injection--carbon dioxide injection for enhanced oil recovery.

Ms. LAZENBY. We are doing that right now.

Mr. VAN KIRK. And we would love to have more CO2 to put into the ground underground for improving the recovery and perhaps sequestering the CO2 underground.

Mr. COSTELLO. Mr. Chairman, I thank you and I thank our witnesses. For the record, I would like to state that our colleague on this Subcommittee, Congresswoman Sheila Jackson Lee, wanted to be here today. She is a member of this Subcommittee, but as most of you probably know, about half of her district is under water. So she is at home trying to help her constituents. But she did call and wanted us to let you know that she is sorry that she could not be with us today.

Mr. Chairman, thank you.

Chairman BARTLETT. Thank you very much. Ms. Lazenby, you mentioned that enhanced recovery could produce 60 billion barrels more oil. Was that just in this country?

Ms. LAZENBY. Yes. There--yes. There are about 350 billion barrels of oil in place that have not been recovered from existing wells. And you--the 60 billion is the percentage that we think is attainable within--with enhanced oil recovery techniques that are either in place now or could be developed with additional research and development. And it has been proven--I think we just heard this morning about a
... project in California, and I have just told about mine—we
can do it. And it is out of existing wells. And, for example,
we are putting CO2 in addition to nitrogen into our wells now
and we have already gotten good response from CO2 and
nitrogen in our wells. So that is one place to put the
nitrogen—I mean, the CO2 also.

So there are a lot of positive benefits to taking the
resource base that exist in existing wells that have already
been drilled, that are already there, that are now producing
approximately—both oil and gas, approximately 1/3 of our oil
and oil equivalent needs in this country. And with just a
little bit of extra R&D we can really keep the—keep a good
source of energy coming.

Chairman BARTLETT. These are big numbers and it is useful
to put them in perspective so that you can get some idea of
what they mean. In terms of oil consumption, at present use
rates, and we ought to preface every statement relative to
use at present use rates, because use rates are going up
and—but at present use rates, that is about a 2 years'
supply for this country. And so that is a meaningful amount
of oil.

Mr. VAN KIRK. Mr. Chairman—

Chairman BARTLETT. Some of you mentioned the
petrochemical industry. Mr. Cuneo, you mentioned that, and,
Dr. Van Kirk, you mentioned that also.
Mr. VAN KIRK. I think you might have misquoted some numbers. If you are talking about 60 billion.

Chairman BARTLETT. Yeah. That is about a 2 years' supply.

Mr. VAN KIRK. No. We consume about 2 billion in crude oil per year--or we produce about 2 billion barrels per year--we produce. We consume--

Chairman BARTLETT. Oh. I am talking about our consumption.

Mr. VAN KIRK. We consume--

Chairman BARTLETT. We consume about 20 million barrels a day; the world about 80. If you multiply that by roughly 400 days in a year, you are somewhere in the neighborhood of 30 billion barrels a year and 60 billion--

Ms. LAZENBY. He means for the country.

Chairman BARTLETT. Oh. Okay. You are right. But that is world supply.

Ms. LAZENBY. World supply. Right.

Chairman BARTLETT. Yeah. We are a fourth--that is 8 years for us and--

Mr. VAN KIRK. Right.

Chairman BARTLETT. Thank you for correcting.

Mr. VAN KIRK. You are welcome.

Chairman BARTLETT. That is 8 years for us and 2 years for the world. Thank you.

Mr. VAN KIRK. You are welcome.
Chairman BARTLETT. Okay. Thank you. Thank you. Two of you mentioned petrochemical industry. I think there is too little appreciation of how important oil and natural gas are in this petrochemical industry, which is very large, as you have pointed out. We live in a plastic world. Our clothes, our automobiles, much of our automobiles, the television in front of you there, the plastic cups here, the containers for the water, the laminate on top of the desk here--these are all made from oil. What will we do when natural gas and oil are in really short supply, essentially gone? Could we make these things from agricultural products? Mr. Cuneo.

Mr. CUNEIO. I would like to respond that, Mr. Chairman.

There is technology today to make all of the products from what we call syn-gas, which is a mixture of carbon monoxide and hydrogen. Syn-gas can be made from coal. And, in fact, coal gasification does that before it converts it to electrical generation. That technology of being able to make these building blocks is commercial today. We have been producing detergents from syn-gas for years. We have been producing other components from syn-gas. So what we really need is--it is more expensive, obviously, in terms of total capital and operating costs to do it that way versus using the building blocks which occur in petroleum. But the technology is available today to continue to produce our chemical building blocks through the syn-gas and...
Fisher-Tropsch type technology.

Chairman BARTLETT. Another byproduct--another product made from this is nitrogen fertilizer. Today, essentially all of the nitrogen fertilizer is made from natural gas. Before we learn how to mimic what nature does in a summer thunderstorm, we got our nitrogen fertilizer from the barnyard or from guano, from bat caves and islands where birds have nested for thousands of years. So the food we eat is, in a very real sense, petroleum and gas that powered the farm machinery that produced it and produced the nitrogen fertilizer. And, by the way, without nitrogen fertilizer, productivity of food and fiber would be drastically, drastically reduced. In a very real sense, natural gas, particularly, and oil, secondarily, aren't they really too good to burn?

Mr. CUNEO. In many ways that is true. On the other hand, there is nothing that provides the economic transportation fuel for the country with the mobility that people want, especially in vehicle systems, than petroleum. It is the most cost-effective out there today. And when you look at the overall theme that I think this Panel and the previous Panel had, this country needs a good mix of energy sources, including things like coal for stationary power generation. We have a large installed capital base in the power plant. But just imagine trying to translate that to petroleum fuels...
Chairman BARTLETT. Let me ask the Panel a question. Is there general agreement--we had a hearing several weeks ago on the available fossil fuel resources in the world. And there was general consensus that there is about a thousand giga-barrels of oil remaining in the world. That maybe if you are wildly optimistic about recovery that you might get almost that much more by recovery. But that thousand giga-barrels is not forever. That translates to roughly 30 years of use at present use rates. And if you factor in increased use rates, maybe that which we will find, maybe the enhanced recovery will give us enough to make up for the increased use rates.

The point I am trying to make is that we should--and I am trying to think of an analogy that really explains it. It is true that these fossil fuels are very cheap today. But those that are of high quality, gas, particularly, and oil; there is roughly 30 years remaining in the world. Just because they are cheap today, does that mean we should use them all today and let our kids and our grandkids worry about tomorrow? Certainly, they are cheap. But this is a finite resource that we need to husband and I don't see us addressing that consideration hardly at all in our energy policy.

A better way of looking at the energy policy is that it is a giant hide-and-go-seek game. That God knew how
profligate we would be in the use of fossil fuels, so he hid
a very large amount out there and our only challenge is to go
find where he hid it. I think that a rational national energy
policy needs to reflect the fact that these high-quality,
readily available, cheap fossil fuels are not going to be
there forever and we need to consider that in our national
policy. Do you agree?

Mr. VAN KIRK. Certainly, it has to be—certainly, it has
to be considered and forecasts have to be made naturally.
And, certainly, we don’t want to leave our children and
grandchildren to suffer because of what we have done and
wasted. Excuse me. But as was mentioned a few minutes ago,
hydrocarbons—we humans have a lot of hydrocarbons in our
bodies. Coal, oil, gas, trees, plants, animals—it is a very
common substance on earth. And scientifically, we can
make—we can convert one to the other and back and forth in
the laboratory and in the field. Most of these
transformations are not profitable and they are not useful.
But some time in the future it may be that the price of a
particular resource might be such that competition from other
possibilities becomes profitable and reasonable and takes
over. I see oil and gas being produced for another few
hundred years, but not to fuel transportation. Something else
will fuel transportation and we will enjoy oil and gas to
make medicines and plastics, artificial things, synthetic
things, as we have talked about earlier today.

Chairman BARTLETT. But at the rate of their consumption today, we need to have a policy which husbands them or they won't be available for the next 20 or 300 years as a feed stock for the industries that mentioned.

Mr. VAN KIRK. I think the policy needs to be balance and forecasting realistic futures.

Chairman BARTLETT. How good a job are we doing at using byproducts? The better we do of using byproducts, the lower the cost of the ultimate fuel will be and the kinder we will be to our environment. Do we have an aggressive program to develop uses for these byproducts?

Mr. HUFFMAN. I guess I will try and speak to that, Mr. Chairman. Our company, for example, has developed a carbon fiber technology that uses what we call the bottom of the barrel, the pitch that comes out of the refining process. And many other companies are pursuing similar technologies that will use the parts of the barrel of oil that in the past have considered debris or waste. We are seeing, as was mentioned earlier, gas-to-liquids technology, which allows us to actually separate in the Fisher-Tropsch process some of the impurities and byproducts and separate them into quantities that can be sold and delivered to markets.

So we are seeing the industry move in the direction of modifying the hydrocarbon molecule and utilizing all the
parts of that molecule as efficiently as possible. And I think we will continue to see that trend in the next 20 or 30 years, hopefully to the point where we are not burning gasoline in cars anymore and we are seeing other types of fuels that are by products of the hydrocarbon molecule. And we are using the carbon for certain things, such as carbon fibers, and composite materials. And I think that would be a very wise use in the long term.

The challenge we face, as you pointed out in the first Panel, is, how do you make that transformation quickly without disrupting the economy. And I think that is the balance that we have to keep in making those kind of transformations, working with government and industry together.

Chairman BARTLETT. Mr. Huffman, I would like to comment briefly on your suggestion for the USE Center, the U.S. Energy Center. We have been concentrating here in these two hearings this morning--these two Panels this morning, on the availability internationally of gas and oil and somewhat on the availability here in this country. I would like to point to another dimension that makes your U.S. Energy Center even more needed. We have 2 percent of the known reserves of oil in the world. We consume 25 percent of the world's oil. This is clearly a prescription for disaster. At the time of the Arab Oil Embargo when we, in effect, went screaming into the
night because of the problems that we were facing. We imported 35 percent of our oil. Today, we import 56 or more percent of our oil. From a national security viewpoint, we desperately need the kind of a center that you point to.

And freeing ourselves from our dependence on these high-quality fossil fuels, gas and oil, isn't just an economic consideration. It is a national security consideration. We cannot afford to be held hostage by the rest of the world because we produce so little of the oil that we use in this country. With only 2 percent of the known reserves in this country, we clearly face a very uncertain energy future. And I would concur with you that we need the equivalent of the national effort that we put into putting a man on the moon.

By the way, there are 200-and-some industries in Maryland alone that wouldn't be there if it weren't for the spin-off that came to that. No longer does government push the envelope. We now are buying most of the stuff we put in our space and our military equipment, we are buying it what we call COTS, commercial-off-the-shelf. And I would like to see an effort equivalent to putting a man on the moon to do something about energy. We face a very uncertain energy future worldwide. And particularly in this country, with having only 2 percent of the known reserves of oil, we face a very, very uncertain energy future that impacts our national
security. And I think that should be reason enough to justify a center of that magnitude.

Let me recognize my colleague if he has additional questions or comments.

Mr. COSTELLO: Mr. Chairman, I do not. I thank the witnesses for being here today and I thank you for calling the hearing.

Chairman BARTLETT. I want to thank the witnesses. Thank you very much for your testimony. This has been a productive hearing, I think. And we will now be in adjournment.

[Whereupon, at 12:55 p.m., the Subcommittee was adjourned.]
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*Obtained and made public by the Natural Resources Defense Council, May 2002*
STATEMENT OF ROBERT S. KRIPOWICZ, ACTING ASSISTANT SECRETARY
FOR FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY

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STATEMENT OF BEN YAMAGATA, EXECUTIVE DIRECTOR, COAL
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SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE

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STATEMENT OF VIRGINIA B. LAZENBY, CHAIRMAN AND CEO, BRETAGNE,
GP, NASHVILLE, TENNESSEE, ON BEHALF OF THE INDEPENDENT
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STATEMENT OF PAUL CUNEO, VICE PRESIDENT AND CHIEF INFORMATION
OFFICER, EQUIVA SERVICES, LLC, HOUSTON, TEXAS, ON BEHALF OF
THE AMERICAN PETROLEUM INSTITUTE
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