price options. Marketers offered a variety of new payment options, including electronic drafts, credit card payment, or payment at local supermarkets. One placed kiosks in supermarkets to educate consumers about retail competition and publicly renounced telemarketing. Many gas marketers plan to expand their offerings to include telephone service, Internet access, home security, energy management, and appliance sales and service.[19]

Telecommunications. The introduction of competition in long-distance and telephone equipment accelerated the deployment of fiber optic cable and digital switching.[20] It is also highly likely that competition in customer equipment hastened the introduction of innovations like answering machines, fax machines, cordless phones, and other types of equipment found in many homes. As an equipment monopolist, AT&T strenuously fought the introduction of any customer premises equipment not produced by Western Electric, AT&T's manufacturing division.[21] Opening the equipment market to competition allowed many different competitors to offer different types of equipment and pursue different marketing strategies.

Airlines. Deregulation facilitated at least three major innovations that cut costs and increased flight frequency: (1) the hub-and-spoke routing systems adopted by most major airlines, (2) low-cost airlines (such as Southwest, Spirit, and others), and (3) short-distance commuter airlines. One study pegged the value to passengers of increased flight frequency at $10.3 billion annually (in 1993 dollars). Passengers strongly prefer to remain on the same airline when they change planes, and the creation of national route networks facilitated by the hub-and spoke system means that the percentage of passengers changing airlines has fallen from 14 percent in 1978 to 1 percent today.[22]

Trucking. Increased competition created incentives to improve service quality and invest in sophisticated shipment tracking and monitoring technology. By 1985, shippers saved nearly $1 billion annually in reduced costs due to more reliable service. The combination of rail and trucking deregulation also permitted an expansion of intermodal service, which cuts costs and, in some cases, improves delivery times.[23]

Rail. Deregulation facilitated service quality improvements, largely by making it attractive for railroads to invest in maintaining worn-out track and equipment. Service

[18] Appendix, pp. 15-16.
[19] Hall, "Consumer Benefits from Deregulation," pp. 16-22.
[20] Appendix, p. 29.
[21] Robert W. Crandall, *After the Breakup: U.S. Telecommunications in a More Competitive Era* (Washington: Brookings Institution, 1991), pp. 33-34.
[22] Appendix, pp. 40-44.
[23] Appendix, p. 52.

improvements have made shippers better off by between $5 billion and $10 billion annually.[24]

Where analysts estimate a monetary value for new or improved services, the figures are surprisingly large. For airlines and railroads, the value of new and improved service is almost as large as the value of the price reductions! The figure for trucking is more modest, but still substantial. Clearly, competition generates important benefits in addition to price reductions. Given this experience, it would not be surprising if retail electric competition created nonprice benefits worth at least as much to customers as the price benefits.

IV. Retail Electric Competition in Practice

As the Commission notes, the various states are in different stages of retail electric restructuring. Although it is too early to identify definitive results in most states, we would like to bring to the Commission's attention a useful data source that facilitates nationwide comparison of states' electric restructuring plans. In addition, we believe it is instructive to compare the restructuring experiences in California and Pennsylvania, two early leaders that have had quite different levels of success in promoting effective competition.

A. Nationwide comparison—the RED Index

The Commission has solicited highly detailed information on the various states' electricity restructuring programs. Fortunately, a comprehensive source of such information already exists and is updated annually. The Center for the Advancement of Energy Markets (CAEM) has developed the Retail Energy Deregulation Index, a list of 22 attributes that measure the extent to which each state has put in place policies that will lead to a workably competitive retail electricity market. CAEM surveys state public utility commissions to ascertain their progress on each attribute and synthesizes the results into a ranking that allows each state to see where it compares nationally. Scholars affiliated with the Mercatus Center and George Mason University have found CAEM's data extremely helpful, and we recommend that the Commission make use of this unique information source to answer many of the questions posed in the announcement of the Commission's stuffy of retail electricity competition.[25]

B. California vs. Pennsylvania

California has, of course, received enormous publicity as an alleged example of the "failure" of electric restructuring. Pennsylvania has received much less attention—which is unfortunate, because Pennsylvania is electric restructuring's shining success story.

[24] Appendix, p. 49.
[25] CAEM's RED Index report is available free of charge to the public sector at www.caem.org.

1. California

California has a reputation for being the first state to deregulate its electric market, but California's plan suffered from several significant flaws. Until late 2000, utilities had to purchase all of their power through a state-mandated, centralized Power Exchange. They could not make bilateral deals with individual generators, which would let them avoid inefficiencies or "gaming" made possible by poorly-designed Power Exchange rules. They could sign long-term contracts for power with individual generators, which might help mitigate price fluctuations. On the retail level, competition is distorted by mandated rate cuts, mandated rate freezes, and an accelerated stranded cost recovery schedule. These three factors have essentially prevented the development of competition in the retail market for residential and small business customers.

California ranks surprisingly low in an independent assessment of the openness of state electricity markets. The state ranks only 13th on the Center for the Advancement of Energy Markets RED Index, despite the fact that California was the first state to enact restructuring legislation. Many of the other states that restructured relatively early rank near the top, including (1) Pennsylvania, (2) New York, and (3) Maine. Even jurisdictions that acted more recently, such as Arizona (1998), Maryland (1999), New Jersey (1999), and the District of Columbia (2000) outrank California. Given this ranking, it should come as no surprise that California's deregulation effort has been plagued by problems and has resulted in relatively little customer switching in the residential market.[26]

California's much-publicized power crisis has actually occurred due to forces largely separate from electric restructuring. Electricity demand in California has risen by 25 percent during the past eight years, but generating capacity has increased by only 6 percent.[27] No new power plants have been built in California for 12 years. After California's restructuring legislation was enacted in 1996, several companies applied for permission to build new power plants, but not one had been approved by the summer of 2000.[28] The state's permitting process for power plants takes three times as long as in Texas. California's largest independent power producer plans to build a plant on an Indian reservation so it will only have to deal with federal regulations.[29]

Investors who purchased the utilities' divested power plants at a premium foresaw this imbalance, which is why they were willing to pay such high prices for power plants that some people speculated would lose a lot of their value once competition arrived. The

[26] Of course, lack of customer switching does not necessarily indicate that the market is uncompetitive. Even in a fully competitive system, the vast majority of customers might choose to take service from their familiar old utility, or its marketing affiliate, if they perceive the utility to offer the best deal. But the structural analysis underlying the RED Index suggests that the lack of switching in California is due to a poorly-designed market.

[27] William P. Kucewicz, "Too Much Regulation Keeps California in the Dark," *Wall Street Journal* (August 7, 2000).

[28] Adrian Moore, "San Diego's Politically Driven Deregulation," *San Diego Union* (August 24, 2000).

[29] Chris Kraul and Nancy Rivera Brooks, "Officials Go from Cold to Hot on Power Projects," *Los Angeles Times* (Sept. 4, 2000), p. A-1.

market price of power clearly indicates that additional capacity is needed, but no significant new power plants or transmission facilities have been built in California for more than a decade. In the meantime, the state's economy has boomed, boosting demand. Since the price spikes occurred after California claimed to deregulate the retail market, deregulation gets blamed for the price increases.

It is instructive to consider how California's utilities would have dealt with the supply-demand imbalance in the absence of restructuring. Instead of paying market prices for power to the owners of divested power plants, the utilities would still own the plants. But under old-fashioned monopoly regulation, neither the utilities' plants nor the independently-owned power plants would be capable of generating any more power than they currently generate under a less regulated system. At peak periods, the supply-demand imbalance would still exist. Regulators and utilities would face the same choice they face under today's system: allow retail prices to increase to cut back demand, or ration electricity through blackouts, brownouts, and mandatory consumption curtailments for large users. As Robert Michaels, an economist at California State University, Fullerton, noted, "This is reality, and markets force people to face it in ways that politicians live to help them avoid. Things are tight all over the West, there isn't much demand flexibility, new plants are taking forever to arrive, and the simple choice is between high prices and shortages."[30]

2. Pennsylvania

Pennsylvania probably provides the best example of successful electric restructuring. Since its retail competition program was enacted, more than 500,000 Pennsylvania customers have switched electricity suppliers. More than 444,000 of these are residential customers.[31] In addition, Pennsylvania ranks first in the RED Index, which suggests that it has done a good job of creating an environment conducive to competition.

More residential customers have switched suppliers in Pennsylvania than in all other states combined. Approximately 20 percent of Pennsylvania's customers have switched, compared to 2 percent for California.

Entry of new supply is also easier in Pennsylvania than in California. In the Pennsylvania-New Jersey-Maryland Power Pool, 1,000 mw of new generation were built in 2000, and the power pool expects an additional 15,000 mw to come on-line by 2005.[32]

The Pennsylvania Department of Revenue projects that average electricity prices in Pennsylvania will be 16.9 percent lower in 2004 than they would be if regulation had continued. Prices will be 14.6 percent lower for residential customers, 18.8 percent lower for commercial customers, and 17.9 percent lower for industrial customers. The

[30] Michaels, "Give Peace a Chance," p. 5.
[31] Statistics available from Web site of the Pennsylvania Office of Consumer Advocate.
[32] John Hanger, "On the Watch for Icebergs: Navigating the Commonwealth's Electricity Future," Citizens for Pennsylvania's Future (August 29, 2000), p. 2.

Pennsylvania Public Utility Commission estimates that competition saved electricity customers $750 million in 1999.[33]

3. California vs. Pennsylvania

A key factor affecting the success of competition is the extent to which state policies distort price relationships from those that would exist in a truly competitive market. A comparison of retail competition in California vs. Pennsylvania illustrates how price distortions can undermine competition.

In California, the state's "deregulation" legislation ordered utilities to give residential and small commercial customers a 10 percent rate cut. As a result, residential customers received a rate cut even if they made no effort to learn about competitive offers or switch to a new power supplier. The value of this "gift" becomes even greater when one considers that as long as the rate cut is in effect, residential customers who stick with their utility are also protected from increases in the market price of power.[34] The recovery period for utilities' stranded costs was also accelerated, so that utilities received the opportunity to recover these costs over four years. Customers who switch suppliers must still pay these costs—a fact that further diminishes their incentive to shop around.

Pennsylvania, on the other hand, adopted smaller rate cuts whose size and length were negotiated on a utility-by-utility basis. Customers who choose alternative suppliers receive a "shopping credit" representing the amount per kwh that they no longer have to pay for electricity they are no longer purchasing from the utility.[35] The shopping credit is always less than the utility's unbundled generation rate, so customers who switch still make a contribution to cover stranded costs. The recovery period for these investments will be approximately 10 years, which regulators believe is closer to the useful life of the assets.[36] These policies effectively mean that the price paid by Pennsylvania customers who switch suppliers is closer to the true, free-market price than the price paid by customers who switch in California.

Residential customers in Pennsylvania can achieve savings of 13-29 percent by opting for competitive suppliers. Before the current power crisis, California customers could save 5-6 percent at most. (See Table 3.) Almost all of the alternative suppliers available to California residential customers sell various forms of renewable energy that are

[33] Pennsylvania Department of Revenue, *Electricity Generation, Customer Choice, and Competition: A Report to Governor Ridge and the General Assembly* (August 1, 2000), pp. E-5 and 2.

[34] As a result, the only California residential customers who initially paid higher prices because of the price spikes were those served by San Diego Gas & Electric, which was not subject to rate caps in the summer of 2000 because it had recovered all of its stranded costs.

[35] "Shopping credit" is an unfortunate term, because it implies that customers who switch suppliers are receiving some type of subsidy. In reality, the shopping credit simply means that consumers do not have to pay the utility for electricity if they decide to buy their electricity from someone else.

[36] 10-year figure is from Comment of the Staff of the Bureau of Economic Policy of the Federal Trade Commission before the Arkansas Public Service Commission in Docket No. 00-148-R (July 6, 2000), p. 2. Regulators' assessment of the useful life of the assets is from author's conversation with former Pennsylvania PUC Commissioner John Hanger.

sometimes more expensive than power offered by the utilities. Such suppliers are competitive only because renewable power is heavily subsidized in California and because some customers are willing to pay a premium for "green" power.

California's policies significantly distort price relationships in ways that reduce the customer's benefit from switching power suppliers, and thus they discourage alternative suppliers from competing in the residential market. Pennsylvania's policies involve much less distortion. California's mandated price cuts are larger, and so are the charges for stranded costs that customers cannot escape when they switch suppliers.

Table 3: Competitive Options in California vs. Pennsylvania (Pre-CA Power Crisis)

(Utilities are italicized.)

CALIFORNIA			PENNSYLVANIA		
	Sample bill, 500 kwh	**Maximum % Savings**		**Sample bill, 500 kwh**	**Maximum % Savings**
PG&E	***$54.89***		***Allegheny Power***	***$16.22***	
Competitors, standard	$54.66-57.14	0.4	Competitors, standard	$12.97	20
Competitors, Renewable	$51.89-66.89	5.5	Competitors, renewable	$29.95-36.40	No savings
SCE	***$59.32***		***Duquesne***	***$24.00***	
Competitors, standard	$61.57	No savings	Competitors, standard	$19.20-$23.00	20
Competitors, Renewable	$56.32-$71.32	5.0	Competitors, renewable	$30.45-36.40	No savings
SDG&E	***$49.10***		***GPU Energy – Met Ed***	***$22.63***	
Competitors, standard	$51.35	No savings	Competitors, standard	$18.10-$26.75	20
Competitors, renewable	$46.10-$61.10	6.1	Competitors, renewable	$31.45-39.40	No savings
			GPU Energy – Penelec	***$22.64***	
			Competitors, standard	$18.11-26.75	20
			Competitors, renewable	$31.45-39.40	No savings
			PECO Energy	***$27.75***	
			Competitors, standard	$22.60-$27.90	18.6

			Competitors, renewable	$24.00-39.40	13.5
			Penn Power	***$27.42***	
			Competitors, standard	$19.36-$30.50	29
			Competitors, renewable	$29.95-$36.40	No savings
			PPL Utilities	***$24.28***	
			Competitors, standard	$18.52-$25.65	24
			Competitors, renewable	$31.35-$39.40	No savings
			UGI	***$21.58***	
			Competitors, standard	$17.27-$23.25	20
			Competitors, renewable	$31.45-$39.40	No savings

Sources: California Office of Ratepayer Advocates Shopper's Guide for Residential and Small Commercial Customers (March 1, 2000); Pennsylvania Office of Consumer Advocate Price Comparison Charts (July 31, 2000).

V. Conclusion

The Commission's study of the effects of retail competition in the electric industry is timely and appropriate. We offer the following observations in the hope of maximizing the study's relevance and effectiveness:

1. Deregulation often generates price reductions both by curbing market power and by improving incentives for innovation. The potential for innovation implies that a deregulated market may experience lower prices even if substantial market power remains.

2. If regulation holds prices below competitive market levels, then deregulation can simultaneously raise prices and increase consumer welfare.

3. For most of this century, our society has been wedded to the idea that everyone (except big businesses) should have the right to buy as much electricity as he or

she wants at a fixed, regulated retail price. Inelastic retail demand—which exacerbates wholesale price spikes—may simply be an artifact of regulation. A sound restructuring plan would allow customers to face retail prices that more closely reflect the varying cost of producing it at different times of the day.

4. Experience in other industries shows that deregulation typically produces large price reductions, as well as nonprice benefits whose magnitude can exceed that of the price benefits.

5. The Retail Energy Deregulation Index produced by the Center for Advancement of Energy Markets provides useful data on the details of electric restructuring programs in all states.

6. A comparison of California's and Pennsylvania's experiences with electricity restructuring suggests that competition can indeed produce substantial benefits, but a poorly-designed restructuring plan can prevent competition from emerging.

Statement of
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Professor of Economics, Stanford University
Chairman, Market Surveillance Committee, California Independent System Operator
Before the
House Committee on Financial Services
June 20, 2001

Members of the Committee, I am pleased to submit this written statement on the California electricity crisis and its implications for short-term and long-term energy policy. I am a Professor of Economics at Stanford University. I began my work on energy and environmental issues at the Los Alamos National Laboratory (LANL) in 1980. The following year I entered graduate school at Harvard University, where I received an S.M. in Applied Mathematics and Ph.D in Economics. For the past fifteen years, I have been engaged on research program studying the process of privatization, competition and regulation in network industries such as electricity and natural gas. A major focus of my work is the empirical analysis of market power and, more generally, market design issues in newly restructured electricity markets. I have studied the design and operation of the PJM (The Pennsylvania, New Jersey, and Maryland Interconnection), New York, New England and California electricity markets, as well as virtually all restructured electricity markets currently operating around the world. Since April 1, 1998, I have been the Chairman of the Market Surveillance Committee (MSC) for the Independent System Operator (ISO) of California electricity industry.

MARKET SURVEILLANCE COMMITTEE

To provide further background on my expertise on the California electricity market, it is helpful to describe the role of the Market Surveillance Committee of the California Independent System Operator and the activities that I have undertaken as its Chairman. The MSC is an independent committee charged with monitoring the California electricity market for the exercise of market power and for market design flaws which may enhance the ability of market participants to exercise market power. The MSC was required by the Federal Energy Regulatory Commission (FERC) as part of the market monitoring function of the California ISO. Because the California ISO had a board of governors composed of employees from firms participating in the California market, as well as stakeholders from state agencies and regulatory bodies, FERC mandated the formation of an independent market monitoring entity to prepare and file with FERC periodic reports on the performance of the market. In this capacity I have written or coauthored more than ten reports on aspects of the design and performance of the California electricity markets during my three years as

Chairman of the MSC. In preparing the MSC reports I have analyzed confidential data made available by the ISO on bidding, scheduling and production by all generation unit owners selling into the California. In addition, the MSC has worked closely with the Department of Market Analysis and management at the ISO in preparing these reports. These reports, along with other papers I have written on competitive electricity markets, are listed at the end of my testimony.

My testimony focuses on three issues. The first is the appropriate form of long-term regulatory oversight for competitive electricity markets. The second is FERC's short-term regulatory policy for the California electricity market. The third describes the several essential features of a long-term energy policy.

REGULATORY OVERSIGHT OF COMPETITIVE ELECTRICITY MARKETS

The events of the past year in the California electricity market have exposed the crucial role of an active forward market in a making a spot electricity market workably competitive. Different from the markets in PJM, New York and New England, since its inception in April 1998, the California relied on purchases made at time-horizons less than or equal one day in advance of delivery for the vast majority of energy consumed in the California ISO control area. This over-reliance on the spot market is the result of two factors.

First, before the start of the market, California ordered the three investor-owned utilities–Pacific Gas and Electricity, Southern California Edison and San Diego Gas and Electric–to sell off more than 17,000 MW of their natural gas-fired capacity to new entrants. This sale was made without any corresponding "vesting contract" whereby the seller of the asset has the right to purchase from the new owner a significant fraction of the expected output of the unit at a price set by the regulator.

In all other markets in the US and around the world, when the incumbent monopolist's capacity is sold to new entrants, these assets are sold with vesting contract obligations. For example, suppose the incumbent firm sells a 500 MW baseload unit. A typical vesting contract would require the buyer of this asset to sell 400 MWh each hour for at least the next two years at a price set by the regulator.

The second factor contributing to California's dependence on the spot market is that the state imports historically between 20 and 25 percent of its electricity needs from neighboring states. This electricity is primarily surplus energy not needed to meet the needs of these states. For this reason,

the seller may not know the electricity is available to sell to California only a few hours before it is produced.

A generator selling virtually all of its power on the spot market has a significantly stronger incentive to bid to raise the price in the spot market, because it receives this price for all of its output. However, a generator with a vesting contract for 85 percent of its energy at a pre-specified price receives the spot market price only for production in excess of this forward market commitment. In addition, unless this generator produces more energy than its forward market commitment, it has a strong incentive to set the spot price as low as possible, because if the spot price is low enough, the generator will find it profitable to purchase its forward market commitment from the spot market rather than generating this electricity. Consequently, a generator with a significant commitment in the forward market will bid extremely low in the spot market for at least its forward market commitment.

This logic implies that an industry where all firms have significant forward contract obligations tends to produce competitive spot market outcomes. Because generation unit owners are aware of these incentives for aggressive bidding created by forward contracts, they must be induced to sign these financial arrangements. Fortunately, at time horizons greater than the time necessary to build new generating capacity, the forward market for electricity is extremely competitive. This provides existing firms with the necessary inducement to sign forward contracts at competitive prices because any existing generator faces competition from all possible potential competitors at this time horizon. For example, if the time to construct new capacity is two years, then all existing firms know that a significant amount of new capacity can be constructed within two years. Therefore, if a consumer is willing to purchase a forward commitment for electricity at this time horizon, he can obtain an extremely competitive price from an existing firm because all existing firms know that if they fail to offer a price below the long-run average cost of producing electricity using the most cost-effective technology, the consumer will instead elect to purchase electricity from a new entrant and a new plant using the latest technology will be constructed.

Unfortunately, competition to provide forward electricity at time horizons shorter than the time necessary to construct new capacity only takes place among existing firms. Without regulatory intervention, existing generation unit owners are able to charge whatever the market will bear for forward contracts for energy at these time horizons because the threat of new entry is unable to

discipline the prices existing firms offer. In addition, because the relevant opportunity cost of generators selling a forward contract for electricity over the next two years is the average expected spot price of electricity over this period. If firms know that there are opportunities to raise spot prices during this time period, they will only be willing to sign a forward contract at a price that compensates them for these forgone opportunities to set high prices in the spot market over the next two years.

These characteristics of competitive electricity markets imply that unless there are a substantial number of consumers willing and able to alter their demand in response to wholesale prices at time horizons shorter than two-years, the amount of forward contracts signed between consumers and generators will play a major role in determining the level and volatility of wholesale electricity prices. Less forward contracts between generators and loads will increase the number of hours of the year when generators can significantly raise spot prices through their bidding and scheduling behavior. This will lead to higher average prices and more volatile prices. More forward contracts between generators and loads will reduce the number of hours when generators can raise spot prices through their bidding and scheduling behavior. This will lead to lower average prices and less volatile prices.

Stated differently, the total amount of forward contracts that consumers have purchased from generation unit owners determines the magnitude of spot price risk that consumers must bear. If consumers own a substantial quantity of forward contracts for electricity, only a small fraction of their total consumption must be purchased from the spot market. Changes in the spot price exert very little influence on their average monthly price of wholesale electricity. Moreover, because of the incentives discussed above, generators have less incentive to attempt to increase the spot price. So the consumer's average monthly wholesale price remains stable. In contrast, with little forward contract cover, movements in the spot price exert an enormous influence on the average monthly wholesale price by consumers. In addition, generators with few forward obligations have increased incentives to attempt to increase the spot market price, so the consumer's monthly price for wholesale electricity is extremely unstable.

By owning more generation, a firm can exert a greater influence over the spot price. This has two benefits to the firm. First, it has more opportunities to raise the spot of price electricity. However, this ability to move the spot price electricity also allows the generator to reduce the risk

associated with commitments it makes to supply electricity in the forward market. For example, if a firm knows that it can influence the spot price at a future date, and this fact is unknown to other market participants, then the firm can engage in financial contracts with these market participants that it can later profit from by using its ability to alter the spot price of energy.

This financial aspect of the electricity supply industry did not exist in the former vertically integrated monopoly regime, where firms earned higher profits by operating their generating facilities at a lower average cost than the regulated retail price of electricity. Competitive electricity markets allow power marketers to speculate on the level of spot electricity prices at future dates. Virtually every hour of every day power marketers sell obligations to supply electricity that they have no ability to produce or buy commitments to demand electricity they have no intention of consuming. Electricity has now become like any other commodity market. In order for firm to make profits in this industry it is no longer necessary for it to own generation. To extent that a firm has superior information about the future pattern of spot prices, it can profit from this information by taking the appropriate forward market position and closing it out before the delivery data occurs.

This is not just a theoretical possibility. Enron owns no generating capacity in California. Nevertheless, it has managed to carve out an extremely lucrative power marketing business using its ability to forecast spot electricity prices in California and the rest of the western US.

Different from the market for pork bellies or wheat, the spot market for electricity presents a formidable engineering challenge to operate. Supply must equal demand at every instant in time and it is extremely costly to store electricity. The production of electricity is subject to severe capacity constraints: a 500 MW facility can only produce 500 MWh in a single hour. Electricity must be delivered over a transmission grid that is often subject to congestion which limits the number of firms that can deliver energy to a given geographic area. In short, there are number impediments to the efficient operation of a spot electricity market that do not exist for these other commodity markets. These impediments imply that consumers face more risk than exists for other commodities when they rely on the spot market for a significant fraction of their electricity needs.

This dramatic change in the structure of the electricity supply industry, requires a corresponding change in the regulatory oversight of this market. The growing financial side of the electricity supply industry makes it essential that the regulator of this market be able to secure information on the bidding, scheduling and production decisions of generating facilities and the

forward financial market positions of the energy trading affiliates of each generating company. The Federal Energy Regulatory Commission has limited authority to request information on the financial transactions unregulated affiliates of these generating unit owners.

The Public Utility Holding Company Act (PUHCA) of 1935 granted the Securities and Exchange Commission the authority to examine all affiliate transactions of a public utility. Given the role of power marketers and financial transactions in a competitive electricity market, it will be very difficult to protect consumers from firms making use of affiliate transactions to raise electricity prices without some regulatory agency having this authority. For this reason, the outright appeal of the PUHCA makes very little sense, particularly in light of the current situation in the California electricity market. Moreover, transferring this authority to FERC also makes very little sense, given its inexperience in monitoring the financial side of wholesale electricity markets.

The increasing degree of integration between electricity and natural gas suppliers underscores the need to monitor transactions between natural gas and electricity affiliates in order to effectively oversee competitive wholesale gas and electricity markets. California's experience with natural gas prices during the winter and spring of 2001 highlights the importance of regulatory transparency on the interface between natural gas and electricity markets. Over this time period, natural gas prices were the major cost driver of higher electricity prices in California. Natural gas prices were consistently more than double and often more than triple the prices in neighboring western states.

The February 6, 2001 report of the MSC argues that the $150/MWh soft-cap imposed by FERC on January 1, 2001 played a major role in maintaining these higher announced gas prices in California. The soft cap allowed all generators who could cost justify their bids above the $150/MWh level to be paid as bid if their capacity was necessary to meet demand. The MSC report outlined how these firms could use affiliate transactions to raise the announced spot price of natural gas in California and thereby cost-justify higher electricity bids in the ISO markets under the FERC soft-cap. It also presented evidence that the persistent divergence in natural gas prices in California relative to the rest of the western US could be attributed to this activity.

Although many other provisions of PUHCA are no longer necessary, for the reasons discussed above, it is essential that some regulatory agency maintain the wide-ranging authority that it gives the SEC to collect information on the affiliate transactions of public utilities. Given the evolution of electricity from a commodity that is produced and sold at a regulated price to one where

financial transactions play such a major role, the obvious agency to transfer the authority to request access to affiliate transactions, audits and access to books and records is the Commodity Futures Trading Commission (CFTC). Because electricity is now traded like all other commodities, it should be regulated in the same manner as other commodities.

There is also a role for a self-regulation of these markets. As noted above, a major risk in competitive electricity markets is an over reliance by consumers on the short-term market. For the same reason that banks are required to hold a pre-specified fraction of their deposits in liquid securities and cash; the CFTC or FERC could require that all generation unit owners have physical or financial hedges for some minimum fraction of their expected output with final consumers. In this way, the incentive for these firms to attempt to increase prices in the spot market through their bidding and scheduling behavior would be reduced. An independent market monitoring committee formed by the industry could certify compliance with these forward contracting requirements and administer penalties to market participants not in compliance. In this way the role of regulatory oversight in the electricity industry would evolve from one of setting output prices to making sure that consumers are not exposed to unnecessarily high levels of short-term price risk.

SHORT-TERM MARKET POWER MITIGATION IN CALIFORNIA

Before discussing the specific case of market power mitigation in California, I would first like to state two goals of market power mitigation. Then I will briefly explain why I believe the plan recently implemented by the Federal Energy Regulatory Commission is unlikely to achieve these two goals. Finally, I will summarize a market power mitigation plan proposed by the Market Surveillance Committee of the California Independent System Operator in its December 1, 2000 report to FERC that I believe satisfies these goals.

The first goal of market power mitigation is to reduce the average price of wholesale electricity paid by California to a level that would be occur in a competitive electricity market with California's current supply and demand conditions and fuel costs. Any successful market power mitigation plan must provide a guarantee that it can at least achieve this goal. One implication of this goal of market power mitigation is that producers will necessarily receive lower prices and therefore less revenues from selling the same amount of electricity as a result of a market power mitigation mechanism. This conclusion is the result of the accounting identity which states that the

amount the producers receive for electricity must be greater than or equal to the amount that consumers pay for wholesale electricity.

The second goal of market power mitigation is to alter the incentives faced by market participants so that it will no longer be profit-maximizing for generation unit owners to withhold capacity from the spot market by bidding substantially in excess of their variable cost of producing electricity. The idea is to alter the market rules in such a way that after implementing a mitigation plan, the spot market functions in a manner consistent with a competitive market for the vast majority of hours.

By altering the incentives of generation unit owners to produce their output in the most efficient manner possible, the profits of generators may need to be reduced much less than the revenues to generators in order to achieve a given level of market power mitigation. This possibility exists because exercising market power typically requires a generation unit owner to produce a given level of output in an inefficient manner. For example, it may make sense given the rules of the market to run the firm's inefficient units in order to drive up the market price earned by all units. This strategy may maximize the profits of the owner of the generating facilities, but it does not minimize its costs of producing the observed level of output.

I believe the market power mitigation plan recently implemented by FERC is unlikely to achieve either of these goals, particularly the second goal. In this first place, this plan proposes to pay market-clearing prices for energy based on unit-specific, cost-based bids in addition to reimbursing firms for verifiable start-up and no load costs and NOx emissions costs. This mitigation scheme implies that all but the lowest cost generators is receiving more than its regulated production costs for supplying electricity. This scheme therefore guarantees that consumers pay more for wholesale electricity than they would pay under cost-of-service pricing. Under the FERC plan, consumers have the potential to pay significantly more than total production costs to receive the same amount of electricity in order to preserve a market-clearing price mechanism which provides incentives for generators to produce in an inefficient manner.

In particular, if a firm would like to receive a higher level of revenues, then it only needs to declare some of its lower cost units unavailable to supply electricity in order to set the market-clearing price (earned by all of its remaining units) with its highest cost unit or the highest cost unit of its competitors.

For this reason, the FERC proposal does little to eliminate the incentive generators have to withhold capacity from the spot market. Because it caps the spot price in the ISO's real-time energy market, the FERC also plan dulls the incentive for generators located in and outside of California to supply electricity into the California market. Consequently, this plan should increase the likelihood of capacity shortfalls in California this summer, because it truncates the level of potential profits an out-of-state supplier can receive from selling into the California market and therefore reduces the likelihood these facilities will remain on for as many hours for the option to sell into California.

By offering generators the opportunity of higher prices during system emergency conditions than during normal system conditions, the FERC plan creates further incentives for generators to withhold capacity in order to cause system emergencies.

Because this plan allows generators to cost justify their bids beyond the proxy price contained in the order and be paid as bid if their capacity is necessary to serve demand, the FERC plan can provide no guarantee that consumers will be protected from the same runaway natural gas prices that occurred in California during the winter and spring of 2001. For this reason, the FERC plan provides little incentive for generators to procure fuel and other inputs in a least cost manner, because the remedy guarantees recovery of all justifiable costs associated with supplying electricity. This plan assigns all of the risk associated with managing these costs to California consumers, who have little ability to manage it. Some, if not all of these risks should be assigned to the generation unit owners. They are major players in the natural gas market and have the resources and expertise to manage this risk.

Finally, the FERC plan provides no incentive for generation unit owners to maintain their facilities in top working order. This plan assigns all outage risks to California consumers who are in no position to manage them. Their only choice is to pay higher market-clearing prices because the ISO is forced to operate higher cost units due to forced outages. This plan faces California consumers will the real possibility of a repeat of the winter and spring of 2001, when generation outages reached unprecedented levels. In fact, this plan creates incentives for unit owners to maintain their high cost facilities in top working order and their low cost facilities in poor working to increase the likelihood the market prices will set by their higher cost units.

In summary, FERC's market mitigation plan does not alter the incentives of generators to attempt to raise prices in the spot market. It only limits the range of actions they can take to accomplish this. However, many of the potential actions that generators might take to raise prices can have dire consequences for the reliability of the ISO grid. As a consequence, California consumers face the real possibility of paying unnecessarily high prices for electricity for a lower level of reliability under this mitigation plan.

The December 1, 2000 Market Surveillance Committee report outlines a market power mitigation plan which I believe achieves both of the goals mentioned above. This remedy does not impose a price cap on the spot market, but it does require FERC to make a one-time regulatory intervention that results in just and reasonable rates in California for the next two years. This plan would allow all sellers in the California market during 1998 to 2001 (besides the three California investor-owned utilities) to continue to be eligible for market-based rates only if they offer 75% their expected annual sales in the form of two-year forward contracts at a price set equal to the average of the perfectly competitive benchmark price over this time period. This is the market price that would prevail under the no market power standard explicitly stated in FERC's competitive market requirement for allowing a market participant to substitute market prices for cost-based prices.

The potential upside profits for each market participant is still unbounded, because they have the opportunity to sell any remaining energy beyond their forward contract commitment at market-based rates. However, because of the forward commitments that all generators selling into California will have under this plan, the opportunities for these generators to exercise market power in the energy and ancillary services spot markets will be significantly reduced. The details of how each participant's contract quantity and price are set are outlined in the December 1, 2000 MSC Report. The February 6, 2001 MSC Report computed a just and reasonable price of $55/MWh for these forward contracts for this two-year period using futures market gas prices at that time. Current futures prices for gas are even lower.

Any market participant that does not offer these two-year forward contracts would lose its market-based price authority and be subject to cost-of-service rates for all of its sales of energy and ancillary services into the California market and surrounding markets in the western US for at least this two-year period. These cost-of-service prices would be subject to a prudency review by both the FERC and the California Public Utilities Commission.

Once these forward contracts are in place, all market participants still eligible for market-based prices will not be subject to bid caps or price caps in any of the ISO markets. This will maximize the likelihood that sufficient generation capacity in the western US will be available to serve California's demand during all hours of the summers of 2001 and 2002. Moreover, because all California suppliers will face a significant risk of having to purchase out of a potentially very high-priced spot market to fulfill their forward market commitment in the event that they do not have sufficient generating capacity available to meet their forward energy commitments, these firms will have very strong incentives to maintain their generating unit in top working order.

All market participants with capacity located in California, including those subject to cost-based rates, would be subject to the following availability standard. All generators would be required to submit on an annual basis planned outage schedules. These would be reviewed by and approved by the California ISO. At all times besides those previously scheduled with the ISO, all generation units would be required to submit standing bids into the ISO's real-time energy market for the difference between the unit's nameplate capacity and its final energy schedule at whatever price the owner chooses. If a unit owner's bid is selected and it is unable to respond to the ISO's dispatch instruction, either with its own unit or some other unit in the same local area, the unit owner will be required to purchase this quantity of energy from the real-time energy market at the current market price. This availability standard effectively assigns the risk of forced outages to the unit owner, rather than the ISO.

With 75% percent of the expected sales of all market participants locked-in for the next two years at a price in the neighborhood of $60/MWh and 100% of the expected production from the assets of the three investor-owned utilities available at production cost, California will have wholesale price certainly for between 80 and 85 percent of expected electricity consumption over the next two years at a wholesale price of less than $65/MWh.

California can allow prices in a significantly smaller spot market to rise to the point necessary to attract sufficient supply into state to avoid rolling blackouts and to provide the necessary signals to final demand to cut back during high-priced periods. In order to provide signals to final demand to cut back during these high-priced periods, California is in the process of implementing real-time pricing program to accomplish just this. With this mitigation plan in place and California's efforts

in implementing these demand-responsiveness programs, the California electricity market will function in a manner that benefits California consumers and consumers in the rest of the western US.

This intervention corrects the fundamental flaw with the California market described above–the over-reliance on the spot market. The immediate result will be a competitive spot electricity market that will require no further regulatory intervention by FERC and not require bid or price caps. This is in stark contrast to the enormous adminstrative burden associated with implementing the FERC mitigation plan. Moreover, the MSC plan takes away any incentive for generators located in and outside of California to withhold energy from the spot market. They have a forward commitment for 75% of their expected sales whether or not their plant is available and any additional sales can be made at an unrestricted spot price. This creates both a carrot and stick to maintain their generating units in top working order and to operate them in a least-cost manner.

By intervening in the forward market, as opposed to the spot market, California consumers are able to purchase the lowest cost energy of each generation unit owner in the forward market at a price that at least recovers the cost of supplying this quantity of energy over the next two years. The remaining high cost energy of each supplier will be purchased in a competitive spot market at the market-clearing price. In contrast, the FERC mitigation plan will pay a market-clearing price based on the regulated cost of the highest cost unit operating in each hour for all of the energy consumed. It is highly unlikely that the FERC scheme will result in lower average energy prices over the next two years than the scheme proposed by the MSC which mitigates market power in the forward market by guaranteeing the price that consumers will pay for 75% percent of each market participant's expected output over the next two years.

LONG-TERM ENERGY POLICY

Properly functioning competitive markets provide very strong incentives for new entry to occur. The best example of this comes from the US natural gas market where the increase in the price of natural gas beginning in the autumn of 2000 led to an explosion in new drilling activity. Consequently, it is difficult to see the need for a long-term federal energy policy where there are competitive markets for energy. In this case, the only role for a Federal energy policy is to eliminate the barriers to entry of new firms and allow normal market forces to operate.

However, when market forces cannot operate, there is a clear role for a long-term Federal energy policy. For a variety of legal and technological reasons, it is difficult for market forces to

operate in the transportation network for both electricity and natural gas. This is particularly true for the electricity transmission network. The technology favors no more than one transmission network for a single geographic area. For this reason, even in a competitive electricity market transmission services are provided by a regulated monopoly. Similar logic applies to natural gas pipelines, although the scope for market forces to signal opportunities for new investment seems greater than in electricity transmission.

Because virtually all new generating capacity proposed throughout the US is natural gas-fired, significant cost-savings can be realized by placing the oversight of the national natural gas network and national transmission network in the same regulatory agency. There is a clear need to give this agency the authority to site electricity transmission facilities. Currently, the authority to site transmission facilities is the responsibility of state governments, despite the fact that the siting of natural gas and oil pipelines is the responsibility of the Federal government. For the full benefits of competitive wholesale electricity markets to be realized, this regulatory agency must have the authority to coordinate the siting of transmission facilities for natural gas and electricity.

Another source of benefits from a competitive electricity market comes form expanding the size of the market that each generator can sell into. This can only be accomplished if the amount interstate transmission facilities is significantly increased. If this process is coordinated with the development of the interstate gas pipeline network the competitiveness of both the electricity and natural gas markets will be enhanced.

A second area when market forces have not been allowed to operate is in determining the level of environmental quality. The historical method for regulating environmental quality is through the use of engineering standards set through a complex and tedious administrative process. As a result, many environmental market have been developed to price environmental bads such as nitrous oxides and sulfur emissions. These markets endow each market participants with an initial allocation of emissions credits that decline over time. Firms then have the option to either install emissions control technology in order to meet these limits, or purchase emissions credits from other firms and which then allows them to emit at higher levels than their initial endowments.

A Federal energy policy can foster the development of markets for environmental goods and bads. By creating markets for these environmental goods and bads, consumers have the opportunity to vote with their money to reduce the levels of these environmental bads and increase the level of

environmental goods. The prices of these environmental goods and bads will then become tangible costs which must be borne by users of the energy sources which produce these environmental bads.

Only if the full costs, including environmental costs, of all energy sources are charged tothe firms producing and consuming these energy sources will producers and consumers make economically efficient energy consumption decisions. By developing the necessary environmental markets to price all of these environmental goods and bads in a transparent manner will it be possible to the marketplace to make the socially efficient long-term energy investment decisions.

A long-term energy policy is also needed to redesign a regulatory structure to oversee and foster a competitive electricity market. As the events of the California market have demonstrated, it is an extremely challenging regulatory problem to honor all of the mandates of the Federal Power Act in a wholesale electricity market. Specifically, there is no guarantee that a market will set just and reasonable wholesale electricity prices. For this reason, another role for Federal energy policy is to implement revisions to the Federal Power Act that would make it compatible with a competitive market. It is unacceptable to have law in place that requires that FERC set just and reasonable wholesale electricity prices without a clear definition of how to determine whether prices are in fact are just and reasonable. Moreover, this agency should also have a clear definition of how to determine refunds of any unjust and unreasonable prices given that the Federal Power Act also requires that FERC issues refunds for any payments in excess of just and reasonable prices. A deliberately vague definition of just and reasonable prices and an unspecified procedure for determining the level of refunds in the event that prices are determined to be unjust and unreasonable only invites future problems between FERC and another state that decides to introduce wholesale competition at some date in the future, similar to those that have occurred over the past year between California and FERC.

Market Surveillance Committee Reports/Opinions

"ISO Market Surveillance Committee Opinion on Firm Transmission Rights Proposals," May 22, 1998

"Preliminary Report on the Operation of the Ancillary Services Markets of the California Independent System Operator (ISO)," August 19, 1998.

"Report on the Redesign of the Markets for Ancillary Services and Real-Time Energy," March 25, 1999.

"Reliability Must-Run Contracts for the California Electricity Market," April 2, 1999.

"Report on the Redesign of the California Real-Time Energy and Ancillary Services Markets," October 18, 1999.

"The Competitiveness of the California Energy and Ancillary Services Markets," March 9, 2000.

"Comments on 'Comprehensive Congestion Management Reform--Zonal-Forward Market--White Paper' by California ISO," April 24, 2000.

"Opinion on the California ISO's Proposal for Interim Locational Market Power Mitigation ('Interim LMPM')," June 13, 2000.

"Recent Events in the California Electricity Industry and the Level of Price Caps on the ISO's Energy and Ancillary Services Markets," July 6, 2000.

"Market Surveillance Committee Opinion on the ISO's Proposal For Congestion Management Reform," July 31, 2000.

"Designing the Market for Local Reliability Service," August 3, 2000.

"An Analysis of the June 2000 Price Spikes in the California ISO's Energy and Ancillary Services Markets," September 6, 2000.

"Long-Term Price Cap Policy," September 20, 2000.

"Analysis of 'Order Proposing Remedies for California Wholesale Electric Markets (Issued November 1, 2000)' December 1, 2000.

"Proposed Market Monitoring and Mitigation Plan for California Electricity Market," February 6, 2001.

"Comments on "Staff Recommendation on Prospective Market Monitoring and Mitigation for the California Wholesale Electricity Market," March 22, 2001.

Other Papers and Presentations on Electricity Markets

The Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market, mimeo, February 1996 (with R. H. Patrick).

The Time Series Behavior of Market Prices and Output in the England and Wales Electricity Market, mimeo, October 1996 (with R. H. Patrick).

Estimating the Customer-Level Demand for Electricity Under Real-Time Market Prices, mimeo, August 1997, (with R.H. Patrick).

An Equilibrium Model of a Multi-Unit Auction Market: The Case of a Competitive Electricity Market, mimeo, January 1999.

Market Design and Price Behavior in Restructured Electricity Markets: An International Comparison, forthcoming in Competition Policy in the Asia Pacific Region, EASE Volume 8, Takatoshi Ito and Anne Krueger (editors) University of Chicago Press, 1999.

Regulation and the Leverage of Local Market Power in the California Electricity Market, July 1999 (with James Bushnell).

Measuring Market Power in the California Electricity Market, mimeo, August 2000 (with Severin Borenstein and James Bushnell).

An Empirical Analysis of the Impact of Hedge Contracts on Bidding Behavior in a Competitive Electricity Market, International Economic Journal, Summer 2000, 1-40.

Identification and Estimation of Cost Functions Using Observed Bid Data: An Application to Electricity, August 2000.

"Ten Myths About Competitive Electricity Markets: Lessons for Designing Congestion Management Protocols," May 2001.

"Will FERC See the Light on the Law? (Los Angeles Times, 4/30/01)

"Want 10,000 megawatts? Use Variable Power Pricing" (San Jose Mercury News, May 4, 2001)

"A Comprehensive Market Power Mitigation Plan for the California Electricity Market" April 24, 2001.

TESTIMONY

Before the

United States
House of Representatives

Committee on Financial Services

The California Energy Crisis: Impacts, Causes and Remedies

Wednesday, June 20, 2001

At 10:00 AM

James L. Dobson, CFA
Managing Director
Deutsche Banc Alex. Brown

HOW THE ELECTRICITY MARKETS WORK

Electricity and other energy sources remain the life-blood of the United States economy. The United States electricity markets have traditionally been regulated, largely on the basis of cost-plus and return-on-investment regimes. Vertically integrated companies generated, transmitted and distributed electricity to consumers in their franchised region, recovering reasonably incurred costs and having the opportunity to earn a "reasonable" return on invested capital. Over 100 investor-owned electricity companies, commonly known as electric utilities, operated in the country. Both state and federal authorities are charged with overseeing the industry. The historic regulatory regime, based on asset investment as a method to grow earnings, encouraged the addition of generating capacity, among other things. Dating back to the mid-1980s, the industry operated with a 35% capacity reserve margin (or with 35% more supply than peak electricity demand required). However, the regulatory regime did not maximize efficiency or minimize costs. As a mature and asset intensive industry, the generation of electricity is ripe for competition, in order to exploit these inefficiencies. Demand for electricity is currently expected to grow about 2.5% annually over the next few years.

The Public Utility Regulatory Policies Act of 1978 and the 1992 Energy Policy Act both encouraged the idea of a competitive electricity generation industry. In both laws, wholesale generators without the desire to sell electricity to retail consumers were permitted to enter the industry and construct and operate electricity generation facilities. Electric utilities purchased the electricity under long-term contracts from the unregulated wholesale generators. However, consumers indirectly financed these generators as their wholesale prices were passed on, dollar for dollar, to consumers. This spawned the idea of a fully competitive generation market, with the idea of passing the risks of excess supply and high costs from the consumer to the industry participants.

Over 20 states have passed legislation to adopt a more competitive industry structure for the electricity industry. This includes California, but also other states like Pennsylvania, Massachusetts, Illinois and Rhode Island. The deregulation movement in these states has generally included the recovery of previously incurred regulatory costs, the elimination of regulation of generation resources, and the eventual introduction of competition to consumers of electricity. However, many consumers (residential, commercial and industrial) still receive relatively fixed-price electricity as a result of the transition from a regulated monopoly to a competitive generation business, which is taking several years. Ideally, deregulation of electricity would occur in a period of excess supply rather than a period of shortage of supply. In deregulating any commodity, the economic forces of supply and demand will take over and efficiently determine prices. The UK electricity market was deregulated in a period of excess supply and prices have declined precipitously.

The wholesale spot market for electricity is largely deregulated, with over 370,000 megawatts of new generation proposed to be built over the next five years. By comparison, about 760,000 megawatts of generating capacity is installed in the United States currently. About half of the existing capacity is coal-fired. The new capacity

(370,000 MW) suggests that a 49% addition to generating capacity is possible over the next five years, most of which is likely to be natural gas fired generating capacity. By comparison, at a demand growth rate of 2.5% annually, the necessary capacity additions over the next five years would be 93,000 megawatts. The current announced backlog of generation development is a 400% increase over the required amount.

THE CALIFORNIA ENERGY CRISIS

As stated above, California is among more than 20 states in the US that have legislatively begun to deregulate the electric power industry. However, California is different in several critical ways. California fixed retail prices for several years, but allowed the deregulated wholesale market for power to move with the competitive forces. Further, regulators in the state forced the divestiture of some generating assets by the incumbent electric utilities. This divestiture forced the incumbents to purchase competitively priced wholesale power in the open market and to sell the power at fixed retail prices. Beginning in the summer of 2000, wholesale electricity prices were well above the retail prices the incumbent utilities were permitted to charge, creating a significant loss on certain sales by the incumbents. California regulators also implicitly forced the retail electric companies to buy in the spot market or risk clear 20/20 hindsight by regulators of long-dated contractual obligations.

Electricity supply nationwide is currently short. This is the result of a lack of new investment in the industry, largely as a result of the uncertainty of deregulation. As a result of this shortage, electricity prices in the spot market have been rising. This coupled with very poor hydroelectric conditions in the Northwest (almost 50% of electricity generation in the Northwest is hydro-powered) has left the western portion of the United States with very short electricity capacity and higher than normal electricity prices. As California has for several years been a net importer of electricity, the regional shortage is particularly acute for California. The state of California currently has an electricity capacity reserve margin of less than 3%.

Although many of the characteristics of California deregulation were flawed, we believe one of the major shortcomings was deregulating supply when supply was so short as to be bordering on inadequate. Many other examples of deregulated markets suggest the theoretic outlook for deregulation for the electricity markets in California and elsewhere is very strong. However, significant amounts of new generating supply must be added in all regions of the United States. Absent state or federal funding for electricity generation resources, we believe the new capacity is best built and financed by the private sector. With a need of between 100,000 and 200,000 megawatts of generating capacity nationwide and a cost of about $700,000 per megawatt of capacity, the total cost of the new capacity is between $70 and $140 billion.

IMPACT OF CALIFORNIA

Beginning with the 1992 Energy Policy Act, the industry has been encouraged to pursue competition as a method to squeeze out these efficiencies. California was one of the first

electricity markets to move towards a more competitive industry structure. The near-term impact of the current electricity crisis on California may slow the economy. However, as we are quite convinced that excess supply will develop in the entire United States, including California, we believe the appropriate course of action is to allow the competitive markets to take their course.

High prices in competitive industries attract capital to those industries. The high prices temporarily generate high returns for industry participants. However, as new supply is added to take advantage of the high prices and high returns, the new supply reduces prices and profit margins. This is particularly true in commodity industries like electric power. As we stated above, the high prices that have existed in the United States over the last 12-18 months have caused over 370,000 megawatts of new generation to be proposed. If even half of this new capacity is built, electricity prices will decline significantly over the next few years. Our forecast suggests net additions between now and 2005 to approximate 220,000 megawatts.

In California, almost 17,000 megawatts of new electricity generating supply has been announced to be operating by 2003. Another 8,000 megawatts of electricity generating capacity is expected to be added between 2003 and 2006. Between now and 2006, this suggests an addition of 45% to existing generating resources. Importantly, a 31% addition to existing capacity is possible by 2003. The new additions, coupled with a return to more normal hydroelectric conditions should reduce electricity prices materially in 2002 and 2003.

ASSESSMENT OF THE CALIFORNIA CRISIS

In our opinion, the most critical action state and federal legislators and regulators can take is to ensure the development of a competitive market for electricity. Avoid the temptation to cap electricity prices in the near-term. Actions to ensure the enforcement of current law should be more than adequate to control price spikes. Importantly, avoiding the near-term temptation to cap electricity prices will deliver a much larger and longer term benefit to consumers – the economic benefit associated with the development of excess generating capacity in the United States. Ironically, the excess electricity supply we expect will benefit consumers both economically and environmentally. Economically, prices will be lower as a result of excess generating supply, providing a tangible benefit to consumers. Environmentally, the new generating resources are significantly cleaner and more efficient than existing electricity generating facilities. Combined, this will provide a cleaner environment and lower electricity prices.

We believe it is important to recall that the last time excess generating capacity was "enjoyed" in the United States (during the 1980s), consumers financed the excess supply through higher prices. This was a result of regulation. Avoiding price caps and allowing the development of excess generating supply and an efficient competitive market for electricity in the United States will hand consumers the benefit originally promised to them in electricity deregulation – significantly lower prices.

Beyond avoiding price caps and encouraging the development of new generating capacity, we believe there are two other important items for regulators and legislators to consider. This is to encourage the development of new transmission investments and to encourage a diversity of generating resources.

On electricity transmission, we believe solving bottlenecks and other transmission constraints will also aid in the development of a competitive electricity market. However, at relatively low returns, investor-owned companies are not encouraged to make investments in the electric transmission business currently. Part of this is a result of the high returns in the short generation market, but another contributing factor is the relatively low return offered for transmission investments. Considering the relatively higher investment permitted for natural gas transmission development and expansion, we believe electricity transmission ought to be encouraged with higher returns.

About 50% of the electricity generating resources in the United States use coal as a boiler fuel. Approximately another 18% is nuclear and another 18% is natural gas. The balance is oil, wind, solar and other renewables. Considering the 370,000 megawatts of proposed new capacity in the United States, over 95% of the capacity is natural gas driven. The consideration of nuclear, coal and other resources will be important over time to maintain fuel diversity and to avoid any fuel specific shocks to the price of electricity.

APPENDIX

1. **US Electricity Supply & Demand Update** (dated June 5, 2001)
2. **Restructuring of the US Electric Generation Sector** (dated June 8, 2001)
3. **Electricity Supply & Demand in the US** (dated March 8, 2001)

Deutsche Banc Alex. Brown

US
Utilities

June 5, 2001

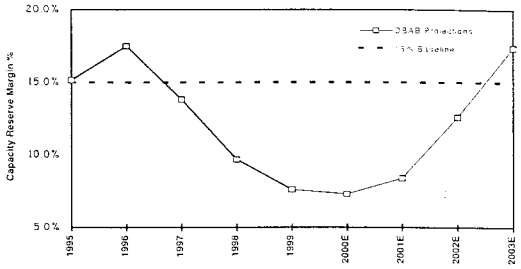
Americas

Deutsche Bank

U.S. Electricity Supply & Demand Update:

Capacity Shortage Still Evident, But Additions Continue – Suggests Near-Term Outperformance by Generators

U.S. Capacity Reserve Margins 1995 - 2003



Source: Deutsche Banc Alex. Brown, NERC, RDI Consulting

- Based on our most recent analysis of planned electricity supply additions, we still believe that nearly every U.S. region will experience tight capacity margins for electricity supply this summer.
- We expect about 35,000 megawatts of new generating capacity to come on line in the U.S. by mid-June. However, even factoring in this capacity, we still expect regional capacity margins to hold at historically low levels this year, providing rising prices for generators in the wholesale markets.
- The regions where we see the most difficult supply situations this summer include California, the Northwest, New York City, and parts of the Midwest and the Northeast. Texas and New England are the only regions showing close to adequate capacity.
- Overall, we expect power generators and marketers throughout the country to see strong year-over-year earnings comparisons in 2001, both from new capacity additions as well as improved margins and higher pricing. With the addition of more new supply in 2002, we expect to see electricity prices moderate in 2002.
- The companies we expect to benefit from this opportunity in the near term include Calpine Corp., Reliant Resources, UtiliCorp United, Allegheny Energy, Exelon Corp. and Orion Power Holdings. Other potential benefactors include Duke Energy, Mirant Corp. and NRG Energy.

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Executive Summary

Comprehensive work on supply and demand in any industry requires constant updating and review. Although we continue to believe our March 8 report on electricity supply and demand in the United States (*The March to a Commodity Drum*) is the most comprehensive, it needs to be updated regularly to remain useful. As such, we have been updating the figures monthly and watching the development of new supply additions during the first and second quarter. We believe that capacity added for the summer of 2001 will be a strong indicator of the industry's commitment to new capacity and the effectiveness of high prices to act as a catalyst for new supply additions.

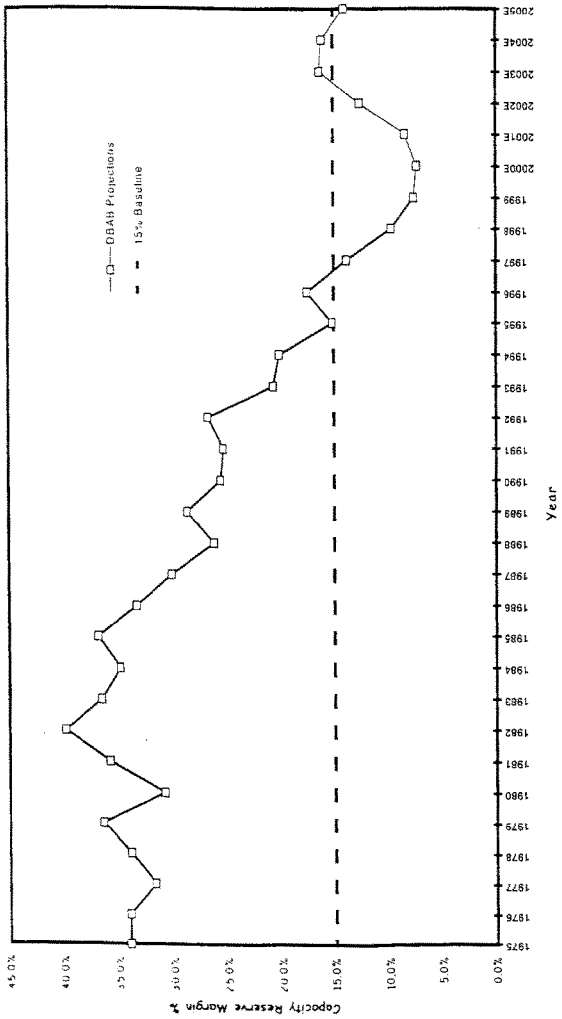
Based on our most recent analysis of planned electricity supply additions for 2001 and 2002, we still believe that nearly every region of the United States will be short electricity generating capacity during the summer of 2001. We expect 35,000 megawatts of new generating capacity to be available to meet the summer peak demand, relative to year-end 2000. However, this will still leave the U.S. with a capacity reserve margin of 8.4%. This is only slightly over the 7.0% reserve margin we saw in 2000. We continue to assume adequate capacity of a reserve margin of 15%. Admittedly, as we stressed in our March 8 report, a regional review of supply and demand is far more useful than any national average.

The regions where we see the most difficult supply situations this summer include California, the Northwest, New York City, and parts of the Midwest and the Northeast. California will almost certainly face periods of rolling blackouts this summer due to the lack of generation investment in the state over the last decade, and as a result of the low hydroelectric production levels in the Northwest, stemming from low water levels. New York City also faces a very tight summer due to the lack of supply additions and the growing level of demand. The two areas of the United States with the lowest capacity reserve margins this summer are California (-0.3%) and the Mid-Continent Area power Pool – MAPP (0.9%). The two regions with the highest estimated capacity margins are in Texas (16.0%) and New England (13.0%).

The shortage of electricity generating supply during the summer of 2001, coupled with the rising prices of electricity and the increasing output of new generating resources will drive earnings for the generators in the second and third quarters. We expect electricity prices and profit margins to be strong in 2001 but begin to moderate for the first time in the last three years during 2002. First quarter 2001 profits supported our forecast, with almost every one of the companies in the electric generation sector beating our expectation for earnings growth. We expect similar activity in the second and third quarters —particularly in light of the relatively easy earnings comparisons. The companies we expect to benefit from this opportunity in the near term include Calpine Corp. (CPN), Reliant Resources (RRI), UtiliCorp United (UCU), Allegheny Energy (AYE), Exelon Corp. (EXC) and Orion Power Holdings (ORN). Other potential benefactors include Duke Energy (DUK), Mirant Corp. (MIR) and NRG Energy (NRG).

Figure 1:

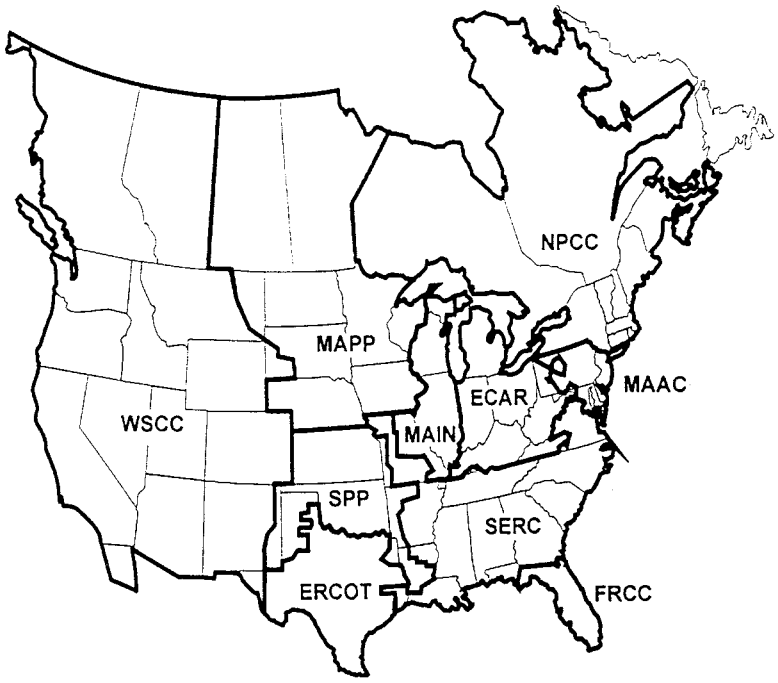
U.S. Capacity Reserve Margins 1975 - 2005



Source: Deutsche Banc Alex. Brown, NERC, RDI Consulting

Figure 2: Map of NERC Regions

North American Electric Reliability Council (NERC) Regions



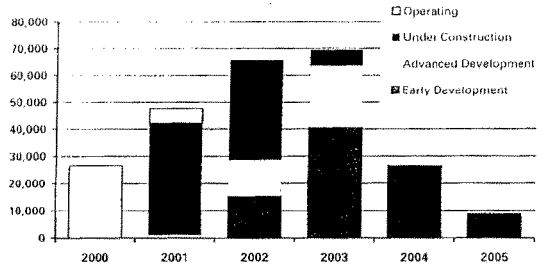
ECAR
East Central Area Reliability Coor. Agreemt.
ERCOT
Electric Reliability Council of Texas
FRCC
Florida Reliability Coordinating Council
MAAC
Mid-Atlantic Area Council
MAIN
Mid-America Interconnected Network
MAPP
Mid-Continent Area Power Pool
NPCC
Northeast Power Coordinating Council
SERC
Southeastern Electric Reliability Council
SPP
Southwest Power Pool
WSCC
Western Systems Coordinating Council

Source: Deutsche Banc Alex. Brown estimates and company information

Figure 15: **Capacity Outlook – United States**

United States

Capacity Additions by Year (MW's)

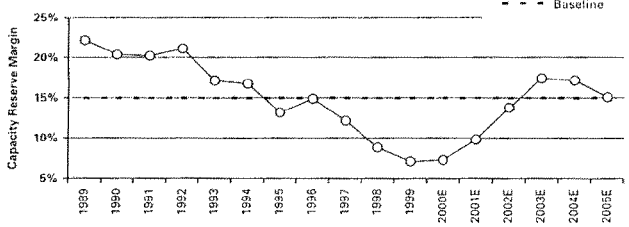


Capacity Additions	
Year	MW
2000	26,654
2001	47,688
2002	65,783
2003	69,481
2004	28,996
2005	8,818
Total	*247,420*

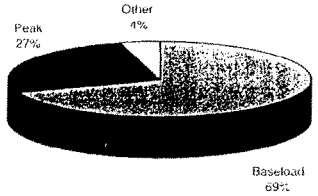
TOP FIVE BUILDERS IN U.S.*	
Company	MW*
1) Calpine Corp	30,856
2) Duke Energy	18,697
3) Cogentrix	12,700
4) PG&E Corp	12,395
5) Panda Energy	12,246

* Actual additions announced & completed 2000 to 2005; Not probability weighted

United States
Capacity Reserve Margin



U.S. MW Additions by Plant Type
2000 - 2005



Source: Deutsche Banc Alex. Brown estimates and company information

Deutsche Banc Alex. Brown

US
Utilities

Deutsche Bank

Americas

June 8, 2001

Restructuring of the U.S. Electric Generation Sector

Expect Trend to Continue Despite California's Troubles

- Despite California's difficulties in deregulating the electric generation business, deregulation is working in 24 states in the U.S. We do not subscribe to the view of a sustained national or regional retreat from competition or the prospect of re-regulation.
- California's energy crisis is driven by a lack of generation supply and a failed deregulation framework.
- The pace of change may slow in some states in the near term, but may produce a more deliberate, comprehensive process toward restructuring at the state and federal level.
- A number of catalysts should help advance the restructuring process, which provides new opportunities for investors.
- We are bullish on the prospects for the generation sector, which we rate Buy.
- Recommend generators such as AES Corp (AES) and Calpine Corp (CPN), which are rated Strong Buy. In addition, we recommend Buy-rated Allegheny Energy (AYE), Exelon Corporation (EXC), Orion Power Holdings (ORN), Reliant Resources (RRI) and UtiliCorp United (UCU).

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Introduction

Despite the glaring failure of California's process to deregulate the electric generation business, deregulation is working elsewhere in the U.S. We do not subscribe to the view of a sustained national or regional retreat from competition or the prospect of re-regulation. The situation in California may slow the pace of change in some states, but may actually transform the transition to a more deliberate, comprehensive process toward restructuring at the state and federal level. The process of deregulation has been under way over the last decade, and we believe that a number of factors will serve as catalysts to continue the process. The addition of new generating supply, the movement toward the creation of regional transmission organizations, the Bush Administration's efforts to create a national energy policy, and an engaged, fully staffed Federal Energy Regulatory Commission (FERC) will contribute to this process.

California has clearly identified a number of pressing issues that must be addressed on a regional and national level. We believe Congress is poised to act this summer on several legislative initiatives in response to the energy crisis in California and the Western U.S. We do not expect this to include price caps though. At the state level, deregulation in 24 states continues relatively smoothly. No other region of the country is experiencing the same difficulties as California for a variety of reasons. We continue to think that California is an anomaly, driven by a lack of generating supply and a failed deregulation framework.

This report is designed to identify and briefly describe the characteristics of California's deregulation scheme that led to its failure. We explain how deregulation is working elsewhere and provide specific examples of the success in Pennsylvania and Texas. We attempt to address questions about other regions of concern, particularly New York City, which will also face a tight supply of power this summer. We believe that industry restructuring will continue to provide additional opportunities for investors. We are enthusiastic about the prospects in the near to intermediate term, especially for the wholesale generators, given the shortage of electricity nationally in the U.S. and the concern for price stability in a volatile pricing environment. Thus, our outlook continues to be bullish for the generation sector, which we rate Buy. We continue to recommend generators such as AES Corp (AES) and Calpine Corp (CPN), which are rated Strong Buy. In addition, we recommend Buy-rated Allegheny Energy (AYE), Exelon Corporation (EXC), Orion Power Holdings (ORN), Reliant Resources (RRI) and UtiliCorp United (UCU).

Deutsche Banc Alex. Brown

US
Utilities

Deutsche Bank

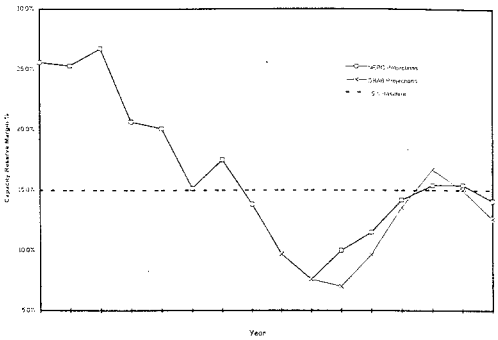
Equity Research
Americas

March 8, 2001

Electricity Supply & Demand in the U.S: The March to a Commodity Drum!

An Analysis of Regional Electricity Supply and Demand Dynamics

U.S. Capacity Reserve Margins 1990 - 2005



Source: Deutsche Banc Alex. Brown, RDI Consulting, NERC

- Our recent analysis of U.S. electricity supply and demand dynamics indicates that every region of the country will be short generating capacity in 2001.
- We expect about 45 GW of generating capacity to be added in 2001 and close to 60 GW in 2002. We assume demand growth of 3% annually.
- Profit margins in the electric generation sector are expected to be strong in 2001 and are likely to peak in 2002.
- The most interesting region at this time, in terms of likelihood of adequate or oversupply by 2002, is Texas.
- The analysis supports our generation thesis. Our favorite ideas in the sector are Calpine Corp., AES Corp., Reliant Energy and Exelon Corp. All four stocks are rated Strong Buy.

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Executive Summary

The electricity supply and demand outlook for 2001 continues to appear challenging. We expect 45 gigawatts (GW) of generating capacity to be added in 2001, with about 70% of that capacity available to meet summer peak demand. In 2002, we expect closer to 60 GW of generation capacity additions. However, siting and permitting challenges continue, so we would not be surprised if the 2002 figure is lower than our forecast. In 2000, 24 GW of new generating capacity were added in the U.S. This compares with our forecast of 31 GW. Although siting and permitting is slowing the addition of generating capacity in the U.S. somewhat, we remain convinced that we will move from a short capacity position in the U.S. to a long capacity position over the next several years. In fact, we continue to believe that the industry will build to excess capacity by 2005. Currently, 350 GW of capacity additions have been announced. We believe about 200 GW are necessary to adequately meet 3% annual demand growth comfortably by 2005.

Profit margins in the generation sector are likely to peak in 2002, leaving only capacity additions to drive earnings growth. Although the rising profit margins in 2001 continue to support our generation focused investment thesis in the electric power industry, we continue to emphasize that the generation opportunity is a finite one. The summer of 2001 and the second and third quarters of 2001 still look very promising from an earnings growth perspective. Every region of the U.S. will be short generating capacity in 2001. In 2002, the only region that appears to be moving towards adequate capacity and lower margins is Texas. Figure 1 shows U.S. capacity reserve margins from 1975. This chart also includes our capacity reserve margin projections through 2005, as well as projections by the North American Electric Reliability Council (NERC). Relative to our capacity addition forecast, NERC is more conservative. Table 1 displays estimated capacity reserve margins for every region of the United States for 2001 and 2002 using our supply growth estimates. Overall, the supply and demand analysis for 2001 and early 2002 continues to support our investment thesis on the generators in the US. Our favorite ideas in the sector are AES Corporation, Calpine Corporation, Reliant Energy and Exelon Corporation. These four stocks are Strong Buy rated.

The regional capacity outlook is more important in the electricity sector than the national outlook. The regions closest to adequate capacity include Texas and New England. In New England, though, the variable cost of a lot of the generation is very high, particularly at peak. The steepness of the variable cost curve in the region makes us relatively more comfortable with the capacity position in New England. The variable cost curve in Texas is very flat, which makes the region more susceptible to wholesale price pressure. The regions shortest generating capacity include California, the upper Midwest (MAPP), the Midwest (MAIN), the Southeast (SERC), Florida and New York.

Congress of the United States
Washington, DC 20515

May 9, 2001

Chairman Curt Hebert, Jr.
Federal Energy Regulatory Commission
888 1st St., NE
Washington, DC 20426

Dear Chairman Hebert:

We write to bring your attention to a number of issues likely to confront New York electricity consumers in the coming months.

As you know, New York's electricity market has recently been deregulated. Although these changes were expected to result in lower prices for consumers, these savings have often not been realized. In fact, consumers have been hit with significant price spikes during high demand periods and during inclement weather. Although supply and demand has effected the energy marketplace, we are concerned that a number of other factors have forced consumers to pay higher prices.

New York's power grid contains a number of built-in challenges which often force New York to rely on out-of-state power. To ensure grid reliability, New York maintains power supplies 18% above anticipated peak demand. In addition, New York City's enormous appetite for electricity forces the city to rely on peak production from local generators as well as imported electricity from outside of the city limits. As a result, New York is vulnerable to price fluctuations and market manipulations from out-of-state generators when demand rises significantly during the hot summer months. Last summer, prices dramatically rose on days with peak demand. On June 27, 2000, real-time prices were charged at a rate 18 times the amount charged earlier and later in the day.

Given the tight supply and demand situation that currently exists, we are concerned that there is potential for significant market manipulation. During high demand periods, generators are able to withhold power and keep generators offline to keep prices high. This opportunistic behavior takes advantage of deregulation and prevents the market from working as it should. In the end, consumers end up paying astronomical energy bills.

As the summer approaches, we strongly urge you to examine New York's energy marketplace as soon as possible to determine if price manipulation has occurred or if the potential for future market gaming exists. We hope you will take whatever steps are necessary to prevent this aggressive market manipulation and to allow the market to work as it should. We welcome your views on this issue and look forward to hearing from you soon.

CAROLYN B. MALONEY

EDOLPHUS TOWNS

ELIOT L. ENGEL

CAROLYN MCCARTHY

JOSE E. SERRANO

NITA M. LOWEY

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426

OFFICE OF THE CHAIRMAN

June 14, 2001

The Honorable Carolyn B. Maloney
U.S. House of Representatives
Washington, D.C. 20515

Dear Congresswoman Maloney:

Thank you for your letter of May 9, 2001, expressing concern about the possibility of price spikes in New York energy markets. I am concerned, as you are, about the effects of electricity price volatility on New York consumers.

This Commission is aware of the importance of a successful transition to a competitive market for the electric industry in New York, and will continue to work to ensure that wholesale prices remain just and reasonable. This Commission has recently approved two demand-side management programs proposed by the New York Independent System Operator, Inc. (NYISO), the entity administering New York energy markets. These programs are designed to provide consumers with the flexibility and incentive to respond to high prices. See New York Independent System Operator, Inc., 95 FERC ¶ 61,136 (2001) and New York Independent System Operator, Inc., 95 FERC ¶ 61,223 (2001).

The Commission has been closely following the events in New York markets, and the Commission's staff is in ongoing contact and consultation with the NYISO and the New York State Public Service Commission. NYISO closely monitors the energy markets that it is administering. At its inception, NYISO formed a Market Monitoring Unit to be responsible for detecting exercises of market power, including price manipulation, and for mitigating the market effects of such conduct. Similarly, the Commission's staff will investigate thoroughly any indications that generators are exercising market power.

This Commission will do everything within its jurisdiction to prevent unjustifiably high energy prices in the State of New York. However, regulators must be careful not to adopt approaches that exacerbate existing problems. Price caps can both aggravate supply shortages and dampen incentives for further investment to increase generation and install new transmission. In the long run, competitive markets will best serve consumers' need for reasonably priced electricity.

Be assured of my continued attention and cooperation on these matters.

Sincerely,

Curt L. Hébert, Jr.
Chairman

STATEMENT OF PROFESSOR PAUL L. JOSKOW[1] BEFORE THE COMMITTEE ON FINANCIAL SERVICES UNITED STATES HOUSE OF REPRESENTATIVES

JUNE 20, 2001

Thank you for giving me the opportunity to discuss issues associated with the development of wholesale power markets, the role of the Federal Energy Regulatory Commission (FERC) in the development of truly competitive wholesale power markets with good performance attributes, opportunities for FERC to improve its performance, and the need for FERC to respond to market failures in the wholesale power market in California. I have been working on the challenges associated with introducing competition into the U.S. electricity industry for 20 years.[2] During the last ten years I have also been involved in electricity market design and performance assessment initiatives in several regions of the U.S., including California, and in several other countries.

I continue to believe that if properly implemented, wholesale and retail competition in electricity can bring real benefits to electricity consumers in the long run. I also continue to believe that creating well functioning competitive electricity markets is a very difficult challenge, that we will make mistakes along the way, and that mid-course corrections will be necessary. I am anxious to see these competition and regulatory

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[1] Elizabeth and James Killian Professor of Economics at the Massachusetts Institute of Technology (MIT) and Director of the MIT Center for Energy and Environmental Policy Research. The views expressed here are my own and do not necessarily reflect the views of MIT or any other organizations with which I am affiliated. A CV with my educational background, affiliations and a list of my publications can be obtained at http://web.mit.edu/pjoskow/www/ .

[2] My book (with Richard Schmalensee) *Markets for Power: An Analysis of Electric Utility Deregulation*, MIT Press, 1983 was my first major publication on this subject.

reform initiatives succeed. However, as I look around the country at the states which have restructured and introduced wholesale and retail competition programs, it is quite clear that things are not going nearly as well as many had hoped only a couple of years ago.[3] We need to identify the nature of the problems, do what is necessary to fix them, and demonstrate that when electricity reform programs go bad responsible federal agencies will not abandon the states with which they worked to implement them but rather will work closely with them to find and apply solutions.

The development of competitive wholesale and retail electricity markets in the U.S. is a work in progress. The events in California and the rest of the West during the past year have, properly, attracted enormous attention and concern. This is not what California's electricity consumers, utilities, or its government officials bargained for when their innovative electricity restructuring and competition reform program was initiated in 1994. (I have attached a table of average hourly wholesale prices in California for each month from April 1998 through April 2001.) The causes of California's electricity crisis are complex, reflecting a combination of bad market design, bad regulatory decisions, unanticipated changes in basic supply and demand conditions, and supplier behavior which rationally took advantage of opportunities created by these conditions to further increase market prices.[4] Some progress has been made in mitigating the short run and long run problems in California. However, both federal and state government officials can and should do more. The restructuring program developed and

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[3] Expectations were probably too rosy. However, nobody expected the kind of mess that we have seen in the last year in California and the West generally. There are aspects of these reforms that are going well. A large amount of new merchant generating capacity has been attracted to the market and is in the construction or site approval stage around the country, including in California.

[4] My views on what happened can be found in my paper "California's Electricity Market Meltdown," June 7, 2001. A copy can be obtained by sending an email to pjoskow@mit.edu .

implemented in California was the outcome of a close cooperative relationship between FERC and California officials --- they called it "cooperative federalism." FERC approved California's new wholesale market institutions before they went into operation in April 1998. Both federal and state officials enthusiastically took credit for the restructured wholesale and retail electricity markets they were creating. However as problems emerged, and especially when the market exploded during the summer of 2000, FERC was not as closely involved in solving the problems as it should have been. The cooperative relationship between Federal and California government officials quickly deteriorated into a hostile relationship that focused on finger pointing and sloganeering rather than on finding practical solutions. We need to do better.

There are a number of useful lessons to be learned from the California experience. (I have attached a list of some of the useful lessons to be learned from California as an Appendix to this statement.) These lessons are important because competitive electricity market performance problems, including market power problems, are not unique to California during the last twelve months. Numerous market performance problems became evident in California as early as the summer of 1998, long before the meltdown in 2000. There have been market performance problems requiring market reforms and mitigation measures in the new wholesale markets in New York, New England, and PJM. Moreover, large portions of the country have not yet embraced comprehensive electricity restructuring and competition programs. They are unlikely to do so unless we can convince responsible state officials and the public that we have figured out how to make electricity market institutions yield results in terms of prices and reliability that are superior to traditional industry structures and regulatory institutions.

The fact that market performance problems have occurred and mitigation measures have been necessary in all of the newly created wholesale markets should not be surprising. Electricity has unusual physical attributes that make the design of well functioning competitive wholesale power markets a significant technical challenge. It is impossible to get it right the first time around. Electricity markets with good performance attributes do not create themselves and do not fix themselves. They must be created and reformed by people with appropriate technical expertise and experience working together and must ultimately be approved by responsible government agencies. Accordingly, mid-course corrections have almost always been necessary after competitive electricity markets first go into operation. Ongoing market reforms and regulatory "mitigation" initiatives designed to remedy serious market performance problems should be an *expected* feature of the *process* of creating efficient competitive wholesale electricity markets. Price caps, bidding rules, cost-based contracts and a variety of other mitigation mechanisms have been used or are being used in most new wholesale markets in the U.S. as short run mechanisms to protect electricity consumers from serious market imperfections until longer term fixes can be developed, introduced, and evaluated. Most other countries that have introduced competition into wholesale and retail electricity markets have confronted similar problems and relied on similar mitigation methods.

From this perspective, one should be very skeptical of the knee jerk rejection of calls for FERC to adopt price mitigation mechanisms to deal with the evident performance problems in California's wholesale electricity market.[5] Of course, we need

[5] The typical knee jerk reaction is that price caps necessarily cause shortages and are always an unreasonable intrusion into "free markets." This is simply not true if the markets at issue are characterized

to be sensitive to the possibility that mitigation measures can make things worse rather than better if they are poorly designed. Of course, we must be concerned that mitigation mechanisms do not discourage new investment in generating capacity. Of course, the proper long term strategy is to fix the features of the markets and regulatory framework that are broken. But we also must be concerned about the interim costs to consumers and the economy of unmitigated market failures.

The new wholesale market that began operating in California in April 1998 is not an "unregulated" market that has been operating smoothly for decades under the guidance of the "invisible hand" of competition. Rather, it is a newly created market that most knowledgeable people expected would have at least some problems that would need to be fixed and over which FERC had and has continuing regulatory authority and responsibility. Before the new market began to operate FERC wisely created the Market Surveillance Committee (MSC) of the ISO and the Market Monitoring Committee (MMC) of the PX to monitor the performance of the California markets and to make recommendations for mitigation when serious problems emerged. Outstanding independent economists were appointed to lead each of these monitoring committees. FERC created these institutions precisely because the performance attributes of these new market institutions were very uncertain and they had been the subject of extensive criticism and controversy before they went into effect. It would have made no sense to create these monitoring organizations if FERC did not expect that it might need to make

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by significant supplier market power and the price cap is set high enough so that markets can clear at competitive prices. A properly designed price mitigation program designed to mitigate market power will both increase supplies and reduce prices in the short run. Ironically, one of the reasons for restructuring the electricity industry to rely on competitive wholesale markets was the view that cost-of-service regulation of monopoly suppliers led to excess generating capacity. Moreover, the vast bulk of the electricity generated in the U.S. continues effectively to be subject to cost-based regulation since it is produced by vertically integrated firms supplying their retail customers at regulated rates.

reforms and implement mitigation measures if market performance problems emerged after the market began to operate.

Accordingly, it appears that prior to 1998 FERC understood that market monitoring and at least some mitigation measures and market reforms would be necessary *after* experience was gained with California's new wholesale market institutions. At the time, I thought that the MSC would be FERC's "eyes and ears" at the center of the new market institutions and would provide information, analysis and problem solving ideas which FERC could use quickly to resolve market performance problems. The MSC and MMC did their jobs admirably. However, for some reason FERC did not make effective use of the market monitoring institutions it created or of the analysis and recommendations that they produced. It should not have taken FERC so long to evaluate the performance of California's markets when they exploded during summer 2000. FERC should have relied much more on the extensive analyses performed by the MSC at that time and worked closely with it and the ISO's Department of Market Analysis. It should also have given more serious consideration to constructive mitigation proposals put forward by the MSC and the ISO well before FERC got around to finishing its own study.[6] Why did FERC create the MSC if it was then going to ignore it when serious unexpected problems became evident?

I was especially disappointed by FERC's response to abundant evidence that market power problems were exacerbating an already bad situation caused by rising

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[6] It is not my intention to place all of the blame on FERC for prolonging or exacerbating the crisis. There is plenty of blame to go around and policy makers have spent too much time looking for parties to blame and too little time fixing the problems. The CPUC's slow reaction to the problems, its failure to increase retail prices, the ensuing utility credit problems, and the legitimate reluctance of suppliers to supply without some assurance of getting paid certainly worsened the underlying wholesale market problems. The failure of

natural gas prices, reduced imports of power, higher demand and rising prices for NOx emissions permits.[7] There is a very basic problem here. FERC does not appear to have a clear definition of market power, has not identified the empirical indicia it will use to measure the presence and extent of market power, does not routinely collect or analyze the data necessary to draw conclusions about market power, has not defined how much market power is too much market power to satisfy its obligations to ensure that wholesale electricity prices are just and reasonable,[8] and it does not appear to have a well developed set of mitigation measures that it can choose from if it indeed finds that there is a significant market power problem. This is not a prescription for success in the identification of and effective response to serious market power problems.

By delaying its analysis of the problem, by failing to specify a clear definition of market power, by failing to specify or apply clear numerical criteria for evaluating market performance generally, and by ignoring constructive comprehensive proposals for mitigation, FERC did not in my opinion properly fulfill its responsibilities to respond to the California's market meltdown adequately or in a timely fashion. As summer is now upon us, the practical mitigation options for this summer are limited. At the very least, I would like to see FERC extend the number of hours to which the current mitigation rules apply, identify remaining loopholes, and close them. I also hope that California continues its efforts to remove unnecessary barriers to construction of new generating plants, to raise retail prices to reflect wholesale market prices, to restore credit to the

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FERC and the CPUC to find a way to work together constructively to find practical solutions in the early Fall of 2000 made the crisis much worse than necessary.

[8] A "perfect competition" standard would not appropriate, but benchmarking market performance off of textbook competition models can be very useful. The question then becomes how to use the benchmark information to determine whether there is too much market power necessitating some kind of mitigation response.

system, and to continue its energy efficiency and conservation efforts. I would also like to see Federal and California officials bury the hatchet and start to work more closely together in a cooperative fashion to find practical solutions to market performance problems

Until Congress amends the Federal Power Act to direct otherwise, FERC has the responsibility to guide restructuring and the expansion of competition in wholesale markets to achieve widely shared public interest goals, including reasonable wholesale prices for electricity. As FERC tackles this challenge it is important to keep in mind that "deregulation" is not a goal in and of itself. The goal is to create well functioning *competitive* markets that perform better than the regulated structures they replace.[9] Significant market power problems must be addressed both before suppliers are given market-based pricing authority and, *if necessary*,[10] after markets begin to operate as evidence about actual market performance and supplier behavior emerges from market experience.[11] Responsible regulators need to be in a position to evaluate alternative market design frameworks and to agree to allow only those to go forward that are likely

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[9] Neither regulation nor competition can yield "perfect" textbook outcomes. The goal is to do the best that we can in an imperfect world.

[10] Clearly, it is also highly desirable for market rules to be sufficiently stable so that investors are not subject to unnecessary regulatory uncertainty. This suggests that reforms should be focused on serious market performance problems, that comprehensive rather than piecemeal reforms should be undertaken, and that legitimate investor expectations should be respected in the reform process.

[11] In this regard, FERC's current "hub and spoke" method for evaluating potential market power problems in the context of market-based pricing applications is clearly outdated. Structural screens applying the methodology FERC uses in merger applications would provide better structural indicia of market power. These screens should be supplemented by information about the extent and nature of longer term hedging contracts in the relevant markets (e.g. what fraction of retail demand is covered with longer term contracts?), retail procurement arrangements, and on analyses of wholesale supplier and market behavior and performance based on actual market information. These analyses should encompass both generators and marketers of power.

to perform well. They must have the capabilities to identify serious market performance problems and to develop and apply reforms to fix them.

If FERC is successfully to perform on its obligations it will have to change as well. FERC needs to become an agency with the human resources, organizational structure, administrative procedures and leadership that allows it to play an active constructive role in guiding resolution of wholesale market design issues, to be actively involved in ongoing monitoring of market performance, to develop and effectively apply objective market performance indicia, and to act quickly and cooperatively with the relevant state agencies, Independent System Operators, Regional Transmission Organizations, and market participants to fix serious market performance problems quickly once they have been diagnosed. FERC must also play a more active role in creating new organizational structures and regulatory institutions to govern the nation's currently balkanized transmission system.

As you evaluate how well FERC is doing in performing on its responsibilities, both with regard the mess in California and the evolution of wholesale markets in the rest of the country, I suggest that you seek answers to the following questions:

1. What specific market performance attributes does FERC believe characterize a well functioning competitive wholesale electricity market that meets its obligations under the Federal Power Act? For example, what is FERC's definition of market power?

2. What numerical indicia does FERC use to measure these attributes of competitive market performance based on actual market experience? For example, what indicia of market power does FERC rely on and how does it measure them empirically?

3. Does FERC have ready access to the data, and the human resources to make appropriate use of these data, necessary to construct and evaluate these indicia of market performance?

4. Does FERC interact closely with the market surveillance committees and market monitors that have been set up in some parts of the country, sharing analytical techniques, and data, to find solutions to market performance problems?

5. What criteria does FERC use to determine whether and when these numerical market performance indicia indicate that market performance does not meet the requirements for "just and reasonable rates" under the Federal Power Act? For example, what would lead FERC to conclude that there is too much market power in a market based on its evaluation of actual market experience?

6. Does FERC actively monitor market performance and take action on its own initiative or does it wait for complaints?

7. Does FERC feel the need to find that individual suppliers have done something "wrong" and are "at fault" to conclude that there are market performance problems

or can it simply proceed with mitigation measures based on general evidence of market performance failures?

8. What menu of mitigation tools does FERC expect to rely on, in the short run and the long run, when these performance indicia indicate that the market is performing poorly?

CALIFORNIA PX DAY-AHEAD HOURLY PRICES
($/Mwh:Weighted Averages 7 x 24)

	1998	1999	2000	2001
January	-	21.6	31.8	260.2
February	-	19.6	18.8	363.0 (ISO)
March	-	24.0	29.3	313.5 (ISO)
April	23.3	24.7	27.4	370.0 (ISO)
May	12.5	24.7	50.4	
June	13.3	25.8	132.4	
July	35.6	31.5	115.3	
August	43.4	34.7	175.2	
September	37.0	35.2	119.6	
October	27.3	49.0	103.2	
November	26.5	38.3	179.4	
December	30.0	30.2	385.6	
AVERAGE	30.0	30.0	115.0	326.5

LESSONS LEARNED FROM THE CALIFORNIA ELECTRICITY CRISIS

Paul L. Joskow
MIT

- Electricity has unusual physical attributes that make the design of well functioning competitive wholesale power markets a significant technical challenge. Electricity markets don't design themselves via "the invisible hand." Effective market design requires substantial technical expertise and careful application of lessons learned from international experience. Market institutions and residual regulatory mechanisms need to be designed to be robust to extreme contingencies. Market and regulatory institutions need to be designed to be robust to extreme contingencies. Market power problems must be addressed both initially and as evidence about actual market performance and supplier behavior emerges as the markets operate. Responsible regulators need to be in a position to evaluate alternative market design frameworks and to approve only those that are likely to perform well. They must have the capabilities to identify serious market performance problems and to develop and apply reforms to fix them. California relied on "market design by committee" and allowed mindless free-market rhetoric and interest group politics, to ignore technical realities, international experience and common sense.

- Competitive electricity markets will not work well if consumers are completely insulated by regulation from wholesale market prices. California deregulated wholesale prices, but failed to deregulate retail prices or to allow the utilities to use forward contracts to hedge their default service supply and pricing obligations. The terms and conditions of default service made it necessary for utilities to buy at an unregulated hourly wholesale spot market price and to sell at a fixed regulated retail price for up to four years. Not only did this drive the utilities to the point of insolvency after wholesale prices rose above the fixed retail price in June 2000, but it has also made it very difficult for competing retail suppliers to attract customers or for consumers to respond to high prices by reducing consumption.

- Spot electricity markets work very poorly when supplies are tight; the combination of relatively tight supplies and extremely inelastic demand means that prices can rise to extraordinary levels and are much more susceptible to market power problems than when supplies are abundant. One way to help to protect consumers from volatile and excessive spot markets for electricity is to ensure that a large fraction of consumer demand is covered by longer term fixed price contracts negotiated under competitive conditions well in advance of spot market crises. These contracts both protect consumers from price volatility (they act like an insurance policy) and reduce incentives suppliers have to exercise market power when supplies get tight. Such contracts can also facilitate financing of new power plants. A good retail procurement framework, whether it relies of utility distribution companies, competitive electricity service providers (ESPs), or

a combination of both, must assure that a large fraction of retail demand is being met with longer term fixed price contracts and only a small fraction fully exposed to the spot market.

- In addition, the default service option for larger commercial and industrial consumers should be to purchase their electricity at real time prices. Real time pricing at the retail level introduces demand elasticity into the spot *wholesale* market and this in turn dampens price volatility and helps to mitigate supplier market power. (These customers should also have the option of hedging some or all of their demand with contracts purchased from electricity marketing intermediaries or their distribution company.) California both refused to allow the entities (the utility distribution companies) with the responsibility to procure supplies for 85% to 90% of the retail demand to enter into forward contracts *and* ignored proposals for demand response programs that would allow customers to respond to wholesale price spikes by reducing consumption.

- The primary benefits of electricity sector reform will occur in the long run as a consequence of investments in new more efficient power plants, the introduction retail risk management, demand management and energy efficiency services, and continuing innovations on both the supply and demand sides. Speeding the ability of developers to site and build new generating plants and providing good incentives to expand transmission networks, all of which meet reasonable environmental standards, is essential for good long run market performance. Removing unnecessary administrative barriers to entry allows supply to increase more quickly as market conditions make it profitable to do so and will reduce the likelihood of extreme contingencies. California focused too much on illusive short run gains from low-priced power that was available when there was excess capacity and focused too little on creating sound institutional arrangements to support investments in new generation and transmission facilities.

- All electricity market reform programs have experienced some problems at the outset. Mid-course corrections have almost always been necessary to mitigate market performance problems. When market performance problems emerge, government officials must act quickly and decisively to fix the problems. Ongoing market reforms and regulatory "mitigation" initiatives designed to remedy serious market performance problems should be an *expected* feature of the process of creating efficient competitive wholesale electricity markets. If the California and federal regulators had done so in September 2000 when the current problems became crystal clear, they would have reduced significantly the ultimate magnitude of the crisis. Unfortunately, both the CPUC and FERC acted too slowly and ineffectively as the crisis deepened and spent most of their energies pointing fingers of blame at one another rather than working together cooperatively to find a solution.

- The recent events in California, as well as less severe problems in other electricity markets in the U.S., also raise questions about whether federal (FERC) regulators

are up to the task of supervising the design and diffusion of well functioning competitive electricity markets, effectively monitoring market performance, identifying and measuring performance problems, developing and implementing reforms to fix them. FERC's responses to the problems in California, as well as to problems that have emerged in other regions, have not been satisfactory. FERC needs to become an agency with the human resources, organizational structure, administrative procedures and leadership that allows it to play an active constructive role in guiding resolution of wholesale market design issues, to be actively involved in ongoing monitoring of market performance, to develop and effectively apply objective market performance indicia, and to act quickly and cooperatively with the relevant state agencies and Regional Transmission Organizations to fix serious market performance problems when they emerge.

Related Papers By Paul Joskow

Paul L. Joskow and Richard Schmalensee, *Markets for Power: An Analysis of Electric Utility Deregulation,* MIT Press, 1983.

Paul L. Joskow, "Regulatory Failure, Regulatory Reform and Structural Change In The Electric Power Industry", *Brookings Papers on Economic Activity: Microeconomics,* 1989.

Paul L. Joskow, "Restructuring, Competition and Regulatory Reform in the U.S. Electricity Sector", *Journal of Economic Perspectives*, Summer, 1997

Paul L. Joskow, "Deregulation and Regulatory Reform in the U.S. Electric Power Sector," in *Deregulation of Network Industries: The Next Steps* (S. Peltzman and Clifford Winston, eds.), Brookings Press, 2000

Paul L. Joskow and Jean Tirole, "Transmission Rights and Market Power on Electric Power Networks," *Rand Journal of Economics*, 31(3) Autumn, 2000.

Paul L. Joskow and Edward Kahn, "A Quantitative Analysis of Pricing Behavior In California's Wholesale Electricity Market During Summer 2000," January 15, 2001, National Bureau of Economic Research Working Paper 8157

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Statement of Alfred E. Kahn
before the
House Financial Services Committee
June 20, 2001

I trust it will be helpful to the Committee if I frame this statement as an answer to the—in a sense—personal question: How and why could I, who have played a leading role in the deregulation of airlines, surface transportation and telecommunications, have joined some other economists in calling for the imposition of regulatory caps on wholesale electric rates in California?

This background of experience, will, I trust make it relatively easy for me to tread a judicious path between the deplorably ideological arguments and restatements of preconceptions that have characterized far too much of the public discussion of this issue—arguments between ideologues of the Right and Left, Greens and Browns, "liberal" Populists and Conservative "Realists." (I had at first effort attempted to supply adjectives suitable respectively to each of these groups, and think it worth reporting to the Committee that I find characterizations such as "ideological," "self-righteous," "indignant," "scornfully dismissive," "arrogant," "supercilious" seem to apply equally to all of them.)

Since I have in this instance joined in what the eminent economist, William Safire, has characterized as

> the demagogic call for energy 'price caps,' always politically satisfying at first—populist interference with the markets' self-correction that would lead to worse shortages and rationing, to inflation and wage control,[1]

I express the hope that commentators such as these will be at least partially satisfied that the sybarites of California and the politicians and militant consumer advocates who promised them the benefits of free markets without the risks are already being sufficiently rewarded for their opportunism. In a sense, the only substantial difference between us is their evidently greater willingness to see retribution fall not just on the actual perpetrators but on the millions of

[1] "What to Remember," *New York Times*, May 28, 2001, p. A11.

innocents while generators—a number of whom, some responsible, non-populist economists have concluded contributed to their good fortune by withholding supplies at critical junctures—reap billions of dollars of economically superfluous profits.

Since the letter that I signed elicited the immediate response, from the President on downward, demonstrating a firm command of the first week of Economics 101, that caps would not only do nothing to solve the fundamental imbalance of supply and demand but by interfering with the elasticity response on both sides and particularly by discouraging the expansion of capacity, exacerbate the problem, I can respond most efficiently in the form of a few propositions from Economics 101.1:

- In the presence of extreme inelasticities of both demand and supply and in the presence of extreme shortages, such as have characterized California at times of peak demand, unregulated markets don't work very well.
- True, the elasticity response of demand has been prevented by the ridiculously extended freeze in charges to residential customers, followed by grudgingly inadequate increases; but since the extreme shortages, producing 10- and 20-fold increases in wholesale prices, have taken the form of extreme spikes at particular times and places, and the overwhelming majority of customers do not have meters permitting them to be charged on a real-time basis, it has not been possible to elicit efficient demand responses, and the result has of course been severe blackouts. It is a truism that blackouts have occurred because most retail rates have not been free to increase to whatever extent necessary to prevent them. What is frightening to contemplate is the extent of that "extent."
- As against the minimal contribution of 10-fold increases in prices to an improved balance of supply and demand in such circumstances must surely be weighed not merely the income distributional consequences of such price explosions but the adverse macroeconomic consequences of generators extracting hundreds—indeed thousands—of dollars a year from every inhabitant of the state, much as of the three-fold explosions in the prices of crude oil nationally in 1973 and 1979-80.

- The spectacular historical instances of price controls doing more harm than good—cited eagerly by opponents of our present initiative—by interfering with the expansion of supply—notably the controls on prices of crude oil and natural gas in the 1960s and '70s—have been ones in which regulation held prices below short- and long-term marginal production or opportunity costs. The caps advocated here would decidedly not hold them below the costs of additional supply. That cost-based price ceilings are not inevitably in conflict with economic expansions of supply is amply attested by the experience of the electric industry, to choose an example at random, during the entire half-century, 1945-95. If the literature agrees on anything about that experience, it is that cost-based regulation, as traditionally practiced, encouraged the goldplating of service and the very excess capacity that seemed to promise such enormous benefits to consumers during the past decade if rates were deregulated.
- There seems good reason to believe that the explosions of wholesale prices has not been a phenomenon of pure competition alone, but have reflected the not-necessarily-collusive or antitrust-law-violative withholdings of capacity at peak times, in order to lever up the market-clearing prices—a process that Professors Joskow and Borenstein have documented.
- In such circumstances, Economics 101.33 tells us, ceilings may actually result in expansions of offerings: there is no benefit in withholding supply in those circumstances, only sacrificed profits.
- Interference with the fundamentally required correctives—of expanded capacity, on the one side, and conservation, on the other—would of course be severely counterproductive. But where those supply-and-demand responses inevitably take time—to cite the most relevant example, at least a couple of years before the additional generating capacity is likely to come on the market—any discouragements can readily be prevented by making the price caps (a) designedly temporary, automatically sunsetting within, say, two to three years, and/or (b) inapplicable to new capacity coming on line.

So much for elementary economics.

Testimony of Heidi Wills
Council Member, City of Seattle
House Financial Services Committee Hearings on the California Electricity Crisis
June 20, 2001

Good morning, Chairman Oxley and other members of the House Financial Services Committee. My name is Heidi Wills. I am a member of the Seattle City Council, and chair of the Council committee that oversees our municipally owned electric utility. I am here to testify today about the extraordinary financial impacts of the West Coast electricity crisis, and in particular its effects on public utilities in the Northwest.

I'd like to begin with a few comments on how we got here. It is popular to blame this crisis on a number of factors – siting laws in California, unique features of California's deregulation process, air quality, and lack of foresight. Some of those factors might make sense if this were just a California problem, but it is not. We have gone from a situation of surplus gas and pipeline capacity and surplus electric generation capacity to being tight on all fronts.

Five years ago, prices in the wholesale market were very low. New capacity could not be profitably built, whether it was sited in California, Washington, Oregon, or Mexico. Seattle City Light and many Northwest utilities turned increasingly to the short term market to meet customer needs. We were assured that this was a robust competitive market. We sited thousands of megawatts of new independent generation, but it was not built. Developers up and down the West Coast indicated that it would be built when

wholesale prices hit $28 per megawatt-hour, and, for better or worse, we relied on that advice.

As you know, that vision has backfired. In the first two months of this year, Seattle's utility spent its entire annual power budget on the 10-20% of our electricity that comes from the wholesale spot market. We have raised retail electric rates 40 percent and I doubt we will end the year below 50 percent. We have also gone to the bond market with $750 million offering this year, most of which is needed to cover operating losses sustained this year. We are certainly not alone. Many Northwest utilities might give you different numbers, but the same conclusion. Many utilities that might be want to build new generation, or sign long term contracts, face a very difficult financing environment.

All of this translates into great harm for our customers for a prolonged period of time. Some of the impacts, particularly in rural communities of eastern Washington and Oregon, Idaho, and Montana, have yet to materialize. Those communities will be hit hard by Bonneville rate increases this fall, and that comes on top of drought and depressed prices for most agricultural commodities.

We applaud FERC's willingness to finally step into the breach. But it will take more than one order to solve this problem. The order must be enforced, and it must translate into reasonable prices. I also appreciate this opportunity to testify before the Committee and welcome your questions.