Statement of Francis S. Blake  
Deputy Secretary of Energy  
U.S. Department of Energy  
before the  
House Budget Committee  
June 20, 2001

Mr. Chairman, Congressman Spratt and Members of the Committee I want to thank you for the opportunity to testify before you today on the economic effects of energy policy.

**Trends in the Energy Markets**

I will begin my testimony by discussing some of the major trends in energy markets and changing patterns in US energy consumption. In 2000, America consumed 99 quadrillion British thermal units (or quads) a year in all forms of energy, while our domestic production was only 72 quads. This imbalance between energy demand and domestic energy production is made up with imports. Between now and 2020 our energy demand is projected to rise at a rate of 1.3% a year. If the energy intensity of the U.S. economy - the amount of energy needed to generate a dollar of GDP - remained constant, our energy demand would reach 179 quads in 2020. Under current policies, improved energy efficiency and structural changes in the economy suggest that forecasted energy demand in 2020 can be lowered to 127 quads. This would continue the decline of 58% in US energy intensity since 1970. 

Another important trend relates to energy consumption and the electricity generation mix. Electricity represents an increasingly larger share of total energy consumption. This trend will likely continue as our high technology economy becomes more dependent on electricity to power everything from our computers, to our cell phones and palm pilots. At the same time, the mix of fuels we use to generate electricity has changed and will continue to do so over the next 20 years, with natural gas predicted to be the fuel choice for most new power plants. 

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Increasing competition has also spurred significant change in the structure of our energy industry. To better understand the changing mix of electricity generation resources, it is helpful to look at both capital and fuel costs for different types of power plants. In a deregulated environment in which recovery of capital costs is no longer guaranteed to power plant developers, firms are less likely to commit the massive capital investments required to construct large nuclear and coal base load facilities. Instead, they are attracted to the relatively lower capital cost of smaller and more modular new natural gas fired facilities, despite higher fuel costs. [Figure 4]

Increased demand for natural gas has strained both production capabilities and the pipeline delivery system. Bottlenecks and capacity constraints have restricted this new dynamic industry, resulting in soaring commodity price volatility. Similarly, our electricity system is strained. Investment has not kept pace with demand, with the result that system overloads are occurring with increasing frequency. [Figure 5] These infrastructure limitations exacerbate problems of supply and demand in areas like California.

Increased volatility adds risk for energy dependent businesses, including producers and consumers. Accompanying this increased price risk has been the added regulatory uncertainty associated with an industry in transition and an outmoded set of rules and regulations that often restrict or delay new investment and can result in investment dollars being allocated inefficiently. An example of the effect of regulatory uncertainty can be seen in the slow pace of investment in new power generation throughout most of the 1990's when the rules of the newly competitive generation market were still being developed in many States. This in turn has been followed by a significant acceleration in investment over the last couple of years as competitive wholesale markets have taken hold. [Figure 6]

**Economic Effects of the National Energy Policy**

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Chapter Two of the Report of the National Energy Policy Development Group (NEPDG) is entitled “Striking Home” and addresses the impacts of high energy prices on families, communities and businesses. The Report points to a nearly 20-year decline in the share of household income devoted to energy needs. But importantly, the Report notes that between 1998 and the end of last year, that share has risen by almost 26% from 3.8 to 4.8 percent of after-tax income. [Figure 7] The Report also cites higher fuel and oil prices as representing one-third of the increase in farm production costs in 2000.

On March 7, 2001, the Federal Reserve reported that businesses across the country experienced high fuel and other energy costs in February 2001 but were unwilling or unable to pass these costs on to consumers. This absorption of increased energy cost decreased the profit margins of many businesses. About one quarter of the increase in total unit costs of non-financial, non-energy corporations in the final quarter of last year reflected a rise in energy costs. Beyond the costs associated with higher energy prices for families, agriculture and businesses, there is also a broader macroeconomic impact of energy price increases as set out in Dr. Hubbard’s testimony.

With an energy industry in transition and an economy that has been negatively affected by recent high energy prices, it is important that we develop the tools to more critically evaluate the effects of energy policies on the economy. Earlier this year the Energy Information Administration (EIA), the independent statistical and analysis arm of the Department of Energy, released a report entitled “Energy Price Impacts on the U.S. Economy.” The report concluded that both the level of prices and the level of price volatility may hinder economic growth and lead to inappropriate investment decisions. The report also suggested that over the entire 4-year period 1997 through 2001, a steady path of energy prices throughout could have boosted GDP growth by 0.2 percentage points, to a rate of 4.3 percent rather than its actual 4.1 percent. As we look to implement the recommendations of the NEPDG and develop long-term solutions to our energy challenges, we will need to build on the analytical capabilities of groups like EIA to undertake further work of this kind.
As we study the effects of energy on the economy, it is important to note the need for improved transparency in competitive energy markets. Price volatility has spurred increased use of energy risk management tools ranging from long-term contracts, to futures and options and complex energy derivatives. These tools are of growing importance to businesses for the mitigation of energy price risk. In order for these markets to thrive and provide energy producers and consumers with a forum to manage risk, there must be a level of information symmetry. Transparency provides consumers with the information to make rational decisions on energy consumption, and we need reliable, independent information to provide transparency to our competitive energy markets.

**National Energy Policy**

The Report of the NEPDG recommends a comprehensive approach to challenges that are long-term in nature. The recommendations are balanced, with a number of proposals addressing energy efficiency to ensure that the improvements made in lowering the level of energy intensity over the last 30 years continue into the next two decades. At the same time, the report recognizes the changing nature of the energy industry and the need to address issues of constrained supply and infrastructure to meet our energy needs in the future.

The Report addresses the need to expand and diversify our energy resource base by increasing domestic production while looking to expand global markets through cooperation within our own hemisphere and encouraging increasing energy resource development abroad. Removing transmission bottlenecks, expanding refinery capacity and encouraging the expansion of our pipeline network will further decrease the likelihood for future price spikes caused by supply limitations or disruptions. The Report also recognizes the important role of renewable fuels and promotes environmentally sound increases in energy supply.
The Report further addresses regulatory barriers and regulatory complexity. Working to limit regulatory uncertainty will create a more robust investment environment; allowing refiners, electricity generators, and other energy providers to make the appropriate investment decisions to improve the efficiency of existing facilities, while simultaneously, looking to new projects to better serve the energy consumer. The Report also requires EPA to study opportunities to maintain or improve environmental benefits of state and local "boutique" clean fuel programs while exploring ways to increase the flexibility of the fuels distribution infrastructure, improve fungibility, and provide added gasoline market liquidity.

Finally, the Report advocates protecting lower income consumers from the effects of high energy prices by strengthening the Low Income Home Energy Assistance Program. Additionally, the President recently requested $150 million in FY2001 supplemental funding for LIHEAP. The NEPDG also recommends further funding of $1.2 billion over the next 10 years for the Department of Energy's Weatherization Assistance Program, which concentrates on making homes more energy efficient. This increase nearly doubles the funds dedicated to this program over the next decade.

Conclusion

Today, there is little question that the effects of energy on the economy are significant. Recognizing this fact, the NEPDG has provided a valuable and balanced blueprint to address the energy needs of the American economy through increased energy supply, improved infrastructure and more efficient use of our energy resources. Meeting our energy challenges is critical to maintaining a healthy economy and while we recognize that additional work needs to be done to quantify the relationship between the energy and the economy, we must act now to ensure that supply limitations and price volatility do not limit economic growth.

I again thank the Committee for the opportunity to testify today and look forward to answering any of your questions.
Figure 1. Projected U.S. Energy Consumption and Production in Three Cases, 1990-2020 (quadrillion Btu)

- **Consumption**
- **Domestic Production**
- **Constant Energy Intensity**
- **Consumption Assuming Declining Energy Intensity**

Source: Energy Information Administration
Figure 2. Total Energy Consumption and Electricity Sales per Unit of Gross Domestic Product, 1960-1998

Electricity Sales per Unit GDP
(kilowatthours per thousand 1996 dollars)

Consumption per Unit GDP
(Btu per 1996 dollar)

Economy's need for energy for each dollar of output continues to decline as homes and businesses become more energy efficient and the economy shifts to making less energy-intensive products. Economy's need for electricity for each dollar of output holds steady as growing use offsets improving efficiency.

Source: Energy Information Administration
Figure 3. Electricity Generation by Fuel, 1970-2020
(billion kilowatthours)

Source: Energy Information Administration
Figure 4. Projected Electricity Generation Costs, 2005 and 2020 (1999 mills per kilowatthour)

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Source: Energy Information Administration

Obtained and made public by the Natural Resources Defense Council, May 2002
Figure 5. Level 2 or Higher Transmission Load Relief Logs (number of logs)

Source: North American Electric Reliability Council
Figure 6. Net U.S. Electricity Capacity Additions, 1990-2000 (gigawatts).

Source: Energy Information Administration
Figure 7. Natural Gas and Crude Oil Spot Prices, January 1, 1998 - June 1, 2001 (nominal dollars per million Btu)

- Natural gas spot price midpoint at Henry Hub
- Natural gas average, 1998-1999
- Natural gas average price +/- two standard deviations, 1998-1999 = $.64
- Crude oil spot price

Source: Financial Times Energy, Gas Daily
Chairman NUSSLE. When I was home in my district over the recess here for Memorial Day, I had the opportunity, as I know many Members did just from conversations I had with people on the way back, where we took the opportunity to visit a number of different energy kinds of examples in my district, everything from--you mentioned many of them--nuclear, coal, natural gas. We have many others out in my State as there is a variety throughout the Nation, wind, methane. We obviously have biodiesel and ethanol, but we also have ag lubricants. We are now making lubricants and transformer box oils and things out of all sorts of different renewable resources.

I noticed on your chart that renewables--and I have noted in the report and the recommendations that renewables and many different types of energy are important to the solution. To start with, I just wanted to get your impression.

It has been my impression that the Vice President has said, and others from the administration have indicated, that while they are part of the solution, we can't do--we can't do enough in renewables and we can't do enough in conservation in order to solve the problem in and of itself. I take some--not exception, but I am concerned about that to some extent because I think that part of the beauty of our economy is the--and that is what we are talking about today is the fact that people will step up to the plate and solve a
problem. It is as much as whether it is solving a problem, coming up with new ideas, using manure for methane, which is a very unseemly kind of thing for maybe some to consider, but out in Iowa we have a lot of it, and, therefore, that may be part of the solution. We also have a lot of wind, and not only when I am there, but throughout the year. There are many other opportunities. How important are these areas, conservation and renewables, to the overall solution to the energy strategy that the administration has put forth?

Mr. BLAKE. I think they are tremendously important. You have outlined some of the really interesting technological advances, just the ingenuity people are now applying to what we can do with the resources that we have. It obviously--it happens on the import issue because using whether it is manure or wind or ethanol, whatever it is, these are going to be local U.S. sources. Conservation by definition is largely local. So it has got a very important role, and I think maybe that has been somewhat misunderstood in terms of the importance of the role. I think the administration and the Vice President's group recognize that.

The only point that still needs to be made, though, is that this is not a set of issues that will go away through conservation and renewables. Just, again, with the data on where we are now, we already have issues with our transmission system. Those issues will remain whether that
new power plant is run on biomass or natural gas. We are
going to be putting more natural gas-fired turbines on the
system. That is going to put a stress on our pipeline
structure. It is going to require some additional activity
in terms of supply.

So I think it is your basic point is exactly right.
These are very important. I think they are recognized as
very important. The only thing to remember is that they
don't supply the entire answer.

Chairman NUSSE. Again, as we concern ourselves with the
volatility of energy prices and what that means to overall
economic growth and its impact on the budget, you indicated
that the Energy Information Agency has done a report, and I
guess I am interested in some of its conclusions. Growing
up, as I am sure we all have, with a father or mother that
constantly--maybe more so for me than others--who constantly
said, you know, shut the door when the air conditioning is
on; what were you born in, a barn; turn the lights off, what,
are you paying the bills; every one of us in the room has had
that experience. So there is a mindset that we have that if
the prices go up, that is bad, and if the prices come down,
that is good. But what you are telling us is that the
volatility in those prices can be just as bad; is that true?

In other words, is volatility worse than steadily
increasing prices? Can the economy still grow with steadily
increasing prices if it is predictable, or is one worse than the other, volatility versus steadily increasing prices?

What did the report indicate?

Mr. BLAKE. The report was not trying to indicate that volatility is worse than steadily increasing prices. The economy is better off on the main to the extent you have a good balance of supply and demand and prices are declining. The point of the report was that volatility itself has a drag--has an effect on the economy that is negative.

As we think as a country of our policy solutions, what we can do to tamp down some of that volatility helps the overall economy. It helps investment decisions. It helps people react in a more timely way. You are not suddenly faced with as this happened to businesses, as you know, on the west coast that have looked at dramatically increased prices and have found continued production extremely difficult.

Chairman NUSSLE. I think the two go hand in hand. The more options that we have out there, the more different alternative energy supplies that we have out there that is producing energy for us, I think the better the marketplace will be. So I appreciate those parts of the energy strategy that diversify so that it can help keep volatility to a minimum.

Mr. Spratt.
Mr. SPRATT. Thank you very much for your testimony. It was very useful.

Let me ask you this: In the 1970s, we prioritized the use of natural gas, preferring human needs customers over boiler heat customers, and even over process users of natural gas. In the late 1980s, we removed most of those restrictions and allowed gas to be used once again extensively for electric generation. When we did that, did we see or foresee or explore the consequences for human needs use? Did we have reason to see that this was going to create a demand for gas that would run the price up before the supply would be there to meet the requirements?

Mr. BLAKE. Not having been part of the planning process in the 1980s, I don’t know that I can directly address that. I could say, though, that as you said, in the late 1970’s with the Fuel Use Act, the use of natural gas for generation was actually prohibited in large parts of the country; that I think an objective look at that would be that that had, and a number of the other energy control programs in the late 1970s actually had, a negative impact on supply. It wasn’t well calibrated to the needs of the country for clean generation, which natural gas provides. I think every estimate that I have seen is what we are going through now is a market perturbation that needs to be addressed in terms of making sure that we have the right infrastructure.
Mr. SPRATT. One of your charts showed the demand for natural gas continued to rise steeply and steadily right on to 2020 to the far end of the chart. Can that happen in today's--without today's prices? Do prices have to stay where they are for new gas to come on to meet that kind of demand level, or can gas come back down to affordable levels and still have the exploration and development of new gas needed to supply that curve?

Mr. BLAKE. I think you are already seeing natural gas prices come down. When I checked this morning, I think the price is now slightly down below $4. And if I am not, I can't remember exactly what the forward pricing is, but that is also going down. So the markets would say, yes, it is possible to supply this demand for power generation and maintain reasonable costs for consumers.

Mr. SPRATT. If we allow electric generation fuel by natural gas, which is very efficient and very cost-efficient in particular, what happens to other alternatives like nuclear production which has a high front-end capital cost? Does it discourage the use of other alternatives, resort to other alternatives?

Mr. BLAKE. I think, and the Vice President's group addressed the use of nuclear power. Nuclear power has a very important role to play for the Nation's overall energy picture both in terms of the existing plants that are now
online, how do we make sure that they have a full, useful life, extending the licensing and the like. Building new nuclear plants is a different issue. My experience at least, there the private sector would say that the capital cost issue may be secondary to some of the regulatory uncertainty issues. They are capital-intensive, as you suggested, and as you make your investments, you need some certainty."

Mr. SPRATT. Still the capital cost on the front end and the time it takes to begin and carry out a plan on your books before you get any return is a significant hurdle to cross. And if you have got natural gas out there as an easy alternative, aren't most utilities going for the easy alternative?

Mr. BLAKE. I think what you see now is exactly that, although, as I said, I would say that the issues with nuclear are that the capital issue and capital cost recovery is probably secondary in the case of nuclear to other issues.

Mr. SPRATT. You mentioned the need for transmission lines. One component of the President's recommendations, I believe, is that utilities engaged at least in wholesale sale of power would have Federal condemnation rights. Is that truly needed? I mean, the State utilities seem to have all the authority they need to run transmission lines about anywhere they want. I say that as someone who owns a farm, and I have a 505-foot right of way through my farm. The
power company didn’t have any trouble at all acquiring it. When I tried to get them to move it, they wouldn’t think of it. So why do we need to give them the additional authority of Federal prescription for doing that?

Mr. BLAKE. It is an option that is being considered. It matches the authority FERC has on natural gas. The interesting thing, and I don’t know the specific laws in your State, but nearly—I think actually over half of the States for their siting laws actually don’t allow consideration of benefits that are external to the State.

And the issue that the transmission—we are now increasingly a regional system rather than a State-by-State system. And so one of the issues is how do you open up the consideration of benefits? So if the line going through Connecticut, for example, as there was a recent incident along these lines, the line going through Connecticut that is to benefit Long Island, how does Connecticut take that into account? Right now the Connecticut structure would not allow that to be taken into account, or that is my understanding of the Connecticut regulations.

Chairman NUSSLE. Mr. Collins.

Mr. COLLINS. Thank you, Mr. Chairman.

I think we can all agree that the changes in energy prices, whether it did be gasoline or electricity or natural gas or whatever, has a real impact on our economy from the
standpoint that it has forced families to change the cash
flow of their own home budget. Many of you have experienced
in the past the opportunity to buy other products or other
items, things that they would like to have for their
families, now having to shift that cash flow to provide a
necessity for the families. So it has had a tremendous
impact.

In Georgia about 3 years ago or 4 years ago, we had a
deregulation of the natural gas industry. I believe that
deregulation has probably slowed down if not completely
halted the deregulation of electricity. At least I hope it
has, because natural gas prices in Georgia increased
dramatically, and one of the reasons, I believe, was the fact
that we created another profit center. When you deregulated
natural gas, you left in place a company that owned the
transport lines, and then you created other entities that
actually sold the gas, but had to use the transport lines.
So instead of one profit center, we then had two profit
centers. Then you have others that are--the gas people
themselves are creating another profit center. So that, I
think, has had a lot to do with the increase in price of
natural gas which consumers of natural gas have to pay.

Prior to deregulation in California, because that has
been the focus of this whole problem as far as the part of
this problem--part of the deregulation of electricity in
California, were the utilities companies--were they profitable?

Mr. BLAKE. I am sure they were. They would have, as regulated utilities they would have had a regular rate of return that would have included an equity return.

Mr. COLLINS. It is questionable to me. I am having a problem understanding, then, after deregulation, creating a wholesale market and entity to handle those wholesale prices or the wholesale sales of that electricity, why the rates had to increase so when the plants were producing the same power, and the lines were, you know, transporting the same current? Why did we have such a drastic increase in rates?

Mr. BLAKE. The California situation, just a brief summary of it is the structure of their deregulation plan. They couldn't have been worse for a situation where you have constrained supply and unconstrained demand. The way they did their deregulation was they did not--their retail rates were not reflective of the charges that they were seeing at the wholesale level. The utilities were told to buy spot market rather than long-term bilateral contracts, and they didn't build anything.

Mr. COLLINS. I understand that, but I am talking about the wholesale rate. Why did the wholesale rate in some instances increase tenfold?

Mr. BLAKE. The way they structured their deregulation,
the price of electricity, wholesale electricity, is determined at the margin by the last unit that was dispatched or the last price in. So if you take the least efficient, old gas turbine, say, for an example, and it has I won't go through the...

Mr. COLLINS. I understand that. But your first answer was they were profitable before deregulation, and yet when you deregulated, wholesale price coming from the same plants, carried over the same transmission lines in some instances increased tenfold. I don't follow that scenario. I know supply and demand. I have been in the marketplace for 30 something years, almost 40 years. I know what supply and demand does. But I also have a little bit of understanding and feeling when somebody is just a little bit dadgum greedy.

Mr. BLAKE. If in 1997 or 1996 to 2001, the 5 years they had remained totally regulated, and they still hadn't built these plants, they would be in the same...

Mr. COLLINS. Maybe some folks would be sitting in the dark. I mean, that is just natural. I mean, I can take my house, and I can put in enough appliances that my switch box won't carry. My circuit breakers will go to tripping left and right. But the power company is still putting the same amount of power at my house. If the power companies were still pulling the same amount of power from those plants through those transmission lines, then why did it increase...

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tenfold?

Mr. BLAKE. Again--.

Mr. COLLINS. I don't understand this. Don't use the words that the natural gas prices went up considerably. Did it cost more to get the natural gas out of the well because of this fact? I go back, I understand supply and demand, but I also understand just plain greed and gouge, and I am afraid we have had a little bit of all of this as we have tried to justify supply and demand. Prices have been just accelerating too much.

Mr. BLAKE. On-the--FERC has authority on unjust and unreasonable rates. They have ordered rebates in California. I think the fundamental question, though, remains if you don't build supply, and your demand continues to increase, something has to give.

Mr. COLLINS. I understand that, too. I think you have to have profits in order to be able to encourage investments, and that must happen. We have got to have the investments of the invested utilities to build these plants, and we need some changes in the government regulations that has hindered this from taking place as well. But we also need to be very conscious of what is happening in the power structure.

Chairman NUSSLE. The gentleman's time has expired. If you have a response, we will take it. Otherwise--do you have a response to that question? Statement?
Mr. BLAKE. No, I understand the point. Again, the structuring of the market in California was not well thought out, and that has created the pricing problem that they have now.

Chairman NUSSLE. Mr. Capuano.

Mr. CAPUANO. Thank you, Mr. Chairman.

Mr. Blake, I just have a few questions on some of the numbers. Your first page of written testimony you talk about 99 quadrillion BTUs versus 72 that we produced. I am just curious. Of that 72, is that any of the energy resources that we exported to other countries?

Mr. BLAKE. Yes.

Mr. CAPUANO. So, that is already taken into account. So if we hadn't exported any energy anywhere, that 72 would have been a higher number?

Mr. BLAKE. Well, let me-- I will have to check on that.

Mr. CAPUANO. If you could, because I am not sure. I think the answer is not. I think that is not taken into account. So I would suggest that if we are really interested in increasing our production, that the very first thing we should do is tell those companies that have paid this government and the American people that they should stop exporting immediately if they are really concerned about what is happening in America. But, again, I will wait to hear that answer.