

**DEPARTMENT OF THE INTERIOR AND RE-
LATED AGENCIES APPROPRIATIONS FOR
FISCAL YEAR 2005**

THURSDAY, MARCH 4, 2004

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:32 a.m., in room SD-124, Dirksen Senate Office Building, Hon. Conrad Burns (chairman) presiding.
Present: Senators Burns, Stevens, Bennett, Dorgan, Byrd, Leahy, Reid.

DEPARTMENT OF ENERGY

OFFICE OF THE SECRETARY

STATEMENT OF HON. SPENCER ABRAHAM, SECRETARY

OPENING STATEMENT OF SENATOR CONRAD BURNS

Senator BURNS. We will call the Appropriations Subcommittee on the Interior to order.

Welcome, Mr. Secretary.

Secretary ABRAHAM. Good to be with you.

Senator BURNS. Appreciate that.

Secretary ABRAHAM. Thank you.

Senator BURNS. We are glad to have you here to discuss the President's fiscal year 2005 budget request from the Department of Energy. Due to the tortured evolution of jurisdictions in Congress, your Department is relegated to "related Agency" status in our subcommittee. The Interior Department gets its name on the bill, but we rarely ever hear of the Energy aspect of this. We appreciate that you are here for the good or the bad, but nonetheless we know that what you do at the Department of Energy is important to the country, and in a lot of ways it is related for the simple reason that Interior and Energy should be working together. They support development of technologies that can slow our growing dependence on foreign oil. Your programs also support the development of technologies that promote the more efficient use of all forms of energy, which enables our economy to grow without sacrificing environmental quality.

The Department of Energy's budget, under this subcommittee, is roughly \$1.7 billion. Direct comparisons with current funding levels is a bit complicated due to the use of revisions, deferrals, and advance appropriations, but generally speaking, your budget request

reflects a zero sum situation. A handful of administrative priorities, such as FutureGen and weatherization, were given large increases. These increases are paid for by steep reductions in a range of ongoing R&D programs such as oil and gas research, industrial technology, distributed generation, and coal fuels. As a general matter, Mr. Secretary, I think it is appropriate that the budget posture, given the current fiscal climate, the budget committee will be going into the mark-up session today, so it is clear that what you have recommended here and what has been recommended to us up in budget will be dealt with.

With that in mind, it is clear in our discussions that we need to center around tradeoffs as opposed to where the next additional Federal dollar should go, I do not foresee that there will be any additional Federal dollars for any programs coming up. This is going to be a tough budget year. We have invited you here today to explain some of those priorities you've set within your budget requests. If we go along with the reductions that you propose in oil and gas R&D or distributed generation research, what do we lose? If we go along with the major investments you propose in FutureGen, carbon sequestration, and weatherization, then what do we get? We might not necessarily agree on all of the answers but by and large I am sure we will have an informative discussion before it is all over.

PREPARED STATEMENT

So again, Mr. Secretary, thank you very much for coming this morning. We appreciate your time; we know that you are busy at this time of the year.

[The statement follows:]

PREPARED STATEMENT OF SENATOR CONRAD BURNS

Welcome Mr. Secretary. We're glad to have you here to discuss the President's fiscal year 2005 budget request for the Department of Energy.

Due to the tortured evolution of jurisdictions in Congress, your department is relegated to "Related Agency" status in our subcommittee nomenclature. The Interior department gets its name on the bill (along with most of the attention—good and bad), while your programs tend to get somewhat less scrutiny.

But there is no question in my mind that the DOE programs under this subcommittee's jurisdiction support critical national goals.

They support development of technologies that can slow our growing dependence on foreign oil—something that is essential to our national security. And down the road those technologies may help free us from our dependence on oil imports once and for all.

Your programs also support development of technologies that promote the more efficient use of all forms of energy; enabling our economy to grow without sacrificing environmental quality.

The President's fiscal year 2005 budget request proposes roughly \$1.7 billion for DOE programs under our jurisdiction.

Making direct comparisons with current funding levels is a bit complicated due to the use of rescissions, deferrals, and advance appropriations. But generally speaking, your budget request reflects a "zero sum" situation.

A handful of Administration priorities such as FutureGen and Weatherization are given large increases. These increases are paid for by steep reductions in a range of ongoing R&D programs, such as Oil and Gas research, Industrial Technologies, Distributed Generation, and Coal Fuels.

As a general matter, Mr. Secretary, I think that is an appropriate budget posture given the current fiscal climate. In just a few minutes the Senate Budget Committee is going to begin to mark up this year's budget resolution, and it is clear that it

will recommend less discretionary spending than contemplated in the President's request, not more.

So with that in mind it is clear our discussions need to center around tradeoffs, as opposed to where the next additional Federal dollar should go. I don't foresee there will be any additional Federal dollars for these programs.

We have invited you here today to explain to us the priorities you've set within your budget request. If we go along with the reductions you propose in Oil and Gas R&D, or Distributed Generation research, what do we lose? If we go along with the major investments you propose in FutureGen, carbon sequestration and Weatherization, what do we get?

I'm not sure we'll necessarily agree on all the answers by lunch, but am sure we'll have an informative discussion.

Again, Mr. Secretary, thank you for coming today. I know you have a number of different Congressional committees to which you must answer, and we appreciate your time.

Senator BURNS. Welcome Senator Dorgan, my co-chair on this committee, I look forward to your statement.

OPENING STATEMENT OF SENATOR BYRON L. DORGAN

Senator DORGAN. Senator Burns, thank you very much and Mr. Secretary thank you for being with us. You and I have talked prior to this hearing and you know that I feel that we have a fiscal policy that does not work, increases in funding for large areas of the budget, defense and homeland security coupled with tax cuts, tax cuts and more tax cuts means that we have very large budget deficits and they are growing, not receding. I know my colleague, Senator Burns, will be working with the budget committee this morning trying to grapple with all that but I just do not think this adds up. And you see the final result of it as you take a look at these individual budget requests from the administration. Senator Burns asked the right question, what is the consequence of cutting some of these funding areas such as clean coal technology. What is the consequence of cutting that funding, fossil energy R&D, coal research, oil research, natural gas research? And so, we need to think through all of this carefully. I really do hope, even as we consider the individual appropriations bills, that we find a way, in a bi-partisan way, to put our fiscal policy in some kind of thoughtful order, because it is not there today.

ENERGY AND ENVIRONMENTAL RESEARCH CENTER (EERC)

I am going to ask you some questions about some specifics. The EERC, which is located in North Dakota, has been recommended for a cut. I know that we have talked about that and I want to ask you some questions about that, I think that is a very important institution. The issue of purchase power for the Western Area Power Administration (WAPA), we need to fix the budget recommendation there. I would love to see us, and I think it is important for us to have targets and timetables with respect to hydrogen and fuel cell initiatives; I support the President very much in that area. I believe that we should do even more than he recommends and I believe we should have targets and timetables. And the energy savings performance contracts need to be extended; it makes no sense for us not to extend them. We need to work together to find a way to do that posthaste in my judgment. These and a few other areas are areas I will ask you some questions about today.

Mr. Secretary, thank you for coming back to the Senate and making another return visit. I appreciate your testimony today.

Senator BURNS. Thank you, Senator Dorgan, and Mr. Secretary, the time is yours.

SUMMARY STATEMENT OF HON. SPENCER ABRAHAM

Secretary ABRAHAM. Mr. Chairman, Senator Dorgan.

Senator BURNS. We will give you 15 minutes to sum up everything that you do down there.

Secretary ABRAHAM. Well, Mr. Chairman, as you know we have submitted a fairly lengthy testimony, opening statement to the committee and I would like to submit that for the record, and just make a shorter statement here.

Senator BURNS. It shall be made a part of the record.

Secretary ABRAHAM. Obviously, it is always a pleasure for me to come back to the Senate and to have a chance to discuss our Department with former colleagues. Obviously this budget request builds on a number of programs and successes which we have worked on over the last 3 years. I am proud of a lot of things that the Department of Energy has accomplished in terms of working towards providing energy, economic and national security to the American people. But in particular I am very proud and I want to just make a statement on the record today of the fine people, the men and women who work in the Department and whose dedication makes our success possible. I want to acknowledge the fact that a testament, I think, to their dedication and commitment is a recent announcement by the Office of Management and Budget which ranked the Department of Energy first among Cabinet level agencies in terms of the implementation of the President's Management Agenda, really the scorecard for managerial performance. This evaluates a number of criteria but it recognized the Department of Energy as the Cabinet level agency leading the pack with regard to management improvement. And so, as you can imagine, we are all proud of that, but that happened because people in the frontlines of our facilities and at the Department's main offices have done a great job, the career people who really work very hard to implement these programs that we debate and discuss in the budget process. I just want to make that statement as an initial point here today.

The submission which we make this year tries to continue charting the focus on the management of resources to accomplish our four key areas of focus, defense and national security, energy security, world-class scientific research and environmental stewardship. As you noted, the total request for our budget, \$1.7 billion, is requested for programs funded by this subcommittee. Those programs are in the areas of fossil energy, energy conservation, and the Energy Information Administration. And as I said, my written statement goes into some detail on a number of the components of those. I would like to emphasize just two or three of the priority areas here today.

FOSSIL ENERGY BUDGET

The Department's Fossil Energy program seeks new technologies and methodologies to help take advantage of our vast supplies of

energy in an environmentally safe fashion. The centerpiece of these programs is our clean coal and carbon sequestration initiatives, which account for about 60 percent of the fossil energy request. They aim at insuring that our Nation's 250-year reserves of coal can be used without concern about environmental impact. We are very excited about those programs, particularly about a program we launched last year called FutureGen. This 10-year program, costing approximately \$1 billion in total, is designed to create the world's first zero emission fossil fuel plant. I think we have made good progress in the first 12 months working on this program and we expect to have continued progress in fiscal year 2004 and 2005. And when it is operational, this will be the cleanest fossil fuel-fired power plant in the world. Virtually every element of the FutureGen prototype plant will employ cutting edge technology. Rather than using traditional coal combustion, it will rely on coal gasification and because of this advanced process; we envision that FutureGen will be able to produce large amounts of transportation grade hydrogen fuel as well as electricity.

CARBON SEQUESTRATION

We are also exploring advanced carbon sequestration technologies, both as part of FutureGen and beyond. This may not be a glamorous area to some but I think it is extremely important and I believe that the demonstrated potential of carbon sequestration is convincing. It has convinced us to fully pursue its promise. Last June we brought together representatives from 13 countries to form the Carbon Sequestration Leadership Forum and to build on international interest in this sort of work. That global consortium has already begun investigating ways to work together to sequester greenhouse gas emissions from fossil fuels. And so, we are very excited about and will be focusing heavily on these areas. Of course, this fossil budget involves a variety of other areas as well, ranging from oil and gas research to the Strategic Petroleum Reserve to the Northeast Home Heating Oil Reserve and other projects as well.

ENERGY CONSERVATION BUDGET

Our Energy Conservation budget funds several top presidential initiatives. First and foremost is the President's Hydrogen Fuel initiative, which we announced last year, to accelerate the transition to a hydrogen economy, to go from a world where our cars and trucks run on petroleum to one where they can run on hydrogen-powered fuel cells. President Bush committed an initial investment of \$1.7 billion over 5 years launching of this program, for hydrogen fuel cell research and development, and the budget we submit here would fully fund the program for fiscal year 2005. I believe in the 1 year since the President unveiled this program we have made tremendous progress. We have engaged partners in both the automotive and the energy industries working together really for the first time, in parallel on this project, which is what is required, in my judgment, for its success. We have also found a tremendous amount of enthusiasm and involvement from State and local governments. We have moved forward with critical hydrogen fuel cell research and development. And maybe the most important breakthrough has been that we have been able to attract a wide array

of international interest in and partnership on the project, meaning that we can spread our research dollars further and we can begin laying the groundwork for the kinds of codes and standards and other developments that need to take place for this broader transition to occur. Last November we had the inaugural meeting of a group we called the International Partnership for the Hydrogen Economy. We had 14 countries join the United States; virtually all of the major auto producing and automotive using countries on the planet to start working together. And so, we are excited about what that groundbreaking work will accomplish. We think this partnership really will help us to accomplish the objectives we have set, at least on schedule if not sooner.

WEATHERIZATION

Another top presidential initiative in the area of Energy Conservation is Weatherization. One of the most significant things which the Department of Energy does is attempting to reduce the burden of high energy costs for low-income households that spend a disproportionate share of their total annual income on energy, as much as 19 percent in the case of the average of the lower income households as opposed to only about 4 percent of the income of other households in our country. The Weatherization Assistance Program works to improve the energy efficiency of the homes of these low-income families, effectively slashing their energy bills and freeing up dollars that can be put to use in better ways. By making these homes more energy efficient, the program lowers costs for those who can least afford to either cool or heat their homes and those who are most vulnerable to very volatile changes in energy markets. We think the program is an extraordinarily good one. We hope that this year we will be able to see a level of funding enacted that is consistent with the request we have made. In 2001, in our National Energy policy, we called for an increase for weatherization of \$1.4 billion over 10 years in order to weatherize a total of 1.2 million low-income homes. That would be about twice as many as would have been otherwise affected by the program. We continue to submit budgets consistent with that and we hope this year, working together with you, we can reach our goal.

ENERGY INFORMATION ADMINISTRATION

Finally, I would just mention that this budget also supports the Energy Information Administration. We're requesting nearly a 5 percent increase for EIA in 2005 than our 2004 comparable appropriation which will provide Federal employee pay raise support and maintain the other ongoing data and analysis activities which EIA conducts as part of its responsibility to continue to disseminate accurate and reliable energy information and analysis to inform energy policymakers.

PREPARED STATEMENT

Again, Mr. Chairman, we could obviously go into detail on the areas of interest to all of you. I look forward to doing that and appreciate the chance to be here today.

[The statement follows:]

PREPARED STATEMENT OF HON. SPENCER ABRAHAM

INTRODUCTION

Mr. Chairman and Members of the Subcommittee, it is a pleasure to be here today to discuss the President's fiscal year 2005 budget for the Department of Energy (DOE). The fiscal year 2005 budget includes a total of \$24.3 billion for DOE, \$1.7 billion of which is requested for programs funded in the Interior and Related Agencies Appropriations under the jurisdiction of this Subcommittee. Those programs are Fossil Energy, \$728.9 million; Energy Conservation, \$875.9 million; and the Energy Information Administration, \$85 million. I will provide highlights of those programs later in my statement.

This fiscal year 2005 budget request builds on a number of successes we have had over the past 3 years. I'm very proud of what we have accomplished in terms of fulfilling the President's management vision for this Department and also what we have achieved for the energy and economic security of the American people. We are grateful for the support and guidance that the Members of this Subcommittee have provided to the Department.

The Office of Management and Budget recently announced that DOE has made the most progress among cabinet-level agencies in the implementation of the President's Management Agenda. OMB recognized DOE as the cabinet-level agency "leading the pack with regard to management improvement."

A large part of that leadership involves defining the mission of the Department. From our first days in office we stressed that the overriding mission of this Department is national security.

Another significant part of the Department's mission is to protect our economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy. The fiscal year 2005 budget includes \$2.7 billion to meet energy-related objectives. Of this amount, approximately \$1.6 billion is for Fossil Energy and Energy Conservation programs. The budget request maintains Presidential commitments to promote energy security and reliability through coal research and development, hydrogen production, fuel cell powered vehicles, advanced nuclear energy technologies, and electric transmission reliability.

Within the jurisdiction of this Subcommittee, this budget provides for investments in the President's Clean Coal Power Initiative (\$287 million)—including the ambitious FutureGen program—and Hydrogen Fuel Initiative (\$93.5 million). These initiatives will serve as the technological spring board to solve the nation's long-term energy needs by focusing on energy independence and reliability with a diverse energy portfolio.

Also included in this budget is funding that continues the Administration's 10-year commitment to the Weatherization Assistance program. With a proposed budget of \$291 million, approximately 119,000 homes will be weatherized in fiscal year 2005.

INVESTING IN AMERICA'S ENERGY FUTURE

An important element of all our energy programs is making energy use more secure, more efficient, and more environmentally sound. At the same time, we are preparing long-term energy solutions that will eventually make questions of supply and environmental effects obsolete. The Administration's energy portfolio takes a long-term focus through investments in hydrogen use and production, electricity reliability, and advanced coal and nuclear energy power technologies. Investments in these pivotal areas honor a commitment to strengthen the nation's energy security for the near-term and for generations to come.

In fiscal year 2005, the Department's Energy Efficiency and Renewable Energy program is at the forefront of implementing the President's Hydrogen Fuel Initiative. Hydrogen promises to help meet our nation's future energy challenges. The Department is requesting \$227 million for hydrogen-related activities. That figure includes \$173 million in the Energy Efficiency and Renewable Energy program, \$29 million in the Science program, \$16 million in the Fossil Energy program, and \$9 million in the Nuclear Energy program.

This budget invests \$447 million in the President's Coal Research Initiative to improve the efficiency and environmental protections being developed for coal burning power production. Of that figure, \$287 million will go to the President's Clean Coal Power Initiative, including the FutureGen program which was launched in fiscal year 2004. This cost-shared, \$1-billion project will create the world's first near zero-emissions fossil fuel plant. When operational, the FutureGen plant will be the cleanest fossil fuel-fired power plant in the world.

Mr. Chairman, I would now like to discuss some highlights of our fiscal year 2005 Interior and Related Agencies Appropriations budget request.

[In thousands of dollars]

	Fiscal year		
	2003	2004	2005
Fossil Energy R&D	611,149	672,771	635,799
Naval Petroleum & Oil Shale Reserves	17,715	17,995	20,000
Elk Hills School Lands	36,000	36,000	36,000
Energy Conservation	880,176	877,984	875,933
Economic Regulation	1,477	1,034	.....
Strategic Petroleum Reserve	171,732	170,948	172,100
Strategic Petroleum Account	1,955	.....	.....
Northeast Home Heating Oil Reserve	5,961	4,939	5,000
Energy Information Administration	80,087	81,100	85,000
Subtotal Interior Accounts	1,806,252	1,862,771	1,829,832
Clean Coal Technology	- 47,000	- 98,000	- 140,000
Total Interior & Related Agencies	1,759,252	1,764,771	1,689,832

FOSSIL ENERGY

[In thousands of dollars]

	Fiscal year		
	2003	2004	2005
Budget Request	797,512	804,653	728,899

As part of the effort to lessen the level of our reliance on imported energy sources, the Fossil Energy program is seeking new energy technologies and methodologies that promote the efficient and environmentally sound production and use of fossil fuels, as well as providing strategic protection against the disruption of oil supplies.

The United States relies on fossil fuels for about 85 percent of the energy it consumes, and forecasts indicate U.S. reliance on these fuels could exceed 87 percent in 2025. Accordingly, a key goal of DOE's fossil energy activities is to ensure that economic benefits from fossil fuels and a strong domestic industry that creates export-related jobs are compatible with the public's expectation for exceptional environmental quality and reduced energy security risks. This includes promoting the development of energy systems and practices that will provide energy to current and future generations that is clean, efficient, reasonably priced, and reliable.

Fossil energy programs focus on supporting the President's top initiatives for energy security, clean air, climate change, and coal research. Fiscal year 2005 fossil energy programs:

- Support the development of lower cost, more effective pollution control technologies embodied in the President's Coal Research Initiative or help diversify the nation's future sources of clean-burning natural gas to meet the President's Clear Skies goals;
- Expand the nation's technological options for reducing greenhouse gases either by increasing power plant efficiencies or by capturing and isolating these gases from the atmosphere as called for by the President's Climate Change Initiative; or
- Measurably add to the nation's energy security by providing a short-term emergency response, such as the Strategic Petroleum Reserve, or longer-term alternatives to imported oil, such as hydrogen and methane hydrates.

PRESIDENT'S COAL RESEARCH INITIATIVE

President Bush has committed \$2 billion over 10 years on coal research through his Clean Coal Research Initiative. This includes two major programs: the Clean Coal Power Initiative, and the Coal Research and Development program. The fiscal year 2005 budget continues to meet the President's commitment by providing \$447 million for the Coal Research Initiative. Under President Bush's leadership, budget requests for coal R&D have more than doubled over historical amounts and appropriations.

CLEAN COAL POWER INITIATIVE AND FUTUREGEN

The Clean Coal Power Initiative (CCPI) is a key component of the National Energy Policy to address the reliability and affordability of the nation's electricity supply, particularly from coal. The initiative fulfills the President's commitment to conduct research on clean coal technologies to meet this challenge.

Included in the fiscal year 2005 budget is \$287 million for the CCPI program. The CCPI program is a cooperative, cost-shared program between the government and industry to rapidly demonstrate emerging technologies in coal-based power generation and to accelerate their commercialization. The nation's power generators, equipment manufacturers, and coal producers help identify the most critical barriers to coal's use in the power sector. Technologies are selected with the goal of accelerating development and deployment of coal technologies that will economically meet environmental standards, while increasing the efficiency and reliability of coal power plants. The FutureGen program is funded within this initiative and was launched in fiscal year 2004.

The President's Clean Coal Power Initiative is especially significant because it directly supports the President's Clear Skies Initiative. The first projects included an array of new cleaner and cheaper concepts for reducing sulfur dioxide, nitrogen oxides, and mercury—the three air pollutants targeted by the Clear Skies Initiative.

The "first round" in the Clean Coal Power Initiative—the centerpiece of the President's clean coal commitment—attracted three dozen proposals for projects totaling more than \$5 billion. In early 2003, we announced the first winners of the competition—eight projects with a total value of more than \$1.3 billion, more than \$1 billion of which would be provided by the private sector. These projects are expected to help pioneer a new generation of innovative power plant technologies that could help meet the President's Clear Skies and Climate Change Initiatives.

Competitive solicitations for the "second round" were made just last month and are open to technologies capable of producing any combination of heat, fuels, chemicals, or other useful by-products in conjunction with electricity generation.

FutureGen.—The FutureGen component of the Clean Coal Power Initiative will establish the capability and feasibility of co-producing electricity and hydrogen from coal with essentially zero emissions, including carbon sequestration and gasification combined cycle, both integral components of the zero emissions plant of the future.

It is anticipated that the cost-shared FutureGen project will create a public/private partnership to produce technology ultimately leading to zero emission plants, including carbon dioxide, that are fuel-flexible and capable of multi-product output and efficiencies of up to 60 percent with coal. The project is critical to the continued and expanded use of coal—our most abundant and lowest cost domestic energy resource.

Carbon Management.—Several Clean Coal projects also help expand the menu of options for meeting the President's climate change goal of an 18-percent reduction in greenhouse gas intensity (carbon equivalent per Gross Domestic Product) by 2012, primarily by boosting the efficiencies of power plants (meaning that less fuel is needed to generate electricity with a corresponding reduction in greenhouse gases).

Carbon management has become an increasingly important element of our coal research program. Carbon sequestration—the capture and permanent storage of carbon dioxide—has emerged as one of our highest priorities in the Fossil Energy research program—a priority reflected in the proposed budget of \$49 million in fiscal year 2005.

Carbon sequestration, if it can be proven practical, safe, and affordable, could dramatically enhance our long-term response to climate change concerns. It could offer the United States and other nations an approach for reducing greenhouse gases that would not necessitate changes in the way we produce, deliver, or use energy.

A cornerstone of our carbon sequestration program will be a national network of regional partnerships. This initiative, which I announced last year, will bring together the federal government, state agencies, universities, and private industry to begin determining which options for capturing and storing greenhouse gases are most practicable for specific areas of the country.

Hydrogen.—Another aspect of the President's Clean Coal Research Initiative is the production of clean fuels from coal. A major priority for the Administration is hydrogen as a clean fuel for tomorrow's advanced power technologies (such as fuel cells) and for future transportation systems. Within the Fossil Energy program, we have allocated \$16 million for research into new methods for making hydrogen from coal.

Advanced Research.—To provide fundamental scientific knowledge that benefits all of our coal technology efforts, our fiscal year 2005 budget includes \$30.5 million

for advanced research in such areas as materials, coal utilization science, analytical efforts, and support for coal research at universities (including historically black and other minority institutions).

Other Power Systems Research and Development.—We are also proposing \$23 million for continued development of fuel cells with an emphasis on lower-cost technologies that can contribute to both Clear Skies emission reductions, particularly in distributed generation applications, and Climate Change goals by providing an ultra-high efficiency electricity-generating component for tomorrow's power plants. Distributed power systems, such as fuel cells, also can contribute to the overall reliability of electricity supplies in the United States and help strengthen the security of our energy infrastructure.

Natural Gas Research.—The President's Clear Skies Initiative also provides the rationale for much of the Department's \$26 million budget request for natural gas research. Even in the absence of new environmental requirements, natural gas use in the United States is likely to increase by 40 percent by 2025. The National Petroleum Council has estimated that 14 percent of our natural gas supply in 2025 will be provided from advances in technology that have not yet been developed.

Our natural gas research program, therefore, is directed primarily at providing new tools and technologies that producers can use to expand and diversify future supplies of gas. The program will focus on resources in high-priority regions to find and produce gas from non-conventional and deep gas reservoirs with minimal environmental impact. Emphasis will be on research that can improve access to onshore public lands, especially in the Rocky Mountain region where much of our undiscovered gas resource is located. A particularly important aspect of this research will be to develop innovative ways to recover this resource while continuing to protect the environmental quality of these areas.

We will continue the National Stripper Well Consortium involving industry and the research community to investigate multiple technologies to improve stripper well production and prevent continued abandonment.

Natural gas importation and storage will also assume increasing significance in the United States as more and more power plants require consistent, year-round supplies of natural gas. We will continue a nationwide, industry-led consortium that will examine ways to improve the reliability and efficiency of our nation's gas storage system, and we will initiate analyses to facilitate LNG importation and facility siting.

Over the long-term, the production of natural gas from hydrates could have major energy security implications. Hydrates—gas-bearing, ice-like formations in Alaska and offshore—contain more energy than all other fossil energy resources. Hydrate production, if it can be proven technically and economically feasible, has the potential to shift the world energy balance away from the Middle East. Understanding hydrates can also improve our knowledge of the science of greenhouse gases and possibly offer future mechanisms for sequestering carbon dioxide. For these reasons, we are continuing a research program to study gas hydrates with a proposed fiscal year 2005 funding level of \$6 million.

OIL TECHNOLOGY DEVELOPMENT

The President's National Energy Policy calls attention to the continued need to strengthen our nation's energy security by promoting enhanced oil and gas recovery and improving oil and gas exploration technology through continued partnerships with public and private entities.

At the same time, however, we recognize that if the federal oil technology R&D program is to produce beneficial results, it must be more tightly focused than in prior years. Consequently, our fiscal year 2005 budget request of \$15 million reflects a reorientation of the program toward those areas where there is clearly a national benefit.

One example is the use of carbon dioxide (CO₂) injection to enhance the recovery of oil from existing fields. CO₂ injection is a proven enhanced oil recovery practice that prolongs the life of some mature fields, but the private sector has not applied this technique to its fullest potential due to insufficient supplies of economical CO₂. A key federal role to be carried out in our proposed fiscal year 2005 program will be to facilitate the greater use of this oil recovery process by integrating it with CO₂ captured and delivered from fossil fuel power plants. This technology has the dual benefit of enhancing oil recovery and sequestering CO₂. In fact, this technology could potentially be a key method of meeting the President's 18-percent carbon reduction commitment.

A high priority effort in fiscal year 2005 will be to develop "micro-hole" technology. Rather than developing just another new drilling tool, the federal program

will integrate “smart” drilling systems, advanced imaging, and enhanced recovery technologies into a complete exploration and production system. Micro-hole systems may offer one of our best opportunities for keeping marginal fields active because the smaller-diameter wells can significantly reduce exploration costs and make new drilling between existing wells (“infill” drilling) more affordable. In addition, micro-hole technology has the potential to greatly increase recovery of the almost 60 percent of oil that remains in reservoirs after conventional production.

We will also work toward diversification of international sources of oil supplies through bilateral activities with nations that are expanding their oil industry, including Venezuela, Canada, Russia, Mexico, and certain countries in West Africa. Bilateral and multi-lateral work will include technology exchanges.

OTHER FOSSIL ENERGY R&D

The budget also includes \$124.8 million for other activities in the Fossil Energy program, including \$106 million for headquarters and field office salaries, \$6 million for environmental restoration, \$3 million for federal matching funds for cooperative research and development projects at the University of North Dakota and the Western Research Institute, \$1.8 million for natural gas import/export responsibilities, and \$8 million for advanced metallurgical research at our Albany Research Center.

PETROLEUM RESERVES

The Strategic Petroleum Reserve and Northeast Home Heating Oil Reserve are key elements of our nation’s energy security. Both serve as resource options for the President to use to protect U.S. citizens from disruptions in commercial energy supplies.

Strategic Petroleum Reserve.—The President has directed us to fill the Strategic Petroleum Reserve (SPR) to its full 700 million barrel capacity. The mechanism for doing this—a cooperative effort with the Minerals Management Service to exchange royalty oil from federal leases in the Gulf of Mexico—is working well. We have been able to accelerate fill from an average of 60,000 barrels per day at the start of the President’s initiative to a rate of 130,000 barrels per day.

Because of the President’s “royalty in kind” initiative, we have achieved the Reserve’s highest inventory level ever, now at 640 million barrels. Our goal remains to have a full inventory of 700 million barrels by the end of calendar year 2005.

The fiscal year 2005 budget for the SPR is \$172.1 million, all of which is now in our facilities development and operations account. We do not require additional funds in the oil acquisition account because charges for transporting “royalty in kind” oil to the SPR are now the responsibility of the oil supplier.

Northeast Home Heating Oil Reserve.—We are requesting \$5 million for the Northeast Home Heating Oil Reserve, the same level as last year. The two-million-barrel reserve remains ready to respond to a Presidential order should there be a severe fuel oil supply disruption in the Northeast. A key element of this readiness is a new online computerized “auction” system that we implemented to expedite the bidding process. Installing and testing the electronic system (including tests with prospective commercial bidders) have also been major elements of the Fossil Energy program’s role in implementing the “e-government” initiatives in the President’s Management Agenda.

Naval Petroleum and Oil Shale Reserves.—The fiscal year 2005 budget request of \$20 million reflects funds for continued operation. The Rocky Mountain Oilfield Testing Center (RMOTC), established at the Naval Petroleum Reserve No. 3 in Wyoming, will be funded at \$2.1 million. We are considering transfer of Naval Petroleum Reserve No. 2 in California to the Department of the Interior. We expect to be able to reduce our funding requirements for equity redetermination studies for the government’s portion of the Elk Hills Naval Petroleum Reserve No. 1, which was divested in 1998. Of the four producing zones for which final equity shares had to be finalized, three have been completed and the fourth (the Shallow Oil Zone) is expected to be finished in fiscal year 2007.

ENERGY CONSERVATION

[In thousands of dollars]

	Fiscal year		
	2003	2004	2005
Budget Request	880,176	877,984	875,933

Now turning to the Energy Conservation budget, the Department continues to allocate more funding for energy efficiency and renewable energy programs than it does for fossil and nuclear energy activities. Our overall Energy Efficiency and Renewable Energy (EERE) budget request for fiscal year 2005 is a robust \$1.25 billion. Of the \$1.25 billion, we are requesting \$875.9 million for Energy Conservation programs funded in the Interior appropriation. The Interior portion of the EERE budget request continues to reflect priorities consistent with Presidential initiatives, the Administration's Research and Development (R&D) investment criteria and the Office of Management and Budget's PART recommendations.

As you know, in 2002 we dramatically restructured the EERE program in response to the President's Management Agenda by streamlining program management and centralizing administrative functions with a focus on developing consistent, uniform, and efficient business practices. This focus is helping to assure that we not only fund the right mix of R&D, but that we get more work done for every R&D dollar spent in the lab.

EERE's R&D and technology deployment efforts funded by the fiscal year 2005 budget support Presidential initiatives for increased energy security, greater freedom for Americans in their energy choices, and reduced costs and environmental impacts associated with those choices.

Vehicle Technologies.—America currently imports 55 percent of its oil—a level projected to rise to 68 percent by 2025, and highway transportation currently accounts for more than 54 percent of our oil use. Alternative means of fueling highway transportation from domestic resources is critical if we are to reverse this trend and improve our energy security. The Vehicle Technologies program is focused on just this challenge.

In fiscal year 2005, the Department is requesting \$156.7 million for the Vehicle Technologies program. Activities in this program contribute to two cooperative government/industry initiatives: the FreedomCAR Partnership (where CAR stands for Cooperative Automotive Research) and the 21st Century Truck Partnership. In addition, the Hydrogen Fuel Initiative builds on the FreedomCAR Partnership. Together these initiatives comprise a collaborative effort among the three domestic automobile manufacturers, five major energy companies and DOE for cooperative, precompetitive research on advanced automotive and hydrogen infrastructure technologies having significant potential to reduce oil consumption.

Under the FreedomCAR Partnership, the Vehicle Technologies program supports advanced, high-efficiency vehicle technologies including advanced combustion engines, hybrid vehicle systems, high-powered batteries, materials and power electronics. These critical technologies can lead to near-term oil savings when used with gasoline or diesel-fueled hybrid vehicles; they are also the foundation for the hydrogen fuel cell vehicles of tomorrow. The fiscal year 2005 request fully supports the FreedomCAR Partnership goals for Electric Propulsion Systems, Electric Drivetrain Energy Storage, and Material and Manufacturing Technologies.

The 21st Century Truck Partnership has similar objectives but is focused on heavy vehicles. The partnership involves key members of the heavy vehicle industry, truck equipment manufacturers, hybrid propulsion developers, and engine manufacturers along with other federal agencies. The effort centers on improving and developing engine systems, heavy-duty hybrids, parasitic losses, truck safety, and idling reduction.

Fuel Cell Technology.—In fiscal year 2005, we are requesting \$77.5 million for the Fuel Cell Technology program. Fuel Cell Technology plays an important role in both the FreedomCAR Partnership and the Hydrogen Fuel Initiative. These initiatives seek to effect an industry decision by 2015 to commercialize hydrogen-powered fuel cell vehicles. To the extent that hydrogen is produced from domestic resources in an environmentally-sound manner, hydrogen fuel cell vehicles will require no petroleum-based fuels and emit no criteria pollutants or carbon dioxide. Their development and commercial success would essentially remove personal transportation as an environmental issue and substantially reduce our dependence on foreign oil.

The program works to advance both fuel cell vehicle technology and the hydrogen infrastructure needed to support it. This helps ensure that hydrogen will be available and affordably priced when fuel cell vehicles are ready for commercialization.

The major focus of the Fuel Cell Technology program continues to be on high risk research and development to overcome technical barriers, centered on core research of key fuel cell components, with industry focused on engineering development of complete systems. DOE provides funds to major fuel cell suppliers, universities and national laboratories to develop materials and component technology aimed at lowering cost and improving durability, which are two major barriers to commercialization. The fiscal year 2005 Fuel Cell Technology budget also continues support of our Vehicle Validation effort, a "learning" demonstration program that integrates real-

world operation of vehicles provided by major automotive companies with the required refueling infrastructure provided by major energy suppliers (the refueling portion of this effort is funded through the Energy and Water Development appropriation bill). Projects were selected from a major solicitation in 2004 and this effort will play a significant role in integrating fuel cell vehicle and hydrogen activities, measuring progress and determining remaining challenges, leading to the 2015 commercialization decision. This past year we awarded a total of \$75 million for 15 new fuel cell projects that support the FreedomCAR Partnership and the Hydrogen Fuel Initiative. Through open competition, the program has secured the country's leading scientists and engineers and strong corporate involvement to implement the President's vision that the first car driven by a child born today will be powered by hydrogen.

Weatherization and Intergovernmental Activities.—In fiscal year 2005, we are requesting \$364 million for Weatherization and Intergovernmental Activities. Given increases in natural gas and heating oil prices, it is especially important to fund programs that will help reduce the energy costs of low-income Americans who spend a disproportionately high share of their income on energy. The program also promotes rapid deployment of clean energy technologies and energy efficient products. This request supports the President's commitment to increase funding for the Weatherization Assistance program by \$1.4 billion over 10 years.

The fiscal year 2005 Weatherization Assistance program request of \$291.2 million will support the weatherization of approximately 119,000 low-income homes. The fiscal year 2005 request for other activities includes State Energy Program Grants (\$40.8 million), State Energy Activities (\$2.4 million), and Gateway Deployment (\$29.7 million).

Building Technologies.—EERE's building technology R&D programs address technologies, techniques, and tools to make residential and commercial buildings, both in existing structures and new construction, more energy efficient, productive and affordable. Our fiscal year 2005 request for the Building Technologies program is \$58.3 million. The funding supports a portfolio of activities that includes solid-state lighting, energy efficiency improvement of other building components and equipment, and their effective integration using whole-building-system-design techniques, as well as the development of codes and standards.

The Building Technologies program has expanded work supporting longer-term, higher-risk activities with a large potential for public benefits. For example, last year we supported a \$5 million investment to expand our Solid State Lighting research activities, and we request an increase of that funding to \$10.2 million in fiscal year 2005. Solid State Lighting represents one of the most exciting and promising new approaches to efficient lighting systems, with potential to more than double the efficiency of general lighting systems in the coming decades. Our Solid State Lighting research will create the technical foundation to revolutionize the energy efficiency, appearance, visual comfort, and quality of lighting products.

Industrial Technologies.—The mission of the Industrial Technologies program is to reduce the energy intensity of the U.S. industrial sector through a coordinated program of research and development, validation, and dissemination of energy-efficiency technologies and operating practices. The industrial sector is the most energy-efficient sector of our economy, due in part to the strong economic incentives energy-intensive companies have to reduce their energy consumption and costs.

In fiscal year 2005, we are requesting \$58.1 million for the Industrial Technologies program. As in previous years, the request reflects the refocus of government R&D to higher priority activities that align better with the Administration's R&D investment criteria. Beginning in fiscal year 2005, we will shift a portion of funding to focus on multi-industry "Grand Challenges" for next generation manufacturing and energy systems technologies. These include efforts for the steel, aluminum, glass and metal casting, and chemical industries. These Grand Challenges will require high-risk investment for high-return gains to achieve much lower energy use than current processes.

Biomass.—This program receives appropriations from both the Energy and Water Development (EWD) and the Interior and Related Agencies Appropriations Subcommittees. Interior-funded activities focus on developing advanced technologies for more energy efficient industrial processes and co-production of high-value industrial products. EWD-funded activities focus primarily on developing advanced technologies for producing transportation fuels and power from biomass feedstocks.

Our fiscal year 2005 request for the Interior-funded portion of the biomass program is \$8.7 million. The request supports continuing R&D on processes for the production of chemicals and materials that can be integrated into biorefineries. Projects with industrial partners will focus on novel separations technologies; bio-based plastics; novel products from oils; and lower cost and energy use in biomass harvesting,

preprocessing, and storage. Additional work with industry, universities, and the national laboratories will focus on improvements to increase the efficiency of individual process steps; for example, catalysis and separations.

Distributed Energy Resources.—Our Distributed Energy Resources program leads a national effort to develop a flexible, smart, and secure energy system by integrating clean and efficient distributed energy technologies complementing the existing grid infrastructure. By producing electricity where it is used, distributed energy technologies can increase grid asset utilization and reduce the need for upgrading some transmission and distribution lines. Also, because distributed generators are located near the point of use, they allow for the capture of the waste heat produced by fuel combustion through combined heat and power systems. In fiscal year 2005, we are requesting \$53.1 million. This funding level reflects relative priority within our overall energy R&D portfolio and is consistent with our fiscal year 2004 request. The program emphasizes integrated designs for end-use systems, but also continues support for individual technology components such as microturbines, reciprocating engines, thermally activated devices.

Federal Energy Management Program (FEMP).—The federal government is the nation's single largest energy consumer. It uses approximately one quadrillion Btu of energy annually, or about 1 percent of the nation's energy use. Simply by using existing energy efficiency and renewable energy technologies and techniques, the federal government can set an example and lead the nation toward becoming a cleaner, more efficient energy consumer. FEMP alternative financing programs help federal agencies access private sector financing to fund energy improvements through Energy Savings Performance Contracts and utility energy service contracts at no net cost to taxpayers. FEMP also provides technical assistance to federal energy managers so they can identify, design, and implement new construction and facility improvement projects in areas such as energy and water audits for buildings and industrial facilities, peak load management, and new technology deployment, including combined heat and power and distributed energy technologies.

As FEMP's core activities have matured, program efficiencies have increased. In fiscal year 2005, we are requesting \$17.9 million for FEMP to continue meeting the goals of improving federal energy efficiency.

Program Management.—Program Management provides executive and technical direction, information, analysis, and oversight required for efficient and productive implementation of those programs funded by Energy Conservation appropriations in EERE. In addition, Program Management supports headquarters staff, six regional offices, the Golden Field Office in Colorado in planning and implementing EERE activities, as well as facilitating delivery of applied R&D and grant programs to federal, regional, state, and local customers. In fiscal year 2005, we are requesting \$81.7 million for these activities. Funding increases will be directed to federalize project management and contracting activities that have been performed by national laboratories, which have much higher overhead costs than our federal staff. This Project Management Center initiative frees our laboratories to devote more time to real research as opposed to management oversight functions, and will help more program dollars remain focused on research, development, and deployment.

ENERGY INFORMATION ADMINISTRATION

[In thousands of dollars]

	Fiscal year		
	2003	2004	2005
Budget Request	80,087	81,100	85,000

For the Energy Information Administration (EIA), we are requesting \$85.0 million, which is \$3.9 million more than the fiscal year 2004 comparable appropriation. The fiscal year 2005 funding will provide for the federal employee pay raise and maintain the other on-going data and analysis activities, allowing EIA to continue disseminating accurate and reliable energy information and analyses to inform energy policy-makers.

EIA's base program includes the maintenance of a comprehensive energy database, the maintenance of modeling systems for both near and mid-term energy market analysis and forecasting, and the dissemination of energy data and analyses to a wide variety of customers in the public and private sectors through the National Energy Information Center.

In fiscal year 2005, EIA plans to discontinue the Annual Electric Industry Financial Report (EIA-412) that collects financial, plant cost, and transmission line data

from municipal, state, and federal utilities and generation and transmission co-operatives. Funds provided to EIA with this budget request and savings from the discontinuation of the EIA-412 Report will be used to accomplish the following activities:

- Improve the quality and timeliness of natural gas data. As part of this initiative, a new natural gas production survey will be developed and fielded;
- Continue the Weekly Underground Natural Gas Storage Survey;
- Update our core electricity surveys to provide improved estimates of fuel-switching capabilities and other critical parameters, and enhance data quality;
- Update petroleum product surveys and systems to maintain data quality and accommodate changes in fuel specifications;
- Provide better regional information in the Short-Term Energy Outlook;
- Conduct independent reviews of energy data and analytical work to improve its accuracy and timeliness; and
- Improve the voluntary reporting surveys and databases to collect and disseminate information on greenhouse gas emission reductions in accord with updated reporting guidelines that are being developed as part of the President's Climate Change Initiative.

EIA continues to aggressively expand the availability of electronic information and upgrade energy data dissemination, particularly on the EIA website. The increased use of electronic technology for energy data dissemination has led to an explosive growth in the number of its data customers and the breadth of their interests, as well as an increase in the depth of the information distributed. Since establishing a fiscal year 1997 goal to increase the number of users of its website by 20 percent annually, EIA has either met or exceeded this commitment in each of the succeeding years. In fiscal year 2003, EIA accomplished a 23-percent increase as compared to fiscal year 2002, delivering more than 2,600 gigabytes of data.

Mr. Chairman, and Members of the Subcommittee, this completes my prepared statement. I would be happy to answer any questions you may have at this time.

Senator BURNS. Mr. Secretary, thank you very much. We have been joined on the committee this morning by Senator Byrd and Senator Bennett.

Senator Byrd, did you have an opening statement that you would like to provide this committee? And thank you for coming this morning.

OPENING STATEMENT OF SENATOR ROBERT C. BYRD

Senator BYRD. Thank you, Mr. Chairman. I count myself to be very privileged to have you as the chairman of this subcommittee as long as the Republicans have to be in control. And I thank the witness for being here this morning.

Mr. Chairman, let me start by thanking you and the subcommittee's distinguished ranking member, Senator Dorgan, for convening the hearing. Many of the research activities conducted by the Department of Energy, particularly the coal research activity that is overseen by the Office of Fossil Energy, are vital to the Nation's energy security and energy independence. Having an opportunity to publicly review the President's budget request is therefore time well spent. I appreciate Secretary Abraham's being here this morning to answer our questions; it is always nice to see a former colleague, although he may not be so happy to see me after he hears what I have to say about this budget.

Last month, the cover of Time Magazine contained a picture of President Bush, along with a caption that read, "Believe him or not? Does Bush have a credibility gap?" For several reasons, I think the answer to that question is a resounding yes. But as far as today's hearing is concerned, I offer up the Department's fossil energy budget as exhibit A. Despite coming to my State and personally promising the people of West Virginia that he would spend

\$2 billion over 10 years on the clean coal technology program, President Bush has, for the fourth time in a row, simply walked away from that pledge. In fact, for this budget, the President is now 40 percent behind on his promise. If that does not constitute a credibility gap then I do not know what does. Even a cursory review of the President's fossil energy budget shows it to be an exercise in arithmetic gymnastics. In an effort to hide the fact that the President is seeking \$50 million instead of \$200 million for the clean coal technology program, the budget request simply blurs these line items. In an effort to hide the fact that the President is proposing to cut the fossil energy budget by 32 percent in terms of new budget authority, the request props itself up by counting \$237 million dollars in previously appropriated funds. And, in an effort to hide the fact that the President is unable or unwilling to pay for his much-touted FutureGen project without completely destroying the core research and development program, the request refuses to tell us where half the cost of that \$1 billion project will come from.

In short, the Office of Management and Budget has produced a document that goes beyond the realm of credibility. Indeed, this budget request is something I would expect to see coming from the accountants at Enron, not a government agency. Furthermore, this administration would love to be able to tout the multiple billions in the now-stalled energy bill for the promotion of coal. Given this administration's track record on the No Child Left Behind, homeland security, international AIDS and the farm bill, it hardly seems that this funding will ever come close to a reality. I am very aware that this administration would like to get an energy bill passed, any energy bill. However, it seems more to fulfill a campaign promise than anything else and it is time to stop passing bills for the sake of passing bills.

Now, Mr. Chairman, out of fairness to the Secretary, I will reserve further comment until he has had an opportunity to make his opening statement and we can begin our questioning. But I want him to know that I have no intention of letting this White House get away with these distortions and half-truths. What they are doing to the fossil energy program is unconscionable. And while I understand that the Secretary must support this charade, I think that in his heart he too knows that this is not in the best interest of our Nation.

Thank you, Mr. Chairman.

Senator BURNS. Thank you, Senator Byrd. Senator Bennett.

Senator BENNETT. After that, I probably better be quiet. I will reserve my comments for the question period, Mr. Chairman.

Senator BURNS. Thanks, Senator Bennett. Senator Reid.

OPENING STATEMENT OF SENATOR HARRY REID

Senator REID. Thank you very much, Mr. Chairman. Secretary Abraham, you know, as a person, I really like you. But I voted against your confirmation because I knew you would have no authority to do anything other than what you were told by this administration and that has proven to be true. I say to you, Senator Byrd, you should feel good that you are getting 40 percent of what the President promised, because in Nevada we are getting nothing that he promised. Zero. He showed up once during the last cam-

paign, and refused to take any questions from the press. When he realized the election was getting close he sent in some of his people, and issued statements, did little TV things, saying that he would only allow nuclear waste to come with good science. Then he did not even look at the reports that were prepared for him. He okayed Yucca Mountain quicker than Willie Mays covered center-field. So, you should feel fortunate that you are even 40 percent of what he said he would do because in Nevada we got nothing.

Mr. Chairman, I really appreciate your holding this hearing to discuss funding for the Department of Energy. And Spence, I appreciate your being here, taking the abuse that you are going to take.

YUCCA MOUNTAIN

I want to speak about an extremely pressing matter, potentially affecting thousands of people who worked at Yucca Mountain. And I am sure members of this committee do not even realize what is going on out there.

My concern over this project as you know involves many things. But what we have recently learned of the treatment shown to workers who are digging the main test tunnel at Yucca Mountain, they were exposed to silicosis and other substances that basically are killing them. Hundreds and hundreds of these people, because the Department of Energy and the contractors involved, put these men's lives at risk. From 1992 to 1996, workers were exposed to dust from drilling and mining operations that were composed primarily of silica, better known as quartz. Everyone knows that the Department of Energy should have known, and did know, of these dangers.

One need only look at Tonopah, which is a short distance away, which was a big mining camp in the early part of the last century. After the camp was established the operators of those mines would not hire what they called Americans, only foreigners, because they knew they would die. Silicosis was so bad in the mines at Tonopah that they only hired foreigners and they died by the score of miner's consumption, silicosis. Silicosis, though, is a 100 percent preventable, 100 percent. But no precautions were taken at Yucca Mountain. None. Some of the people wanted to wear respirators but the DOE would not let them. It took too much time taking them on and off. They would not let them. The mining industries learned a hard lesson in Nevada over the years, Tonopah is one example. My father had silicosis. I thought all dads coughed at night. But all dads did not cough at night.

Less than 10 years ago, the Department of Energy, it is hard to believe, would send these workers into Yucca Mountain with nothing to protect them from the poison of silicosis, this silica. There are many common safety protocols and equipment which were ignored because the Department was too concerned with meeting an unrealistic schedule and the contractors were too interested in making as much profit as they could. And there is plenty to be made. You know, that project, if it continues, will be the most expensive public works project in the history of the world; estimates now are about \$85 billion. But there is no price that anyone can put on the health of just one of these sick miners. These men

worked hard to dig and excavate the tunnel under the assumption that the Department of Energy would protect their health. The failure of the Department of Energy to do this is a tragedy. We are holding a hearing in Nevada during the March break. Dr. Chu has been invited to testify, she is in charge of this program; she was not there at the time but she has had the opportunity to look at these records and even she recognizes how terrible it is. And I think the record of protecting workers from these foreseeable risks is just horrible and it is time we put a stop to this blatant disregard for the health and safety. There are people that are, as I speak, dying as a result of this.

Also, Mr. Secretary, I want to spend just a minute talking about your railroad that you are planning to build through Nevada. You have what is called a preferred rail corridor for possibly transporting nuclear waste in Nevada, and I think you should check to see what's going on in Europe and see they have given up on transporting nuclear waste because the widespread protest and delays. Then they only have to haul it a few hundred miles and here we are talking about hauling it as many as 3,000 miles. Germany even scrapped its nuclear waste repository program following widespread protests of waste shipments. Each shipment of waste is a potential terrorist target, especially after September 11; we have learned how vulnerable our Nation's transportation infrastructure is. But you have been part of selecting a corridor called the Caliente route. The Bureau of Land Management have made no evaluation of possible impacts. This is something, another part of the rush job, just like having these miners killed as a result of working in these mines. This tunnel, I should not say mines. But we in Nevada know what the rail line means. It means that ranches that have been in operation since the time of the Civil War will be put out of business. Take, for example, Gracian Uhalde. Mr. Uhalde operates a ranch near Garden Valley in northwestern Lincoln County, and the proposed line is going right through his ranch. He was not considered—talked to, and what you are proposing will ruin his ranch. This is a family farm we're talking about.

So, Mr. Secretary, there are many challenges facing our Nation, ranging from the war on terror to creating jobs to cutting health care costs. It is time we stopped risking the health of our citizens and wasting our Nation's dwindling financial resources in this blind pursuit of the flawed Yucca Mountain project.

Let me just say this. Everyone who serves on the Appropriations Committee, wait until you see what the administration has done with the energy and water subcommittee budget. A half-a-billion dollars a year was not enough. This year they are asking for about \$900 million for Yucca Mountain. It is going to take away from Devil's Lake, all the many things we do in West Virginia, things we do in Montana, things we do in Utah. There is not enough money when they want \$1 billion to dig in this hole some more. So, good luck on energy and water.

Senator BURNS. Strong letter to follow.

Mr. Secretary, thank you very much. I did not know we were going to get into a little old food fight up here but we try to work

through these things together if we possibly can, then if we cannot we will try other avenues of approach.

FUTURE GEN

Mr. Secretary, we talked about FutureGen, let us delve into that a little bit because we look at how it is structured, and I think we have discussed the project and our shared commitment to see it move forward. Unfortunately, the Department has not provided the report demanded by December 31, 2003 in the fiscal year 2004 conference report. And details remain extremely hazy on that project. I would ask your Department to expedite that report because there are a lot of us that are very interested in this. It is research that is done so that we can use the largest resource we have in this country to provide power and energy for the United States. And that is why a lot of us are very much interested in this. We have been tracking the issue, but I think upon inquiry we hear three things from industry; this is people outside the Department. First, they want to commend you and your staff for doing an excellent job of sorting through the technical and scientific implications of the project. I think your sorting process on where we should be going and stressing those points has been good. But they see it as a meritorious project and want to lend their financial support to the project if a productive path can be found. And they are deeply concerned that OMB and the Department are heading toward a financing and project management strategy that brings into question the long-term viability of the project. And I think we are getting that feeling up here on the Hill, too. There is one thing that government does very well, probably better than any other entity in the world, and that is to throw good money after bad. And I do not think this committee or this Congress should be doing that. But FutureGen is very, very important. It is doing research in the right areas.

So, would you want to comment on that? Can you update us on the project and outline, give us your successes and also, do not be afraid to mention the failures. After all that is what R&D is all about we have more failures than we have successes, and we should know about those.

Senator REID. Mr. Chairman, could I have your permission to have written questions propounded to the Secretary and have him respond within a reasonable period of time?

Senator BURNS. Are they going to be anything like your opening statement?

Senator REID. No.

Senator BURNS. Okay. You may do that then.

Senator REID. Thank you.

Senator BURNS. Mr. Secretary, go ahead.

Secretary ABRAHAM. Thank you. Thank you, Mr. Chairman, and Senator Reid, I would be glad to respond to your questions. Thank you.

FUTURE GEN

First of all, let me just return to a comment on FutureGen that I made initially and just emphasize that it is, in our judgment, the highest priority project. We launched the concept of FutureGen be-

cause we recognized, looking into the future, that it was not good enough to just simply make incremental gains in terms of clean coal technology but to really try to have a transformational change that would develop the kind of power plant of the future that ensured that we transcended all of this debate about whether or not we can operate coal-fired generation in a fashion consistent with environmental quality. We believe we can, we think this project will do more than any other that we have in mind to accomplish that. I apologize to the Committee, to the Congress, that the report, which was due at the end of the year, has not been provided. I am happy to report it will be provided today and I hope that will help to address and clarify some of the issues that have been raised about the path forward. We envision a program that will be approximately \$950 million over the next decade or so with the Government share being very substantial, in the range of \$620 million. We also believe that we will have some international participation in this project, based on the highly successful Carbon Sequestration Leadership Forum conference of last June and the subsequent meetings, which I and others from the Department have participated in with foreign counterparts who have a great deal of interest in trying to work together with the United States to perfect carbon sequestration and coal gasification technologies. We believe that, of course, there is an important role for the private sector to play. We would envision that role being in the range of \$250 million for this project; we think that is a fair allocation of responsibilities and we see already, that there is a strong industry coalition that has been developing to participate in the project as well. And so, I am highly confident it will be successful. You know, this is going to be tough work. The research involved in perfecting these technologies is, as you know, going to really test our capabilities but we think it is well worth the investment. I also believe that when we combine this work with the other work we are doing on clean coal technology and carbon sequestration not included in the FutureGen project, that in the early part of the next decade we will find ourselves with results that truly, as I said, transcend the current debate about the use of coal and the environmental impact of the use of coal. And that is our goal. I mean, this administration is deeply committed to maintaining coal as the key component in our electricity generation mix; it is 50 percent today, we have 250 years of reserves, we cannot afford to not use those reserves and we are committed to making sure that the coal industry is successful in staying as strong as it is today.

Senator BURNS. Well Mr. Secretary, I agree with everything that you said. But when we start making decisions up here on how to allocate money, and where it should go, we have got to have some kind of an idea of the work that has been done, the success and the failure of it, if that be the case, and then if we find a failed procedure or research that has failed to come up with the right answers, then I have no problem in phasing that out and using that money in another direction. It seems like we do not ever hear of the failures, we only hear of the successes and the failures we keep on funding. I think this report is very, very important—

Secretary ABRAHAM. Right.

Senator BURNS [continuing]. To this committee. And since we do not have it, it does not let us prepare in asking some pretty straightforward questions on where does this committee, working with you, take our research dollars.

Secretary ABRAHAM. Sorry.

Senator BURNS. And that is the point I am trying to make here.

Secretary ABRAHAM. No, and it is a well-taken point. I appreciate it and, as I said, I apologize that we were delayed in getting it here. We have been working hard to try to come to an agreement within the administration on it. As you know, in the FutureGen program, which was launched just last year, the initial year's work was primarily a planning phase, a phase in which——

Senator BURNS. That is right.

Secretary ABRAHAM [continuing]. We were focusing on the environmental impact issues. And so, there has not been a lot of research conducted to either succeed or fail yet, that comes later. But certainly, your point is well taken about the timing of this report's release.

Senator BURNS. We have been joined by the chairman of the full committee on appropriations. Senator Stevens, did you have a statement?

Senator STEVENS. No sir, I will just take my turn when the time comes. Thank you very much.

Senator BURNS. Senator Dorgan.

Senator DORGAN. Mr. Chairman, let me defer to Senator Byrd. I know he has other things to do, why do not we have Senator Byrd proceed with his questions, if he would like to, I'll be here until the end of the hearing in any event. Would you like to proceed, Senator Byrd?

Senator BYRD. I think, let us see, how many are ahead of me here?

Senator DORGAN. There is not anybody ahead of you.

Senator BURNS. No, I would go to Senator Bennett if you want to.

Senator BYRD. I would be glad to wait my turn. I think I have a little time in the budget committee, I will be glad to take my turn.

Senator BURNS. Senator Bennett.

Senator BENNETT. Thank you very much, Mr. Chairman. I would be happy to defer to Senator Byrd if his schedule requires it.

Senator BYRD. Thank you very much. Thank you.

Senator BENNETT. Mr. Secretary, I cannot resist just making a note, having listened to Senator Reid as he talked about the desperate conditions in the building of Yucca Mountain. And I made the note, I hope I made it accurately, that he said this occurred during 1992 to 1996, when Hazel O'Leary was the Secretary of Energy, rather than you. I think if there are any in the audience that heard that attack on the actions of the Department made while you are in the chair they should note the historic fact that he pointed out that, in fact, neither you nor anyone else in this administration was in a position of power with respect to those issues from 1992 to 1996. And I think, Mr. Chairman, we simply ought to perhaps highlight that, which Senator Reid mentioned.

NATURAL GAS AS A FUEL OF CHOICE

Mr. Secretary, the fuel of choice is not coal but natural gas. In the joint economic committee, we have had Chairman Greenspan raise the various economic issues confronting this country. I was a little surprised, as he went through the standard statements of a central banker, talking about all of the financial implications of interest rates and trade policy and so on, for him to say that one of the most significant economic challenges we face in the future is the shortage of natural gas. He pointed out that natural gas, unless it is liquefied, is one fossil fuel we cannot import, that the only way we get natural gas in its natural form into this country if we run low in our own supply, is through pipelines through Mexico and Canada. But natural gas that is available anywhere else in the world has to be liquefied and then brought in to special ports that have been prepared for that. We are now in the process of seeing the country build those kinds of ports at fairly significant expense, to bring in liquefied natural gas, even while, from a seismological point of view, we have a tremendous amount of natural gas in the United States, if we would just build the pipelines to move it around. The first one, which is on our radar screen up here, perhaps because we have the presence of the senior Senator from Alaska, is the pipeline from Alaska. That would be very important to build and will produce a significant economic impact for the entire country if we get that natural gas pipeline built.

I know it is not your area, but it is the area of the Interior Department, which this subcommittee is concerned with, to open up natural gas supplies in Federal lands to make it available. And I would be interested if not here, or if in your other testimony, you could give us any information that you might have as to what could be done to make natural gas more available to deal with the problem Chairman Greenspan is concerned about, and which I am, as the cost of natural gas keeps going up, as the environmental community continues to insist that it is the fuel of choice. Do you have any comments on this situation?

NATURAL GAS

Secretary ABRAHAM. Well, let me make a broad statement and then touch on a few specific facts. There is no question that in recent years, as a result of regulations that deal with the environment, we have moved the power generation development in this country in the direction of gas and that puts the stress on the market that you are talking about. We have regulated ourselves in the direction of gas on the demand side and we have sort of regulated ourselves in the other direction with regard to the supply side. That does not mean there is not new gas being produced but there is not as much as the demand levels are prompting. I have been encouraged by the recent developments, the interest that has been shown in the building of an Alaska pipeline. Last week I was on the West Coast and heard from the Port Authority of Alaska about their plan to possibly split the facility, or split the pathway forward to use LNG, actually, to move some of the gas from Alaska to the West Coast, California or lower 48, and move the rest to Chicago through a pipeline. The interest of companies now has, I think,

been growing in terms of building that pipeline, so we are encouraged by that.

But let me put some facts on the table for the committee and urge you to think about these as you deliberate on, not just this budget but on the broader policies the Senate considers. Last year, actually in March 2002, I asked the National Petroleum Council to do an updated study of natural gas prospects and forecasts, for this country. They had done one in the late 1990s; I felt it probably was out of date just given what we were seeing in the market. They released the results of that study in September of last year and it was quite staggering. Even using very optimistic calculations about gains and energy efficiency, and contemplating the arrival of the Alaska gas to the lower 48 over the next 20 years, they forecast the following: that where America had once been able to supply all of its natural gas demands domestically and where in recent years we have seen about a 10 percent import, mostly from Canada, in 20 to 25 years, their forecasts would have the United States importing about 25 percent of its natural gas from beyond North America. And that is with optimistic proposals.

Senator BENNETT. That is even if we build the Alaska pipeline—

Secretary ABRAHAM. Yes, it is.

Senator BENNETT [continuing]. And the two tracks you have described?

Secretary ABRAHAM. Yes.

Senator BENNETT. I see.

Secretary ABRAHAM. And the results of that, I would be happy to submit for the record to the committee and also to the joint economic committee, if that would be helpful, what it calls for is, a continued effort to make sure we have diverse sources of electricity generation, that we do not simply rely on gas. That means the coal programs we are talking about here. It means that nuclear energy has to continue to play a role, which means we do have to resolve the question of what we do with nuclear waste. It also means that we have to be capable of importing larger amounts of natural gas. And that is why one of the focuses in our Department since that report came out has been on what groundwork needs to be laid in order for liquefied natural gas facilities to be built, what do we have to do to try to partner with other gas producing countries. And one of the concerns, obviously, that comes from this is that we do not want to find ourselves moving in terms of foreign dependence on gas in the direction we have all been concerned about regarding oil. So in December we convened a summit of all the major gas producing countries, 20 countries came, talking about what they could do, what they wanted to do, what their prospects were. There are immense natural gas reserves around the world; Australia has huge supplies, they would like to sell those supplies to the United States. And so, I think we had an excellent summit. We identified some serious challenges, one of which, clearly, is the question of safety that comes out of these kinds of issues. So, our Department is working now to try to address some of those issues, to try to identify the safety challenges and hopefully the solutions to them. But we also need to look at the regulatory approach that will be taken to make sure that we address the safety issues in a

timely fashion so that facilities can be built. But this is going to be, in our judgment, a major, long-term strategic challenge for the country. I do not think that the demand for gas is going to abate; I think we are going to see this continue and if we are not able to facilitate the import of LNG it is going to put tremendous stress on what is already a pretty tight marketplace.

Senator BENNETT. Thank you for that answer and for the thoughtful analysis that it demonstrates on the part of the Department.

Mr. Chairman, again, in this committee, subcommittee, we have to deal with the BLM and the Forest Service. On BLM land there is a tremendous amount of natural gas that is being prevented from coming to the market for a series of other reasons unrelated to the Secretary, and I think we ought to address that.

MOAB ATLAS TAILINGS

Mr. Secretary, I am taking advantage of the fact that you are here, very quickly hitting a parochial issue that frankly is not before the purview of this committee, it is the energy and water committee. But taking advantage, as I say, of the fact that you are in front of us, I want to raise the issue of the Moab Atlas Tailings, to tell you that we are very concerned about that. We hope that we can work with you. I will not ask you a bunch of detailed questions about that because it would intrude on Senator Byrd's time, but I will just trigger that issue for you and let you know we will be in touch with you and look forward to your cooperation in trying to help us get that problem solved.

Secretary ABRAHAM. Well, we look forward to working with you. As you know, we are trying to move ahead to both produce the draft environmental impact statement, which I believe will be taking place in the April-May timeframe.

Senator BENNETT. The quicker the better.

Secretary ABRAHAM. We are hoping to have a final environmental impact statement by November, with a record of decision in December. And so we understand the importance of trying to move this process ahead and we will do our best to accomplish those timetables.

Senator BENNETT. Thank you very much for your attention to that.

Senator STEVENS. Senator Byrd, my questions would follow on the same line. Would you mind if I asked them now?

Senator BYRD. Not at all, Mr. Chairman. Go ahead, please.

ALASKA ARCTIC ENERGY OFFICE

Senator STEVENS. Well, Mr. Secretary, the Congress created an Arctic Energy Office, a branch of your Department's National Energy Technology Laboratory. It was created to work with Canada with the knowledge that a substantial portion, an overwhelming portion of the remaining natural gas to be produced from this continent under the American flag and the Canadian flag would be available to us if we could really conduct the research that is necessary to go ahead. I point out that we do have some additional supplies in the world. The Shtokman Deposit of Russia was presumed to be oil but it is primarily gas now, I understand, and there

is gas off our shores that is going to be available to us. But the cost of that gas in the long run is going to be overwhelming compared to our own domestic gas if you compute in, which the Congressional Budget Office does not, the affect of spending money in the United States as opposed to buying our energy overseas as we have done in the oil industry. But your budget this year eliminates the funding, as we understand it, for the Arctic Energy Office. We had over \$635 million in the Fossil Energy Research and Development last year. I am told that your budget indicates that none of it will be spent in the Arctic. What led to that decision?

Secretary ABRAHAM. Senator, we have not made requests for this line item either this year or last year, I do not think in previous years in our submission because it has been a Congressionally initiated project. That has been kind of the policy on the submissions. That does not mean we do not feel that the office has been doing important work. We would certainly agree to that. And we have talked to Senator Mikulski about this as well and look forward to further discussion on how we might be able to maintain the effectiveness of that office. But it is not in our submission because it has been a congressionally initiated project.

ALASKAN ENERGY RESOURCES

Senator STEVENS. Well, as we look through this budget, for instance, in terms of the basic research in hydrates, gas hydrates—

Secretary ABRAHAM. Right.

Senator STEVENS [continuing]. 590 trillion cubic feet estimated in our State. The funding for the Department in terms of that project has been reduced by \$3.35 million. If you look at the Syngas Ceramic Membrane project, that has been eliminated in 2005. The President called for the sensitive development of Alaska's oil and gas reserves but we find that consistently through the bill, for instance, University of Alaska in Fairbanks was at the forefront of some of these items and that research, budget item two, has been eliminated. It almost looked like someone decided that we did not want Alaska's gas or other resources to be pursued at this time.

Secretary ABRAHAM. Well, that is obviously not the way we view it. We certainly see tremendous Alaska potential and look forward to working together to figure out how to tap it. I think that, with the hydrates budget, I believe we have budgeted about \$6 million in our submission; we think that is a valuable area. We think that it has great promise, maybe not immediate, but we see it as a potentially vast source in the future, and given the demands that I mentioned earlier we are going to need to be tapping unusual or new sources for our future needs.

GAS HYDRATES

Senator STEVENS. Well, on the gas hydrates it specifically takes that money out. But beyond that, we put up \$6.5 million to conduct research for the development of the Syngas Ceramic Membrane technology to enhance the Fisher-Tropsch gas conversion concept and that project too was eliminated totally. I just really do not understand this budget from the point of view that we are looking to try to develop our own resources on this continent, I think we should help Canada even more than we are, as a matter of fact,

because some of their areas are so remote from their really population bases they are not that interested in moving their gas. But our projects alone would create 400,000 jobs in 3 years. And yet, we are still dragging along. Congress has not enacted the bill we need to get it started, but if there is a jobs bill in the United States, it is to assist the development of the Alaska natural gas pipeline. That pipeline, by the way, is to bring to market gas, which has already been produced, reinjected into the ground; there is absolutely no question that it is there. When we get to the Interior Department, we are going to have some questions about what we are doing there. But clearly Congress has seen fit to withdraw almost 90 percent of Alaska's arctic that belongs to the Federal Government; a portion of it belongs to our State. I see some fine hand here. You have been a good friend for a lot of years but I do not understand. You go through this budget and look at the Alaska items, each one of them has been reduced and that is the one area of great promise as far as natural gas supplies in the United States.

Secretary ABRAHAM. Senator, on the hydrates, our submission last year was quite a bit lower than our submission this year. We are trying to find a level where the Congress and the Department are in agreement. We submitted a \$3.5 million request last year, this year it is \$6 million. I think in that sense, we certainly demonstrated our keen interest in the project. There is no question this administration is certainly firmly on record in support of the development of Alaskan resources, as you well know.

Senator STEVENS. You cannot do that without Federal money in Alaska when you own most of the land in the area.

Secretary ABRAHAM. Well, we are working within a budget in which I have constraints and we are doing our best to try to make sure we address as many priorities as we can. We are anxious to work with the committee and with you to make sure we come up with a final resolution that is as positive as it can be. It is certainly not an attempt to focus on any one State or one program. We are also, as you well know, committed to trying to bring Alaska gas to the lower 48. I think the recent developments, as I said in my answer to Senator Bennett with regard to the interest expressed by Mid-America Company and others in moving that project ahead, is a very positive one. As you know, we are separately working on trying to expedite permit processes on this. Obviously, some of that falls in other agencies, but we are all trying to work together to accomplish it.

Senator STEVENS. Well, again, I am belaboring it. Arctic Research, line item 296, that eliminated the Arctic Energy Office, gas hydrates, chlorine wells; that eliminated \$3.35 million in gas hydrates for Alaska Arctic research; \$1.48 million, that eliminated the Arctic Energy Office. The effective environmental protection concepts, that eliminated the funds that have been used, \$2.71 million, eliminated the funds for evaluating environmental questions that have limited production and exploration on the former National Petroleum Reserve for number four. Those are all in your Department and all very selective reductions in the Alaskan effort at a time when we need more money.

My last comment would be, not only to you but to the committee and Senator Bennett certainly said too many times, but if we look at China, they build the roads out for the companies that are drilling for their oil. But our way, we have to use our State funds to build roads out of the Arctic areas. If you look at the investments that have been made in Shtokman, the Russian Government is putting infrastructure totally in there. We are expected to go ahead of the game and put it in there before we even get the approval of the Congress for the gas pipeline. I think we put the cart before the horse. But the main thing I am disturbed about is this elimination of research money to find the ways to do it better, as we know we are going to have oil and gas development at the Arctic. I cannot understand eliminating the money in the very key areas that I have mentioned.

Again, you are a good friend, I am not criticizing you personally but the concept of reducing the budget for needed infrastructure to assure our future energy supplies is misguided. Thank you very much, Mr. Chairman.

Senator BURNS. I think that is what we are talking about and I think when I went back to my question on successes and failures, as far as our R&D is concerned, is trying to set our priorities.

Senator Byrd.

Senator BYRD. Thank you, Mr. Chairman.

CLEAN COAL TECHNOLOGY PROGRAM

Mr. Secretary, in October 2000, during his campaign for the presidency, then-Governor Bush came to West Virginia. He told the voters that if elected he would seek \$2 billion over 10 years for the Clean Coal Technology program. The following night in Boston during a nationally televised debate Governor Bush repeated his promise. He said, I am going to ask the Congress for \$2 billion. Eight days later on October 11, 2000, in another presidential debate, the Governor said, I think we need to have clean coal technologies. I propose \$2 billion worth. Those are the exact words used by Governor Bush during his campaign, \$2 billion over 10 years, or \$200 million per year, for clean coal technology. By any conceivable measure, that is a strong endorsement. There is absolutely no doubt in my mind that that promise was key to the winning of West Virginia's five electoral votes. If those five votes had gone to Mr. Gore, you would not be sitting there in that chair. Yet, despite all the promises, the President has not even come close to proposing \$200 million per year for the Clean Coal Technology program. The first Bush budget contained \$150 million. The second Bush budget contained \$150 million. The third Bush budget proposed \$130 million. This budget, the fourth Bush budget, has been cut back to a mere \$50 million. Instead of honoring his commitment and seeking \$800 million over the past 4 years, the President's requests have totaled only \$480 million. That is 40 percent less than what was pledged. Compounding the problem is the outright deception that the White House is engaging in with respect to this matter. According to the fossil energy budget justification, and indeed your own prepared statement, President Bush never promised \$2 billion dollars specifically for the Clean Coal Technology program. On the contrary, the new revised version of events

has him promising \$2 billion for coal research overall. Such a claim defies logic and, in my opinion, is simply not true. As the chart that I have distributed, I hope it has been distributed, clearly shows, when the President made his \$200 million per year pledge, the coal research budget was already \$317 million; \$95 million for the Clean Coal Technology program and \$222 million for other coal research programs. Therefore, if the President wants us to believe that he was only promising \$200 million per year for coal research in general, then we have to believe he went to West Virginia and campaigned on a promise to cut the coal program by \$117 million, or 37 percent. That is absurd. That is absurd, at best.

Furthermore, when you spoke, Mr. Secretary, to the employees of the National Energy Technology Laboratory in Morgantown, West Virginia, on March 1, 2001, you told them that you were there to: "announce a down payment on that commitment with next year's budget providing \$150 million, new dollars, for clean coal technology." You did not say that the budget was providing \$150 million for all coal research, which it did not. You were very clear in specifying the Clean Coal Technology program.

Now, my question to you, Mr. Secretary, is this. Given these facts, what does the administration say to those West Virginians who actually believed the President when he promised \$2 billion for the Clean Coal Technology program?

Secretary ABRAHAM. Thank you, Senator. Let me, Mr. Chairman? Mr. Chairman? I'm going to just need, if I could, a little time here to respond in some detail on the numbers here.

Senator BURNS. Okay.

Secretary ABRAHAM. Let me give you a sense of how we see this program evolving; let me give you a sense of what those numbers look like. As you know, Senator, since taking office we have now had two solicitations under the President's Clean Coal Initiative. The first one was for about \$313 million, that would be the Government's share, and it has tracked at, I might point out, about \$1 billion of private investment and partnership.

The second one, which just went out, was for \$280 million; went out just a few weeks ago. We are doing them on a 2-year basis, every 2 years is our plan to put out one of these solicitations. We are very confident that the newest one will likewise attract a lot of private partnership and requests. We envision doing these on a 2-year basis throughout the balance of this 10-year period, which we have identified. And each of these solicitations is at the \$300 million level. Why did we only ask for \$50 million for these programs in this budget? Because that is all we needed to complete this second solicitation's \$280 million total amount. But, by the end of the 10-year period, when we have done five \$300 million solicitations, we envision that that will be \$1.5 billion in clean coal technology projects.

In addition, as you know, we have talked here already today at great length about our proposed FutureGen program. As I said, we will submit the report today, and I again apologize to this committee for its delay. We envision the government's share of this new Bush initiative to be about \$620 million for a combined total of \$2.1 billion when you add those five solicitations that we envision and the FutureGen program. Now, in addition to that, and,

you know, the definition of what is a clean coal program obviously can be interpreted in different ways, but as you also know we have significantly increased the carbon sequestration research programs that the Department has undertaken in the last couple of years. We strongly feel that we must address the carbon sequestration issue as part of the clean coal pathway forward, because we believe that we need to address not just the issues of the emission of *nox* or *sox* or mercury but also of greenhouse gases and carbon is obviously the central focus of this initiative. Our budgets for that have been in the range and the submission here, I think, is in the \$49 million range, in this \$40 to \$50 million a year range as well. And I would argue that those dollars are all part of the clean coal initiative that we have launched. And so, when you add those up, you do exceed \$2 billion over 10 years.

As for our submissions to date, all I would say is this: if we take all the coal programs, which is what I think is listed here, and our submissions versus the submissions of the 4 years before, we have been here 4 years, we can go back the previous 4 years, the previous 4 year submissions for all coal programs was about \$668 million; in our first 4 years our submissions are \$1.5 billion. That is an average of \$375 million a year for all coal programs. If you extrapolate that to 10 years, if you go out to 10 years, it is obviously a number close to \$3.7 billion. And so, I look at this program as a very substantial investment in clean coal and I think the case for the submission is a strong one and we hope the committee will support it.

Senator BYRD. Mr. Chairman, well, I will ask a second question. First of all, I will say, when the President made those statements, when he was looking for votes in West Virginia, you were not onboard at that time, but we did not talk about previous administrations or previous submissions. He made an ironclad promise; that is the way we take words like that in West Virginia. And the moving finger writes; and, having writ moves on, nor all thy pageant nor wit shall lure it back to cancel half a line, nor all thy tears wash out a word of it. We take those promises to be bona fide and that they come from the heart.

Now, Mr. Secretary, with all due respect to you, this Senator and the people of West Virginia are not going to forget those words. And we were not talking about all the other clean coal programs when that promise was made. Let me read it again. Let me just for the record read that promise again. The President said, in October 2000, that if elected he would seek \$2 billion over 10 years for the Clean Coal Technology program. Now, you are looking at the daddy of the Clean Coal Technology program. I understand what those words mean. I understand what the President meant when he said them. He said I am going to ask the Congress for \$2 billion. By the old math and the new math, it was \$2 billion.

Eight days later on October 11, 2000, in another presidential debate the Governor said: "I think we need to have clean coal technologies. I propose \$2 billion worth." Now, those are the President's words. And what you are saying is not going to register with great accuracy in the mountains of West Virginia. You are trying to bring in other coal-related programs to get to \$2 billion but it is still under-funding clean coal technology.

Now, my second question. How can this administration say that it is working to reduce our Nation's dependence on foreign energy resources when it continues to undermine that objective by cutting, cutting, these vital fossil energy research programs?

Secretary ABRAHAM. Are we referencing oil and gas programs in particular?

Senator BYRD. Well, you are cutting this program. You are cutting vital energy research programs and you are not keeping the promise that was made. I get back to that, I am going to go back to that every time.

Secretary ABRAHAM. Senator, you know I have the highest regard for you and on this one we just see the numbers differently, I guess. I just want to reemphasize to the committee, we have done two \$300 million solicitations under the President's new program. We do them on an every 2-year basis, so there will not be another one for 2 years. We would envision each of the remaining three to have approximately the same level of financing of \$300 million as the first two. If you add the five up it is a billion-and-a-half dollars over 10 years. And if you add the FutureGen program, which I think is inextricably tied to the Clean Coal Technology Initiative of the President, then you are in the range of \$2 billion. So I believe we are fulfilling that commitment.

As to the other programs, I will acknowledge to this committee as I did last year that we have offered very substantial reductions from enacted levels on the oil and gas programs. It is an interesting challenge we have because obviously the Senator is exactly correct, as we see growing dependence on foreign oil. And as I acknowledged to Senator Bennett, we are seeing the need for increased imports of natural gas. The reason we have submitted these numbers at this level is related to the evaluations these programs have gotten from the Office of Management and Budget. They have been deemed ineffective and we are trying very hard to improve the performance of these programs so that we can come both to the Congress and the American people with programs that do not have such ratings. I have a hard time making the case, justifying the request for funds for programs where I am getting low scores. These are major areas, we are not cutting them out but we are scaling them back in the hope that we can make them more cost-effective.

Senator BYRD. Mr. Chairman, I am going to desist now. I will just shoot one final shot across the bow. A promise made is a debt unpaid. That promise was made. The words are etched in stone. The words of now-President Bush. We expect that promise to be kept. It is not being kept. And, Mr. Secretary, I feel for you because you have to try to skim over and put a little new face on the promise after it was made. And you are doing a good job, you are doing the best you can but that promise was made by then-Governor Bush; the people of West Virginia have not forgotten it and it is impinging upon the credibility of the administration and it will not be forgotten. We expect the administration to do better in keeping its promises.

Thank you, Mr. Chairman.

Senator BURNS. Thank you, Senator Byrd. And, Senator Dorgan.

FOSSIL ENERGY BUDGET CUTS

Senator DORGAN. Mr. Secretary, I was interested in hearing the questions by my colleague, Senator Byrd. As you know there are reductions in the fossil energy spending and it comes at a time when you indicate that based on the studies that you had developed we will, in 20 years, be importing 20, 25 percent of our natural gas from offshore; 68 percent of our oil will come from imports. You know, this energy problem has not just occurred on your watch; it has been the previous administration and administrations before that. But we are smoking something strange if we just sit around here and think that we can allow this to happen. It is okay 20 years from now, 68 percent of the oil comes from other places, troubled places in the world; better ramp up now. You know, we are using natural gas, the chairman and I were just talking about, we are using natural gas the way we are using it because of policy choices. And now we discover, well, we are going to have a problem in getting enough natural gas and so we will have 25 percent coming from other parts of the world. And I mentioned earlier, our fiscal policy, that is on this administration's watch; it is completely out of whack. And, you know, to sit around and pretend that this adds up suggests none of us has gone to a school that is worthy of being called a school. And so, I understand budget cuts in the situation where you have this kind of fiscal policy where you increase spending for defense, increase it for homeland security and then cut taxes, cut taxes and cut taxes again and say, oh, by the way, on domestic discretionary let us just shrink the devil out of it. I understand that approach but I think that we are really not thinking very much as a country, fight terrorism and go to war and say, oh, by the way, nobody has to pay for any of that, in fact, you can all enjoy tax cuts. That might be politically interesting but it is not interesting to me as a policymaker. And with respect to budget cuts here, the one thing that occurs to me in response to what Senator Stevens was talking about, I believe it is the case, maybe you can confirm this for me, I believe it is the case that the Office of Management and Budget, which I believe probably ought to be abolished if that were possible, the Office of Management and Budget, I think, as a matter of policy, believes that any spending programs that have been initiated here are by and large unworthy and therefore should not be included in the budget. Would that be?

Secretary ABRAHAM. No. I think that is an incorrect statement.

Senator DORGAN. Okay.

Secretary ABRAHAM. I would say this. When we submit a budget to Congress, it is an effort to reflect the priorities of the administration.

Senator DORGAN. Right.

Secretary ABRAHAM. We fully appreciate that the Congress would and does write its own budgets, which reflect its priorities. And so, what you see in front of you, whether it is my budget or anybody else's, is what reflects the spending priorities that we would emphasize. That does not deem any of the programs that Congress thinks important meaningless or unimportant or ineffective but what we reflect in our budget are the programs in the areas that we think are the maximum benefit to the American people.

Senator DORGAN. It is a different way of saying what I think I said. Does not OMB have a policy of saying that which represents earmarks by the Congress will be zeroed out in our submission?

Secretary ABRAHAM. I do not know if that is a policy on every single earmark but it definitely affects one-time-only projects.

Senator DORGAN. Well, I am not even in the administration and I know this. I believe that is OMB's policy.

Secretary ABRAHAM. One of the frustrating things is that we have a budget overall for our Department and we have a number of congressionally-directed projects that are one-time projects. They are funded in enactment and then we come in with a budget that does not reflect them and people say, well, you have cut the budget for this area.

Senator DORGAN. But that is not what Senator Stevens was talking about. You ought to just blame OMB; if I were you, I would. Just say well, I do not agree with OMB but I understand why you cannot do that. But the point of my questions is not to be critical of you, it is to say they have this goofy policy at OMB that says anything that somebody wrote here on a continuing program is marginally unworthy and it will be zeroed out because we do not recognize that as having worth.

Secretary ABRAHAM. Well, all I can say, Senator, is you and I.

Senator DORGAN. Just take a shot at OMB just for a moment.

Secretary ABRAHAM. You know, there are some of them here. Look, the Congress likewise, though, certainly identifies programs that I bring in here that we think are terrific and I have noticed a similar outcome with regard to the funding of them and so it does kind of work both ways. It was certainly my perspective when I sat on that side of the room; however, that Congress's ideas should have been given higher emphasis than maybe is the case today.

ENERGY SAVINGS PERFORMANCE CONTRACTS (ESPC)

Senator DORGAN. All right. ESPC, the Energy Savings Performance Contracts. The authority for that expired at the end of September.

Secretary ABRAHAM. Right.

Senator DORGAN. We know that saves energy, we know it is a good investment. It has been widely supported by Republicans and Democrats and yet we do not have an ESPC program in place. So, how do we get there?

Secretary ABRAHAM. Well, we need to; obviously, we would like to pass an Energy bill. We would like to have the ESPC program reauthorized. I share your view, as you know, on its value. Obviously, I have spent a great deal of time over the last several years working with you and Senator Byrd and Senator Bennett and others to try to get an energy bill passed. We need to do this. There are many components that are included in this bill that do not receive all the headlines. This is one of them. Our key ingredients in terms of meeting our Nation's energy challenges that have been put on a slow track or in this case been stopped dead in their tracks because we cannot get the overall bill passed. So, I look forward to working with you to accomplish that.

Senator DORGAN. But Mr. Secretary, the energy bill that has been reintroduced in the Senate now does not any longer include ESPC. So even if we pass that energy bill this afternoon—

Secretary ABRAHAM. Right.

Senator DORGAN [continuing]. We would still be in the situation where we do not have.

Secretary ABRAHAM. We support ESPCs.

Senator DORGAN. But the question is, how will you help us get there? Will the administration recommend this? It is not in the budget, it is not in the energy bill, so how do we get there?

Secretary ABRAHAM. Well, I guess we will have to confer and consider what the right approach is. I do not have a strategic proposal today. Senator, I would be glad to continue the discussion with you to see if there is a way to address this issue.

ENERGY AND ENVIRONMENTAL RESEARCH CENTER

Senator DORGAN. All right. The Energy and Environmental Research Center, obviously I have a parochial concern there, but I think it is one of the crown jewels in energy research in this country and, as you know, the funding for that has been cut roughly 60, 65 percent. Give me your assessment of the value of that center and is that cut, is that a kind of an OMB push?

Secretary ABRAHAM. Well, first of all, as you know we have talked about this project for several years. There will be some who might consider it an earmarked investment but I made the decision some years ago that we would not treat it in that fashion. I think it had established its credibility to justify that broad program support as well as the work done both in Wyoming and North Dakota. It has played a great role in terms of development of advanced transport gassifer. Working with us now in a U.S.-Australian climate partnership project that involves lignites and other, which I think are useful things. We have had a year in which we have had to be tough about funding levels in our submission. And we also believe, frankly, that these folks do very good work and will be able to attract and be successful in being grant recipients to significantly augment the direct support that we propose here. But obviously, I am sure this is one we will work together on in the weeks ahead.

Senator DORGAN. Well, I hope Mr. Garman and others have visited EERC. I think by all accounts it leverages a great deal of private investment and by all accounts, it is a terrific institution and I certainly want to work to deal with that.

HYDROGEN FUEL CELLS

One final point. You and I have talked about hydrogen fuel cells. First of all, I commend the President. I think it is exactly right. Those in the environmental community who last year said, well, the President is talking about the by-and-by because they do not want to deal with the here-and-now. I will not comment on the here-and-now except to say that if you do not worry about trying to find a way not to run gasoline through carburetors for the next 100 years, then you are not really concerned about our energy future.

Secretary ABRAHAM. Right.

HYDROGEN FUEL CELL VEHICLE PROGRAM

Senator DORGAN. And I think hydrogen fuel cells can be and will be our future and so I support this program. I said last year that I think it is probably more timid than I would like; I would like a more robust Apollo-type program.

But the one point I wanted to make is with respect to targets and timetables. If you do not know where you are going you are never lost, as they say, and so I think with all of these things you should try to aspire to have some targets and timetables. And we in the Senate passed that with a pretty good vote, an amendment that I offered setting up targets and timetables, 100,000 vehicles by 2010 and 2½ million vehicles by 2020. And I would like you to rethink the opposition to that. Why on earth should the administration be opposed to that? These are not hard targets; they are just setting up goals. So, rethink that if you would. I do not understand where the opposition comes from.

Secretary ABRAHAM. Well, I will continue to talk to you about this. I will make one comment about our concern. First of all, we are trying to perfect a technology at this stage, not a particular vehicle, and so our focus in terms of a roadmap, in terms of milestones in that has been on the development of the fuel cell technology, the hydrogen storage capacity, the production of hydrogen and the sort of infrastructure support. And I think we have a very aggressive timetable for all of those. One of the concerns I would have about an early date in terms of the deployment of vehicles is the fear that we would actually move, and again, I recognize these are not mandatory targets, but if you are pushing hard to deploy large numbers of vehicles you may force the development of the wrong technology. You may end up with not the ideal operating system but the one that is the easiest to get to in that timeframe. We have tried to resist that because we fear that it might be pushing us in the wrong direction. There was a problem with diesels. I think it was back in the 80s where there was a premature introduction of technology that just did not fly. And now, as we look at clean diesel, I see this previous experience as having had some relevance.

So, those are some of the considerations that have gone into our views. Let me just say this. We appreciate your support and that of many other Members who have joined you and other co-sponsors in pushing this program. When we talk about these long-term issues of oil dependence, this program is, in my judgment, and I think most who have looked at it outside of the United States, it is increasingly the view of people that hydrogen-operating vehicles are the way to transcend this issue of dependence and at the same time address these environmental concerns that make internal combustion engine usage problematic in terms of meeting environmental standards. So, we certainly appreciate the support the committee has given this and hope we can work together to get further support in the future.

FUTURE GEN

Senator DORGAN. Mr. Secretary, the chairman has to go to the budget committee and I have to go elsewhere as well. Let me mention two points in just a second.

You spoke about FutureGen; you suggested \$80 million would come from foreign countries. I would like, if you could, to submit to the committee where you think that is coming from, number one. And number two; I would hope you agree that the additional Federal funds will not come from core research and development programs in the Department of Energy. We will talk more about that at some point.

[The information follows:]

FOREIGN INVESTMENT IN FUTUREGEN

We have found great interest in FutureGen participation from several countries including those who are members of the United States-led Carbon Sequestration Leadership Forum (CSLF), representing at least 14 countries (Australia, Brazil, Canada, China, Colombia, Germany, India, Italy, Japan, Mexico, Norway, the Russian Federation, South Africa, and the United Kingdom) and the European Union. We have also provided the CSLF countries with a general prospectus for international participation that outlines the benefits of participation. We plan to continue to engage interested countries in serious discussions with respect to their cost-shared participation.

Senator DORGAN. I do want to just come back to the point of OMB. I have not come recently to this question of asking whether OMB is a valuable contribution to our government. In the previous administration, I asked the same questions and I hope perhaps you and I together could start a new discussion about the value of this Federal agency, through which apparently every single piece of paper now moves and from which almost every policy emanates.

Mr. Secretary, thank you very much.

Secretary ABRAHAM. Thank you, sir.

Senator BURNS. We could move OMB up here on the Hill so we would have greater access to them.

As I have heard the questions here, and sometimes—we were doing some adding up here—our figures are a little bit different than Senator Byrd's and I think they say, you have got to look out for generation gaps. Working on an old pickup one time, I had a young son as you well know, and I needed a screwdriver. I said run in the garage, or the shop, and get me a screwdriver. And he came out with a glass of orange juice, and said: "I found the orange juice, cannot find the vodka." Now, that is not a generation gap, that is a communications gap. And on some of these things that are contentious I think it would help both us and the Congress to seek ways to communicate with you as we start down this road. If we want to change policies, why do we have to do it in a formal hearing, where you get a lot of dialogue but I think we are going to have to work much closer with the bureaucracy. And whenever you want to veer and change directions call us up and we will meet with you and then we will figure out a way that we can do it and the merits of the suggestion. I think we would only meet about once a year and that is not very often.

OFF-HIGHWAY ENGINE PROGRAM

You have, once again, proposed to terminate the off-highway engine, such as heavy equipment, railroad engine, research offices. While off-road fuel consumption is far less than on-road consumption, it does seem that there is significant emission reduction potential, and in our part of the country much of these emission reductions could be obtained by off-road applications. It seems like you view these programs as low-hanging fruit whenever we start examining them. I have examined them and found otherwise. Can you elaborate, for the record, the reasons you are proposing to terminate these programs?

Secretary ABRAHAM. I would be glad to. Take it for the record, if I could?

Senator BURNS. Oh, for the record?

Secretary ABRAHAM. I thought, yes.

[The information follows:]

REASONS FOR PROPOSED TERMINATION OF OFF-HIGHWAY ENGINE PROGRAMS

Because the fuel savings potential from off-highway vehicles research is an order of magnitude lower than the potential for on-road vehicles, our R&D priorities emphasize on-road vehicle R&D. Since the top priority of EERE is to reduce our Nation's dependence on foreign oil, the FreedomCAR and Vehicle Technologies Program decided to focus its R&D efforts on those technologies that offer the opportunities to save the greatest amount of petroleum. This decision is supported by a recent peer review of transportation R&D plans. In fiscal year 2004, approximately one-half of the funds are going directly to makers of off-highway equipment (construction, agriculture, mining, road construction, and rail) for competitively awarded cooperative agreements, while the other half goes to our National Laboratories to conduct cooperative, cost-shared research with industry. Our R&D on heavy-duty on-road vehicle engines does address many of the same technical issues present in engines of off-road vehicles.

Senator BURNS. Okay. I have some other questions on things that have recently happened down there. I will tell you, Mr. Secretary, I am very much interested in the fuel cell and fuel cell technology in the areas of both carbon and hydrogen because I think it is the way of the future. I think we are closer to a hydrogen society than most people think. But people do not know about it, and the results of it and what works and what does not work. We need to phase out what does not work; and let us go with what does work and what is practical. We up here sometimes forget that there is still a market out there, and it still has to be market-driven. Can people afford it? I do not see hydrogen stations popping up like gasoline stations. Is the infrastructure there to support it? There are a lot of things out there to think about whenever we start talking about uses of alternative fuels.

Secretary ABRAHAM. Senator, can I just?

Senator BURNS. I am sorry, yes?

Secretary ABRAHAM. Quick comment on the last point you made, it is an excellent one, about the infrastructure and without belaboring it I would just say one of the real challenges that we foresaw when we began the hydrogen program was that we for years in this country have been talking about the idea of hydrogen, and others have too. There has always been this challenge that on the one hand, you need the infrastructure and on the other hand, you need the vehicles. And the one, I think, most promising development of this past year has been our capacity to bring together in one stra-

tegic organizing oversight group both sets, the energy and the automotive industries, which I think will allow us to move down both of the pathways successfully. The problem we had, the standoff, where people said, well, we will build the fueling stations when they have the cars and the people who said, we will build the cars when they have the fueling station.

Senator BURNS. It is an interesting chicken and the egg. By the way, the numbers that Senator Byrd was alluding to a little while ago, we came up with the President's commitment this year around \$470 million. Now, you want to multiply that times 10 and you are going to go way over what he was talking about. The use of prior year funds is around \$140 million, so if you subtract that it is still around \$330 million, which is a little bit more than what we have been told in some figures. So I do not think there has been any breach of commitment here.

CLEAN COAL POWER TECHNOLOGY PROGRAM

Secretary ABRAHAM. I would just ask, I know that a chart, I got one, was handed out. I would like to submit some charts that I think would put this in perspective as well and I think demonstrate clearly that we are on a pathway to meeting the \$2 billion commitment for the very specific programs I have mentioned and that we are on a pathway over the 10-year period to vastly exceed the kind of levels that I think.

Senator BURNS. I would suggest that you do that to clarify that. [The information follows:]

CLEAN COAL POWER TECHNOLOGY FUNDING—COAL BUDGET (FISCAL YEARS 1997–FISCAL YEAR 2011)
 [In millions of dollars]

	Fiscal year										Total
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006–2011	
Historical request	149.2	148.2	172.3	160.1	178.1	161.6	161.6	161.6	161.6	969.6	1,616.0
Historical enacted	152.7	147.6	167.3	168.3	295.3	186.2	186.2	186.2	186.2	1,117.2	1,862.0
Old CCPI Request						150.0	130.0	50.0	.....	.....	480.0
FutureGen Request									237.0	263.0	500.0
All Other Request/Total Coal Undistributed OMB Out years						159.8	225.1	237.5	183.0	2,008.0	2,813.4
Total DOE Coal						309.8	375.1	367.5	470.0	2,271.0	3,793.4
Old CCPI Enacted						150.0	150.0	170.0	50.0	.....	520.0
FutureGen Enacted								9.0	237.0	254.0	500.0
All Other Enacted/Total Coal Undistributed OMB Out years						246.5	263.0	271.5	183.0	2,017.0	2,981.0
Total DOE Coal						396.5	413.0	450.5	470.0	2,271.0	4,001.0
Old CCT Remaining Balances						400.0	385.0	237.0	.....	.....	.....

Senator BURNS. Senator Leahy.

Senator LEAHY. Thank you very much, Mr. Chairman and Secretary Abraham, welcome back. I do not know which is better, on that side of the dais or this side.

Secretary ABRAHAM. I know which is better, but—

CLEAN AIR ACT—NEW SOURCE REVIEW

Senator LEAHY. We had a certain scheduling problem. We had a matter of some interest in judiciary committee and I was over there. I wanted to come because of one issue. The past year-and-a-half, your Agency and the administration have argued the roll-back of the new source review provisions of the Clean Air Act would lead to increased efficiency, increased electric reliability; something of interest to us especially in the Northeast after black-outs, and would not lead to increased emissions. Sort of the alchemist's best result; you would have increased reliability, not increased emissions. But then the Natural Resource Defense Council has some e-mails obtained through the Freedom of Information Act. They are between your senior staff and industry officials; industry officials apparently helping them put together what the Department of Energy would report, they showed just the opposite. They showed no real affect on reliability and, worse yet, increased emissions. What bothers me, certainly in my part of the country, you have a real problem, the administration does, on the Clean Air Act. People are worried their children are drinking water that has mercury in it; they are not enthused by hearing about more arsenic in water, all these kind of things. And then it appears that your agency has made clearly misleading arguments when, as these e-mails show, you knew they were misleading, you knew there was not going to be increased reliability and there would be increased emissions; apparently nobody benefits but some of the industry people who helped write them. What do you say about that?

Secretary ABRAHAM. Well, I would be happy to answer for the record in detail on the e-mails; I do not have them fresh in my mind at this point. I would say that the—

Senator LEAHY. We could give you a copy if you would like.

Secretary ABRAHAM. Well, I will be happy, as I said, Mr. Chairman, to answer that for the record. I think that our view has been, and at least the recommendation of our Department has been that as we consider this issue that the concern that prompted—well, let us start back. A review of new source review did not just begin on the day we took office. There has been, as you know, a long-standing and somewhat frustrating pathway of trying to resolve what the proper way to determine what constituted appropriate repairs and replacements and whole changes in facilities. We had concluded, and we have consistently recommended, that we clarify this so that the people who were withholding decisions on whether or not to improve their facilities, whether or not to repair their facilities and so on would know what the entire extent of the work they would have to do would be. And, at least our recommendations, in terms of the interagency discussions have been consistent with trying to clarify the rules in a fashion that would—

Senator LEAHY. But the rules, you know, new source review started back, as I recall, in 1977. I was brand new here in the Sen-

ate at the time and I must admit, not being all that familiar with it, Senator Stafford from Vermont had been one of the architects of this. And then subsequent administrations followed up and at the end of the Clinton administration there were some fairly tough rules on that because all of these plants had been grandfathered, saying, come on guys, we grandfathered you at first but now it is time to do what everybody expected you to do, that is, get less-polluting plants. And we understand when the special review that Vice President Cheney did, they said, well, why do not we just make this open enough that, if it did not cost less than 20 percent of the cost of overhauling the entire plant that would be considered routine maintenance. Now that lets these power plants off the hook pretty well; they do not really have to put any pollution controls and maybe find some of the areas where they are but most of these pollutants go up in the air and come back down in my part of the country. You have 13 different places in the proposed and the final NSR rule that you speak about reliability and yet your own internal documents say it is not a reliability issue. And these e-mails your staff has sent, I do not expect you to see everything that goes through there; lord knows you have got enough other things to do. But these e-mails go back to 2002 and they say that your staff and your Department knew that what they were saying was not true. Now, a lot of industry officials wanted you to say it but even they acknowledge were not true. And when you have people who are concerned about the water they drink and the air they breathe, as they should be, especially if they have young children or grandchildren, they worry a lot about this. I mean, why not set the record straight.

Secretary ABRAHAM. Well, I will be happy to answer, as I said, I will be happy to look at the e-mails and provide the committee with a response. It has been our view, as I said in the discussions we have had, in the intraagency discussions which we have had that leaving facilities unrepaired, operating at minimal efficiency in some cases, being unwilling to invest in any kind of replacements and repairs because of fear that it would trigger a much more expensive process and not knowing whether it would or would not, was actually, in a very broad sense, a negative impact, having a very negative impact but people were not taking actions that would in fact improve the efficiency as well as the emissions of their facilities.

Senator LEAHY. But Mr. Secretary, a quarter of a century ago the argument made by some of these companies was well, we cannot go ahead and upgrade, we cannot do that overnight, we need time; of course, we could make them less polluting, of course we could do a lot to go along with the Clean Air Act but we cannot do this overnight, we need time. Now, they have had 25 years. I mean, when is time enough? I am 63 years old and I would love to still be alive when they finally get around to doing what they were told to do in 1977. You, of course, are much younger; it is conceivable you may live long enough to see it but not at the rate they are going.

Secretary ABRAHAM. Well, again, and I think it is not surprising to me that if the process of moving forward is one that is based on litigation enforcement proceedings versus the passage of or the

clarification of these rules that it does produce this uncertainty. I mean, that is the issue we attempted to and are attempting to address. How this process plays out, obviously with the lawsuits that are going on and so on it remains to be seen. I would say that between the courthouses and the slowness of the process we probably are going to continue to get older before anything changes here.

Senator LEAHY. Well, you know, I realize this is a major policy issue and you know me well enough to know that I do not play “gotcha” at these hearings; I actually do want answers and I realize this is something you want to answer for the record. You and I have been friends for a long time and I have a great deal of respect for you but I do not have respect for this policy. And I would like you to respond for the record.

Secretary ABRAHAM. Glad to.

[The information follows:]

CLEAN AIR ACT—NEW SOURCE REVIEW

The e-mail in question is a response from an employee of American Electric Power (AEP) to a DOE employee who had posed questions to the AEP employee concerning computer modeling of power plant maintenance practices. DOE was interested in understanding the emission and energy impacts of such practices because of regulatory changes under consideration that might encourage greater efficiency, reliability, and safety at U.S. power plants. The DOE employee sought the views of the AEP official because of that official’s current responsibilities for strategic planning at a large utility, and because of his extensive experience performing similar modeling in his previous capacities at firms that performed such analytical services for the government and for industry.

The view expressed by the AEP employee, who had included the views of another AEP employee as well as a legal consultant to AEP, was technical in nature, as one would expect for a discussion of modeling assumptions. The AEP employees stated that they believed possible regulatory changes concerning the maintenance of industrial facilities would not result in power plants increasing their availability by 5 percent, and that plant changes resulting in 10–15 percent increases in efficiency may include some measures that are not economic in current markets. For pollutants with an emissions cap, like SO₂, they foresaw no change in emissions from changes in availability, capacity, or efficiency, but for other pollutants “improved efficiencies will REDUCE emissions” [their emphasis], and “NSR revisions should not have a negative impact [i.e., an increase] on emissions at all.”

It is important to note that the NSR revisions related to “routine maintenance, repair, and replacement” apply only to replacing “identical or functionally equivalent” equipment that does not change the basic design parameters of the affected process unit. As stated in the rulemaking, EPA believes that such changes “are necessary for the safe, efficient and reliable operations of virtually all industrial operations.”

DOE believes that there is a large body of information supporting the conclusion that there are current and emerging technologies that could substantially increase the efficiency of existing coal-fired power plants. In simple terms, efficiency is the ratio of useful energy produced by a power plant to the energy input to the power plant. When efficiency increases, we obtain more power for a given amount of fuel, and a given level of emissions. So improved power plant efficiency is a very desirable goal. Although we anticipate modest improvements in power plant availability from NSR revisions, these changes are not insignificant and could be crucial in a power shortage (blackout) situation. Moreover, the NSR revisions could prevent a loss in current levels of availability, which is also valuable. The Administration received substantial input from industry in response to EPA’s June 27, 2001, request for public comment on an EPA paper discussing NSR (the NSR 90-day Review Background Paper). Comments by utilities and consulting firms identified major losses in capacity and availability that could result from a NSR policy that impeded the ability of power plant owners to repair or replace equipment that had broken or was about to break. For example, Southern Company predicted a loss in capacity of 38 percent over 13 years; TVA estimated 32 percent over 20 years. These comments were echoed by those of WEST Associates, and the National Rural Electric Cooperative Association, both of which cited degraded generating capabilities resulting from

the current interpretation of NSR regulations. Public comments supporting the need for regulatory change to support improved efficiency and reliability were received by EPA from a host of organizations, including the Tennessee Valley Authority, the American Public Power Association, the Utility Air Regulatory Group, and the Electricity Reliability Coordination Council.

DOE has conducted its own analyses of how current and emerging technologies could improve the efficiency of existing coal-fired power plants. Improvements of up to 15 percent appear feasible. For perspective, an efficiency increase of only 10 percent in the coal-fired power plant fleet would provide as much electric power as 60 large new power plants, without an increase in emissions. DOE has modeled a range of possible improvements in efficiency, availability and capacity and determined that the energy, economic, and environmental outcomes of such changes are almost universally positive. EPA has conducted similar analyses and reached similar conclusions. These energy and environmental analyses are discussed in the preamble of the rulemaking, and their details are fully documented in the publicly available regulatory docket for the NSR rule.

It is both necessary and appropriate for DOE to seek out and consider the views of experts in these matters, just as it is appropriate for EPA to do so. Decisions on these regulatory matters have consequences that go beyond their direct cost and environmental impact, and encompass energy policy and energy security issues. Moreover, it would be simplistic to assume that all the information on a complex issue would point in a single direction. With respect to the e-mail from AEP, it expressed some views that differ from those expressed by others and with our own views. There is nothing extraordinary about that. It is the responsibility of government to examine data and to weigh different opinions in the light of the government's own analyses and determine the best approach to achieve public policy objectives consistent with applicable law. That is what was done in the case of this rulemaking.

DOE is confident that the changes in NSR will allow utilities to make repairs and replacements that improve plant efficiencies and benefit consumers. The old regulations discouraged utilities from making these repairs and replacements. The new regulations, and the flexibility they will bring about, will result in lower national emissions, lower power costs, and greater efficiency from fossil-fueled power plants.

Senator Leahy also remarked that many power plants are grandfathered from putting on emission controls. Most power plants are subject to State regulations to achieve federal ambient air quality standards, and all coal-fired power plants larger than 25 megawatts are subject to the stringent SO₂ and NO_x requirements of Title IV (acid rain) of the Clean Air Act. Those facts notwithstanding, the Administration has introduced legislation to achieve an additional 70 percent reduction in emission of those pollutants, as well as reductions in mercury emissions. That bill is still pending in Congress, so EPA is proceeding under existing Clean Air Act authority to obtain similar levels of emission reductions. It is clear to me that these power plants are not "uncontrolled", and that they will be further controlled in the near future.

Senator LEAHY. And then, Mr. Chairman, depending upon that answer I may have follow-up questions, if I might, based on what he answers.

Senator BURNS. Follow with anything you like.

Senator LEAHY. You are such a fine man. I just want the air to be as clean along the East Coast as it is in the beautiful State, the Big Sky State of Montana.

Senator BURNS. I will tell you what. The folks in New York, I was just saying a little while ago, if you do not like those plants shut them down.

Senator LEAHY. But actually if that is what the Clean Air Act was supposed to do is supposed to shut them down and replace them with something else, now, as we found out in the blackout a lot of this stuff has not replaced that should have been and we do not seem to have the money. I wish that what we had said was a lot of these plants were really going to supply energy to Iraq because we voted enormous amounts of money to replace their power plants, it would be kind of nice just to replace a couple here in the United States. But thank you very much.

Senator BURNS. Well, the structure is a bit different, as you well know. You can change that structure if you like.

I have a couple of other questions. I have got to go to Budget, and I guess we are underway with a great deal of debate on the sixth floor and we had better get to be a part of that. Mr. Secretary, we have some other questions, if you could respond please.

Let me emphasize, we really need that report. The communication between us and the Department gets rid of a lot of misunderstandings and figures, and we all need to use the same calculator in order to get on the same page, if we can.

Secretary ABRAHAM. I agree.

Senator BURNS. I know there are some misunderstanding and misinterpretation of what figures mean but the way we have it figured out up here, and like I said, it is a matter of phasing out some programs that are not working. There is no use throwing good money after bad. And then redesigning and retooling ourselves to pursue those things that are working, never limiting our ability to change and to be flexible enough to take advantage of the situations that we have in front of us to better serve the energy needs of this country.

So, thank you very much for coming this morning.

Secretary ABRAHAM. Could I, Mr. Chairman?

Senator BURNS. Yes?

YUCCA MOUNTAIN—SILICOSIS ISSUE

Secretary ABRAHAM. Just make one comment, please. Earlier today, Senator Reid made some comments with respect to the Yucca Mountain project that really did not take the form of a question and then he had to depart. I do not want to leave open any question in the minds of the committee as to the actions which our Department has been taking. The issues that, as Senator Bennett pointed out, that took place in the period of the mid-1990s came to our attention, to our inspector general's attention, in 2003. This is the silicosis issue, and we are trying to move very aggressively to provide a program for workers, for screening to determine the nature of any illnesses that may have emanated from that exposure. We have brought the University of Cincinnati in to be a partner in this effort to do the screening programs for us and we take this very seriously, as we do all safety issues that are involved in any of our programs, whether it is in Nevada or elsewhere.

YUCCA MOUNTAIN—RAIL CORRIDOR

It was also commented on that the transportation, the rail corridor in Nevada would go through the properties of individuals. That is sort of inevitable. There is no route; there is no rail line in Nevada to this very remote site for obvious reasons. We had, of course, options of moving it through densely populated areas and the preferred route which we have designated is the one, which in our judgment has the least potential impact on the populace of the State. And I would just point out again to this committee, as I have to others where I have testified on Yucca Mountain, that we have an enormously successful track record, both in America and throughout the world, on the transportation of radiological materials. It's totally safe. There has been more nuclear material of this

sort transported in the United States and Europe than all the transport that will ultimately take place to Yucca Mountain without a harmful exposure. We intend to maintain that safety record.

YUCCA MOUNTAIN—FUNDING

Last, I just want to say, the issue of financing. Yes, we are asking for more money. This is a project that is many, many years delayed. The Department itself is now the recipient of numerous lawsuits from utility companies who have been told that we would take responsibility for the waste that we have not. And yes, we are ramping up the cost because Congress made the decision to move forward with the project and now the costs of doing that will begin to grow. But the good news is this: we have been collecting money from utilities from the very inception of this project for exactly these purposes. The amounts of money we are seeking are consistent with the revenue to the Federal Government that is being secured as a result of the polluter pays kind of approach in which the utility collects the money, sends the money to us and it is our job now to use it. So, the amount is substantial but we are asking for an amount consistent with the revenue that comes to the government from the utilities for precisely this work.

So, I look forward to answering his questions but I did want to make sure on the record that we did respond to some of the issues raised.

Senator BURNS. You can raise a lot of questions where Congress, through legislation, promised to do something and have not carried through. So, thank you very much Mr. Secretary.

Secretary ABRAHAM. Thank you.

ADDITIONAL COMMITTEE QUESTIONS

Senator BURNS. There will be some additional questions which will be submitted for your response in the record.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR CONRAD BURNS

RECENT R&D ACCOMPLISHMENTS—FOSSIL ENERGY

Question. Obviously this Committee is generally familiar with the Fossil Energy R&D work your programs support. Can you elaborate on a few specific examples of successes that were achieved in the last fiscal year? If you can, choose some examples in different Fossil Energy program areas, and tell us what breakthroughs were achieved and what the Federal role was in achieving those breakthroughs.

Answer. Fossil Energy has been actively supporting the development of advanced technologies for the separation of hydrogen and carbon dioxide from a gasification-based synthesis gas stream for carbon sequestration and the hydrogen economy. Two such projects have had major successes within the past year, one in the CO₂ hydrate and one in the advanced membrane area.

CO₂ Hydrates

The CO₂ hydrate project, jointly sponsored by FE's gasification and sequestration programs, has been under development for the past few years by a team consisting of Nexant, Simteche, and Los Alamos National Laboratory (LANL). Over the past few years, fundamental studies were performed by LANL in a batch and semi-continuous laboratory-scale flow reactor system to confirm the concept and to identify specific technological hurdles to scale-up. Recently, Nexant successfully translated this information into a continuous-flow reactor unit that will permit longer duration

runs, demonstrate taking the hydrate-forming reactions to completion through novel heat removal design, and provide for better data collection. The unit was successfully commissioned in the 2nd quarter of fiscal year 2004 and has demonstrated sustained production of CO₂ hydrates for several hours. The data to be generated with this unit over the next year will provide the basis for scale-up to a 2.5 MWe equivalent unit for testing at a commercial gasification site. Negotiations are in progress with Tampa Electric for testing this unit at its Polk Power Station. This novel technology has potential for reducing carbon capture cost to \$8–9/ton of CO₂ compared to today's cost of about \$40/ton.

Advanced Membranes

The advanced membrane project, sponsored by FE's gasification program, is focused on the development of membranes that separate hydrogen from a shifted synthesis gas stream. This past year, Eltron Research, together with Noram Engineering, CoorsTek, and Sud Chemie, have been successful at developing a membrane composition that has achieved more than 100-fold increase in hydrogen flux over where they were one year ago at process temperatures as low as 400 °C compared to 900 °C previously. These new results have tremendous implications on the cost of coal-based hydrogen and have sparked considerable interest within the team to further develop and scale-up the technology over the next five years. These "leap-frog" improvements in membrane performance have caused Praxair, an industrial gas company and hydrogen supplier, to join the development team. Also, because of its interest in hydrogen for chemicals production, Eastman Chemicals has committed to participation in the latter phases of the project and has offered its Kingsport, TN chemical complex as a site for field demonstration of a unit producing almost 9,000 lb/day of hydrogen from a coal feedstock. Incorporating this technology in a gasification plant will reduce the cost of coal-derived hydrogen to an amount comparable to hydrogen produced from natural gas when natural gas is priced at approximately \$4.00/MMBtu.

Oil & Natural Gas

A new lightweight, flexible drill pipe engineered from space-age composites rather than steel was developed and commercialized. The composite drill pipe is much lighter than steel pipe, it is more flexible and can remain bent for extended periods of time, and can be used in multiple drilling operations. These advantages significantly reduce drilling costs. The improved economics and technological advances could bring new life to thousands of idle wells. This drill pipe was developed by ACPIT a small firm in California that previously built lightweight composite parts for race cars. The first commercial order for this pipe came from a small independent oil and gas company that is going into old wells, drilling horizontally, and giving new life to their existing fields.

IntelliPipe™, a revolutionary new drill pipe with built-in high speed two-way data transfer, has changed the state-of-the-art in downhole communication speed. IntelliPipe™ is the key to establishing high-speed communication links throughout the drill string to provide drillers with the industry's highest resolution data feedback and control of downhole tools real-time. This advanced telemetry transmission revolutionizes the way drilling is done now and into the future. With IntelliPipe™, drillers gain access to real-time critical information when they need it at volumes impossible by today's standards. Drilling engineers receive an unprecedented one million bits per second (similar to a Local Area Network) of real-time streaming information that improves monitoring and measurement of all vital aspects during downhole operations. It also allows data to be sent the other direction, giving oil and gas drillers the capability to direct the drill bit more precisely toward oil and gas bearing sweet spots and away from less productive areas almost instantaneously. This invention will greatly improve the speed of drilling operations, reduce environmental impact of drilling, and significantly improve safety. This will enhance the efficiency of oil and gas wells and reduce the number of wells needed to produce a reservoir.

Tinkering with a device to jumpstart compression in a gas well, a pair of West Texas dropouts-turned-wildcatters invented a four chamber pump they say can be used as a replacement heart just as easily as an oil well pump. Their invention caught the attention of doctors at the Texas Heart Institute in Houston, who asked for a prototype for preliminary tests as a blood pump. The pump is designed to operate much like a heart. It is simple to operate, lightweight, can be made of virtually any material, and does a nearly complete intake and sweep of fluids in one 360-degree motion. The pump eliminates valves, cuts overheating by reducing revolutions per minute, simplifies power requirements, overcomes clotting problems, does not destroy as many red blood cells, and eases lung pressure complications. Another

advantage to the versatile pump is that it will allow for a revolutionary reduction in the size of devices that would use their invention—enabling, for example, air conditioning systems now available only in huge airplanes to be comfortably fitted in a small car. In developing countries without ready sources of electricity, this simple pump could result in major improvements to the quality of life.

In partnership with the Department of Energy, Venoco Inc. and the University of Southern California developed a suite of new technologies enabling them to find and tap into 80 million barrels of previously overlooked oil deposits in the Santa Barbara Channel, simultaneously improving the environmental impact of production operations. The new non-invasive technologies improved the sub-surface understanding of the Monterey formation and allowed Venoco Inc., an independent operator, to overcome a two-decade old ban on new seismic surveys in California's offshore region. Applying state of the art technology, production in five old wells has increased by an additional 600 barrels of oil per day. "Seep tents" positioned on the ocean floor capture naturally occurring oil and gas seeps. This additional effort has eliminated the oil sheen on the ocean, reduced pollution of the seawater, made the Santa Barbara Channel healthier for marine mammals, and eliminated new tar on the beaches. Both Venoco and the University of Southern California have very aggressive technology transfer and outreach efforts to other U.S. producers and researchers.

Bluff Exploration developed user-friendly software for neural network solving of complex seismic and reservoir characterization problems. Intelligent Computing System (ICS) uses clustering, artificial neural networks and classical regression methods to combine seismic, geologic and engineering data for predicting reservoir potential. The integrated software modules are designed to be used by small teams consisting of an engineer, geologist and geophysicist. They are flexible and robust, working in many environments. The tools are used to transform seismic attribute data to reservoir characteristics such as storage, permeability, probable oil/water contacts, structural depth, and structural growth history. When these reservoir characteristics are combined with neural network solvers, they can provide a more complete description of the reservoir. This leads to better estimates of hydrocarbons in place, a real limits, potential for infill or step-out drilling, and ultimate producible reserves. The ICS software was used extensively in the Red River formation of the Williston Basin in North Dakota. Proved oil reserves were increased by 3.25 million barrels and daily production increased by over 2,600 barrels. Horizontal wells in this formation are expected to produce over 1 million barrels of incremental oil by 2005. The ICS software is not specific to any particular region or depositional types. Users can apply their own databases to populate the programs and generate predictions. Luff Exploration has presented the results of this effort at many national conferences and regional technology transfer workshops. Their software and instructional manual is free to the public.

The Spraberry Field has earned the dubious title of being "the largest uneconomic field in the world," because it holds more than 8 billion barrels of oil under six Texas counties, but has produced 750 million barrels of oil, or less than 10 percent of the original oil in place. Department of Energy funding allowed the risk-taking needed to challenge "conventional wisdom." Pioneer Natural Resources Co. and Texas A&M teamed up to identify the most effective recovery technique for Spraberry. New imaging and horizontal coring techniques were applied to the formation, revealing three major fracture networks, the spacing of the fractures and the direction in which they ran. The information was surprising and important. They redesigned an effective water flood approach that has increased the reservoir pressure, increasing oil production from 15 barrels of oil per day to 80 barrels of oil per day. Cumulative incremental production after 2.5 years is estimated to be over 150,000 barrels of oil. Effective technology transfer efforts resulted in other operators in this field applying the same process. Estimates indicate recovery of an additional 15 percent of Original Oil In Place over the next 20 years, or 1.5 billion barrels of incremental oil. Following the water-flooding period, Spraberry will still hold the potential for successful CO₂ flooding as demonstrated by the pilot study.

Question. Since R&D is as much about failure as it is about success, can you offer any examples from the last year of Fossil Energy research that has failed to produce the desired result?

Answer. Examples of research that did not produce desired results are:

Coal & Power Systems

One example deals with the development of effective means for storing enough hydrogen on board fuel cell powered cars to provide an acceptable range without taking up an excessive amount of room. This is a critical goal of FE research. Carbon nanotubes were proposed as a likely answer to this problem and initial results from

different laboratories were highly encouraging. More recently, closer examination by both experimental and computational science provides a more sobering assessment—at their present state of development carbon nanotubes fall considerably short of DOE goals. Reaching the desired result along this line of attack still requires a major breakthrough that has so far eluded the talent of the best in nanotube research.

Oil & Natural Gas

The “Hot Ice No. 1” well recently drilled in Alaska did not encounter methane hydrate as expected, but it did produce information that should help to overcome the substantial technical obstacles to the eventual commercial production of this abundant energy resource. The well also provided an opportunity to showcase several unique and previously untested Arctic drilling technologies that can be expected to play a role in future Alaskan drilling operations. The absence of hydrate at the site is in itself a significant scientific finding. Based on detailed evaluation of log data from adjacent offset wells, the Hot Ice No. 1 well was expected to encounter a significant thickness of reservoir quality sands in the Upper West Sak unit. The sands were there just as expected but we found free gas and water rather than hydrate in the hydrate stability zone. Figuring out why will require a thorough post-mortem analysis of the core, log, and seismic data from the well. Although disappointed by the missed opportunity to evaluate a hydrate-filled formation, the researchers believe that a tremendous amount of knowledge will be gained for future hydrate exploration through analysis of the unique suite of collected data. Clearly, the model for distribution of methane hydrate on the North Slope may be more complex than previously thought. Although the hydrates expected were not found, a suite of technologies were advanced that could ultimately make exploration for and production of the Arctic methane hydrate resource economically feasible. These new technologies can be taken to future hydrate research sites where they will ultimately aid in building a better characterization of this potentially important frontier resource. In addition, the geologic knowledge gained from an ongoing comprehensive analysis of the core, log, and seismic data from the well will improve models for the genesis and distribution of hydrate accumulations on the North Slope.

Another example is in the area of seismic wave stimulation technology. This has the potential for being a relatively low-cost procedure for enhancing oil recovery in depleted fields, or returning some shut-in wells to production. A project to develop a novel downhole sonic stimulation tool to increase production resulted in a design error indicated by 2 bench-scale test failures, and finally failure in a field test where the tool became stuck in the well bore. This project focused on a very under-developed technology that has a high potential to improve oil recovery.

Question. What did we learn from these failures?

Answer. Based on the knowledge and experience gained in nanotube research, we learned that a better route to achieving DOE goals might be seen by exploiting a new class of materials, the so-called metal organic frameworks. Higher storage capacities have already been found with one example of this material than the best yet achieved with nanotubes. Following this lead is a more productive use of available resources. In addition, we have found that we can apply the expertise and experience that we obtained in our investigations of nanotubes for hydrogen storage to more rapidly assess and evaluate the potential of metal organic frameworks. The ability to apply the expertise and experience from previous efforts will result in much more cost-effective research in the development of hydrogen storage materials capable of achieving the DOE goals.

RECENT R&D ACCOMPLISHMENTS-ENERGY CONSERVATION

Question. Obviously this Committee is generally familiar with the Energy Conservation R&D work your programs support. Can you elaborate on a few specific examples of successes that were achieved in the last fiscal year? If you can, choose some examples in different Energy Conservation program areas, and tell us what breakthroughs were achieved and what the Federal role was in achieving those breakthroughs.

Answer. Several success examples are provided below:

Buildings Success

- With support from EERE, Cree Lighting, an American company based in Research Triangle, North Carolina developed a 74 lumen per watt white-light LED—that’s higher than a compact fluorescent lamp (CFL) and five times better than incandescent;
- In this project, two critical R&D advances were made—
 - it is the first high-power LED built on a silicon-carbide substrate and

- it incorporates an innovative packaging design to manage heat.
- This laboratory prototype was tested in 2003. It is estimated that products incorporating this technology could be in the consumer market by 2006 or 2007.

Distributed Energy Success

- The Solar Turbines Mercury 50 turbine was developed under the Advanced Turbine Systems Program (ATS).
- One goal of the ATS Program was developing turbines with less than 9 parts per million (ppm) NO_x.
- The commercially available Mercury 50 is available with a guarantee of 5 ppm NO_x.
- The Mercury 50 has over 40,000 hours of operating experience at 6 field sites.
- It is noteworthy that this success does not represent a single technological advance achieved with fiscal year 2003 funds. (In fact, no funds were provided in fiscal year 2003.) Instead, it represents the culmination of more than a decade of Federal investment, totaling more than \$200 million, which came to commercial fruition on fiscal year 2003.

FreedomCAR and Vehicle Technologies Success

- The program's research reduced the cost estimate for a high-power 25kW battery system from the 1999 estimate of \$3,000/system to \$1,180/system.
- This work forms the basis for one of the nine FreedomCAR Partnership 2010 goals, to reduce to \$500 the production cost of a high power 25kW battery for use in light vehicles, enabling cost competitive market entry of hybrid vehicles.

Fuel Cell Success

- DOE sponsored fuel cell research achieved a modeled cost of \$225/kW for a hydrogen-fueled, 50 kW fuel cell power system, down from \$275/kW in 2002.
- \$225/kW includes the fuel cell stack, hydrogen storage, and all ancillary components for air, thermal, and water management. (Does not include vehicle drive components such as the electric motor)
- The cost estimate is derived from analysis of best current technology across the industry and assumes high volume manufacturing (500,000 units/year). The estimate does not correlate to any one manufacturer.
- Cost improvement has primarily occurred through research that led to reductions in platinum loading, and the introduction of composite bipolar plates

Industry Success

- Working with industry through activities like Best Practices, EERE helps the country's most energy-intensive industries improve their energy efficiency, environmental performance, and productivity.
- Many BestPractices technological advances and practices have helped companies reduce their natural gas consumption, per unit of output.
- For example, EERE's Industrial Technologies Program provided technical assistance to Progressive Powder Coating, a company based in Mentor, Ohio, to install an infrared (IR) oven in between the powder coating booth and the convection oven on its production line. The IR oven allowed the plant to increase its conveyor line speed and increase production by 50 percent. In addition, the plant was able to reduce its natural gas consumption by 10,500 MMBtu, yielding annual energy cost savings to the company of approximately \$54,000.

Question. Since R&D is as much about failure as it is about success, can you offer any examples from the last year of Energy Conservation research that has failed to produce the desired result?

Answer. Research and development in EERE is a process of testing and developing ways to overcome barriers to technology performance and market adoption. Each program within the EERE portfolio has developed a multi-year program technology plan that presents multiple pathways and performance gateways essential for selecting the most cost-effective and technologically-feasible solution and reducing planned performance risk. In every program, failure accompanies success as a necessary component of conducting high-risk research.

Examples of EERE research that failed to produce the desired result and were closed out include:

- In the FreedomCAR and Vehicle Technologies Program, two separate projects aimed at producing very small holes (50 microns) for diesel fuel injector orifices were conducted in recent years. These projects were conducted: (1) at Argonne National Laboratory (ANL) using a deposition approach and (2) at Oak Ridge National Laboratory (ORNL) using a sintering approach. Both projects were conducted for three years. At the end of fiscal year 2003, because of the superior performance results, favorable feedback from industry stakeholders, and the De-

partment's engineering judgment, the project at ANL received continued funding while the ORNL project was discontinued.

- Another example of an R&D project not meeting its goals is the work on matrix materials cost-reduction of the wheel substrate material for enthalpy wheels in our Buildings Technology Program. This project was terminated after the Department determined that the biggest impact of reducing the cost of an enthalpy wheel lies in the cassette design, rather than the matrix materials that had been the focus of this project.
- In 2001 and 2002, research on Advanced Materials for Industrial Gas Turbines was being performed. The research involved the use of Titanium Silicon Carbide in rotors, inlet nozzles, and inlet scrolls. In late 2002 it was jointly decided by both the contractor and the Department that sufficient technical progress had not been made to continue the research and no further funding was provided in fiscal year 2003.
- A project was terminated in the mining area of the Industrial Technologies Program that involved microwaves. It was determined that the research could not prove that this technology could be economic in the mining industry, so the project was terminated and other avenues will be explored.

Question. What did we learn from these failures?

Answer. Albert Einstein once said, "If we knew what it was we were doing, it would not be called research, would it?" All of EERE's research programs gain valuable information from both successes and failures, and many research failures by their very nature redirect technology pathways towards success and increase the likelihood of achieving program goals and objectives.

In nearly all instances, EERE's past "research failures" provided important information that significantly impacted the projects' multi-year technical plans. In some cases, such as the vehicle technologies example, the differing results of two research projects helped the project manager decide which technology pathway to pursue in the years ahead. In other cases, such as the mining project in the industrial program, the research findings convinced the project managers that the costs of continued research were not warranted given the limited economic potential for the technology and the project was terminated.

EERE conducted a rigorous Strategic Program Review in 2002 that analyzed the entire EERE portfolio and pointed out that redirections and project terminations are a necessary part of any research plan. Some failures resulted in lessons that could be applied across the entire office, rather than just one project or program.

EERE has learned a number of lessons from its experiences over the years, including:

- Open, competitive solicitations can often, depending on the technology and its stage of deployment, be an effective way to identify promising research avenues. EERE has increased its emphasis on competitive solicitations in recent years.
- Multiple research pathways are important to pursue to increase the likelihood of success and to broaden the range of learning.
- Realistic, clear, quantifiable goals, metrics, and milestones are necessary components of successful RD&D pathways.
- Carefully developed go/no-go decision points focus efforts and provide for the opportunity for termination or graduation of research projects.
- Public-private partnerships are critical for effective technology transfer.

MOUNTAIN STATES ENERGY (MSE) CONTRACT EXTENSION

Question. As a follow-up to Monday's [March 1, 2004] conversation, it will be helpful to get the Department on record regarding MSE's contract. Mr. Secretary, we have previously discussed extending the DOE contract for the Western Environmental Technology Office (WETO) housed at the Mike Mansfield Advanced Technology Center. I want to thank you for your attention to this matter and ask that you have your staff work with mine to ensure the great work performed by WETO continues. Can you please provide an update?

Answer. MSE has submitted a contract extension to the Department of Energy. The Office of Environmental Management has conducted a preliminary review of the request for extension and determined further evaluation needs to be made.

FOSSIL ENERGY—FUTURE GEN

Question. FutureGen continues its march toward possible demise. Last year you (and you alone, I might add) worked to add \$9m to get the FutureGen program started. This year the budget allocates \$237 million to the project, however, this amount cannot be spent in fiscal year 2005. Industry is concerned that the Government must make a substantial investment to get the program moving along. Unfor-

Unfortunately, the Department used \$140 million of prior year Clean Coal Technology (CCT) funding, and an approximately \$120 million of reduction in other clean coal research to fund FutureGen. This rob-Peter-to-pay-Paul solution has not been met with industry support. Considering industry is expected to bring hundreds of millions in investment to the table, they are noticeably concerned that the federal government is not stepping up to the table with “new” money to fund FutureGen.

Mr. Secretary, on numerous occasions we have discussed the FutureGen project and our shared commitment to see it move forward. Unfortunately, the Department has yet to provide the report demanded by December 31, 2003 in the fiscal year 2004 Conference Report, and details remain extremely hazy on the project. The Committee is anxious to see your plan.

We have been tracking this issue closely, and upon inquiry, we hear three things from industry: (1) they commend you and your staff for doing an excellent job sorting through the technical and scientific implications of the project; (2) they see it as a meritorious project and want to lend their financial support to the project if a productive path forward can be found; and (3) they are deeply concerned that OMB and the Department are heading toward a financing and project management strategy that brings into question the long-term viability of the venture. Can you update us on the progress of the plan and outline what you have done to date to move FutureGen forward?

Answer. The FutureGen Report to Congress was submitted by the Department of Energy on March 4, 2004. The Department is currently completing internal management review requirements that should be finished in about a month. Once the internal management review is complete, and once the fiscal year 2004 funding for FutureGen is released by Congress, the Department can begin negotiations with an industry partner. We forecast awarding the cooperative agreement in the late calendar year 2004 time frame. After release of funds in fiscal year 2004, the Department will begin its NEPA process for FutureGen. Once the negotiations are complete, the first priority is to develop a set of technical siting criteria that will be used in an open, fair, and transparent competitive process. After release of funds in fiscal year 2004, the Department will begin its NEPA process for FutureGen.

Question. The Conferees of the Interior Appropriations Bill, as well as the Industry Stakeholder Group, have been very clear that FutureGen cannot come at the expense of critical fossil R&D research. However, the coal R&D budget is \$470M in your budget with \$140M of this funding coming from previously appropriated funding that is earmarked for FutureGen. In reality, this means that your request is \$330M of new funds for other coal R&D programs including the Clean Coal Power Initiative.

This \$330M compares very unfavorably to the \$450M that was spent on the very same programs last year. It is a significant cut in programs like fuel cell research, coal gasification, advanced materials research, and other important programs. FutureGen is not a substitute for these base R&D programs. How does the Department justify such a cut in the base fossil energy R&D programs?

Answer. The Department considers FutureGen as the highest priority coal research effort. The fiscal year 2005 budget request reflects a research focus, of which FutureGen is a key part, towards achieving the goal of affordable zero emissions energy from coal. In the fiscal year 2005 budget request, a rescission of \$237 million (including prior year deferrals) is proposed as a total offset to fund FutureGen from prior year available funds from projects that were terminated in the original Clean Coal Technology Demonstration program, thus providing for a total request of \$470 million. The budget request reflects a combination of several actions to rebalance our research portfolio to accelerate the zero emission goal for coal. Funding requests in several areas such as fuel cells are reduced because the work on near term fuel cells has reached a point of maturity where it is appropriate for the industry to take it to commercialization. In Solid Energy Conversion Alliance (SECA) fuel cells the work can be stretched out by one year and still accommodate the FutureGen schedule where SECA fuel cells can be used in the power module. Coal gasification research is also stretched out by one year without a schedule impact on the delivery of potential technology for FutureGen. In addition, the gas separation membrane research funded in fiscal year 2004 under gasification is being proposed in fiscal year 2005 as part of the increased request (\$16 million) for the hydrogen fuels research to maximize the synergy between these areas. Advanced research was streamlined to emphasize novel concepts that could have potential for zero emission applications. The fiscal year 2005 budget request therefore reflects the priority of achieving a zero emission option for coal given budget realities.

FOSSIL ENERGY—DISTRIBUTED GENERATION—FUEL CELLS—SOLID STATE ENERGY
CONVERSION ALLIANCE (SECA)

Question. The majority of interest in DOE—Fossil's fuel cell programs is centered on the SECA program. This program is based upon a number of vertical teams working on competing fuel cell technologies. Also funded are horizontal, or cross-cutting, teams that are focused on addressing technological hurdles the vertical teams are facing. This year, DOE has reduced funding for the core fuel cell program from \$71 million to \$23 million. This cut comes after DOE has added two new vertical teams to the SECA program (increasing from 4 to 6 teams) at the reduced funding level.

Mr. Secretary, I am extremely interested in the fossil fuel cell programs. I know that DOE now has six industry teams working on the SECA program, yet has proposed a reduction from \$71 million to \$23 million Distributed Generation with \$25 million coming from SECA related activities. I am concerned that reducing the funding for stationary fuel cells will cause the program to slow, when it is poised to make great strides.

Additionally, it is my understanding some teams may be underperforming, and some of the competing technologies may show little promise for future development. Can you update the Subcommittee on the progress of the SECA program and explain how you propose allocating resources in fiscal year 2005 to ensure we are providing sufficient resources to the teams showing the most promise?

Answer. In fiscal year 2005, our highest priority is adequate funding for FutureGen. Within the Fuel Cells Program, our highest priority is SECA, which is expected to contribute to distributed generation applications, and larger-scale FutureGen applications.

Funding for SECA is at the same level as the fiscal year 2004 Request. Proposed funding for SECA is about two-thirds of the fiscal year 2004 appropriation (\$35,063,000). Our fiscal year 2005 funding request of \$23 million will fund the continuation of work by the SECA teams, given current fiscal constraints. At the proposed funding level we expect identical impacts on each of the participating teams, namely, stretching out the SECA development schedule by one year.

Currently, six Industrial Teams are aggressively pursuing different promising approaches to meet the SECA goal of \$400/kW. Each team's progress will be assessed against our rigorous contract requirements in 2005, 2008, and 2010.

Over 40 research and development projects that support the SECA industry teams are in place. The SECA Core Technology Program, SBIR, University Coal Research and the FE Distributed Generation Advanced Research budget lines fund these projects. Each Industrial Team has successfully demonstrated full size cells that promise to meet the SECA 2005 criteria in full prototypes. Half of the Industrial Teams have already operated full prototypes, including balance-of-plant, that demonstrate the basic system operation. One Industrial Team, in partnership with a major electric utility (Southern Company), has demonstrated SECA technology in a coal power plant using coal gas as the fuel. Significant progress has been made in solving the two most challenging SECA technology issues, interconnects and seals: New materials for SECA metallic interconnects and seals are under development at two national laboratories and several small businesses and universities. Long-lived metallic interconnects with significantly reduced degradation and seals that exhibit significantly reduced leak rate have been demonstrated in the SECA Core Technology Program.

FOSSIL ENERGY—DOMESTIC OIL PRODUCTION/IMPORTS

Question. Current Domestic Production continues to decrease in the face of rising demand. Last year you expressed concern that oil prices remained around \$28 a barrel following the initial stabilization of Iraq. Currently, the price remains at approximately the same level and, just like last year, domestic crude storage is fairly low heading into the summer months. There continues to be a lag in exports. Most price forecasts continue to highlight that the volatility of fuel costs will be determined on our ability to access crude stocks, but almost all forecasters highlight our ongoing dependence as the reason for continued price swings in the oil markets. Can you comment on this?

Answer. As with any commodity, inventories provide an immediate source of supply should demand surge or shortfalls in other supply sources occur. Should OPEC reduce its production, and consequently its exports, at the same time demand for crude oil is increasing as refiners come out of their maintenance programs to increase refinery throughput to maximize gasoline production, crude oil inventories can be the bridge to fill this possible gap in supply. However, with crude oil inventories well below the average range, pressure will likely build on prices should these

low inventories be required to be drawn down further. Simply put, without more crude oil available to world markets, it will be difficult for refiners to maximize gasoline production without drawing crude oil inventories to even lower levels. It appears that more crude oil is needed to supply refiners and help to rebuild crude oil stocks to more normal levels.

OIL RESEARCH BUDGET FIGURES

Question. Obviously, I do not agree with the Department's budget request reducing Oil Technology R&D from \$35 million to \$15 million. However, your budget request proposes collapsing the traditional functions under the Oil Technology Program. For example, under Exploration and Production, the enacted program includes 8 program areas with specific funding levels. This year you simply propose 3 program areas, with one focused on Global Oil Supply. Given we are overly reliant on imported oil as is, why are you proposing to cease the oil programs that help domestic production and shift those funds to increasing our dependence on foreign oil production?

Answer. The Oil Technology Program includes policy, science and technology development to help resolve oil supply, environmental, and reliability constraints. In addition to activities focused on increasing domestic production, bilateral technology exchange and joint research, in areas including enhanced oil recovery, between the United States and non-OPEC countries will also increase secure supplies of oil. In fiscal year 2005, the program includes a modest effort to diversify oil supplies through bilateral activities with nations that are expanding their oil industry, including Venezuela, Canada, Russia, Mexico, and certain countries in West Africa. Bilateral and multi-lateral work will include technology exchanges and joint research, development, and demonstration under the Administration's North American Initiative and other international agreements.

UPDATE ON WORLD OIL MARKETS

Question. During the early stages of the operations in Iraq, crude prices rose to over \$38 a barrel and stabilized back in the mid to high \$20s. However, crude prices are rising again and stocks are low. Can you update us on the current state of the highly fluctuating oil markets?

Answer. Crude oil prices have increased by about \$7 per barrel since early December. Converted into cents per gallon, this would explain about 17 cents of the 26-cent increase seen in retail gasoline prices since December. OPEC has kept production, and consequently global exports, at levels that have prevented crude oil inventories worldwide, and especially here in the United States, from returning to more normal levels. This OPEC restraint has been followed by a call to decrease production further beginning in April. Additionally, global oil demand continues to increase, particularly in China and the United States. While supply and demand factors explain most of the increase in crude oil prices, other factors, including the large net long position by non-commercial participants in the near-month NYMEX contract and even a demand pull from higher gasoline prices, have also put pressure on oil prices. Nevertheless, crude oil prices have increased in recent months primarily due to a tightening global crude oil market. With crude oil prices at these levels, it is uneconomical for stockholders to hold excess inventories, thus crude oil inventories remain relatively low, and will likely not increase without more global supply being made available.

CURRENT CRUDE IMPORT LEVELS

Question. Can give us a sense of how current crude imports compare to prior years as a percentage of domestic consumption?

Answer. Net crude oil imports were 63 percent of U.S. crude oil inputs to refineries for the month of December 2003, up from December 2002, when net crude imports comprised 61.2 percent of U.S. crude oil inputs to refineries. The current figure is also up compared to the five-year average, as crude oil net imports were responsible for an average of 58.2 percent of U.S. crude oil inputs to refineries during the month of December in each of the years 1998 through 2002. While crude oil imports do seem to be increasing, it is clearly not enough to keep crude oil inventories from reaching very low levels this past winter.

IRAQI PRODUCTION

Question. There is still obvious concern regarding the timeline to return Iraq's oil production to the world market, and we have recently heard rumblings that the Saudi fields may have a shorter lifespan than previously thought. Can you update

the Subcommittee on the actions the Department has been taking to help the Iraqi peoples' attempts to bring production online?

Answer. The Coalition Provisional Authority (CPA) is responsible for Iraqi reconstruction, including restoration of their oil industry. The CPA has recruited support for their activities from several Federal agencies, including the Department of Energy. Some of our employees volunteered to serve and have completed rotations; some are still in Iraq. They were chosen based on their backgrounds in oil production, oil logistics, and electrical engineering. While each employee has made meaningful contributions to reconstruction, the Department of Energy is not responsible for planning or executing plans for reconstruction in Iraq and is not best positioned to respond to this question.

CENTRAL ASIAN PRODUCTION

Question. Secretary, you and I have recently discussed the need to work with nations in Central Asia to support both natural gas and oil production. Could you give us your outlook on the region and the potential to work with ex-Soviet states to help stabilize global energy markets?

Answer. The Caspian Sea region is important to world energy markets because of its potential to become a major oil and natural gas exporter over the next decade. Progress has been made in improving export capacity as the Baku-Tbilisi-Ceyhan oil pipeline is now under construction and plans for the Shah Deniz gas pipeline are proceeding. Estimates of the Caspian Sea Region's proved crude oil reserves vary widely by source. The Energy Information Administration (EIA) has estimated proven oil reserves as a range between 17 and 33 billion barrels, which is comparable to OPEC member Qatar on the low end, and larger than the United States on the high end. The Caspian Sea region's natural gas potential is, by some measures, more significant than its oil potential. Regional proven natural gas reserves are estimated by EIA at 232 trillion cubic feet (Tcf), comparable to those in Saudi Arabia. The Shah Deniz offshore natural gas and condensate field in Azerbaijan, which is thought to be one of the world's largest natural gas field discoveries of the last 20 years, contains "potential recoverable resources" of roughly 14 to 35 Tcf.

IMPORT/EXPORT AUTHORIZATION FUNDS

Question. I notice you have decreased the Import/Export Authorization line item, which raised a few eyebrows. However, I am told this decrease is the result of shifting functions out of the Fossil Account to align them with a more appropriate area within the Department. Can you elaborate on this change?

Answer. The budget request for fiscal year 2005 reflects the reorganization plan to move the cross border electricity regulation function out of Fossil Energy to the Office of Electric Transmission & Distribution, which was established August 10, 2003, and funded in the Energy and Water Development Appropriations, and combines DOE's electricity transmission and distribution (T&D) programs and research in a single, focused office. The requested funds for Fossil Energy in fiscal year 2005 are appropriate for the remaining Fossil Energy natural gas regulatory functions.

GASOLINE STOCKS

Question. Last year we discussed the alarming dependency on foreign refined product. My hope was that the dependency on foreign gasoline was an anomaly rather than a trend, however, with recent disruptions due to an accident on the Mississippi and regional price spikes, I am hearing more concern from my constituents. Can you update us on imports of refined product and give us an outlook for gasoline prices this summer?

Answer. The average retail price for regular gasoline in the United States has been about \$1.72–1.73 per gallon over the last couple of weeks, just a couple of pennies shy of the all-time high of \$1.747 (unadjusted for inflation) set on August 25, 2003. While the average retail price declined slightly from March 1 to March 8, EIA expects this to be temporary, and continues to forecast prices averaging \$1.83 per gallon later this spring.

Gasoline prices have risen because of two primary factors: (1) a rise in global crude oil prices, and (2) tight gasoline markets nationwide.

—Crude oil prices have increased by about \$7 per barrel since early December. Converted into cents per gallon, this would explain about 17 cents of the 26-cent increase seen in retail gasoline prices since December. OPEC has kept production, and consequently global exports, at levels that have prevented crude oil inventories worldwide, and especially here in the United States, from returning to more normal levels. This OPEC restraint has been followed by a call to decrease production further beginning in April. Additionally, global oil demand

continues to increase, particularly in China and the United States. While supply and demand factors explain most of the increase in crude oil prices, other factors, including the large net long position by non-commercial participants in the near-month NYMEX contract and even a demand pull from higher gasoline prices, have also put pressure on oil prices. Nevertheless, crude oil prices have increased in recent months primarily due to a tightening global crude oil market.

—Gasoline supply and demand factors have also played an important role in explaining higher gasoline prices. Despite relatively high nominal prices, U.S. gasoline demand has been very strong, averaging 4.5 percent above year-ago levels over the last four weeks, and supply has simply not increased enough to keep up. On the supply side, with the refining system globally showing much less excess capacity than last year, the lack of ability to further increase gasoline production substantially, including here in the United States, may make it difficult for refiners to supply enough gasoline this spring. Gasoline imports have averaged significantly below year-ago levels, particularly in January and February, despite the fact that product imports in January and February 2003 were adversely affected by the disruption in Venezuela that had resulted from the oil workers strike in December 2002. Gasoline imports have been lower so far this year for a number of factors: relatively high freight rates, low supplies available for export from Europe, and, possibly, from lower-than-normal exports from Venezuela.

With supply unable to keep up with demand growth this year, U.S. inventories have been drawn down much more than normal this year. January, which would typically be expected to see an increase of more than 12 million barrels, actually saw total gasoline inventories fall by nearly 1 million barrels, and there wasn't any significant improvement in February, relative to normal changes. As a result, there is little, if any, flexibility in the gasoline market to respond to any imbalances, should they occur in specific regions of the country, or across the country.

Question. Does the Department have any short-term solutions to combat the trend?

Answer. We all understand that the current oil market conditions have evolved over many years and will require patience and resolve to be addressed adequately. The Administration continues to work towards assuring that American consumers have adequate supplies of petroleum products at reasonable prices. I urge the Congress to do its part to complete comprehensive energy legislation and send it to the President.

The trend in imported petroleum products is simple economics: the foreign refiners have excess capacity to produce gasoline; we have strong demand for gasoline, primarily on the East Coast. As long as the U.S. price is attractive to foreign refiners, they will provide our markets with needed petroleum products.

With the FreedomCAR and Hydrogen Fuels initiatives, we are working aggressively to fundamentally change the way we look at transportation, oil use and the environment over the long term, by developing an integrated system using hydrogen from domestic sources that produces no emissions of greenhouse gases or criteria pollutants.

SOLID STATE LIGHTING

Question. The fiscal year 2005 request includes \$10.2 million for Solid State Lighting, up from \$7.7 million in fiscal year 2004. Industry is pleased by this show of support, but is concerned by the split between core research projects (national labs, universities) and industry-led research. They feel the industry portion provides a bridge to product development, which will allow the U.S. industry to keep pace with foreign competitors. DOE would say that product development should be largely the responsibility of industry. I was pleased to see the Department's formal launch in November 2003 of a dedicated Solid State Lighting research and development program. The energy savings and environmental benefits of this technology could be enormous.

You've asked for just over \$10 million for solid state lighting in your fiscal year 2005 budget. I am interested in how the Department is allocating funds in this program between core research and research more geared toward product development and commercialization. From reports that I've heard—including a recent visit to the Far East by our colleague Sen. Bingaman—Korea, China, and Japan are very active, with government support, in developing solid state lighting technologies. Is enough being done to support product development research?

Answer. The Department is funding core research, or "Core Technologies" as well as "Product Development" activities. The November 2003 Solid State Lighting (SSL)

Workshop provided a formal launch of the program and a discussion of the research and development (R&D) plan for SSL. Much emphasis and priority was placed on the Core Technologies tasks, as many fundamental activities still need to be completed and capitalized into products before the performance and price of SSL will be market competitive. Product Development tasks were also prioritized, but for light emitting diodes (LEDs) only. The top priorities for both Core Technology and Product Development will be addressed with competitive solicitations in fiscal year 2004.

Given that Core Technology projects will (a) achieve the technology breakthroughs for large jumps in efficiency (among other attributes), and (b) are longer term with results further out, EERE will emphasize the Core Technology agenda during the early years of its SSL activities. However, it should be noted that less risky projects (generally those in Product Development) require more industry cost sharing than riskier projects (generally those in Core Technology), as required by the Energy Policy Act of 1992 and in alignment with guidelines developed as part of the Administration's R&D investment criteria. Thus, total project funding—including participant cost sharing—is approximately equal between the two categories.

Question. Are you confident we are applying adequate resources to secure the intellectual property, manufacturing capability and infrastructure to lead the world in solid state lighting?

Answer. Yes. The Department is carefully applying the resources available within solid state lighting (SSL) to high-priority tasks selected by the November 2003 Solid State Lighting Workshop and is seeking a balance between long-term Core Technology and near-term Product Development activities. The Department recognizes that foreign-government-funded SSL consortiums are targeting the same white-light markets and applications. However, the U.S. industry base presently holds an edge in technology knowledge and expertise. Given the potential for large profits in the lighting industry, we are confident that the U.S. industry investment, combined with the Department's funding, will allow the United States to continue to lead.

Question. How specifically are fiscal year 2004 funds for this program being allocated?

Answer. For fiscal year 2004, EERE's Building Technologies Program is focusing on placing available funding on competitive solicitations or competitive National Laboratory research and development solicitations. Of the \$7.75 million appropriation for solid state lighting (SSL) in fiscal year 2004, \$1.5 million is being used to pay mortgages for projects from past solicitations, \$6.0 million is being used for competitive solicitations and the balance of \$250,000 is being used for analyses and other activities. The competitive solicitation will be split between Core Technology (\$4.0 million) and Product Development (\$2.0 million) in an approximate two-to-one ratio. Research and development activities (\$7.5 million) have been given a higher priority than workshop (\$100,000), analysis (\$100,000), and communication (\$50,000) activities.

Question. How will fiscal year 2005 funds be allocated if funded at the President's request?

Answer. In fiscal year 2005, SSL funding will be allocated using the funding logic emanating from the November 2003 Solid State Lighting (SSL) Workshop, which provided a formal launch of the program and a discussion of the research and development (R&D) plan for SSL. The Department is funding both core research, or "Core Technologies," as well as "Product Development" activities. From this SSL Workshop, many tasks were identified as priority tasks, but only a subset will be placed in the fiscal year 2004 solicitations for either Core Technology or Product Development. The funding split in fiscal year 2005 between Core Technology and Product Development solicitations will be approximately two-to-one.

HYDROGEN—NATIONAL RESEARCH COUNCIL REPORT

Question. The National Research Council recently released a study that identified some pretty tall hurdles that need to be cleared before hydrogen can make a significant impact this country. Big improvements are needed in the cost and reliability of fuel cell systems; advances are needed in transportation infrastructure for hydrogen; and we must determine whether it is feasible to sequester carbon that would be produced if we were to produce hydrogen from coal. Some have interpreted this report as saying that hydrogen is a pipe dream, and that funding anything but the most basic research at this time would be folly. What is your take on the NRC report?

Answer. Conclusions that only the "most basic research" should be funded are gross mischaracterizations of the NRC report. The NRC recommended that the program shift away from "some" development areas and toward more "exploratory"

work—as has been done in the area of hydrogen storage. “Exploratory” research is not synonymous with “basic” research.

Exploratory research involves the application of novel ideas and new approaches to “established” research topics, and is likely to catalyze more rapid advances than basic research and more innovative advances than applied research. The Department is doing this through the Hydrogen Storage Grand Challenge, for example, which includes the establishment of three “Centers of Excellence” led by National Laboratories along with multiple university and industry partners. This is the model that the NRC is recommending that the Department use in addressing fuel cell cost, durability, and other areas. The NRC is not recommending a shift away from development in general; the NRC is specifically limiting the areas that it recommends we shift away from to: compressed gas/liquid storage, centralized natural gas production, stationary polymer fuel cells, and biomass gasification.

We agree that significant hurdles exist to realization of the hydrogen economy. These barriers had been previously identified by the Department (see the National Hydrogen Energy Roadmap, released by Secretary Abraham on November 12, 2002); barriers specifically mentioned in your question are each addressed as part of the President’s Hydrogen Fuel Initiative:

- Fuel cell cost and reliability.*—Over the last several years, the program has increasingly shifted emphasis away from systems development activities because industry is taking on this work with private funding. Instead, the Department is focusing on research at the component level addressing cost and durability issues. This trend is expected to continue, is supported by the fiscal year 2005 budget request, and is in agreement with NRC recommendations.

- Transportation infrastructure for hydrogen.*—NRC recommendation ES-5 indicates that distributed hydrogen production systems deserve increased research and development (R&D). The Department agrees with this recommendation, and believes an increased focus on relevant technologies (distributed reforming and electrolysis) will help eliminate large infrastructure investments in the transition. Figure 6-1 of the report shows the transition beginning in 2015. The NRC gave a clear strategy that the transition can occur by focusing on distributed production of hydrogen that eliminates the need for full hydrogen production and delivery infrastructure in the near term. The Department will place much more emphasis on exploratory research on electrolysis in fiscal year 2005 and beyond. Decreasing electrolyzer cost and increasing efficiency are critical to producing hydrogen from renewable electricity. We will also continue our work in hydrogen production through distributed natural gas reforming, another key technology in the transition to a full hydrogen economy.

- The feasibility of carbon sequestration.*—Coal is a potential abundant and domestic source for hydrogen. It is considered a long-term hydrogen source because the technical, economic and environmental feasibility of carbon capture and sequestration technology must be evaluated. Over the next 10 years, FutureGen, a project to employ carbon capture and sequestration technologies will demonstrate emissions-free electricity and hydrogen from coal. Although funding for this demonstration is not part of the President’s Hydrogen Fuel Initiative, the FutureGen project is critical to addressing greenhouse gas reductions and evaluating the long-term potential for coal-based hydrogen and electricity.

Finally, basic research is critical to understanding the underlying science that will lead to hydrogen and fuel cell technology improvements in the near-term and potentially “breakthroughs” in the long-term. The Department has now included the Office of Science as a direct participant in the President’s Hydrogen Fuel Initiative and has requested \$29.2 million in the fiscal year 2005 budget for basic science. However, if we shift too many resources away from applied research and technology development, we will not meet the technology milestones needed to enable the industry commercialization decision in 2015. As pointed out by Dr. Michael Ramage, Chairman of the NRC committee on hydrogen, when he testified before the House Science Committee, a continuum of basic science, applied research, development, and learning demonstrations is necessary for the hydrogen initiative to be successful. The Department believes that fiscal year 2005 funding represents a balanced program in terms of the mix of research and development.

Question. Does anything in that report cause you to rethink the allocation of funds in your budget for hydrogen research?

Answer. The Department initiated the request to have the National Research Council (NRC) evaluate its hydrogen program planning in December 2002. In April 2003, we received the interim NRC report with recommendations that we incorporated into the President’s fiscal year 2005 budget request. The fiscal year 2005 request reflects funding increases in fundamental research (\$29.2 million for the Of-

fice of Science), safety (\$18 million represents a 3-fold increase over fiscal year 2004), and systems analysis (to help prioritize research activities).

The Department fully concurs with 35 of the 43 recommendations in the final report. The remaining eight will be implemented to some degree after careful consideration and consultation with our stakeholders, including the Congress. One of the major reasons the Department asked the NRC to examine the program was to obtain independent advice on our priorities and resource allocation. The recommendations are now being considered and funding allocations in future years will be made consistent with our understanding of the proper role of the Federal government and emphasize technology areas that can most greatly impact U.S. oil consumption and carbon emissions. We will continuously re-evaluate technology status, and reallocate funds appropriately.

HYDROGEN—TECHNOLOGY VALIDATION PROGRAM

Question. Last year this subcommittee funded a new activity within the fuel cell program that was designed to support full scale demonstrations of hydrogen vehicles, fueling systems and storage. You're seeking a further increase in funding in fiscal year 2005. Can you update us on how the fiscal year 2004 funds are being spent?

Answer. A solicitation was issued in fiscal year 2004 for a fuel cell vehicle and hydrogen infrastructure "learning" demonstration. The "learning" demonstration is an extension of the research program and is not a commercialization demonstration intended to accelerate market introduction. The planned project is a 50/50 cost-shared effort between government and industry and will provide important performance, durability, and safety data, under real-world operating conditions, necessary to continuously refocus the research program.

Funding from the Interior and Related Agencies appropriations will be used to manufacture and test hydrogen fuel cell vehicles in fiscal year 2004 and fiscal year 2005. Funding from the Energy and Water Development appropriations will be used to develop and test hydrogen infrastructure components. It is expected that award selections will be announced in the near future.

This activity will provide a critical assessment of hydrogen fuel cell technology and the information necessary to validate whether we are on track to meet our interim milestones for a 2015 commercialization decision by industry. It will involve automotive manufacturers and energy companies, with multiple suppliers and university partners, and is critical to understanding the systems integration and interface issues involved with a major transformation in our transportation energy system.

Question. How many demonstrations will be funded, where will they be and what kind of projects will they be?

Answer. The Department anticipates selecting approximately three to five demonstration applications for negotiation for award. Although the applicants were asked to propose specific geographic locations, they cannot be disclosed at this time because selections have not been publicly announced. The solicitation required that vehicles operate in cold and hot climates, dry environments, and in humid conditions. This will provide valuable fuel cell performance data related to water management and heat management that feed back into the applied research program to fully address these issues.

As stated earlier, the vehicle/infrastructure learning demonstration will involve the automotive and energy industries to seek national system solutions, and possible synergies between hydrogen fuel electricity generation and transportation applications.

The demonstration data will include very controlled testing on chassis dynamometers so that fuel cell technology readiness can be reported to Congress with extremely high confidence. We will also be able to focus on safety and work with industry to develop uniform codes and standards necessary for eventual commercialization and safe use of hydrogen as an automotive fuel. The project will specifically validate fuel cell durability, vehicle range, and hydrogen production costs under real-world operating conditions by 2008. The data produced will help focus our R&D to accelerate technological advances. The goal is a 2015 commercialization decision by industry.

Question. In light of the NRC report, are you at all concerned that we're getting ahead of ourselves in committing substantial resources to a demonstration program like this, rather than investing those funds in additional basic research?

Answer. As pointed out by Dr. Michael Ramage, Chairman of the NRC committee on hydrogen, when he testified before the House Science Committee, a continuum of basic science, applied research, development, and learning demonstrations is nec-

essary for the hydrogen initiative to be successful. Furthermore, the NRC report does not recommend that funding be shifted from this “learning” demonstration to “basic” research. The Department’s mix of funding according to OMB circular A–11 for the fiscal year 2005 Hydrogen Fuel Initiative budget request is as follows:

	Percent
Basic Research	12.9
Applied Research	42.5
Development	29.2
Demonstration	¹ 13.4
Deployment (Education)	¹ 2.0

¹ OMB Circular A–11 does not provide a definition for this category.

The Department believes that fiscal year 2005 funding represents a balanced program in terms of the mix of research and development. As you can see, 85 percent of the program is research and development.

Basic research is critical to understanding the underlying science that will lead to hydrogen and fuel cell technology improvements in the near-term and potentially “breakthroughs” in the long-term. However, if we shift too many resources away from applied research and technology development, we will not meet the technology milestones needed to enable the industry commercialization decision in 2015.

These learning demonstrations are critical to assessing how well the research is progressing in meeting customer targets and in establishing the business case. A major transition to a hydrogen-based transportation energy system could not occur without the involvement of the automotive and energy industries in this type of project.

FOSSIL ENERGY—DOMESTIC GAS PRODUCTION/IMPORTS

Question. While oil reliance is especially concerning right now, natural gas prices and availability are at the heart of an ongoing domestic energy crisis. Spikes in natural gas prices on the spot market rival the cost spikes for electricity that lead to public outrage in recent years. Mr. Secretary, we have recently discussed our mutual concern over natural gas prices and increasing dependence on foreign natural gas. Could you share some of the statistics you shared with me on Monday, March 1, regarding our need for imported natural gas?

Answer. Total natural gas consumption is projected to increase from 2002 to 2025 in all Energy Information Administration (EIA) AEO2004 cases. The 2005 projections for domestic natural gas consumption are in the range from 29.1 trillion cubic feet per year in the low economic growth case to 34.2 trillion cubic feet in the rapid technology case, as compared with 22.6 trillion cubic feet in 2002.

The North American resource base has matured, making it much more difficult to increase supply levels faster than the rate of production decline. Net imports of natural gas make up the difference between U.S. production and consumption. Imports are expected to be priced competitively with domestic sources. Imports of foreign LNG account for most of the projected increase in net imports. When planned expansions at the four existing LNG terminals are completed and projected new LNG terminals start coming into operation in 2007, net LNG imports are expected to increase from 0.2 trillion cubic feet in 2002, to 2.2 and 4.8 trillion cubic feet in 2010 and 2025, respectively.

Net annual imports of natural gas from Canada are projected to peak at 3.7 trillion cubic feet in 2010, then decline gradually to 2.6 trillion cubic feet in 2025. The depletion of conventional resources in the Western Sedimentary Basin is expected to reduce Canada’s future production and export potential, and prospects for significant production increases in eastern offshore Canada have diminished over the past few years.

Question. I notice the Department is focusing on Liquefied Natural Gas (LNG) to help meet these import needs. Have you worked with the Department of Homeland Security to assess the risk and viability of a large LNG infrastructure?

Answer. DOE’s Office of Fossil Energy, working with the Office of Intelligence, is leading interagency cooperation on assessing the risk of LNG infrastructure. The lead agencies for LNG infrastructure permitting are the Federal Energy Regulatory Commission and the U.S. Coast Guard, the latter of which is now part of the Department of Homeland Security (DHS). In addition, discussions have been held in an interagency context with the DHS Office of Science and Technology to coordinate efforts.

Question. I know the Natural Gas Technologies accounts under Fossil Energy focuses on exploration and production techniques as well as developing advances in infrastructure to prevent failures and enhance delivery capabilities. Unfortunately your budget request suggests reducing these activities from \$43 million to \$26 million, down from nearly \$46 million just a few years ago. Can you explain the disconnect between the information collected by your Department and the direction the Research and Development Accounts appear to be headed?

Answer. The Administration's fiscal year 2005 budget request for oil and gas research is at the same level as the fiscal year 2004 request. The Department believes that this is the appropriate level based on the priority placed on addressing the growing demand for clean energy with a portfolio of research in clean coal, LNG, renewables, conservation and more.

The oil and natural gas program budgets reflect the PART scores ("ineffective" for the past two years, although the scores improved from fiscal year 2004 to fiscal year 2005), which were lower than other Department of Energy research programs, and budget allocation is based in part, on this evaluation process. However, the Department is committed to improving performance and is taking active steps to improve project planning and the agency's ability to measure its effectiveness. We are in the process of an oil and gas strategic planning initiative and are working with external groups to improve our benefits measures.

GRID RELIABILITY AND FEDERAL LANDS

Question. As you well know, maintaining and improving the reliability of the electric grid is dependent on our ability to maintain transmission lines across Federal lands—particularly in the West. From time to time we hear complaints that maintaining this infrastructure on Federal lands is a cumbersome and expensive process, whether it's vegetation management, line maintenance, or other necessary tasks.

I know DOE has worked closely with the White House to coordinate the designation of corridors across federal lands in 11 Western states for transmission and other utility rights-of-way. My understanding is that the next step in this process is the completion of a region-wide Environmental Impact Statement, and that the Argonne National Laboratory has been designated to prepare the programmatic EIS, funded by the Department of Energy.

I believe it is very important that these corridors be designated if we are going to have adequate transmission capacity in the West to deliver power from renewable and other energy sources. My understanding is that the DOE funding commitment for fiscal year 2004 has not yet been fulfilled.

Can you advise this Committee as to the status of the fiscal year 2004 funding commitment for the region-wide EIS, and whether you are requesting the requisite funds to complete the EIS in fiscal year 2005?

Answer. It must be recognized that the Bureau of Land Management (BLM) and the Forest Service (FS) have made progress in the past 2 years to streamline the management of existing right-of-way grants (ROW) for BLM administered lands or special use permits (SUP) for FS administered lands, and to reduce the burden and expense of infrastructure maintenance, whether vegetation management, line maintenance, or other necessary tasks. It is anticipated that additional administrative practices will be implemented by the BLM and the FS in the next couple of years that continue to streamline many aspects of ROW and SUP management while maintaining safety, public health, and environmental protections. Improvements in transmission policy, such as better practices for siting of transmission lines, is one of the activities supported by the Office of Electric Transmission and Distribution's Electricity Restructuring program. However, completion of the EIS in fiscal year 2005 depends on the availability of funds.

Question. From what program would such funding most logically be derived?

Answer. The electric transmission system would benefit from designated corridors across Federal lands; the expedited review process itself would save both time and money during siting evaluation. Thus, the Office of Electric Transmission and Distribution sees value in this effort. However, other programs outside the electric transmission and distribution area would also benefit. For instance, these corridors would enable better access to renewables and other energy sources, including natural gas and hydrogen.

Question. Are there other steps you're taking administratively on an inter-agency level to address these issues?

Answer. DOE is working closely with the Task Force on Energy Projects established under Executive Order 13212 in addressing these issues. The Bureau of Land Management (BLM) and the Forest Service (FS) are pursuing an effort to modernize their land use plans throughout the West. Both agencies have directed their field

offices to identify management issues associated with right-of-way (ROW) grants and special use permits. The agencies will identify ROW corridors, analyze the corridors for their present and future ROW uses, and where appropriate, officially designate the lands as ROW corridors. In accordance with BLM and FS management practices, a designated ROW corridor is a preferred location for the placement of future ROW facilities. Proposals to place future ROW facilities across BLM and FS administered designated as ROW corridors may be able to benefit from an expedited National Environmental Policy Act (NEPA) review process. The DOE is coordinating with the BLM and the FS to ensure that concerns of DOE are addressed in the BLM and FS land use planning efforts/NEPA reviews. DOE will support the designation of appropriate ROW and work with the agencies to help ensure that unwarranted restrictions to the placement of ROW on other public lands do not occur.

Question. Are you getting an appropriate level of response and cooperation from Interior and the Forest Service?

Answer. The Bureau of Land Management and the Forest Service have provided outstanding support to DOE with respect to identification, analysis and resolving of rights-of-way issues on lands the agencies administer. DOE has every expectation that this outstanding level of cooperation will continue.

FOSSIL ENERGY—FUELS

Question. The request reduces the Fuels account under Fossil Energy Research and Development from \$31 million to \$16 million. This research has focused on producing cleaner fuels using a number of technologies including using carbon feed stocks (coal, petroleum, gas) and separating it into various components, notably isolating the carbon from other elements. The budget proposes stopping all ultra clean fuels research and syngas research that creates clean fuels and hydrogen from coal.

Mr. Secretary, I am interested in your decision to essentially stop all advanced fuels research in the Fossil program. For fiscal year 2004, Congress provided \$31 million to continue research aimed at developing cleaner fuels from domestic fossil sources including coal, gas, and petroleum. The strides made in producing new fuel products such as ultra clean diesel have given hope we can produce and utilize much cleaner burning fossil fuels in the near term. Can you explain why you believe we should abandon research that is arguable on the verge of creating marketable solutions to near-term environmental concerns?

Answer. The Coal to Hydrogen program is an important part of the President's Hydrogen Initiative and supports the FutureGen project by providing advanced, less costly technology for producing more hydrogen and hydrogen separation technology for evaluation. In fiscal year 2005, \$16,000,000 has been requested for the program. This funding is a significant increase over the fiscal year 2004 appropriated funding of \$5,000,000 for hydrogen from coal research and is consistent with the programmatic need as defined in the Hydrogen Posture Plan and FE Hydrogen Program Plan.

No fiscal year 2005 funding is requested for ultraclean transportation fuels and syngas membrane technology because these activities are related to the production of compliant liquid fuels required to meet EPA Tier-2 Standards which industry itself can support without DOE R&D assistance.

The Administration's request does include funding for an alternate route for producing hydrogen via clean, zero sulfur liquid fuel hydrogen carriers that would utilize the existing infrastructure and can be converted to hydrogen near the end-use site.

Question. Your budget proposes numerous projects to produce hydrogen from fossil energy sources. I believe we both realize our natural gas infrastructure is spread too thinly. Can you give us an indication of the potential success of production of hydrogen from coal and other resources?

Answer. In a recent comprehensive study, the National Academies concluded that "a transition to hydrogen as a major fuel in the next 50 years could fundamentally transform the U.S. energy system, creating opportunities to increase energy security through a variety of domestic energy resources for hydrogen production, while reducing environmental impacts, including atmospheric CO₂ emissions and criteria pollutants." The Committee did point out that "breakthroughs" in production, storage, delivery and fuel cells are required.

The mission of the hydrogen from coal program is to develop through public/private RD&D advanced and novel technologies that will enable the use of the Nation's abundant coal reserves to produce, store, deliver and utilize affordable hydrogen in an environmentally responsive manner. The potential for the economic production of hydrogen from coal is considered to be very high. However, in addition to developing new innovative processing technology, studies must be conducted to show the

integration of these technologies in producing hydrogen, while successfully sequestering the carbon dioxide. These advanced technologies being developed by the Hydrogen from Coal Program offer the potential of reducing overall cost of hydrogen production by 25 percent, making the cost of the hydrogen fuel very competitive with alternatives.

The integration of processes and the advanced technology studies would be significantly advanced by the design and construction of the FutureGen facility.

In fiscal year 2005, \$16,000,000 has been requested for the Hydrogen from Coal Program. This funding is a significant increase over the fiscal year 2004 appropriated funding of \$5,000,000 for hydrogen from coal research and is consistent with the programmatic need as defined in the Hydrogen Posture Plan and the FE Hydrogen Program Plan.

NAVAL PETROLEUM AND OIL SHALE RESERVES—ROCKY MOUNTAIN OIL TECHNOLOGY CENTER (RMOTC)

Question. The Naval Petroleum request and proposed DOE Reorganization propose moving the Rocky Mountain Oil Technology Center (RMOTC) (pronounced Remot-C) under the auspices of the Natural Gas R&D portfolio. This facility allows industry to partner with DOE and place facilities on NPR-3 (Teapot Dome) to explore advanced oil recovery techniques. The budget and DOE reorganization proposes moving the Rocky Mountain Oil Technology Center into the Natural Gas R&D portfolio. It is my understanding industry partnerships to promote advanced oil recovery utilize this center with great success. Can you assure the Subcommittee that joint efforts at the center will continue at or above the current level in the upcoming fiscal year?

Answer. The RMOTC program is not being placed under the auspices of the Natural Gas R&D portfolio as you have noted; rather it will be managed as part of the overall oil and gas R&D program within the Office of Natural Gas and Petroleum Technologies. RMOTC offers a place to perform hands-on testing and demonstration of upstream petroleum and environmental products that is tailored to the small, independent domestic oil producers. Government participation accelerates technology transfer by helping speed new technology to the market place. RMOTC also supports the Administration's goal to develop new/alternative energy sources and energy efficiency technologies for use in the petroleum industry. However, we cannot make assurances that funding will remain level or increase.

The type of work done at the RMOTC—field demonstrations of oil exploration and production technology—is something that the petroleum industry primarily should lead. The RMOTC appropriation for fiscal year 2004 was for \$2.96 million and the fiscal year 2005 request is \$2.17 million, which will primarily be utilized to continue the work commenced in fiscal year 2004. RMOTC will concentrate these resources on primary and applied research and development that does not overlap with industry. It will use the fiscal year 2005 appropriation to complete work on already signed cooperative agreements and judiciously select new projects to fund.

OFF-HIGHWAY ENGINE R&D

Question. You have once again proposed to terminate research on off-highway engines such as heavy equipment, railroad engines, etc. I gather this is because the potential energy savings are not nearly as high as for on-road vehicles research. While off-road fuel consumption is far less than on-road consumption, it does seem that very significant emission reductions could be attained in the off-road area by picking some of the "low hanging fruit". Can you give us an idea about how you weigh such things in your budget development process?

Answer. Our budget development process weighs multiple factors such as program performance, relative priority, alignment with the Administration's R&D investment criteria, and other factors. The R&D investment criteria include considerations such as the Federal role, the quality of the research planning, and the potential for public benefits. While we continue to refine our methods for quantifying and comparing potential benefits of our activities, it is clear that advances in on-road vehicles offer greater benefits than in off-road vehicles. In fact, we estimate that the fuel savings potential from off-highway vehicles research is an order of magnitude lower than the potential for on-road vehicles. Accordingly, our R&D priorities emphasize on-road vehicle R&D, consistent with our fiscal year 2004 request. Also, in a recent peer review of our multi-year R&D plans the review committee recommended that the Department follow this course of action. Our R&D on heavy-duty on-road vehicle engines, however, does address many of the same technical issues present in engines of off-road vehicles.

With regard to emissions from off-highway vehicles, although the Department is deeply concerned about emissions, the Environmental Protection Agency has primary jurisdiction over this area. Recent EPA regulations mandate that the manufacturers of off-highway vehicles reduce future emissions and industry is working to meet these regulations on their own. Our cooperative R&D efforts emphasize research areas that industry would not choose to undertake on its own, especially in the absence of regulation.

Question. Are fuel savings and energy efficiency your only true goals in these programs, with things such as emissions reductions being secondary benefits?

Answer. The Environmental Protection Agency has primary jurisdiction over emission issues. Recent EPA regulations mandate that the manufacturers of off-highway vehicles reduce future emissions, and industry is working to meet these regulations on its own. Our cooperative R&D efforts emphasize research areas that industry would not choose to undertake on its own, especially in the absence of regulation.

The Department of Energy's Office of Energy Efficiency and Renewable Energy certainly considers environmental factors such as emissions in its decision-making and evaluations, but its primary goal is to achieve greater energy efficiency in the United States. In the area of transportation, this translates to decreasing our dependence on foreign oil through fuel savings and fuel switching opportunities.

Question. Can you elaborate for the record your reasons for proposing to terminate this program? Could you describe specifically how the funds appropriated in fiscal year 2004 are being spent?

Answer. Our budget development process weighs multiple factors such as program performance, relative priority, alignment with the Administration's R&D investment criteria, and other factors. The R&D investment criteria include considerations such as the Federal role, the quality of the research planning, and the potential for public benefits. While we continue to refine our methods for quantifying and comparing potential benefits of our activities, it is clear that advances in on-road vehicles offer greater benefits than in off-road vehicles. In fact, we estimate that the fuel savings potential from off-highway vehicles research is an order of magnitude lower than the potential for on-road vehicles. Since the top priority of EERE is to reduce our Nation's dependence on foreign oil, the FreedomCAR and Vehicle Technologies Program decided to focus its R&D efforts on those technologies that offer the opportunities to save the greatest amount of petroleum. Also, in a recent peer review of our multi-year R&D plans the review committee recommended that the Department follow this course of action.

In fiscal year 2004, approximately one-half of the funds go directly to makers of off-highway equipment (construction, agriculture, mining, road construction and rail) for competitively-awarded cooperative agreements, while the other half goes to our National Laboratories to conduct cooperative, cost-shared research with industry.

QUESTIONS SUBMITTED BY SENATOR TED STEVENS

ALASKAN ENERGY RESOURCES

Question. Increasing domestic energy supplies to ensure our energy security is a major element of President Bush's National Energy Policy. Alaska's vast energy resources are a key component in meeting the President's goal. Alaska's North Slope provides almost 20 percent of U.S. oil production. Additionally, Alaska's large natural gas reserves are estimated at over 130 trillion cubic feet and our coal reserves are estimated at 5,500 billion short tons. Developing and enhancing these energy resources will ensure stability in domestic energy supplies.

Despite Alaska's enormous resource potential, its energy reserves are largely untapped. Part of the problem has been a lack of research focusing on how to develop the resources given the Arctic's harsh climate, remoteness, and unique geology and environment. Recognizing that such research was important, Congress created the Arctic Energy Office, a branch of the Department of Energy's National Energy Technology Laboratory. The Arctic Energy Office was tasked with conducting Arctic energy research in fossil energy and remote electrical power generation in order to advance the economic and energy security of the United States.

With the federal funding it has received, the Arctic Energy Office has engaged in various energy related research, including tundra studies, enhanced oil recovery (which has the potential to generate an additional 20–25 billion barrels of oil), gas hydrates, gas to liquids technology, and natural gas production and transportation related to the Alaska Natural Gas Pipeline.

In fiscal year 2005, the Department of Energy is requesting over \$635 million for fossil energy research and development. It appears from the Department's budget request, none of these funds will be used to support the important research of the Arctic Energy Office.

It is my understanding that your department eliminated funding used to identify and study ways to make the gas pipeline more economical. Alaska gas will meet approximately 10 percent of our nation's natural gas needs, decrease our dependency on foreign sources of LNG, generate over \$40 billion in federal revenues, and create 400,000 jobs. At a time when high natural gas prices are severely impacting our industries and consumers and hindering our economic recovery, why would the Department eliminate funding for this project?

Answer. At the requested budget level for oil and gas, DOE decided it would not identify a specific line for Arctic research. This does not preclude competitively funding Arctic projects consistent with program priorities. However, any funding for Arctic research would be at a significantly lower level than the previous appropriations as a result of the overall decrease in funding for oil and gas. Specific gas pipeline funding to conduct testing of an innovative membrane technology for reducing the cost of gas processing prior to its delivery for pipeline transport was appropriated in prior years and remains available to conduct this project.

Question. The mean estimate of gas hydrates on Alaska's North Slope is 590 trillion cubic feet. As the Department of Energy has stated, development of 1 percent of this resource would triple the United States' resource base. Despite this vast potential gas resource, why did the Department decrease funding for the Alaska project by \$3.35 million?

Answer. The Department is actually emphasizing hydrate research by increasing its fiscal year 2005 budget request by \$2.5 million over the fiscal year 2004 budget request. The requested increase reflects the natural gas program's efforts to focus on areas where there is a clear government role: long-term, high risk research with potentially high payoffs. In fiscal year 2004 and fiscal year 2005, this program will focus on ongoing joint projects in assessing the potential hydrate resource in the Gulf of Mexico and in Alaska.

Question. In fiscal year 2004, over \$6.5 million was appropriated to conduct research into the development of syngas ceramic membrane technology used to enhance Fischer-Tropsch (F-T) gas conversion to create environmentally friendly liquid fuels and hydrogen. Why was funding for this project eliminated in fiscal year 2005?

Answer. While the development of syngas ceramic membrane technology would enhance the economic production of Fischer-Tropsch liquids and/or hydrogen from natural gas, this advance could be supported by the private sector and we believe it has the economic incentives to do so. This funding request is consistent with the Administration's budget request for fiscal year 2004.

Question. The President's National Energy Policy called for environmentally sensitive development of Alaska's oil reserves and gas reserves, including those in the National Petroleum Reserve-Alaska. Consistent with that mandate, the Arctic Energy Office engaged in research into tundra travel to extend the exploration window on the North Slope. Why did the Department of Energy eliminate funding for this Arctic research?

Answer. The Tundra Travel Model was fully funded in fiscal year 2003 and the project has been successfully completed. To our knowledge, the Alaska Department of Natural Resources is not seeking additional funds from the Department of Energy to continue the project.

Question. The University of Alaska-Fairbanks and the Arctic Energy Office have been at the forefront of climate change research. Changes in climate are severely impacting Alaska's coastal communities. Why was funding eliminated for this research in the budget for fiscal year 2005?

Answer. Although the Arctic Energy Office has a close working relationship with the University of Alaska-Fairbanks, it does not fund climate change research.

QUESTIONS SUBMITTED BY SENATOR BYRON L. DORGAN

FUTURE GEN

Question. The Department's FutureGen plan, which is dated March 3, 2004, refers to the congressional directive that the plan be "closely" coordinated with the private sector. The plan does not, however, provide any detail on how the Department went about accomplishing that task. Please tell the Committee how the FutureGen plan was coordinated, including the organizations consulted, the number of meetings con-

vened, and when the Department expects comments back from the industry regarding its plan.

Answer. DOE staff communicated on several occasions with a point of contact designated by the FutureGen industry alliance. The point of contact coordinated industry views and inputs that were discussed. Communications took the form of informal meetings and telephone conversations between Departmental staff and the industry coordinator as the drafting of the plan progressed. The industry alliance also provided input through a letter to the Department from the designated coordinator. The Department considered this input in the drafting of the plan. However, as stated in the FutureGen plan, industry has not had sufficient time to review or comment on the final plan that was submitted. Comments from the industry alliance are being requested on the FutureGen plan.

Question. As the FutureGen plan rightly points out, community acceptance will be one of the keys to the success of the project. What is the Department planning with respect to community outreach, both before and after a specific site is selected? And does the Department have a plan or strategy for addressing environmental legal challenges?

Answer. The Department is planning to include early planning activities for NEPA compliance in its community outreach prior to site selection. Early in the process, we will conduct early community outreach activities including an announcement of an Advance Notice of Intent to prepare an Environmental Impact Statement (EIS) for the FutureGen project. This announcement will include outreach to those state and tribal nation entities that initially submitted letters of interest in hosting the plant, including potentially interested communities within offering states. Every reasonable effort will be made to provide early information to keep the public and potential stakeholders apprised.

Following an open competition to select a host site, the Department will issue a final Notice of Intent regarding the EIS and will announce that intent to all communities, states, and tribal nations responding to the Consortium's competition. The Department will plan and conduct public meetings in communities within all regions offered as reasonable (i.e., potentially qualified) candidate sites for the plant. An extensive state and community outreach program will continue after a site has been selected.

As with any sizeable project, there is always the potential for environmental legal challenges. With respect to addressing these potential challenges, the Department plans to adhere to and comply with all relevant NEPA regulations, meticulously adhere to established procedures, document such procedures, and implement a full and open process that would engage the public and stakeholders throughout. It will also incorporate alternatives (site and technology alternatives) that are as broad as reasonably possible to ensure the reasonable range of alternatives were evaluated in the EIS documentation and serve to embody the actual conditions the project plans to move forward in at the time the site is selected.

Question. Obviously, funding sources for the \$950 million cost of the FutureGen project are an important factor that must be carefully considered by the Congress before committing substantial funds to this endeavor. The plan states that \$80 million will come from state and foreign governments. Which governments have pledged funds, how much have they pledged, and what mechanism is in place to ensure that these funds will actually end up "in the bank"?

Answer. At this time, several state and foreign governments have expressed a keen interest in participating in the FutureGen initiative. However, at this early stage in the FutureGen process, pledging of funds from any governmental entity would be premature and thus, is not yet expected since such commitments would be subject to further discussions and negotiations. The Department is encouraging broad international participation and will be actively pursuing cost sharing partnerships in FutureGen. Several mechanisms such as existing protocols and agreements, modification of existing agreements, and new agreements could provide the avenues for addressing cost-share contributions, extent of participation, rights and other quid pro quo issues.

Question. The FutureGen plan also envisions \$250 million coming from a private-sector consortium. Please provide the Committee with a list of consortium members and the amount of funding each member has agreed to contribute. In addition, specify whether or not the funds are legally committed to FutureGen.

Answer. As reported by the industry consortium that refers to itself as the FutureGen Industrial Alliance, the members are: American Electric Power, Cinergy Corporation, CONSOL Energy Inc., Kennecott Energy Company, The North American Coal Corporation, PacifiCorp, Peabody Energy, RAG American Coal Holding, Inc., Southern Company, and TXU. It is not known by the Department what arrangements, if any, have been made among the membership regarding the funding

contributions of each member. The Department has no knowledge at this time as to whether industry funds are or have been legally committed to FutureGen. It is anticipated these and other questions and issues will be addressed prior to or at the time of negotiations with the industry partner.

Question. There is a real concern that the administration intends to pay for its \$620 million share by supplanting current coal research programs. Even assuming Congress agrees to the administration's proposal to transfer the remaining Clean Coal Technology balances to the FutureGen program, approximately \$375 million remains unaccounted for. Does the administration intend to fund the FutureGen program with budget requests above and beyond the base coal R&D program, or will some of the base funds be used for FutureGen?

Answer. On page 8 in the FutureGen plan report, a profile is provided of the estimated governmental expenditures. As shown in the report, the administration's plan calls for a total of \$500 million in new direct funding for the project and \$120 million from the sequestration program, with \$80 million being sought from international partners. The Department considers FutureGen the highest priority coal research effort, and as such, adequate supporting base coal research for FutureGen will most likely continue to be needed. Certain research in some areas such as that in emissions controls will wind up in the out years. In addition, the sequestration research program calls for large scale field tests that would be conducted with or without FutureGen. Therefore, that portion of the large scale sequestration research which can be conducted in an integrated mode with FutureGen could be funded as part of the project.

Question. The FutureGen plan states that the Department will provide \$100 million toward the project in fiscal year 2008; \$11 million for plant design, and \$89 million for procurement and construction. Are these funds in addition to the base coal R&D program, or will they be included in the basic coal research budget?

Answer. On page 8 in the FutureGen plan report, a profile is provided of the estimated governmental expenditures. It is the administration's intent to request a total of \$500 million in new direct funding for the project and \$120 million from the sequestration program, with \$80 million being sought from international partners. The Department considers FutureGen the highest priority coal research effort, and as such, adequate supporting base coal research for FutureGen will most likely continue to be needed.

Question. Please also answer this question with respect to the \$113 million the Department proposes to spend in fiscal year 2009.

Answer. On page 8 in the FutureGen plan report, a profile is provided of the estimated governmental expenditures. It is the administration's intent to request a total of \$500 million in new direct funding for the project and \$120 million from the sequestration program, with \$80 million being sought from international partners. The Department considers FutureGen the highest priority coal research effort, and as such, adequate supporting base coal research for FutureGen will most likely continue to be needed.

Question. The Department states that \$120 million will be subsumed from the Sequestration research budget and put into the FutureGen project. According to the plan, for fiscal years 2009, 2010, and 2011, this amounts to \$52 million. Yet, in looking at the plan's expenditures for those three fiscal years, no research activities are noted. On the contrary, design and construction account for virtually all of the funds proposed to be spent. How does the Department justify using much-needed sequestration research dollars for basic building construction, particularly in light of the fact that the plan makes abundantly clear that much more needs to be done in the sequestration area if FutureGen is to be a success?

Answer. The carbon sequestration aspect of FutureGen will integrate carbon capture in the above-ground facility with geologic carbon sequestration. During fiscal year 2009, fiscal year 2010, and fiscal year 2011, funding from the sequestration R&D program will be used in conjunction with direct project funding for the design, procurement, and construction of carbon sequestration sub-system components for FutureGen, which are required for FutureGen carbon sequestration research and testing. Thus, funds from the sequestration R&D program will be used to enable sequestration research at the integrated FutureGen facility. Funding from the sequestration R&D program for fiscal year 2011 will also support shake-down and start-up testing of the carbon sequestration sub-system components. In addition, the sequestration research program calls for large scale field tests that would be conducted with or without FutureGen. Therefore, that portion of the large scale sequestration research which can be conducted in an integrated mode with FutureGen would be appropriately funded as part of the project.

QUESTIONS SUBMITTED BY SENATOR ROBERT C. BYRD

FOSSIL ENERGY BUDGET REQUEST VS. THE ENERGY BILL

Question. I am aware that this administration did not take into account the now stalled Energy bill when releasing its fiscal year 2005 budget for DOE's Fossil Energy programs. However, one does not have to look far to see a clear disparity between what the administration is proposing this fiscal year and what is needed for many important energy programs. For example, the administration has cut the basic research and development funding for the Fossil Energy program by 32 percent for the fiscal year 2005 request. That is just an average cut, as specific oil, gas, coal, fuel cell, and other fossil energy programs have been cut even more severely. Based on the authorization levels in the Energy bill, the fossil energy program would require a 22 percent increase for fiscal year 2005 above and beyond the fiscal year 2004 appropriated funds. I am sure that similar examples exist for other important energy programs. We have seen this disparity in so many other bills. After the Congress passes a bill, the administration promotes it but then underfunds it.

The Secretary recently traveled to West Virginia touting the administration's work for coal. This administration has suggested that it stands behind the multiple billions for clean coal in the Energy bill, including the President's campaign promise for Clean Coal Technology. However, given this administration's track record, it hardly seems likely this funding will ever fully blossom.

Can the Department provide the Committee a copy of the Department's request to OMB for the Fossil Energy program for fiscal year 2005?

Answer. According to the Office of Management and Budget (OMB), the advice and counsel leading up to the recommendations that form the basis of the President's budget are part of the internal deliberative process of the Executive Branch. Similar to the pre-markup activities of any Congressional Committee, the initial views and positions within the Executive Branch vary widely relative to the final outcome in the President's budget. In order to assure the President the full benefit of advice from the agencies and departments, the Administration treats these working papers, such as the Department's OMB budgets, as pre-decisional internal working documents. Therefore, the Department's OMB budget is not releasable outside of the Executive Branch.

Question. If an energy bill were to somehow pass, would the administration actually support an increase in its funding requests to be in line with new authorizing levels for critical energy programs, or would it simply follow the same deceptive patterns that it has pursued after signing other authorizing bills?

Answer. The fiscal year 2005 budget request represents the Administration's view of where the Department of Energy's budget should be given the totality of demands placed on the Federal budget. The Administration has indicated concern with the potential costs of both H.R. 6 and S. 14, including their cumulative appropriation authorization levels, which in many cases significantly exceed the President's Budget and set unrealistic targets for future programmatic funding decisions.

NATIONAL ENERGY TECHNOLOGY LABORATORY (NETL)/DOE OFFICE OF ENERGY ASSURANCE

Question. As the Department is aware, the National Energy Technology Laboratory (NETL) is currently providing unique expertise and resources to assist the Office of Energy Assurance. NETL has a broad knowledge of how to effectively work with energy infrastructure owners and operators and forge effective partnerships with government and the private sector. I believe that NETL is a good fit for the Office of Energy Assurance, and I hope that the Department will do all in its power to ensure that NETL has the opportunity to excel under this important program.

NETL began providing assistance for the Office of Energy Assurance in fiscal year 2003 at a level of \$16 million, with my support. In fiscal year 2004, I added an additional \$16 million to the Energy and Water Appropriations bill for NETL to continue its activities under this program, as well as an additional \$4 million for NETL to begin construction of a DOE facility dedicated to training first responders and industry on ways in which to prepare for, and respond to, a variety of energy-related emergency scenarios. I understand that this facility is a high priority for the Department.

While I realize that the Department may not have this information readily available today, for the record, would the Department provide a detailed report on the activities for which the \$16 million for NETL was expended in fiscal year 2003?

Answer. In fiscal year 2003, the Office of Energy Assurance worked with NETL to direct and allocate the following initiatives:

[In thousands of dollars]

Performer	Description of Work	
NETL	Requirement definition and support of the Energy Infrastructure Training and Analysis Center (EITAC).	3,980
Nat'l Labs	EITAC modeling support	1,700
IUOE	Training first responders	1,265
ISAC, SNL	Energy Information Sharing and Analysis Center (ISAC) support and technology exposition.	689
NASEO	State emergency planning and response enhancements	707
Nat'l Labs	Technology development from a National Laboratory competition	2,200
Nat'l Labs	Visualization and analysis systems	601
GTI	Natural gas disruption study	305
SNL	Supervisory Control and Data Acquisition system technical support	300
BCS	Emergency response protocol support	250
Energetics	Facilitate stakeholder meetings	310
NETL	Develop metrics for energy assurance	761
NETL	Program direction for Federal/contractor salaries, travel, and materials	2,575
NETL	Budget rescission	357
Total .....	.....	16,000

Question. For the record, how much of the \$20 million that I have added for NETL in fiscal year 2004 has been released and for what purpose?

Answer. NETL has received \$14,070,000 of the \$20,000,000 that was enacted by Congress in fiscal year 2004. In March 2004, the Office of Energy Assurance (OEA) issued Work Authorizations to NETL describing scope, cost, and schedule for work to be performed.

OEA has requested the fiscal year 2004 funds to be allocated as shown below:

[In thousands of dollars]

	Amount
Energy Disruptions and Preparedness	2,645
Coordination with the Private Sector	650
State and Local Government Support	1,075
Criticality of Assets	2,190
Policy and Analysis	875
Technology Development	3,885
Management Support	250
Program Direction	2,500
Total	14,070

By site, OEA funding would be distributed as :

[In thousands of dollars]

	Amount
ANL	550
INEEL	1,080
LANL	400
NETL	5,495
ORNL	375
PNNL	770
SNL	1,455
National Lab Council	200
National Labs (TBD)	470
Private Sectors/Universities	3,275
Total	14,070

Question. Further, I would appreciate a detailed report on how the fiscal year 2004 funds yet to be released will be utilized by NETL to assist the Office of Energy Assurance.

Answer. The Office of Energy Assurance has retained \$5,930,000 of fiscal year 2004 funding. Of these funds, \$4,000,000 is for construction and furnishing of faci-

ties to support the analytical, training, and emergency response needs of the energy sector; \$1,000,000 for NETL Program Direction; and \$930,000 for program activities yet to be defined by OEA.

Question. I would also like to know how many NETL jobs are supported by the Office of Energy Assurance.

Answer. In fiscal year 2004, approximately 14 Federal and contractor NETL employees will support the Office of Energy Assurance.

Question. What is the Department's vision for NETL's role in the Office of Energy Assurance in the future? For example, will the Department incorporate funding to support NETL's work under this program into future budget requests and will the Department encourage NETL to work with the Department of Homeland Security in complementary activities?

Answer. Funding for NETL was not identified in the fiscal year 2005 budget request for the Office of Energy Assurance. However, the Department of Energy has encouraged NETL to work with the Department of Homeland Security (DHS) in complementary activities. For example, in fiscal year 2004, NETL is prepared to assist DHS in procuring up to \$100 million in national security R&D. NETL would allocate this funding to projects selected by DHS that focus on security and reliability of energy infrastructure. Examples include development of an electric grid monitoring system, development and demonstration of mobile transformers to recover from electricity outages, and implementation of protective measures to monitor buffer zones near key energy infrastructures. NETL is coordinating this work with DOE's Offices of Electric Transmission and Distribution and Energy Assurance.

CLEAN ENERGY TECHNOLOGY EXPORT (CETE) INITIATIVE

Question. In October 2002, the administration, through the Department, released the Clean Energy Technology Exports (CETE) strategy. This action plan outlined a five-year, nine-agency initiative to increase U.S. clean energy technology exports to international markets through increased coordination among federal agency programs and between these programs and the private sector. As I indicated in my September 16, 2003, statement in the Congressional Record, this funding is to be specifically provided to the Office of International Energy Market Development (OIEMD) within the Department to more concretely grow this multi-agency, congressionally initiated effort. The CETE funding in fiscal year 2004 should be made available to the OIEMD to embark on the establishment of an interagency administrative center and to carry out related, near-term outreach efforts in support of CETE's long-term goals.

Answer. Funds have not yet been made available to the Office of International Energy Market Development (OIEMD). The department is working closely with OIEMD to make these funds available from those offices that are funded by the Energy Supply line as specified in the Energy and Water Development Appropriations Conference Report 108-357.

NATIONAL ENERGY TECHNOLOGY LABORATORY (NETL) REORGANIZATION PLAN

Question. On Thursday, March 4, 2004, the Department submitted the follow-up reorganization plan for the National Energy Technology Laboratory (NETL). I have noted that this long overdue reorganization plan follows the nearly three-year, top-to-bottom review of Fossil Energy and the May 2003, reorganization plan that was submitted for the Office of Fossil Energy. As a strong proponent of NETL, I will pay careful attention to the continuation of its mission and strongly support the work of its employees who conduct that mission. As a member of the Interior and Related Agencies Subcommittee, I will also continue to review the reorganization plan and make my views known to the Subcommittee Chairman and Ranking Member prior to its being brought up for approval by the Committee. How can you assure me that the NETL will continue to have the appropriate and necessary flexibility to carry out its important mission?

Answer. The top-to-bottom review and resultant reorganization plan will not adversely impact NETL's flexibility to carry out its mission. Rather, it will strengthen the programmatic relationship between NETL and Fossil Energy Headquarters by better aligning resource management with strategic direction. This will improve program accountability.

Question. Do you foresee disruptions in any ongoing NETL research and development and other programs as a consequence of this reorganization plan?

Answer. No disruptions are expected to occur in any ongoing NETL research and development and other programs as a result of the reorganization plan.

Question. Given NETL's unique role as a government-owned, government-operated laboratory, how can you assure me that federal employees will be equitably treated—treated in a manner that is comparable to that afforded to the private-sector employees of the Department's government-owned, contractor-operated laboratories? What assurances can you make that contact, communications, and decision-making processes will continue to flow both ways—from the Department to the lab and from the lab to the Department?

Answer. NETL's expertise and capabilities have and will continue to be valued by the Department. Their technical contributions are vital to decision-making, communications, and contacts with the public and private sectors, state and local governments, industry, and academia.

Question. Will job losses, immediately or in the future, occur as a result of the laboratory reorganization plan?

Answer. NETL will not sustain any job losses, immediately or in the future, as a result of the reorganization plan.

Question. Does the Department plan further outsourcing or contracting efforts that would, in any way, threaten the jobs of NETL's employees?

Answer. NETL supports the President's Management Agenda by providing documentation to conduct the fiscal year 2004 Feasibility Studies approved by the Competitive Sourcing Executive Steering Group in DOE. The Feasibility Studies may result in determinations that specific functions are appropriate for formal A-76 studies, therefore it is too early to determine any potential impact.

Question. My review of the NETL reorganization plan indicates that the Department is proposing changing the reporting relationship of the employees in the Natural Gas Program to the National Petroleum Technology Office in Tulsa, Oklahoma. Is this a first step in a chain of actions to physically relocate those employees from Morgantown, West Virginia to Tulsa, Oklahoma?

Answer. We do not anticipate, now or in the future, physically relocating employees in the Natural Gas Program to the National Petroleum Technology Office in Tulsa, Oklahoma.

Question. What assurances can you give me that these employees will not be transferred in subsequent years to the National Petroleum Technology Office?

Answer. We do not anticipate, now or in the future, physically relocating employees in the Natural Gas Program to the National Petroleum Technology Office in Tulsa, Oklahoma.

Question. If no plans are anticipated, then how is it in the best interest of the lab's structure that these employees report to distant managers in such an unwieldy fashion?

Answer. As a result of the top-to-bottom review, it was determined that the Department needed a clear strategic focus for the entirety of the natural gas and petroleum programs. The future direction of these programs will provide a significant economic benefit to the American people by aiding the efficient production of domestic resources and diversifying global resource supplies. The reporting relationship is not expected to be unwieldy since the National Petroleum Technology Office is an integral part of the NETL. The manager of the Tulsa office holds weekly face-to-face and/or telephone conference meetings with the NETL Director.

QUESTIONS SUBMITTED BY SENATOR PATRICK J. LEAHY

ENERGY EFFICIENCY BUDGET CUTS

Question. Secretary Abraham has repeatedly stressed the importance of energy efficiency in addressing high natural gas prices. For example in a June 6, 2003 letter to a number of senators, he said, "we concur with the conclusion advanced in your letter that over the next 12 to 18 months there are only limited opportunities to increase supply; and that, therefore, the emphasis must be on conservation, energy efficiency, and fuel switching." Given the importance of energy efficiency to addressing this critical problem (and other energy problems), why does DOE propose to cut funding for Energy Efficiency programs for the third year in a row?

Answer. Our overall budget request for the Office of Energy Efficiency and Renewable Energy (EERE) across both our funding accounts is up 1.2 percent above last year's appropriation. You are correct that we are seeking an amount for the energy efficiency activities in the Interior Appropriations account that is two-tenths of one percent less than the amount of funding provided last year, or roughly \$2 million out of an \$876 million budget request. Through increased efficiencies, reductions, down-selects, project terminations, and significant shifts across its portfolio of programs, EERE determined that is able to meet its program goals at a funding

level that is basically unchanged from fiscal year 2004. Most notable among its internal funding shifts, EERE is seeking a \$64 million increase over fiscal year 2004 appropriated levels in the Weatherization Assistance Program. In alignment with the President's commitment, the Department is increasing its assistance to low-income Americans who spend a disproportionately high share of their income on energy. This program not only reduces energy costs for low-income families, but also saves energy for the Nation. The main tradeoff for this increase is a decrease in funding for the Industrial Technologies Program, which generally benefits larger corporations with both the means and the incentive to save energy.

NATURAL GAS SAVINGS

Question. Do you have estimates of potential natural gas savings from the various buildings, industry and other efficiency programs?

Answer. Projected natural gas savings from energy efficiency programs are presented in the table below. We recognize that our point estimates rely heavily on key assumptions. For the appropriate context to interpret these figures, we urge you to consult the description of our modeling procedures and assumptions, which will be available on line at www.eere.energy.gov/office—eere/ba/gpra.html by May 31, 2004.

POTENTIAL NATURAL GAS SAVINGS

[Quads]

	2010	2015	2020	2025
Buildings Technologies	0.15	0.33	0.54	0.78
FEMP	0.02	0.03	0.03	0.04
FreedomCAR and Vehicle Technologies .....	.....	.....	.....	.....
Industrial Technologies	0.19	0.39	0.71	0.63
Weatherization and Intergovernmental	0.19	0.29	0.29	0.23

Benefits reported are annual, not cumulative, for the year given. Estimates reflect the benefits associated with program activities from fiscal year 2005 to the benefit year or to program completion (whichever is nearer), and are based on program goals developed in alignment with assumptions in the President's Budget. Mid-term program benefits were estimated utilizing the GPRA05-NEMS model, based on the Energy Information Administration's (EIA) National Energy Modeling System (NEMS) and utilizing the EIA's Annual Energy Outlook (AEO) 2003 Reference Case.

FEDERAL ENERGY MANAGEMENT PROGRAM

Question. The Federal Energy Management Program is unique in that the money saved through efficiency improvements returns directly to the federal government, and thus to the taxpayers. Nonetheless, you propose to cut the FEMP program by 9 percent. How much money does the federal government save due to DOE's FEMP program each year?

Answer. The nine percent cut in Federal Energy Management Program's (FEMP) fiscal year 2005 budget request will not impact the program's alternative financing programs, the primary driver for generating energy cost savings for the Federal government. Instead, programmatic efficiency improvements within these activities will allow FEMP to help Federal agencies achieve the same amount of savings in fiscal year 2005 as is expected in fiscal year 2004. Unfortunately, the authority for the Energy Savings Performance Contracts (ESPCs) expired October 1, 2003, and we are awaiting legislative extension of ESPC authority providing temporary or permanent ESPC authority.

FEMP estimates that its Super ESPC activity "saved" the Federal government approximately \$48 million in fiscal year 2003 (assuming energy usage in the form of electricity). Note that, due to the nature of ESPCs, most of the "savings" realized by government agencies during the ESPC contract term are paid to the ESPC contractor to offset the original capital and installation cost of the energy efficiency equipment. Thus, Federal energy cost savings really don't begin to accrue until the contractor's investment (including interest) is fully paid (the average duration of the ESPC term since inception of the program is 17 years, which has decreased to 15 years on average over the past five years). However, the Federal government realizes real energy consumption savings as soon as the contractor implements the energy efficiency measures (typically, the first or second year of the contract). Because the Federal government is the largest single consumer of energy in the United States, the use of ESPCs to reduce Federal energy consumption can contribute to the Department's energy security strategic goal.

Question. Since this program saves federal tax dollars, why are you proposing to cut it?

Answer. As the Federal Energy Management Program's (FEMP) core activities have matured, the efficiencies in those activities have increased, enabling the program to reduce its funding request in fiscal year 2005.

In fiscal year 2005, FEMP will continue to streamline program activities. For example, FEMP has determined that it is no longer necessary, because of activity maturation, to create any new Technology Specific Energy Savings Performance Contracts (ESPCs). We have found that we can achieve the same benefits through a fuller utilization of our baseline ESPCs in a way that is less complicated for our agency customers. Through more efficient use of its resources, FEMP will continue to conduct its other activities, such as partnership meetings, annual awards, outreach publications and technical assistance projects.

CLIMATE CHANGE INITIATIVE AND ENERGY CONSERVATION BUDGET CUTS

Question. The President's Climate Change Initiative sets a target for reduction of greenhouse gas emission intensity. Energy efficiency measures are typically the cheapest and quickest means of reducing greenhouse gas emissions. With the energy conservation budget cuts, are we taking advantage of the full potential of these programs to reduce global warming?

Answer. The cuts to our energy efficiency budget from the fiscal year 2004 appropriation amount to only two-tenths of one percent, or roughly \$2 million out of an \$876 million budget request. At this requested funding level, our internal analyses indicate that EERE energy efficiency programs will reduce about 30 million metric tons (mmt) of carbon emissions in 2010 and 100 mmt in 2020 if they achieve the goals contained in the fiscal year 2005 budget request. The size of the benefits depends not only on the success of the EERE program activities, but also on the evolution of future energy markets and policies. The EERE estimate of carbon emissions assumes a continuation of current policies and business-as-usual development of energy markets. It does not include the improvements in energy efficiency that would be expected in the absence of continued funding of EERE's programs.

We recognize that our point estimates rely heavily on key assumptions. For the appropriate context to interpret these figures, we urge you to consult the description of our modeling procedures and assumptions, which will be available on line at www.eere.energy.gov/office_eere/ba/gpra.html by May 31, 2004.

Question. Which DOE efficiency programs show the greatest potential for reducing greenhouse gas emissions over the next 10 or 20 years.

Answer. Our modeling suggests that the Industrial Technologies Program (ITP) has the greatest potential to help reduce greenhouse gas emissions by 2020. However, because many ITP activities may contribute directly to the bottom line of some companies, industry has a financial incentive to pursue many of these activities without Federal support. Moreover, the modeling results reflect the fact that many ITP projects are near term in nature, allowing for early market penetration and significant reduction of emission in the year 2020. The Department has generally tried to shift its portfolio to more long-term activities where a stronger case can be made for Federal involvement. Also, like most models, our modeling relies heavily on a few key assumptions, and we have not run the model under multiple scenarios where key assumptions may be different.

Finally, the category of environmental benefits, such as greenhouse gas emissions reductions, is only one of several categories of public benefits that the Department considers in managing its portfolio. Reduced use of oil and consumer energy expenditure savings are also considered, as are benefits that we do not quantify, such as the ability to reduce peak power demand. Given these considerations, the Department does not believe there is a "silver bullet" energy efficiency technology that has the greatest potential for reducing greenhouse gas emissions over the next 10 to 20 years. Instead, DOE has decided to invest in a portfolio of energy efficiency research and development (R&D) programs, each of which has the potential to reduce greenhouse gas emissions and/or provide other public benefits over the next 10 to 20 years.

WATER HEATER STANDARDS—ENERGY STAR

Question. Water heaters are the second largest user of energy in the American home. Thus, DOE should be promoting ways to improve the efficiency of these systems and promote consumer use of the most efficient products available on the market. In an effort to address these issues, DOE recently undertook a substantial effort to establish ENERGY STAR criteria for water heaters, taking it to the point of writing draft standards and convening a stakeholder meeting in April 2003. However, on January 6, 2004, DOE sent a letter to all water heater stakeholders announcing they had "decided not to establish ENERGY STAR criteria for domestic

water heaters at this time.” Even small gains in efficiency that save energy are worthwhile. Why did DOE decide not to move forward with a water heater ENERGY STAR program?

Answer. This decision rests on several market and technical considerations that made it impractical to consider ENERGY STAR labeling for water heaters at this time, along with the realization that labeling this product category prematurely could undermine some of the fundamental tenets of ENERGY STAR. The key reasons are as follows:

- One of the ENERGY STAR program’s basic tenets is that products must provide sufficient market differentiation and savings to consumers. The Department decided, based on its analyses and stakeholder comments, that labeling conventional technologies such as water heaters would not offer sufficient market differentiation or savings to consumers. “Conventional” technologies are established, widespread, commercialized technologies used by homeowners in common applications; in the case of water heating, a “conventional water heating system” consists of a storage tank in the utility room (or basement) with a gas or electric heat source heating the water initially and keeping it hot for distribution throughout the house on demand.
- With stricter Federal energy conservation standards for water heaters already having gone into effect in January 2004, the incremental savings offered by the best performing conventional gas and electric products would not be large enough to justify the awarding of an ENERGY STAR designation.
- ENERGY STAR is an appropriate differentiator of energy efficient products only for product groupings offering a broad range of energy performance levels within the given category. The margins between the top-performing gas and electric storage water heater models and the Federal standards are smaller than for other ENERGY STAR product categories.
- For non-conventional products, the credibility of ENERGY STAR in the market place depends on the label being placed only on those products that save energy without sacrificing performance or customer enjoyment of the product. While many of the non-conventional products offer significant energy savings, there are insufficient numbers of models and manufacturers offering such products for sale to support a viable ENERGY STAR program for these products at this time.

TANKLESS WATER HEATERS

Question. DOE’s January 2004 letter recognizes the benefits of tankless water heaters, saying “In order to achieve significant energy efficiency gains, manufacturers will have to pursue tankless technologies, and ‘tankless water heaters have significant energy savings potential compare to conventional products,’ tremendous gains in energy savings and associated pollution prevention could be achieved.” Given that DOE recognizes the benefits of tankless water heaters, why did DOE categorize it as a “non-conventional product” and not support using the ENERGY STAR program to promote its use?

Answer. A key tenet of the ENERGY STAR Program is that a broad range of manufacturers and distribution channels exist for products designated as ENERGY STAR. The infrastructure to sell and service “non-conventional” products is not fully developed in most parts of the country, either because the product is new and not widely distributed (as in the case of heat pump water heaters), or because there is low demand for the product in much of the country due to economic considerations (as in the case of solar water heaters).

Although the energy savings potential is great, the challenges associated with bringing these products into the mainstream are also great. The Department hopes that over the next several years the market for these products will develop, leading to a more mature delivery infrastructure, increased reliability, and improved performance and reduced prices. This would create the type of conditions in which the Department would consider creating an ENERGY STAR label for heat pumps and tankless, solar, and other newly developed water heaters.

SPINNING RESERVE DEMONSTRATION PROJECTS

Question. What is the status of DOE’s research by the Oak Ridge National Laboratory’s (ORNL) Building Technology Program on spinning reserve demonstration projects?

Answer. ORNL has conducted research concerning the technical feasibility of obtaining spinning reserve from aggregations of both large and small responsive loads for enhancing bulk power system reliability and reducing costs. Spinning reserve is the fastest responding and most expensive bulk power system contingency reserve.

This concept requires both a paradigm change and a rule change. As a result of ORNL and other's efforts, NERC rules have been modified to no longer prohibit loads from providing spinning reserve. FERC has also stated that it will allow load to provide spinning reserve. A next step is to change the rules in the Regional NERC Reliability Councils. In addition, market rules, ISO rules, and utility rules all have to be addressed.

ORNL has worked with large aggregations of residential and small commercial heating and cooling loads to develop the concept of spinning reserve from responsive load. Several technologies exist that could support this reliability application, and ORNL has issued two reports on its work with Digi-log and Carrier on the aggregation of small responsive loads.

ORNL has also worked with large water pumping loads and found that they also offer significant potential for spinning reserve. ORNL has worked with the California Department of Water Resources (CDWR) to analyze pumping operations and the results of the analysis are quite encouraging. Based on the aggregated CDWR pumping load, it was found that the CDWR could theoretically supply more spin capacity than the CAISO needs for over 3,000 hours per year, and realize potential total annual revenues for CDWR of over \$11 million are possible. Results are documented in the report: B. Kirby, J. Kueck, 2003, Spinning Reserve from Pump Load: A Technical Findings Report to the California Department of Water Resources, ORNL/TM 2003/99, Oak Ridge National Laboratory, November.

As a result of the favorable findings of this report, ORNL is working with the Western Electricity Coordinating Council (WECC) to support a request for a WECC rule change to supply spin from load.

Question. Has DOE considered testing the Digi-log technology in a cold weather climate as well?

Answer. ORNL successfully tested the Digi-log technology for supplying spinning reserve for enhancing bulk power system reliability and reducing costs during the summer of 2003 on eighty room heating and air-conditioning units equipped with Digi-log controllers at a motel in New York. Testing confirmed that load could respond fast enough to perform as spinning reserve. Similar response speeds would be expected when using the Digi-log technology in cold weather applications. DOE has not tested Digi-log technology for cold-weather loads.

SUBCOMMITTEE RECESS

Senator BURNS. Thank you all very much. The subcommittee will stand in recess to reconvene at 9:30 a.m., Thursday, March 11, in room SD-124. At that time we will hear testimony from the Honorable Mark Rey, Under Secretary for Natural Resources and Environment, Department of Agriculture and Dale Bosworth, Chief, Forest Service.

[Whereupon, at 11:22 a.m., Thursday, March 4, the subcommittee was recessed, to reconvene at 9:30 a.m., Thursday, March 11.]