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THE GROWING NATURAL GAS SUPPLY AND DEMAND IMBALANCE: THE ROLE THAT PUBLIC LANDS & FEDERAL SUBMERGED LANDS COULD PLAY IN THE SOLUTION

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

OF THE

COMMITTEE ON RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTH CONGRESS

SECOND SESSION

July 16, 2002

Serial No. 107-140

Printed for the use of the Committee on Resources

Available via the World Wide Web: http://www.access.gpo.gov/congress/house
or
Committee address: http://resourcescommittee.house.gov

U.S. GOVERNMENT PRINTING OFFICE

80-724 PS WASHINGTON : 2003

For sale by the Superintendent of Documents, U.S. Government Printing Office
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THE GROWING NATURAL GAS SUPPLY AND DEMAND IMBALANCE: THE ROLE THAT PUBLIC LANDS & FEDERAL SUBMERGED LANDS COULD PLAY IN THE SOLUTION

Tuesday, July 16, 2002
U.S. House of Representatives
Subcommittee on Energy and Mineral Resources
Committee on Resources
Washington, DC

The Subcommittee met, pursuant to call, at 10:02 a.m., in room 1334 Longworth House Office Building, Hon. Barbara Cubin, [Chairman of the Subcommittee] presiding.

Mrs. CUBIN. The oversight hearing by the Subcommittee on Energy and Minerals Resources will come to order.

The Subcommittee is meeting today to hear testimony on the growing natural gas supply and demand imbalance and the role that the public and Federal submerged lands could play in the solution.

Under Committee Rule 4(g) the Chairman and the Ranking Minority Member can make opening statements. Since there are no other Members here at this time, we will include their opening statements in the record.

STATEMENT OF THE HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WYOMING

Mrs. CUBIN. The Subcommittee meets today to explore the roots and the magnitude of a growing natural gas supply and demand imbalance, an imbalance that could have a very adverse effect on the nation's future economic growth and development.

We will also explore the impediments to environmentally responsible natural gas exploration and development on public lands and on Federal submerged lands where the majority of potential new reserves exist.

A substantial portion of the American economy is fueled by natural gas and it is important to every major sector of the economy. It is used to heat homes, generate electricity, make chemicals and manufacture numerous products, including fertilizer for agriculture.

Natural gas is expected to play a proportionately greater role in the U.S. economy in the future because it is clean-burning and domestically produced. For instance, of the nearly 300,000 megawatts

of proposed new electricity generation capability, about 90 percent is expected to be natural gas fired. Gas demand is expected to increase over 60 percent between now and 2020 when the United States consumption is expected to reach 34 trillion cubic feet per year.

While natural gas has become increasingly popular as a fuel source, supply is not keeping pace with demand. In fact, recent surveys of natural gas producers suggested a year-to-year production decline as high as 7 percent.

Much of the current gas production is taking place in mature fields. Gas production from some large fields is depleting at a rate of over 29 percent per year. In order to keep up with current gas demand, which is growing at about 2 percent annually, the gas industry must produce about six trillion cubic feet of gas per year.

Given the current rate of production and consumption, new gas fields need to be found. The country has sufficient gas resources to fuel our economy for decades, but public policies are preventing them from being developed. Significant restrictions on natural gas development in the form of land withdrawals, development moratoria and regulatory restrictions lock up a large proportion of potential new reserves.

Much of the most promising new gas reserves are on public lands in the Rocky Mountains, Alaska, and the Outer Continental Shelf. The Rocky Mountains, for instance, is a frontier natural gas province with about 85 percent of its known resources still in the ground, but a substantial percentage of those new resources are off limits to oil and gas production.

Those areas that are available are often subject to restrictions that make them, for all practical purposes off limits.

A 1999 National Petroleum Council assessment showed that about 40 percent of the gas resources in the Rockies are affected by access restrictions. Additional impediments to gas development in the Rockies are imposed by difficulties and delays in obtaining permits to drill for gas reserves in areas that are available for development.

The cumulative effect of these restrictions and permitting difficulties is an impending natural gas shortfall. All of this is occurring at the same time that our economy is becoming more dependent on clean, natural gas.

We are currently on a dangerous collision course. If future natural gas supplies cannot meet demand, the consequences could be devastating for our economy. We need to enact a policy that reverses this trend and allows increased environmentally responsible natural gas development on Federal lands.

Today's hearing will focus on the current natural gas situation and explore policy initiatives that could boost supply. About a year ago, the House of Representatives passed H.R. 4, Securing America's Future Energy Act of 2001. This Subcommittee crafted several provisions in the bill that address a number of issues concerning access to gas reserves on public lands.

These provisions are designed to reduce complexities and increase access to reserves. As a conferee on the Energy Committee, I am working to hammer out the differences in the bill passed by

our Senate colleagues. We hope to have a strong energy bill that addresses the gas supply issue on the President's desk by October.

From our witnesses today, we will learn more about the causes of the growing natural gas supply and demand imbalance, its potential impact on the United States families and the economy and the policies that could help reverse this worrisome trend.

The engine that drives the U.S. economy is increasingly being fueled by natural gas. However, in order to keep the engine humming and our economy expanding, a sound energy policy is needed that allows access to domestic gas resources on Federal lands.

[The prepared statement of Ms. Cubin follows:]

Statement of Hon. Barbara Cubin, a Representative in Congress from the State of Wyoming

The Subcommittee meets today to explore the roots and magnitude of a growing natural gas supply and demand imbalance—an imbalance that could have a very adverse effect on our nation's future economic growth and development. We will also explore the impediments to environmentally responsible natural gas exploration and development on public lands and federal submerged lands where the majority of potential new reserves exist.

A substantial portion of the American economy is fueled by natural gas and it is important to every major sector of the economy. It is used to heat homes, generate electricity, make chemicals and manufacture numerous products, including fertilizer for agriculture. Natural gas is expected to play a proportionally greater role in the U.S. economy in the future because it is clean burning and domestically produced. For instance, of the nearly 300,000 megawatts of proposed new electricity generation capacity, about 90 percent is expected to be natural gas-fired. Demand is expected to increase over 60 percent between now and 2020 when U.S. consumption is expected to reach 34 trillion cubic feet per year.

While natural gas is becoming increasingly popular as a fuel source, supply is not keeping pace with demand. In fact, recent surveys of natural gas producers suggested a year-to-year production decline of as high as 7 percent. Much of the current gas production is taking place in mature fields. Gas production from some large fields is depleting at a rate of over 29 percent per year. In order to keep up with current gas demand, which is growing at about 2 percent annually, the gas industry must produce about 6 trillion cubic feet of additional gas per year.

Given the current rate of production and consumption, new gas production fields need to be found. This country has sufficient gas resources to fuel our economy for decades, but public policies are preventing them from being produced. Significant restrictions on natural gas development—in the form of land withdrawals, development moratoria and regulatory restrictions—lock up a large portion of potential new reserves. Much of the most promising new gas reserves are on public lands—in the Rocky Mountains, Alaska and the Outer Continental Shelf. The Rocky Mountains, for instance, is a frontier natural gas province with about 85 percent of its known resources are still in the ground. But a substantial percentage of those new resources is off-limits to oil and gas production. Those areas that are available are often subject to restrictions that make them, for all practical purposes, off-limits. A 1999 National Petroleum Council assessment showed that about 40 percent of the gas resources in the Rockies are affected by access restrictions. Additional impediments to gas development in the Rockies are imposed by difficulties and delays in obtaining permits to drill for gas reserves in areas that are available for development.

The cumulative effect of these restrictions and permitting difficulties is an impending natural gas shortfall. All of this is occurring at the same time that our economy is becoming more dependent on clean natural gas. We are currently on a dangerous collision course. If future natural gas supplies cannot meet demand, the consequences could be devastating for our economy. We need to enact a policy that reverses this trend and allows increased environmentally responsible natural gas development on federal lands.

Today's hearing will focus on the current natural gas situation and explore policy initiatives that could boost supply. About a year ago, the House of Representatives passed H.R. 4, Securing America's Future Energy Act of 2001. This Subcommittee crafted several provisions in that bill that address a number of issues concerning access to gas reserves on public lands. These provisions are designed to reduce com-

plexities and increase access to reserves. As a conferee in the Energy Conference, I am working to hammer out the differences in the bill passed by our Senate colleagues and we hope to have a strong energy bill—that addresses the gas supply issue—on the President's desk by October.

From our witnesses today we will learn more about the causes of the growing natural gas supply and demand imbalance, its potential impact on U.S. families and the economy, and the proposed policies that could help reverse this worrisome trend. The engine that drives the U.S. economy is increasingly being fueled by natural gas. However in order to keep the engine humming and our economy expanding, a sound energy policy is needed that allows access to domestic gas resources on federal lands.

Mrs. CUBIN. With that, I would like to recognize the ranking member, Mr. Kind, for an opening statement.

STATEMENT OF THE HON. RON KIND, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WISCONSIN

Mr. KIND. Thank you, Madam Chair. I welcome my colleagues here this morning, as I do Assistant Secretary Watson for your presence and your anticipated testimony, as well as the other panelists here today.

This morning we meet again to review the question of natural gas supplies from Federal lands. This is a topic that the Subcommittee has taken up now in this Session of Congress quite a few times and it is an important topic because we know that natural gas provides about 15 percent of the electricity production in the United States today.

We are anticipating about 90 percent of the new electricity coming on line is going to be natural gas generated. Canada is exporting roughly 15 percent of our natural gas needs right now into the country. There are some promising fields that we are taking a closer look at up in Alaska, in the Rocky Mountains off the Continental Shelf, in the Gulf of Mexico.

So, this is an important hearing. I appreciate the witnesses' time in coming to testify about it. But I'm also hoping that there are some other issues that the Subcommittee may be able to take up during the course of this session before we run out of time.

For example, just several weeks ago on June 16, The New York Times Sunday edition featured a front-page story on how the loss of the Permafrost is dramatically impacting the region up in Alaska. It is entitled, "Alaska, No Longer So Frigid. It Starts to Crack, Burn and Sag."

Madam Chair, with unanimous consent, I would ask that this article be included in the record at this point.

Mrs. CUBIN. Without objection, it is so ordered.

[The information referred to follows:]

The New York Times

June 16, 2002

Alaska, No Longer So Frigid, Starts to Crack, Burn and Sag

By TIMOTHY EGAN

ANCHOR POINT, Alaska, June 13 -- To live in Alaska when the average temperature has risen about seven degrees over the last 30 years means learning to cope with a landscape that can sink, catch fire or break apart in the turn of a season.

In the village of Shishmaref, on the Chukchi Sea just south of the Arctic Circle, it means high water eating away so many houses and buildings that people will vote next month on moving the entire village inland.

In Barrow, the northernmost city in North America, it means coping with mosquitoes in a place where they once were nonexistent, and rescuing hunters trapped on breakaway ice at a time of year when such things once were unheard of.

From Fairbanks to the north, where wildfires have been burning off and on since mid-May, it means living with hydraulic jacks to keep houses from slouching and buckling on foundations that used to be frozen all year. Permafrost, they say, is no longer permanent.

Here on the Kenai Peninsula, a recreation wonderland a few hours' drive from Anchorage, it means living in a four-million-acre spruce forest that has been killed by beetles, the largest loss of trees to insects ever recorded in North America, federal officials say. Government scientists tied the event to rising temperatures, which allow the beetles to reproduce at twice their normal rate.

In Alaska, rising temperatures, whether caused by greenhouse gas emissions or nature in a prolonged mood swing, are not a topic of debate or an abstraction. Mean temperatures have risen by 5 degrees in summer and 10 degrees in winter since the 1970's, federal officials say.

While President Bush was dismissive of a report the government recently released on how global warming will affect the nation, the leading Republican in this state, Senator Ted Stevens, says that no place is experiencing more startling change from rising temperatures than Alaska.

Among the consequences, Senator Stevens says, are sagging roads, crumbling villages, dead forests, catastrophic fires and possible disruption of marine wildlife.

These problems will cost Alaska hundreds of millions of dollars, he said.

"Alaska is harder hit by global climate change than any place in the world," Senator Stevens said.

Scientists have been charting shrinking glaciers and warming seas in Alaska for some time. But only recently have experts started to focus on what the warming means to the people who live in Alaska.

The social costs of higher temperatures have been mostly negative, people here say. The Bush administration report, which was drafted by the Environmental Protection Agency, also found few positives to Alaska's thermal rise. But it said climate change would bring a longer growing season and open ice-free seas in the Arctic for shipping.

"There can no longer be any doubt that major changes in the climate have occurred in recent decades in the region, with visible and measurable consequences," the government concluded in the report to the United Nations last month.

It does not take much to find those consequences in a state with 40 percent of the nation's surface water and 63 percent of its wetlands.

Here on the Kenai Peninsula, a forest nearly twice the size of Yellowstone National Park is in the last phases of a graphic death. Century-old spruce trees stand silvered and cinnamon-colored as they bleed sap.

A sign at Anchor River Recreation Area near this little town poses a question many tourists have been asking, "What's up with all the dead spruce trees on the Kenai Peninsula?" The population of spruce bark beetles, which have long fed on these evergreen trees, exploded as temperatures rose, foresters now say.

Throughout the Kenai, people are clearing some of the 38 million dead trees, answering the call from officials to create a "defensible space" around houses for fire protection. Last year, two major fires occurred on this peninsula, and this year, with temperatures in the 80's in mid-May, officials say fire is imminent. "It's just a matter of time before we have a very large,

possibly catastrophic forest fire," said Ed Holsten, a scientist with the Forest Service.

Joe Perletti, who lives in Kasilof in the Kenai Peninsula, has rented a bulldozer to clear dead trees from the 10 acres where he lives.

"It's scary what's going on," Mr. Perletti said. "I never realized the extent of global warming, but we're living it now. I worry about how it will affect my children."

Mr. Perletti, an insurance agent, said some insurers no longer sold fire policies to Kenai Peninsula homeowners in some areas surrounded by dead spruce.

Another homeowner, Larry Rude, has cut down a few trees but has decided to take his chances at the house he owns near Anchor Point. Mr. Rude says he no longer recognizes Alaska weather.

"This year, we had a real quick melt of the snow, and it seemed like it was just one week between snowmobiling in the mountains and riding around in the boat in shirt-sleeve weather," Mr. Rude said.

Other forests, farther north, appear to be sinking or drowning as melting permafrost forces water up. Alaskans have taken to calling the phenomenon "drunken trees."

For villages that hug the shores of the Bering, Chukchi and Beaufort Seas, melting ice is the enemy. Sea ice off the Alaskan coast has retreated by 14 percent since 1978, and thinned by 40 percent since the mid-1960's, the federal report says. Climate models predict that Alaska temperatures will continue to rise over this century, by up to 18 degrees.

Kivalina, a town battered by sea storms that erode the ground beneath houses, will have to move soon, residents say. Senator Stevens said it would cost $102 million, or $250,000 for each of the 400 residents.

The communities of Shishmaref, Point Hope and Barrow face a similar fate. Scientists say the melting ice brings more wave action, which gnaws away at ground that used to be frozen for most of the year.

Shishmaref, on a barrier island near the Bering Strait, is fast losing the battle to rising seas and crumbling ground. As the July 19 vote on whether to move approaches, residents say they have no choice.

"I'm pretty sure the vote is going to be to move," Lucy Eningowuk of Shishmaref said. "There's hardly any land left here anymore."

Barrow, the biggest of the far northern native villages with 4,600 people, has not only had beach erosion, but early ice breakup. Hunters have been stranded at sea, and others have been forced to go far beyond the usual hunting grounds to find seals, walruses and other animals.

"To us living on the Arctic coastline, sea ice is our lifeline," Caleb Pungowigi testified recently before a Senate committee. "The long-term trend is very scary."

A 20-year resident of Barrow, Glenn Sheehan, says it seems to be on a fast-forward course of climate change.

"Mosquitoes, erosion, breakup of the sea ice, and our sewage and clean-water system, which is threatened by erosion as well," he said. "We could be going from a $28 million dollar sewage system that was considered an engineering model to honey buckets -- your basic portable outhouses."

The people who manage the state's largest piece of infrastructure -- the 800-mile-long Trans-Alaska Pipeline -- have also had to adjust to rising temperatures. Engineers responsible for the pipeline, which carries about a million barrels of oil a day and generates 17 percent of the nation's oil production, have grown increasingly concerned that melting permafrost could make unstable the 400 or so miles of pipeline above ground. As a result, new supports have been put in, some moored more than 70-feet underground.

"We're not going to let global warming sneak up on us," said Curtis Thomas, a spokesman for the Alyeska Pipeline Service Company, which runs the pipeline. "If we see leaning and sagging, we move on it."

North of Fairbanks, roads have buckled, telephone poles have started to tilt, and homeowners have learned to live in houses that are more than a few bubbles off plumb. Everyone, it seems, has a story.

"We've had so many strange events, things are so different than they used to be, that I think most Alaskans now believe something profound is going on," said Dr. Glenn Juday, an authority on climate change at the University of Alaska at Fairbanks. "We're experiencing indisputable climate warming. The positive changes from this take a long time, but the negative changes are happening real fast."

Mr. KIND. According to the federal officials cited in the article, mean temperatures have risen by five degrees in the summer and ten degrees in the winter since the 1970's and it is having a dramatic impact up in Alaska.

Further more, according to the report, Senator Ted Stevens said that no place is experiencing more startling change from rising temperatures than the State of Alaska, listing as possible consequences sagging roads, crumbling villages, dead forests, catastrophic fires, possible disruption of marine wildlife.

I think the interest that the Subcommittee may have in this and the implications in the future is what is happening on the Federal lands, what impact this is going to have on pipeline safety, the environmental impact, the ability to produce the natural resources and bring them to market there and also what the overall financial impact is going to be to the Federal Government if not the State of Alaska, given what is occurring to the Permafrost up north.

As the House and Senate Conference Committee meet to finalize a new national energy policy which may include provisions for the further development of a natural gas pipeline from Alaska to the Lower 48, it would be useful to hold an oversight hearing to consider how temperature changes in Alaska could affect pipelines in petroleum production in the region as well as what steps would be necessary to ensure public health and safety.

Also, last week, the General Accounting Office released a new report entitled, "Alaska's North Slope Requirements for Restoring Lands After Oil Production Ceases."

This report, prepared in response to a request from our colleagues, Representatives Gephardt, Ranking Member on the Full Committee, Nick Rahall, as well as Mr. Markey who is a member of the Committee, discusses the nature and the extent of dismantlement and removal and restoration requirements for oil industry activities that are occurring in both the Federal and State lands in the North Slope of Alaska.

Madam Chair, I would ask again unanimous consent that the GAO report be included in the record at this time.

Mr. TAUZIN. Reserving the right to object, I think if we are going to include that report, we also ought to include the statement in the report of the State of Alaska regarding that report, both explaining why they thought the report was not only inappropriate, but why it was incorrect in many respects. That ought to be included as well.

Mr. KIND. I have no objection to that.

Mr. TAUZIN. I withdraw my reservation.

Mrs. CUBIN. Without objection, it is so ordered. We will submit for the record both of the statements or studies.

[The information has been retained in the Committee's official files.]

Mr. KIND. Thank you. I would respectfully request, Madam Chair, an oversight hearing into the GAO's recommendations and any other witnesses you choose to call should take place to ensure that the North Slope is properly restored would be an appropriate function of this Subcommittee and our oversight responsibilities.

In closing, I would respectfully suggest in the time remaining in this Congress the Subcommittee also try to address some of these

issues if we have the time and the inclination to get into these areas.

I have made several such requests in writing to the Chair and stand ready to assist you if you do decide to bring these issues before the Subcommittee.

Thank you again, Assistant Secretary Watson for your presence and the rest of the panelists. I look forward to hearing your testimony.

Thank you, Madam Chair.

[The prepared statement of Mr. Kind follows:]

Congressman Ron Kind, a Representative in Congress from the State of Wisconsin

This morning we meet to again review the question of natural gas supplies from federal lands. This is a topic the Subcommittee has already reviewed several times during this Congress. While we recognize the role that natural gas plays and will continue to play in meeting our energy needs, there are other issues that we would like to see the Subcommittee address.

For example, several weeks ago, on June 16, the New York Times Sunday edition featured a front page story on how the loss of permafrost is dramatically impacting the region. ["Alaska, No Longer So Frigid, Starts to Crack, Burn and Sag" (front page, June 16)] According to this report, mean temperatures have risen by 5 degrees in summer and 10 degrees in winter since the 1970's.

Further, according to the report, Senator Ted Stevens says that no place is experiencing more startling change from rising temperatures than Alaska, listing as possible consequences: sagging roads, crumbling villages, dead forests, catastrophic fires and possible disruption of marine wildlife.

As the House and Senate Conference Committee meet to finalize a new national energy policy, which may include provisions for development of a natural gas pipeline from Alaska to the Lower 48, it would be useful to hold an oversight hearing to consider how temperature changes in Alaska could affect pipelines and petroleum production in that region as well as what steps would be necessary to ensure public health and safety.

Also, last week, the General Accounting Office released a new report entitled "Alaska's North Slope: Requirements for Restoring Lands After Oil Production Ceases." This report, prepared in response to a request from our colleagues, Congressmen Gephardt, Rahall and Markey, discusses the nature and extent of dismantlement, removal and restoration requirements for oil industry activities that are occurring on both federal and state lands in the North Slope of Alaska.

An oversight hearing into GAO's recommendations that the Department should take to ensure that the North Slope is properly restored would be an appropriate function of the Subcommittee.

In closing, I would respectively suggest that in the time remaining us in this Congress, the Subcommittee address these issues. I have made several such requests in the past to the Chair, and stand ready to assist should you decide to bring these issues before the Subcommittee.

Mrs. CUBIN. Thank you, Mr. Kind and thank you for your suggestions about topics for further hearings. However, I think we would run into jurisdictional problems if we went into pipeline building and reacting to the GAO statement. I think there are jurisdictional problems that we will have, but I will look into it.

At this time, I would like to ask unanimous consent of the panel to allow the Chairman of the Commerce Committee and Member of the Resources Committee to give an opening statement.

STATEMENT OF THE HON. BILLY TAUZIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF LOUISIANA

Mr. TAUZIN. I thank the gentle lady. I, too, want to welcome Secretary Watson. Thank you for all of the hard work of the depart-

ment in so many areas and for the extraordinary contributions that your department has already made on H.R. 4 and on the conference that we have begun on energy for our country's security future.

I want to focus on that for a second. The gentleman who preceded me was very good about outlining the importance of natural gas in our energy future. I think the Vice President's report indicated that we might need as many as 1600 new power plants over the next 10 years to address the growing electricity needs of America.

I don't think Americans have yet focused on the seriousness of that call. In our Energy Committee we have done some examination of the present and future needs of our country regarding electricity. We have come up with some rather startling numbers.

For example, we found out that the Internet alone, and I am talking about the old, slow, dial-up Internet, when it is examined in its four quarters, its four components, manufacturing, the lines that are built, the businesses that sell services over the Internet and the businesses that actually operate the Internet, when you combine those four components, the old Internet consumes about 8 percent of the electricity produced in America. That is more than the country of Italy. That is the old Internet.

When we go to the new, high-speed Internet with the massive data centers and the high-speed portals and the high-speed production of video and voice over broadband services, when television becomes fully enabled in this system, there are wildly swinging estimates of the enormous electricity demands those new systems are going to require.

Even the predictions of the Vice President's office for 1600 more major power plants may be very conservative. If 90 percent of those plants are going to rely upon natural gas, we have a real problem. We have a huge problem in terms of supplying cheap, clean, affordable natural gas to these electricity power plants so we don't all end up in the situation California found itself in, where we don't have enough power affordably to keep our systems going.

But it is even more serious than that. As we prepare to finish the work of the energy conference, and we are thick into it right now and Senator Bingaman and I have a very strong relationship we are building. I think we are building a pretty good plan to get the work of the conference done before we leave in November.

We are reminded that every day we send Saddam Hussein $20 million plus to purchase over one million barrels of oil from him every day. The dollars he gets from American citizens every time we buy gasoline in this country are converted, unfortunately, into weapons of mass destruction. It is converted into dollars that are paid in tribute to families whose sons commit suicide bombing attacks upon Israelis.

It is spent on schools that are training young children how to hate this country and how to come to this country and be part of the terrorist operations against our cities and our citadels. It is dollars that Americans are paying to one of America's worst enemies, who is literally doing everything he can to develop nuclear weapons and chemical and biological weapons to use against not just Americans abroad, but Americans in this country.

It is amazing to me that we have let ourselves be put in that position. I was in the Chesapeake just a couple of weeks ago, fishing with some of our friends. We caught some nice sea bass right next to a platform that was built back in the '70's.

It has never been operated, to receive liquefied natural gas. It has never been operated because we have since then developed sufficient supplies of natural gas in the this country at affordable prices that we didn't have to import the volumes of liquefied natural gas that everyone thought we would have to import in the crisis of the oil and gas price controls of that period. It is about to go back into operation. It has been purchased. It is going to be retrofitted.

We are going to see more and more imports of liquefied natural gas to this country. That will be brought in in liquefied form, warmed up, put in the pipeline to service the needs of this country again.

So, we are building a situation where we not only dependent upon people we can't trust, people that hate us, people that are trying to kill us. We are building a situation where we are not only dependent upon them for oil, but now we are going to depend on more and more different countries to supply us with natural gas when natural gas is abundantly available in this country.

I, too, am concerned about the permafrost. I don't think we ought to produce energy in this country without making sure we do it with the utmost care for the environment. We have learned that ugly lesson in Louisiana. We have learned how when you don't pay attention to that you do some pretty bad damage. We are paying a lot more attention to it in Louisiana.

We are doing a much better job in Louisiana. But years and years of production of natural gas in Louisiana, we supply 19 percent of the nation's needs today. Years and years of production offshore with pipelines that have cut our marshes up and in a State that has welcomed oil and gas development for the good of this country, for the good of the economy, has left us with a 35,000 to 50,000 acre loss of wetlands every year.

I lost as much land in my district as the whole State of Rhode Island in 1950 and we are losing it every day.

So, while you worry about some permafrost thinning out, and I'm worried about that, too, I am equally concerned about the damage we have already done and that is occurring every day in my State. It goes unmitigated.

I can't seem to get Congress to even pay attention or try to help save those marshes, the same way we are saving the Everglades and we are saving the Chesapeake.

So, Madam Chairman, yes, we should be looking at what happens to our resources in America as we develop needed oil and gas resources for our country. We should be developing more natural gas resources on Federal and State lands.

We should not be deterred by reports on what it is going to cost to dismantle the operations in Alaska, any more than we should be discouraged by what it is going to cost to dismantle any business in any one of our districts that we can't estimate today, because that is true about every business. Nobody knows whether they are creating a Superfund site today. Nobody knows what it is going to

cost to dismantle a chip manufacturing plant in Massachusetts any more than it is going to cost to dismantle a field in Louisiana.

Those things are generally managed on State lands and the States generally take care of that. Our State provides for dismantling agreements, so does Alaska.

We ought to be concerned about all those things. But the two overriding concerns we ought to have in my opinion is, No. 1, in a national security sense we need to do everything we can through this conference and this Committee—and I want to thank this Committee for its major contributions to H.R. 4.

We need to do everything we can so we become less, not more, dependent on people like Saddam Hussein. So, we produce resources in this country with a care for our environment, but nevertheless with an eye on making sure that America doesn't have to keep sending money to people that are spending it to train terrorists to attack our people.

Then second, this Committee needs to be the extraordinary steward, as my friend has said, of America's wilderness area, our refugees and all the important places that are Federal and State lands in this country and that indeed are going to be a treasure that we yield to the future generations. We have to keep those in balance. But you can't do one without the other.

We can't subject this country to any more insecurity by constantly refusing to do what we can do in this country to supply ourselves with fuels we need in a reliable and sensible way that respects the environment and the environmental conditions of our State lands and Federal lands.

I think we can do that. That is the challenge of this Committee and the conference. I am glad we are taking it up.Thank you, Madam Chair.

Mrs. CUBIN. Thank you, Mr. Tauzin.

Now I ask unanimous consent to submit for the record questions that Senator Murkowski sent to GAO and their responses regarding how they came to their conclusions, what they did and what they did not do in their study.

[The information referred to follows:]

Comptroller General
of the United States

United States General Accounting Office
Washington, DC 20548

July 10, 2002

The Honorable Frank H. Murkowski
United States Senate

Dear Senator Murkowski:

This correspondence responds to your July 9, 2002 letter requesting specific information related to our recent report entitled ALASKA'S NORTH SLOPE: Requirements for Restoring Lands After Oil Production Ceases (GAO-02-357). Those questions and our answers follow.

1. **Does GAO believe the report to be "a powerful indictment of the existing federal and state permitting process, which allows private oil and gas development of public lands, using permits that are so vague and financial assurances so inadequate that the public interest in restoring these lands may never be redeemed?"**

Our report provides no basis to support this assertion. The report does provide information on the state of Alaska's dismantlement, removal, and restoration (DR&R) requirements and financial assurances. Further, it discusses our concerns about federal DR&R requirements and financial assurances for federal lands located on the North Slope. In this connection, we made recommendations to federal land managers to issue specific DR&R requirements on federal lands and to examine the adequacy of their financial assurances. The Department of the Interior agreed with these recommendations.

2. **Does the GAO believe that the situation in Alaska is "a world-class accounting scandal in the same league as WorldCom or Enron?"**

No, our report provides no basis for alleging any "accounting scandal." We did not audit or evaluate the accounting practices of oil companies operating on the North Slope.

3. Does the GAO believe the State management of its lands is improper?

Our report did not evaluate the propriety of the state of Alaska's management of its lands. We did describe the state's policies and practices concerning DR&R requirements and financial assurances that the state provides in its bonding requirements. The information we developed helped form the basis for our recommendations for standards and financial assurances needed on federal lands.

4. Does the GAO report support the implication that the companies referenced in your report are engaged in "accounting gimmicks?"

No. Our report states that generally accepted accounting principles require oil companies to estimate their future DR&R liabilities. The Financial Accounting Standards Board and the Securities and Exchange Commission require oil companies to estimate future DR&R costs in order to determine annual depreciation and amortization charges. We did ask the five major oil companies operating on the North Slope to provide us with estimates of their DR&R liabilities for oil and gas activities on the North Slope. However, accounting principles do not require oil companies to separately report their DR&R liability for each operation such as those on the North Slope and the companies consider this information to be proprietary. As such, the companies did not provide this information. The companies report their overall DR&R liability for their entire operations in their annual financial reports. We do not have the authority to audit the companies' financial statements or evaluate their reserve calculation methods and assumptions.

5. Is it the position of the GAO that management policies of State lands are within your scope of authority or that State's practices in general are subject to review by the General Accounting Office?

No. GAO does not have the authority to conduct studies, reviews, evaluations or audits of state or local programs or activities that are solely within the purview of the states or localities. On the North Slope, we would not have undertaken this assignment if it were to look solely at state oil and gas activities on state lands. In this case, we undertook the project because oil and gas activities on state lands are being performed in accordance with federal regulations issued by among others the U.S. Army Corps of Engineers, the Department of the Interior's Fish and Wildlife Service, and the U.S. Environmental Protection Agency. In commenting on this report, the state of Alaska said that it is clearly legitimate to look at Alaska's experience before coming to final policy decisions regarding appropriate DR&R standards on federal lands. Importantly, the lessons we learned from the state's experience resulted in our making recommendations for improving the management

of oil and gas activities on federal lands on the North Slope, which the Department of the Interior accepted.

Sincerely yours,

David M. Walker
Comptroller General
of the United States

cc: The Honorable Ted Stevens, United States Senate
The Honorable Richard A. Gephardt, House of Representatives
The Honorable Nick J. Rahall, House of Representatives
The Honorable Edward J. Markey, House of Representatives
The Honorable Don Young, House of Representatives

Mrs. CUBIN. Now I am happy to recognize our first panel, the Honorable Rebecca Watson who is the Assistant Secretary of Land and Minerals Management with the United States Department of Interior. Welcome. We are anxious to hear your testimony.

STATEMENT OF THE HONORABLE REBECCA WATSON, ASSISTANT SECRETARY, LAND AND MINERALS MANAGEMENT, U.S. DEPARTMENT OF THE INTERIOR

Ms. WATSON. Thank you. Today I would like to focus on what all of you have talked about in your opening remarks, and that is the role that Federal Lands and Resources can play, particularly in meeting the supply and demand balance that we face with natural gas.

I want to talk about short-term solutions and long-term solutions for meeting our nation's energy needs. I think we do face an energy challenge to day. Energy use, as you have articulated, sustains our economy and our quality of life.

But there is a fundamental imbalance between the energy that we use in this country and the energy we produce.

President Bush's National Energy Plan laid out a comprehensive long-term approach to meeting our nation's energy needs. Before I turn to natural gas, I would just like to highlight the provisions in that report concerning conservation and renewable energy fuels and a couple of initiatives we have at the Department of Interior.

I think as to conservation we can look back to 1973 and how our industrial base reacted to the crisis at that time. That was with increased efficiency. Our economy grew by three times. Our population grew, yet we continued to consume the same amount of energy that we did in 1973. That is energy saved and money saved over the long term.

As far as renewable energy, right now renewable energy supplies about 7 percent of our nation's energy consumption. It is predicted by 2020 that the use of renewable energy will rise to about 9 quadrillion btu's but it will still account for about 7 percent of consumption.

So, it appears for the foreseeable future, the next 20 years, that renewable energy will be an important part of diversifying our energy portfolio, but it will be an incremental source of supply supplementing fossil fuels.

Over the last year, Secretary Norton convened two conferences on renewable resources. An Interior report discussing initiatives and how we can improve the use of renewable energies at the department is expected before the fall.

At MMS we are looking at how to encourage alternate energy uses on Federal offshore lands, including offshore wave, wind and solar projects. On June 20th, this year, we presented a piece of legislation that would help facilitate the permitting of these types of projects.

As you have mentioned earlier, the Department of Interior manages significant resources, over 500 million surface acres of land. The BLM manages 262 million of those acres and more than 700 million acres of sub-surface mineral estate.

MMS manages 1.76 billion acres of offshore mineral estate. These Federal lands and resources contributes significant energy to the nation. They currently account for 30 percent of our domestic energy production. So you can see that Federal lands, Federal resources, are critical to our nation's supply of energy.

Natural gas is the cornerstone of President Bush's National Energy Policy for two very important reasons. We have significant resources of natural gas domestically and it is an efficient and clean-burning fossil fuel.

With regard to supply, total proven reserves of natural gas in 2000 exceeded 177 Tcf. Experts estimate that there are 617 Tcf of undiscovered natural gas resources in our country.

On the demand side, as the Chairwoman pointed out, we use 23 Tcf of natural gas annually. We produce 84 percent of it. The remaining 16 percent comes from our neighbors in Canada.

EIA predicts that in the next 20 years our use of natural gas will rise to 34 Tcf. I think it is pretty much common knowledge that natural gas is the cleanest burning fossil fuel. Because of its clean burning qualities, the increased use of natural gas was encouraged by the previous Administration and similarly President Bush in his National Energy Plan has also highlighted the important role of natural gas in meeting the demands of energy and also clean air.

But these benefits—supply and environmental benefits—create future challenge because as has been highlighted, many people are turning to natural gas for a source of energy. An ever-increasing number of our new electrical generating plants are switching from coal to natural gas, industrial chemicals, pharmaceuticals, all depend on reliable natural gas, as do the new high-speed Internet centers.

Gas is a reliable form of energy that these industries need. We predict that that will lead to an increased demand over the next 10 to 20 years.

In my new position, which I have held since the end of February, I have been intrigued by these facts and these figures. I wanted to know whether or not we have the resources to meet this demand in the short term. I have been talking to industry leaders as they come into my office.

I have been meeting with the Department of Energy, Assistant Secretary Mike Smith, his colleagues and generally just poking around trying to find out the answer, and of course, relying upon my staff at the Department of Interior for a lot of these questions.

It is a complex mix of questions, a complex mix of factors on demand and supply.

On the demand side, the strength of our economy and the harshness of weather dictate very strongly on the demand. Factors that affect supply include the interrelated price of oil and gas, access to reliable sources and the availability of infrastructure to transport that product to where it is needed.

The consensus that I have heard is that over the long term we will have to look more and more to imported, liquefied, natural gas and piped gas from Canada, Alaska and the Gulf of Mexico. But liquefied natural gas terminals, pipelines in Alaska and Canada and drilling in the deep water of the Gulf are all very capital intensive and they are long-term projects, the planning, the permitting, just the simple construction of these facilities takes time.

These factors suggest that in the short term domestic production and transportation of natural gas may not meet the rapid increases in demand as our economy continues to improve and we may or may not experience a cold winter in the years to come.

Given the importance of natural gas to Americans which the Chairwoman has outlined in her opening statement, the President does not think we should rely on luck alone to meet our natural gas needs.

This is why the National Energy Plan encourages the environmentally responsible development of domestic natural gas to meet this demand.

Two areas that we are looking at are the shallow waters of the Gulf of Mexico and gas reserves in the Rocky Mountain States. The Minerals Management Service is taking steps to develop economic incentives to spur activity in the shallow waters of the Gulf. This is deep drilling, down to 15,000 feet, but in shallow water. This deep gas play is expected to hold between five and 20 Tcf of gas and can be brought on quickly because there is existing infrastructure there. A final rule supporting this was issued on July second.

Coal bed methane, a natural gas, accounts for about 9 percent of the total natural gas reserve in the United States. The Rocky Mountain States of New Mexico, Utah, Colorado, Wyoming and Montana hold an estimated 30 to 48 Tcf of undiscovered natural gas resources associated with coal.

This represents the second largest gas resource in the United States, just behind the Gulf of Mexico. The majority of coal bed methane is owned by the Federal Government. Over the short term coal bed methane, because of the nature of how it is produced, can be developed more economically and more quickly than any other deep reservoir onshore gas or any of the deep water offshore gas.

Coal bed methane from public lands developed in an environmentally responsible manner can and should play a role in meeting our country's natural gas demands. The Secretary and I support the multiple use of public lands. We think multiple uses of public lands, the traditional uses, the new growing recreational use of our public lands; can coexist with the development of natural gas if they are properly managed. We are committed to seeing that they are properly managed.

As I mentioned earlier, 30 percent of our domestic energy production comes from Federal lands. Without the contribution of Federal

resources, the country's energy supply would lack needed diversity and would be almost entirely from other countries. This doesn't seem to be a prudent choice to make when we have the domestic resources in our country and these resources can be produced here in a more environmentally responsible manner than in many areas of the world.

I would be remiss if I didn't point out that it has particular benefits for the public land States which are between 30 and 80 percent managed by the Federal Government. The development of these Federal resources can help diversify western rural economies. They can create jobs, provide new wealth and enhance the State's tax revenue.

Certainly, like all natural gas resource development, coal bed methane and offshore oil and gas present environmental and social challenges that must be addressed. But I am confident that technology, best practices and creative thinking can successfully address those challenges.

Over the long term, I will just briefly address a couple of things we have, looking at that time period between five and 10 years. As was noted earlier, MMS estimates approximately 58 percent of our country's undiscovered natural gas resources lay under the outer continental shelf.

Again, we are looking at royalty relief to encourage that production.

The second thing that MMS is supporting, and this is over the much longer term, 15 to 20 years, is the technology to produce natural gas hydrates from offshore. They possess many hundreds or more volume of natural gas in these natural gas hydrates. We are looking at the technology and regulations necessary to produce this new form of natural gas.

Onshore we have several initiatives that I know the Committee is aware of, the EPCA study, which we expect to issue, as required, in November identifying where the Federal resources are and the extent and nature of any impediments to accessing them.

Once we get that information, we will incorporate it into BLM's land use planning efforts. These land use planning efforts, of course, involve extensive public participation.

I will just conclude with a couple of thoughts. The other long-term initiative we are working on are rights of way for transmission lines. I know that is a problem that Wyoming has recently focused on, the importance of that.

I just want to conclude that we are going to develop these resources on Federal lands. We think it is important, but we are not going to forget the Secretary's command to us to do so under her guidance of four C's, cooperation, collaboration, communication, all in the service of conservation. We take that seriously. We want to work with our partners here in Congress and the State and Federal agencies, tribal governments and all interested members of the public.

I thank you for the opportunity to testify today. I look forward to your questions.

Mrs. CUBIN. Thank you very much. Your presence here and your testimony are greatly appreciated.

[The prepared statement of Ms. Watson follows:]

Statement of Rebecca W. Watson, Assistant Secretary for Land & Minerals Management, U.S. Department of the Interior

Madam Chairman and Members of the Subcommittee, thank you for the opportunity to appear here today to discuss natural gas supply and demand issues. Today, I would like to outline the critical role the Federal lands and resources play in meeting our Nation's needs for natural gas, briefly discuss the supply and demand for natural gas, and identify short-term and long-term solutions for meeting our Nation's energy needs. I am accompanied by Bob Anderson, the Bureau of Land Management's (BLM's) Deputy Assistant Director of Minerals, Realty and Resource Protection; and Michael Hunt, the Minerals Management Service's (MMS") Resource Evaluation Division Chief.

Our Energy Future

America faces an energy challenge. Energy use sustains our economy and our quality of life, but a fundamental imbalance exists between our energy consumption and domestic energy production. We must look at ways to narrow the gap to an acceptable level between the amount of energy we use and the amount we produce. There is no one single solution. Achieving the goal of secure, affordable and environmentally sound energy will require diligent, concerted efforts on many fronts on both the supply and demand sides of the energy equation.

President Bush's National Energy Policy report laid out a comprehensive, long-term energy strategy for securing America's energy future. While most of the media coverage focuses on the production of traditional energy sources, energy conservation and efficiency and the expanded innovation, production and consumption of energy from alternative and renewable sources are also critical components of the President's balanced and comprehensive policy.

Good stewardship of the resources dictates that we use energy judiciously and conserve resources whenever possible for the benefit of future generations. Thus, fossil fuel development is only a part of the solution to our Nation's energy issues. Americans have already made great strides in using energy more efficiently. Since 1973, the United States economy has grown nearly three times faster than energy use. Had we continued to use energy as intensely as in the 1970's, the United States would have consumed about 177 quadrillion BTUs of energy last year, compared to actual consumption of approximately 99 quadrillion BTUs. To put that in perspective, the 78 quadrillion BTUs saved is more than the total amount of energy produced in the United States from all sources—oil, gas, coal, nuclear, renewable—in the year 2000.

Alternative and renewable sources of energy can also play an important role in helping meet our increased energy needs. To this end, the National Energy Policy encourages a clean and diverse portfolio of domestic energy supplies. The Policy includes measures to aid in the development and expansion of renewable energy technologies in wide-spread use today, including geothermal, wind, solar, and biomass, as well as continued research into alternative energy technologies that are still over the horizon such as hydrogen. Such diversity helps to ensure that future generations of Americans will have access to the energy they need.

Between 1975 and 2000, total renewable energy production in the United States increased from about 4.8 to 6.8 quadrillion BTUs, supplying about seven percent of the nation's energy consumption in 2000. By 2020, renewable energy production is forecast to rise to about 9.0 quadrillion BTUs, but still will account for only about seven percent of consumption.

Thus, for the present and as far as the future can be reasonably forecast, renewable energy is likely to remain an incremental source of supply supplementing fossil fuels as our primary source of energy. Renewable and alternative energy sources are currently considered a "step" energy technology, but they can be an important component to a diversified domestic energy portfolio. At the Department of the Interior, Secretary Norton has convened two conferences focused on renewable resources.

In an effort to help encourage innovative, alternative and renewable energy uses on Federal offshore lands, on June 20, 2002, the Administration officially transmitted to Congress proposed legislation to help facilitate the permitting of these type of projects. The legislation is in direct support of the President's National Energy Policy initiative to simplify permitting for energy production in an environmentally sound manner. It would allow the Secretary of the Interior to grant an easement or right-of-way for a range of OCS energy related projects—including renewable energy projects such as offshore wave, wind, or solar energy projects—and would provide a transparent and uniform permitting process. In turn, this regulatory certainty should help expedite such projects and their associated benefits. We

hope that Congress will enact this legislation prior to the end of its current legislative session.

Energy Production from Federal Resources

As the Assistant Secretary for Land and Minerals Management at the Department of the Interior, I have the administrative and managerial responsibility for the Bureau of Land Management (BLM), Minerals Management Service (MMS), and the Office of Surface Mining Reclamation and Enforcement (OSM). All of these bureaus are undertaking significant initiatives to comply with the President's National Energy Policy, and are working diligently to promote the environmentally sound production of our Nation's energy resources. The BLM and MMS have authorities to offer lands under their jurisdiction to produce mineral and energy (renewable and non-renewable) resources in an environmentally-sustainable manner.

The Department of the Interior manages more than 500 million surface acres of land, with the BLM managing 262 millions surface acres and more than 700 million subsurface acres of Federal mineral estate. MMS manages approximately 1.76 billion acres of offshore Federal mineral estate. These lands and resources currently account for 30% of total domestic energy production—including 48% of geothermal production, 35% of natural gas production (24% offshore and 11% onshore), 35% of coal production, 30% of oil production (25% offshore and 5% onshore), 20% of wind power, and 17% of hydropower production.

Importance of Natural Gas / Supply–Demand Equation

Natural gas is an important cornerstone of President Bush's National Energy Policy for two very important reasons. First, we have significant resources of natural gas in the United States. Second, natural gas is an efficient and clean-burning fossil fuel.

Regarding supply, our country's total proven reserves of natural gas in 2000 exceeded 177 Tcf. In addition, experts estimate that there are 617 Tcf of undiscovered natural gas resources. However, according to the 1999 report of the Department of Energy's Advisory Committee and the National Petroleum Council, 29 Tcf of the Rocky Mountain states" natural gas and approximately 76 Tcf of the Outer Continental Shelf natural gas are unaccessible for development.

On the demand side, meanwhile, the United States currently uses about 23 Tcf of natural gas annually. The U.S. produces approximately 19 Tcf (84%) of its annual natural gas demand and imports the remaining 4 Tcf (16%) from Canada. The U.S. Energy Information Administration (EIA) in its Energy Outlook 2002 reference case projects that the demand for natural gas will rise to just under 34 Tcf by 2020.

Looking at environmental benefits, natural gas produces fewer emissions than other fossil fuels. It is simply the cleanest-burning fossil fuel. Natural gas development has significant bipartisan support due to these benefits.

But these two factors—supply and environmental benefits of using natural gas—create future challenges, because they encourage increasing demand. We see a nationwide trend towards the use of natural gas. Heating and electricity generation have traditionally been the predominant uses of natural gas. Because of Clean Air Act standards and the availability of clean-burning natural gas, an increasing number of our electric generating plants are switching to natural gas for power generation. In fact, an overwhelming majority of new electric generation projects will be fueled by natural gas. This will lead to a dramatic increase in demand for natural gas in the next 10 to 20 years.

In recent years, we have learned through hard experience how high natural gas prices negatively affect households, farmers, businesses and our economy as a whole. For example, the sharp natural gas price increases during the winter of 2000–2001 brought higher utility bills to many consumers. Low income families were especially hard hit. More than 5 million consumers applied for federal and state assistance—an increase of 1 million over the previous winter.

Farmers also felt the impact of higher gas prices that winter. Farmers paid twice the 1999 price of fertilizer because of higher prices for natural gas, which is a major component in fertilizer production. Many farms, which are already operating on the economic edge, simply cannot survive these higher costs.

Whether we will have reliable supplies of natural gas to meet this growing demand is a question I have been asking industry, petroleum economists, and experts at the Department of the Interior and the Department of Energy. On the demand side, the factors that impact it are the strength of the economy and the extremes of the weather. Factors that affect supply include the price of oil and gas, access to reliable sources, and availability of infrastructure. The consensus is that in order to meet long-term demand we will have to look to imports of liquified natural gas and piped gas from Canada, Alaska, and the Gulf of Mexico. But liquified natural

gas terminals, pipelines in Alaska and Canada, and drilling in the Gulf are capital intensive and take time. These factors in the short term suggest that domestic production and transportation will not meet rapid increases in demand. At a recent meeting on oil and gas production in the United States, one expert noted that as a result of declining reserves in the Gulf of Mexico and a slow-down in drilling in 2001, the line between the Nation's gas surplus and gas shortage is increasingly narrow.

Short Term Solutions/Role of Coalbed Methane

Given the importance of natural gas to all Americans—to provide electricity, to heat our homes, and to support our industrial needs—as stated by the President, we should not rely on good fortune to avoid a natural gas shortage. That is why his National Energy Policy encourages the environmentally-responsible development of natural gas to meet the near term natural gas demand. Without readily available gas, our electricity-reliant economy could suffer. Two areas currently being considered are the shallow waters of the Gulf of Mexico and the Rocky Mountain States.

The shallow waters of the Gulf of Mexico hold the greatest promise for new resources of natural gas to meet the nation's near term gas needs. MMS is taking steps to develop economic incentives to spur industry activity in this area of the Gulf. MMS is issuing royalty relief for production from new wells drilled to deep horizons (greater than 15,000 feet total depth). This deep gas play, expected to hold between 5 and 20 Tcf of gas, can be developed quickly due to existing infrastructure in the shallow waters of the Gulf. MMS also issued a final rule on July 2, that allows companies to apply or lease suspensions for exploration of subsalt resources.

Coalbed methane, a natural gas, accounts for about 9% of the total natural gas reserves in the United States. The Rocky Mountain States of New Mexico, Utah, Colorado, Wyoming, and Montana hold an estimated 30 to 48 Tcf of undiscovered natural gas resources associated with coal. This represents the second largest gas resource in the United States behind the Gulf of Mexico. The EIA refers to this area as a possible "Persian Gulf for natural gas." While many areas of the United States are experiencing declining natural gas reserves, the Rocky Mountain resources are largely untapped and the amount of newly discovered gas in the area is increasing on a daily basis. The majority of the coalbed methane is in the Federal mineral estate. As good stewards of these domestic natural gas reserves, we should develop these resources in an environmentally-responsible manner to sustain our nation's quality of life in the face of our increasing demand for natural gas.

Over the short-term, coalbed methane can be developed more economically and more quickly than other deep reservoir onshore gas or deepwater offshore gas. Coalbed methane from public lands can and should play a role in meeting our increasing demand. The Secretary and I support multiple use of the public lands. These public uses can co-exist on public lands, if properly managed. We do not believe the public lands and resources should be put off limits to development. Today over 50% of our petroleum products are imported. Thirty percent of our total domestic energy production comes from Federal lands and resources. Without the contribution of public resources, the country's energy supply would be almost entirely from other countries. That does not seem prudent when we have the domestic resources to meet our needs and those resources can be developed in a much more environmentally responsible manner than in other areas of the world. And, of significance for the public lands states that are anywhere from 30% to 80% Federally-managed, the development of coalbed methane can help western rural economies by creating jobs, new wealth, and tax revenue.

But like all natural resource development, coalbed methane presents environmental and social challenges that must be addressed. Environmental concerns and issues associated with the production of coalbed methane vary significantly from basin to basin depending on water quality, gas reserves, and topography. The BLM is working with State, Federal and tribal governments, surface owners, environmental groups, and industry to address these issues, including what to do with the produced waters and how to reduce the impacts of gas production and transportation on surface owners. I am confident that technology, best practices, and creative thinking can address these challenges.

Long Term Solutions—Offshore

To meet our natural gas demand in the medium and long term (5 to 10 years and beyond) without increasing imports, we need to maintain or increase domestic natural gas production—both onshore and offshore. MMS 2000 Resource Assessments estimates approximately 58% of our country's undiscovered natural gas resources lie under the OCS. The production from this area currently contributes a quarter of our nation's gas supply. Over 362 Tcf of undiscovered natural gas resources remain to

be explored and developed in the OCS. We estimate over 23 Tcf of discovered reserves remain to be produced.

As I mentioned before, development of the deep water Gulf of Mexico, which holds the prospect of supplying the majority of the future offshore natural gas production, is capital intensive, and because of the long lead times required, new deep water reserves won't be available to the U.S. market for possibly another decade. MMS continues to provide royalty relief, on a targeted basis, for new deep water leasing. The continued use of royalty relief in the deep waters of the Gulf provides the needed economic incentive to keep industry moving forward on new technologies and exploring deeper water frontiers.

Additionally, in the 15- to 20-year range, the technology to produce clean burning natural gas hydrates from offshore, which are present in volumes hundreds of times larger than conventional gas resources, may be perfected and may contribute to meet our energy needs.

Long Term Solutions—Onshore

As the Subcommittee knows well, we will not be able to solve the imbalance between the supply of and demand for natural gas without the ability to access that resource. To address this access issue, the National Energy Policy emphasizes the importance of the ongoing interagency Energy Policy and Conservation Act (EPCA) study which will identify where the onshore resources are and the extent and nature of any planning impediments to accessing them. The initial report will be completed in November as required by the Act. All information gathered as a result of the EPCA effort will be integrated into the BLM's ongoing land use planning efforts which is a cornerstone for future energy production from public lands. The BLM has also prioritized a number of land-use planning efforts that have major oil and gas components.

Once natural gas has been discovered and produced, it must be transported via a pipeline to the end user. The National Energy Policy also identifies the necessity for a comprehensive, long-term solution to deliver natural gas and other energy resources to industry and consumers in a reliable and safe manner. Federal lands are important to the rights-of-way needs of the energy industry and utilities, especially in the western United States. BLM estimates that 90% of the oil and gas pipelines and electric transmission line rights-of-way cross western Federal lands. The BLM alone administers approximately 85,000 rights-of-way, including approximately 23,000 oil and gas pipeline rights-of-way.

Our challenge is to improve and expand the existing network of pipelines and transmission lines to meet the increased demand for energy. One way to meet that challenge is to identify and designate right-of-way utility corridors on public lands in collaboration with the Western Governor's Association and the Western Utility Group, an industry coalition. The designation of utility corridors through BLM land use plans provides an important tool in the planning and location of future pipelines and assists in the processing of rights-of-way applications on the public lands.

Conclusion

Madam Chairman, as you know, the natural gas resources of the Federal lands, both onshore and the OCS, provide us with an immense opportunity to maintain a quality of life of all Americans. As the Department of the Interior continues to promote the environmentally-sound recovery of the Nation's natural gas resources, we will continue to operate under Secretary Norton's leadership and vision for managing the public resources—through communication, cooperation, and consultation in the service of conservation. The essence of this goal is to continue to forge new and stronger partnerships with other Federal and state agencies, Tribal governments, and all of our stakeholders—including Congress—to create greater opportunities for the responsible development of this important energy resource.

Thank you for the opportunity to testify before you today. This hearing offers a unique and timely opportunity to educate all Americans about natural gas—an energy source that plays a vital role to our current and future well being. I welcome any questions the Subcommittee may have.

[An attachment to Ms. Watson's statement follows:]

DOI Natural Gas Development Initiatives

Both the Bureau of Land Management (BLM) and the Minerals Management Service (MMS) are undertaking initiatives to comply with the President's National Energy Policy and to increase our Nation's natural gas production. A brief overview

our important work related to the responsible development of our Nation's natural gas resources follows:

ONSHORE NATURAL GAS DEVELOPMENT-BUREAU OF LAND MANAGEMENT INITIATIVES

The BLM administers the minerals underlying on-shore Federal lands—a total of about 700 million acres of mineral estate throughout the Nation. As mentioned, these lands account for about 11 percent of natural gas production nationwide. Major components of the BLM's Federal onshore oil and gas program include: 1) land-use planning; 2) leasing; 3) post-lease authorizations, such as drilling permits; and 4) inspection and enforcement (I&E) activities. The BLM has a significant role in meeting the President's National Energy Policy goal to provide for the environmentally-sound development of natural gas on Federal lands. Some of these initiatives are outlined below.

Land–Use Planning

The BLM is currently undertaking a major effort to update the land use plans which are the basis for all of its actions. Of BLM's twenty-one high-priority plans scheduled for completion by 2004, ten have major oil and gas energy components. These will authorize the continued development of oil and gas resources in Alaska, Colorado, Montana, New Mexico, Utah and Wyoming. In particular, the Bureau's planning efforts related to natural gas development in the Powder River Basin of Wyoming and Montana continue to progress with the goal of providing for the responsible development of the Nation's significant natural gas resources in this region.

Access / "EPCA" Inventory

As the Subcommittee knows well, we will not be able to solve the imbalance between the supply of and demand for natural gas without the ability to access our natural gas resources. To address the access issue, the President's National Energy Policy emphasizes the importance of the ongoing inter-agency Energy Policy and Conservation Act (EPCA) study. Under the Congressionally-mandated EPCA study, the BLM is working closely with U.S. Geological Survey, the U.S. Forest Service, the Department of Energy (DOE) and DOE's Energy Information Administration to produce a scientific inventory of both oil and natural gas resources and reserves. The inventory also identifies the extent and nature of any restrictions or impediments to the development of these resources. Five areas within the Rocky Mountain Region were identified as priority areas for study: the Powder River, Green River, Uinta/Piceance and San Juan/Paradox Basins and the Montana Thrust Belt. This inventory is underway and completion of the five priority natural gas producing basins is on schedule to meet Congress" November 2002 statutory deadline.

As we complete the initial EPCA inventory, the BLM plans to analyze the data and look for opportunities to improve the Bureau's management of the oil and natural gas resources on Federal lands specifically to address the access issue. All information gathered as a result of the EPCA effort will be integrated into the BLM's ongoing land use planning efforts. By integrating the information into the BLM's planning process, extensive opportunities will be available for the public to provide comments and recommendations on the specific application of the information. Any changes made as a result of the EPCA project will be made in full compliance with all Federal statutes—those addressing environmental processes (National Environmental Policy Act) and substantive environmental protections.

Permitting / Timeliness

Another important component of access is the certainty of being able to produce the natural gas to meet rising demands in an economically timely manner. Industry must have confidence that it can develop the natural gas to receive a fair and a viable rate of return for its investment. The BLM recognizes the importance of minimizing delays in its permitting role. The Bureau is working on various actions to expedite internal administrative processes, such as the processing of Applications for Permits to Drill.

This is one of the Bureau's important tasks in implementing the President's National Energy Policy. In March of this year, the Bureau conducted an outreach meeting in Denver to open communications between the agency and the public regarding the processing of drilling permits. The BLM continues to cooperate and consult with all interested parties, including the oil and gas industry and environmental interests, regarding its efforts to more efficiently process drilling permits. The Bureau is also looking at revising guidance to its field offices and the oil and gas industry as a part of this effort. This serves to advance the conservation of both the mineral resources and other important public land values. In other efforts, the BLM is ag-

gressively pursuing the use of electronic commerce in its oil and gas program. This would allow industry to file electronic applications and forms. By utilizing new technologies, both the Federal Government and the BLM's stakeholders can benefit from increased efficiency.

Transportation & Infrastructure

Once natural gas has been discovered and is ready for production, a means of transportation, primarily by pipeline, is then required. The President's National Energy Policy identifies the necessity for a comprehensive, long-term solution to deliver natural gas and other energy resources to industry and consumers in a reliable and safe manner. Public lands are important to the rights-of-way needs of the energy industry and utilities, especially in the western U.S. It is estimated that 90 percent of the oil and gas pipeline rights-of-way in the western U.S. are dependent to some extent on right-of-way authorizations on public lands. The BLM alone administers some 85,000 rights-of-way, including approximately 23,000 oil and gas pipeline rights-of-way. The BLM processes more than 600 pipeline right-of-way authorizations annually, and the number of applications has increased by more than 10 percent each year during the last couple of years. The demand for additional energy infrastructure is expected to increase this workload by as much as 15–20 percent per year over the next 5 years.

Our challenge is to improve and expand the existing infrastructure of pipelines and transmission lines to meet the increased demand for energy infrastructure, including oil and natural gas pipelines. The BLM is responding to these challenges through several initiatives and efforts. As part of its efforts to implement the President's National Energy Policy and recognizing the existing backlog of right-of-way applications and the anticipated increase in the number of future applications, the BLM has prioritized the processing of energy related rights-of-way. The BLM has assigned additional Project Managers to selected major energy related right-of-way projects, especially interstate projects, to assist in their expeditious processing. The BLM is also working closely with the Federal Energy Regulatory Commission (FERC) in developing cooperative procedures for the improved streamlining of natural gas pipeline projects. Finally, the BLM has also taken the initiative to identify and designate right-of-way utility corridors on the public lands in collaboration with the Western Utility Group, an industry coalition, and the Western Governors" Association. The designation of utility corridors through BLM land use plans provides an important tool in the planning and location of future pipelines and assists in the streamlined processing of future right-of-way applications on the public lands. In order to pursue these efforts, additional resources are being dedicated to the processing of these right-of-way applications, and an increase of $1.6 million is included in the President's fiscal year 2003 Budget request for energy rights-of-way.

OFFSHORE NATURAL GAS DEVELOPMENT-MINERALS MANAGEMENT SERVICE

Since the publication of the 1999 National Petroleum Council study indicating the impending natural gas supply shortfall in the first quarter of the 21st Century, MMS has taken the initiative to implement a number of incentives to augment natural gas production from the Gulf of Mexico OCS. Some of these initiative include:

Shallow Water Deep Gas Initiative

Production in the shallow water areas of the Gulf of Mexico has been steadily declining—some 13 percent from 1997 through 1999. Increasing gas production from OCS deep water areas is keeping that production in balance. However, deeply buried sediments underlying the shallower waters of the continental shelf remain virtually unexplored. Of more than 35,000 wells drilled in the Gulf of Mexico, only about 5 percent were drilled deeper than 15,000 feet total well depth. MMS estimates that there could be 5 to 20 Tcf—with a most likely value of 10.5 Tcf—of recoverable natural gas present in the deep portion of the OCS. Realizing the emerging natural gas potential of this area of the OCS, as well as higher exploration/development costs and a higher geologic risk, in March, 2001, MMS instituted a royalty relief incentive on the first 20 billion cubic feet of production from natural gas wells drilled at greater than 15,000 feet total well depth for the Central and Western Gulf of Mexico planning area. This relief applies to new leases acquired since Sale 178 held in early 2001. Since that time, MMS had been developing a program to apply a similar type of economic incentive to existing older leases that are drilled to deep depths. Proposed regulations have been drafted and are currently undergoing Departmental review.

Suspensions of Operations for Exploration Under Salt Sheets

In general, exploring and developing areas under salt sheets is more difficult in many instances than other types of development on the OCS. There are instances where oil and gas companies begin to conduct timely analysis of geophysical data early in their primary lease term; however, data may be inconclusive because of problems caused by existence of salt sheets. Realizing this fact, MMS issued a final rulemaking on July 2, 2002, that would modify existing requirements for suspensions of operations for oil and gas leases that have salt sheets associated with them. Specifically, the rule allows companies to apply for a suspension of operations prior to drilling a well on a lease in order to have time to perform and complete the necessary geophysical analysis.

OCS Deep Water Royalty Relief

The Deep Water Royalty Relief Act of 1995 provided a substantial fiscal stimulus to new leases issued between 1996 and 2000 and located in water depths of 200 meters or greater in the Central and Western Gulf of Mexico. As a result, the number of deep water leases increased dramatically by 2000. At this time, the mandatory royalty relief provisions of the Act related to new leases has expired. However, in order to maintain the momentum and positive benefits associated with that program, MMS instituted a follow-up policy in 2001, which has continued the strong trend of leasing and production in deep water.

The discretionary deep water royalty relief program instituted by MMS in 2001 has been modified slightly for 2002. As currently formulated, new tracts offered in the Central and Western planning areas of the Gulf of Mexico are eligible to receive royalty suspensions on a specific amount of initially-generated production—5 million barrels of oil equivalent (BOE) in water depths of 400–800 meters; 9 million BOE in water depths of 800–1600 meters; and 12 million BOE in water depths of greater than 1,600 meters. These volumes are not affected by the status or level of production generated on the field to which a lease is assigned, which was the case under the Deep Water Royalty Relief Act (1996–2000 period). Currently, under MMS regulations, eligibility for relief depends on the prices of production, with ceiling prices being equivalent to those which applied under the Act, plus adjustments for inflation.

Mrs. CUBIN. I want to start by asking about coal bed methane because, as you know in the Powder River Basin of Wyoming there is a large coal bed methane play. There is an environmental impact statement that is in the process of being completed right now.

Now too long ago I flew over the methane fields in Campbell County and then took a tour on the ground and looked at some of the problems that there have been and how they are being dealt with, talked to people who are royalty owners and people who have production on their land who are not royalty owners. That is another thing that we need to look at.

But what impressed me the most was that the people who are producing the coal bed methane told me if that environmental impact statement isn't completed soon that it will literally stop new drilling. And as you stated in your testimony, that is the easiest, least environmentally disturbing mineral that we have.

So, could you give me an idea when that will be completed, that environmental impact statement will be completed? Will it be done by the end of the year? It is very important that we get that completed.

Ms. WATSON. I apologize for having to answer the first question you posed to me in this manner, but I represented one company, Fidelity, and they are involved in the Montana EIS and the Wyoming EIS. So, I am recused from discussion of either one of those EIS's. I am not recused from the entire topic of coal bed methane, but only from those two particular matters. So, we can get back to you with an answer to that question.

I am aware that you sent a letter posing that question. Others in my office, Tom Fulton and Patricia Morrison, are handling those issues for me.

Mrs. CUBIN. Thank you. I don't think we have had a response to the letter. I would really be grateful if we could at least get a response to that real soon.

Ms. WATSON. I will see that it happens.

Mrs. CUBIN. Thank you.

I wonder also, does the department have any plan or are they taking into consideration the image that oil and gas companies in exploration on public lands, and you know, the environmental questions that arise, is the department addressing any of those issues? Are you thinking about how to build more public support for needed policy initiatives?

Ms. WATSON. I think that is a concern that we share, the image of natural gas and production, the disconnect between our modern life style which is increasingly dependent on electricity and natural gas that runs that electricity and the lack of acceptability for any kind of resource or natural gas production.

We are not, in the Department of Interior, in the role of cheerleader for energy. We have multiple responsibilities, long-term stewardship of the land as well as using the land for natural resource production. We are interested in making sure that energy companies are their own best friend.

Some of the things we have been talking about have been the relationship with the surface owners. As you mentioned, some of the surface owners do not own the minerals. How are they treated as mineral owners come on to their property? Are they being treated in a good manner? Are there considerations for their long-term economic needs to run their ranch? How are those being incorporated? We are encouraging companies to take that into account. We have had very positive response from companies to those charges. So, we are certainly aware of it and we are doing what we can to provide good answers and facts to the concerns that people raise.

Mrs. CUBIN. Thank you. I certainly wouldn't think that the Department should be in any way a cheerleader for the oil and gas industry, but I think in the past the department has responded itself to what I would call "crazy environmental opinions" at times. And some of them are crazy. I mean, you know, to think that we can solve the forest problem with solar-powered chainsaws is a crazy idea.

But I think in the past the Department has responded in that way, has responded toward the environmental side, even at times when it wasn't justified. So, I just am sure and hope that the Department doesn't continue along that course.

Ms. WATSON. I would just be more specific and say that we have developed a coal bed methane fact sheet that our Public Affairs Office has. We use that to try and shed some light on some of the mythology that surrounds coal bed methane and again, made sure that accuracy informs public debate on this.

Mrs. CUBIN. Good. Thank you very much.

Now, I would like to recognize Mr. Kind.

Mr. KIND. Thank you, Madam Chair, and thank you, Secretary Watson, for your testimony. I appreciate your coming before us

today. This is very serious. I think the American public understands that we are by and large a fossil fuel-dependent nation and we will be for some time.

We are not going to be able to turn from this dependence any time in the foreseeable future. Natural gas will have to be a part—a significant part, obviously—for a comprehensive and sustainable long-term energy plan. I don't think there is any question about that.

But I think the American public will also hope that we will be able to produce and deliver these natural resources in an environmentally sustainable fashion.

I appreciate your statements in regards to the role of alternative and renewable energy sources, 7 percent now and probably 7 percent in the future, based on your current calculation.

In fact, in your written statement you indicate that, and I quote, "Energy conservation and efficiency and the expanded innovation, production and consumption of energy from alternative and renewable sources are also critical components of the President's balanced and comprehensive policy."

I agree that has to be a critical component and with all due respect to our distinguished conferees serving on the Energy Conference, I think the Energy Bill right now that we are looking at is a little light when it comes to our interest or investment in exploring the true potential of alternative and renewable energy sources.

In fact, just a little while ago during a previous hearing, your BLM Director, Kathleen Clark, indicated that right now less than 5 percent of the BLM energy budget is spent on non-oil and gas activities. Again, less than 5 percent of the entire Energy Budget over at BLM is actually devoted to expanding alternative and renewable energy sources.

So, an energy bill that, I think, emphasizes the exploration and production and delivery of fossil fuels will, surprise, surprise, leave our nation extremely dependent 20 or 30 years from now on fossil fuels. And a bill that does not emphasize replacing the investments in developing these alternative and renewable sources really aren't going to give them the chance or the potential that I think they hold in this country.

Is there energy going on right now in your department at BLM to try to devote more resources, more investment in developing alternative and renewable energy sources or will this below 5 percent budget be the norm for sometime to come?

Ms. WATSON. The area that we are focused on right now which should inform the budget is the Secretary's two conferences on renewable energy and the report with recommendation that is flowing out of it. How that will inform the budget, I can't answer you in detail as to whether the 5 percent number will increase or not. I haven't looked at that particular issue, but I can get back to you on that.

We are looking at that. I can tell the Committee that 48 percent of geothermal energy is produced from public lands, so just like fossil fuels, public lands play a big role in renewable energy as well.

Mr. KIND. I appreciate that. I think we will just follow up and see what is happening at the department with regards to the alter-

native and renewable energy budget in that. In fact, we worked hard on the Committee in order to develop a survey on geothermal potential in the country as well, with a particular emphasis obviously, in the Rockies right with a lot of the potential that that holds. So, hopefully, we will be able to work closely with you on exploring that.

I want to ask a few questions with regards to some proposed legislation that administration just sent up to us late June. The goal is to try to get the Department of Interior involved in the permitting process in offshore or Outer Continental Shelf alternative and renewable energy programs. I think it is a worthwhile goal, one that we need to explore.

The question I have is that right now under the permitting process you have both the Coast Guard and the Corps of Engineers that are involved in the permitting process of Outer Continental Shelf alternative and renewable energy programs such as offshore wave, wind, solar energy projects, things of this nature.

How will bringing in another Federal department or agency like the Department of Interior streamline the process or make it more efficient than what we currently have in place with the Coast Guard and with the Corps of Engineers? Are you familiar? It is legislation that you referenced in your written testimony.

Ms. WATSON. I will probably have to get some assistance here, but my understanding of it is there are two competing pieces of legislation; one which would provide the Department of Transportation with authority over offshore permitting and then our proposed legislation that would put the authority in the Minerals Management Service.

We are offering that legislation. We certainly think some regulation needs to be in place. We feel it would be better with Minerals Management Service because this is our area of expertise. This is the area that we work in, in the offshore area. This involves energy, so we think we would be the more appropriate agency to regulate that.

Now, how the relative roles of the other two agencies that you mention sort out in that proposal, I don't know.

Mr. KIND. We would be happy to follow up with you on that because we are taking a very close look at the proposed legislation right now. We may have some additional questions as I explore it in further detail.

I see my time has expired. Thank you.

Ms. WATSON. Thank you.

Mrs. CUBIN. The Chair now recognizes Mr. Tauzin.

Mr. TAUZIN. Thank you, Madam Chairman.

Madam Secretary, what is the department's definition of a proven reserve? By the way, before I do that, let me remind my friend, Mr. Kind, that the House bill we passed, which passed in a very bipartisan fashion, 70 percent of it was concerned with conservation and renewables.

The Senate bill is about 90 percent. So, both bills are extremely weighted on the side of conservation and renewables. If we have a conference agreement that strikes a balance between the two and hits it around 80 percent, that is an enormous percentage of attention paid to conservation of renewables.

I tell him that only because I support that. I think the President supports that. I think we have not paid enough attention to the extraordinary contributions of conservation. I think Secretary Watson, in her original statement, pointed out that the economy grew three times faster than our energy needs, which is pretty good stuff.

So, we are not by any means neglecting that. On the contrary, I think we are beginning to pay much more attention to the power of conservation, the power of renewables. But we are, nevertheless, going to need more natural gas in this country, with all the conservation, all the renewable energy we can produce in the bill.

What is the definition of a proven reserve?

Ms. WATSON. With the assistance of my able assistants back there, these are reserves that have been both mapped in detail and then an economic analysis performed.

Mr. TAUZIN. Ah, you see, you touched the right word. It is an economic term. A proven reserve is not physical term so much as an economic term. It is a definition that says you found it and it is producible under the economics of the day; that is, it is producible for a price that can earn you a profit in a marketplace today.

If the price of natural gas were to drop, proven reserves drop because production goes out. People stop producing gas that is not economically feasible to produce. When the price of natural gas goes up, all of a sudden the proven reserve numbers go up because economically much more of the gas that has been found is available for production or gas that can easily be recovered at that price suddenly enters the marketplace because people invest in those fields.

It is an important point because in some many of our discussions about what energy we have in this country and what is available for our country, we use these proven reserve terms, which are very flexible. They are very dependent upon what the economy of natural gas is in a given marketplace. They change depending upon the price.

If we are willing to pay three times as much for natural gas as we are paying today, all of a sudden we have a lot more proven reserves available in America to be produced. That is my point. Price drives that determination.

Secondly, you say the top place to go is the OCS. The second top place to go is coal bed methane. I want to ask you two questions. When gas is produced in the Federal OCS, what share of the royalties goes to the States on shore?

Ms. WATSON. I believe it is 25 percent.

Mr. TAUZIN. It is zero. The answer is zero.

Ms. WATSON. Oh, in offshore.

Mr. TAUZIN. Oh, yes. The answer is zero.

Ms. WATSON. There is a certain area, though, that you get 25 percent.

Mr. TAUZIN. No. That is only in an area where there is drainage occurring. It is an 8(g) area where there is a dispute over whether the gas or oil is coming from the Federal line or the State line. There is an agreement to share that.

Outside of that drainage area where the State is actually claiming some part of the reserve because it underlies both the Federal

and the State line, outside of that in the Federal OCS the percentage that the State gets is zero.

That is the biggest place to go. I tell you that because when we get through all this fighting about where are we going to find some more natural gas, I can tell you where we are more likely to go than anywhere else. We are more likely to go off Louisiana and Texas and a little bit off of Alabama; not much off of Florida because they don't want it over there.

So, the States I live in are going to be the ones where everybody goes to get some more natural gas and our States get zero percent of the royalties from that natural gas produced on Federal lands off our States. But the impacts are severe on our States.

Now, let's talk about coal bed because I am a big supporter of coal bed methane projects, too. By the way, I think the Senate bill on energy has a very good position that we are going to look favorably on in the conference. A coal bed methane gas is produced. How much royalty goes to the States there?

Ms. WATSON. Fifty.

Mr. TAUZIN. Fifty percent. You get my picture?

Ms. WATSON. I do. I knew where you were headed.

Mr. TAUZIN. Yes. So, as we begin to think about energy policy for our country and its impact on the environment and the need to mitigate damage to the environment as we produce it, I am just going to try to keep reminding folks, you know, that if you just keep coming back to Louisiana and we get zero percent of the royalties and all of the impacts, pretty soon, somebody in Louisiana is going to say, no, no, don't come back; go somewhere else.

Now, some environmentalists might like that, but our country is going to be in much worse shape than it is today. If we shut off the 19 percent that Americans are getting today, what would it do to the U.S. economy?

Ms. WATSON. It would have a negative impact.

Mr. TAUZIN. Negative? You think the stock market looks bad today? The economy would go into recession or depression, probably. That is how much people depend on that resource offshore in my State. But we get zero royalties for its production.

One final question. I know my time is up. You mentioned methane hydrates. Would you send me everything you have on methane hydrates? I mean everything you can send me reasonably so I can read about it?

Ms. WATSON. Yes.

Mr. TAUZIN. Methane hydrates is methane frozen in ice in beds along the coast of our country and from country in the world almost, big reserves of it. Eight thousand years ago methane hydrates exploded to the surface in the northern Atlantic and raised the temperature of the earth 12 degrees in a 10-year period of time. That is pretty dramatic stuff, that big release of methanes into the atmosphere. People believe that methane hydrate releases may be responsible for some of the global warming that is going on today because as the earth shifts and plates move around methane hydrate releases occur and we have dramatic increases.

I think methane in the atmosphere has about 20 times the effect of CO2 on global warming. That is pretty serious stuff. Producing it, getting to it and producing it rather than letting it escape into

the atmosphere and causing all this environmental damage, would be pretty smart stuff.

I would like to know more about what you are doing in terms of encouraging research and development in this area, what is happening around the world in terms of production. I understand there are some other countries experimenting with it. You know, it is pretty tricky stuff, to get it out without releasing it. But it would be pretty good for our country and the world if we could get to it and stop it from being released into the atmosphere accidentally.

So, I would like to know more about it and if you could supply me with whatever information you have about it, I would appreciate it.

Ms. WATSON. Yes, I would be happy to do so. I am aware that the Environmental Protection Agency has the Star Program, which is focused internationally and nationally on the capture and use of methane, getting it out of the atmosphere and utilizing it as a fuel source.

My understanding is that Japan has been particularly aggressive in looking at this.

Mr. TAUZIN. I think Japan is the most aggressive. Obviously, learning what they are doing and what we are doing would be very important as we think through the future needs. Methane is natural gas. It is natural gas stripped of all its liquids. It is the basic component that we use in methane or natural gas-fired electricity plants and in our homes, to heat our homes. So, it is critically important to know more about that resource.

Again, I thank you if you could share whatever you can with me.

Thank you, Madam Chairman.

Mrs. CUBIN. Yes. And I would like to tell the gentleman from Louisiana that I absolutely agree with him about the need for some portion of the royalties, not royalties, but to go to Louisiana. I think it is inexcusable that that wealth is created and the benefit to the country is accrued while Louisiana is suffering from that.

I am committed, Mr. Tauzin, to doing everything that I can do to help you with that.

Mr. TAUZIN. Thank you, Madam Chairman.

Mrs. CUBIN. The Chair now recognizes the gentleman from Colorado, Mr. Tancredo.

Mr. TANCREDO. Thank you, Madam Chairman.

I just have one question. You know, as I listened to this discussion, I am somewhat perplexed to try to determine the extent to which we can deal with the problem of NIMBY, that is "not in my back yard." You know, everybody wants prisons and people put in prison if they have done something wrong, but nobody wants the prison in their back yard. Everything wants to use resources, but nobody wants that development in their back yard.

That extends to States, of course. We have States like Florida that frankly, I don't know if we have any numbers, like how much it imports, how much it uses, I should say. What is the total usage of resources in that state, energy resources, as opposed to how much they produce?

Montana is another example of a State that has become very, very difficult to deal with, especially coal bed methane. You know,

the discharge of water in the Powder River Basin is causing enormous problems.

I just wonder at what point do we have a responsibility here to do something either via legislation or maybe you, by rule, to try and deal with this phenomena, because if it spreads to any great extent, you know, where are we left if every State ends up saying, "Gee, you know, we want the energy. We need the energy. We need it for our economy. We just won't let you produce it here."

Do we have a role? How do we deal with that in terms of State's rights, but on the other hand the overall responsibility for the development of these resources? I wonder, is it the issue of sharing of tax resources? We don't want to use the word "royalties," but is that the incentive that we need? That would only work with States that have coastal areas.

I am just perplexed about where we go from here and this phenomena that I think is going to increase as time goes by.

Ms. WATSON. It is a perplexing question. I lived in Montana for 6 years. During that time I saw the end of the mining industry which was over 100 years old that started that State.

I saw the reduction of the timber industry and the oil and gas was really dormant at that point until coal bed methane began to be discussed. It is something I have thought about a lot. I don't think you can legislate or administratively require public acceptability.

I think it is something that all of us in this room as political leaders have a role to play in talking to the public about. There is a moral dimension that is never discussed and that is we enjoy a quality of life in this country that is unsurpassed, yet we don't want to put the impacts on ourselves. We want to export those impacts to other countries. We want our medals, we want our energy, but please don't produce it in our own back yard.

Is that the right way to think? Is that the responsible, adult way to think or do we have some role to help produce energy for our own needs instead of pushing the impacts of our demands elsewhere?

I think it is a long-term educational effort. It is a dialog we all have to have. At the Department of Interior we want to listen to people and their concerns. But I think the trend that you describe is very real. We are seeing that everywhere.

Liquefied natural gas terminals, I mentioned that those are the long-term direction it looks like we are going. People object to those. We looked at wind energy off the coast of Florida and off the coast of Massachusetts. Again, objections to those.

So, many forms of energy that have impacts, nobody wants them in their backyard. They love the electricity. That is all I can say, I guess, that we have to talk about the issue and try and get the public in a dialog to take a look at the cumulative effect of all these NIMBY-like decisions.

Mr. TANCREDO. Does the department actually maintain any sort of data base that would actually look at resource usage, in this particular case, energy usage by State?

Ms. WATSON. I believe probably the Department of Energy and EIA would be the place and also individual States maintain those records, I know.

Mr. TANCREDO. Thank you very much, Madam Secretary. Thank you, Madam Chairman.

Mrs. CUBIN. I thank you very much for your testimony and also the members for their questions.

Other members of the Subcommittee may have further questions that they were not here to be able to ask. So, we would ask you if we submit those questions, to respond to them in writing.

Ms. WATSON. Thank you.

Mrs. CUBIN. Now I would like to recognize the second panel of witnesses, Mr. Glenn Schleede, Member of the Advisory Council of Consumer Alert; Mr. Lee Gooch, Chairman of the PCS Nitrogen Process Gas Consumers Group; and Mr. Eugene F. Peters, Vice President, Government Affairs, for the Electricity Power Supply Association.

I would like to remind you that the Committee rules allow for 5 minutes of testimony. If you are not able to complete your written testimony in that time, the entire written testimony will be submitted to the record.

I would like to start by recognizing Mr. Schleede.

STATEMENTS OF GLENN R. SCHLEEDE, MEMBER, ADVISORY COUNSEL, CONSUMER ALERT;

Mr. SCHLEEDE. Madam Chair and members of the Subcommittee, my name is Glenn Schleede. I am appearing today on behalf of Consumer Alert, a nationwide, nonprofit, non-partisan consumer group committed to protecting consumer choice and promoting economic growth.

Thank you for holding this hearing and providing an opportunity for Consumer Alert to outline some of the interests of real consumers in the adequacy and price of natural gas and to make some recommendations.

We believe that the interests of real consumers are often overlooked as Congress considers matters before it. So, we are especially grateful for this opportunity. I have submitted a detailed statement that documents five points. I would appreciate it if you would put the statement in the record. I will merely summarize it.

First, natural gas is playing an increasingly important role in supplying the energy that consumers need for their homes, including in generating electricity.

Second, natural gas prices for residential customers and electricity generating companies have increased sharply from 1994 and '95 levels and have been extremely volatile with negative impacts on customers and the economy, particularly in late 2000 and early 2001.

Third, given the limitations on other sources, including traditional sources and non-hydro renewables, natural gas is the only energy sources that can be expected to make a significant contribution in supplying the nation's energy needs for the foreseeable future.

Fourth, competition for available supplies of natural gas will increase, particularly for electric generation. This portends additional price increases for consumers using natural gas and using electricity generated with natural gas.

While consumers bills are now down from the 2001 levels, they are likely to increase in the future due to higher gas prices, higher gas transportation costs and automatic tax increases.

Fifth, there are actions that Federal, State and local governments can take to increase the availability of gas and help restrain price increases that damage consumers and the economy.

My detailed statement lists seven steps that could be taken.

One, recognize that oil and natural gas exploration and production can be carried out in an environmentally responsible manner.

Two, remove unnecessary restrictions from oil and natural gas exploration and production and particularly on Federally controlled lands and offshore, as cited in my detailed statement and one other I would like to mention if there is time at the end.

Three, reducing any unnecessary barriers to the construction of gas pipelines so capacity will be available to move gas from areas where it is available to markets.

Four, encourage the administration to lift tariffs on steel imports that are including the price of pipe that will be needed to build pipelines recently approved by FERC. Higher prices for steel pipe would increase the cost of building gas pipelines and those increases will be passed on to natural gas consumers.

Five, encourage State and local governments to remove taxes and fees, including so-called "public benefit charges" from natural gas bills, particular those that are based on a percentage of the bill. Those charges give consumers a double hit when gas prices rise or when the weather is colder than normal. They get hit with both the higher price for the gas and the higher tax.

Six, stop the flow of tax dollars to nonprofit organizations that work against the interests of consumers, particularly through the U.S. Department of Energy and the Environmental Protection Agency.

Seven, require all Federal agencies to determine the effects of proposed actions on real consumers to be sure that the interests of real consumers are represented in agency proceedings and assure that they are taken into account when considering proposed actions, just as they have been in the case of environmental matters.

Both environmental and consumer interests need to be considered but at present consumers are being short-changed as Federal agencies pay a lot of attention to environmental issues, often ignoring the interests of real consumers.

It is especially important to note that actions that push up energy prices are most harmful to people in the lower income levels with little discretionary income.

If I may take another 30 seconds, I would like to point out that my detailed statement does not mention the promising natural gas production potential that has resulted from deep drilling in the Appalachian Basin, what is called the Trenton Black River Play. It is an area stretching from the southern tier of New York through Pennsylvania and into West Virginia.

The good news is that the significant amounts of gas are being found and produced by deeper drilling than has been the case in the past production in that area.

The bad news is that the Pennsylvania Department of Conservation and Natural Resources, pressed by environmental interests,

recently reduced by 56.3 percent the State-owned acreage where gas exploration and production rights are to be auctioned.

The department also set higher per acre bonus payments and annual per acre lease payments and tightened environmental criteria to limit exploration activity.

I recognize this area may not be within your Subcommittee's jurisdiction, however, I believe the matter deserves attention because it is one more example where environmental activists and those who finance them are working to limit energy supplies and thereby push up prices to the detriment of all consumers, especially those at lower income levels who have little discretionary income.

Thank you for the opportunity to appear.

Mrs. CUBIN. Thank you, Mr. Schleede.

[The prepared statement of Mr. Schleede follows:]

Statement of Glenn R. Schleede, on Behalf of Consumer Alert

Madam Chairman and Members of the Subcommittee:

My name is Glenn R. Schleede[1] and I am appearing today on behalf of Consumer Alert, a nationwide, non-profit, non-partisan consumer group committed to protecting consumer choice and promoting economic growth.

Thank you for holding this hearing on natural gas supply and demand and the potential role of public and federal submerged lands. Thank you, especially, for providing an opportunity for Consumer Alert to outline for you some of the interests of real consumers in the adequacy and price of natural gas and to make some recommendations. We believe that the interests of real consumers are often overlooked as the Congress considers matters before it, so we are especially grateful for this opportunity.

In summary, I will be making the following 5 points:

- Natural gas is playing an increasingly important role in supplying the energy that consumers need for use in their homes, including its use in generating electricity.
- Natural gas prices for residential customers and electric generating companies have increased sharply from 1994–95 levels and have been extremely volatile, with negative impacts on consumers and the economy (particularly in late 2000 and early 2001).
- Given the limitations on other energy sources, natural gas now appears to be the only energy source that can be expected to make a significant contribution in supplying the nation's energy needs for the foreseeable future.
- Competition for available supplies of natural gas will increase, particularly the demand for its use in electric generation, portending additional price increases for consumers using natural gas and using electricity generated with natural gas. While consumers" bills are now down from 2001 levels, they are likely to increase in the future due to higher gas prices, higher gas transportation costs and automatic tax increases.
- There are actions that federal, state and local governments can take to increase the availability of natural gas and help restrain price increases that damage consumers and the economy. Perhaps the most important action is to remove unnecessary restrictions on access to public lands and federally submerged lands for gas exploration and development.

The pages that follow expand on these points and provide data to support our findings and recommendations.

High and Volatile Natural Gas Prices

The graph below shows the rise in nationwide average annual prices for natural gas at the wellhead, at city gates, and delivered to electric utilities and to residential consumers as reported by the US Energy Information Administration (EIA). The volatility of prices is shown more clearly in Attachment 1, which shows prices on a monthly basis for the same period.

[1] I am a member of Consumer Alert's Advisory Council. I am semi-retired after working on energy and related matters in government and the private sector for over 30 years. I now devote a significant portion of my time in analysis of and writing about (a) government policies, programs and regulations that are detrimental to the interests of consumers and taxpayers, and (b) government or private sector programs and projects that are presented to the media, public and government officials in a false or misleading way.

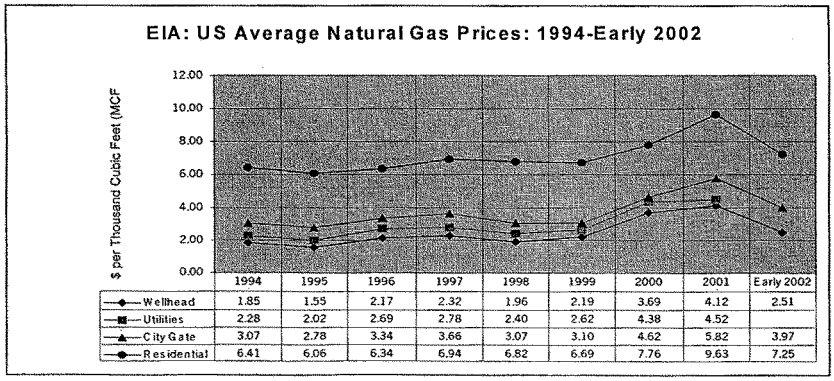
Prices rose sharply in late 2000 and early 2001 from earlier levels due to:

- Inadequate gas exploration and development drilling in 1998 and 1999 (due in part to low prices and low profit margins).
- High demand for natural gas for electric generation (due in part to low hydroelectric production in the Pacific Northwest).
- High demand by commercial and residential customers due to cold weather.
- Higher taxes on residential gas customers.

Those high natural gas prices (and high electricity prices due heavily to high natural gas prices) were felt throughout the economy and undoubtedly contributed to the recession. Consumers feel the economic impact of high gas prices in several ways: directly through their own monthly bills, and indirectly through higher prices for the goods they purchase and higher taxes. (See page 5 of Attachment 2 for a more complete explanation of the way high natural gas bills adversely affect consumers, particularly those with little or no discretionary income.)

The last point deserves special attention. Some states and many local governments impose taxes on natural gas and often those taxes are imposed as a percentage of a consumer's gas bill. This means that taxes go up when gas prices increase and even when the amount of gas used increases due to cold weather.

States and local governments imposing taxes in this way enjoyed a tax windfall especially during the winter of 2000–2001. The magnitude of that windfall as well as the effects of other factors pushing up consumers" prices can be seen in the analysis presented in Attachment 2 which compares in detail the natural gas bills for December 1999 and December 2000 for a home in the District of Columbia. Each factor contributing to the doubling of the bill is identified.



	1994	1995	1996	1997	1998	1999	2000	2001	Early 2002
Wellhead	1.85	1.55	2.17	2.32	1.96	2.19	3.69	4.12	2.51
Utilities	2.28	2.02	2.69	2.78	2.40	2.62	4.38	4.52	
City Gate	3.07	2.78	3.34	3.66	3.07	3.10	4.62	5.82	3.97
Residential	6.41	6.06	6.34	6.94	6.82	6.69	7.76	9.63	7.25

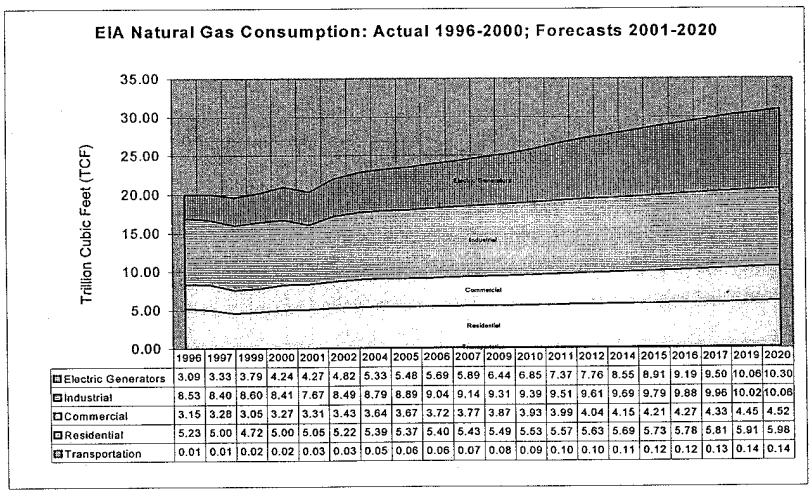
Fortunately, natural gas prices have moderated somewhat since early 2001 but remain higher than in the past. Clearly, there is the potential for higher natural gas prices in the future. Several actions identified later in this statement could be taken to help restrain those price increases.

Increasing Role for Natural Gas

The graph below shows recent history and EIA forecasts[2] of US natural gas consumption through the year 2020. If EIA's forecast is correct, natural gas use by electric generating companies will increase by more than 6 trillion cubic feet—Tcf (143%) by 2020 from 2000 levels. Industrial use is projected to increase by 1.65 Tcf, commercial use by 1.25 Tcf and residential use by .98 Tcf during the same period.

The important points for residential consumers is that they will be facing steep competition for natural gas and the price could rise if gas producers and transporters are unable to keep up with demand. Consumers will see higher costs in their own natural gas bills and in their electric bills as gas use in electric generation increases.

[2] Energy Information Administration, Annual Energy Outlook 2002, Supplementary Table 95.



	1996	1997	1999	2000	2001	2002	2004	2005	2006	2007	2009	2010	2011	2012	2014	2015	2016	2017	2019	2020
Electric Generators	3.09	3.33	3.79	4.24	4.27	4.82	5.33	5.48	5.69	5.89	6.44	6.85	7.37	7.76	8.55	8.91	9.19	9.50	10.06	10.30
Industrial	8.53	8.40	8.60	8.41	7.67	8.49	8.79	8.89	9.04	9.14	9.31	9.39	9.51	9.61	9.69	9.79	9.88	9.96	10.02	10.06
Commercial	3.15	3.28	3.05	3.27	3.31	3.43	3.64	3.67	3.72	3.77	3.87	3.93	3.99	4.04	4.15	4.21	4.27	4.33	4.45	4.52
Residential	5.23	5.00	4.72	5.00	5.05	5.22	5.39	5.37	5.40	5.43	5.49	5.53	5.57	5.63	5.69	5.73	5.78	5.81	5.91	5.98
Transportation	0.01	0.01	0.02	0.02	0.03	0.03	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.14

Natural Gas is the Only Energy Source That Can Make a Significant Contribution for the Foreseeable Future.

The EIA forecasts, summarized in a table later in this statement, make clear that natural gas is the only energy source that can make a significant contribution toward meeting the nation's growing demand for energy, in general, and electricity, in particular. This is quite clear from a brief review of the alternatives:

1. Energy Conservation and Energy Efficiency. The US has made impressive gains in energy efficiency during the past 3 decades. According to EIA data,[3] real US Gross Domestic Product (GDP) increased by 126% from 1973 to 2001 while energy use increased by only 27%. The US accounted for 29.5% of the world's GDP in the year 2000 but accounted for only 25.4% of the world's energy use. Gains in energy efficiency and reductions in energy intensity have largely been the result of:

- Energy price-induced measures by businesses and individuals that have found ways to hold down energy consumption.
- Energy efficiencies that were a byproduct of technological changes in electronics, materials, computerization, telecommunications and other areas that did not have energy efficiency as their principal objective.
- Spin-offs from R&D supported by the Department of Defense, such as the much more efficient combustion turbines now being used to generate electricity that benefited from DOD sponsored aircraft engine R&D and materials research.
- Changes in the makeup of the US economy with productive activity trending toward less energy intensive pursuits; e.g., computer software and services require less energy than steel and aluminum production.
- Foreign competition and periodically high motor fuel prices that encourage the production of energy-efficient vehicles.

While impressive gains have been made, conservation and efficiency will not offset the increases in energy use that will be necessary for a steadily expanding economy. We must have additional sources of energy.

I should also point out that the much-ballyhooed government-dictated DOE energy efficiency standards contribute very little in improving our nation's energy efficiency. For example, DOE's data show that the recently issued efficiency standards for central air-conditioners and heat pumps mandating a 20% increase in efficiency above current levels will save very little energy while costing consumers hundreds of millions of dollars.

Specifically, DOE claims that the new standards will save "about 3 quads" of energy during the period from 2006–2030.[4] Three quadrillion Btu sounds like a lot of energy but it really is only 9/100 of 1% of the 3,200 quads of energy that will be used during that period. That tiny amount will undoubtedly be overwhelmed by

[3] EIA, Monthly Energy Review, Table 1.9.

[4] The even more costly 30% reduction standards planned by the Clinton Administration would have saved only less than 4 quads of energy, according to DOE's Technical Support Document.

changes brought about by market forces and private sector technology developments such as those listed in bullets above.

An additional insult to consumers is the fact that DOE admits that about 25% of the 140 million consumers expected to buy the air conditioners and heat pumps during 2006–2030 period would NEVER recover through energy cost savings the higher cost of the products meeting the DOE-dictated standard. Members of your Committee should note that self-appointed "non-profit" energy efficiency advocacy groups that receive tax dollars via DOE and the National Laboratories have been extremely active in promoting tight efficiency standards that help drive up consumers" costs.

2. Renewables. Many people like the sound of getting energy from "renewable" energy but, again, it is necessary to be realistic and look at the facts.

a. Hydropower is the only significant source of economical renewable energy. Advocates of "renewable" energy do not like hydropower despite the fact that it is the one "renewable" energy source that is providing a significant contribution; in fact, over 7% of the nation's electricity. They favor only the non-hydro "renewables."

Furthermore, the potential for an increased contribution from hydropower is limited because few sites are available, there is opposition to expansion and the very real possibility that the contribution from hydropower could be reduced in the future. Reductions could come from diversion of water around dams to serve other needs (e.g., fish, recreation), breaching dams in some areas, and the slow pace of re-licensing of existing hydropower projects.

b. Non-hydro "renewables" will provide little usable energy. The non-hydro renewables—wind, solar, geothermal, biomass (including wood and wood wastes) and municipal solid wastes[5] are, essentially, niche technologies that are not likely to ever make a significant contribution towards supplying US energy requirements. DOE has spent hundreds of millions in tax dollars on renewable energy R&D during the last 20 years.

The small role that non-hydro renewable energy sources can be expected to play in supplying our energy and electricity requirements during the next 20 years is demonstrated clearly in the two tables, based on EIA data, shown on the next page. For example, the tables show that all non-hydro renewables combined (wind, solar, wood, wood, waste, biomass, geothermal, and municipal solid wastes) supplied only:

- 3.67% of US overall energy requirements in 2000 and may reach only a 4.57% contribution by 2020.
- 2.13% of US electricity generation in 2000 and are not expected to reach a 3% contribution by 2020.

These small but realistic forecasts by EIA take into account the enormous federal and state subsidies now being provided some renewables such as "wind energy.

Furthermore, it is important to recognize that all the generous subsidies now being provided for "renewable" energy—and others being contemplated such as federal "renewable portfolio standards—merely shift costs from renewable energy developers to consumers and taxpayers—and hide those costs in tax bills and monthly electric bills.

Some of these technologies have negative environmental implications that are only now being recognized, such as the significant scenic impairment cause by windmills in some areas—even though the huge structures produce very little electricity.

[5] Some environmental and renewable advocates are strongly opposed to the use of municipal solid wastes for energy production.

US Energy Consumption by Energy Source: 2000 Actual and EIA Forecasts for 2010 and 2020
(In Quadrillion Btu - Quads)

	Actual 2000		EIA Forecase 2010		EIA Forecase 2020	
Energy Source	Quad Btu	% of Total	Quad Btu	% of Total	Quad Btu	% of Total
"Traditional" Sources						
Petroleum Products**	38.49	38.75%	44.96	38.88%	51.71	39.50%
Natural Gas	23.43	23.59%	28.85	24.95%	34.63	26.46%
Coal	22.34	22.49%	25.41	21.97%	27.35	20.89%
Nuclear Power	8.03	8.08%	7.87	6.81%	7.49	5.72%
Hydropower	3.02	3.04%	3.31	2.86%	3.30	2.52%
Other*****	0.38	0.38%	0.38	0.33%	0.44	0.34%
Sub Total - Traditional	95.69	96.33%	110.78	95.79%	124.92	95.43%
Non-hydro Renewables ##						
Geothermal #	0.30	0.30%	0.53	0.46%	1.00	0.76%
Wood	0.43	0.43%	0.43	0.37%	0.45	0.34%
Biomass	2.40	2.42%	3.02	2.61%	3.50	2.67%
Municipal Solid Wastes ###	0.28	0.28%	0.38	0.33%	0.42	0.32%
Solar Thermal & Hot Water***	0.05	0.05%	0.07	0.06%	0.08	0.06%
Solar Photovoltaic ****	0.00	0.00%	0.00	0.00%	0.00	0.00%
Ethanol	0.14	0.14%	0.24	0.21%	0.28	0.21%
Wind	0.05	0.05%	0.20	0.17%	0.25	0.19%
Sub Total -Non-hydro Renew.	3.65	3.67%	4.87	4.21%	5.98	4.57%
Total *	99.34	100%	115.65	100%	130.90	100%

Data Source: EIA, Annual Energy Outlook 2002, Tables A1 and A18
* Includes liquid hydrogen, methanol, supplemental natural gas, and some domestic inputs to refineries.
** Excludes ethanol used in transportation fuels which is included in non-hydro renewables: .14 in 2000, .24 in 2010,.28.in 2020.
*** The numbers shown are all for solar hot water heating. ****Grid connected only. Off-grid use of solar photovoltaic energy (e.g., remote locations and does not show up in EIA's summaries which are reported in hundredth of quads (quadrillion Btu).
***** Electricity imports, 70% of which is produced by hydropower.
Includes non-marketed renewable energy ### Estimated to be about 60% biomass and remainder petroleum and other non-renewables. Growth in MSW is expected to be from landfill gas. Burning of trash to produce energy is not accept to some environmentalists.
Includes small amounts for geothermal heat pumps. .02 in 1999-2005; .03 in 2010-2015; .04 in 2020.

Energy Sources for US Electricity Production: 2000 Actual and EIA Forecasts for 2010 and 2020
In Billions of Kilowatt-hours

	Actual 2000		EIA Forecase 2010		EIA Forecase 2020	
Energy Source	Billion kWh	% of Total	Billion kWh	% of Total	Billion kWh	% of Total
"Traditional" Sources						
Coal	1968.73	51.60%	2264.41	48.78%	2472.23	45.49%
Nuclear	752.44	19.72%	736.88	15.87%	701.76	12.91%
Natural Gas	625.34	16.39%	1152.61	24.83%	1732.94	31.89%
Petroleum	102.34	2.68%	38.26	0.82%	48.62	0.89%
Other *	10.08	0.26%	13.85	0.30%	15.37	0.28%
Hydropower **	275.31	7.22%	304.46	6.56%	303.31	5.58%
Sub Total - Traditional	3734.24	97.87%	4510.47	97.16%	5274.23	97.05%
Non-Hydro Renewables						
Geothermal	13.52	0.35%	20.20	0.44%	34.71	0.64%
Wood, wood waste & biomass	38.00	1.00%	58.90	1.27%	64.31	1.18%
Municipal Solid Wastes ***	23.44	0.61%	31.07	0.67%	34.27	0.63%
Solar Thermal	0.87	0.02%	0.96	0.02%	1.12	0.02%
Solar Photovoltaic	0.05	0.00%	1.07	0.02%	1.66	0.03%
Wind	5.30	0.14%	19.45	0.42%	24.07	0.44%
Sub Total -Non-hydro Renew.	81.18	2.13%	131.65	2.84%	160.14	2.95%
Total	3815.42	100%	4642.12	100%	5434.37	100%

Data Source: EIA, Annual Energy Outlook 2001, Tables A8 and A17; Supplemental Tables 72 and 88.
* Other includes refinery and still gas, hydrogen, sulfur, batteries, chemicals, fish oil and spent sulfite liquor. ** Includes hydro pumped storage whic is a negative number because more electricity is used to fill reservors than is produced when the water is released (! billion kWh per year is shown.
*** Includes small amounts of landfill gas. Most is burning of trash which is not considered an "acceptable" renewable fuel by many renewable advocates.

3. Coal. Clearly coal makes a significant contribution in supplying US energy requirements; specifically 22.49% of overall energy demand and 51.6% of electricity generation in 2000. Coal could provide an even larger contribution on an economically competitive basis but environmental requirements and concerns that are well known to this Subcommittee are limiting its contribution.

4. Petroleum. Petroleum products provided 38.75% of overall US energy requirements in 2000 and EIA expects that share to remain about constant through 2020. Very little oil is used in electricity generation; in 2000 its share was 2.68% and it is expected to drop to less than 1% by 2020. However, petroleum products account

for 97.5% of the energy used in transportation.[6] Substitutes for petroleum (e.g., ethanol) are still expensive and highly subsidized. The cost of the subsidy is hidden from consumers at the gas pump but shows up in tax bills paid by the nation's remaining taxpayers.

Concern about dependence on oil imports continues to dominate public policy debates and is likely to continue to do so. Oil imports accounted for about 9% of total US merchandise imports in 2001,[7] but accounted for about 55% of the petroleum products supplied in the US during 2001.

5. Nuclear Energy. Nuclear energy provided over 8% of overall US energy requirements in 2000 and 19.7% of US electric generation. EIA expects the contribution to decrease somewhat in absolute terms and decline substantially in market share by 2020 as some plants are shut down. While some are still concerned about safety and proliferation issues, the primary obstacle to increased use of nuclear energy and new plants is the continuing uncertainty about long term management of nuclear wastes. Until that problem is solved and the public becomes comfortable with nuclear energy, building new nuclear plants is unlikely.

6. Natural gas. There is much more that could be said about each of the potential energy sources but the conclusion would not change. That conclusion is that with current constraints on traditional energy sources (coal, oil, hydropower and nuclear energy) and the limited potential for non-hydro renewable energy, natural gas is the only source of energy that can be counted on to supply the nation's growing energy needs for the foreseeable future.

The Outlook for Natural Gas Supply and Prices

We are not likely to run out of natural gas. However, if the demand for natural gas forecast by EIA (summarized earlier) and by other experts is to be satisfied:

- Additional supplies will have to come from:
  - Natural gas from the "Lower–48" onshore and offshore areas that are now blocked from exploration and development.
  - Canadian imports.
  - Natural gas from Alaska and the Arctic.
  - Liquefied natural gas (LNG) imports.
- Additional pipelines will have to be built.
- Natural gas prices will increase.

Consumers (and the US economy) will suffer less if a larger share of natural gas can be obtained from the lower–48 states, since natural gas from Alaska and the Arctic and LNG will cost more. Thus, the greater the share from the lower–48 states and offshore lands the better.

One of the country's most astute experts on natural gas supply and demand, Stephen Thumb of Energy Ventures Analysis, Inc., has summarized the situation as follows:

> "In order for the market to increase from the current demand level of 22 TCF to the projected level of 33 TCF at the end of the forecast period, natural gas supply will have to increase 28.5 BCFD from current levels. It is fairly apparent that traditional, conventional supply areas will not be able to achieve this level of increase in deliverability, but instead the U.S. market will have to rely on a series of evolving gas resources to fill in the projected gap between supply and demand" Key among these is increased LNG supplies from existing and regasification terminals. Also included are these evolving plays within the U.S., namely the subsalt play in the Gulf, 16 emerging coalbed methane basins and deep gas (i.e., >15,000 feet)" At the end of the forecast period Arctic gas from both the MacKenzie Delta and Alaska will enter the U.S. market.
>
> "The potential imbalance between supply and demand appears to be particularly acute during the 2003 to 2005 time frame, as it takes time to develop significant results from these evolving sources of supply.[8]

When focusing on the matter of land restrictions, Mr. Thumb points to the following areas and resource estimates[9] as key:

- East Coast:
  - Grand Banks—10 Trillion cubic feet, which is 100% restricted.
  - Atlantic Offshore shelf and slope—31 Trillion cubic feet—100% restricted (including the Baltimore Canyon Trough, Carolina Trough Salt Basin, and Blake Plateau Basin).

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[6] EIA, Monthly Energy Review, Table 2.5.
[7] EIA, Monthly Energy Review, Table 1.6.
[8] Energy Ventures Analysis, Inc., FUELCAST: 2002 Long–Term Outlook, p. 1–4.
[9] Op Cit., Exhibit 3–15.

- Gulf Coast: Eastern Gulf shelf and slope—24 to 43 Trillion cubic feet—100% restricted.
- Rockies: 137 to 346 Trillion cubic feet—40% restricted.
- Pacific Offshore shelf and slope—21 Trillion cubic feet—100% restricted.
- British Columbia—26 Trillion cubic feet—100% restricted.

I should also note that the costs of constructing, operating and maintaining natural gas pipelines are, inevitably, passed along to consumers. Therefore, government actions that affect these costs, such as the higher cost of steel pipe—as a result of tariffs imposed on imported steel—place additional burdens on consumers.

Recommendations

Clearly, there are actions that the federal government can take to temper the adverse effects on consumers that lie ahead as the demand for natural gas increases. Listed below is a sample of steps that could be taken to benefit consumers. Some may not be within the jurisdiction of this Subcommittee but you may be able to work through other committees or otherwise influence your colleagues on Committees with jurisdiction, in state and local governments, and in the Administration.

1. Recognize that oil and natural gas exploration and production can be carried out in an environmentally responsible manner.
2. Remove unnecessary restrictions from oil and natural gas exploration and production, particularly on federally controlled lands on shore and offshore cited earlier.
3. Reduce any unnecessary barriers to the construction of gas pipelines so that capacity will be available to move gas from areas where it is available to markets.
4. Encourage the Administration to lift tariffs on steel imports that are increasing the price of pipe that will be needed to build pipelines recently approved by FERC. The higher prices of that steel pipe would, of course, increase the cost of building gas pipelines and will be passed on to natural gas consumers.
5. Encourage state and local governments to remove taxes and fees (including so-called "public benefit charges") from natural gas bills, particularly those that vary with the dollar amount of the bill. Such "percentage of bill" charges give consumers a double hit when gas prices rise (i.e., higher price for gas AND higher tax).
6. Stop the flow of tax dollars to non-profit organizations that work against the interests of consumers, particularly through the US Department of Energy (DOE) and Environmental Protection Agency (EPA).
7. Require all federal agencies to determine the effects of proposed actions on real consumers, assure that the interests of real consumers are represented in agency proceedings and assure that they are taken into account when considering proposed actions.

[Attachments to Mr. Schleede's statement follow:]

Attachment #2

[NOTE: This fact sheet was prepared in March 2001 and is based on data for 1999 and 2000 – not 2001]

FACT SHEET

High Monthly Natural Gas Bills in the District of Columbia -- Understanding the Causes & Their Economic Impact --

Contents

Page

A. Graphic illustration of the dramatic increase in monthly gas bills now hitting consumers, using actual December 1999 and 2000 gas bills 1

B. Breakdown of the actual monthly bills to show each part of the increase 2

C. What are the underlying reasons that gas bills are so high this year? 3

D. Adverse economic impacts of higher natural gas bills 5

E. Natural gas prices are likely to remain abnormally high until actions are taken that rebalance supply and demand for gas and pipeline capacity 6

March 7, 2001

Prepared as a public service at the request of the DC Peoples Council by:
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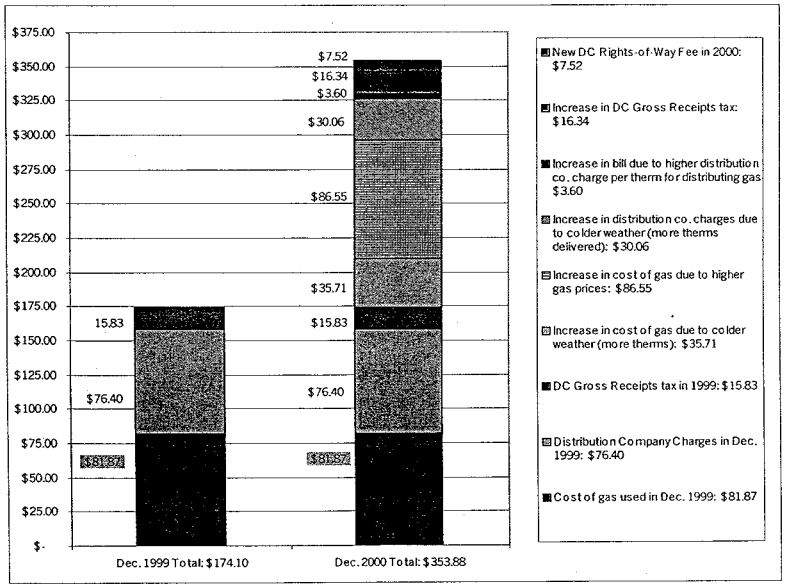
FACT SHEET: High Monthly Natural Gas Bills in the District of Columbia -- Understanding the Causes & Their Economic Impact --

Many residents of the District of Columbia who heat their homes with natural gas are wondering why their gas bills are so high this winter. This FACT SHEET illustrates the dramatic increase in gas bills faced by residential customers, breaks down actual monthly gas bills to show which parts have led to the higher bill totals, explains why gas costs have increased, identifies adverse economic impacts, and lists actions needed to protect consumers from high natural gas bills.

A. Graphic illustration of the dramatic increase in monthly gas bills now hitting consumers

The graph below compares the **actual** December 1999[1] and December 2000 monthly gas bills for a home in the District of Columbia.



	December 1999	December 2000
Amount of Gas used	203.8 Therms	292.7 Therms
Price of gas per Therm	$0.3381	$0.6974
Average temperature	43 degrees F	34 degrees F

The above graph is explained in detail on the next page.

B. Breakdown of the actual monthly bills to show each part of the increase

In the District of Columbia, monthly natural gas bills consist of the following elements:

- A charge for unit ("therm"[2]) of natural gas (i.e., the gas itself) that is used.
- Charges for the services provided by the local gas distributing company (Washington Gas), which include:
  - A fixed amount, called a "customer charge," that does not vary from month to month by volume of gas used.
  - A delivery charge for each therm of gas used by the residential customer.
- A District of Columbia "gross receipts tax" which varies with both the volume of gas used and the cost of the gas.
- A new (in 2000) District of Columbia "Rights of Way" Fee.

Now, here are the facts concerning the *actual* December 1999 and December 2000 gas bills depicted in the graph on page 1. The first bar shows the December 1999 gas bill. The second bar repeats the three December 1999 blocks and then adds a new block to identify each element of the December 2000 bill that increased from December 1999:

- The volume of gas used in this home increased, due principally to 9 degree colder outside temperatures, from 203.8 therms to 292.7 therms – an increase of 43.6%.
- The unit price of the natural gas itself (the commodity) increased from $0.4017 per therm to $0.6974 per therm – an increase of 73.6%. (This price per therm jumped to $.8492 in January 2001 – an increase of 111.4% from the December 1999 price.)
- The total price of the natural gas itself increased from $81.87 to $204.13 (i.e., $81.87 plus $35.71 plus $86.55 in the above graph) – an increase of 149%
- The local distribution company's charges, because more gas flowed through its pipes, increased from $76.40 to $110.06 (i.e., $76.40 plus $30.06 plus $3.60 in the above graph) – an increase of 44%.
- The DC Gross Receipts Tax increased from $15.83 to $32.17 – an increase of 103%.
- A new (or newly identified) DC Rights-of-Way Fee, which did not appear on the December 1999 bill, was $7.52 in December 2000.
- In summary:

	12/1999	12/2000
▪ Total price of gas (commodity) delivered to customer	$ 81.87	$204.13
▪ Distribution company charges	76.40	110.06
▪ DC Gross Receipt tax	15.83	32.17
▪ DC Rights-of-Way Fee	.00	7.52
Total bill	$174.10	$353.88

- The total bill for 30 days increased from $174.10 to $353.88 – an increase of 103%.

C. **What are the underlying reasons that gas bills are so high this year?**

As the above table and graph show, DC taxes and fees accounted for a significant share of the increased costs borne by gas consumers. Apart from the taxes and fees, there are six principal reasons why natural gas bills across the country are much higher this winter than last winter.

1. **This winter is much colder than last winter**, so everyone heating with natural gas is using much more gas (more "therms") this winter than last. In fact, the National Weather Service has reported that the months of November and December 2000 were the coldest on record.

2. **Bills received from local distribution companies (LDCs) or other gas suppliers[3] are higher because:**

   - The price for each unit of natural gas (the commodity) delivered is much higher because the distribution company must pay much more this winter than last for the gas they buy and deliver to customers. (Regulated LDCs generally are not allowed to markup the price they pay for the gas they buy and then resell to customers.)

   - More gas is being used because temperatures are lower (as explained above) and LDCs are allowed to charge for each unit of gas that they transport through their gas distribution system.[4]

3. **The cost of natural gas purchased by LDCs for delivery to customers is much higher this winter than last because:**

   - The price charged by companies that find and produce natural gas is much higher. *Natural Gas Week* reports that the average "wellhead" spot price charged by gas producers at Henry Hub, Louisiana rose from $1.69 per million Btu in December 1998, to $2.35 in December 1999 (39%) and to $8.08 in December 2000 (244%), or 378% over 2 years.[5]

   - The prices charged by the companies[6] that buy gas from producers, arrange for its transportation, and resell it to your local gas distribution company are also higher this winter than last. (The "intermediary" companies may be marketers, traders or other organizations that have control of the pipeline transport capacity.[7]) For example, *Natural Gas Week* reports that the spot (cash) prices at three "city gates" for December 1999 and December 2000, were as follows: Southern California: $2.49 and $23.92, Midwest: $2.43 and $9.69, and New England: $2.95 and $10.80. "City gate" refers to the point where LDCs receive their gas supplies from a pipeline company.[8]

   - The price charged by these intermediate companies includes the price they have had to pay to producers ("at the wellhead") and:

     - *Charges by interstate pipeline companies for transporting gas from the "wellhead" to the "city gate."* These charges probably have not increased between this winter and last because rates charged by interstate pipelines are regulated by the Federal Energy Regulatory Commission (FERC). Changes in rates are permitted only after public hearings. There appear not to have been any rate increases for interstate pipelines during the past year or longer.

     - *Intermediate companies' charges for the services they provide.* These services may include procuring gas for resale, procuring gas transport capacity on

pipelines, gas storage, supply balancing, and price hedging in derivative markets. These charges generally are not regulated and the amounts charged depend on gas market conditions, pipeline availability and costs incurred. Charges tend to be higher when markets are volatile and when the demand for gas and/or pipeline capacity exceeds the supply available in the region being served.

4. **Natural gas producers are charging much higher prices this winter than last winter because:**
   - The demand for gas is much higher this year than last. EIA estimates released on January 29, 2001, indicate that US total natural gas consumption grew from 21,703 billion cubic feet (Bcf) in 1999 to 22,555 Bcf in 2000, an increase of 3.9%.
   - U.S. producers of natural gas have not been able to produce enough gas to keep up with demand. EIA estimates released on January 29, 2001 indicate that US total dry gas production grew from 18,623 BCF in 1999 to 18,848 BCF in 2000, an increase of 1.2%.
5. **The supply of gas available from producers is lower this year than in the past because:**
   - Gas producers had reduced their efforts to find and produce new gas because gas prices have been very low for the past 2-3 years. Producers could make little or no profit and had less money available to spend on gas exploration and production activities.
   - Exploration and production of natural gas has been ruled out in some areas because of governmental restrictions and environmental objections.
6. **Overall US gas demand is higher this year than last because:**
   - **Colder weather** has increased the demand for gas for heating homes, offices, schools, hospitals, stores and other buildings.
   - **More gas is being used this year to generate electricity because:**
     - Less electricity is being generated from hydroelectric power plants because less water is available (due to lower precipitation over the past year) and much of the difference is being made up with natural gas-fired generation. EIA reports that US hydroelectric generation during the first 10 months of 2000 was down by 13.5% from the comparable period in 1999. Meanwhile, US gas-fired generation was up by 10% during the same periods.[9]
     - Most new electric generating plants being built in the U.S. use natural gas, particularly because gas is cleaner burning than coal or oil, and gas-fired generating plants have lower capital costs than coal-fired plants, which are the only viable option at present to produce significant amounts of electricity.
   - **The strong economy** during the past year has led to higher gas use by industrial plants, such as those making chemicals, fertilizers and other products.
   - **Year 2000 gas consumption estimates** released by EIA on January 29, 2001 indicate that US residential gas use was 5% higher in 2000 than in 1999, commercial use 10% higher and industrial use 4% higher.

D. Adverse economic impacts of higher natural gas bills

The current situation in natural gas markets may be pleasing to environmental activists who see energy supply constraints and high energy prices as a way of forcing energy conservation and limiting economic activity they consider detrimental to the environment. However, higher natural gas prices result in significant adverse impacts across the country that should not be overlooked. Specifically:

1. **Direct impact on individuals and families.** The cost of higher monthly gas bills:
   - Will force many people to curtail spending for the full range of consumer goods and services – from automobile purchases to paying the local dry cleaner – and reduces their ability to pay down credit card debt. (There probably is a direct relationship to the sharp reductions in consumer confidence revealed by recent surveys.)
   - Are particularly devastating to people with lower incomes who have little or no discretionary income and who are then forced to reduce spending for other necessities such as food, clothing, shelter, and medical care.
2. **Higher costs for commercial and industrial establishments and for electricity generation.** Higher natural gas prices have already led to other negative economic impacts and more are likely, such as:
   - Factory closings or reductions in production in industries that are heavily dependent on natural gas (e.g., chemicals and fertilizer).
   - Reduced production in various industries due to cutbacks in consumer confidence and spending (e.g., automobiles).
   - Reduced capital expenditures and curtailed plans for business expansion because of reduced growth in the US economy.
   - Job losses due to the above.
3. **Higher costs of electricity generation.** As the situation in California demonstrates, higher natural gas prices push up the cost of generating electricity, particularly in areas that are heavily dependent on gas-fired electric generating plants.[10] EIA reports that the US average delivered price of natural gas to electric utilities was $3.84 during the first 10 months of 2000, compared to $2.51 during the same period of 1999, an increase of 53%. Delivered gas prices have continued to increase since October 2000.
4. **Secondary economic impacts.** Higher monthly gas and electricity bills work their way through the economy and become an increased burden for consumers and taxpayers in many ways. For example:
   - Higher bills for heating schools and government buildings and for electricity are likely to find their way into higher income, sales or property taxes.
   - Higher bills for electricity and for heating hospitals are likely to find their way into medical bills and health insurance premiums.
   - Higher gas and electricity bills for commercial and industrial establishments will find their way into higher prices for goods and services.

E. Natural gas prices likely to remain high until actions are taken that rebalance supply and demand for gas and pipeline capacity

The "drag" on the economy from high natural gas bills for residential customers is likely to continue. Even if wellhead and "city gate" prices were to come down immediately, which is unlikely, residential customers – particularly those who use "budget billing" to smooth out their monthly bills – are likely to be paying more than they had been accustomed to for months. Quite likely, LDCs have not increased the required monthly payments for "budget billing" customers enough to keep up with price increases, with the result that consumers will be paying high bills well into summer months.

In any case, prices for natural gas are likely to remain high until significant actions are taken to bring supply and demand for both natural gas and gas pipeline capacity into a better balance. Actions that are likely to be necessary to bring down prices include the following.

- Probably the most immediate action to bring down monthly gas bills would be action by state public utility commissions (PUCs) to reduce LDC charges for transporting gas through their delivery systems in those cases where regulated "cost of service" rates were based on lower gas throughput assumptions than have actually occurred. As pointed out on page 2, some LDCs are receiving something of a "windfall" when the amount of gas being delivered is higher than expected (e.g., due to colder than expected temperatures). LDCs are unlikely to initiate rate cases in such situations, so actions to reduce the burden on consumers would have to be initiated by the state PUCs that regulate LDC rates.
- A second action that could be taken immediately is that state and local governments that tax gas (and electric bills) on the basis of the dollar amount of the bill or the volume of gas used could change the basis for the tax to a flat rate (or, preferably, eliminate the tax on utility bills. Governments that tax utility bills in this way – *including the District of Columbia* -- have been getting a significant revenue windfall simply because of high market prices for gas and electricity and colder temperatures. Taxes and fees on utility bills are among the most regressive taxes, hitting hardest those with lowest incomes.
- The local gas distributing company's gas buying strategy should be reviewed. It may be the case that a different strategy (e.g., a different mix of long and short-term contract and spot purchases of gas would have resulted in a lower price for the gas (i.e., the commodity), that the LDC purchased and resold to its customers in DC.
- Gas exploration and production (E&P) will have to be increased. Drilling for gas dropped sharply when wellhead prices were low both because of low prices and profitability, and inadequate cash flow to finance the drilling. [11] Gas E&P companies have sharply increased drilling, with the number of rotary drilling rigs at work in the US reaching 854 in December 2000, compared to 636 in December 1999.[12] E&P companies undoubtedly will need increased access to areas where gas is likely to be found in economic quantities, particularly where such access has been unnecessarily limited by environmental requirements.
- Gas pipeline capacity will need to be expanded, particularly where necessary to deliver gas to the large number of gas-fired electric generating plants that are likely to be completed during the next few years. Substantial investments have been made by pipeline companies to increase gas transportation capacity by building new pipelines, increasing

interconnections and removing bottlenecks.[13] However, additional capacity will be needed and steps will have to be taken by FERC to expedite approvals, including in those cases where capacity is needed but it is being strongly opposed by environmental activists, landowners, competing pipelines, those holding firm capacity on existing pipelines who want to maximize the value of that capacity, and others who oppose capacity expansion. Construction of a pipeline to bring gas from Alaska to the "lower 48" may be both economic and necessary.

- Voluntary and forced "conservation" (e.g., lower thermostats) may slow the rate of growth in gas demand but the only real solutions to the problem of high prices are in increased gas exploration and production, increased imports, and expanded gas pipeline capacity, particularly in those areas where constrained capacity is contributing to substantially higher prices.

Endnotes:

[1] The actual bills compared in this fact sheet each covered a 30-day period beginning on November 29 and ending on December 29 in 1999 and 2000.

[2] The "units" are shown as "therms" on monthly bills. A therm is a measure of the heat value of energy. One therm is equal to 100,000 Btu (i.e., British Thermal Units), which is another measure of the heat value of energy.

[3] In a few states or smaller areas, consumers are now allowed to buy their gas from suppliers other than the local regulated gas distribution company.

[4] When the volume of gas delivered by an LDC exceeds the volume assumed when its rates were last set by the Public Service Commission, the LDC receives something of a "windfall." In fact, the February 2, 2001 *Washington Post* (p. E3) reports that WGL Holdings, Inc., reported that its subsidiary, the Washington Gas Light Company which delivers gas in the Washington DC region had dramatically higher profits in the third quarter of 2000 compared to the same period in 1999 because the volume of gas delivered was 30% higher. Profits are significantly higher in such cases because the distribution company incurs little, if any, additional cost when delivering larger volumes.

[5] Note that, technically, "at the wellhead" refers to the place where natural gas emerges from a gas or oil well. Actually, when prices are described as "at the wellhead," it is the price of the first sale of the gas, which may be at a processing plant, at the entry point to an interstate pipeline, or at a pipeline hub – the prices shown here.

[6] Some Local Distribution Companies buy gas directly from producers and arrange its transportation over interstate pipelines, rather than buying the gas from marketing companies. Some marketing companies sell gas directly to customers in states where this is permitted, rather than selling it to Local Distribution Companies.

[7] "Intermediary" organizations may control pipeline capacity by virtue of having signed up with pipelines for "firm" capacity, secured interruptible capacity from pipelines, or purchased the rights to pipeline capacity in secondary markets (known as "capacity release" markets) where prices are no longer regulated.

[8] Note that "spot" or "cash" transactions account for only a part of the total gas transactions. Prices are likely to be much less volatile in 30-day contract markets or in transactions that occur under longer-term contracts.

[9] US Energy Information Administration (EIA), *Electric Power Monthly*, January 31, 2001.

[10] Each $1.00 per million Btu (MMBtu) increase in the delivered cost of natural gas to a gas-fired generating plant increases generating cost by one full cent ($0.01) per kilowatt-hour (kWh) of electricity produced if the plant has a "heat rate" of 10,000 Btu per kWh or by ¾ of a cent ($0.0075) per kWh of electricity produced if the plant has a "heat rate" of 7,500 Btu per kWh.

[11] Some experts (e.g., Energy Ventures Analysis of Arlington, VA) have pointed out that some revenue from higher gas prices was used initially to pay down debt incurred by E&P companies during periods of low gas prices.

[12] US EIA, *Monthly Energy Review*, January 2001.

[13] US EIA, Status of Natural Gas Pipeline System Capacity Entering the 2000-2001 Heating Season, *Natural Gas Monthly*, October 2000, pp. vii-xviii.

Mrs. CUBIN. I would now like to recognize Mr. Gooch.

STATEMENT OF LEE GOOCH, CHAIRMAN, PROCESS GAS CONSUMERS GROUP

Mr. GOOCH. Good morning and thank you. My name is Lee Gooch and I am Vice President of Potash Corp. I am here today speaking as Chairman of the Process Gas Consumers Group. PGC is a national association representing a broad cross-section of U.S. industry, both geographically and in terms of products manufactured.

Our membership employs millions of people and represents over a half of trillion feet of gas purchased and consumed annually. Indeed, natural gas is an essential component used in the processing and manufacturing of a host of American products and access to adequate and affordable supplies are crucial to our economic well-being.

According to the Energy Information Administration, EIA, overall demand for natural gas in the U.S. is expected to grow rapidly in the next 20 years. Historically, industrials have represented the largest consuming sector or natural gas, roughly 35 percent of all natural gas consumed in this country. And industrial consumption is expected to grow another 27.7 percent the year 2015.

This preference by the industrials to burn natural gas is not only heavily influenced by environmental mandates, but much of the gas used by industrials is consumed as feed stock for which other fuels are not physically or economically viable substitutes. As such, the natural gas industry has a substantial impact on U.S. manufacturers' ability to compete in an increasingly globally competitive world.

Vice President Cheney, in his natural energy policy report, noted that over the next 20 years, U.S. natural gas consumption will grow by over 50 percent. At the same time, U.S. natural gas production will only grow by 14 percent, if it grows at the same rate that it has for the last 10 years.

To ensure the manufacturing community continues to fully contribute to our nation's economic vitality, we need a national energy policy that will foster the development of adequate and reliable supplies of natural gas and other energy sources at reasonable prices.

As the members of the Subcommittee know, there is an enormous amount of natural gas that currently is either off-limits to exploration and production or is located where exploration and production activities are severely restricted.

While PGC fully supports environmental policies designed to safeguard our national parks, monuments and wilderness areas, we are also concerned about a national policy that on one hand favors increased reliance on natural gas as the environmentally preferred fuel, while on the other hand, promotes policies that limit the ability to explore, produce and distribute natural gas to the market area.

Not only do we need adequate supplies, but we also need less volatile gas prices. From the beginning of the year 2000 to its close natural gas prices climbed from the mid-$2.00 per MMbtu range to $10 per MMbtu. For some U.S. manufacturing plants, this over 400

percent increase had devastating effects. For instance, in California Shasta Paper Company closed its plant just before Christmas, laying off more than 400 workers.

Likewise, two potato flake processors in the west also shut down, one stating that it closed because its gas bill grew by more than tenfold in 1 year. The other said it closed because its gas bill for the month of January was expected to top $140,000, or four times that of its October bill.

Ammonia manufacturing was also greatly affected by gas price volatility. By mid-year 2000, $4 gas resulted in U.S. gas ammonia production to fall as low as 71 percent of capacity. By first quarter 2001, soaring gas prices pushed that production rate even lower, idling 55 percent of total ammonia manufacturing in the United States.

Despite today's lower gas prices, several of those plants remain permanently shut down. We have seen at least one major U.S. fertilizer company file bankruptcy and there are more yet likely to come.

Adequate supplies of natural gas, expanded pipeline infrastructure and reasonable prices are all areas of critical need to PGC members because contrary to popular belief, switching to alternate fuels is not always possible by industrials. For some it is due to the increasingly stringent environmental regulation and difficulty in obtaining permits to burn coal or fuel oil. For others, natural gas is used as a feedstock where there is no other energy substitute.

For example, ammonia manufacturers combine the nitrogen molecule with the hydrogen molecule from natural gas to create ammonia, the basic building block for producing nitrogen-based fertilizer. There is no economically viable alternate for natural gas as a feedstock in this process.

For many other types of industries the use of natural gas is a preferred energy choice. For example, if a wallboard manufacturer switches to Number 6 fuel oil, that fuel oil can leave a sooty deposit on white wallboard that paint cannot cover up. Therefore, this type of manufacturer has product quality issues that in effect eliminate non-gas substitutes.

In closing, I ask that you read my written testimony in full along with the attached PGC white paper entitled, "The Industrial End User Perspective on our Nation's Energy Policy." The white paper outlines PGC's goals for the Administration and Congress with regard to the development of a National Energy Policy.

We include a balanced approach considering a broad variety of energy alternatives, continued deregulation of natural gas commodity prices, free market competition in preventing the exercise of monopoly power, allowing environmental responsible and timely exploration and production of natural gas on public lands, and streamlining environmental review and the certification process to allow more rapid approval of pipeline projects.

That concludes my prepared remarks. I thank the Subcommittee for the opportunity. I would be happy to answer any questions you may have.

Mrs. CUBIN. Thank you, Mr. Gooch.

[The prepared statement of Mr. Gooch follows:]

Statement of Lee Gooch, Chairman, Process Gas Consumers Group

Good morning Madam Chairman and Members of the Subcommittee. I am pleased to appear before you today and wish to thank the Subcommittee for holding this important hearing.

My name is Lee Gooch and I am the Vice President of Natural Gas for the Potash Corporation of Saskatchewan ("PotashCorp"). PotashCorp is the world's largest integrated fertilizer company. We mine and manufacture potash, phosphate and nitrogen products. Nitrogen products begin with the manufacture of ammonia and ammonia is derived from stripping the hydrogen molecule from natural gas. As such, this industry is one of the largest industrial consumers of natural gas in the U.S. and we have no alternative feedstock choices. Indeed, the natural gas component of ammonia production in the U.S. accounts for 75–90% of total production cost. Yet, we compete in worldwide marketplaces that manufacture products from natural gas made available overseas at a fraction of the cost.

As an industrial end user of natural gas, PotashCorp is also member of the Process Gas Consumers Group ("PGC"). I am here today, as the Chairman of PGC, to provide the Subcommittee with insights into the importance of natural gas to industrial end users such as the members of PGC, and the critical issues currently facing us involving access to adequate supplies of natural gas at reasonable prices.

I. Overview of PGC—Industrial Profile

PGC is a national association of industrial gas consumers who require natural gas in many of their key operations. PGC works to promote coordinated, rational, and consistent federal and state policies relating to natural gas and its transportation.

PGC member companies represent a broad cross-section of U.S. industry, both geographically and in terms of products produced. Our membership employs millions of people and represent over half a trillion cubic feet ("Tcf") of natural gas purchased and consumed annually.

Unlike other sectors of the natural gas industry, the buying and selling of natural gas and the pipeline capacity required to transport it represent only one facet, albeit an important one, of an industrial end user's overall business operations. Industrials generally are not in the natural gas business. Rather, our involvement in the natural gas marketplace typically is a means to an end, not an end in itself. Industrials purchase and consume natural gas as one of the requisite inputs in the processing and manufacturing of automobiles, aluminum, steel, metal products, fertilizer, alcohol, wallboard, insulation and other building products, paper products, plastics, glass, fibreoptics, food and grain products, and a host of other, readily recognizable commodities.

II. Industrial Consumption of Natural Gas and the Need for Adequate Supplies

Access to adequate supplies of natural gas is crucial to the economic well being of the industrial community. The studies we have reviewed all point toward ever-increasing demand for natural gas and project continued reliance on natural gas by the industrial community.

According to the Energy Information Administration ("EIA"), overall demand for natural gas in the U.S. has been steadily increasing and is expected to grow even more rapidly over the next 20 years.[1] Historically, industrials have represented the largest consuming sector of natural gas and our amount of natural gas consumption has grown consistently over the years.[2] According to a recent report published by the Interstate Natural Gas Association of America Foundation, Inc. ("INGAA"), in Y2000, the industrial sector accounted for approximately 35% of all natural gas consumed in the country, making it the single largest consuming sector.[3] Specifically, INGAA reports that the industrials consumed 8,736 billion cubic feet ("Bcf") of the total 23,321 Bcf of natural gas consumed that year.[4] The closest other sector was

[1] James Tobin, Energy Info. Admin., "Natural Gas Transportation—Infrastructure Issues and Operational Trends" at 1 (October 2001)(herein "EIA October 2001 Report").

[2] For instance, in 1986, industrials consumed approximately 5.6 Tcf of natural gas. Energy Info. Admin., "Historical Natural Gas Annual" at 10 (1998). By 1997, of the 20 Tcf of natural gas consumed nationwide, industrial consumption accounted for the largest single amount, approximately 8.8 Tcf or 44.2%. Energy Info. Admin., "Natural Gas Annual 1997" at 39–41 (1998). This amount does not include lease and plant fuel consumption, which would raise industrial gas consumption to 10 Tcf for 1997. Energy Info. Admin., "Annual Energy Review 1997" at 177 (1998).

[3] INGAA, "Pipeline and Storage Infrastructure for a 30 Tcf Market, an Updated Assessment" at 2 (2002)(herein "2002 INGAA Report").

[4] Id.

the residential sector at 5,084 Bcf, followed by the power generation section at 4,180 and the commercial sector at 3,298 Bcf.[5]

Moreover, in addition to growing steadily over the previous years, natural gas usage by industrials is predicted to continue growing well into the future. Again, INGAA reports that industrial consumption will grow to 10,545 Bcf in 2015—a 20.7% increase.[6] And, while it is true that natural gas for electric generation is projected to grow substantially (from approximately 4,000 Bcf in 2000 to almost 8,000 Bcf in 2010[7]), the fact remains that industrials currently consume about two times the quantities of natural gas that electric utilities consume. Importantly, industrials will still out-consume power generation by about 2 Tcf in 2015.[8]

Similarly, EIA has also projected that natural gas consumption by the industrial sector will continue to grow and will continue to be the largest consuming sector of the economy, with industrial consumption projected to reach 9.39 Tcf by 2010, which is 34% of the projected total consumption of approximately 28 Tcf.

Future industrial need and preference for natural gas also will be heavily influenced by environmental considerations as well as continued demands for process, fuel, feedstock, and other uses. Strengthened governmental mandates setting environmental limits encourage and increasingly require that industrials use "clean fuels," particularly natural gas, versus coal, oil and other fossil fuels.[9]

Much of the gas used by industrials is consumed in feedstock and process uses, for which other fuels are not physically or economically viable substitutes.[10] Therefore, the access to competitive, reasonably priced natural gas supply and service options is absolutely crucial. The options and prices can significantly affect manufacturing costs and the ultimate price of industrial products. As such, the natural gas industry has a substantial impact upon industrial manufacturers" ability to compete in their own, increasingly globally-competitive, markets. Thus, both projected gas consumption growth for increased industrial production and increased reliance on more environmentally-favored natural gas dictate the industrial sector's need for gas as well as our compelling interest in its availability, price and ease of use.

III. The Need to Expand Exploration and Production Efforts

U.S. industry has made significant strides in recent years to control energy costs, both through the use of more efficient technology, as well as through conservation measures. Nonetheless, as we stated earlier, our member companies are heavily dependent on natural gas as both as a fuel and as a feedstock and consume more than half a Tcf of natural gas annually in essential processing, manufacturing and other operations. However, despite new efficiencies, consumption of natural gas is still outpacing production and will continue to do so in the future. As noted recently by Vice President Cheney in his National Energy Policy Report, "[o]ver the next 20 years, U.S. natural gas consumption will grow by over 50 percent. At the same time, U.S. natural gas production will grow by only 14 percent, if it grows at the rate of the last 10 years.[11]

To ensure the future ability of energy-dependent companies to contribute fully to our nation's economic vitality, we need a national energy policy that will foster the development of adequate and reliable supplies of natural gas and other energy sources at reasonable prices.

As the Members of this Subcommittee know, and has been reported by EIA and others, there is an enormous amount of natural gas that currently is either off-limits to exploration and production or is located where exploration and production ac-

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[5] Id.

[6] 2002 INGAA Report at 2.

[7] American Gas Association, "Impact of Power Generation Gas Demand on Natural Gas Local Distribution Companies" at 3 (October 2001). See also Natural Gas Council, "Overview of Natural Gas Markets: A Focus on Natural Gas Supply" at 4–8 (June 11, 2002)(herein "2002 NGC Report"), noting that the primary driver for increased natural gas demand is the power sector.

[8] 2002 INGAA Report at 2.

[9] Notably, the Clean Air Act Amendments of 1990 affect industrial gas use as they "continue the trend toward stricter emission limits for industrial sources" and mandate "tighter control of VOC emissions, [and] requirements for NOx reductions from industrial combustion sources" ." Gas Research Institute, "The Implications of the Changes in Industrial Energy Demand: 1985–1992" at 78 (1999). Further, industrials and utilities would be affected by the need to shift to gas versus coal or other carbon fuels if proposals on climate change are adopted that require substantial greenhouse gas emissions reductions. See e.g., Energy Security Analysis, Inc., "Electricity & Climate Change: Estimating the Effects of Compliance with the Kyoto Treaty" (1998).

[10] Gas Research Institute, "1998 Industrial Trends Analysis" at 3–2 (1998).

[11] Report of the National Energy Policy Development Group, "National Energy Policy Report" at x, Figure 3 (2001).

tivities are severely restricted.[12] The most recent EIA numbers that we have reviewed indicate that there is about 293 Tcf of natural gas in the Rocky Mountain region that is unproved and technically recoverable.[13] Of that amount 33.6 Tcf is completely off limits to exploration and production.[14] Another 57.5 Tcf is considered to be de facto off limits because of the impact of compliance with a variety of environmental laws and regulations.[15] Further, an additional 50.8 Tcf is located in areas where the costs and timing of the development is affected by the lease stipulations.[16] Finally, we note that significant offshore reserves are also off limits to exploration and production.[17]

PGC fully supports environmental policies designed to safeguard our nation's National Parks, national monuments and wilderness areas. However, the industrials are also concerned about a national policy that, on the one hand, favors increased reliance on natural gas as the environmentally preferred fuel of choice while, on the other hand, promotes policies that limit the ability to either explore for, produce and/or bring natural gas to the market areas. It is difficult to reconcile these two sets of policies. And, as discussed further below, as industrial consumers with limited choices except to rely on natural gas, we, and our employees and communities, are among those hurt by these conflicting policies.

IV. Price Volatility Concerns

Not only do we need adequate supplies, we also need less volatile gas prices. According to EIA, the average natural gas prices in January 2000 was $2.40 at the Henry Hub, with daily prices climbing steadily until the price exceeded $10 in December of 2000.[18] As evidenced in the various newspaper reports, the impact on this fly up was significant. For instance, in California, Shasta Paper Company "temporarily closed its plant just before Christmas [2000] and laid off more than 400 workers, largely because of the soaring price of gas used in its production process.[19] Likewise, two potato-flake processors in the West, which also rely heavily on gas to run their machinery, shut down temporarily and idled dozens of workers. Specifically, one stated that it closed because its "gas bill grew by more than tenfold from one year ago[20] and the Sunshine Potato Flakes of Colorado said it closed because "its gas bill for January was expected to top $140,000, or four times its October bill, leaving it "no choice" but to idle a plant in the San Luis Valley.[21]

Closer to home, ammonia manufacturing is also greatly affected by gas price volatility. For example, when, in January 2000 the natural gas price was $2.40 per MMBtu, the average cost to produce a ton of ammonia in Louisiana was $100. By mid-year, gas prices rose to over $4.00 per MMBtu and ammonia manufacturing costs rose to near $170 a ton resulting in the entire U.S. operating rate falling as low as 71%. By first quarter of 2001, soaring gas prices caused ammonia production costs to jump to well over $300 per ton, idling 55% of total U.S. ammonia manufacturing. By the following year, during first quarter 2002, natural gas prices returned to a range of low-to-mid $2.00 per MMBtu yet manufacturing only returned to an equivalent 75–78% range, suggesting some permanent shut-downs had occurred. Today, with natural gas prices over $3.00 per MMBtu, we've seen at least one U.S. fertilizer company file bankruptcy and may see more yet to come. The level of natural gas price volatility we have experienced in the past few years have created significant economic and operational impacts to this industry, and this volatility continues to greatly discourage future manufacturing growth in the U.S.

Make no mistake, by our desire for less volatile prices we do not mean to imply that Congress should step in to regulate the wellhead price of natural gas. PGC, along with many other representatives of the other energy industry sectors, fully supported the legislative efforts that led to the decontrol of natural gas prices.[22] Regardless of how volatile the prices are and regardless of how much this volatility

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[12] Energy Info. Admin., "U.S. Natural Gas Markets: Mid–Term Prospectus for Natural Gas Supply" at 17 (2001)(herein "2001 Supply Mid–Term Prospectus"). See also, 2002 NGC Report at 31, noting that 21 Tcf in the Pacific Offshore Shelf and Slope is 100% restricted, 24 to 43 Tcf in the Eastern Gulf Shelf and Slope is 100% restricted, 31 Tcf in the Atlantic Offshore Shelf and Slope is 100% restricted and 10 Tcf in the Grand Banks is 100% restricted.

[13] 2001 Supply Mid–Term Prospectus at 17.

[14] Id. at 18.

[15] Id. at 19.

[16] Id.

[17] Id. at 19–20.

[18] Id. at 5.

[19] Retail Service Report, January 19, 2001.

[20] Id.

[21] Id.

[22] Natural Gas Wellhead Decontrol Act of 1989, Pub. L. No. 101–60, 103 Stat. 157 (Jul. 26, 1989)

adversely impacts our companies, we, most emphatically, do not want the federal government to set the price of natural gas at the wellhead. Rather, PGC believes that increased access to sources of natural gas will allow the market to stabilize the price of gas to a reasonable level.

EIA correctly noted that, "unpredictable [natural gas] prices have deleterious consequences for natural gas consumers. For example, they—can affect the financial viability of large industrial projects such as electricity generation plants and fertilizer plants, where natural gas supply is the largest component of operating costs. [23] Although some tools are available to industry to try to mitigate these prices swings, the usefulness of these tools is somewhat limited in the long term. As the EIA report also correctly recognized, the "deleterious effects of cyclical prices on suppliers and consumers can be mitigated through long-term, fixed-price contracts and price hedging; however, those financial instruments are limited in their duration and access. [24]

We are already seeing press reports warning of a "major supply crunch" in the winter of 2002–2003. Notably, as reported in Gas Daily two weeks ago, "U.S. gas production has fallen for a fourth consecutive quarter, dipping about 1% in the three months ended June 30, according to a recent report by analyst Raymond James and Associates. [25] According to Raymond James, "we continue to believe that the U.S. is on the verge of another major natural gas supply shortage, which could be felt as early as this upcoming winter. [26] As further discussed later in my testimony, this type of supply shortage report is cause for great concern in the industrial community because of the difficulties industrials face in using alternative fuels.

V. Need to Develop Sufficient Pipeline Infrastructure to Bring Supplies to Market

In addition to adequate supplies at reasonable prices, industrial gas consumers also have a strong interest in policies that support the needed growth of the pipeline infrastructure to bring gas and competitive transportation options to new and existing markets.

Currently, the interstate pipeline grid in the U.S. consists of more than 206,000 miles of mainline transmission. [27] With the ever-increasing demand for natural gas supply, the pipeline network must also be expanded to enable reliable delivery to the domestic market. [28] As I indicated earlier, one of the major areas of expansion in the demand for natural gas is the expected growth in gas-fired power plants. According to EIA, "[i]n 2002, it is estimated that 50,000 MW of new gas-fired capacity will be installed into the United States. That figure translates into 4.4 to 5.6 Bcf/d of new mainline capacity likely to be needed" to serve these plants. [29] EIA goes on to note that "[w]hile the national natural gas pipeline network has expanded sufficiently to meet demand growth during the past several decades, the large incremental needs of power plants over the next several decades can be expected to place unusual demands upon the natural gas pipeline industry. [30]

To that end, PGC has long urged the Federal Energy Regulatory Commission ("FERC") to maintain a pro-competitive approach to pipeline construction proposals and has consistently highlighted the following threshold concerns.

First, in particular, PGC has requested that FERC generally trust the market to decide issues related to the need and proper location for new interstate pipeline capacity. That is, pipelines should be allowed to respond to perceived customer demands for new or expanded capacity, and potential customers should be able to exercise their own judgments about varied pipeline proposals. FERC should not presume to select new projects on behalf of the market or to so burden new projects with construction conditions and delays as to render otherwise viable projects untimely or unmarketable.

Second, FERC should provide a foundation of stable, consistently implemented rate and certificate polices, to the maximum extent practicable. Investors who see erratic FERC policy adjustments will soon decide that investments in new pipeline capacity are too dangerous to justify such expenditures. That would not be in consumers' interests.

Third, as part of this approach, pipelines should bear a reasonable share of the economic risk of new construction, without receiving any recovery guarantees from FERC. If a pipeline builds new capacity that is substantially unused or that re-

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[23] 2001 Supply Mid–Term Prospectus at 48.
[24] Id.
[25] Platts, Gas Daily at 1 (July 2, 2002).
[26] Id.
[27] EIA October 2001 Report at 1.
[28] Id. at 22.
[29] Id.
[30] Id.

quires reservation charge discounts, then that pipeline's investors should bear the consequences not the existing shippers. At the same time, FERC should not impede the pipeline's ability to take risks (at its shareholders" expense), or take any other shortsighted steps to "protect" pipelines from the consequences of the market's responses (or lack of responses) to their capacity offerings. In this regard, the industrials urge a fair opportunity to earn a reasonable return, while also placing the pipelines at risk if the projected demand falls short of the capacity proposed.

Fourth, FERC should continue to streamline its certificate procedures, including expanding the range of automatically authorized projects under the blanket certificate rules.

We appreciate the strides FERC has made in this area in recent years and continue to support initiatives that ensure the development of adequate infrastructure to meet the ever-growing demand for natural gas.

VI. Common Misperception About Industrials and Fuel Switching

The need for adequate supplies of natural gas at reasonable prices and the infrastructure to bring it to the market are critical areas of concern to PGC because, contrary to popular belief, industrial fuel switching is difficult and at times impossible.

There is a common misperception that, for industrial end users of natural gas, all we have to do is go out to our plants and flip a switch to stop using natural gas and, in its place, use propane, or Number 2 or Number 6 fuel oil, or burn some other alternative fuel so we don't have to rely on natural gas. We stress to the Members of this Subcommittee today that fuel switching is simply not always possible.

Regardless of the economics, for some industrials, fuel switching is impossible and the reasons vary from industrial to industrial. For instance, some industrials just do not have alternative fuel capability. Also, some industrials that perhaps at one point in time had the capability to fuel switch have given up the capability because of the increasingly stringent environmental restrictions. In one instance, one PGC member wanted to expand its plant. However, in order to get the appropriate air and environmental permits for that expansion, this industrial had to give up its ability to fuel switch, and, as a consequence, that plant no longer has fuel switching capabilities.

Also, even absent a plant expansion, with more stringent environmental controls, it is harder to get the kinds of permits needed to burn coal and fuel oil. This means that even if one of our PGC members decided today to try to install more fuel switching capability, in the current environmental or regulatory landscape, it is not at all easy, and in some instances may be impossible.

The other issue that comes into play is capital investment. It costs money for companies to maintain a secondary fuel capability and, in times of economic difficulty, that capital investment may be foregone. Some companies have been forced to make these tough economic decisions.

Furthermore, if a company is using natural gas as a feedstock there is often no other energy substitute. For example, ammonia manufacturers combine the nitrogen molecule from air with hydrogen molecules from natural gas to create anhydrous ammonia, the basic building block for producing virtually all other forms of nitrogen fertilizer and ammonia based industrial products. There is no economically viable alternative for natural gas as a feedstock in this process.

Moreover, even if there is an alternative fuel available, for many types of industries, the use of natural gas is a preferred energy choice. For example, if a wallboard manufacturer switches to Number 6 fuel oil, that fuel oil can leave a sooty residue on the white wallboard that cannot be covered by paint. Therefore, although it is possible to switch, these types of manufacturers have product quality issues that, in effect, eliminate such an option. Similarly, fuel switching is not an efficient option for some backup systems, such as propane, where more experienced operators are needed because propane burns as a "touchier" flame than does natural gas.

One of the PGC member companies manufactures cars and uses natural gas for drying the paint on the cars. This company can switch from using natural gas to using propane but, again, the process utilizing propone is very sensitive and, if it is not managed very well, an entire day's worth of the paint-drying process can be lost.

Regardless of whether fuel switching remains a viable option, for some companies, even in an emergency situation, a minimum amount of natural gas is needed for plant protection purposes. For example, if a glass manufacturing facilities loses its gas supply quickly and does not maintain plant protection, the entire glass-manufacturing unit freezes up and cannot be restarted. These industrials have to scrap the entire plant and rebuild it again. I have been told that this could cost upwards of $20 million.

For corn milling plants in the winter, a sudden loss in gas supply can cause those plants to freeze up as well. Now those, when the warm weather comes back, will eventually thaw out. But, apparently there is nothing that they can do to restart them once they lose the gas supply.

Also, for some facilities, depending on the time of year, lines can burst. For ammonia manufacturers, these plants operate at very high temperatures. And even for plant protection volumes, that is generally about 70 percent of their maximum daily quantity.

Another issue arises in the case of an emergency situation that requires a plant to shut down. In this case, the facility that needs to shut down would like as much notice as possible. Some of these large manufacturing units have told me that an emergency shutdown is three days. Preferably, these plants would like to have a couple of weeks to shut down a plant. Three days is what they like to have on an emergency basis in order to do it safely and in order to protect their investment in their equipment.

VII. Conclusion—White Paper Principles

To conclude, I would like to focus your attention to the PGC white paper ("The Industrial End User Perspective on our Nation's Energy Policy") that I have attached to my written testimony. The white paper outlines PGC's goals for the Administration and Congress with regard to the development of a national energy policy and the future of natural gas use, including the following principles I touched on today:

- Develop a balanced national energy policy that appropriately considers contributions from a broad variety of energy sources (including natural gas, coal, nuclear and hydropower as well as renewables such as biomass, solar and wind).
- Continue current policies allowing deregulated natural gas commodity prices.
- Encourage competition and the operation of free-market forces while preventing the exercise of monopoly power.
- Allow environmentally responsible, and timely, exploration and production of natural gas on public lands.
- Streamline environmental review and certification process to allow more rapid approval of interstate natural gas pipeline projects to bring natural gas supplies to market.

That concludes my prepared remarks but I would be happy to answer any questions that the Subcommittee may have. I thank the Subcommittee for its interest in this important matter and for the opportunity to present the industrial point of view with regard to natural gas supply issues and the formation of a national energy policy.

[An attachment to Mr. Gooch's statement follows:]

The Industrial End User Perspective On Our Nation's Energy Policy

The Process Gas Consumers Group (PGC) is a national trade association of industrial natural gas consumers. For over 20 years, PGC has worked to promote coordinated, rational, and consistent federal and state policies relating to natural gas and its transportation. PGC member companies represent a broad cross-section of U.S industry and produce a wide range of products including automobiles; steel; aluminum; textiles; paper; laundry, health, and beauty care products; fertilizer; plastics; chemicals; glass; and food and grain products.

U.S. industry has made significant strides in recent years to control energy costs, both through the use of more efficient technology as well as through conservation measures. Nonetheless, our member companies are heavily dependent on natural gas as both a fuel and a feedstock and consume more than 500 billion cubic feet of natural gas annually in essential processing, manufacturing and other operations.

To ensure the future ability of energy-dependent companies to contribute fully to our nation's economic vitality, we need a national energy policy that will foster the development of adequate and reliable supplies of natural gas and other energy sources at reasonable prices. **We therefore urge the Administration and the Congress to:**

Develop a **balanced national energy policy** that appropriately considers contributions from a broad variety of sources (including natural gas, coal, nuclear and hydropower as well as renewables such as biomass, solar and wind).

Continue current policies allowing **deregulated natural gas commodity prices.**

Encourage competition and the operation of free-market forces while preventing the exercise of monopoly power.

Allow **environmentally responsible, and timely, exploration and production of natural gas on public lands.**

Streamline the environmental review and certification process to allow more rapid approval of **interstate natural gas pipeline projects** to bring natural gas supplies to market.

Promote **energy conservation and increased energy efficiencies**

Promote the **development of new, cost-effective energy technologies**

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Mrs. CUBIN. The Chair would now like to recognize Mr. Peters.

STATEMENT OF EUGENE F. PETERS, VICE PRESIDENT, GOVERNMENT AFFAIRS, ELECTRIC POWER SUPPLY ASSOCIATION.

Mr. PETERS. Madam Chair, thank you and good morning. My name is Eugene Peters, Vice President of Legislative Affairs for the Electric Power Supply Association (EPSA). I am here today representing our member companies.

EPSA is a national association that represents the competitive electric power supply industry which owns and operates more than 35 percent of the nation's installed generating capacity.

Our members include the leading developers of new power generation in the United States. In the first 6 months of this year, roughly 90,000 megawatts of new power generation came on line. A megawatt can provide roughly enough power for 1,000 homes. Of this capacity, more than 97 percent was gas-fired.

Our records show that there were about an additional 250,000 megawatts of capacity under construction or in development in the United States today.

While there is renewed interest and growing interest in fuels such as coal, nuclear and various renewable technologies, we believe that 90 percent or more of this capacity under development is likely to be gas-fired.

Let me describe in some detail the attributes that have brought about this strong interest in natural gas within the electric power sector.

First, availability. The domestic gas industry has an excellent and reliable supply infrastructure. Natural gas pipelines are often obtrusive and easier to cite than energy alternatives.

Two, affordability. Historically natural gas prices have been very competitive with other fuels. Recently natural gas prices have shown significant price volatility. As you would expect, this volatility has led developers to broaden their focus to include a range of alternative fuels. However, companies seeking to use gas take advantage of a wide variety of techniques to hedge prices and protect themselves and their customers against volatility.

Long-term contracts for supply, what are called tolling agreements with natural gas and power marketers and the direct acquisition of natural gas reserves are strategies that are commonly employed to guarantee profitable projects and affordable electric power.

Three, environmental impact. Project development is difficult at any time. Local communities may not initially embrace power plant development, notwithstanding the significant tax and employment benefits that often result.

Inevitably, difficult negotiations with host communities are often critical to demonstrate minimal environmental impact. Natural gas facilities benefit from their compact footprint and low emissions of the principal air pollutants.

Four, advanced technology. Few technologies have been more advanced and refined over the last 25 years than those used to convert natural gas to electricity. Until the early 1980's, at highly efficient fossil fuel power plant, gas-fired or otherwise, would typically

convert only one-third of the input fuel's energy content to electricity. The result would be lost as waste heat.

For natural gas this 33 percent efficiency rate has dramatically improved to where technologies today convert the energy content of natural gas to electricity at a rate of over 60 percent. This near doubling of energy efficiency had led to sharply lower operating costs over time.

In addition to cost savings from increased efficiency, power plant developers have had access to equipment that is ever more reliable with predictable plant performance and construction time-lines.

Now, given the attributes of natural gas and gas-fired power facilities, it is not surprising that the lion's share of projects and developments they utilize as fuel. While concern about over-dependence on any one source is always an appropriate focus for policymakers, alarm about these trends certainly is not.

The competitive power developer, plant developer, is flexible and acutely aware of market trends. Although most companies are engaged in the development of gas facilities, these same companies, in many cases also own and operate coal-fired, nuclear and renewable power plants.

For example, one EPSA member, CalPine, is both a prominent natural gas plant developer and the largest operator of geothermal power plants in the world. We believe if supply constraints lead to higher prices you can explain the power industry to react quickly and appropriately to these trends.

In addition, it is important to understand that the fundamental characteristics of the electric power supply portfolio will change only slowly due to the size of the industry. The largest fuel resource for electric generation is currently and is likely to remain coal, with new coal plants under development.

In an analysis performed by the U.S. Energy Information Administration, natural gas fired power plants were more than double their capacity between 2000 and 2010. Yet in spite of all this growth, the market share of gas should only increase from the present rate of 17 percent to 26 percent in 2010.

Coal, which fuels 51 percent of the power market today, would still dominate with 49 percent of the capacity in 2010. IF the move toward more gas capacity continues, we believe there will be plenty of time to make appropriate policy adjustments to insure a balanced energy portfolio for U.S. energy consumers.

Our industry strives to provide the most affordable power possible to American consumers. In a competitive market place that applies rigorous downward pressure on prices, the cost and reliability of natural gas supplies is no academic concern.

Abundant supplies lead to lower prices and continued interest in building gas-fired facilities. If that supply is threatened, our companies will shift to alternative fuels and technologies. We strongly encourage Federal policies that make available access to economical gas resources.

While it is clear that there may be some environmental costs of this new production, we believe these to be limited and open to mitigation. Further, any environmental costs associated with development must be contrasted with the environmental benefits of gas use.

Once again, I thank you for the opportunity to testify before your Subcommittee. Natural gas is a critical fuel for the national economy and electric power sector. We look forward to working with you in the Subcommittee to ensure balanced energy policy and continued access to clean, affordable, and efficient electricity production.

[The prepared statement of Mr. Peters follows:]

Statement of Eugene F. Peters, Vice President of Legislative Affairs, Electric Power Supply Association

Madam Chairwoman Cubin, Representative Kind, and members of the Subcommittee, I am Eugene F. Peters, Vice President of Legislative Affairs for the Electric Power Supply Association (EPSA), and am here today on behalf of EPSA's member companies. EPSA is a national association that represents the competitive electric power supply industry. Our members include the leading developers of new power generation in the United States. I am pleased to testify before you concerning the use of natural gas as a fuel source in the electric power industry and the need for continued access to economic resources.

Natural gas represents an abundant, clean-burning energy resource that is available from secure sources. The growth of the natural gas industry has been critical to the continued economic expansion of the U.S. economy, and gas has become a vital fuel for electric power production. In many regions of the United States, natural gas is the clear fuel of choice for new electric generation. Given the affordability and availability of gas, its excellent environmental characteristics and the continued development of new highly efficient technologies, this should of be no surprise.

In the first six months of this year, roughly 90,000 MW of new power generation capacity came online (1 MW can provide enough power for about 700 families). Of this capacity, more than 97 percent was gas-fired. Our records show that there are about 350,000 MW of merchant capacity currently in operation, under construction or in development in the United States today. While there is renewed and growing interest in fuels such as coal, nuclear and various renewable technologies, 90 percent or more of this capacity under development is likely to be gas-fired.

Let me describe in more detail each of the attributes that have brought about the strong interest in natural gas within the electric power sector:

Availability

The domestic gas industry has an excellent and reliable supply infrastructure. Natural gas pipelines are often less obtrusive and easier to site than other energy alternatives. Utilizing natural gas can allow power plants to be sited with flexibility, allowing better access to regional markets or particular pockets of electricity demand.

Affordability

Historically, natural gas prices have been very competitive with other fuels. The emergence of extremely efficient fuel-burning technologies (which I will further describe later in my testimony) strongly enhances this cost competitiveness. Recently, natural gas prices have showed significant price volatility. As you would expect, this volatility has led developers to broaden their focus to include a range of alternative fuels.

However, companies seeking to use gas take advantage of a wide variety of techniques to hedge prices and protect themselves and their customers against dangerous volatility. Long-term contracts for supply, "tolling agreements" with natural gas and power marketers and the direct acquisition of natural gas reserves are strategies that are commonly employed to guarantee profitable projects and affordable electric power.

Environmental Impact

Project development is difficult at any time. Local communities may not initially embrace power plant development, notwithstanding the significant tax and employment benefits that often result. In the inevitably difficult negotiations with host communities, it is often critical to demonstrate minimal environmental impact. Natural gas facilities benefit from their compact "footprint" and low emissions of the principal air pollutants—SO2, NOX and mercury. While the environmental attributes of competing fuels are steadily improving, natural gas facilities are likely

to retain for some time a significant edge with respect to land-use issues and effects on air quality.

Advanced Technology

Few technologies have been more advanced and refined over the past twenty- five years than those used to convert natural gas to electricity. Until the early 1980s, a highly efficient fossil fuel power plant (gas-fired or otherwise) would typically convert only one-third of the input fuel's energy content to electricity. The rest would be lost as waste heat. For natural gas, this 33 percent efficiency rate has dramatically improved to where technologies now convert the energy content of natural gas to electricity at a rate of over 60 percent. This near doubling of energy efficiency has led to sharply lower operating costs over time.

In addition to cost-savings from increased efficiency, power plant developers have had access to equipment that is ever more reliable, with predictable plant performance and construction timetables. Prior to 1980, all electric power plants were essentially custom-designed and constructed. No longer. Turn-key projects, with performance guaranteed by the equipment manufacturer, are the rule, not the exception. In a competitive setting, there is a high premium placed on the technical sophistication and predictability that has been engineered into the modern natural gas-fired power plant.

Questions of Fuel Diversity

Given the attributes of natural gas and gas-fired power facilities, it is not surprising that the lion's share of projects in development today utilize this fuel. While concern about overdependence on any one fuel source is always an appropriate focus for policy makers, alarm about these trends certainly is not.

The competitive power plant developer is flexible and acutely aware of market trends. Although most companies are engaged in the development of gas facilities, these same companies also own and operate coal-fired, nuclear and renewable power plants. For example, one EPSA member, Calpine, is both a prominent natural gas plant developer and the largest operator of geothermal plants in the world. If supply constraints lead to higher gas prices, expect the power supply industry to react quickly and appropriately to these trends.

In addition, it is important to understand that the fundamental characteristics of the electric power supply portfolio will only change slowly, due to the size of the industry. The largest fuel resource for electric generation is currently, and is likely to remain, coal.

In an analysis performed by the U.S. Energy Information Administration, natural gas-fired power plants will more than double their capacity between 2000 and 2010. Yet, in spite of all this growth, the market share of gas should only increase from the present rate of 17 percent to 26 percent in 2010. Coal, which fuels 51 percent of the power market today, should still dominate with 49 percent of the capacity in 2010. If the move towards more gas capacity continues, we believe there will be plenty of time to make any appropriate policy adjustments to ensure a balanced energy portfolio for U.S. electricity consumers.

Gas Production from Federal Lands

Our industry strives to provide the most affordable power possible to American consumers. In a competitive marketplace that applies rigorous downward pressure on prices, the cost and reliability of natural gas supplies is no academic concern.

Abundant supply leads to lower prices and continued efforts to build gas-fired facilities. If that supply is threatened, our companies will shift to alternative fuels and technologies. We strongly encourage federal policies that make available access to economical gas resources. While it is clear that there may be some environmental costs to this new production, we believe these to be limited and open to mitigation. Furthermore, the environmental costs of production can be more than offset by the environmental benefits that flow from the development of clean-burning gas power plants.

Conclusion

Once again, I thank you for the opportunity to testify before your Subcommittee. Natural gas is a critical fuel for the national economy and the electric power sector. Efforts to increase the supply of gas will pay dividends—both economic and environmental—for all Americans. We look forward to working with the Subcommittee to ensure a balanced energy strategy and continued access to clean, affordable and efficient electricity production.

Mrs. CUBIN. Thank you, Mr. Peters. I will begin questioning by asking all of you to respond to one question.

What kinds of policy initiatives do you think we in Congress, as well as the administration, should be promoting in order to ensure an adequate natural gas supply?

I will start with Mr. Schleede.

Mr. SCHLEEDE. I think the most important one is the one that I hope you are focusing on here and that is opening up public lands, on shore and off shore. It seems to me it offers the best promise for early availability of natural gas and there are others that I mentioned, getting the pipelines built. Keeping the costs down on those pipelines would help a whole lot.

Mrs. CUBIN. Mr. Gooch?

Mr. GOOCH. I would say a balanced approach to energy. You can't just focus all on natural gas, even though it is very clean burning. There is only so much in the ground and once you pull it out and consume it, it is gone.

For some of the manufacturing companies, gas is their only alternative. So, a more balanced approach, be it renewals, bringing back nuclear power or whatever, but you can't just focus on natural gas alone.

Mrs. CUBIN. Thank you.

Mr. Peters?

Mr. PETERS. Yes. I note that H.R. 4, which was passed by this body, included important provisions dealing with Federal leasing management, royalty reform and technological development. Certainly all three of those areas need to be reinforced by Federal policy.

I would add that one of the things that is very important for policymakers to recognize, and I think you will hear this on the next panel, is really the difference between the sort of short term costs and the long term costs.

A lot of the electricity producers really have shifted toward longer term contracts in order to hedge that risk. One of the things that we see occasionally is political, the politics of that. When the spot prices drop, those contracts look high and you get a lot of policymakers second-guessing a lot of decisions that get made.

It is very important for people to recognize the value of those long-term contracts to stability within the industry, both the electric power industry and the natural gas supply industry.

Mrs. CUBIN. Stability of industry certainly is of major concern. Mr. Gooch, I think you alluded to that in your testimony. What do you think a sustained period of high prices, say in the $8 to $10 per thousand cubic feet range, would have on your business and other businesses like it?

Mr. GOOCH. Well, certainly in the first quarter of 2001, the fertilizer business practically shut down completely, with prices that were upwards of $10. Even when they were $4, many companies could not continue to operate. We are in a very globally competitive environment, a worldwide environment.

Nitrogen is manufactured in Trinidad, in Venezuela and in Russia for far cheaper prices. Venezuela's price of gas is equivalent to fifty cents right now. That is the feedstock to make ammonia.

We are not going to see any expansion in this country of ammonia plants in the near future, I am afraid, because of high natural gas prices. Right now we are just struggling to survive. So, to answer your question, if gas again got up to that kind of level I think we would see permanent shutdowns, many more than what we have already seen, of businesses in this country.

Mrs. CUBIN. In addition to the shutdown, I guess the next step is then in order to meet the needs the plants would move overseas where the cost to do business is cheaper. Would you agree with that?

Mr. GOOCH. Yes, absolutely, especially in the fertilizer business, we are already seeing expansions primarily in Trinidad and Venezuela because they are very close to the U.S. from a shipping standpoint.

Mrs. CUBIN. So, if there are environmental concerns it is another one of those NIMBY things where the situation of the impact on the environment doesn't change, it just changes where it is. I think anyone who is interested and concerned about the environment has to realize that it is a global environment that we all live in, not just an environment here in our backyard.

I would like to ask Mr. Peters a question. My time is just about up. If the trends toward diminishing gas supply continue, what do you think will happen to all of the new planned natural gas fired generation capacity that we are counting on and where will our power come from?

Mr. PETERS. Well, first of all, as anyone who studies the industry knows, nothing changes over night. The question that Mr. Tauzin asked about what a recoverable resource is, it deals with the economics. So, if the price goes to $8 and $10, you hope that doesn't happen, but if it does the resources will increase.

What you see when you look at natural gas, you don't see sudden changes. It is not like today there is capacity and tomorrow there is not. I think the important thing is for the right price signals to be there so people can make the appropriate decisions.

Every one of my companies can develop coal facilities. They can develop nuclear facilities. They can develop renewable resources, and they do. I think that what we want to guard against are policies that lead to abrupt changes in price or availability of supplies. As long as that doesn't happen, I think the planning timeframe will continue to be ten to 15 years and people will make the right set of decisions.

But make no mistake about it. If the prices start to become more volatile with more frequency, you will see, as you have already seen, shifting development to coal supplies, to renewed interest in nuclear and to renewable supplies.

Mrs. CUBIN. One last quick question, Mr. Peters, do you see an adequate natural gas supply for this coming winter?

Mr. PETERS. Adequate is always a question of what the—you know. Especially when you talk about the winter, you are talking really about issues that are bigger than the electric power industry. It is how cold it is.

Mrs. CUBIN. Nature?

Mr. PETERS. Exactly. I think that is a question that is probably best left to the folks that come after me. My guess is that there

are adequate supplies for this winter. I think that most people believe that to be true. But again, you know, you are in a situation where you have a strong winter peak for a lot of natural gas usage.

If you get a very cold winter, you could have increased price volatility. That is what you will see. You probably won't see gas cutoff; you will see increased price volatility. Then what you will see is companies that have either protected themselves or not. If you have protected yourself, then you have bought in and you look smart in retrospect because you will have locked in prices at a low rate and prices will escalate and other people will be paying more for gas.

I think that is what you will see. You won't see a physical shortage, but you will see high price volatility and we hope that doesn't occur.

Mrs. CUBIN. Thank you. I would now like to recognize Mr. Kind.

Mr. KIND. Thank you. I thank you all for coming. I appreciate your testimony.

Mr. Schleede, is the problem in regards to meeting our natural gas potential or production a matter of being able to deliver to the market those reserves which exist on public lands or is the so called closed lands a significant issue too, in your opinion?

Mr. SCHLEEDE. Well, in my opinion or at least in the opinion of the experts that I listen to, it is heavily due to the lack of access to public lands, particularly in the Rockies now and off the east and west coast, around Florida. That is the principal problem.

Pipelines get built when there is need for them. Pipelines get built. There is the Federal Energy Regulatory Commission that has recently approved about 25 different pipeline new construction and beefing up of existing pipeline capacity. Those do get built when the supply is there and when the demand is there. That is the access to the resource that is important.

Mr. KIND. Just so we are clear, are you claiming that there is no enough access on the public lands now in order to develop the natural gas reserves that are there or the access is there, but it is just difficult in producing it and getting it to market?

Mr. SCHLEEDE. Based on the views that I have seen from people who know a lot more about the gas markets than I do, it is sufficient access to the lands for exploration and development.

Mr. KIND. How much reserve capacity are we talking about if we deal with the access problem?

Mrs. CUBIN. Mr. Schleede, I am not sure your microphone is on. It is a little difficult to hear.

Mr. SCHLEEDE. Maybe I am too far away from it.

The numbers that I have used relying on the person I consider to be quite an expert in this area show that in the Rocky Mountains area alone 137 to 346 trillion cubic foot of gas, 40 percent of which is restricted. Now, our current consumption is around 23 or 24 Tcf, trillion cubic feet, and here we are talking in the Rockies of 137 to 346.

Offshore and Pacific, another 21 trillion cubic feet. Offshore the east coast, 10 trillion. Off Grand Banks, another 31. Off the Atlantic offshore and slope, and then British Columbia also has some restrictions on its things. So, there is a lot of gas there, not to mention ANWR, of course.

Mr. KIND. Thank you. Thank you all. I appreciate your testimony. Thank you, Madam Chair.

Mrs. CUBIN. I would like to thank the panel for their testimony and once again mention that there will be members who have further questions and we would appreciate if you would respond to those in writing. Now I will call the third panel, Ms. Mary Hutzler, Acting Administrator of the Energy Information Administration; Mr. Matthew Simmons, the President of Simmons and Company, International; and Mr. Diemer True, Partner and Chairman, True Oil Company, Independent Petroleum Association of America.

Once again, I welcome you. We will start the testimony with Ms. Hutzler. Thank you for your testimony. Please begin.

STATEMENTS OF MARY HUTZLER, ACTING ADMINISTRATOR, ENERGY INFORMATION ADMINISTRATION

Ms. HUTZLER. Madam Chairman, I appreciate the opportunity to appear before you today to discuss the outlook for natural gas markets in the United States.

The projections in my testimony are from the Energy Information Administration's July Short Term Energy Outlook and our Annual Energy Outlook 2002.

Over the past several years natural gas prices have faced extreme volatility due to demand spikes related to weather and the economy. Moreover, low levels of hydroelectric generation in the Northwest caused higher demand for natural gas generation.

When supplies are not adequate to meet demand, prices rise to bring supply and demand into balance. However, there is a lag between higher prices and higher production due to the time required to explore for it, drill and produce natural gas.

Volatility in prices causes shifts in drilling investments which cause variations in production and it also causes variations in consumption.

EIA projects natural gas demand to increase by 1.7 percent in 2002 with growth in both the industrial and generating sectors. In 2003, natural gas demand is expected to increase by 3.5 percent, boosted by higher heating related demand and an accelerating economy which will return gas demand to its 2000 levels of 22.5 trillion cubic feet.

As of the end of June, working gas in storage was estimated to be 19 percent above the 5-year average and about 22 percent higher than a year ago. Storage is expected to remain above average levels through the beginning of the next heating season and beyond.

Due to the low demand growth and high storage inventories, domestic dry natural gas production is projected to fall by 2.3 percent in 2002. Lower natural gas prices have reduced gas production and gas drilling activity from their highs of last summer. Current supplies, including natural gas and storage appear to be at very comfortable levels.

In 2003, production is expected to rebound by 4.1 percent as demand rises. Until last week, spot wellhead prices had been over $3 per thousand cubic feet since mid March. The market has been fairly volatile over the last several months, with spot gas prices

varying by as much as 25 cents per thousand cubic feet on a daily basis.

Weather forecasts and underground storage reports are two factors that have had an effect on the spot price of gas. We project natural gas prices to average $2.89 per thousand cubic feet in 2002 and $3.22 in 2003.

Over the long term, U.S. natural gas consumption is expected to increase by 2.2 percent annually, from 2001 to 2020, to nearly 34 trillion cubic feet.

As this chart shows, most new electric generation capacity is expected to be fueled by natural gas, despite decreasing coal prices to the electric generation sector. Natural gas fired electric generators are expected to have advantages over coal-fired generators, including lower capital costs, higher fuel efficiency, shorter construction lead times and lower emissions.

In 2001, electric generators, not including industrial cogenerators, were the third largest consumers of natural gas. By 2020, however, the projected growth in gas-fired generation is expected to make electric generators the largest gas-consuming sector.

Gas consumption by electric generators is expected to more than double over the forecast. Industrial consumption is also expected to increase driven primarily by macroeconomic growth. Consumption in the residential and commercial sectors increases as well due to increase in population, healthy economic growth and preference by consumers to use natural gas as a heating fuel.

Long-term domestic gas production is projected to increase at an annual rate of 2 percent, rising from 19.3 trillion cubic feet in 2001 to 28.5 trillion cubic feet in 2020. Growing production reflects rising wellhead gas prices, relatively abundant gas resources and improvements in technologies, particularly for offshore and unconventional gas.

Lower 48 onshore conventional, non-associated sources are expected to remain the largest gas production source, increasing from 36 percent of domestic production in 2001 to 39 percent in 2020, as you can see from this chart.

Off shore production, mainly from the wells and the Gulf of Mexico is also expected to increase, although less rapidly. Unconventional gas production increases at the fastest rate of any source, from 26 percent in 2001 to 28 percent in 2020, largely because of expanded tight sands gas production in the Rocky Mountain region.

Alaska natural gas production rises gradually over the forecast to provide for consumption in the State itself and continued LNG exports to Japan.

The projection forecasts are based on estimates of the resource base from the U.S. Geological Survey and the Minerals Management Service. Total technically recoverable natural gas resources in the United States as of January 1, 2000, is estimated to be 1,191 trillion cubic feet. Based on this estimate, the U.S. could produce almost 30 trillion cubic feet of natural gas a year for the next 40 years.

The difference between consumption and production is met by the increasing use of imports, particularly from Canada. By 2020, total net imports are expected to increase by 1.8 trillion cubic feet.

The reopening and expected expansion of mothballed liquefied natural gas terminals is expected to result in a significant increase in net LNG imports, reaching 830 billion cubic feet in 2020.

National average wellhead prices are expected to increase to $3.26 per thousand cubic feet in 2020. That is in 2000 dollars. In nominal dollars, it is equal to $5.56. The projected price of natural gas reflects the long run marginal cost of domestic natural gas production which depends strongly on technological progress.

In our slow and rapid technology cases, we assume that the rate of technological improvement and production costs, finding rates and success rates will respectively decrease or increase by 25 percent relative to the historical rate in the reference case.

The Lower 48 average wellhead price in 2020 in the slow technology case is projected to be $4.06 per thousand cubic feet, which is 25 percent higher than the reference case.

In the rapid technology case, Lower 48 natural gas wellhead prices are projected to be $2.73 per thousand cubic feet in 2020, 15 percent lower than the reference case.

These price forecasts are long term price trends and as such do not reflect the transient conditions which cause price volatility.

Thank you, Madam Chairman. I would be happy to answer any questions you may have.

Mrs. CUBIN. Thank you.

[The prepared statement of Ms. Hutzler follows:]

Statement of Mary J. Hutzler, Acting Administrator, Energy Information Administration, Department of Energy

Madame Chairman and Members of the Subcommittee:

I appreciate the opportunity to appear before you today to discuss the mid-term outlook for natural gas markets in the United States.

The Energy Information Administration (EIA) is the statutorily chartered statistical and analytical agency within the Department of Energy. We are charged with providing objective, timely, and relevant data, analysis, and projections for the use of the Department of Energy, other Government agencies, the U.S. Congress, and the public. We do not take positions on policy issues. We produce data and analysis reports that are meant to help policy makers determine energy policy. Because we have an element of statutory independence with respect to the analyses that we publish, our views are strictly those of EIA. We do not speak for the Department, nor for any particular point of view with respect to energy policy, and our views should not be construed as representing those of the Department or the Administration. EIA's baseline projections on energy trends are widely used by Government agencies, the private sector, and academia for their own energy analyses.

The projections in this testimony are from the Annual Energy Outlook 2002 (AEO). These projections are not meant to be exact predictions of the future, but represent a likely energy future, given technological and demographic trends, current laws and regulations, and consumer behavior as derived from known data. EIA recognizes that projections of energy markets are highly uncertain, subject to many random events that cannot be foreseen, such as weather, political disruptions, strikes, and technological breakthroughs. (Many of these uncertainties may be explored through alternative cases.)

Overview and Assumptions

The Annual Energy Outlook is produced using the National Energy Modeling System (NEMS), a computer-based, energy-economy modeling system of U.S. energy markets for the period through 2020. NEMS projects the production, imports, consumption, and prices of energy, subject to assumptions on macroeconomic and financial factors, world energy markets, resource availability and costs, behavioral and technological choice criteria, cost and performance characteristics of energy technologies, and demographics. Two of the key assumptions in NEMS are world oil prices and macroeconomic growth.

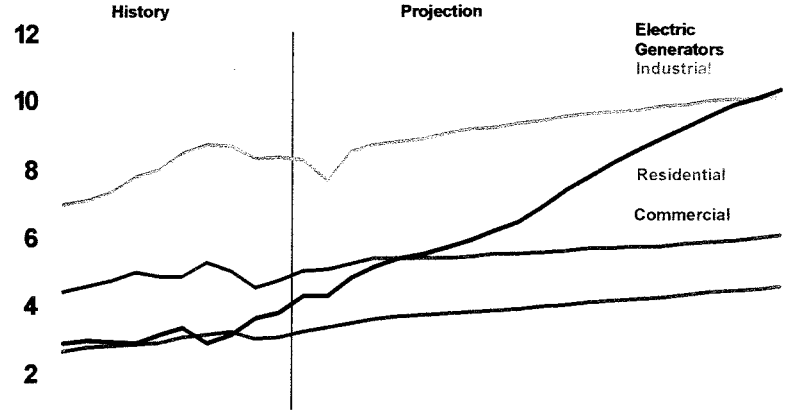
World oil prices averaged about $22 per barrel in 2001. Between now and 2020 they are expected to rise to about $25 a barrel in 2000 dollars, as world oil demand increases from 76 million barrels per day to 119 million barrels per day. Growth in oil production in both OPEC and non–OPEC nations leads to relatively slow growth in prices through 2020. OPEC production is expected to reach 58 million barrels per day in 2020, nearly double the 31 million barrels per day produced in 2000. Non–OPEC production is expected to increase from 46 to 61 million barrels per day between 2000 and 2020.

Even though there was an economic slowdown in the United States in 2001, by 2003 gross domestic product is projected to grow by 3.1 percent and to continue to grow at an annual average rate of 3.0 percent between 2000 and 2020. Productivity growth (GDP growth minus labor force growth) is expected to increase 2.2 percent per year through 2020. The projected rates of growth in GDP and labor force productivity are lower in the first 5 years of the forecast period, reflecting present economic uncertainty and revisions to national income and product account data from the Bureau of Economic Analysis. They are expected to pick up as productivity increases and the economy moves back to its long-term growth path. Total population growth is expected to remain fairly steady, with an annual growth rate of 0.8 percent per year. The slowing growth in the size of the labor force results from the increasing size of the population over the age of 65.

Natural Gas Outlook to 2020

U.S. natural gas consumption is expected to increase by 2.2 percent annually from 2001 through 2020, to nearly 34 trillion cubic feet (Tcf) (Figure 1). Most new electricity generation capacity is expected to be fueled by natural gas. Despite decreasing coal prices to the electricity generation sector, natural-gas-fired electricity generators are expected to have advantages over coal-fired generators, including lower capital costs, higher fuel efficiency, shorter construction lead times, and lower emissions. In 2001, electricity generators, not including industrial cogenerators, were the third-largest consumers of natural gas. By 2020, however, the projected enormous growth in gas-fired generation makes electricity generators the largest gas-consuming sector, rising 0.2 Tcf above the industrial sector. Gas consumption by electric generators is expected to more than double over the forecast, from 4.3 Tcf in 2001 to 10.3 Tcf by 2020.

Figure 1. Natural Gas Consumption by Sector, 1990 - 2020 (trillion cubic feet)



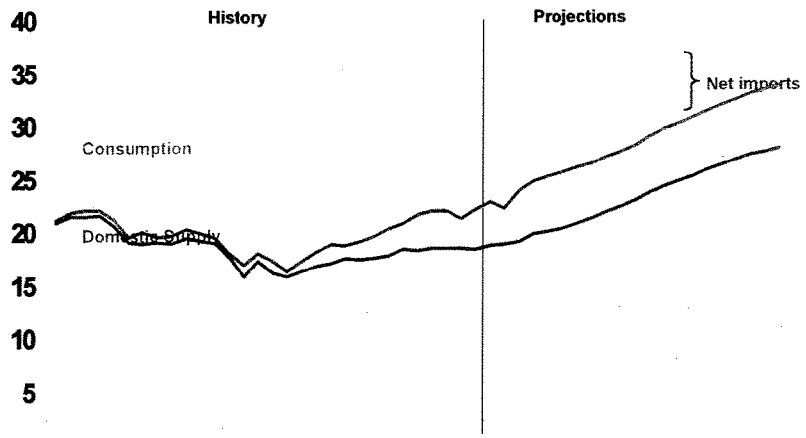
Historically the industrial sector is the largest gas-consuming sector, with significant amounts of gas used in the bulk chemical, refining, and metal durables sectors. Industrial consumption is expected to increase by 1.7 Tcf over the forecast, driven primarily by macroeconomic growth.

Combined consumption in the residential and commercial sectors is projected to increase 2.1 Tcf from 2001 to 2020, driven by increasing population, healthy economic growth, and preference by consumers to use natural gas as heating fuel over other heating fuel types. Because residential natural gas prices are projected to be lower than the prices of other fuels, the number of homes heated by natural gas

is projected to increase more than those heated by electricity. Natural gas currently accounts for 20 percent of commercial energy consumption and is projected to maintain that share throughout the forecast.

Supply and Imports. Domestic gas production is projected to increase at an average annual rate of 2 percent over the forecast, rising from 19.3 Tcf in 2001 to 28.5 Tcf in 2020 (Figure 2). Growing production reflects rising wellhead gas prices from 2002 through 2020, relatively abundant gas resources, and improvements in technologies, particularly for offshore and unconventional gas. However, under the prices in our reference case we do not expect that additional liquefied natural gas (LNG) facilities will be constructed or that an Alaskan pipeline will be built to the Lower 48 States through 2020. The national average wellhead price is projected to be $3.26 per thousand cubic feet (Mcf) in 2000 dollars in 2020.

Figure 2. Natural Gas Supply, Consumption, and Imports, 1970-2020 (trillion cubic feet)

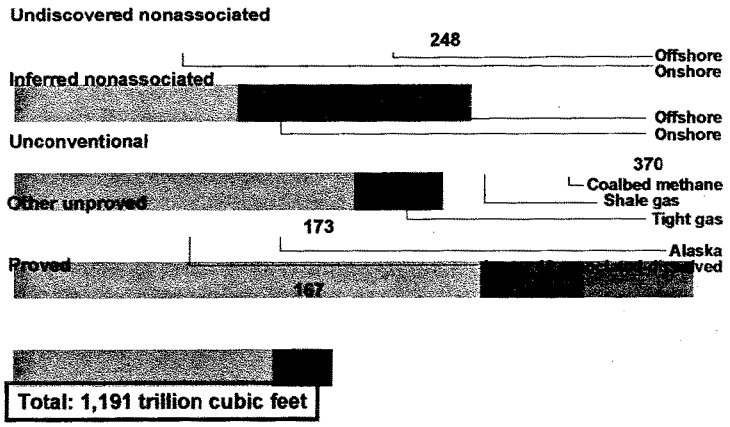


The difference between consumption and production is met by the increasing use of imports throughout the forecast, particularly from Canada. By 2020, total net imports are expected to increase1.8 Tcf over 2001 levels of 3.6 Tcf. While we do not expect the construction of new LNG terminals in the United States by 2020, expansion at the existing terminals and opening of mothballed terminals is expected to result in a significant increase over 2001 LNG import levels, from 0.24 Tcf to 0.83 Tcf. One LNG facility, at Cove Point, Maryland, has been closed for years but is expected to reopen late in 2002 or early in 2003. By 2010, this facility plus the three currently operating facilities at Elba Island, Georgia; Everett, Massachusetts; and Lake Charles, Louisiana, will be operating at full capacity, including announced expansions.

Resources. The estimate of total technically recoverable natural gas resources in the United States as of January 1, 2000, that was used in developing this forecast, is 1,191 Tcf. Based on this estimate, the United States could produce almost 30 Tcf of natural gas a year for the next 40 years.

Proved natural gas reserves were 167 Tcf in the beginning of 2000 (Figure 3). Proved reserves are gas from known reservoirs that have been demonstrated with reasonable certainty (using geological and engineering data) as being recoverable in future years under existing economic and operating conditions.

Figure 3. Technically Recoverable U.S. Natural Gas Resources as of January 1, 2000 (trillion cubic feet)



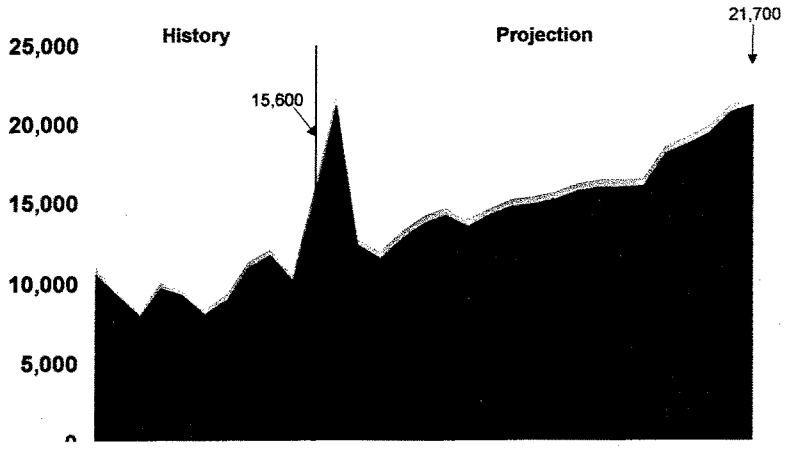
Inferred natural gas reserves (at 233 Tcf) are gas in known reservoirs that are estimated to exist, but data are insufficient as to the certainty of recovery. Some 79 percent of inferred reserves are in onshore reservoirs.

Undiscovered resources are unproved resources that are estimated to exist in fields that have yet to be discovered. More than half of the estimated U.S. technically recoverable undiscovered resources are in the offshore, with 65 percent of these in deep waters, greater than 200 meters. The largest category of unproved resources is unconventional gas resources, 370 Tcf, with 69 percent from tight gas (low permeability deposits in sandstone formations).

Drilling. One of the key activities in producing natural gas is drilling. The slowdown in drilling that resulted from low natural gas wellhead prices in 1998 and 1999 is one of the contributing factors to the high winter prices of late 2000 and early 2001, and the subsequent boom in drilling in 2000 and 2001.

While lower prices are expected to bring down drilling levels in 2002, overall drilling generally increases in the AEO2002 forecast. The number of gas wells drilled is estimated to be 15,600 in 2000, 22,000 in 2001, 13,000 in 2002 and 21,700 in 2020 (Figure 4). Throughout the forecast about 96 percent of total gas wells are drilled for development in proven reservoirs.

Figure 4. Lower 48 Successful Natural Gas Wells Drilled, 1990-2020 (number of wells)

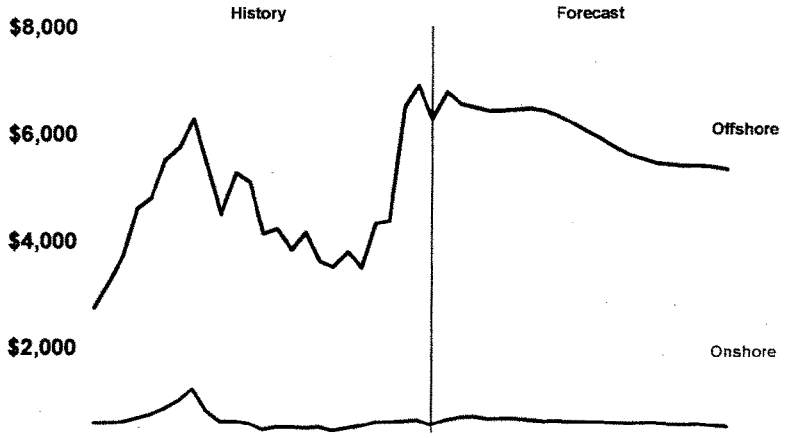


Increases in drilling over the forecast are largely driven by growing revenues from drilling activities, as a result of both higher prices and higher production levels. A secondary driver of increased drilling is decreases in drilling costs resulting from technological advances. Technological improvements in the oil and gas supply industry are assumed to continue at historically estimated rates. For example, the annual rate of technological improvement in drilling costs is estimated to be a low of 0.9 percent for shallow wells and a high of 2.6 percent for deep wells.

Drilling Costs. Drilling costs are estimated at the regional level and take into account the separate impacts of drilling to greater depths, rig availability, the level of drilling activity in the given year, and technological progress. Technology exerts downward pressure on costs but drilling to greater depths, increases in drilling activity, and reductions in rig availability exert upward pressure on costs. In order for drilling costs to decline, technology must offset the impacts of these other components.

Average onshore drilling costs per well have been increasing for the past decade as the use of relatively new, more expensive techniques has increased (Figure 5). Costs are estimated to increase in 2000 and 2001, primarily because of the growth in drilling in activity and rig demand. As technologies continue to reduce costs and the growth in drilling activity stabilizes, drilling costs on average are projected to decline. By 2020, average onshore drilling costs per well are projected to be almost 26 percent lower than in 2001 (9 percent lower than in 1999).

Figure 5. Average Natural Gas Drilling Costs, 1975-2020 (thousand 2000 dollars per well)



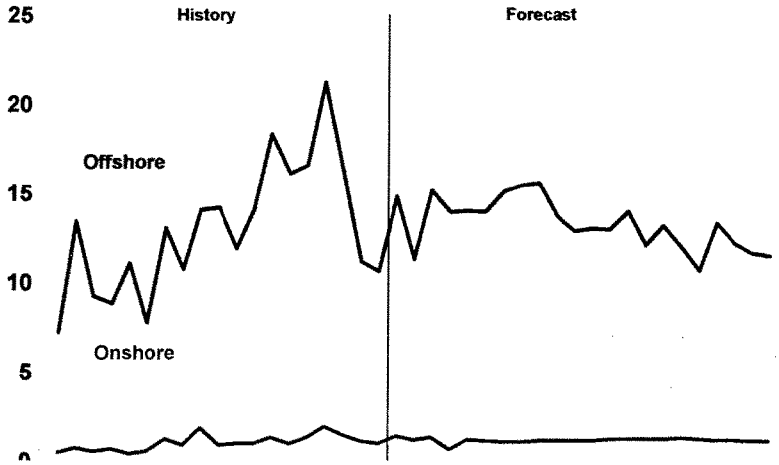
Historically, average offshore technology gains have been more substantial than average onshore gains. The average cost to drill an offshore well significantly increased after 1996 driven by an increase in drilling in the deep waters of the Gulf of Mexico. Continued technological improvements in deep water drilling is expected to lower the overall offshore drilling cost. By 2020, the cost to drill an offshore well is projected to be 19 percent lower than in 2001 and 15 percent lower than in 1999.

Finding Rates. Reserve additions are calculated through a set of equations distinguishing between new field discoveries, discoveries in known fields (also defined as extensions and new pools), and increases due to re-evaluation of discovered areas during the developmental phase (also known as revisions and adjustments).

The finding rate equations capture the impacts of technology, as well as the impact of prices and declining resources. In the absence of technological and economic change, the yield from exploratory and developmental drilling declines with cumulative additions. This reflects the natural progression of the discovery process from larger, more profitable fields to smaller less economical ones. The more mature the region, the faster the decline. Technological advancement accelerates the discovery of the resource by improving the ability to target the more promising resources and by making current uneconomic resources accessible and economic—it does not create new resources.

Natural gas finding rates have varied significantly over the historical period, particularly for offshore wells, but have generally increased from the levels seen in the early 1980's (Figure 6). Over the projection period, onshore gas finding rates are projected to remain fairly constant (roughly 1 billion cubic feet per well). Offshore finding rates are projected to be generally declining yet remaining well above the projected rate for onshore wells.

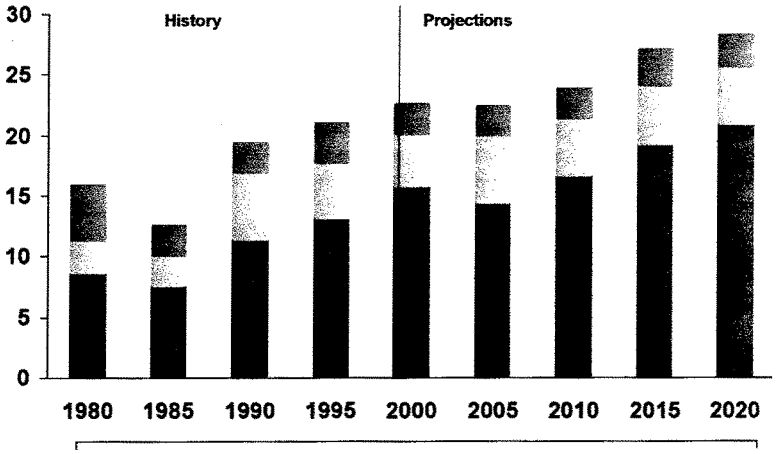
Figure 6. Average Reserve Additions per Nonassociated Gas Well, 1980-2020 (billion cubic feet per well)



Reserve Additions. For most of the past two decades lower 48 natural gas production has exceeded reserve additions, but the pattern for natural gas reversed from 1994 through 1997. With the 1998 decline in prices, reserve additions once again fell below production, but they exceeded production again in 1999. After 2004, rising prices are projected to result in natural gas reserve additions that generally exceed production through 2020, even with expected increases in demand.

The relatively high projected levels of annual gas reserve additions through 2020 reflect an expected increase in exploratory and developmental drilling (Figure 7). This increase is a result of higher prices and expected strong growth in demand, as well as expected productivity gains from technology improvements comparable to those of recent years.

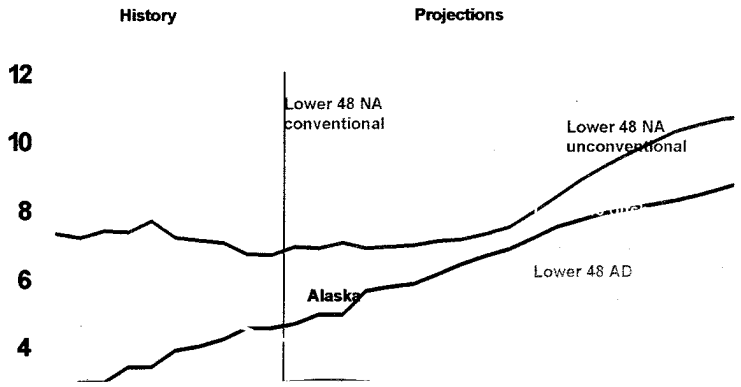
Figure 7. Natural Gas Annual Reserve Additions, 1980-2020 (billion cubic feet)



Production by Source. Domestic gas production is expected to increase from 19.3 Tcf in 2000 to 28.5 Tcf in 2020. Increased U.S. natural gas production is expected to come primarily from lower 48 onshore conventional nonassociated sources—which

accounted for 36 percent of U.S. domestic production in 2001—with an expected increase of 3.9 Tcf by 2020 (Figure 8).

Figure 8. Natural Gas Production by Source, 1990 - 2020 (trillion cubic feet)

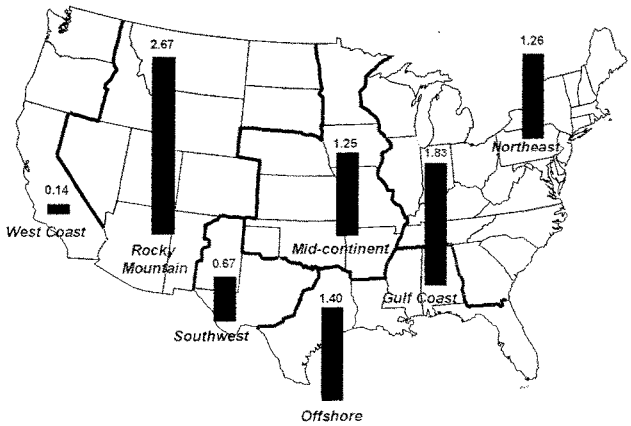


Offshore production, mainly from wells in the Gulf of Mexico, is also expected to increase between 2001 and 2020, although less rapidly. Lower 48 offshore Gulf Coast production was 5.2 Tcf in 2001, down slightly from the record 5.5 Tcf level in 1996. But by 2020 this level is expected to increase to 6.8 Tcf.

Unconventional gas production increases at the fastest rate of any other source over the forecast period, largely because of expanded tight sands gas production in the Rocky Mountain region. Annual production from unconventional sources is expected to increase by 4.1 Tcf by the end of the forecast. Alaska natural gas production rises gradually over the forecast to provide for consumption in the State itself and continued LNG exports to Japan.

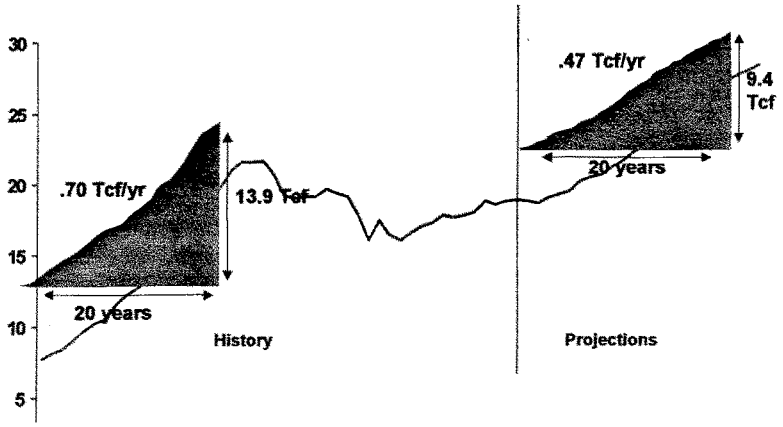
Incremental Production. The Rocky Mountain region, with the majority of the unconventional production (Figure 9), shows the greatest increase in production from 2000 through 2020 due to improved technologies and the availability of abundant resources. The highest producing region throughout the forecast is the offshore Gulf of Mexico. Innovative use of cost-saving technology in recent years and the expected mid-term continuation of recent huge finds, particularly in the deep waters of the Gulf of Mexico, support the projections. While the onshore Gulf Coast region is the second highest producing region throughout the forecast, it is the only region with a decline in production in the last 3 years. Both the Southwest and the Mid-continent regions grow at about the same rate as the total U.S. production, generally maintaining their regional share. The Northeast continues to be the second lowest producing region throughout the forecast, but shows the greatest growth in percentage terms. The majority of gas production from the Northeast is from unconventional sources such as tight sands and gas shales in Michigan, Pennsylvania, and West Virginia.

Figure 9. Incremental Natural Gas Production, 2000 - 2020 (trillion cubic feet)



Historic Gas Production. The growth in natural gas production projected from 2000 to 2020 is not unprecedented for the natural gas industry. From 1952 to 1972 production increased faster than projected over the next 20 years (Figure 10). However, the natural gas market in the 1960's was quite different than today's market and from the market anticipated in the future. One difference is the deregulation of natural gas prices at the wellhead. Even in real terms prices were significantly lower during the earlier time frame than they are today. The average wellhead price from 1952 to 1971 was only 27 percent of the average wellhead price between 1995 and 2000 ($0.64 compared to $2.38 per Mcf in 2000 dollars). Higher prices provide greater incentive to increase production.

Figure 10. Natural Gas Production,1952 - 2020 (trillion cubic feet)



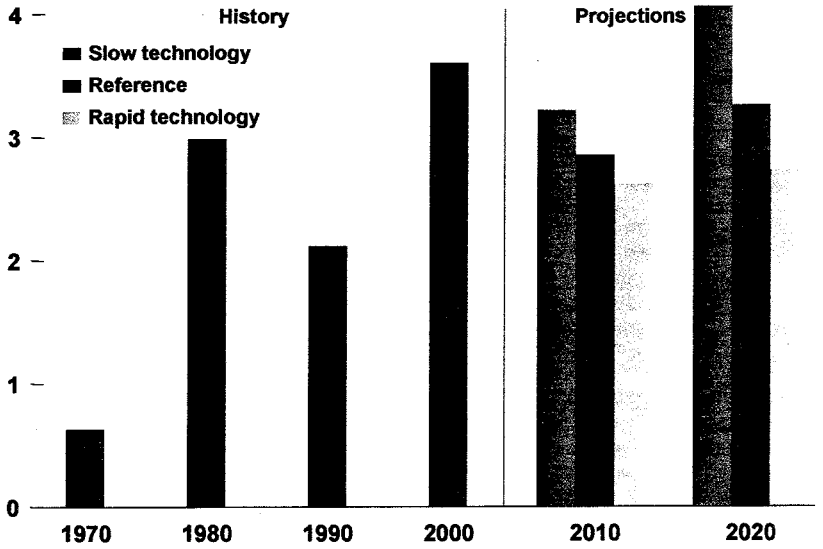
A more important difference is the quality of available prospects. Producers tend to first drill for the gas that is relatively cheaper to access and produce. Progressively over time the more expensive prospects are tapped. However, vast improvements in exploration and production technologies have brought overall costs down significantly. One of the key areas of improvement has been the ability to better determine where gas is located before drilling an expensive and potentially dry hole.

Prices. Wellhead natural gas prices are expected to be more sensitive to variation in technological change than are the levels of natural gas production and consumption. The projected price of natural gas reflects the long-run marginal cost of domestic natural gas production and imports, which depends strongly on technological progress. Natural gas production and imports, however, vary across the technology cases only to the extent that demand for natural gas responds to the change in price.

Natural gas demand is relatively unresponsive to price changes in the short term but can be more responsive over time as price differences among competing fuels lead to different decisions with regard to purchases of natural-gas-consuming equipment.

Over the projection period, lower 48 natural gas wellhead prices are projected to increase from the average wellhead natural gas price of $2.38 per thousand cubic feet between 1995 and 2000 in the reference and technology cases (Figure 11). The slow and rapid technology cases assume that the rate of technological improvement in production costs, finding rates, and success rates will respectively decrease or increase by 25 percent, relative to the historical rate assumed in the reference case.

Figure 11. Lower 48 Natural Gas Wellhead Prices in Three Cases, 1970-2020 (2000 dollars per thousand cubic feet)



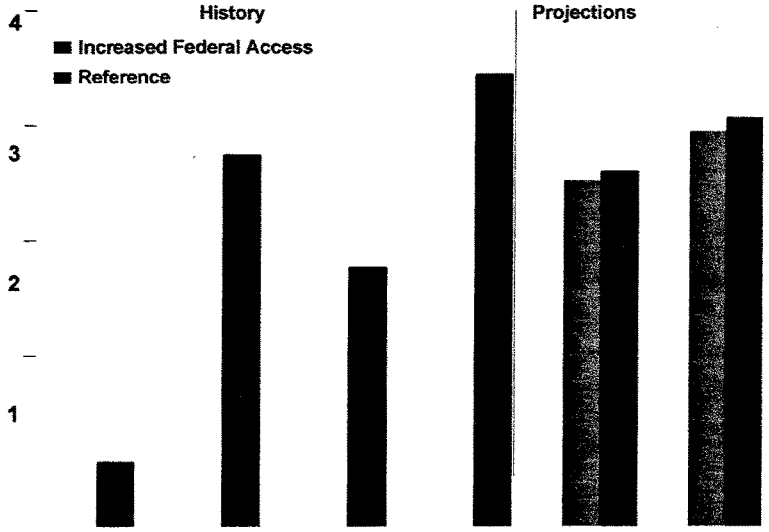
The lower 48 average wellhead price in 2020 is projected to be $4.06 per thousand cubic feet in the slow technology case, which is 25 percent higher than the reference case price of $3.26 per thousand cubic feet in 2020 ($5.56 in nominal dollars). In the rapid technology case, lower 48 natural gas wellhead prices are projected to remain relatively flat from 2005 through 2020, reaching $2.73 per thousand cubic feet in 2020, which is 16 percent lower than in the reference case. These price forecasts are long-term price trends and as such do not reflect the volatility in short-term markets. For example, the variation from the general price trajectory in any given year could be significant, as happened in 2001.

Access to Restricted Federal Lands and Waters. Federal access restrictions substantially affect the Rocky Mountain region, where considerable natural gas resources are either off limits to exploration and development or subject to Federal lease stipulations when production is allowed. Federal access limitations also affect offshore natural gas resources in the Pacific, Atlantic, and Eastern Gulf of Mexico Outer Continental Shelf. If Federal access restrictions were reduced as described in the EIA's December 2001 study, U.S. Natural Gas Markets: Mid-term Prospects for Natural Gas Supply, the technically recoverable natural gas resource base would be expected to increase by 86 tcf, expanding the resource base 7 percent (from 1,191 Tcf to 1,277 Tcf), and 50.8 Tcf of resources in the Rocky Mountain region would become less costly to develop because of shorter lead times. This reduction in restric-

tions does not include access to the estimated 62.5 Tcf of natural gas resources in National Parks, National Monuments, and wilderness and roadless areas.

With the larger, less costly resource base, cumulative lower 48 reserve additions throughout the forecast are projected to be 15 Tcf higher than in the reference case (506 Tcf compared to 491 Tcf). The remaining lower 48 natural gas reserves in 2020 are projected to be 11 Tcf higher than in the reference case. With this improved reserve position, natural gas production in 2020 is projected to be 0.6 tcf higher, and the average wellhead price is projected to be 11 cents per thousand cubic feet lower than in the reference case (Figure 12).

Figure 12. Lower 48 Natural Gas Wellhead Prices in Two Cases, 1970-2020 (2000 dollars per thousand cubic feet)



Conclusion

In summary, domestic natural gas production is projected to increase by 2 percent per year on average over the forecast period. A similar rate of increase is expected for the price, from a base price representing the average over the last 5 years of the 1990's—$2.18 per Mcf in 2000 dollars. With a slightly more rapid growth in imports (2.4 percent per year), largely from Canada, sufficient supplies are expected to be available to satisfy the growing demand for natural gas, primarily from electric generators.

Thank you, Madame Chairman and members of the Subcommittee. I will be happy to answer any questions you may have.

Mrs. CUBIN. Thank you.

I would now like to recognize Mr. Simmons for 5 minutes.

STATEMENT OF MATTHEW SIMMONS, PRESIDENT, SIMMONS AND COMPANY, INTERNATIONAL

Mr. SIMMONS. Madam Chairman, I testified at this Subcommittee 15 months ago about the precarious supply demand balance facing North American natural gas. Since then, the problem has grown in its severity.

Natural gas demand needs to grow even faster than once thought while supply continues to stay flat as it has done for the past 8 years, despite a natural gas drilling boom of historic proportion in both the U.S. and Canada.

There is now a grave chance that natural gas supplies will fall beyond the three to 5 percent drop seen so far. By the time the current supply decline bottoms out, the drop could be severe.

It is now becoming clear that the concept that gas supplies could grow to even partially meet the demand and the magnitude of a 30 TCF a year market is unlikely to occur in this decade. Even worse, if daily gas production falls by as much as 10 percent, and the drop could be worse, this could become America's most serious energy wakeup call since the 1973 oil shock.

Let me put some numbers behind this grave warning by starting with the demand side. The March 2000 National Petroleum Council (NPC) natural gas report presented a compelling case as to why gas supplies needed to grow to almost 30 TCF by 2010.

Since the study was done, almost as many new gas-fired power plants have already been built, as the NPC study assumed would occur by 2010. Furthermore, there are almost as many additional gas-fired plants still under construction as have been built thus far.

Natural gas demand in 2000 was more robust than the NPC model assumed. Then gas demand began to weaken and the residential, commercial and industrial markets, largely due to benign weather, added by a weakened economy.

However, gas used to create electricity grew by 16 percent between 1999 and 2001. The amount of gas now used to create electricity is almost 30 percent more than the gas consumed for all industrial uses.

If the U.S. experience is a hot, muggy summer in 2002, similar to the summer of 1999, gas used to create electricity could soar to over 8 TCF this year. This is double the amount of electricity creation as the decade of the 90's began. On the supply side, daily U.S. gas production stayed mired at 50 to 53 BcF a day, from 1990 to 1999, despite a steady increase in more gas wells being drilled and a dazzling array of technology advances.

A drilling boom of record proportion then occurred in 2000 and 2001. But despite this drilling boom, supply barely grew. Over the past decade the industry completed over 116,000 new gas wells, but less than 6,000 were exploratory wells.

In the old drilling boom of 1976 to 1981, the industry completed almost nine times more exploratory gas wells than it averaged between 1995 and 1999. All this frenzied development drilling was also rapidly exhausting most of the available drill sites.

To use a real estate analogy, it would be the equivalent to a large homebuilder adding record amounts of new subdivisions without ever buying any new raw land.

Had the drilling boom continued, a lack of identifiable drills sites would have eventually brought it to a standstill? But the drilling boom did not persist. Instead, it collapsed.

There is now a serious question as to how far gas supplies could fall. In an effort to answer this serious question, our firm conducted an in-depth supply analysis for 53 counties in Texas, which account for 65 percent of Texas' gas supply and 16 percent of U.S. supply.

We measure the production results from all the gas wells completed in 1998 through 2001. What the survey highlighted was the

remarkable importance which new gas wells have on total gas supply.

Nearly 30 percent of the production coming from 39,000 individual wells in this 53 county survey came from less than 3,000 wells, which were completed in 2001. More important, 167 wells out of the 3,000 completions accounted for almost half of the new well production.

Once these high volume wells reach peak production, they begin ferocious rates of decline. These giant gas wells are expensive to drill and take almost a year from spudding the well to reaching peak rates.

What this highlights is the industry's evolution into a just-in-time supplier which created a necessity for appropriate access to all the best drilling sites and for stable gas prices to ensure steadily increasing amount of new wells were always being drilled. But neither of these occurred.

Since the 2000-2001 drilling boom did not last, the U.S. now faces a possible gas crisis. Gas supplies will almost certainly continue to drop. The fall could be as severe as 10 percent or more. There are some long-term solutions to this problem. The biggest solution and only genuine remedy is access to all possible gas resources.

We need far more Arctic gas than a single pipeline can deliver. Whether two pipelines is even sufficient is a serious question to debate. We need all the deep water gas that can be developed as fast as possible. We need to find ways to drill the great vertical depths that the high volume giant gas wells in south Texas now tap.

Unfortunately, though, these wells do not last long, so a far bigger fleet of high horsepower rigs is essential to make this important supply sustainable.

There is an urgent need for serious research programs on ways to tap unconventional gas resources and to ensure ultra deepwater development advances fast.

Creating such an R&D program could be the most lasting positive impact of a badly needed U.S. energy bill. But at the end of the day it all gets back to access. Ultimately access will need to be extended to the entire Outer Continental Shelf acreage of the United States and in all Federal lands where gas can be tapped.

The U.S. would be wise to learn from Canada who will soon begin to drill deepwater gas offshore British Columbia, in addition to the impressive results it is now realizing in offshore gas development just north of New England.

If gas supplies do drop by 10 percent or more, this should serve as a serious energy wakeup call for the United States. It would be tragic for the strongest economy in the world to be held hostage to an inability to grow domestic natural gas supply simply because the U.S. shut down any ability to find and develop this clean energy source in the offshore waters outside our two main energy producing States.

I hope I am being overly worrisome about our pending supply drop, but I have reached this view through hundreds of hours of personal study of the issues and numbers involved.

Thank you.

Mrs. CUBIN. Thank you.

[The prepared statement of Mr. Simmons follows:]

Statement of Matthew Simmons, President, Simmons & Company International

I am Matthew Simmons, president of Simmons & Company International, an investment bank that has specialized exclusively in energy investment banking and energy research to the leading institutional investors in the U.S. for the past 29 years. I serve on the National Petroleum Council and was the Demand Task Force Chairman for the NPC's 2000 report on the future challenges facing natural gas. I am also a past chairman of the National Ocean Industries Association.

I testified at this committee 15 months ago about the precarious supply/demand balance facing North American natural gas. Since then, the problem has grown in its severity. Natural gas demand must grow even faster than once thought in order for America to increase its electricity use while supply continues to stay flat as it has done for the past eight years, despite a natural gas drilling boom in both the U.S. and Canada of historical proportion.

There is now a grave chance that natural gas supplies will fall beyond the 3 to 5% drop seen so far. By the time the current supply decline bottoms out, the drop could be severe. Suddenly the concept that gas supplies could grow to even partially meet the demand in the magnitude of 30 TCF a year is becoming a remote dream. If supply falls by as much as 10%, and the drop could be far worse, this could become America's most serious energy wake-up call since the 1973 Oil Shock.

The precarious supply/demand imbalance of 15 months ago is now headed towards a colossal mismatch between a need for demand to soar while supply drops. The only truism is energy is that demand can never exceed supply. Whatever supply becomes will define the limit to what demand for natural gas will be.

Let me put some numbers behind this grave warning by starting with the demand side of the gas equation. The March 2000 NPC natural gas report presented a compelling case as to why gas supplies must grow from 22 TCF to almost 30 TCF by 2010. We now have on-stream close to the number of gas fired power plants that the NPC study assumed would be built by 2010. Moreover, there are almost as many additional gas fired plants still under construction that have been built thus far, despite cancellations right and left in the wake of Enron and other energy traders" scandals.

The NPC study also assumed that a large number of new gas-fired plants would have dual fuel switching capability. In reality, virtually almost all new plants are being built to use only natural gas.

The NPC report assumed very little gas-fired plant additions in Canada. This also turned out to be incorrect. The combination of these various assumption errors created a need for far more gas supply than the aggressive 30–TCFneeds by 2010 suggested.

Actual gas demand in 2000 was more robust than the NPC model assumed. Then gas demand began to weaken in the residential, commercial and industrial markets. However, gas used to create electricity grew by 16% between 1999 and 2001, despite a particularly mild summer in 2001 and virtually no severe winter weather in 2001/2002.

When the gas used for non-electric utility power plants is added to the electric utility gas use (and subtracted from industrial gas where the critical component of gas demand is still listed in the EIA Natural Gas Statistics,) the amount of gas used to create electricity now exceeds the gas used for all industrial markets by a sizable percentage.

The weak economy dampened gas demand by a modest degree, but benign weather and the demand destruction caused by $10 gas kept gas demand from being far higher. Had the weather not been benign, gas storage would now be facing a severe crisis. Instead, storage became sufficiently full, and, once again, gas prices collapsed. The difference between a storage crisis and storage being (what some believe) too full was a modest 5 bcf/d of lesser demand, highlighting the precarious balance the country faced for its most precious energy source as the 21st Century began.

If the U.S. experiences a hot, muggy summer in 2002, similar to the summer of 1999, gas used to create electricity could soar to over 8 TCF for the year. This is double the amount used for electricity creation as the decade of the 1990s began.

On the supply side, daily U.S. gas production stayed mired at 50 to 53 bcf/d (18 to 19 TCF per year) from 1990 through 1999, despite a steady increase in more gas wells being drilled and a dazzling array of technological advances. A drilling boom of record proportion then occurred in 2000 and 2001. U.S. gas well completions totaled 15,600 in 2000, almost 60% higher than the average new wells completed in the past seven to 10 years. But, this was just a prelude to the all-time record gas

wells completed in 2001, which, at 22,086 was almost 2,000 more new wells than were completed in 1981.

Despite this drilling boom, supply barely grew and some data argues that it merely stayed flat when the added gas from natural gas liquids that remained in the gas stream (instead of being stripped) are taken out of normal gas supplies.

It took a massive effort to keep natural gas supplies flat. Over the past decade, the industry completed over 116,000 new gas wells. Of these, 110,000 wells were development wells. In a decade, only 5,939 exploratory gas wells were drilled. Between 1977 and 1982, the industry completed 8.9 times more exploratory gas wells than it averaged between 1995 and 1999. Even during the greatest drilling boom in U.S. history in 2001, only 954 exploratory gas wells were completed.

Despite a record drilling boom, little exploration was done. All this frenzied development drilling merely kept daily gas supply flat. Even if the drilling boom had continued, the industry was facing a risk of running out of available development drill sites. To use a real estate analogy, it would be like a large homebuilder adding record amounts of new subdivisions without ever buying any new raw land.

A large contributor to the industry's dwindling gas well drill sites is a lack of access to many potentially high unexplored gas areas, including parts of the Rockies and most of the Outer Continental Shelf (other than offshore Texas and Louisiana.) If the problem of limited access to prime unexplored areas was not bad enough, highly volatile natural gas prices caused massive downsizing in skilled personnel and created a generation of industry participants who became extremely risk adverse.

My guess is that the gas business would have soon faced some supply limits even if the drilling boom grew, as lack of added drilling sites would have eventually brought it to a standstill. But, the drilling boom did not occur. Instead, it collapsed as gas prices fell when gas storage reached a safely full level and demand weakened. Gas drilling stayed strong through October 2001, but thereafter, it fell rapidly. By mid–April of this year, gas rigs at work had declined by 43% from their 3rd quarter 2001 peak.

Reported gas well completions have also started to decline, even though the reported numbers through April 2002 still reflect higher gas drilling through the end of last fall. This is simply a lag effect between the time a gas well is completed and when it is reported. As soon as gas well completions for the 3rd and 4th quarters of 2002 are reported, they will likely drop by another 200 to 400 wells per month, taking the gas completion rate back to levels last seen in early 2000.

Gas drilling has rebounded from April lows. If this increase continues, these low completions should bottom out by late this year. If the industry begins to suffer from a simple lack of drill sites, a drilling rebound to the levels seen throughout 2001 would be a long way off. There were too many signs that the peak of the 2001 drilling boom was unsustainable from a personnel, rig and drill-site standpoint.

The question this raises is how far gas supplies could fall. Our firm conducted a massive supply analysis for 53 counties in Texas which account for 65% of all Texas gas and represents 16% of the U.S. supply. In this extensive survey, we measured the production coming from all the wells completed in 1998 through 2001. Nearly 30% of the production coming from 39,000 individual wells came from less than 3,000 wells completed in 2001.

More important, a small number of highly prolific wells, amounting to only 5% of the new 2001 wells drilled, accounted for almost half of the new well production. These high volume wells maintain peak production for a very brief time and then begin ferocious rates of decline. These giant gas wells are expensive to drill and take almost a year from spudding the well to reaching peak rates.

A classic example of this phenomenon is in Brooks County in South Texas. Ten to eleven high-volume wells make up over 75% of the total gas production in this county, though Brooks County has been a fast-growing source of Texas gas and now ranks as one of the top-ten producing counties in the state. Once these giant wells peak, they can easily lose two-thirds of their production volume within six to nine months.

In this 53-county analysis, 167 giant gas wells completed in 2001, with an average production life of less than six months, made up almost 15% of the total production coming from 39,000 total wells.

This highlights the risk gas supplies now face in a drilling decline. The industry has gone to what has literally regressed to just-in-time supply. A just-in-time supply could have worked if appropriate access to all the proper drilling sites had been available, and gas prices created a stable environment for a steadily increasing amount of new wells being drilled. But, none of this happened.

The decline rates for most of the new gas wells have never been higher. To fight this decline will take a steady increase in more new wells being drilled, not to grow supply, but to merely keep the current base flat.

But, the 2000/2001 drilling boom was unsustainable. Instead, a new decline set in. As a result, the U.S. now faces a possible gas crisis that not only raises serious questions about what was believed to be America's most reliable energy source, but a crisis that could also put a lid on the country's ability to expand our generation of electricity until we diversify future power-plant fuel sources, weaning them off their current almost total dependence on natural gas.

Gas supplies will almost certainly continue to drop. A fall of 10% or more is not a certainty, but the risk is high enough that America and the energy industry need to formulate contingency plans on how to react to such a supply short fall.

There are some long-term solutions to this problem. We need far more Arctic gas than a single pipeline can deliver. We need all the deepwater gas that can be developed but it is also important to understand that most deepwater oil and gas projects have the same high decline rates that conventional gas now experiences.

We need far more LNG infrastructure than currently exists. But after a handful of added unloading terminals are built, the world's total LNG capacity will be in balance. Thereafter, the next series of LNG projects need to include not just an unloading terminal but also a dedicated gas field, a pipeline, a liquefaction plant and dedicated LNG vessels. It is extremely risky for the U.S. to build a series of offloading terminals on the assumption that all the other components required to make LNG work get developed on a spot market basis.

We need to find ways to drill to the great vertical depths that the high volume giant gas wells in South Texas now tap. Unfortunately, these wells do not last long, so a far bigger fleet of high horsepower rigs to make this important supply sustainable is essential.

It is also critical that we find a way to tame the extreme price volatility that has now become routine in the natural gas world of 2002. No serious business can cope with prices that bounce up and down by a factor of three to 10 times over the course of a year or two. This volatility is like an insidious cancer and will ultimately kill the gas business unless it is destroyed.

One way to address the extreme gas volatility is to better educate energy traders that the data produced by even the best systems available is not very precise, and should not be used like yesterday's racing forms to place aggressive bets on natural gas.

I applaud the EIA's efforts to attempt to get a good handle on the gas storage numbers as they are reported week by week. But, this system will always be subject to err. The problem is not the sketchy data, but the way that energy traders grab this data and translate it into billon dollar energy bets. This data problem and energy price volatility extends far beyond just natural gas.

Finally, access is extremely important. Ultimately, access will need to be extended to all the Outer Continental Shelf acreage of the USA. We must learn from Canada, our northern neighbor, who will soon begin offshore Pacific drilling in addition to the impressive results it is realizing just north of New England. If gas supplies do drop by 10% or more, this should serve as a serious energy wake-up call for the U.S. It would be tragic for the strongest economy in the world to be held hostage to an inability to grow domestic natural gas supply simply because the USA shut down any ability to find and develop this clean energy source in any offshore waters outside our two main energy- producing states.

I commend your committee for holding this hearing to air these serious issues. I hope my remarks help clarify how dangerous and precarious a situation the country now faces with its most precious energy source.

I hope I am being overly worrisome about the pending supply drop, but I have reached this view through hundreds of hours of personal study of the issues and numbers involved.

Thank you.

Mrs. CUBIN. I would now like to recognize Mr. True.

STATEMENT OF DIEMER TRUE, PARTNER AND CHAIRMAN, TRUE OIL COMPANY, INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA.

Mr. TRUE. Madam Chairman, thank you for this opportunity to testify. Today I am testifying on behalf of nine national trade asso-

ciations and 33 cooperating State and regional oil and gas associations.

The role of Federal lands in meeting future natural gas demand is a critical one and this hearing is a timely opportunity to address both that role and the general issues surrounding natural gas supply in the United States.

The challenge facing natural gas producers is two-fold, maintaining existing natural gas supply and increasing that supply to meet future demand. Perhaps the most compelling challenge to maintaining existing supply is coping with increasing rates of depletion.

Over the past decade, producers have seen average depletion rates climb from 16 percent per year to 23 percent per year. In somewhat simplified terms, that means producers must initiate new production equal to a quarter of the existing production each year just to stay even.

Some experts believe that domestic natural gas production in 2002 will decline from last year's level and I agree with these assessments. They reflect the combined effects of higher depletion from existing production and less development of new wells, as Matt very clearly laid out.

Policy makers need to understand these implications clearly. Increases in demand from either higher economic activity or weather can stress the natural gas market, quickly creating supply shortages and the higher prices that follow.

Not only must these issues be addressed, but the industry must also be capable of increasing natural gas supply to meet future increased demand. Natural gas remains the most abundant and reliable clean-burning fuel to meet national environmental objectives while enhancing the use of stable domestic fuel sources.

Natural gas consumption is expected to grow by over 30 percent over the next 15 years. This cannot be done without more access to and development of government-controlled resources. However, development of these resources remains a substantial challenge.

The western and central Gulf of Mexico has proven to be a world class area for natural gas, accounting for over 25 percent of domestic natural gas production. The 1999 NPC study projects that the future production includes in these areas is essential to meet projected demand. However, future production increases will hinge on Federal offshore policies. The most significant of these in the western and central Gulf of Mexico relate to royalty policies, that is creating incentives to encourage the effective development of the area.

Developing the substantial domestic natural gas reserves in m oversight of the eastern Gulf of Mexico, the Atlantic Ocean and California is prohibited by moratoria. Too often, these policies are predicated on the events that happened 30 years ago. Federal policy needs to be reviewed and to be based upon a sound understanding of today's technology.

Over 70 trillion cubic feet of natural gas in these areas is precluded from development. Much of the onshore natural gas resource base is located in the Rocky Mountains where Federal policy limits access to an estimated 137 trillion cubic feet of natural gas.

Regulations like the Forest Service road policy, which is currently stayed by court action, and prohibitions on leasing in the

Lewis and Clark national forest and in wilderness study areas are essentially absolute.

At the same time, the permitting process to explore and develop resources often can work to effectively prohibit access and development. These constraints range from Federal agencies to laying permits to revised environmental impact statements to habitat management plans overlaying one another prohibiting activity to unreasonable permit requirements to prevent production.

For example, in the Jack Morrow Hills area, natural gas development is being delayed because the Federal Coordinated Activity Plan was challenged as outdated. As a result the BLM has revised the Federal EIS to reflect the higher level of natural gas development.

Now, those who seek to prevent access to the resource are challenging that EIS. Similarly, in the Buffalo, Wyoming, BLM area new challenges are underway to existing leases based on the arguments that the current resource management plan does not allow the level of development that is underway.

If such an interpretation is sustained, natural gas development in the entire Power River Basin could be strangled.

There is no simple or single solution to these constraints. What is required is a commitment to develop these access policies with a full recognition of the important of developing the natural gas resources.

The question becomes, what provisions the energy legislation now in conference can improve access to and development of the government-controlled land, both onshore and submerged. There are several beneficial provisions, primarily in the House-passed version of H.R. 4.

In my written testimony, I have summarized our key interests on those provisions.

Thank you again, Madam Chairman for the opportunity to provide this perspective on the challenges facing natural gas production in the United States.

Mrs. CUBIN. Thank you, Mr. True.

[The prepared statement of Mr. True follows:]

Statement of Diemer True, Chairman, Independent Petroleum Association of America

Madam Chairwoman, members of the committee, I am Diemer True, Chairman of the Independent Petroleum Association of America (IPAA). This testimony is submitted on behalf of the IPAA, the American Petroleum Institute (API), the Domestic Petroleum Council (DPC), the International Association of Drilling Contractors (IADC), the National Ocean Industries Association (NOIA), the National Stripper Well Association (NSWA), the Natural Gas Supply Association (NGSA), the Petroleum Equipment Suppliers Association (PESA), the US Oil & Gas Association (USOGA), and 33 cooperating state and regional oil and gas associations. These organizations represent petroleum and natural gas producers, the segment of the industry that is affected the most when domestic energy policy does not recognize the importance of our own national resources.

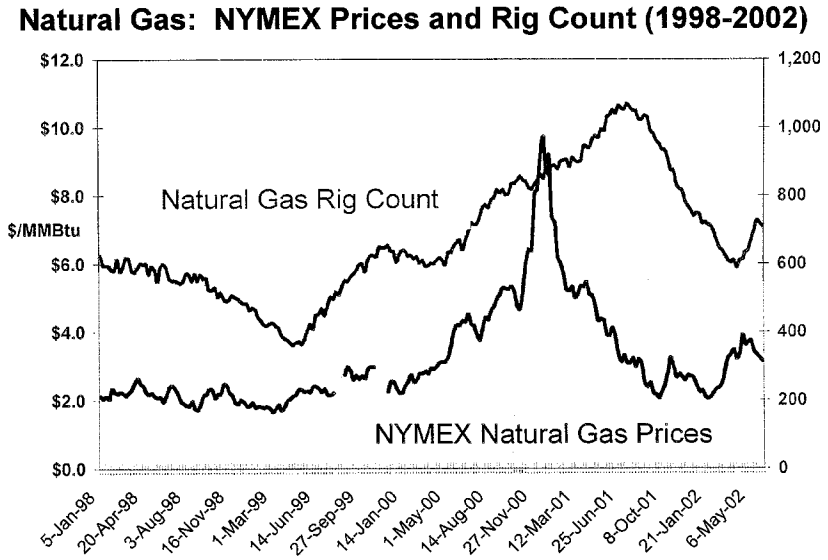
This hearing is directed at examining what we believe is a growing natural gas supply and demand imbalance and the role that public lands and federal submerged lands could play in the solution. The role of federal lands in meeting future natural gas demand is a critical one and this hearing is a timely opportunity to address both that role and the general issues surrounding natural gas supply in the United States.

The Supply Challenge

Initially, it is important to put the current natural gas supply and demand situation in some perspective. At year-end 2000, we saw the consequences of natural gas supply shortages. As storage dwindled, prices soared and consumers had to deal with the consequences. The initial phase of this supply-demand imbalance reflected the effects of low oil prices in 1998–99 on capital availability to develop domestic natural gas supply. These historically low petroleum prices resulted in capital expenditure budget cuts for domestic producers exceeding 30 percent in 1999. The natural gas drilling rig count dropped by over 40 percent at its lowest point. In 1999, new wells failed to replace existing reserves.

The petroleum price recovery and the industry's recognition that future natural gas demand would increase led by more and more electricity generated by gas powered turbines triggered a robust rebound in drilling for natural gas. Rig counts went to record levels. But, the lag in new production caused by the low petroleum prices left a tight market by the end of 2000. Higher prices resulted in more drilling rigs searching for natural gas.

The higher prices also reduced short-term demand. In reality, the abatement of high natural gas prices resulted from significant demand decreases not from supply increases. Increased drilling activity simply could not increase supply in the time period that was involved.



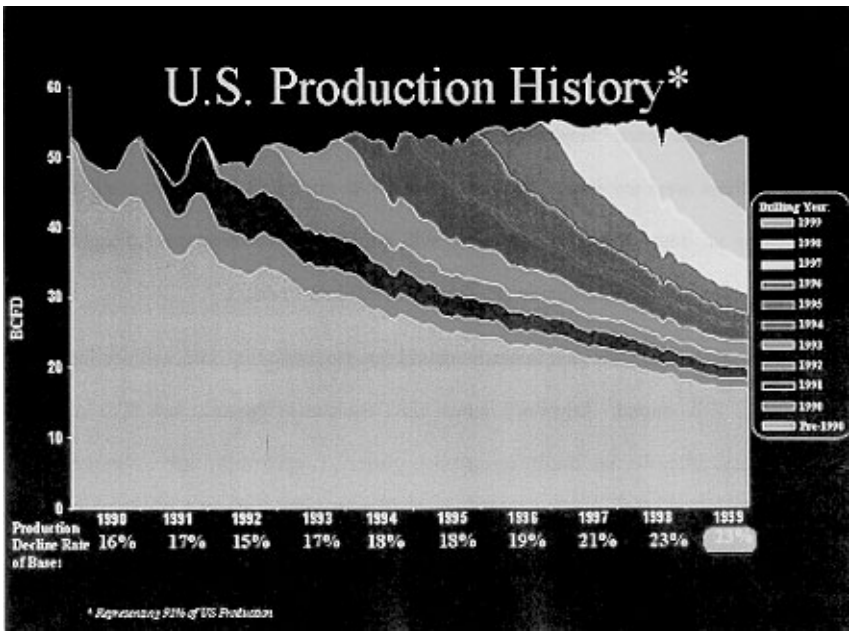
In the latter months of the 2001, prices had fallen to levels comparable to the first part of 1999 and rig counts began to fall as well. By year-end 2001 rig counts had fallen to levels last seen in April 2000. While rig counts have currently risen to around 700, they are well below the 1000 rate that was achieved in the fall of 2001. The implication of these lower rig counts is clear—current supply levels may not be sustainable.

Maintaining Existing Supplies

The challenge facing natural gas producers is twofold—maintaining existing natural gas supply and increasing that supply to meet future demand. While analyses like the 1999 National Petroleum Council Natural Gas study have focused on the resources that need to be developed to meet future demand—particularly with regard to federal lands—the challenge of maintaining existing supply has not received the attention it deserves.

The first and perhaps most compelling challenge to maintaining existing supply is coping with increasing rates of depletion. Conventional natural gas wells begin to deplete as soon as they begin to produce. But over the past decade, producers have seen average depletion rates climb from 16 percent per year to 23 percent per year. In somewhat simplified terms this means that producers must initiate new production equal to a quarter of existing production each year just to stay even. New technologies like 3–D and 4–D seismic enable explorationists to find smaller

reservoirs. Enhanced production technologies like horizontal drilling are allowing better and more environmentally effective development of reserves. But finding smaller reserves and producing them more effectively makes the challenge of maintaining existing natural gas supply more difficult.



Second, it is important to understand the extent of development of the existing resource base. Some opponents of accessing additional federal lands suggest that the current resource base should be the first focus. In reality, it already is. Developing the current resource base for both conventional and unconventional natural gas is the source of existing supply. When the rig count grew to 1000, this is where it had to grow. But this resource base has supplied natural gas for the past 50 plus years. These mature reserves are harder and more costly to develop. New reserves in these areas are smaller and deplete faster or are deeper and more costly to develop. But, there is no doubt that these resources will continue to be developed as aggressively as natural gas prices justify development and capital is available to do so.

Some experts believe that domestic natural gas production in 2002 will decline from last year's level. This month, Raymond James and Associates reported that U.S. natural gas production has fallen for the fourth consecutive quarter. I agree with these assessments. They reflect the combined effects of higher depletion from existing production and less development of new wells. In a sense the market is also reflecting this reality. Despite natural gas storage volumes that would suggest adequate supply, the futures prices for natural gas have remained near or above $3.00 per thousand cubic feet.

Policymakers need to understand these implications clearly. Lower rig counts and higher depletion are adversely affecting available supply. Increases in demand from either higher economic activity or weather can stress the natural gas market, quickly creating supply shortages and the higher prices that follow.

These are the conditions that are defining the current supply and demand balance. Not only must they be addressed, but the industry must also be capable of increasing natural gas supply to meet future increased demand.

Future Supply Challenges

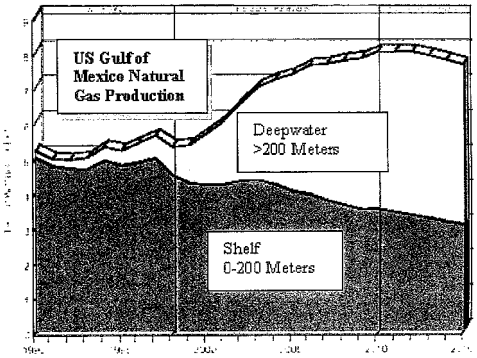
Despite the economic slowdown over the past year and despite the capital limitations that are devastating the merchant power industry that must invest in future electricity generation, natural gas demand will grow. Natural gas remains the most abundant and reliable clean burning fuel to meet national environmental objectives while enhancing the use of stable domestic fuel sources. National energy policy must recognize the importance of accessing the natural gas resource base. The National Petroleum Council in transmitting its 1999 Natural Gas study concluded:

The estimated natural gas resource base is adequate to meet this increasing demand for many decades". However, realizing the full potential for natural gas use in the United States will require focus and action on certain critical factors.

Natural gas consumption is expected to grow by over 30 percent over the next 15 years. While recent events may have slowed the pace of this growth—an issue that is being assessed again by the National Petroleum Council—future natural gas consumption will likely grow at a pace that will require an energy policy that allows the full potential of natural gas to be developed. This cannot be done without more access to and development of government-controlled resources. However, development of these resources remains a substantial challenge.

Offshore - Western and Central Gulf of Mexico

These portions of the Gulf of Mexico have proven to be a world-class area for natural gas as well as petroleum production, accounting for over 25 percent of domestic natural gas production. Production comes from the continental shelf, the deepwater, and the emerging ultra-deepwater. The NPC study projects that future production increases in these areas is essential to meet projected demand. However, future production increases will hinge on federal offshore policies. The most significant of these in the Western and Central Gulf of Mexico relate to royalty policies.

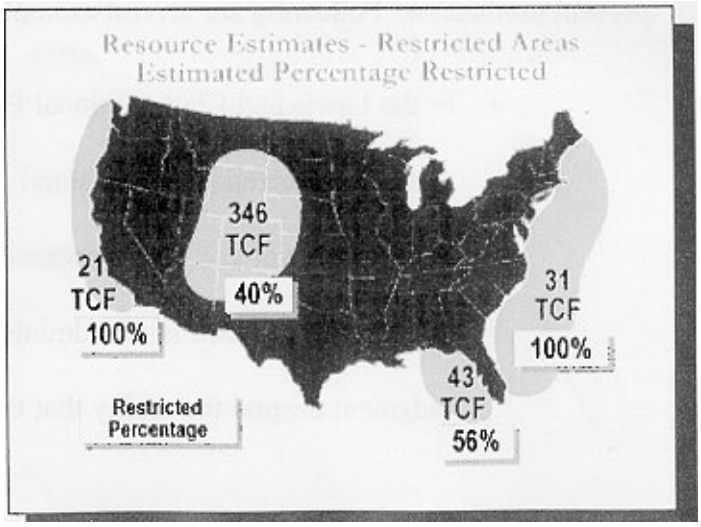


First, offshore production is particularly suited for royalty-in-kind (RIK)—paying the royalty with production instead of dollars. It is a more economical and fairer approach. Recent actions to fill the Strategic Petroleum Reserve could utilize 80 percent of this offshore royalty oil. RIK should be encouraged for natural gas. Second, the 1995 Deepwater Royalty Relief Act was extremely successful promoting activity in the deepwater Gulf. However, the 1995 program expired. Since its expiration, the Minerals Management Service (MMS) has provided more limited, but useful, royalty incentives in recent lease sales. The National Energy Policy recognized that offshore regulatory policies could inhibit the sound development of these resources. Its recommendations should be implemented and further incentives for deep drilling in all depths in the deepwater, deep drilling for natural gas on the shelf, subsalt and highly deviated drilling should be examined.

Offshore - Eastern Gulf of Mexico, Atlantic Ocean, and California

Developing the substantial domestic natural gas reserves in most of these three areas is prohibited by moratoria. President Clinton extended these moratoria for another ten years in 1998 saying, "First, it is clear we must save these shores from oil drilling." This is a flawed argument ignoring the state of current technology; it results in these moratoria preventing natural gas development as well as oil. In fact, both the Eastern Gulf and the Atlantic reserves are viewed as gas reserve areas, not oil—those coasts are not at environmental risk. Too often, these policies are predicated on the events that occurred 30 years ago. For example, no Eastern Gulf of Mexico sale occurred from 1988 to 2001. The recent sale took place only under greatly reduced conditions.

However, this year another ominous step was taken when the federal government decided to purchase leases that have not been developed, primarily due to regulatory limitations, in the Eastern Gulf of Mexico. This action led to calls for similar purchases off the coast of California and on other government controlled land. While each case may have specific merit, following such a course also serves to limit the available resource base at a time when it needs to be expanded.



Federal policy needs to be reviewed. It needs to be based on a sound understanding of today's technology. When the NPC analyzed natural gas reserves that were being inhibited by regulation of these areas, it concluded that over 70 trillion cubic feet of natural gas in these areas are precluded from development.

Onshore Restrictions - A Mosaic of Regulations and Prohibitions

Much of the onshore natural gas resource base is located in the Rocky Mountains where federal policy limits access to an estimated 137 trillion cubic feet of natural gas. The constraints differ. Regulations like the Forest Service roadless policy (currently stayed by court action) and prohibitions in the Lewis and Clark National Forest and in wilderness study areas are essentially absolute. At the same time the permitting process to explore and develop resources often can work to effectively prohibit access and development. These constraints range from federal agencies delaying permits to revise environmental impact statements to habitat management plans overlaying one another prohibiting activity to unreasonable permit requirements that prevent production. Following are several examples.

- In the Lewis and Clark National Forest—a multiple use federal land—the forest manager concluded that natural gas development was inconsistent with the development of the forest because it violated "a sense of place" and prohibited new leasing. There is no administrative mechanism to appeal such an arbitrary judgment despite the reality that there is no such basis for denying the use of the land. Court action to overturn the decision failed because the courts concluded that the decision was within the discretion of the forest manager.
- In the Jack Morrow Hills area, natural gas development is being delayed because the federal Coordinated Activity Plan (CAP) was challenged as outdated. As a result the Bureau of Land Management (BLM) has revised the federal Environmental Impact Statement (EIS) to reflect the higher level of natural gas development. Now, those who seek to prevent access to the resource base are challenging that EIS.
- Similarly, in the Buffalo, Wyoming BLM area, new challenges are underway to existing leases based on arguments that the current Resource Management Plan (RMP) does not allow the level of development that is underway. If such an interpretation is sustained, natural gas development in the entire Powder River Basin area could be strangled.

There is no simple or single solution to these constraints. What is required is a commitment to develop these access policies with a full recognition of the importance of developing the natural gas resource. The National Energy Policy recognized the magnitude of these limitations. Executive Orders to consider energy implications in federal decisionmaking and to convene a task force to improve permitting are important first steps in developing a response. These early efforts have resulted in specific tasks within various Executive Branch departments that should improve the permitting process.

Energy Legislation Before Congress

With these perspectives on the challenges to meet current and future demand for natural gas as a reference point, the question becomes what provisions of the energy legislation now in conference between the House of Representatives and the Senate can improve access to and development of government controlled land, both onshore and submerged. There are several beneficial provisions, primarily in the House passed version of H.R. 4. These include:

Section 6202 provides for royalty incentives in the Western and Central Gulf of Mexico. It parallels the relief now being provided in recent lease sales—those occurring after the House passed its bill. The conferees need to work closely with the Administration to determine the most appropriate approach to assure continuing use of royalty incentives to maximize development of the Western and Central Gulf of Mexico.

Section 6204 provides for analysis of the Gulf of Mexico field size distribution, international competitiveness, and incentives for development. Section 608 of the Senate passed bill addresses some of these same issues. The conferees should examine the best elements of each section to acquire the information needed to formulate future policy on offshore development.

Section 6222 provides for the Secretary of the Interior and the Secretary of Agriculture to jointly undertake a study of the impediments to efficient oil and gas leasing and operations on Federal onshore lands in order to identify means by which unnecessary impediments to the expeditious exploration and production of oil and natural gas on such lands can be removed. Such an analysis could provide policymakers with the information needed to address some of the key problems associated with the leasing process.

Section 6223 directs the Administration to eliminate unwarranted denials and stays of lease issuance and unwarranted restrictions on lease operations from the administration of oil and natural gas leasing on Federal land. Section 602 of the Senate passed bill seeks to ensure timely action on leases and permits. These sections need to be consolidated in a manner that both objectives can be met.

Section 6225 addresses the type of problem raised in the Lewis and Clark National Forest by providing for the involvement of the Secretary of Agriculture in such critical decisions.

Section 6231 and Section 606 (of the Senate bill) provide for suspension of leases involving subsalt formations. These formations can be particularly difficult to develop and the suspension will allow for more time.

Section 6232 provides additional authority to develop RIK programs that will allow for more effective use of the highly desirable approach. RIK eliminates the complexities of determining the royalty value thereby saving both the government and the producer from the convoluted determinations that are now necessary and are frequently questioned—sometimes years after the sales occur.

Section 6233 provides for royalty relief for marginal wells on both federal onshore and offshore properties for both oil and natural gas. As with the marginal well tax credit passed by both houses of Congress, this relief encourages the continued production of these wells in times of low oil and/or natural gas prices. Retaining production from these wells is in the national interest and the provision should be included in the final bill.

Section 6234 provides for the reimbursement through royalty credits when a private party pays for environmental documents that are the responsibility of the federal government to prepare. Given the challenge of developing these key resources and the potential that adequate appropriations are not available, this is a common sense approach to meet the dual objectives of developing sound environmental documents and moving forward on permitting.

Section 610 of the Senate passed bill addresses the important issue of hydraulic fracturing under the Safe Drinking Water Act. While this is not an issue under the jurisdiction of the Resources Committee, it is an important issue to retain in any final bill. The LEAF v. EPA decision in 1997 by the 11th Circuit Court of Appeals incorrectly concluded that Congress intended to regulate the well stimulation process of hydraulic fracturing as underground injection. The Senate passed bill legislatively addresses this issue to eliminate the potential of other litigation on this issue and to provide EPA with the tools to rely on existing state regulation of hydraulic fracturing. In the Rockies, hydraulic fracturing is used extensively on tight sands and shale formations. In the East, it is also used on coalbed formations because harder coal requires it to allow the natural gas to be released.

Collectively, these provisions in the House and Senate passed energy bills address many significant access and development issues. Final legislation needs to include them. Similarly, Congress needs to continue to work with the Administration to facilitate its efforts to improve the permitting process and its resource management

efforts. Money will be an important component of the Administration's efforts, but other authority may be necessary as well.

Thank you for the opportunity to provide this perspective on the challenges facing natural gas production in the United States.

Mrs. CUBIN. It always makes one ponder when you hear testimony and it is contradictory, especially when the testimony is coming from a government agency that contradicts what people in the field actually seem to experience.

Mr. True made a point about assumptions that need to be based on, for example, today's technology, when we are trying to figure out these numbers and what the situation really is.

The assumptions that you base that on are most important and so I would like to ask you, Ms. Hutzler, in your assumptions about the natural gas production out to 2020, you show increases in the Rocky Mountain region based on technological improvements. What assumptions is EIA making about future access to gas on public lands in that regard, using today's technology or unknown technology? What are you taking into consideration on that?

Ms. HUTZLER. In our forecasts we assume that technology in the future will increase at the rate it has increased in the past. So, therefore, we are assuming improved technology in doing our forecasts.

In terms of restricted lands, we do not consider them within our forecast. Let me give you the specifics of the Rocky Mountains. According to the USGS numbers, there is about 293 trillion cubic feet of resources in the Rocky Mountain region. Of this particular number, there is a certain number that is totally off limits that you can't drill on that land at all. That is not included in the forecast.

There is another set which is restricted or off limits de facto because of pipeline or environmental restrictions. This amount of lands we do have phased in over the forecast horizon.

Then there is another amount that has Federal lease stipulations on it. We assume that that is available, but at a cost that is 6 percent higher and would take 2 years longer to develop. The result is that the total unrestricted amount that we have in the Rocky Mountain region is about 151 trillion cubic feet.

Mrs. CUBIN. And in your opinion adequate to meet the demand?

Ms. HUTZLER. Yes.

Mrs. CUBIN. I have quite a few more questions about assumptions, which I will submit to you rather than taking the time here. But I have serious concerns about the assumptions that are made in arriving at the conclusion that is presented here today.

Mr. True, I would like to ask you, actually all of the panel members to start with, should we have an early warning system to better track production to prepare markets and producers for possible supply shortfalls and if you think that is possible, how would you explain it? How would such a system work?

Mr. TRUE. Madam Chairman, energy consumption in the United States is a critical factor in the future prosperity of the country. One of the difficult things that both government and industry has faced is to quantify both sides of that equation, the supply and demand equation.

Experts like Matt Simmons spend almost full time worrying about how to gather that information accurately and then how to interpret it. It would be a significant benefit to the country if we could devise such a system to where we could understand the total energy picture in the United States.

But in order to do that, that would require a great deal of resources, probably coming from the government in order to collect that because it does not good to collect it just from one sector of the energy industry. You would have to understand the total picture.

Mrs. CUBIN. There are two articles that address the supply and demand of natural gas. One is in Natural Gas Week and one is in Plattes that address the alarming drop that both you and Mr. Simmons discussed in gas production this year. I am going to enter those in the record at this time.

[The information referred to follows:]

Tuesday, July 2, 2002 Platts Electric Power Daily

GAS PRODUCTION FALLS IN SECOND QUARTER, SHORTAGES COULD HIT IN WINTER: ANALYST

U.S. natural gas production fell roughly 1% in the second quarter, continuing a decline that began in the second quarter of last year, analyst Raymond James and Associates said Monday in a new report.

The company said it does not foresee any increase in production before year's end, and continues to believe the "U.S. is on the verge of another major natural gas supply shortage, which could be felt as early as this upcoming winter."

Based on a survey of 31 of the largest gas producers representing about 40% of total domestic output, production fell 1% from the first quarter and 6% year-over-year. "Furthermore, although the rig count bottomed in March, activity levels have not yet increased substantially and are clearly far short of the levels needed to overcome natural declines," Raymond James said. "This indicates that we are likely to continue seeing sequential declines in production for the foreseeable future."

The analyst said its survey results "clearly contradict many gas bears that expected to see a sequential increase in production during the second quarter."

Although several production projects, including the Canyon Express platform in the deep-water Gulf of Mexico, are scheduled to begin producing in the third quarter, "we continue to believe that production will fall at a rate of 1.5% per quarter for the foreseeable future," the company added.

Canyon Express is expected to add about 500,000 Mcf/day of new production when it begins operation, but "it will probably take several months for the operators to test the facility and ramp up production to those levels," Raymond James said. "Consequently, there does not appear to be much relief in sight during the third quarter."

In addition, exploration-and-production companies have not dramatically accelerated their capital programs yet despite stronger-than-expected wellhead prices. "The gas rig count remains at historically depressed levels and far short of the number required to increase production," the report said. "Furthermore, even if activity levels were to resume the feverish pitch seen in early 2001, it would take at least six to 12 months for the new production to even begin to arrest the natural declines in existing wells."

Alarming Drop In Production Catches Analysts By Surprise

By Andrew Ware
Natural Gas Week
April 29, 2002

Early first-quarter US gas production figures are in, and the results are brutal. So bad, in fact, that many analysts may need to reconsider the extent to which they estimate deliverability will fall this year.

A drop from the year-ago quarter -- when gas prices were hitting $10/MMBtu -- was universally expected, but more surprising are large sequential declines from the fourth quarter of 2001. What many analysts recently predicted for a full-year average decline -- between 2% and 3% -- may come to pass in the first quarter alone.

That is particularly ominous considering that most estimates were back-end loaded. Many forecasts called for fairly flat output in the first half of the year, with an eight-month slide in drilling to more seriously impact deliverability in the second half of 2002. If production results continue to disappoint, the time lag is apparently much more truncated than presumed and declines will only accelerate in the quarters ahead.

Composite results of 25 producers thus far suggest a 3.3% sequential production decline and a 7.0% year-over-year decline, according to Jon Wolff of Wachovia Securities, who called the results "alarming."

"Extrapolating the trends could easily yield 2-3 Bcf/d production attrition (4%-6%) from [fourth-quarter 2001] levels during [the second quarter], which could quickly erase the ... storage overhang," he said. "Given the inexorable production decline trends, we believe that there is a very strong possibility that we will see $4/MMBtu natural gas prices on the Nymex within the next 2-3 months."

Among the worst performers from the 2001 fourth quarter were Unocal (down 13.3%), Apache (down 10.2%), Conoco (down 8.3%) and Amerada Hess (down 9.6%).

Yet the most striking plunge involves Exxon Mobil, the third-largest US gas producer, which thoroughly underwhelmed the market with its performance. "They stepped on their crank," assessed one observer.

The major produced 2.49 Bcf/d in the first quarter, almost 300 MMcf/d less than in the year-ago period. Some of this loss was due to a one-time gain when, amidst soaring gas prices last winter, Exxon Mobil blew off a huge "gas cap" atop its Webster oil field in South Texas.

This gain accounted for about 200 MMcf/d of added supply, by one estimate. But this does not explain an 84 MMcf/d decline, or 3.3%, from the fourth quarter. Furthermore, based on Smith International data, Exxon Mobil was operating 22 rigs this past quarter versus 17 rigs a year ago.

As often occurs, many producers aren't hitting their estimates. According to Salomon Smith Barney, the top 40 producers since 2000 on average have overestimated their actual gas output by 0.5%.

Some analysts have quietly revised their production estimates. Lehman Brothers analyst Thomas Driscoll had been calling for a full-year 1.5%-2.5% deliverability decline from 2001; last week he predicted a 3%-3.5% drop. DRI-Wefa analyst Ron Denhardt is now predicting a 4.7% drop versus 3.7% one month ago. "Maybe the market is a lot tighter than people thought," Denhardt said.

David Pursell, an upstream analyst at Simmons & Co., cautioned that early producer reports tend to be worse than later ones, for no reason other the luck of the draw. "Last quarter people got really excited when production looked like it was down 2% sequentially, but when the dust settled it was only down 1%," he noted.

BP, the largest US gas producer, is due to report this week and normally hits its estimates. Just as Exxon Mobil skewed the survey to the downside, BP would skew it back up.

Pursell is estimating a 3% average decline for the full year from 2001, noting that several deepwater projects due this year have yet to start up. But he allowed, "If you're down 2%-2.5% sequentially, you need to start worrying about supplying next winter even without heroic assumptions in weather."

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Mrs. CUBIN. Even though my time is up, if you don't mind staying for a few more questions, I would really appreciate that.

Mr. Simmons, you present a fairly gloomy picture about natural gas supply. Why are we suddenly facing this situation?

Mr. SIMMONS. I don't know that it was suddenly. I mean I look back on the statistics and think that it is fairly staggering to see the progress we made in technology and then again go back to the numbers. I used 116,000 new wells being drilled over the last decade and all we did was keep supply flat.

So, I think there was a message building up there that we were headed into some real potential complexities that for one reason or another, even a lot of people in the industry just said, "We will figure out a way around that." But we didn't.

Now, we did have a drilling decline and we are going to have a supply collapse. It is just a matter of how bad will the drop be when it comes.

Then a bigger question is: Can we basically get back to the 52 to 53 BcF level that we basically maintained for 8 years. I personally don't think that is going to be a very easy task.

Mrs. CUBIN. I completely agree with your assessment.

How do you think U.S. energy policy has contributed to the situation that we are in today?

Mr. SIMMONS. It played a big role. When we basically had the facts in front of us that the off shore was really the only solution and yet we as a country going back for, really, this is a bipartisan series of mistakes, we decided that we would limit any form of drilling for natural gas to Louisiana and Texas. We were asking for the sort of problems that we now have in front of us.

Mrs. CUBIN. Mr. True, as a Rocky Mountain producer, can you describe some of the difficulties that you face in getting permits to drill on Federal land?

Mr. TRUE. Madam Chairman, yes. It is not unique to our firm. I mean it is widespread.

Mrs. CUBIN. Right.

Mr. TRUE. Currently, as you know, in the Powder River Basin, the Resource Management Plan is being revised and they are currently working on an environmental impact statement. What has happened is that the BLM had adopted a moratorium on issuing applications for permission to drill.

These APD's are currently mired down in the BLM office in Buffalo. Now this is not unique just to the Powder River Basin. But the significance of it is that we are talking about in an order of magnitude of 20 Tcf of recoverable coal bed methane that could be brought on line in the relatively short term. The infrastructure is in place or being put in place.

Right now, we have a very difficult time just gaining access to the resource. Now, we talk a lot about that and I think that is appropriate because it appears that the environmental extremists now have been targeting that play as, in their terms, the new ANWR, where they are going to stop the development of this resource.

Well, it is incumbent upon government and the industry to bring this resource on production as soon as we can because I think the country needs it for the energy in the near term. I mean, if indeed we are seeing a significant drop in productive capacity year over year, this is a place we can go in the short term and develop it.

But to put it in a little broader perspective, I think the reason comes back to the fact that the American public does not understand the vital role that energy plays in their own personal prosperity.

In the President's Energy Plan, one of his recommendations is a National Energy Education effort. I think what has happened is to move back to what Matt was talking about over the years because the public hasn't understood it. The policymakers haven't led in the area of developing additional energy.

As a result, with NIMBY and I have even heard now we have the acronym NOPE, not on plant Earth, what has happened is that in a site specific debate, those people who believe we need additional resources developed have been losing the public relations battle.

That is what is going on, in my opinion.

Mrs. CUBIN. So, what do you recommend to be done to increase public support for environmentally responsible natural gas development?

Mr. TRUE. Well, Madam Chairman, one of the very first recommendations in the President's Energy Policy is that each segment of the energy industry fund and operate a National Education Program.

Speaking on Behalf of IPAA, we would strongly support a legislative or administration initiative in that regard. The reason it has to come from the legislative branch or the executive branch is that there has to be some sort of funding mechanism which would require some sort of legislation.

Speaking on behalf of IPAA, we would strongly support that.

Mrs. CUBIN. Thank you. In your estimation, what do you think the most important supply provisions are in the Energy Bill?

Mr. TRUE. Madam Chairman, there are a number of provisions in there and it is difficult to single out individual provisions, Madam Chairman. But I would really draw to the Committee's attention the provisions in House Bill 4 that deal with opening up access to the public lands.

I think your efforts in that regard, and also the other thing I would like to mention, not only in my written remarks, but also the provisions for royalty in kind. That is in House Bill 4, Madam Chairman, one of the difficulties the industry has faced is the lack of certainty in the royalty payments process.

The royalty in kind provisions that are incorporated in this bill bring a lot of clarity to that and I strongly support that.

Mrs. CUBIN. I completely agree, especially since I have been working on royalty in kind for about 6 years now.

Mr. Simmons, what do you think a 10-percent supply drop would mean for natural gas prices?

Mr. SIMMONS. Well, as long as we basically as a society set natural gas prices in the commodity exchanges with the skimpiest of margin requirements, they are going to be highly volatile. I think that the $10 gas was a very destructive event, but that is imbedded in the supply drop right back to those sort of prices.

I think it is a dangerous situation.

Mrs. CUBIN. You are exactly right. You know, I think that a lot of people who aren't around the mineral producing areas think that the producers are all real ecstatic when the prices shoot up like that. They don't realize the effect that volatility has on not only the economy and consumers, but on producers as well. That is certainly significant.

I guess I should have asked it more significantly. How do you think such a supply scenario would affect the United States economy if there were a 10-percent drop in supply?

Mr. SIMMONS. I don't believe the U.S. economy can grow without growing electricity. That is my starting point. It becomes fairly complicated to do a reliable model of how we grow electricity in the United States if in fact gas supply doesn't even stay at 54 Bcf a day.

If you follow the geometry of well production, which really is a totally different issue than how many resources we have theoretically in the ground, if we drop down into a 45-ish Bcf a day or lower, it really starts to become hard to figure out how you get back to a 53 Bcf base and we had a market need headed toward 70. The numbers just don't add up. It really is scary.

Mrs. CUBIN. In your opinion, what types of policy initiatives should be implemented to reverse the trend that you discussed earlier?

Mr. SIMMONS. Well, first of all, as was laid out in the Bush Energy Plan, we need to diversify our energy base. I think history will record that one of the worst mistakes we made in the 90's was first of all not keeping pace with the steady addition to power plant growth which had happened for the last 50 years and then at the end to do a catch-up, but in the branch of the United States on the

premise that we had an abundant, readily available supply of natural gas.

So, we are going to have to turn back to coal and hopefully figure out a way to get coal clean. We are going to have to turn back to nuclear power and we are going to have to do everything possible to make sure that we basically at least keep natural gas supplies flat, which gets back to access.

Mrs. CUBIN. That brings to mind another question. Mr. True, what are the obstacles that you face personally, but the industry as a whole, to getting gas to market and how great an effect does that have on the prices and the availability of gas?

Mr. TRUE. Well, Madam Chairman, right now in the Rocky Mountains we are facing an unusual situation where there is a significant price differential between what producers in the Rockies are receiving for their natural gas and what producers elsewhere are receiving.

The differential for transportation and marketing is pretty traditional from 25 cents to 75 cents an Mcf and now it is over $1.50 and in many cases even greater than that. The difficulty we apparently have is the take-away capacity. In other words, there are pipelines where we have restricted pipeline capacity.

Frankly, the State of Wyoming just now is starting to study that situation because, of course, they have a dog in the hunt because they get the royalties off of that production.

It seems to me there is something else at play there other than simply pipeline capacity because it is my understanding that there is pipeline capacity to take the Rocky Mountain gas and move it away into market.

I think there are other forces at work. Frankly until the studies are done I am just not knowledgeable enough on the subject and I don't think anybody is. I have heard everything from the conspiracy theory which I don't agree with, to the fact that we are filling up our storage capacity at such a rate to where we are going to be full and the buyers simply don't need the gas and so they are just not paying market prices for it.

So, I think that is the situation throughout the Rockies right now. It is a very serious problem, frankly, for producers up there because just as recently as yesterday, an individual told me that they were getting as little as 25 cents an Mcf for natural gas. Now, you can not produce it for that. We certainly can't go out and develop new reserves for that.

Mrs. CUBIN. Thank you. I asked Mr. True this question earlier, but I would like to pose it to the other two members of the panel.

Do you think we should have an early warning system in place to better track gas production, to prepare markets for possible supply shortfalls?

Ms. Hutzler?

Mr. HUTZLER. Currently, what we are using for an early warning system is the weekly underground storage report that we are producing and that AGA produced before. From that report, as I mentioned, you can see that our storage numbers are in good shape and we do anticipate that by the winter heating season they will be at their observed maximum.

Along with that, you have the markets and the spot price. That also tells you the kind of condition that supply and demand is in. Some people feel that more data is needed and production data on a weekly basis would be good.

However, there are thousands of producers of natural gas in this country. Right now our data for natural gas production is based on data that we get from the States. It is a voluntary survey from the States and it tends to lag anywhere from four to 12 months.

I think having better annual data would help markets as well. One may want to think about having better monthly or weekly data as well for an early warning system.

Mrs. CUBIN. Mr. Simmons?

Mr. SIMMONS. I think the energy data issue is a very serious issue and I think we have a system today, through no one's fault, that is simply awful. The sheer idea that we are basically glancing at weekly storage numbers—and I really admire the effort the EIA has made to take that over from the AGA and try to get some reliability there. But what they have found so far is it is very, very difficult to get the right numbers.

In the meantime, that is the only thing we have. Here we have the United States of America, world's largest economy, our single most precious energy source and we are flying blind. We think price signals are fairly reliable. Well, go back to this year. On January 28th, natural gas prices were $1.86. In April 28, they were $3.86. Those are price signals.

The single best data happens to be what the publicly traded companies report. If you go back to right before the first quarter reports came out, I think most of the key players in the industry were fairly confident that natural gas supplies would only drop by two to 3 percent this year. Yet, the first quarter numbers came in and the drop was three to 5 percent in the first quarter.

So, we have no good data. I think it is a huge exposure to our country and to our economy.

Mrs. CUBIN. Could you get me some specifics of how we can collect that data.

Mr. SIMMONS. It is very complicated. The complication starts with the fact that the most sophisticated of our publicly traded companies really only know their data, plus or minus one or 2 percent, when they produce it.

So, collecting natural gas data turns out to be far more complicated than the reports that we deliver in phenomenal accuracy. So, I don't think you could do a weekly report. But I think there are probably some teeth that could be put into some early warnings.

When you get to the top 50 producers in the United States, you have really captured the vast, vast majority of our natural gas. So, I don't think you need survey that would capture 2,000 or 3,000 producers.

I think if we are going to have a 10-percent drop it would probably be convenient to know it a few months ahead of time.

Mrs. CUBIN. Mr. True, do you have energy to add to that?

Mr. TRUE. Fred Lawrence who is on our IPAA staff is an economist and he did an interesting back-of-the-envelope analysis on natural gas producers. He estimates that as much as six Tcf a year

is produced by privately held companies. So, that data would not be available out of the large publicly traded companies.

I wanted to throw that in as an added complexity to trying to gather that kind of information because those privately held companies don't report. It makes it more difficult.

Mrs. CUBIN. Well, I thank all of the witnesses for their testimony. Once again, we will have further questions and I would ask that you submit answers to those questions in writing.

Thank you very much.

The hearing record will be held opportunity for 10 days. If there is no further business before the Subcommittee, we are adjourned.

[Whereupon at 2:15 p.m., the Subcommittee was adjourned.]

[Response to questions submitted for the record follow:]

Response from the Energy Information Administration to Questions Submitted for the Record

EIA's Analysis of Reasons for Rapid Growth in U. S. Gas Drilling

Q1. In your latest Annual Energy Outlook, you show a rapid acceleration in gas drilling in the U.S. between now and 2020. Have you analyzed the reasons for this growth?

A1. The increases in drilling over the forecast period in the Annual Energy Outlook 2002 (AEO2002) are fueled by the growth in demand for natural gas. The drilling increases are largely driven by growing revenues from drilling activities, as a result of both higher prices and higher production levels, and improvements in technological progress—particularly, in unconventional gas recovery. There is an acceleration in drilling in the later years of the forecast as unconventional gas, which generally requires more wells for production, becomes a larger component of U.S. natural gas supply.

EIA's Assumptions About Future Access to Gas Resources on Public Lands

Q2. Your assumptions about natural gas production out to 2020 show increases in the Rocky Mountain region based on technological improvements. What assumptions is EIA making about future access to gas resources on public lands? Do you assume access to decline, improve or stay the same?

A2. In AEO2002, the 293.3 trillion cubic feet (Tcf) of Rocky Mountain unproved natural gas resources are subject to a variety of access restrictions (Table 1). Of these resources, 33.6 Tcf (No Access - Legal) are officially off limits to either drilling or surface occupancy. Included in this category are those areas where drilling is precluded by statute (e.g., national parks and wilderness areas) and by administrative decree (e.g., "Wilderness Re-inventoried Areas," "Roadless Areas"). Also included are those areas of a lease where surface occupancy is prohibited by stipulation to protect identified resources such as the habitats of endangered species of plants and animals. An additional 57.7 Tcf (No Access - De Facto) of the resources are judged[1] to be currently de facto off limits because of the prohibitive effect of compliance with restrictions created by such laws as the National Historic Preservation Act, the National Environmental Policy Act, the Endangered Species Act, the Clean Air Act, and the Clean Water Act.[2] Of the 202 Tcf of resources that are accessible, 50.8 Tcf (Access - Lease Stipulated) are located in areas where Federal lease stipulations affect the costs and timing of development. These lease stipulations are set by either the U.S. Bureau of Land Management or the U.S. Forest Service. The remaining 151.2 Tcf (Access - Standard Lease Terms) of unproved Rocky Mountain natural gas resources are located either on Federal land without lease stipulations or on private land and are fully accessible subject to standard lease terms. These 151.2 Tcf of resources are currently available for development and are included in AEO2002.

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[1] Advanced Resources, International, "Technical Memorandum: Federal Lands Access for the NEMS Oil and Gas Supply Module," FE 30 Support Contract: DE–AC01–99FE65607 (July 2001).

[2] Advanced Resources, International, "Federal Lands Analysis, Natural Gas Assessment, Southern Wyoming and Northwestern Colorado: Study Methodology and Results," (May 2001); National Petroleum Council, Natural Gas: Meeting the Challenges of the Nation's Growing Natural Gas Demand, (December 1999).

In AEO2002, the treatment of access restrictions in the Rocky Mountain region varies by access status. Resources that are located on land that is legally inaccessible are removed from the model's operative resource base for the duration of the forecast. Resources located in areas that currently are de facto inaccessible because of regulations under various environmental statutes are made available gradually over the forecast period to reflect the anticipated development (as has been the case in the past) of new technologies that allow increased production while complying with applicable environmental requirements. Resources that are accessible but located in areas that are subject to lease stipulated Federal access restrictions are accounted for by two adjustments. One adjustment is that exploration and development costs for these resources are assumed to be 6 percent[3] higher than the costs for resources located in areas not subject to lease stipulated Federal access restrictions. This is to reflect the increased costs that these access restrictions generally add to a project. A second adjustment is that 2 years are added to the assumed schedules for projects in the areas with lease stipulated Federal access restrictions. This is to simulate the delay usually incurred as a result of efforts to comply with the access restrictions. These two adjustments to the development of resources located in accessible but lease stipulated areas are applied throughout the forecast.

Table 1. AEO2002 Unproved Natural Gas Resources: Rocky Mountain Region as of January 1, 2000

(trillion cubic feet)

Access Status	Conventional	Unconventional[4]	Total
No Access - Legal	3.4	30.2	33.6
No Access - De Facto		57.7	57.7
Access - Lease Stipulated	16.1	34.7	50.8
Access - Standard Lease Term	35.9	115.3	151.2
Total	55.4	237.9	293.3

Source: Advanced Resources, International; table includes both associated/dissolved and nonassociated gas resources.

[4]Natural gas extracted from coalbeds (coalbed methane) and from low permeability sandstone and shale formations (tight sands and gas shales) is commonly referred to as unconventional gas. Most of these resources need to be subjected to a significant degree of stimulation (e.g., hydraulic fracturing) or other "unconventional" production techniques in order to attain sufficiently economic levels of production.

EIA's Examination of Technology Groups In Regard to Future Growth in Natural Gas Supply

Q3. If it is largely technical change driving the growth, have you carefully examined the types of technologies that will be required? Does the ability to access resources on public lands have an effect on the speed at which new technologies are advanced?

[3]This is consistent with the cost factor adjustment utilized in the 1999 National Petroleum Council Study - Natural Gas: Meeting the Challenges of the Nation's Growing Natural Gas Demand, (December 1999), Volume II, Task Group Reports.

A3. Most of the Rocky Mountain natural gas resources in the AEO2002 (81 percent) are "unconventional"—65 percent in low permeability sandstones (tight sands), 16 percent in coal formations (coalbed methane), and a negligible amount in low permeability shales (gas shales). In the construction of the unconventional gas supply model, we examined the following specific "technology groups," to gauge the impact that these technologies might be expected to have on future growth in natural gas supply from unconventional sources.

Unconventional Gas Recovery Technology Groups

1. Basin Assessments: Basin assessments increase the available resource base by a) accelerating the time that hypothetical plays[5] in currently unassessed areas become available for development, and b) increasing the play probability for hypothetical plays—that portion of a given area that is likely to be productive.
2. Play Specific, Extended Reservoir Characterizations: Extended reservoir characterizations increase the pace of new development by accelerating the pace of development for emerging plays, where projects are assumed to require extra years for full development compared to plays currently under development.
3. Advanced Well Performance Diagnostics and Remediation: Well performance diagnostics and remediation expand the resource base by increasing reserve growth for already existing reserves.
4. Advanced Exploration and Natural Fracture Detection R&D: Exploration and natural fracture detection R&D increases the success of development by a) improving exploration/development drilling success rates for all plays, and b) improving the ability to find the best prospects and areas.
5. Geology Technology Modeling and Matching: Geology/technology modeling and matching matches the "best available technology" to a given play with the result that the expected ultimate recovery (EUR) per well is increased.
6. More Effective, Lower Damage Well Completion and Stimulation Technology: Improved drilling and completion technology improves fracture length and conductivity, resulting in increased EUR's per well.
7. Targeted Drilling and Hydraulic Fracturing R&D: Targeted drilling and hydraulic fracturing R&D results in more efficient drilling and stimulation which lowers well drilling and stimulation costs.
8. New Practices and Technology for Gas and Water Treatment: New practices and technology for gas and water treatment result in more efficient gas separation and water disposal which lowers water and gas treatment operation and maintenance (O&M) costs.
9. Advanced Well Completion Technologies such as Cavitation, Horizontal Drilling, and Multi-lateral Wells: R&D in advanced well completion technologies a) defines applicable plays, thereby accelerating the date such technologies are available, and b) introduces an improved version of the particular technology, which increases EUR per well.
10. Other Unconventional Gas Technologies, such as Enhanced Coalbed Methane and Enhanced Gas Shales Recovery: Other unconventional gas technologies introduce dramatically new recovery methods that a) increase EUR per well, and b) become available at dates accelerated by increased R&D with c) increased operation and maintenance (O&M) costs (in the case of Coalbed Methane) for the incremental gas produced.
11. Mitigation of Environmental Constraints: Environmental mitigation removes development constraints in environmentally-sensitive basins, resulting in an increase in basin areas available for development.

For conventional gas, we did not examine the impact of specific technologies. Coefficients on time trend variables in econometric equations that project drilling costs, equipment costs, wells drilled, finding rates, and success rates serve as proxies for the impact of technological progress. These equations are updated on a regular basis, either annually or biennially, based on historical data.

Although it is assumed that there is access to resources on public lands (as described in the answer to Question 2), this access is not assumed to have an effect on the speed at which new technologies are advanced.

[5] A play is a set of known or postulated oil and (or) gas accumulations sharing similar geologic, geographic, and temporal properties, such as source rock, migration pathway, timing, trapping mechanism, and hydrocarbon type. Hypothetical plays are those plays that are identified and defined based on geologic information but for which no accumulations of a given minimum size (e.g., one million barrels of oil or 6 billion cubic feet of natural gas) have, as yet, been discovered.

Importance of Access with Respect to EIA's Projections of Natural Gas Production

Q4. Unconventional gas has accounted for virtually all of the growth in U.S. gas supply over the past decade. Conventional supplies are declining at an accelerating pace. Given that much of this unconventional gas is on federal lands, doesn't this suggest that access is critical to keeping supply growing?

A4. Continued access to currently accessible public lands, as well as the increased access that technological progress is able to provide to those areas that are currently de facto inaccessible because of regulations under various environmental statutes, are both key assumptions that underlie EIA projections of natural gas production.

Consistency of EIA's Forecasts with Observed Resource Patterns

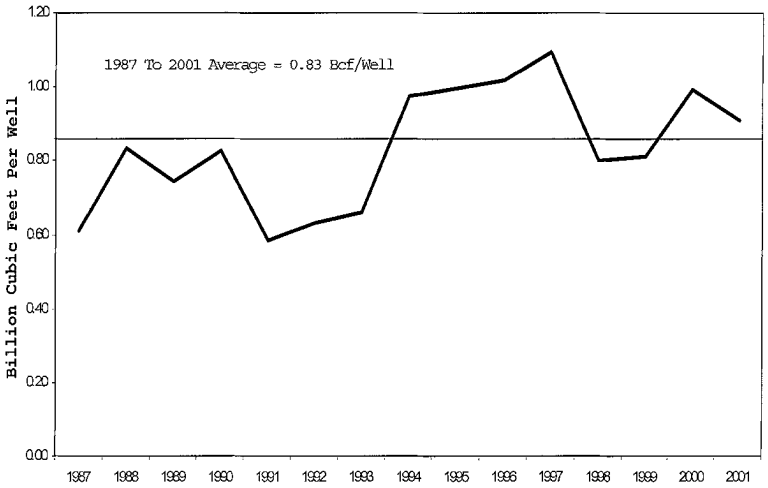
Q5. Have your forecasts in the last five years been consistent with the observed pattern of accelerating conventional resource depletion pointed out by many in the industry?

A5. There are two components to "resource depletion," one is a physical measure of a resource's production and the other is an economic measure of the cost of developing and producing that resource. With respect to the physical measure, the EIA forecasts are consistent with the expectation that as conventional gas production increases in the future due to increased domestic gas consumption, the rate of physical depletion increases. The AEO2002 projected domestic gas production to increase by 2.0 percent per year from 2000 through 2020, with depletion increasing in equal measure.

In the EIA model, the economic measure is reflected in "finding rate" equations, which pertain to the volume of gas discovered per well drilled. Generally, as the finding rate increases, the cost of developing and producing gas resources declines. EIA regularly recalibrates its oil and gas supply model equations based on historic and current data. The most recent cost of developing and producing natural gas is captured in this recalibration process. Recent data show the "finding rate" to be slightly increasing (as graphed below)[6], which indicates that the cost of developing and producing new gas resources has declined, all else equal. The EIA projections reflect this trend. From both a physical and economic perspective, there is no observed pattern of accelerating conventional resource depletion.

[6] This finding rate measure takes into consideration the improved drilling success rates by proportionally allocating "dry-hole" wells to the successful oil and gas well completions. The gas wells completions plus the allocated dry-holes are then divided into the volume of gas discovered that year.

Chart 1. Natural Gas Discovered Per Well Completion, From 1987 To 2001
(Divisor: Well Completions = Gas Wells + Proportionally Allocated Dry-Holes)



EIA's Response to the EPCA Assessment of Federal Resource Inventories

Q6. Given that the EPCA assessment of federal resource inventories is underway, do you feel comfortable with the assessment of the effects of access constraints on gas supply that you prepared in December 2001? Are you planning a new analysis once the inventory is complete?

A6. Until we see the EPCA assessment results and determine how they line up with the access assumptions in the December 2001 access study, we are not able to judge our earlier projections in the light of that assessment. However, the EPCA assessment is a much more detailed and substantial effort than the work upon which the access treatment in our current model is based. We plan to implement the results of the EPCA assessment into our model when the assessment is completed and the necessary information (for implementation) is available. Although the assessment is scheduled to be completed in early November 2002, a firm date has not yet been set for its release.

EIA's Assumption Regarding Construction of Natural Gas Pipeline from Alaskan North Slope

Q7. Do you assume Alaska gas will reach the Lower 48 states at any point in your forecast?

A7. The primary assumption regarding the construction of a natural gas pipeline from the North Slope of Alaska to the Lower 48 States is that it would require a sustained average natural gas wellhead price in the Lower 48 states of $3.50 (year 2000 dollars, per thousand cubic feet) before construction would commence. Since the Lower 48 average wellhead price forecast in the reference case of the AEO2002 did not exceed $3.26 (year 2000 dollars, per thousand cubic feet), the pipeline to transport gas from Alaska was not constructed in the reference case through 2020. However, other scenarios that we analyzed showed the pipeline to be economic by 2020 (e.g., the high economic growth case; the low oil and gas technology case).

DOE's Analyses of Effect of Land Use Restrictions

Q8. Over the past several years, policy choices have been made or are being made that preclude development of much of the Eastern Gulf of Mexico, the entire Atlantic Coast, most of the Pacific Coast, and many of the most promising areas of Northern Alaska, as well as some significant parts of the Rocky Mountains. Has DOE performed any analysis that tries to estimate the cumulative effect of what appears to be a very restrictive pattern of land use decisions?

A8. EIA did a study, U.S. Natural Gas Markets: Mid-term Prospects for Natural Gas Supply (December 2001), which analyzed the effect of reducing some of the restrictions on access in the Rocky Mountains and opening up the Outer Continental Shelf (OCS) to exploration and development. If Federal access restrictions were reduced as described in the study, the technically-recoverable natural gas resource base would be expected to increase by 86 trillion cubic feet (Tcf), expanding the resource base 7 percent (from 1,191 Tcf to 1,277 Tcf), and 50.8 Tcf of resources in the Rocky Mountain region would become less costly to develop because of shorter lead times. (This reduction in restrictions does not include access to the estimated 62.5 Tcf of natural gas resources in National Parks, National Monuments, and wilderness and roadless areas.) With the larger, less costly resource base, cumulative Lower 48 reserve additions throughout the forecast were projected to be 15 Tcf higher than in the reference case (506 Tcf compared to 491 Tcf). The remaining Lower 48 natural gas reserves in 2020 were projected to be 11 Tcf higher than in the reference case. With this improved reserve position, natural gas production in 2020 was projected to be 0.6 Tcf higher, and the average wellhead price was projected to be 11 cents per thousand cubic feet lower than in the reference case.

EIA also performed an analysis, The Effects of the Alaska Oil and Natural Gas Provisions of H.R. 4 and S. 1766 on U.S. Energy Markets (February 2002), for Senator Murkowski. Title V of H.R. 4, "Arctic Coastal Plain Domestic Energy Security Act of 2001," calls for establishing a competitive oil and gas leasing program in the coastal plain of the Arctic National Wildlife Refuge (ANWR), resulting in an environmentally sound program for the exploration, development and production of oil and gas resources in this area. EIA's analysis of this provision showed that opening ANWR to crude oil production would likely increase domestic production, and reduce foreign oil dependence. Using the mean estimates of the available resources, opening ANWR to crude oil development was projected to add 800,000 barrels per day to U.S. crude oil production in 2020, 9 years after production in ANWR was projected to begin. The increased production, relative to the AEO2002 reference case, was projected to reduce the net share of foreign oil used by U.S. consumers in 2020 from 62 to 60 percent, while increasing domestic production by 14 percent. A high resource sensitivity case projected that adding ANWR production could add as much as 1.5 million barrels per day to total Alaskan production and reduce import dependence to 57 percent. In a low resource sensitivity case, ANWR added 590,000 barrels per day by 2015, before production declined to 510,000 barrels per day in 2020. Since the natural gas resources in ANWR are estimated to be about one-eighth the size of the oil resources, opening ANWR to natural gas production was not considered to have as significant an impact on U.S. energy markets and was not considered in this analysis.

The DOE Office of Fossil Energy (FE) has done an analysis, The Greater Green River Basin Natural Gas Study (June 2001), reviewing restrictions on Federal lands in the Greater Green River Basin of Wyoming and Colorado. Working virtually on a tract-by-tract basis, analysts studied Federal lands in the Greater Green River Basin of Wyoming and Colorado and found that nearly 68 percent of the area's technically recoverable natural gas resource—as much as 79 trillion cubic feet of natural gas—is either closed to development or under significant access restrictions. EIA's current access parameters are based on the results of this study. DOE is part of an interagency team that is in the process of conducting similar analyses (the EPCA assessment of Federal resource inventories) for other basins in the Rocky Mountains.

EIA's Treatment of Moratoria on Offshore Drilling

Q9. In your assumptions do the current moratoria on offshore drilling stay in place? Are areas dropped or added?

A9. The current moratoria on offshore drilling stay in place throughout the AEO2002 forecasts.

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