amounts of cost-shared funding.

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

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

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

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

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

I would hasten to add that gasification currently exists
with Texaco and others, as it is now applied commercially
around the world. It is, however, also the building block
upon which future technology ought to be developed.
Importantly--importantly, we have also estimated the total
funding requirements that these technology platforms will be
acquired. That is, to meet the goals and the time tables laid
out in the chart on page 3.

In our view, an investment of at least $10 billion will
be required over the next 20 years, up to 1/2 from the
private sector and the remaining from the public sector, over
the next 20 years. This public/private commitment includes
time and funding for research and development and also for
demonstration and deployment of new first-of-a-kind systems.

Two quick points, Mr. Chairman, if I may. First, the
existing Clean Coal Program has been a great success. As
Assistant Secretary Kripowicz has pointed out, 38 projects
undertaken, a total of more than 5 billion committed and
spent. I commend to you an attachment in my written
testimony, drafted by the Southern Company, that seeks to
identify the benefits of joint industry government clean coal
efforts, for those so critical of past clean coal efforts,
please look at the facts.

Second, and most importantly, we are delighted with
President Bush’s commitment to a multi-year clean coal
development program. He has sought to initiate that
commitment with $150 million request this year, to begin a
long-term demonstration program. I would point out, however,
that you cannot take funds away from the basic coal R&D
program to cover the costs of the demonstration program. We
need both of them. We need R&D, particularly, because it is
the seed corn that will grow improvements later on.

In this same vein, the Vision 21 program, which, frankly,
is more aggressive in its technology goals and even the CURC
road map, needs to contemplate demonstration programs on a
scale that will provide industry with confidence that the
technology actually works.

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

[Statement of Mr. Yamagata follows:]

*************** INSERT 3 **************

Obtained and made public by the Natural Resources Defense Council, May 2002
Chairman BARTLETT. Thank you very much. Mr. Wells.
STATEMENT OF JAMES E. WELLS, DIRECTOR, NATURAL RESOURCES AND
ENVIRONMENT, U.S. GENERAL ACCOUNTING OFFICE

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

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

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

This morning, I will let the other distinguished Panel members here speak to the successes of the program and I will highlight some of the problems that we observed over the last decade. As you know, as auditors, we are best at identifying problems.

1989--as the first awards were made, there were many company financial problems and delays in getting the business arrangements made. The awardees raised issues to DOE relating to their reluctance to repay the federal cost share. Again, concerns over viability in a competitive marketplace.

Proprietary data issues arose over the possible public release of competitive information that may have disadvantaged companies. Again, frustrating delays in achieving and obtaining various permits, either at the national or state or local levels, and not surprisingly, with any new federal program, there were cumbersome headquarters review in approval processes.

1990--as we looked at DOE, as how they were evaluating, ranking, and selecting the projects, we found that some of the awards that appeared weak in meeting all of the evaluation criteria; especially as it related to solving some of the acid rain issues. Some technical readiness issues were observed that surfaced, that showed up in major project delays and completion date slippages. This caused us to
think, in the early '90s, that perhaps too much money may be chasing less than the best projects. We suggested that the program be slowed down a little bit in awarding new money to new projects again in 1990.

We also did some work looking at the potential for the utilities to use the clean coal technology and found, at that time, a cloudy vision for the future. Their interest was relatively low at the time. Most utilities were not sure what the future demand for coal was going to be, given the expanding natural gas availability and pricing structure. We are uncertain, at this time, and suspect that the future and the vision still may be cloudy today.

1991--we raised concerns about how we were using federal funds to support projects that were close to commercialization. We also raised concerns related to being unable to find buyers for the developed products and the technologies.

1994--we commended DOE for doing good cost-sharing features of the cooperative agreements that they put in place to be used in the Clean Coal Program. The process of using multiple solicitations in stages allowed DOE, as the program progressed, to make major improvements and adjustments to how the program was being run. Some earlier problems with financing, with proprietary data handling and sharing of costs were improved. However, the instances of continuing
project delays, cost increases, and compliance issues, and projects still changing locations throughout the country, remained.

1996--we looked in general at recovering federal investments in technology, especially if the products were being used overseas. Having flexible repayment provisions, such as was used in the Clean Coal Program, was found to be a positive thing. Adjustments were made and an increased federal cost recovery was achieved. However, again, some of the companies continued to be concerned about lowering their rate of returns which may have, at that time, discouraged some participation. Even the agency themselves worried about the administrative burden of negotiating, auditing, and enforcing repayment provisions.

Year 2000--our most recent work for the House Budget Committee were, we were asked to go in and focus on the money that was left in the program and what was happening with 13 of the projects that were remaining that had millions of dollars unspent. Five of those projects were nearing completion and the remaining eight showed signs of the same problems that we had seen over the years--serious delays in being completed--2 to 7 years; continuing financial problems with company financing, including ongoing bankruptcy procedures--proceedings. And once again, we observed that projects continued to be moving around the country, cities to
cities, owners to owners, in some sense, continuing to look
for success:

In summary, I think I will stop here, Mr. Chairman. My
time is running out. The Clean Coal Program clearly has had
its ups and downs. Today, as you and fellow Members of the
Congress are addressing today's energy challenges, we would
hope that you would take some of the lessons learned from the
Clean Coal Technology Program to allow you help decide how
you would like to spend your future research dollars. Mr.
Chairman, this concludes my short summary and I would be glad
to answer questions at the end of the Panel presentation.
Thank you.

[Statement of Mr. Wells follows:]

*************** INSERT 4 ***************
Chairman BARTLETT. Thank you very much. Ms. Abend, welcome, and you may proceed. Could you turn on your microphone, please?
Ms. ABEND. Good morning. My name is Katherine Abend, and I am the Global Warming Associate for U.S. PIRG. Thank you, Mr. Chairman, and the Subcommittee for the opportunity to testify on our views on the Department of Energy’s Clean Coal Technology Program.

U.S. PIRG is the national lobbying office for the state Public Interest Research Groups. The PIRGs are nonprofit, nonpartisan and work on environmental, consumer, and good government issues across the country.

We believe that the so-called Clean Coal Program is mismanaged and threatens public health and the environment by subsidizing the burning of dirty coal. Since 1985, the DOE’s so-called Clean Coal Technology Program has received more than $2.3 billion in federal funds, as well as hundreds of dollars through a separate DOE coal research and development program. Unfortunately, there is no such thing as clean coal.

Proposed clean coal plants will still emit carbon dioxide, which causes global warming, smog-forming nitrogen oxide, lung-damaging particulates, toxic mercury, which contaminates water and land.

Now President Bush wants to waste an additional $2 billion subsidizing the coal industry. It is time to protect our pocketbooks and stop wasting money on so-called clean...
coal programs, and it is time to protect our health with stronger clean air standards. It is time for the wealthy coal industry to finance its own research.

No Clean Coal Technology Program can eliminate carbon dioxide pollution, nor would they need to. Reducing carbon dioxide emissions is not a criterion for the program. In fact, some attempts to reduce emissions of NOx, SOx, and mercury from coal-fired power plants results in greater emissions of carbon dioxide, the main component of global warming pollution. In all, coal-fired power plants are responsible for 27 percent of total U.S. global warming pollution. Last week, the National Academy of Science released a report confirming that there is a consensus in the scientific community that global warming that has occurred in the last 50 years is likely the result of increases in greenhouse gases.

Extreme weather events, which are associated with global warming, are on the rise. According to U.S. PIRG's recent report, worldwide, the number of great weather disasters in the 1990s was more than five times the number for the 1950s and the damages were more than ten times as high, adjusted for inflation. In the United States, extreme weather caused $204 billion in economic losses during the 1990s. Clearly, global warming is too expensive to ignore.

Coal-fired power plants emit 90 percent of all pollution...
from the electric industry. The four main pollutants, NOx, SOx, CO2, and mercury, cause serious environmental health threats, including smog, particulates, acid deposition, and toxic impacts to health and ecosystems.

Fine particulate pollution from U.S. power plants is responsible for the deaths of more than 30,000 people each year. Eighteen thousand of these could be avoided with a 75-percent reduction in emissions. A typical coal-powered plant releases about 170 pounds of mercury, a neurotoxin, into the air annually. Less than a teaspoon deposited in a 25-acre lake can make the fish unsafe to eat. Most so-called clean coal systems in use remove less than 30 percent of mercury.

Clearly, burning coal has a huge impact on our health and environment. Unfortunately, the Department of Energy’s optimistically named clean coal programs subsidize burning more dirty coal. Billions of dollars have been spent, yet our health and that of the planet is threatened by dirty coal plant emissions. So called clean coal still leads to more dirty air. According to a General Accounting Office report, emerging coal technologies will probably not contribute significantly to the reduction of acid rain causing emissions in the next 15 years.

The DOE’s own evaluations of some of its projects show that new coal technologies were 40 percent less effective in
removing SO2 emissions than conventional smokestack scrubbers.

Clearly, more subsidies will not help protect public health. Unfortunately, some coal supporters are proposing to squander even more money and explicitly roll back health protections. Twenty-four senators have co-sponsored S.60 an industry-backed bill to spend $1 billion over 10 years for research on clean coal, and up to $6 billion in tax breaks for utilities to upgrade plants or building new ones using the technology. This bill would exempt even new coal technology from its promises. Congress should oppose this and other harmful bills that would waste our money and weaken clean air protections.

Environmental problems are not the only shortcomings of the clean coal programs. Since its conception, clean coal technology has been marked by mismanagement. The GAO has released at least seven reports documenting waste and mismanagement in the Clean Coal Technology Program. Last year, in a sampling of 13 government-supported clean coal projects, GAO watchdogs found 588 million in unspent federal funds. As of March 2000, 1/5 of the total projects had either been withdrawn or eliminated.

The Clean Coal Technology Program is redundant with the Clean Air Act Amendments of 1990, which already create financial incentives to develop cleaner burning coal.
technologies by allowing utilities to buy, sell, and trade emissions allowances to reach required emission levels.

For the past 8 years, U.S. PIRG has been working to cut polluter pork programs, federal spending or subsidies that harm the environment at taxpayer expense. Our coalition of environmental, taxpayer, and safe energy groups has helped to save taxpayers nearly $24 billion by cutting funding for harmful programs. In February, the PIRGs released with other groups, the Green Scissors Report, which recommends cutting 74 wasteful, environmental-damaging programs to save taxpayers $55 billion. One of these programs is the so-called Clean Coal Technology Program.

The coal power industry is mature and lucrative. At a time of scarce federal dollars, these industries should be weaned from the federal dole. Some of the Nation's largest and wealthiest corporations are also--are beneficiaries of the program, including General Electric, United Technologies, and Westinghouse. General Electric reported record earnings of over $3 billion for the first quarter of 2001.

The GAO seems to agree that these mature, profitable companies do not need subsidies. In an audit, the GAO noted that clean coal technology spending may not be the most effective use of federal funds. For example, some projects are demonstrating technologies that might have been commercialized without federal assistance.
Any legislation from the House Science Committee authorizing funding for the DOE should phase out wasteful spending on clean coal programs and increase funding for energy efficiency and renewable energy programs. Continued subsidies for the polluting coal industry creates an unfair playing field for clean energy sources. Congress should reauthorize the 588 million in unused clean coal funds to pay for part of the following proposals.

There are clean, affordable energy alternatives. Energy efficiency offers the fastest, cleanest, cheapest solution. Americans today consume 40 percent less energy and thus have 40 percent lower energy bills as a result of smart energy efficiency policies created over the past 25 years.

President Bush's proposed energy budget would cut funding for some energy efficiency and renewable--would cut funding for energy efficiency and renewable energy programs in half. Instead, this Committee should direct the Department of Energy to double funding for energy efficiency between 1998 and 2003.

According to the DOE, 100 square miles of solar panels could meet the annual electricity needs of the United States. Meanwhile, wind energy is now cost competitive with fossil fuel energy in some areas. The Bush Administration cut funding for renewables by nearly 50 percent. Instead, this Committee should direct the DOE to increase funding for
renewable research and development to over $750 million per year.

In conclusion, we believe that the so-called Clean Coal Program is mismanaged and threatens public health and the environment by subsidizing the burning of dirty coal. This Subcommittee should seize the opportunity to end the oxymoronic Clean Coal Program. Thank you.

[Statement of Ms. Abend follows:]

******* INSERT 7 ************
Chairman BARTLETT. Thank you very much, Mr. Mead.
STATEMENT OF JOHN S. MEAD, DIRECTOR, COAL RESEARCH CENTER,
SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE

Mr. MEAD. Thank you, Mr. Chairman. Mr. Chairman, and, members of the Subcommittee, while the future of coal's use is really a national concern, some states have taken a leading role in supporting clean coal research, development, and deployment. Midwestern states, with their high-sulfur coal reserves, have been significant stakeholders since the 1970 Clean Air Act Amendments. These states, particularly Ohio and Illinois, have been frequent participants in U.S. DOE clean coal projects.

In the past year, the State of Illinois has taken dramatic steps to increase the development of new power-generation with a strong emphasis on development and deployment of clean coal technologies. Mr. Chairman, I think I can say that Illinois is very enthusiastic about clean coal technology.

Illinois has been a pioneer in the development of these technologies, dating back to the early 1970s, with the development of the first generation of fluidized bed combustion, the earliest gasification tests, and other technologies designed to help the high-sulfur coal reserves of the state.

That has continued with a partnership with the U.S. Clean Coal Technology Program and with significant state programs
that are—those that have been developed with industry and without federal government support.

This year, the Illinois General Assembly, with the support of Governor Ryan, developed a dramatic new set of coal-enhancement programs, including a total of $3.2 billion of state resources dedicated to the development of new power generation capacity, particularly coal-fired capacity. These incentives include $500 million in potential grants from state funding for new development of projects; $1.7 billion in revenue bond authority to provide loans for the development of new power plants; and $300 million in the development of advanced systems, including alternative technologies, the improvement of the infrastructure of power transmission.

And included in this will be an examination of where it may be appropriate to increase and further strengthen the state's Clean Air Act laws as they are applied to older, existing power plants. And these are power plants that will have higher emission levels than new generation because of the nature of the requirements for new power plants under the Clean Air Act.

Exploratory clean coal research and development with an emphasis on eventual commercial adoption of clean coal technologies, is another hallmark of Illinois' program. Southern Illinois University has been involved in the
development of an exciting new program, based on $25 million
of funding from a major state utility, to develop and
commercialize more advanced coal technologies. We issued our
first request for proposals one year ago and we are very
excited to receive 16 proposals from projects that would
total over $400 million in investment in new power generation
capability. This was a single program developed by a single
state at one of its universities. A very dramatic
development--and I think one that in the recent months has
been amplified in Illinois and throughout the country with a
tremendous increase in the interest in new power generation.

While Illinois is really emphasizing the development of
commercial projects, there is a very significant need for the
continued development, aggressive development, of very
advanced ultra clean coal-fired capacity for this country.
This is still at the level of exploratory research and pilot
scale development. This is an area where a single state or
groups of states interested in coal production and power
generation cannot, on their own, solve these technical
scientific problems. We need the help of the Federal
Government. We need the continued support of the Department
of Energy.

Mr. Kripowicz and Mr. Yamagata talked about the need for
the development of these high-performance, high-efficiency
systems. I agree. I believe that we need increased federal
support for these very advanced technologies that can promise both reduced emissions of global climate-changing gases and of the current criteria pollutants, as well as increased efficiency and better mining methods. Together and integrated, these technologies can provide a truly advanced clean source of energy for our country for the next hundred years. Mr. Chairman, thank you very much.

[Statement of Mr. Mead follows:]

*************** INSERT 6 ***************

Obtained and made public by the Natural Resources Defense Council, May 2002
Chairman BARTLETT. Thank you very much for your testimony. I want to thank all of the witnesses for their testimony. Obviously, some differences of opinion. I hope we will have a chance to explore those. And later on in the hearing, I will invite members of the Panel to pose questions for other members of the Panel because we want a full airing of all of the issues today. And a whole lot more wisdom is represented at the witness table than represented here at the dais. So we will invite you to ask questions of each other later.

I want to note now that we have been joined by my colleague, Ms. Hart, and by our Full Committee Chair. And I would like to yield my first-round questioning time to our Full Committee Chair.

Mr. BOEHLERT. Mr. Chairman, I appreciate the courtesy, but I prefer to take my turn. That is the way we operate in the Full Committee, first come, first serve, and those of you who have been through the entire hearing deserve to have their questions asked first. I will be the clean-up batter.

Chairman BARTLETT. Well, thank you, and I will follow you as clean-up batter then. So let me now turn to Mr. Costello.

Mr. COSTELLO. Mr. Chairman, thank you. Mr. Kripowicz, one is, you have testified, as some of the other members of the Panel have testified, that the Clean Coal Technology Program has worked. How do you see the $2 billion proposal that the
President has submitted to the Congress and to the American
people for a clean coal technology impacting the future of
technology in the area of clean coal?

Mr. KRIPOWICZ. Mr. Costello, I think it builds on what is
already a successful program. You know, since the program was
introduced, several things have happened. One, there have
been tighter environmental controls put in place and there
are perspective environmental controls, for instance, on
mercury that are going to be put in place and in ozone coming
up in the future. These things were not addressed in the
original program.

Secondly, there is a large requirement for power plant
construction that did not occur in the original period of the
Clean Coal Program. Actually, over the past 10 years, there
was only about 10,000 megawatts of coal capacity built in the
United States. And so with the requirement for power we would
expect a large increase in that requirement.

And, thirdly, there is a lot of new technology that is in
the development stage now that was not available in the early
'90s when this program was initiated. So the demonstration of
that technology, which will lead to higher efficiency and
lower pollution from coal plants is what the attempt of the
new Clean Coal Program would be.

Mr. COSTELLO. On page 5 of your testimony, Mr.,
Kripowicz, you indicate the cost benefits of clean coal