The Honorable Roscoe G. Bartlett  
Chairman  
Subcommittee on Energy  
Committee on Science  
U.S. House of Representatives  
Washington, DC 20515  

Dear Mr. Chairman:  

Enclosed is the edited transcript of the June 12, 2001, testimony given by Robert S. Kripowicz, Acting Assistant Secretary for Fossil Energy, regarding the "Fossil Energy Research and Development and Clean Coal Technology."

Enclosed also is an insert that you requested for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

Dan R. Brouillette  
Assistant Secretary  
Congressional and Intergovernmental Affairs  

Enclosure
HEARING ON THE PRESIDENT'S NATIONAL ENERGY POLICY:
CLEAN COAL TECHNOLOGY AND OIL AND GAS R&D
Tuesday, June 12, 2001
House of Representatives,
Subcommittee on Energy
Committee on Science
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Roscoe G. Bartlett [Chairman of the Subcommittee] presiding.
from R&D efforts in the government, private sector, and in
our universities assist us in producing more energy more
efficiently and in a way that comports with the needs of
public and worker health and safety and the health of our
environment?

Our first Panel will consider all aspects of clean coal
power technology, including how the President's proposed 2
billion in spending on clean coal technologies may both
increase efficiency and reduce emissions from utilities and
find innovative new uses for coal and coal bed methane.

Our witnesses will be Robert S. Kripowicz, Acting
Assistant Secretary for Fossil Energy at the U.S. Department
of Energy. Mr. Kripowicz will also appear on Panel II. Bob
Yamagata, Executive Director of the Coal Utilization Research
Council; James E. Wells, Director of Natural Resources and
Environment at the U.S. General Accounting Office; Katherine
Abend, hopefully, Global Warming Associate at the U.S. Public
Interest Research Group, U.S. PIRG; and John S. Mead,
Director of the Coal Research Center at Southern Illinois
University, Carbondale. I understand that my colleague, Mr.
Costello, will be introducing his constituent, Mr. Mead,
formally at the conclusion of my remarks.

The second Panel will consider how technologies derived
from petroleum and gas R&D can be employed to improve
exploration, extraction, refining, and processing, and
transportation of these fossil fuels. Our witnesses will include Virginia Lazenby, Chairman and CEO of Bretagne, GP, Nashville, Tennessee, on behalf of the Independent Petroleum Association of America; Paul Cuneo, Vice President and Chief Information Officer of Equiva Services, LLC, Houston, Texas, on behalf of the American Petroleum Institute; Dr. Craig W. Van Kirk, Professor of Petroleum Engineering and Head of the Department of Petroleum Engineering at the Colorado School of Mines, Golden, Colorado; and Dr. Alan Huffman, Manager of Conoco's Seismic Imaging Technology Center, Houston, Texas.

I look forward to hearing today's testimony and pursuing these subjects in greater detail. Before we get started, however, I would like to remind the members of the Subcommittee and our witnesses that this hearing is being broadcast live on the Internet, so please keep that in mind during today's proceedings. I would also like to ask for unanimous consent that all members who wish may have their opening statements entered into the record. Without objection, so ordered. I now turn to my distinguished colleague, Mr. Costello, for an introduction and his opening remarks.

[Statement of Mr. Bartlett follows:]

*************** INSERT 1 ***************

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Obtained and made public by the Natural Resources Defense Council, May 2002
Mr. COSTELLO. Well, Mr. Chairman, thank you very much, and I thank you for calling this hearing today. I will submit my statement, my formal statement, for the record. I welcome all of our witnesses here today and I look forward to hearing their testimony.

In particular, I welcome a constituent and friend, John Mead, who is a part of the first Panel. Mr. Mead is the Director of the Coal Research Center at Southern Illinois University in Carbondale. In fact, I recently attended just a few weeks ago a forum on clean coal technology and the future of coal at Southern Illinois University in my Congressional district. Mr. Mead was the moderator. It was a forum called by the Governor of Illinois and Senator Dick Durbin, as well as members of the Congressional delegation, my colleagues, David Phelps and John Shimkus, also attended. John is very familiar with coal issues. He has been at the research center at Southern Illinois University for many years and is very familiar with clean coal technology.

Mr. Chairman, there is no question that clean coal technology exists today that, in fact, significantly reduces emissions of air pollutants. And there is new technology that I believe will reduce emissions to a greater extent than we ever imagined or anticipated. Over 50 percent of all electricity generation comes from coal-powered plants in the United States today. We have an abundance of coal in
southwestern Illinois and other parts of this country and I believe that we, in fact—any policy—energy policy coming out of the White House or the Congress should, in fact, include, to a large part, coal.

I applaud the Administration and Vice President Cheney, as well as President Bush, for asking the Congress to put additional money in fossil fuel research and development and in clean coal technology. We, in fact, need to continue to do research and development so that we can burn coal in the most efficient and environmentally friendly manner. And with that, Mr. Chairman, I will insert my statement in the record and look forward to hearing from our witnesses. Thank you.

[The statement follows:]

************* COMMITTEE INSERT *************
Chairman BARTLETT. Thank you very much. I note that we have been joined by two additional members of our Panel, Mr. Smith and Ms. Biggert. You may make an opening statement if you wish. Any formal statement will be included in the record. Do you have comments before we welcome our witnesses?

Mr. SMITH. Mr. Chairman, if I may, I was on the Presidential Oil Policy Committee during the Arab Oil Embargo back in the early '70s and it seems like again a revisiting of some of the concerns of our increased dependency on especially imported petroleum products. At that time, we were importing about 35 percent of our petroleum energy needs. Now, it is approaching 58 percent, I believe. And so, again, it should be a heads up and a reminder that that kind of dependency makes us more vulnerable and has a tremendous impact on both the economy and the environment. So thank you and the Ranking Member for holding this hearing. Thank you.

Chairman BARTLETT. Well, thank you very much. And I might add that there is a national security implication too and we are getting nearly 60 percent of oil from overseas. That is too little recognized, I think. Without objection, the full written testimony of all the witnesses will be entered into the record. I would ask that you summarize your testimony in 5 minutes so we will have plenty of time for questions. And let me assure you that any detail that you wish to expand on,
you will have ample opportunity to do that during the question and answer period. So without any further delay, Mr. Kripowicz, you may begin.
STATEMENT OF ROBERT S. KRIPOWICZ, ACTING ASSISTANT SECRETARY FOR FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY

Mr. KRIPOWICZ. Thank you, Mr. Chairman. Mr. Chairman, and members of the Subcommittee, I appreciate the opportunity to appear today with both panels and I want to commend the Subcommittee for holding this hearing. I believe it is important that periodically we step back from the day-to-day conduct of our programs and ask the questions, are we making progress, is that progress benefiting the American people, and are we moving in the right direction?

I believe that for the Federal Fossil Energy Program, the answer to each of those questions is an unequivocal yes. And I appreciate the initiative, Mr. Chairman, you have taken in holding this hearing to review the progress and benefits to date and to discuss the course we should be setting for the future.

In my formal statement I have used specific examples to illustrate some of the technology advances that have resulted from our partnerships with industry and academia. For each item I have cited, there are many more that could be referenced. In the interest of time, however, and to provide adequate opportunity for my fellow panelists, I will highlight only a few examples.

Let me begin with the Clean Coal Program. As you are aware, the President has made clean coal technology one of
the core elements of his National Energy Policy. Why clean coal?

As the chart on page 2 of my statement illustrates, coal supplies more than half the electricity consumed in this country and America has more than two-and-a-half centuries of recoverable coal. So at a time when a major issue confronting this Nation is the future reliability of electricity, it makes little sense to turn our back on this abundant resource, especially if we can develop technology that reduces, or perhaps one day soon eliminates, environmental concerns over its use.

The Clean Coal Technology Program that began in the mid-1980s and extended through five rounds of industry competition laid the groundwork for such technology. Thirty-eight projects ultimately were part of this program. Several are still underway. Of the 30 or so that have been completed, 22 have achieved some form of commercial success.

But more importantly, the Nation has benefited. When the Clean Coal Program began, power generations had only a limited number of choices for reducing most types of air emissions, and what was available was generally expensive and, in some cases, unreliable.

Today, largely because of the Clean Coal program and related R&D, the menu of options has been greatly expanded. Low-NOx burners, for example, were unproven when the Clean
Coal Program began. Now, because of the experience gained in
several Clean Coal projects, three out of every four
coal-fired power plants in the U.S. are, or will soon be,
equipped with low-NOx burners.

Within the next 2 years, 30 percent will be outfitted
with selective catalytic reduction for even greater NOx
control. Again, the Clean Coal Technology Program helped
demonstrate the technology and lower costs.

In fact, before the Clean Coal Program, options for
controlling nitrogen oxides could cost as much as $3,000 per
ton of NOx removed. Today, these costs have been cut in half
for selective catalytic reduction. And low-NOx burners can
reduce nitrogen oxide pollutants at costs of less than $200
per ton.

Flue-gas scrubbers for sulfur dioxide, once expensive and
unreliable, now cost 1/3 of their 1970's costs. Not only are
they reliable, but the technology is now available to convert
the sulfur they take out as a pollutant into a product that
can be used to make wallboard, for example.

Again, Mr. Chairman, for a country that is increasingly
concerned about the costs of electricity, having technology
available that can reduce environmental compliance costs from
what is already our lowest cost fuel for power generation,
creates an enormous economic benefit.

Perhaps, equally important, the Clean Coal Program has
provided the basis for future benefits, benefits that the
President's new clean coal initiative is intended to achieve.
Coal gasification-based power generation is one of those new
technologies. Because of the Clean Coal Program, we now have
the first pioneering gasification combined cycle power plants
operating commercially in the U.S. Their environmental
performance approaches that of natural gas.
Moreover, further improvements lie in the future. The use
of fuel cells and advanced turbines, in combination with a
coal gasifier, the ability to convert a portion of the coal
gas into premium liquid fuels and chemicals, the potential to
develop a coal-based energy system that lends itself to the
future capture and sequestration of carbon dioxide—all of
these are future pathways opened up by the clean coal
gasification projects underway at Tampa, Florida and West
Terre Haute, Indiana.
In fact, Mr. Chairman, as I mention briefly in my
prepared statement, we see the very real possibility of
future coal-fired plants that are virtually pollution-free.
That for all intents and purposes, remove environmental
objections from the use of our most abundant fossil energy
resource.
Now, let me turn briefly to the subject of your second
panel, which is petroleum and natural gas technology. Again,
the long-term ability of our energy industry to find and
produce the liquid and gaseous fuels on which our economy depends, will largely be dictated by continuing advancements in technology.

The Vice President's National Energy Policy Development Group recognized this and recommended efforts to continue fostering improvements in oil and gas technology. Again, in this area, I believe our track record is good.

One of the major advancements in oil and gas technology in the last 20 years has been the polycrystalline diamond drill bit, and we are proud of the fact that one of our national labs solved the bonding problem that made such bits possible. Today, we are working with national laboratories, universities, and the industry to make the next leap forward in drill bit technology. For example, using special microwave techniques to develop a bit that will last longer and drill deeper and faster.

I have described new seismic technologies that were supported in our program, like four-dimensional seismic technology that adds time to the imaging equation, and new imaging systems that work at the bottom of an oil or gas well and whose resolution is ten times more precise than other technology.

These are technologies that offer benefits across the board for all types of companies drilling in more complex environments. But in recent years, the nature of our domestic
oil industry has changed and so has the focus of much of our research.

Today, smaller independent companies are rapidly becoming the dominant oil and gas producers in the United States. Independent producers account for 40 percent of the crude oil produced in the United States and 50 percent of the oil produced in the lower 48. They produce 2/3 of our Nation's natural gas and they account for 85 percent of all the new wells drilled in the United States.

Now, very few of these companies conduct significant research by themselves. Traditionally, most have relied on technology to trickle down from the majors, but with more and more of the larger companies moving to more lucrative prospects overseas, the flow of new technology has slowed.

Our program attempts to fill the gap, working with independent producers to determine whether promising, but high-risk approaches work, and, if they do, requiring the producer and others in the industry to undertake an aggressive technology transfer effort.

I have cited two examples in my testimony of partnership projects that have worked. One of the projects involved a complete oil field workover using new technology to locate and produce oil that had been previously abandoned. In the last 5 years, that project, near Bakersfield, California, has produced more than 1 million barrels of oil that, otherwise,
would have remained in the ground. More importantly, it
stimulated 100 new privately funded wells in the surrounding
area.

That was a full cost-shared field test. Often, however,
we find that small grants, targeted at very specific
production problems, can return major benefits. A small
producer working in a field in Los Angeles wanted to try a
new type of acid treatment to remove downhole deposits that
were on the verge of putting many of his wells out of
operation. He applied for a DOE grant to help cover the risks
of this unproven technique and was selected for a
cost-sharing project in a DOE competition. The treatment has
exceeded expectations. Oil flow not only has been restored,
but is now four times the previous rate. And the producer is
now holding workshops and technical meetings to describe the
new acid treatment process to other producers.

These, I believe, Mr. Chairman, are the keys to
successful federal research programs. First, partner with
industry to support the new ideas that otherwise would be too
risk} to pursue. Secondly, wherever possible, support new
ideas through cost-sharing and where industry must compete
with their peers for federal support. And third, ensure that
there is a built-in technology transfer, where the
involvement of industry and the financial commitment that
industry makes provide natural conduits for successful
technologies to be used commercially once the federal project is over.

Our goal is to foster this type of research program in the Fossil Energy Program at the Energy Department. With fossil fuels supplying 85 percent of the Nation's energy, we believe that such a program is a necessary component of a more energy secure, economically strong, and environmentally healthy future. Thank you for the opportunity to testify.

- [Statement of Mr. Kripowicz follows:]

*************** INSERT 2A ***************
[The information follows:]

*************** INSERT 2 ***************
Chairman BARTLETT. Thank you very much. Mr. Yamagata.
STATEMENT OF BEN YAMAGATA, EXECUTIVE DIRECTOR, COAL UTILIZATION RESEARCH COUNCIL (CURC), WASHINGTON, D.C.

Mr. YAMAGATA. --public and private partnerships. I pretend to be a technologist, but that is clear evidence that that is not the case. In any case, we have submitted a written statement. In that written submittal, may I commend to you, Mr. Chairman, and to members of the Subcommittee, for your review, there is a detailed description and discussion of our organization's coal technology road map which has been an attempt by our membership to outline the technology needs for coal that at least we believe will best ensure the long-term economic and environmentally acceptable use of this very plentiful domestic and secure energy resource.

May I also commend to your viewing an electronic version of a document prepared by the National Mining Association that describes the overall benefits of coal and the value of the government and industry's Clean Coal Technology Program.

Within the time allotted to me, Mr. Chairman, I would like to use this handout that I have prepared for the Committee's perusal, and to discuss with you very generally the elements of the CURC technology road map and then to suggest to you that successful pursuit of this road map or any other like technology road map will require a commitment, a commitment on the part of industry and government, a commitment that must form--be formed by adequate amounts of time and adequate
amounts of cost-shared funding.

Over the course of the last couple of years, the membership of CURC has drafted and agreed upon the key elements of a coal technology road map. This is not unlike the road maps that have been produced by the Department of Energy in their Vision 21 program.

May I turn your attention to page 3 of this handout? That page is entitled, "Performance Targets for Coal Generation." Herein lies the essence of our coal technology road map that sets forth the goals and the timetables for technologies to ensure the continued long-term use of coal.

Very, very briefly, this is a chart that attempts to explain the time frames for technology development. That is, the technologies that we have today, both their costs and their performance criteria, along with the technologies in the 2010 and the 2020 time frame, which we believe industry and government are capable of achieving.

Let me just point out that one of the metrics in the 2020 time frame is that we try to, and we believe we can, develop technologies that are twice as efficient as the type of power plants we see today. Technologies that will be cost effective and embedded in the technologies themselves are the ability to sequester CO2 to the extent that that is necessary.

May I turn your attention to page 4 of the handout entitled, "CURC Highest Priority, Coal-Fired Generation"
Here we have attempted to identify the critical technology needs for coal by describing a set of five technology platforms. That is along the left-hand hash marks of the chart. These technology platforms focus upon coal technology needs that are required in the near term to address existing power plant emission regulations. In the mid term, that is to 2010. For--so that we can contemplate the expanded use of what we know we have today--that is, pulverized coal units in the form of supercritical and ultra-supercritical coal units. And in the farther out period, that is the 2020 time period, primarily to use gasification or combustion gasification systems to achieve very high, cost-effective high efficiency and high emission control technologies.

I would hasten to add that gasification currently exists with Texaco and others, as it is now applied commercially around the world. It is, however, also the building block upon which future technology ought to be developed. Importantly--importantly, we have also estimated the total funding requirements that these technology platforms will be acquired. That is, to meet the goals and the time tables laid out in the chart on page 3. In our view, an investment of at least $10 billion will be required over the next 20 years, up to 1/2 from the private sector and the remaining from the public sector, over
the next 20 years. This public/private commitment includes
time and funding for research and development and also for
demonstration and deployment of new first-of-a-kind systems.
Two quick points, Mr. Chairman, if I may. First, the
existing Clean Coal Program has been a great success. As
Assistant Secretary Kripowicz has pointed out, 38 projects
undertaken, a total of more than 5 billion committed and
spent. I commend to you an attachment in my written
testimony, drafted by the Southern Company, that seeks to
identify the benefits of joint industry government clean coal
efforts, for those so critical of past clean coal efforts,
please look at the facts.
Second, and most importantly, we are delighted with
President Bush’s commitment to a multi-year clean coal
development program. He has sought to initiate that
commitment with $150 million request this year, to begin a
long-term demonstration program. I would point out, however,
that you cannot take funds away from the basic coal R&D
program to cover the costs of the demonstration program. We
need both of them. We need R&D, particularly, because it is
the seed corn that will grow improvements later on.
In this same vein, the Vision 21 program, which, frankly,
is more aggressive in its technology goals and even the CURC
road map, needs to contemplate demonstration programs on a
scale that will provide industry with confidence that the
technology actually works.

In conclusion, there are plenty of technology road maps. We have one of them. We know what needs to be done, Mr. Chairman, and, members of the Subcommittee. It is time and money that must be committed by both the private sector and the public sector. We need to set a course for coal-based R&D and then we need to stick to it. Thank you.

[Statement of Mr. Yamagata follows:]

*************** INSERT 3 ***************
Chairman BARTLETT. Thank you very much, Mr. Wells.
STATEMENT OF JAMES E. WELLS, DIRECTOR, NATURAL RESOURCES AND
ENVIRONMENT, U.S. GENERAL ACCOUNTING OFFICE

Mr. WELLS. Thank you, Mr. Chairman, and, members of the
Subcommittee. We, too, are pleased to be here today to
discuss our past work on the Clean Coal Technology Program.
In almost 20 years since it started, a lot has been said,
both for and against this program. Our report last year that
looked at the status of the program at the end of 1999,
talked to 60-some projects had been awarded and funded out of
roughly 210 proposals that had been submitted.

In reporting on the status of the program, we noted that
24 projects had been completed at that time, 16 were
currently active, and 10 had been terminated or withdrawn,
along with another 10 or so that had fallen out earlier in
the program. No new projects have been started in the last 5
or 6 years. About $800 million of the 1.8 billion federal
funds, of the share, had not been spent at that time.

The just-completed White House National Energy Policy
Group is recommending that the Administration invest $2
billion in a new restructured Clean Coal Program over the
next 10 years. In this context, my testimony today will focus
on the findings of our last decades of audits of the Clean
Coal Program and the lessons that may have been learned from
those past efforts. My full statement was prepared and talks
to the successes and the weaknesses that we saw in the