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SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES HOLDS A HEARING ON ENERGY DEPARTMENT BUDGET ENERGY DEPARTMENT BUDGET

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SPEAKERS: SEN. JEFF BINGAMAN, D-N.M. CHAIRMAN SEN. RON WYDEN, D-ORE. SEN. TIM JOHNSON, D-S.D. SEN. MARY L. LANDRIEU, D-LA. SEN. MARIA CANTWELL, D-WASH. SEN. DEBBIE STABENOW, D-MICH. SEN. JEANNE SHAHEEN, D-N.H. SEN. MARK UDALL, D-COLO. SEN. AL FRANKEN, D-MINN. SEN. JOE MANCHIN III, D-W.VA. SEN. CHRIS COONS, D-DEL.

SEN. BERNARD SANDERS, I-VT.

SEN. LISA MURKOWSKI, R-ALASKA RANKING MEMBER SEN. JOHN BARRASSO, R-WYO. SEN. JIM RISCH, R-IDAHO SEN. DAN COATS, R-IND. SEN. MIKE LEE, R-UTAH SEN. RAND PAUL, R-KY. SEN. BOB CORKER, R-TENN. SEN. JOHN HOEVEN, R-N.D. SEN. ROB PORTMAN, R-OHIO SEN. DEAN HELLER, R-NEV.

WITNESS: SECRETARY OF ENERGY STEVEN CHU

[*] BINGAMAN: OK. Why don't we get started?

I thank you all for coming.

Today we have an oversight hearing to examine the president's proposed Department of Energy budget for fiscal year 2013.

We welcome Secretary Chu to testify and present the administration's budget to us today.

The priorities laid out in the president's proposed budget reflect a strong commitment to clean energy and the increased security and economic benefits that "Made in America" energy can achieve for us through American innovation and -- as well as manufacturing. In an overall budget request that seeks to provide substantial government-wide deficit reduction, I'm pleased to see that we have a proposed 3.2 percent increase in the Department of Energy budget. This is an investment in the nation's energy future that will boost our economic growth and global competitiveness and protect the environment and allow the U.S. to continue important nuclear nonproliferation work.

Informed by the Quadrennial Technology Review which we had a hearing on a couple of months ago, the Department of Energy's budget request cuts funding in mature technology areas and provides increased resources for the most promising clean energy innovations. This is an important step toward a national energy policy that invests in critical energy priorities within a framework of a sustainable fiscal policy.

The Department of Energy's budget for the committee today supports a range of cutting-edge technologies that will enable us to lead in the global race for clean energy. Increased investment in high performance computing and basic science will increase understanding and spur new energy technology development, continued investments at ARPA-E will support high-risk transformational energy projects, helping them to mature and attract non-governmental funding.

Support for solar and wind and geothermal and biomass energy will further develop our portfolio of available energy sources and enable a transition to cleaner technologies. And meanwhile, funding for research on carbon capture and sequestration and methane gas hydrates and minimization of the impact of shale gas development will allow us to use fossil fuel resources in a responsible way.

This budget also provides funding to address critical grid modernization issues through a new electricity systems innovation hub and significant funding increases for advanced energy-efficient manufacturing. This holds a promise of providing jobs for the future.

It's important to recognize that the research and development programs that I've mentioned here cannot fully meet the challenges of bringing new energy technologies to the commercial marketplace. The capital

requirements to move promising technologies from the lab bench to pilot scale and, finally, to commercial scale are enormous.

Our overseas competitors have figured this out. They are moving aggressively to gain an edge in clean energy technology, as much of our effort to support domestic players in this race has occurred through the loan guarantee program. That's a proposal that Senator Domenici and I jointly made as part of the 2005 Energy Policy Act.

At its core, the loan guarantee program is intended to allow the government in the case of new technology development and deployment to take on risks that the private investor cannot. Mr. Herb Allison has just published a useful report with some recommendations for managing the program going forward. And many of us are -- many of these are similar to approaches that Senator Murkowski and I have incorporated into the Clean Energy Deployment legislation, the CEDA legislation that we've reported from the committee.

We'll be having a hearing on this report by Mr. Allison when we return after this next week's recess. I will have some questions for the secretary about his -- about the Allison report and the state of the loan guarantee program when we get to questions.

Again, thank you, Mr. Secretary, for coming. We look forward to your testimony.

Let me also just mention before calling on Senator Murkowski, I appreciate the technical assistance that your staff and the folks at the Energy Information Administration and other parts of DOE have provided in helping us develop the proposal for a clean energy standard that I hope we can introduce this legislation in a couple of weeks. The modeling and analysis that has been done in your department has been very helpful in helping us develop that bill.

So let me call on Senator Murkowski for her opening statements.

MURKOWSKI: Thank you, Mr. Chairman. And Mr. Secretary, good morning. Welcome, too. Thank you for being here before the committee to speak to the budget as it relates to the Department of Energy.

I was disappointed with the administration's overall request for fiscal year 2013. I think we all hoped and I certainly expected that the president would lead the way by presenting a good plan to reduce our debt, grow our economy. I think it was an opportunity to address the entitlement issue, reform the tax code, make swift progress in balancing the federal budget, or at least moving in that right direction. But instead, we have a document that I believe largely ignores the greatest threat to our economy, and that's the more than \$15 trillion debt that led the United States' First-ever credit to downgrade last summer.

Last year's budget request lamented the special interest loopholes that riddle our tax code, but this year proposes even more. It describes an economy built to last, and yet is filled with proposals that have virtually no chance of passage.

And unfortunately, I look at the energy budget and I think that this is clear within the energy policy as well. I can understand and certainly support many of the proposals that are within the DOE budget. I greatly appreciate the emphasis on science and research. I think that that is key.

More money for geothermal research, I believe, is a good thing and emphasis on drop-in biofuels clearly a worthy endeavor. But I have some heartburn with the decision to reduce the funding for renewable water power. This is an issue that I hope we can discuss in the questions and answers after this.

R&D efforts that could help unlock massive volumes of unconventional resources are again zeroed out. And I'm also concerned by many of the big-ticket expenses that are either directly or indirectly tied to this budget.

We've got new and renewed tax credits as an extension of the 1603 program. We've got a billion-dollar vehicle deployment program, a \$5 billion for advanced manufacturing, \$6 billion for Home Star efficiency programs.

And I clearly understand why people would want to fund all of those, and I certainly have shown my support in many of these areas. But given the state of the federal budget, where we are, I would stress that now is a time to differentiate between those things that we might want to fund and those things that we need to fund.

And while DOE's discretionary budget just grows by just over 3 percent in this request, adding all of the programs and the subsidies that are included in the broader budget is going to nearly double our spending on energy. And that concerns me.

I'm willing to support more spending in this area, but only if the revenues are derived from new and not existing production. But that's another problem with the budget. It reignites a fight that the administration has

waged and overwhelmingly lost, I might say, for the past three years. Instead of talking steps to extract new domestic energy from our tremendous resource base, the administration has decided to again try to extract \$40 billion from the consumers of oil and gas and coal, regardless of the consequences that they could have for our energy supply, our economy and our security.

The president, in his State of the Union, called for an all-of-the-above approach to energy policy. I think that certainly is something that I have embraced and I think most of our colleagues here. But I'm just not seeing that play out within the budget, and it causes me to wonder whether the budget planners were working together with the president when he enunciated those words in his speech. I would like to see us get to that point.

I, again, appreciate you, Secretary Chu. I think you do try to make a very concerted effort in a difficult area during difficult times.

So thank you for being here. I look forward to your responses to some of these very critical issues.

Thank you, Mr. Chairman.

BINGAMAN: Secretary Chu, why don't you take as much time as you would like to describe the budget and any other points you want to make.

CHU: OK. Thank you, Chairman Bingaman.

And also, thank you, Ranking Member Murkowski and members of the committee.

Thank you for the opportunity to discuss the FY13 -- the president's FY13 budget request for the Department of Energy.

I want to first begin by thanking Senator Bingaman for his years of leadership.

It's been a privilege to work with you, and I look forward to continuing our work together this year.

To promote economic growth and strengthen national security, President Obama has called for an all-of-the-above strategy that develops every source of American energy. The president wants to fuel our economy with domestic resources, while increasing our ability to compete in the clean energy race.

Although the United States has reclaimed the title of world leader in clean energy investments, we're at risk of falling behind again unless we support our domestic clean energy economy. Our country faces a stark choice. We can create jobs making and exporting the energy technologies of tomorrow, or we can see the leadership to other countries that are investing in these industries. As President Obama has said, passing a clean energy standard is a vital step that Congress can take to broaden our clean energy market. Making the most of America's energy resources is a pillar of the president's economic blueprint to build an economy that lasts.

The department FY-'13 budget requests \$27.2 billion is guided by the president's vision, our 2011 strategic plan, and our inaugural Quadrennial Technology Review. It supports leadership in clean energy technologies, science and innovation, and nuclear security and environmental cleanup.

Trillions of dollars will be invested in clean energy in the coming decades. To seize this opportunity, the budget requests invests in the research, development, manufacturing and deployment of energy technologies.

Decades ago, the Energy Department support helped develop the technologies that have allowed us to tap into America's abundant shale gas resources. Today, our investments can help advance technologies that will unlock the promise of renewable energy and energy efficiency.

The budget requests invests of approximately \$4 billion in our energy programs. It advances progress in areas from solar to offshore wind, to carbon capture utilization and storage, to smart grid technologies. And it helps reduce our dependence on imported oil by developing next-generation biofuels, advanced batteries, and fuel-efficient vehicle technologies.

The budget request invests \$770 million in the nuclear energy program to help develop the next generation of nuclear-powered technologies, including small modular reactors. It includes funding for the continued nuclear waste R&D, which aligns with the recommendations of the Blue Ribbon Commission on America's Nuclear Future.

As we move to a sustainable energy future, America's fossil fuel energy resources will continue to play an important role in our energy mix. The budget requests include \$12 million grant -- \$12 million as part of a \$45

million priority research and development initiative by the Departments of Energy, Interior and EPA to understand and minimize the potential environmental, health and safety impacts of natural gas development through hydraulic fracking. The budget also promotes energy efficiency to help Americans save money by saving energy, and it sponsors R&D on industrial materials and processes to help American manufacturers cut costs and compete.

To maximize our energy technology efforts, the department is coordinating research and development across our basic and applied research programs, as well as ARPA-E, in areas including batteries, biofuels and electric grid technologies. To encourage manufacturing and deployment of clean energy technologies, the president has called for extending proven tax incentives including the production tax credit, the 1603 program, and the advanced energy manufacturing tax credit. As industry, Congress and the American people make critical energy decisions, it's also important that we adequately fund the Energy Information Administration. Competing in the new energy economy will require our country to use all our resource including American ingenuity.

To help the United States at the forefront of science and technology, the budget includes \$5 billion for the Office of Science to support basic research that could lead to new discoveries and help solve energy challenges. These funds support progress in material science, basic energy science, advance computing, and more.

The budget request continues to support Energy Frontier Research Centers which aim to solve specific scientific problems to unlock new clean energy development. So far, these research centers have published more than 1,000 peer-reviewed papers and filed more than 90 patent applications, or patent invention disclosures.

It also supports the five existing energy innovation hubs and proposes a new hub in electricity systems. Through the hubs, we're bringing together our nation's top scientists and engineers to achieve game-changing energy goals.

Additionally, the budget requests include \$350 million for ARPA-E to support research projects that could fundamentally transform the way we use and produce energy. ARPA-E invests in high-risk, high- reward research projects that, if successful, could create the foundation for entirely new industries.

In addition to strengthening our economy, the budget request strengthens our security by providing \$11.5 billion for the National Nuclear Security Administration. As the United States begins the nuclear arms reduction required by the new START Treaty, the science, technology and engineering capabilities within the nuclear securities enterprise will become even more important in sustaining the U.S. nuclear deterrent.

That's why the budget request includes \$7.6 billion for weapons activities. It also includes \$1.1 billion for the naval nuclear program.

Additionally, it supports NSA's work to prevent nuclear terrorism, one of President Obama's top priorities. It includes \$2.5 billion to implement key nuclear security, nonproliferation and arms control activities.

Finally, the budget request includes \$5.7 billion to continue progress cleaning up the nation's Cold War nuclear sites.

The budget request makes strategic investments to promote prosperity and security. At the same time, we recognize the country's fiscal challenges and are cutting back where we can. We're committed to performing our work efficiently and effectively.

In countries -- countries in Europe, Asia and throughout the Western Hemisphere recognize the energy opportunity and are moving aggressively to lead. This is a race we can win, but we must act with fierce urgency.

So thank you, and I'll be pleased to answer your questions.

BINGAMAN: Thank you very much, Mr. Secretary.

And let me start with five minutes of questions. I'm sure all members will have questions.

I gather from the news that you, yesterday, were visiting the two new nuclear power plants that have been licensed in Georgia -- and my understanding is that the loan guarantee program was, to some extent, involved in the development of those two plants. I guess I would be interested in getting your perspective -- I know we've had lots of hearings in Congress on Solyndra and the lost taxpayer dollars there.

Looking at the loan guarantee program overall, is it important for the country to maintain a loan guarantee program to assist with development and deployment of new technologies in the energy area? And if so, how do you propose -- in this budget, how does the administration propose that we move forward with that?

CHU: Well, first, Senator, let me say that if you look at the loan guarantee program, the 1703, the 1705, the ATVM parts of the loan program, overall it helped unleash about \$40 billion of investment in these industries in projects like the two new nuclear reactors that are being built in Vogtle. It invested -- it helped Ford do a major retooling to build cars that, despite at the Detroit Auto Show several months ago, really revolutionary, wonderful cars that could be sold worldwide.

There are many, many aspects of this loan program which have really helped bring back a lot of what we were famous for a century. It's helped stimulate the deployment of many renewable energies. So the list goes on.

Now, that loan program, the 1703 loan program, is continuing. The ATVM program is continuing. We still think those are worthy projects.

Going forward, there -- we do see a need as part of an overall plan to finance projects -- projects, for example, where you have a solid technology, like onshore wind technology is very solid, a known technology, a way of financing it so that one can deploy these with power purchase agreements, low risk. There are other -- so that's one part.

There are other parts I think that really could help drive it forward.

Bloomberg New Energy Finance just completed a study about a month ago summarizing what happened in 2011 and projections for 2012. They said if -- and they looked at all forms of energy: new gas turbines, coal, wind, solar, all the way down the line. And they said if you have 10 percent finance, borrowing charges, for all these forms of energy, wind today -- and this is wind on a site that's a four site, not a six site, so it's a moderate site -- within 10 percent or 15 percent of the cost of the loss form of energy today, which is new gas, and we expect that to improve still further. And so we also expect solar to be coming down.

So this is all good news, but you need a financing mechanism. Even at 6 percent, 8 percent, 10 percent, that would really tip the balance.

BINGAMAN: Do you know -- let me ask on a somewhat different issue, we had a very good hearing where the Quadrennial Technology Review was presented to us, and this was the first of these Quadrennial Technology Reviews. To what extent was that -- were the conclusions in that Quadrennial Technology Review used to influence what you've presented to us in this budget? Does this budget reflect the same priorities that the Quadrennial Technology Review identified?

CHU: Well, to a large extent, yes. I think the Quadrennial Technology Review, the first one in the history of the Department of Energy, we wanted to step back and said -- and say a slightly different question than, what are the things we should be funding, but what are the things we should be funding where the taxpayer dollars will do the most good? And if we find that there are certain areas that the private sector is well invested in, we have to say, well, we really shouldn't fund that. They've taking the ball, they're running with it.

This is good. We did this with research in shale gas in 1978, in '92. The industry didn't want to touch it. They didn't think it was feasible, horizontal drilling or fracturing the rock.

Schlumberger got into it. We got out of it. And industry picked it up.

So that's the attitude we have in doing this, that, where could we put our dollars that would actually stimulate the research and the development to a point where the private sector starts to run with it and grow American industries? So that Quadrennial Energy (sic) Review -- Technology Review -- was very useful in helping us find out by pulling back and looking across all of our funding arms of Energy, Office of Science, and now ARPA-E, are we putting the dollars where we think they can do the most good. And so that is beginning to shape, and we hope as it goes on further, that just like the Quadrennial Reviews of the Pentagon and State, actually start to set in long-term plans that can help our country.

Energy investments are 60, 70-year investments. They can't be decided year to year to year. When you build -- you build a new gas plant, a transmission line, you name it, these are long-term investments.

BINGAMAN: Thank you very much.

Senator Murkowski?

MURKOWSKI: Thank you, Mr. Chairman.

Secretary, the chairman has asked you some questions about the loan guarantee program, and I appreciate the fact that we will be having a hearing when we return from the recess. I am one who believes that there is a

useful role to be played in the financing and the deployment of our advanced energy technologies, and the loan guarantee program can be helpful. But we need to make sure that we get it right.

So the question that I would ask you this morning, we can certainly work around your schedules, but will you make yourself available to come testify at the hearing when we are -- when we're able to schedule one?

CHU: There's several hearings on the -- there's going to be one in the House, I guess one in the Senate. I think, you know, if this committee wishes me to appear, I will appear.

MURKOWSKI: I would think it would be helpful and I would certainly welcome you there.

Let me ask you about hydropower. I mentioned that in my opening statement.

This is one of those areas when we're talking about renewable resources. I certainly classify hydropower as a renewable resource, and want to work to make sure that that is clear in our policies here.

But funding for hydropower is down 66 percent at the same time that all the other renewable accounts are slated for an increase. Both you and the president have made statements supporting the growth of hydropower here in this country, but it really appears to me that we're leaving hydropower behind in this budget.

Can you address that?

CHU: Well, I would divide hydropower into -- first, we have to make really tough decisions. And the thinking behind hydropower is the following.

First, we don't anticipate any new large dams being built, but there is potential for hydropower in the United States of two forms. One is what I would call run-of-the-river generation, which we think is environmentally compatible. Also, turbines on existing dams built for flood control where we don't have turbines.

Where it's economically feasible, we think that's also a potential. But those are areas which are very mature technologies. And so, again, based on the philosophy, should we invest -- we've diverted wind research from onshore wind to offshore, which is not as a mature a technology. So that's one class.

The other class of hydropower is essentially what I would call kinetic devices, hydropower that tries to extract energy from wave motion, tidal motions, things of that nature. We have a program that we are invested in, we will continue to invest in it, but we feel in these severe marine environments, while we will continue to invest in it, we don't see in the near term, in the next five or 10 years, these things taking off. We hope they do. And if it really looks like some of these hydropower attempts do look more promising, we will respond. But that's the thinking we were going through.

MURKOWSKI: Well, I think the concern is, is that the funding is pretty anemic it not only the conventional, but in the marine and hydrokinetic technologies as well. And this is something I know Senator Wyden and I have had an opportunity to be in discussion about, some of that.

Let me ask you in my remaining time about a budget increase, a \$2 million increase in natural gas technologies R&D. And it's my understanding that this effort would fund an initiative with EPA and USGS to look at the impacts of fracking.

And we had -- the advisory committee -- the president's advisory committee came, reported to us, had a pretty comprehensive, I felt, report. They presented 20 specific recommendations for how any impacts can be mitigated.

So I guess the question to you is, what was the flaw in that advisory committee's report and recommendations that you felt were insignificant and now warrant a second investigation that we need to increase the funding? It's my understanding that the advisory board's recommendations are already finalized. Most of their proposed directives actually fall on the states, not necessarily on the federal side.

So why are we doing a second run on this? It raises some concern by some that there's an effort to try to find a smoking gun about some bad news about fracking out there, and that's why we're going to do a second investigation. So I'm curious as to why this funding increase in this area.

CHU: Well, Senator, it's actually the exact opposite. I think the committee you're referring to is the Subcommittee of the Secretary of Energy Advisory Board...

MURKOWSKI: Right.

CHU: ... led by John Deutch.

MURKOWSKI: Right.

CHU: It's our view in the Department of Energy -- first, I think that was an excellent report.

Secondly, it's our view in the Department of Energy that if you look at the assets of the U.S. government, particularly thinking of USGS and the Department of Energy, and the intent is, can we help drive the technology development forward to help with the environmentally responsible fracking so that the risks -- you can still continue to mitigate any potential risks to water tables and environmental impacts? And so the tenor of that report and the attitude we have in the Department of Energy is exactly that, that in helping with the technology, there are rapid advances in seismic technologies that tell companies exactly what is happening in fracking, there's a lot of recommendations.

We can have a coordinating role to help as information clearinghouses so that industries can share best practices with each other. So the intent is -- of that fund was not another study to look around, the intent is, as we helped BP stop an oil leak in the Gulf of Mexico, we -- the intent is actually to work with industry, to help improve practices when and if possible so that we can actually extract this resource in an environmentally responsible way.

MURKOWSKI: Well, I'll follow up with you. My time has expired.

My concern is, it does appear that we're directing an additional \$2 million for yet a follow-on study to one that you have agreed and I would agree was a pretty good study.

Thank you, Mr. Chairman.

BINGAMAN: Senator Wyden?

WYDEN: Thank you, Mr. Chairman.

Welcome, Dr. Chu.

And I wanted to ask you first about natural gas pricing, particularly with respect to American business and American consumers.

Now, I've been a supporter of natural gas. It's a cleaner fossil fuel, of course, and potentially a huge boon for American business, steel, plastic, chemicals, and of course our consumers.

I do believe that there are substantial questions that have to be addressed before our country starts allowing significant natural gas exports. And you made some statements a few days ago that are troubling to me, and I want to kind of walk you through it.

As you know, under the Natural Gas Act, your department has an obligation to evaluate whether natural gas exports are in the public interest. So you are, in effect, the regulator.

The comments that you made the other day suggest to me that you've sort of made up your mind. You were quoted here as saying -- and I'll just quote you here, "Exporting natural gas means wealth comes into the United States."

Now, that's not what we've heard from our businesses like steel and chemical and plastics. They had representatives sitting where you did the other day. And a very troubling study just came out from the Energy Information Administration, a part of your department, indicating that natural gas exports could increase prices by more than 50 percent and cost American industry and our natural gas customers as much as \$43 billion.

Now, I'm looking at the chart that estimates, for example, what we would be dealing with in terms of the applications on offer now. It's about 13 billion cubic feet of gas exported per day. That's what we're talking about now. So the applications exceed the amount that EIA made that study based on. They looked at about 12 billion cubic feet per day.

So I want to get your sense of how you're going to objectively look at this question, and I'd like you to disabuse me of the theory that you've already made up your mind, because when I looked at that quote coming from the recent meeting, I said, "Shoot, it looks like Dr. Chu has already made up his mind." And to me, for example, 13 billion cubic feet of gas exported per day, when 12 billion could raise prices 54 percent, that would be a huge shock to the American economy.

So tell me how you're going to approach this issue. And particularly, give us a sense of how you're going to approach it objectively and look at both sides.

CHU: Sure.

So I think the full quote -- I'm going to paraphrase myself, because I've said this a couple times. The full quote is that, certainly, we don't want to see natural gas prices rise dramatically as we have seen in the price, because that has an appalling effect. It creates great difficulties for -- for businesses, for people who heat their homes with natural gas.

And so -- and I said that a major focus on everybody's mind is, if we start to export natural gas, liquefied natural gas, if not done right, that could have that effect. I said, but there's another side, because whatever we decide, it has to be in the best public interest.

And there's a flip side to this that we also have to consider, that it does create American jobs. And if the prices are kept moderate, then it does bring money into the United States. It helps our balance of trade. It creates jobs.

Right now the natural gas prices -- I don't know what they are today, but over the last week or so, they were \$2.00, \$2.50, a million cubic feet, (inaudible) low. Usually, you know, EPA (sic) -- EIA is saying something in the order of \$4 to \$6 in the coming decade or two.

And we're hearing reports of gas extraction companies now pulling their rigs out, moving them, because the prices are too low. And so -- so what we need to do -- so, first, let me assure you, my mind isn't made up. And if you read the full quote...

WYDEN: I did, Mr. Secretary. There doesn't appear to be anything in the article with respect to what you've said, like the public interest test. It makes it out that exporting natural gas is an unmitigated plus. It says, and I quote...

CHU: Well...

WYDEN: ... "Supporting natural gas means wealth comes into the United States." That's your quote on the subject.

CHU: OK. Then the article you're reading from certainly doesn't capture the full quotation.

WYDEN: Fair enough. Fair enough.

CHU: OK? And so I think -- so, certainly, our minds are not made up.

WYDEN: Good.

CHU: We are not going to be making up our minds, because before we do anything to any -- first, let me just very quickly say that there are two classes of countries, countries we have free trade agreements with, countries we don't.

The countries we have free trade agreement with, we're obligated by law to say yes. But the countries we don't have free trade agreements, we have to say, what's in the best interest of the United States?

And before we do anything -- and I talked to people who are concerned about high gas prices. I also talked to the gas industry. I talked to many people and say we are not going to do anything until we make a determination of what the impacts would be as we permit -- we permitted one liquefied natural gas terminal. We determined that that would have a de minimis impact. And before...

WYDEN: Ten percent.

CHU: Well, my -- we can get back to you on the details, but I was told by the EIA that that would have a very, very small impact on the price of natural gas in the United States.

WYDEN: Thank you, Mr. Chairman.

BINGAMAN: Thank you.

Senator Barrasso?

BARRASSO: Thank you very much, Mr. Chairman.

Mr. Secretary, thank you for being here.

We sat close to each other at the State of the Union, and during that address, I was happy to hear the president say, quote, "This country needs an all-out, all-of-the-above energy strategy that develops every available source of American energy."

I'm encouraged to hear you echo those comments today in your testimony. But unfortunately, the president's rhetoric rarely matches the reality.

And Monday, Congress learned the lesson once again, of course, with the president's fiscal year 2013 budget. Specifically, the tens of billions of dollars in new taxes and fees on American energy, oil and natural gas.

You know, it's hard to understand how the president can impose tens of billions of dollars in new taxes on American energy and still pursue the, quote, "all-out, all-of-the-above strategy that develops every available source of American energy." I know the American people realize that doesn't make sense.

We all support renewable energy. What I see though is this president and this administration ignoring the everyday concerns of American families.

Today, the average price of regular unleaded gasoline is over \$3.50 a gallon. "USA Today," the morning after the Super Bowl, "Chaotic Spring Predicted for Gas. Average price likely to hit over \$4.00 a gallon."

This morning's "Wall Street Journal," front page, "Oil Rise Impairs Budding Recovery."

It goes on to say that the average price of a gallon of regular gasoline has jumped 13 cents to \$3.51 a gallon in the past month, so up 13 cents in the last month. Some parts of the country have seen bigger increases, prices approaching \$4.00 a gallon in parts of California.

And then the impact to the families. "Higher prices at the pump force consumers to cut back spending on discretionary items like restaurant meals, haircuts, family vacations, hurting those industries. A prolonged increase can drive up inflation and drive down hiring."

We're trying to get people back to work in this country. It just seems if we're going to try to get the economy going again, we need affordable transportation fuel.

We do know that the president, when he was running for office, said under his energy -- under his policies, specifically electricity costs, he said, quote, "would necessarily skyrocket." People have seen that.

So that's why I'm hoping that the Congress has a chance to vote on and then reject the president's budget.

So I come with a number of questions. And one is in terms of how the policies of this administration are played out.

So I'd like to ask you about Solyndra.

President Obama promised his administration, as he said, would be the most transparent in history. The American people still haven't received all the answers on how their taxpayer dollars were wasted on projects like Solyndra.

So I know that tomorrow, my colleagues in the House are going to consider whether to subpoena five administration officials. It's my understanding that these House colleagues will cancel that meeting and that vote if the White House just makes these officials available to speak with the investigators.

Have you asked you the White House to make the officials available?

CHU: No, I haven't. I wasn't asked to ask.

BARRASSO: OK. Will you ask the White House to make these officials available? Because I'm asking you now.

CHU: I think the White House can make that decision. They're very capable of that.

BARRASSO: The American people still have lots of unanswered questions. And so you're not asking the White House and have not asked the White House to make those officials available, just so I'm clear?

CHU: Well, I work for the White House, and so it will be their decision.

BARRASSO: Now I want to move to Keystone XL pipeline.

A number of us today met with Daniel Yergin, who, as you know, wrote "The Prize" and "The Quest," a national expert on energy. He talked about roughly 170,000 miles of pipeline moving liquid in the United States, petroleum products. Keystone is about 1 percent of that, about 1,700 miles.

It's my understanding the Keystone XL pipeline would ship up to 100,000 barrels per day of oil produced in North Dakota and in Montana. We heard earlier this morning about "Made in America" energy.

Is it fair to say that the Keystone XL pipeline would facilitate oil production in the United States?

CHU: Well, there's -- first, let me back off and say that, if you look at the oil pipelines in the United States, the U.S. government makes a decision on only those parts of the pipelines, and the State Department makes the decision that goes across borders. Within the United States, there -- a lot of companies have the latitude.

The pipelines that are taking the oil from Wyoming-North Dakota, down south to refineries, are up and running. The biggest bottleneck in the United States apparently right now is from Cushing to the Gulf states. And the market is responding.

New pipelines are being built. Pipelines are being reversed so that oil from Wyoming and North Dakota -- another pipeline from Chicago to Cushing, back down to the Gulf states, where the major refineries are. So those all are going forward. And it's my understanding that the State Department has asked to look at other alternatives and environmental impacts on the part of the pipelines that cross the border.

BARRASSO: It seems to me it is fair to say that the Keystone XL pipeline would facilitate oil production in the United States. And then my question to you is, should the Keystone XL pipeline be part of an all-out, all-of-the-above strategy that develops every available source of American energy, which is what the president has actually called for?

CHU: There are pipelines being built and upgraded, as I said, from those -- from Wyoming and from North Dakota. Again, I was trying to point out where some of the bottlenecks are and how the pipeline -- and we're all for this.

This is why the oil production in the United States is at an all-time high, compared to the last eight years. We think -- we are projecting -- first, the oil production has gone up about half a million barrels a day in the United States over the last several years. And we think because of the -- again, because of the technology that the DOE invested in decades ago, that shale oil production may lead to another million barrels a day increase.

You know, we're in the top three oil producers in the world, and we could be either one or two. This is good news for the United States.

All that is within the continental United States. And so those pipelines being built there are -- you know, these investments are going forward.

BARRASSO: Thank you, Mr. Secretary.

Thank you, Mr. Chairman.

BINGAMAN: Senator Franken.

FRANKEN: Thank you, Mr. Chairman.

The ranking member referred to the first-ever downgrade of our treasuries. I would remind the ranking member that the expressed reason given by S&P was the dysfunction of some in Congress who seemed willing to threaten to go into default.

I think that we need to invest in energy, and I think we need to invest in energy of the future. I think that "all of the above" doesn't mean all of all of the above. As the BP spill in the Gulf showed us, that not exercising judgment -- some judgment about environmental and safety impacts, can undermine the economic well-being and the very goal of energy independence.

I think what your budget shows to me is a sensible investment in innovation in energies of the future, including energy efficiency, which brings me to the 1703 loan guarantee program. I see that you didn't really ask for

additional appropriations for that, just -- and that program was for energy efficiency projects and innovation in energy efficiency.

I see you just asked for \$38 million to cover administration costs. It seems the justification for this is that you have funds left over in this program that you haven't yet distributed.

In fact, it seems that there are funds left over in this program because there are approved projects that still haven't yet received loan guarantees that have been promised. One such project is from a company in Minnesota called SAGE Electrochromics. I know you're aware of that.

SAGE has developed energy-efficient windows that are cutting edge, better than anything in the world, and uses photovoltaic cells to control the window, how dark it gets during the winter (sic) -- during the summer to block out UV light and to lower air conditioning costs, and to let it all in and lower heating costs in the summer. And it's really -- I've been there, and it's just an amazing technology.

In the spring of 2010, the Department of Energy promised the company it would receive a \$72 million loan guarantee under the 1703 program to build a new manufacturing facility that would create 160 manufacturing jobs and 200 construction jobs in southern Minnesota. It's now been two years since SAGE has been notified that it will receive the loan guarantee, and the deal has not yet been closed.

While the Department of Energy prolongs closing the deal, time and money are running out for SAGE, there are high-tech manufacturing construction jobs at stake here. It's been going forward with the project assuming they'd get this loan guarantee, but they're running out of time and they may have to sell themselves to a French company.

My first question is, the SAGE loan guarantee was going to be submitted to the credit committee on August 23rd, but it was stopped. Why is the Department of Energy continuing to delay closing and executing the SAGE loan guarantee?

CHU: Well, Senator, as you know -- first, yes, I'm very aware of that company. Actually, the technology was developed by the laboratory I used to be the director of. And so I know about it, and it is very good technology.

But Senator, you will also know that I can't really speak of the particulars of a loan. This is confidential information.

We'd be willing to work with SAGE and get them to talk to you on what they would be willing to divulge, but it has to go through them. We can't really talk about the details of why.

FRANKEN: OK. Well, I've been going through them and I've been going back and forth, as you know, with DOE and the White House on this.

The Treasury Department review of the loan guarantee portfolio conducted by Herb Allison concluded recently that the program is on sound footing and that the 1703 and the 1705 programs will cost the payers \$2 billion less than initially expected. If that's the case, why isn't the DOE moving full force ahead, issuing new loan guarantees with -- and SAGE is, I believe, first in line for that under 1703.

CHU: Yes. Well, the bulk of the 1703 loans are applicants we would expect to have been people like Vogtle, like the Vogtle project, nuclear power plants, also carbon capture sequestration projects. And there is some concern there because -- and we're working with the companies, but we have low gas prices, and so that affects business decisions. And so we're working -- you got it right. We actually -- we didn't request more funds except for the management of the program because we do have funds available.

Now, in terms of carbon capture sequestration, what we are finding is that there are companies who are willing to invest because these are -- it requires a lot of matching funds from companies -- they're willing to invest in that part if there would be a utilization aspect to the carbon capture where the Department of Energy would pay for the measurement, the monitoring verification of where the carbon dioxide is going. We could help -- all those things are necessary in a capture and sequestration project.

We could help with the capture technologies that would be needed to capture carbon, because by mid-century, we're going to have to be capturing carbon from a lot of sources, all the large point (ph) sources. But the utilization part, and particularly enhanced oil recovery, is enough of a stimulus for those companies to say, all right, we'd be willing to look at those projects.

So we're, again, working with companies to look at that. It still carries the agenda forward on what we believe is necessary, develop the technologies of carbon capture storage in geological sites that both would give the public comfort and help us determine -- you know, understand the flow of carbon dioxide in geological strata.

FRANKEN: OK. My time is up, but I'm not sure how -- I really wanted to talk about DOE moving full force on 1703 in regard to this one technology which is about energy efficiency for buildings, which buildings consume almost 40 percent of all our energy in the country. And I think that it's absolutely essential that we pursue energy efficiency in our buildings and that this is -- this technology does just that.

So, thank you, Mr. Secretary.

BINGAMAN: Senator Coats?

COATS: Thank you, Mr. Chairman.

Mr. Chairman, I'd note that this will be the last budget hearing of the Energy Committee that you'll chair, and you've spent a lot of years investing a lot of time in this subject. And I think we're all appreciative of your service. And I know we'll have several hearings and this is not a good-bye.

BINGAMAN: You're going to have lots of chance to see me around here for many months, but thank you.

COATS: And that's good. And we'll take the opportunity to thank you for your years of service. I just wanted to mention that.

Secretary, last year, at a similar hearing, I mentioned to you that it was unlikely that we were going to be able to reach the targets of the president's budget, and as a matter -- and suggested that you needed to go to -- was there a Plan B in place, or some thought of, if we don't reach this, how are we going to triage or how are we going to make decisions about where the money ought to be spent? It turned out that that was true. The vote against the president's budget was unanimous, 97-0 for 2012 fiscal year.

This new budget has been offered. It's unlikely that we'll even debate or vote it. The majority leader has said he's not going to bring it for a vote. But if it does, I think it will probably have the same fate.

So, my question to you is, are you looking at a Plan B for FY-'13 fiscal year? And if not, why not? And if you are, could you share that with us either today or in subsequent hearings, or work with us to try to address the fact that the country just simply can't afford to do everything that we would like to do?

CHU: Well, as what happened last year, I think you -- I hope you felt that there was a willingness to work with Congress. Ultimately, it's Congress' appropriations that determine what we do and what we get, with the consent of the president. And so I think we will -- you know, as the budget process unfolds, we certainly are willing to work with all members of Congress in the House and the Senate.

COATS: Well, thank you. I think we're going to need to do that. This plan is a billion more than last year, this budget. And I just don't see the possibility, given our current fiscal situation, of being able to defund everything that you've requested. So I look forward to doing that.

Let me just turn to the issue of loans and guarantees and subsidies and so forth and so on.

And I want to try to take it out of the political. Whether it's a Republican administration or a Democrat administration, there have been a number of embarrassing moments where winners and losers have been selected on the basis of not doing basic research, which I think is a function of government, but in transferring that research to a specific industry, a specific company.

And it's embarrassing to you. It's embarrassing to the president. It's embarrassing to Congress. It's embarrassing to the way in which money is allocated.

Talk a little bit about how we can avoid -- and the problem is that the political gets involved, and then there are headlines, and there's allegations of crony capitalism and favoring one company over another for political reasons, accompanied with, well, maybe this is the -- you know, maybe this is the future and we ought to invest this money.

I know your department has taken some second looks at some of the proposed loan guarantees, and one of those was as a result of a letter Senator Toomey and I sent to you. And I thank you for doing that second look, that due diligence which resulted in a different decision, saving, potentially, the taxpayer well over half a billion dollars. And so I thank you for that.

Can you talk a little bit about what I'm suggesting here? And that is two things.

One, the due diligence needed to take second looks at what programs are currently being evaluated. And secondly, the whole concept of, should the government be involved? And I think it was Larry Summers who

said, you know -- pardon the language here -- government picking winners and losers is a crappy way to invest money. And I think we've had some examples of that.

So could you address the role of the government being involved in basic research, as opposed to selecting specific companies to develop a particular product when we continue to run into, as I said, whether it's Republican or Democrat administration, continue to run into embarrassing situations on the taxpayers' dime?

CHU: Well, first, Senator, let me say that I'm very glad to hear you are very supportive of the research and development. That is a proper role for the government, because in many instances, not all the investments in research and development are captured by the company that makes that investment. And because of that, not only this country, but countries all over the world, feel it is a government responsibility to help with the competitiveness of the businesses in their home countries, to continue research and development.

As you go more towards piling (ph), and especially towards deployment, that becomes increasingly a larger responsibility to -- really the responsibility of the private sector to decide what they want to invest in. But having said that, there have been policies in the United States that go back a century or more that do help beginning industries start off.

And this has been part of the tradition, if you think about going back, again, about 100 years, and the beginning oil industry in the United States. There were incentives to help early investments and develop this that are continuing, but certainly those incentives were there to -- to spur new technologies.

There are incentives -- there were incentives in the airplane industry. There were lots of things in how to help the semiconductor industry. But in the last analysis, I think the most effective programs are ones which can guide and stimulate private investment.

Senators Bingaman and Murkowski I think are supportive of sort of a seeded-like program, a loan program that -- but in addition to that, there are other things that we can do which can actually, again, just help guide those investment choices. Mostly what we want to do, in my opinion, what we'd like to do, is guide the investment choices that could really stimulate high-technology manufacturing in the United States.

There's no reason why we cannot be competitive with any country in the world. Germany remains competitive in high-technology manufacturing. I believe they have higher labor costs than we do, and so -- and we're at least as innovative and inventive as any country in the world. I would say more so. So...

COATS: Well, my only response would be I think the market makes a better decision -- a better decision-making process than the government based on -- based on the record. And it's not the taxpayers' money at stake, it's the stockholders' money that's at stake...

(CROSSTALK)

CHU: Right.

COATS: ... with the winners and the losers. And I just personally think that's the way it ought to be.

And secondly, the historical comparison might not work now because we weren't drowning in debt when those loans were made. Today, we're drowning in debt and we just can't keep going and having headlines that half a billion or a billion dollars are lost again to the taxpayer.

My time has more than expired, Mr. Chairman. Thank you.

BINGAMAN: Senator Stabenow?

STABENOW: Well, thank you, Mr. Chairman.

First, welcome, Secretary Chu.

And let me just indicate first that I appreciate the efforts in working with us on a clean energy manufacturing strategy. It's clearly leading the recovery for the country. And our efforts, the chairman and I championing the advanced Manufacturing Tax Credit, 48C, and the loan program that you mentioned where Ford is actually now bringing jobs back from Mexico because of their efforts around advanced batteries and retooling. And we're seeing jobs come back from a number of countries because we're focused there.

So I would encourage you to continue that and use the tools available.

I want to talk specifically today, though, about a very, very important project I believe for the country, and certainly for Michigan, and that's the Facility for Rare Isotope Beams project that Michigan State won in a very rigorous competition, as you know, a number of years ago. And they're at a critical point.

We're coming into the fifth year of funding on this national project. It's a core piece of our research for the United States, research infrastructure with broad benefits to science, homeland security, medicine, industry.

And not only would the project develop the next generation of nuclear physics workforce, as you know, but it will create thousands of jobs and really address our U.S. competitiveness and energy security. So we have to move forward. If we don't, other nations will, and they will be the ones attracting the best and the brightest scientists and researchers, not the United States.

So, as you know, I've talked to you numerous times about this, as have my colleagues in Michigan. You've heard from the scientific community.

And I'd like to hear from you today, what is the Department of Energy's level of commitment to this project?

CHU: Well, Senator, yes, you certainly have talked to me many times, and the same with I think the entire Michigan delegation, it feels. We agree with you that FRIB is a worthy scientific project. And what we're trying to do is to try to figure out within the constraints of the nuclear physics -- nuclear physics budget in the Office of Science, how to best appropriate all the precious dollars.

And so the question is precisely that, and ultimately it's going to be the nuclear physics community that will be deciding what to do. So -- and it's not targeted at FRIB, it's the entire nuclear physics program.

We think nuclear physics, as is high-energy physics, are important parts of the Department of Energy portfolio, but the budget has said that we have constraints. We also need to use our budget in the Office of Science to help on the mission-oriented research that could lead to energy solutions and lead to a more competitive America in the near term.

So we recognize the value of the Michigan state project. We have asked for a budget that's the same level as what was appropriated last year. And we will continue this, but in the end, we need -- and, you know, the nuclear physics community writ large to comment on all the projects, not only of projects, but the program in general.

STABENOW: Well, Mr. Secretary, let me ask you now to clarify this, because the president has indicated support for this in his budget. It's not the level that will allow them to proceed as they have been planning...

CHU: Right.

STABENOW: ... to be able to break ground this year, which is critically important. Again, this is going into the fifth year of commitment in the United States on this particular project.

They've been through numerous reviews and competitive reviews, and in fact have come out with stellar recommendations in the past. And so I'm very concerned that -- about what you're now calling another review process and whether this is just an effort to slow down or stop progress on this incredibly important project.

So can you describe the review process? And how does this fit with the fact that there is, in fact, a commitment in the president's budget to continue this?

CHU: Well, the fact that there is a commitment in the project means precisely what you just said. We're not prepared to abandon this project.

The review project is not -- the review will not be a review of just this, and I want to make that clear. We have three large projects, but we have a large nuclear physics program as well. And within the constraints of our budget, we need the nuclear physics community to tell us what they value the most. And so -- and this panel of review is not going to affect what happens in FY13.

STABENOW: And so it's not affecting what's happening in FY-'13. And so that means the project and the funding moves forward for this year?

CHU: Well, we have -- I think it's -- we have an amount in FY- '12, and we requested -- it depends, of course, on what Congress does, but we've requested the same amount for FY-'13. And that was appropriated -- we got an amount....

STABENOW: So, for the record -- I mean, as a member of the Budget Committee and moving forward with the Appropriations Committee, it's my intent to make sure that we do everything possible to make sure they have the full commitment to be able to move forward with this project. And I hope that the department is going to keep its commitment going into the fifth year of a very important, not only science project, but economic development project that's going to create over a billion dollars in economic activity.

And it makes no sense to me why, as we go into the fifth year, that we're having this conversation when those conversations were conducted at the very beginning of all of this and priorities were set, decisions were made, dollars were spent. And now we go into the fifth year.

It's in the budget. It seems to me we ought to be talking about what we need to have -- to break ground and to be able to move forward with this rather than another evaluation. And I'm all for evaluations, but this project has been evaluated and evaluated and, in fact, has come out with stellar reviews at every step of the way. And I would hope that the department will keep its commitment.

Thank you, Mr. Chairman.

BINGAMAN: Senator Paul.

PAUL: Secretary Chu, thank you for coming today.

As you know, we're in the midst of a Great Recession with 12 million people out of work. I'm very concerned about 1,200 jobs in particular, though, that are in Paducah, Kentucky.

They work for a nuclear enrichment plant there that's been in operation for many years. Over 50 years we have accumulated 40,000 cylinders of uranium, uranium waste. It's sitting on the ground. Something has to be done with it.

These are 14-ton canisters of uranium, and we'd just like to enrich them. If we were able to enrich them, you could save these 1,200 jobs.

These 1,200 jobs, in all likelihood, will be lost this year if the company goes under, which it's predicted to go under with six to 12 months if we are not allowed to enrich this uranium. It's my understanding that it's under your discretion to decide to enrich this uranium, and I'd like to ask you today here in public whether you'll help us with these 1,200 jobs and whether or not the Department of Energy will allow us to enrich this uranium.

CHU: Well, Senator, I see it as not a matter of -- first, this company, USEC, which is running the Paducah plant, for them, they say it's going to be a business decision. We are talking about some depleted uranium and whether they're going to use the enrichment facility to generate the uranium.

And what they are asking for is government assistance to say we have some depleted uranium. We can give it to them and have them enrich it.

There -- it's certainly true, we're very concerned about those jobs, but we're also concerned of a number of other things, because in order to provide the funds to allow this to go forward, we would, for example, be using -- we would have to be essentially putting some of our uranium that we have on the open market. We have to do this very carefully because we have a commitment that any use of our uranium, U.S.-owned uranium, on to the open market might have an effect on the uranium markets that would affect the miners.

PAUL: But if we allow this to happen, it really doesn't cost the taxpayer anything, because the payment for enriching it comes out of the proceeds of the sales of the uranium.

CHU: It does, but you have to take that a little bit further, because the market for uranium has changed after Fukushima, as you well know. The Japanese have had their reactors down for a number of months, and it's going to be -- as they bring them up, it's going to be quite slow. The Germans have decided they're going to bring down their reactors more quickly than they had thought possibly.

And so the market for uranium and for reactors has changed over the last couple of years.

PAUL: But if you're concerned about how much you sell, could you not increase your stockpile, and as you increase your stockpile, then sell it over time?

CHU: Well, but the way we see it -- this is a very complex process. The way we see it, we're going to be giving -- we'll be using taxpayer money to pay for the USEC services. That will keep the Paducah plant running.

In the end, if there's -- let's just pose there's a glut in the market of uranium. You've got to separate uranium, the value is not as high because...

PAUL: Right. CHU: ... and then, in the end, the taxpayer has to foot that bill. And so the analysis -- for example, the CBO's office says this is not a moneymaker. In fact, it could be a big liability for -- we have to work through all those things.

PAUL: Well, but the GAO says that the uranium there has a value of \$4 billion, and that would be returned to the taxpayer if we were to enrich it. It's also -- you've got a lot of problems here.

I mean, we've got 50 years of waste, and we're providing you with an alternative that brings money back to the treasury and helps you get rid of a waste problem. We have, I think, 700,000 tons of uranium that's just a waste product now sitting on the ground.

I mean, many in the administration say you all are a green administration, you're for recycling. We're giving you a chance here to save jobs, not on some kind of loan program, save jobs, existing jobs, and recycle something and cut the amount of uranium waste in half. I mean, these are all problems we face.

If we do nothing -- and I believe you have the power to save these jobs, and this is on you. I mean, basically, these 1,200 jobs are yours to save if you choose to save them. But if you don't, it's going to cost the taxpayer.

It's \$100 million a year to put things into cold storage there. It's also \$100 million a year because someone has to guard that uranium. The surveillance costs all come out of the company now.

So I think this is a win-win situation for the taxpayer. As you know, I'm not a big fan of expending new taxpayer dollars, but the taxpayer dollars here come out of the sales of the uranium.

If we were to temporarily raise the limit, which I think you're allowed to do, also, under law -- that's under your discretion -- that we're talking about 1 percent of the world market. I don't think we're talking about affecting the price in a significant degree if we were allowed to do that.

CHU: Well, just very quickly in closing, first, the GAO report came out several years ago, before Fukushima. And so there was a sea change, quite candidly, in prospects for the demand of uranium because of Fukushima, because of the German decision, because of the slower startup of the Japanese, who are still trying to figure out what -- to what extent they're going to be starting all their reactors. So I would be a little surprised, very surprised if their analysis of three years ago would be the same as the analysis...

PAUL: But there's a brand new one. June 13, 2011, nuclear material. DOE's depleted uranium tails (ph) could be a source of revenue for the government. And that's the one I'm still talking \$4 billion worth of...

(CROSSTALK)

CHU: Well, I'd be happy to spend some time -- be happy to meet with you, as I've indicated in the letter.

PAUL: But I just want it to be said for the record that these 1,200 jobs are 1,200 jobs that you could save with a stroke of the pen if you choose to do so. This isn't \$500 million or billions of dollars being spent on something where we might get jobs and we haven't, we've lost it.

These are 1,200 existing jobs in a long-standing nuclear trade. There are defense considerations for why we have to enrich uranium.

Uranium is not a purely open market. We don't sell it to just anybody. There are strict controls on this market.

So I think it is something where the government could do something that costs no money. And I just hope you will help us there.

I mean, the 1,200 families in Paducah are sitting there and they're listening to you today. And they know you have it in your power to save their jobs. And I just hope you'll consider this. It doesn't cost the taxpayer anything, ultimately, because the proceeds will come out of the sales of the uranium.

CHU: If the sales keep at a certain price. Again, Senator, I'd love to talk to you at length about this. We've thought deeply. We have -- but it could -- we also see a potential hundreds of millions of dollars' liability in the future, and we have to work through that as well.

BINGAMAN: Senator Cantwell?

CANTWELL: Thank you, Mr. Chairman.

Secretary Chu, good to see you here this morning. Thank you for visiting the Hanford site and the VIT plant specifically. And obviously you know that it is one of the most complex and largest contaminated sites in the world, and our concerns about making sure we continue to get cleanup done in a timely fashion is of critical importance, not just to the state of Washington, but to the nation.

Are you confident with this level of funding that we will have that plant open and operational in 2019?

CHU: Well, Senator, again, within the budget constraints, we're essentially working hard to keep the environmental management budget essentially flat. It went down a fraction of a percent, but .7 percent, but essentially flat. And we are trying very hard to make some tough decisions. There is the protection of the Columbia River, the waste plant -- the tanks and WTP.

So we first feel that we're going to meet all of our legal obligations for FY-'13 with this budget. But as you know -- and I spoke to you about this -- that there was an ideal funding profile for the completion of the WTP plant, the (inaudible) plant. It would call for more aggressive spending this year, next year and the following years so that you -- just like in a commercial building, when you build a building, you don't mess around. If you got an engineer, you build it and you build it very quickly.

That funding profile is not in the cards anymore because of our budgets. And so because of that, we know that there's a risk that could slip schedule.

But on the flip side, we also have to prioritize and we have to make sure that the waste tank farms are cared for as well. And so it's a tough decision. And as you well know, we take these responsibilities very seriously.

CANTWELL: So 2019, that's your...

CHU: Well, we can't say right now, but -- because there's -- we are working through some of the issues. We have a plan -- a program for testing, for example, the so-called pulse jet mixing, things of that nature, that perhaps two or three years ago we felt that -- we determined with the defense (inaudible) board, others, that it would be prudent to go through more comprehensive testing. So we acknowledge that.

And so these are some of the issues on this very, very complex project. This is, in my mind, the most complex nuclear project that the world has undertaken, let alone the United States.

CANTWELL: I couldn't agree more. And that's why when some of the questions have been mentioned about the VIT plant, do you think we have the right oversight on the, you know, issues that have been brought up by whistleblowers? Because, obviously, once the plant goes operational, you can't fix any -- you know, it's too hot to fix structural issues. So...

CHU: I think we've worked very hard. Both the deputy secretary and I have worked very hard to make sure that we have essentially our A team in place in the direct oversight of the -- of the contractors.

Abecko (ph) -- Dale Knudsen (ph) is a truly outstanding project manager, has had a long track record. We were able to talk him into doing this.

We have a new head lot of the Office of River Protection. We have a lot of -- Scott Samuelson we have a lot of respect for.

Dave Huizenga, again, a superb manager person who is -- so all the way up and down the chain we have put in place what we believe is a very good team. And because of the importance of this project, a lot of these discussions go right into my office.

I've spoken to the COO of -- the head contractor of Abecko (ph), Riley Abecko (ph), probably now four times in my office on making sure that he, too, has an A team as the contractor. And from my discussions with the people on the ground, they say that Abecko (ph) has always been doing their job in trying to get the right people there.

CANTWELL: Thank you to that level of detail, because I think that is what it takes. I've often said you should make the energy secretary for life or until Hanford is cleaned up just so that we don't continue to change horses in the stream. So -- but can I get your viewpoints on whether we can dispose of military waste first?

What we don't want is Hanford to become a de facto site for 90 percent of the storage. And the commission was in here, a blue ribbon commission, a few weeks ago. Senator Domenici basically threw out on the table --

my colleague Senator Wyden got him talking about this, and I tried to follow up about whether the waste isolation plant in New Mexico might be an ideal place for Hanford Waste.

So do you have a -- do you agree with him on that?

CHU: Well, first, we're going to keep separate the civilian and the nuclear waste issues. I think they're -- you know, that we -- it would be prudent to treat it differently.

And we are considering -- I'm not sure where in the status, but the -- first, it's for low-level radioactive waste, and so one would need to do some studies to make sure that that would be safe for the high-level waste. And so we would need to do something along those lines.

But I'm glad you pointed out WIPP, because this is -- this a success story. It's been there operating for about a dozen years. There have been no incidents.

The local people are -- feel confident that we can -- we're running this isn't a very safe way, and it's good for the local economy. It's good for the economy of the state of New Mexico. And so, again, this is something where we can show that we can develop repositories for nuclear waste, which has the acceptance of the local people.

CANTWELL: Well, if I could get a more -- follow up with you on the details of that...

CHU: Sure.

CANTWELL: ... I'd appreciate it. And also, on the 1,000 acres we're trying to get shifted over from DOE, you know, as the cleanup goes on, shifting over acreage to the local community there for energy parks in general.

I think it's a proposal that's moving its way through, but if we could follow up on both of those. Thank you.

Thank you, Mr. Chairman.

BINGAMAN: Thank you.

Senator Risch?

RISCH: Thank you, Mr. Chairman.

Secretary Chu, first of all, let me just say for the record that -- and I know this falls on deaf ears, but -- and this is simply a philosophical disagreement, but your budget request of 3.2 percent increase for the year, but yet decreases the nuclear energy component by 10 percent. And I find that particularly discouraging as we look to the future.

I know that that is not the administration's position, that nuclear is our future. I do. A lot of other people do. And I suppose that's not going to change until the administration changes at some point in time.

So, for the record, just take my objection to the decrease, while increasing other of the boutique-type (ph) energy production systems that you have.

I want to ask particularly about one part of that. I noticed that in the budget you increased -- or you decreased the fuel cycle research and development by 10.8 percent. And yet, yesterday, when you were in Georgia, you announced that there was going to be a new \$10 million advanced nuclear -- innovative cost-cutting research and development for advanced nuclear reactor in fuel cycle technologies.

Those seem to be a little inconsistent. On one hand, you're asking for a -- you're asking for a \$10.8 million decrease, and yet, yesterday, you said there was going to be new funding.

What is this new funding? I didn't quite -- that came out kind of gray.

CHU: OK. So, in the first -- I have been very supportive of nuclear since I walked in office.

RISCH: I understand that, and I believe that, but I also understand you're carrying the administration's water, so...

CHU: So, in terms of the fuel cycle, we believe that, first, as the blue ribbon commission pointed out, that the technologies for fuel recycling today we don't think are economically viable and not proliferation-resistant.

There are other examples of -- so these are the UREX, PUREX methods that the U.S. developed, actually, and Areva uses.

But as we've seen from both -- especially from the Japanese experience, that's well over budget. They believed it was a \$6 billion investment, it's north of \$22 billion today, still not operational. This is the Rokkasho plant.

There are other -- there are other technologies like pyroprocessing which we think have promise. They had good laboratory experiences, and then we went up and did the next step, and it didn't quite work as well as we thought it would in order to be -- it is more proliferation -- it's not proliferation -- proof it's more proliferation-resistant. And had that worked well, we would have been encouraged.

It's not to say that we're going to abandon that. In fact, I'm personally getting very interested in why it's not working. So, in my little spare time, I'm trying to figure out if I can help them, but never mind that.

RISCH: You may resolve that in your garage.

CHU: Well, it's going to be up here, it's not going to be in a garage. I don't think the (inaudible) would like it for me to be experimenting in my garage.

But I would say that this doesn't open up -- it still doesn't mean we shouldn't be looking for other good ideas, because we are very interested in -- if nuclear is going to be part of this century's mix, we would like to not use 1 percent of the fuel, energy content of the fuel, to generate a certain amount of electricity, if we can use 20 percent, 20 times more, so you have a similar -- you've got 20 times more electricity. So this is hanging out there, and we would like very much to develop that.

RISCH: And we're all in agreement of that.

CHU: Right.

RISCH: We're all in agreement.

CHU: And so we do feel that it does make sense to invest in new technologies. We're going to have to come back a little bit and try to figure out why some of these earlier promising things, that the lap (ph) scale doesn't go into the mini pilot (ph) scale.

RISCH: Well, then, the one question I had is, why was the announcement made in Georgia since, as you know, the INL in Idaho has one of its strong missions the actual work that you've described?

CHU: Well, I happened to be in Georgia and, you know, yes, I can be in only two places at once. So that happened to be Georgia, in Oak Ridge.

RISCH: So I can take the message back to the Idaho people that this \$10 million is coming?

CHU: Oh, we announce competitive bids, and Idaho is free to compete with that money.

RISCH: Mr. Secretary, my time is up, but you and I had a discussion at your confirmation hearing about the -- about the contract for cleanup at the Idaho National Laboratory, and you weren't familiar with that, but promised that you'd get up to speed on that. And I've got some questions about that from the budget, which is really not very clear as to where we're headed with that. But if you'll take those questions for the record, I'd appreciate it and we'll...

(CROSSTALK)

CHU: Sure. I will. Thank you.

RISCH: Thank you.

Thank you, Mr. Chairman.

BINGAMAN: Thank you.

Senator Udall?

UDALL: Good morning, Mr. Secretary.

I can speak for Senator Risch. I know he would volunteer his garage if you need it.

And I wanted to -- I know he represents INEL. I represent NREL. And you know I'm very proud of their accomplishments there.

And I want to continue to work with you to see that their good work continues. And in your budget, and in my estimation, you go a long way towards supporting that lab's critical programs which are focused on developing innovative renewable energy technologies that clearly have translated into lasting, well-paying jobs, a more comprehensive energy portfolio, and the national security that comes with energy independence.

So kudos to you. I know that this is a tough fiscal environmental, a tough budgeting process, but I want you to know I support what the president and you have put together.

Now, I mentioned how important NREL is. Financing is also really crucial to energy future.

Would you speak to the fact that we're at a really critical juncture here in regards to the PTC, the Production Tax Credit? It's been very instrumental in the expansion of wind deployment around our country. Every state has a stake in this whether the states are producing wind in any significant amounts because of the supply chain that's developed.

This very important policy expires at the end of 2012. Would you speak to the ramifications if we don't extend the PTC in the time frame that we have left?

CHU: Sure. Yes.

Very quickly, I think things like production tax credits are a way to stimulate moving forward to get deployment in the marketplace. And there -- because Europe is in -- I would say even perhaps even worse economic straits than we are, and you see some countries like Spain decreasing a lot of their feed-in tariffs, a lot of their subsidies for renewables, that there's a diminution of the market. But it's the local markets that actually help stimulate manufacturing in a particular country.

And so the -- and this is why when Spain took away their subsidies, and other countries are decreasing, China put in feed-in tariffs for their market in wind and solar. So they ratcheted it up because they recognized that they want to nurture their industries.

They need a home market to make sure that they're going to be -- they want to catch up in wind turbine technology. They are becoming a dominant force in solar technology, but they see both of those at risk. And so in -- as we saw Europe's subsidies decrease, they said, OK, we're going to have -- we want to develop our home market, and the world is expecting this year that China will be the biggest deployer of renewable energy in the world.

Let's go back to the United States.

If we don't have a home market for these things, industries would not be motivated to develop manufacturing at home. They would not -- they would be less motivated to develop those technologies, the next generation of solar.

For example, you know, NREL was the developer, essentially inventor-developer, of the cad telluride cells. There's a number of solar companies making (inaudible) cad telluride technology.

Those technologies are continuing to improve. One doesn't know whether silicon or cad tell or some other technology, but they're certainly a player in that field, and they're certainly in a competitive race.

So I think to have a home market for clean energy standard, a production tax credit, those are mechanisms that can stimulate private sector investment that then stimulates manufacturing in the United States. And this is why, yes, China wants to export, but they also realize that we have to create a home market as well, and it's this mixture that they need.

UDALL: And you're implying if we don't extend the PTC, that home market mission that we've all agreed in a bipartisan way is crucial?

(CROSSTALK)

CHU: Well, it goes to ways of, how do you get a market draw? How do you help bring slightly lower costs, financing these projects, all those things?

You talk to any supplier of wind, they would rather set up a supply chain in the country where these things are being installed. This is heavy stuff. And so, in the solar world, it's more like a commodity that can be shipped worldwide, but it's going to heavily be influenced.

Now, as wind technology, as I noted before, is getting very, very close to price parity with new gas -- new gas -- let me be careful. New gas at \$4 to \$6 a million cubic feet. Now -- which is considered -- you know, if you average over the next 10 or 20 years, this is what (inaudible) is projecting.

Solar has dropped by more than 75 percent. The solar modules have dropped by more than 75 percent in the last three years. Everybody anticipates another 50 percent drop at least in the next five to eight years.

And so solar is going to be competitive with any new form of energy. And so, again, we need -- we need to spur this market, because this could be -- this is clean energy without subsidy that the world will want. And as I've said repeatedly, we're either going to be buying or selling, and I'd rather be selling.

UDALL: Selling. We all would.

I know my time is about to expire, but on the critical minerals hub, what are you doing at DOE to ensure that the DOE labs, university partners, and industry are working together on the hubs?

Can you give a brief answer and then...

CHU: Sure.

UDALL: ... an answer for the record?

CHU: A very brief answer. Even the design of the hubs, if we select a hub, they have to come in with a design. And what are they doing at the get-go to have industry and then national labs and universities?

I was just visiting a hub, a computation for nuclear reactor simulation, and it was wonderful, because they said at the very beginning, what are the problems that industry is interested in? Let's say a premature aging of the fuel rods.

How do you extract more energy from those fuel rods? How do you make those -- the reactors safer?

Those are the things that industry actually sits with every day. And can you simulate this? Can you simulate erosion processes that they see?

And so, from its very design, it was, we can use the powers of high-performance computing, the intellectual powers of the people in universities and national labs to help industries solve these problems. And so the hubs are specifically designed for that.

The other thing I very quickly should mention is that we have also been easing the way to have technology transferred from national laboratories and universities -- national laboratories, since we help control the technology transfer policies. We've just had a very exciting meeting. About 250 people attended, people from industry, on the materials you would need for solving a lot of the energy challenges. This is not a form of tank (ph) materials, this is lightweight steels and alloys and composites, everything, because it's going to be dominated by new materials.

Two hundred and fifty people came, a lot of companies, a lot of excitement. Immediately, the first week of payoff was, you know, venture capitalists are inviting people from the labs to come. The other labs are saying this really works, we're going to do this, too.

We have another one on advanced computation and how that can help in the industry. Just to tie the -- so the people in the national labs know what the industry problems are and that they can be excited about helping them solve those problems. And so this, again, is something that's -- has been occurring over the last year...

(CROSSTALK)

UDALL: I take from you that this is really important. You're really focused on it.

CHU: Right.

UDALL: You're going to work with all these stakeholders.

Thank you, Mr. Secretary.

CHU: Right. Thank you.

BINGAMAN: Senator Manchin?

MANCHIN: Thank you very much, Secretary.

And let me just say -- I know it's been mentioned before -- the president, in his State of the Union Address, said that the country needs an all-out, all-of-the-above strategy that develops every available source of American energy, a strategy that we all agree is cleaner, cheaper, but full of all new jobs, and also hopefully keeping the jobs we already have.

I want to show you a chart that we put together, and this information is taken from the EIA, your own department, showing where we are as far as the first -- through 2010, 24 percent of our energy coming from natural gas; 10 percent renewables; 45 percent coal; and 20 percent from nuclear and oil and other liquids. This is from your -- from your agency.

Going out to 2035, two more decades, this is where you are, 27 percent will be coming from natural gas; renewables, 16 percent; coal, still at 39 percent; and the rest at 18 percent.

With that being said, the president's budget basically had \$2.7 billion that you all submitted for the energy efficiency, renewable energy, at 47 percent increase from current levels.

If you'll hold this one up, Tom (ph), so you can see the comparison. Stand up.

This is where your money's gone. This is what you're going to get out of the investment. This is about your own.

And then you have the Office of Nuclear Energy. Nuclear's right here. It's where you're going. And this is where you are.

You've cut -- I mean, the greatest cut has been right here. And you're still going to be dependent on it, and we can do it much cleaner.

I can't figure the rationale. And what I would say is when you take all of the above that the president said, and you look at the energy strategy when you're cutting funding to resources, that will continue to provide the energy that we're dependent upon by your own estimation. It doesn't make sense, sir.

It doesn't make any sense at all that we can't do it better, cleaner and work together, because you sure are putting this out there. We're going to be able to depend on it. We need it.

So I don't know if you have a comment on this in relation. It seemed like there's not a balance here at all.

CHU: Well, what we're doing -- as you know, during the Recovery Act there was very large investments in clean coal partnerships and helping test, deploy some clean coal technologies. But unfortunately, a lot of the companies who had supply matching funds, at least 50 percent, have pulled out. But there's some hope, there's -- and we're still pushing this as much as we can, because we do believe that we have to develop the technologies to use coal cleanly, which means not only the normal pollutants, but also capture carbon dioxide.

And so we still remain committed to that. However, because of this changing landscape of companies not wanting to invest in large projects, sometimes hundreds of millions to billion-dollar projects, or multibillion-dollar projects, but we do see a path forward in having carbon capture utilization and sequestration.

MANCHIN: Sir, I hate to interrupt you on it because our times are so limited here.

But you can keep those up. That's very important.

With what -- there's no coordination, as I can, see from the Environmental Protection Agency trying to work with y'all to develop policies and be able to use the energy that we're depending upon. That's where the disconnect comes.

And what we're asking for is, somebody's got to be talking to somebody, coordinating it so we can continue from what you're depending upon to be able to use it, and use it cleaner within the environmental standards that we're setting. But there's no one working together.

And I will say this -- last year, when you came before us, you said the Department of Energy was "eager to promote research on coal to liquids that blended biomass, (inaudible), and had carbon captured sequestration

technology." And then you said, also, "Coal to liquids with carbon capture and sequestration actually makes very clean fuels, and then once you start blending in biomass, it become as real plus. It becomes carbon-neutral in the tailpipe emissions. So, for that reason, the Department of Energy is very eager to promote that type of research.

Last year, your budget had \$5 million in funding for that research. This year, zero.

Have you changed your position? What is the administration's position now, and why would you have such a reversal?

CHU: I'm going to have to look at that and get back to you on that. I do think -- I do think that any coal to liquids with carbon capture, and as you blend in biofuels -- and this is also true of coal firing biomatter with a coal plant -- and if you capture the carbon dioxide after a certain percentage, it does -- it goes with the carbon capture, it actually goes negative. So you're actually net sucking carbon out of the air.

MANCHIN: Right. And I think you testified last year.

CHU: Right.

MANCHIN: We have people wanting to do this type, and the roadblocks are insurmountable, because it looks like the administration is saying one thing, but they're pushing and promoting because of your -- where you're making your investments. And I think this shows completely where you're making your investments without taking into consideration what brought you to the dance and what you're expecting.

If you look at natural gas and coal and what we have there, you're talking about 66 percent of the energy for the next two decades with very little money going into them.

CHU: Well, as I said, the research for carbon capture and storage technologies (inaudible), when it gets to be very expensive it gets to be on the deployment side. This is a chart of electricity which is a major part of energy, but about 38 percent of our energy is from oil.

And if -- if you took -- as I've tried to point out before, our budget doesn't reflect the percentage of energy we use. Therefore, those dollars go into that percentage.

The oil industry is a very mature industry, and we don't think -- even though it's 30 percent over total energy budget, we're not going to put 30 percent of our DOE budget in that. We do think that carbon capture, getting coal clean, is very important, as I said repeatedly.

MANCHIN: Oil recovery? Enhanced oil recovery? So many things we can use it for.

CHU: I absolutely agree with you.

MANCHIN: But sir, your budget doesn't reflect that. Sorry.

CHU: Well...

MANCHIN: I know. We have a difference.

Thank you.

BINGAMAN: Senator Shaheen?

SHAHEEN: Thank, Mr. Chairman.

Thank you, Mr. Secretary, for being here.

I, for one, would never say that you have deaf ears. I have found you to be very responsive. So I appreciate that.

And I want to pick up on the line of questioning that Senator Udall was pursuing relative to the production tax credits and the 1603 program, the advanced manufacturing program, because I was pleased to see that the budget included continuing those programs and expanding them. And we have some real success stories in New Hampshire under at least two of those programs.

We have a company called Revolution Energy in my hometown of Dover, where they've used the 1603 program to put solar installations in schools, saved a significant amount of money. We have a wind farm in a community

of Lempster, in the western part of the state, and one that they're working on that have used the production tax credits. And it's made a difference not just in the jobs that go into building those wind farms, but also in reviving the communities because of the economic activity that goes on around those projects.

So I think they're very important and agree with your comments about the importance of continuing these investments in these markets. I have been concerned, as I know many of us in the Senate are, about the fact that these are going to expire at the end of this year.

At this point, the extension of the payroll tax cut and unemployment have not included a package of tax extenders that address these taxes. So can you talk a little bit about adding to what you said to Senator Udall about what happens to the market when we see this kind of interruption in support for these new energy technologies?

CHU: Well, I think, as you talk -- and I know you have -- as you talk to industries out there, what the industry wants more than anything else is they want to see stable government policies.

SHAHEEN: Right.

CHU: They don't want to see on again-off again. They want to see something, because a lot of these investments, just to plan them and get them permitted and licensed, could go well beyond a two-year cycle.

And so the production tax credit and the 1603 have, by most people's accounts, not everybody's, been very successful in stimulating investments in these new clean energies. And with the end of the Recovery Act, the administration is very concerned about a roll-off of these investments, and you see this in the financial newspapers, Bloomberg, (inaudible), all these things, that there's going to be a real concern. Is it just going to roll off and stop?

And, again, I go back and reiterate that it's very important that America develop a home market for the development of the industries of manufacturing in America. You know, one of the great things about the U.S. automobile industry is we have a very large home market, and that actually stimulated a lot of the development of automobiles.

SHAHEEN: And is it fair to say that if that uncertainty exists, because we let these tax credit expire, that there's a good likelihood that we're going to see a number of jobs lost as part of that?

CHU: Yes. I think there are early returns out on that already, because, again...

SHAHEEN: Right.

CHU: ... if you read the financial pages of various newspapers around the country, and around the world, where there are continuing policies that allow investments, you see growth. And otherwise, there's a pulling back.

SHAHEEN: I was also very pleased to hear the president in his State of the Union, and to see that in action as well, the commitment to energy efficiency, which is something that I believe is very important. Senator Portman and I have a bill, S-1000, that addresses energy efficiency in the industrial sector in government, and in buildings.

But one of the best ways to encourage energy efficiency is by supporting the expansion of co-generation, or combined heat and power. These are -- the technologies used are generally off the shelf. They exist right here in the United States. The jobs that are created are here in the U.S.

So can you talk to what the position of the department is on combined heat and power and how you address that in this upcoming budget?

CHU: We are very bullish in combined heat and power. In today's modern -- let's say gas turbine generation, you can get 55, 60 percent efficiency in converting that energy into electricity, but it's at best, 60 percent efficient. I guess some companies claim 61 percent or 62 percent, but I'm not going to quibble. And in combined heat and power, you go up to 80 percent.

It can be -- now, we think that -- and if there's any way to encourage people to do that, that would be great. There's also new ideas and new innovations being deployed now that seem to work.

Here's the issue. Sometimes you want the electricity, you don't want the processed heat. Or maybe you want the heat and you don't want the electricity.

I was visiting a project we supported in Recovery Act funds in Houston, Texas. It powers this collection of medical centers that -- as about the 12th largest city in the United States, just the medical centers. And -- everything's big in Texas.

And, anyway, what they had is, they had a very efficient gas generator, but single cycle. They had high-temperature processed heat that could be used for heating or air conditioning.

Now, the beauty of what they did is, they took that processed heat and they used it. You can actually use heat to cool. And so they used it to chill water. And they restored this cold water in this big tank right there. And they found that it took about less than 10 percent of the energy, even in a hot Houston summer day, to keep that tank cold. And so they would run it so that that would balance it.

It's like a big battery, but it's a battery of heat that they would use to air condition their complex. OK?

So -- and it was very cost-effective. So they were operating this plant, 80 percent efficiency, recovering all of that. Very fuel-efficient, and again drives down the cost to their customers, the medical centers, the hospitals.

And so that's an excellent example of how combined heat and power can be used in a way. I mean, buildings, new buildings now, many of them, especially if you have real-time pricing of electricity, they use the electricity at night, chill some water, even may turn into ice. Use the ice to cool the building during the day time.

So you're buying electricity where it's inexpensive. You decrease your electricity bill. The asset of generation are used. You're getting better return on your investment because you're using the asset in a more even way.

And so the good news is -- so this all is about energy efficiency, essentially. And so combined heat and power in any city, any university, any hospital that has an integration of steam and chilled water tunnels, or a big complex, could use combined heat and power. And we'd love to see it go in that direction, because now you're going to 80 percent efficiency.

SHAHEEN: Thank you.

BINGAMAN: Senator Portman?

PORTMAN: Thank you, Mr. Chairman.

And Dr. Chu, thank you for being before the committee again and for working with me and other members of the committee on some important projects. I like some of the things in the budget.

One is energy efficiency, as Senator Shaheen has just talked about. And with buildings using about 40 percent of the energy in this country, I think what you're talking about there is consistent with the legislation which, as you may know, was introduced in the House, a companion bill yesterday. So we're hopeful that S-1000 can make its way to the floor.

I appreciate the support of the ranking member and the chair on that as well.

I'm concerned about some other aspects of the budget, but let me focus on something positive, which is the small Modular Reactor Licensing Technical Support program. You funded that at \$65 million. And these SMRs are really, I think, an exciting innovation and, as you know, have safety advantages, as well as economic advantages. I know that the Nuclear Regulatory Commission has just licensed a plant and another one coming with larger reactors, but it seems to me that this is a good investment and something that will be very beneficial to our energy mix going forward. So I thank you for that.

With regard to carbon capture technologies, I don't know if you've had this question from other colleagues, and I apologize if I'm repeating something here, but the CCS programs I think still are lacking direction in this budget. I don't think there's a pathway here as to how long and how much it's going to cost to be able to develop carbon capture technologies.

I would like to see the budget laid out, but in the absence of that, I would hope that the department would do so. I did introduce an amendment last year that would require the department to assess how successful the CCS programs have been, and how much time and what the cost would be to get them to the commercial level. And Senator Shaheen, again, was part of that in adding an assessment of what some of the barriers are for large carbon capture and storage.

So my question to you there would be, you know, what is the pathway and what can the department give us in terms of information as to what your scientists believe is the way to move to commercially-viable demonstration projects?

CHU: Sure.

First, the carbon capture technologies that are being tested today -- and I'll divide them into two categories. This is after combustion, you capture the carbon.

They are MEA-type technology, or chilled ammonia-type technologies. Those are being pilot tested since they're, by and large, in the commercial sector.

We feel that we would like to develop less expensive means, because if you make -- if you put in an estimate of how much it would increase the electricity bills, we think that this would not -- would not spur not only in the United States, but it would not spur China and India into using these technologies. So we would like to improve them. We think there are potential ways of improving them.

One of the potential ways is to -- these are very large high- surface areas. So we're investing a lot of research to decrease the size of these capture stacks, totally different ways of doing it. So instead of that being absorbed in a certain material, you could use small particular matter, the nanoscale -- so we're investing a lot into research in that.

We're investing in ways of -- another way is to separate oxygen from nitrogen.

PORTMAN: Dr. Chu, I guess what I would ask -- this is the danger of having someone who actually knows something about science testifying.

CHU: OK. I'll try to suppress it.

PORTMAN: I guess I would ask you if you're willing -- I'll submit a question for the record. And I know a lot of members of the committee will be interested in your response both on the specific technological improvements that you would recommend, but also just what the department sees as the pathway forward here. And I don't see it in the budget. Again, I think it would be very valuable to the committee.

CHU: And in short, very brief time, I'd say the path forward is to take advantage of industry's interest on the piloting side in the carbon capture utilization and sequestration.

PORTMAN: Yes. We want it to be cost-effective. It seems to me that there is an opportunity here and we're not taking at advantage of it.

With regard to uranium enrichment, I appreciate the fact that in the budget, you do talk about the need for us to have a domestic source and, in fact, provide in the Defense Nuclear Nonproliferation account \$150 million for domestic uranium enrichment development, demonstration research. You and I have talked about this a number of times before.

It was interesting you included it under NSA rather than the Nuclear Energy account, because I think it would also be appropriate under the Nuclear Energy account.

Is there a reason for that?

CHU: No. That was signed by people more like you than me.

(LAUGHTER)

PORTMAN: Uh-oh. You're going to worry Republicans down there.

CHU: Pardon?

PORTMAN: I see what you're saying.

CHU: No. I'm just saying that you had to put it somewhere. It was certainly appropriate to put it NSA budget and...

PORTMAN: OK. Well, we'd be very interested in working with you on that, and I do think there are some appropriators who are particularly interested in knowing which account it's going to come out of and where it's coming from.

CHU: Right.

PORTMAN: I think, you know, a conditional loan guarantee would be a far better solution. But given where we are, and needing to have a domestic source of enriched uranium, I think it's important that we move forward. And the more information, the better.

With regard to enriched uranium, if you could just talk for a moment about why you think it's so important. Obviously, we need it for our nuclear power plants. At one point, we had a majority of the enriched uranium in the world being produced by the United States. I think we're down to about 25 percent of the world's supply of enriched uranium now.

And maybe a place to start is, where do we get now in that we aren't producing nearly as much as we used to?

CHU: Well, there are two parts to this. One is, the military side, the security side.

We have international treaties which we want to abide by, nonproliferation treaties which says that the uranium used in nuclear security -- for nuclear security purposes actually has to be indigenous to that country. It's a very wise treaty, because you don't want one country to be using technology of another country to enrich uranium that they can turn into weapons.

PORTMAN: Right.

CHU: So we need our own indigenous source of uranium for -- to maintain our stockpile, also uranium that we need to produce...

(CROSSTALK)

CHU: ... for that stockpile.

Then there's a larger issue about the civilian nuclear side, much larger amounts of uranium. We think that if the United States -- certainly the United States will be a player. The United States is well respected for its safety record, for its care, and the way it handles its own civilian nuclear industry, and for the technologies that it has developed, companies like GE, Westinghouse.

It would also benefit if we had a homegrown new technology for enriching uranium for -- again, so that we can offer for sale to other countries, other developing countries. You know, France is a player in this. Russia's a player in this. We think that if the United States is a supplier of this uranium, that we could have a moderating (ph) effect, again, on nonproliferation. So it's for that reason as well.

PORTMAN: In essence, discouraging emerging economies from developing their own enrichment capabilities...

CHU: Right.

PORTMAN: ... saying that the fuel they need for a peaceful nuclear power facility can come from the United States, it will be a stable, affordable supply through a domestic source?

CHU: That's correct. In fact, if you put yourselves in the shoes of another country who might want to have nuclear technology, they would want to see several suppliers so they would not beholden to one or two. And we also feel that the United States, in its -- can lead by example of helping do what we can do in order to decrease the risks of proliferation.

So it's the whole nuclear supply issue. We will be a player no matter what, but it would certainly benefit from that respect as well.

PORTMAN: My time is up, Mr. Chairman. Thanks, Mr. Chairman, for giving me a little time there.

BINGAMAN: Senator...

PORTMAN: But I appreciate the follow-up. And we'll move on.

BINGAMAN: Senator Sanders?

SANDERS: Thank you, Mr. Chairman.

Welcome, Mr. Secretary. And thank you for all that you are doing.

Let me begin by saying that I agree with Senator Shaheen and many others that it's absolutely imperative that we pass the Production Tax Credit at 1603. It is beyond comprehension to me that we are not moving forward aggressively, and I thank the administration for their support on it.

I also want to thank you for your help in Vermont's smart grid. I think we will be probably the first state in America that have almost universal smart meters within a few years. And we think if we're serious about energy efficiency and using electricity as efficiently as we can, this will be a major step forward. And I hope Vermont can learn -- the nation can learn from what Vermont will be doing. We want to share that with the rest of the country.

Mr. Secretary, it seems to me that one of the sad moments in terms of what's happening in our country today is the degree to which, as a nation, as a Congress, we are not dealing with the horrendous planetary crisis of global warming. And it is -- and I say this not to be terribly partisan here, but it is very sad that we have a major political party where many of its leading members actually reject what virtually the entire world scientific community is saying, A, about the reality of global warming, B, that it is significantly caused by manmade activities, and, C, that if we are aggressive, we can begin the process of leading the world in reversing greenhouse gas emissions. And without getting partisan, it's just sad to me that we have so many people rejecting what is very clear scientific evidence not only in this country, but from scientists all over the world.

In terms of cutting greenhouse gas emissions, I think that energy efficiency is a huge step forward. I don't think there's much disagreement on that. I think weatherization is a very important part of that.

I come from a cold weather state. We are making some progress in retrofitting homes. And when we do it well, what we are seeing is often, working families, lower-income people saying, you know, I've cut my fuel bill by 20 percent or 30 percent. I'm saving money as a consumer. We are emitting less greenhouse gas emissions. And you know what? We're creating jobs because people are working on those homes.

If there's any win-win-win situation that I see in this country, being aggressive about weatherization is it. And yet, within a pretty good budget, you guys have cut weatherization. Why?

CHU: Well, actually, our -- if you look at our request, I believe it's up from what was given to us for FY12, and...

(CROSSTALK)

SANDERS: Well, here's the story. The budget before us actually invests only half as much in weatherization for 2013 as we did in 2008. That was the last year of the Bush administration. In 2012, Congress approved huge cuts to weatherization, dropping funding to \$68 million in 2012, down from \$227 million in 2008.

Now, you're right. You went up from last year, but we're significantly below where we were in 2008. Would you agree with me that investing in weatherization is a win-win-win situation?

CHU: Oh, I agree. And so we have asked for an increase. And it's not quite double, but a big increase from what we were authorized.

But -- and I think we're also trying to promote programs that -- with not only the federal dollars but also programs -- because I really think if done right, weatherization can actually save money. And the money one needs to borrow, whether you're a business or a home owner, if paid back in moderate interest loans, can actually decrease your bills.

SANDERS: Right. No, we certainly agree. I hope that you will work with us because I don't know that there's any -- much partisan disagreement on that one. It's just common sense. If I lower your fuel bill by 30 percent, why not? Right?

CHU: Right. Right.

SANDERS: And if we create jobs as part of that process, that's a winner.

Let me ask you this question. I am working on a concept, again, which should not be partisan. It's called on-bill financing -- because one of the problems we have in terms of weatherization, if Ron Wyden here wants to reduce his fuel bill in his home and knows that retrofitting will do that, but he doesn't have the up-front money -- if we can get him the \$15,000 he needs to cut his fuel bill by 30 percent and pay it back by the reduced amount of money he's spending on fuel -- we're just lending him money, he's paying it back.

What ideas do you have about how we can get middle-class working families that up-front money so they can weatherize, lower their fuel bill and save money in the long run? CHU: Well, a number of things. First, usually,

one is most motivated and has the capacity when they are buying a house. And we have in the toolbox -- I think it's HUD has energy mortgages, not widely appreciated and not widely known.

One way to stimulate that is encourage lenders. Lenders -- they ask for a person's income (inaudible) know they can pay the mortgage, of course. They ask for the property taxes because that's the cost of owning the house.

They ask for a lot of things. They ask for an engineer because they don't want their asset, the bank's asset, to fall down.

It would not be too much to say, why not get a structural and energy audit from the engineer and -- and to make a wiser home owner that can...

SANDERS: I agree, but it is not only people who are just purchasing a home.

CHU: Right.

SANDERS: You have people who have older homes in the state of -- will you work with us on this concept of on-bill financing, coming up with...

CHU: Yes.

SANDERS: ... loans that will be repaid as a result of lower billing?

CHU: Right.

SANDERS: I think it's a just win-win situation. Will you work with us on that?

CHU: Absolutely. Just very briefly, I think utility companies can play a role in this, as well.

SANDERS: Yes, they can.

CHU: OK? They have access to moderately low-cost capital.

SANDERS: Yes. That's correct. OK, thank you.

BINGAMAN: Senator Hoeven has arrived, but he has asked for a few minutes to review his notes. And I know that some of us have additional questions. I had one additional question, Mr. Secretary, that I wanted to ask, and then I -- we'll see if others do, as well. And then Senator Hoeven can ask his questions when he's ready.

I wanted to ask about the department's plans at Los Alamos national lab now that the chemistry and metallurgy nuclear facility has been put on hold. For a long -- for many years now, we've been told that the replacement nuclear facility was necessary. Now we are told there may be alternatives that the department wants to pursue. Could you describe what changes in operations and staffing you anticipate at Los Alamos now that the CMRR has been delayed?

CHU: Well, much of the staffing I don't think is directly -- so what we plan to do is go ahead and complete substantially the design of that building.

So what we have been putting in previously was mostly engineering design. We're going to get to perhaps 90 percent of the engineering design part of it. That's very prudent for a number of reasons, because before you start construction, it's best you have most of it designed.

But you're correct. We are now putting that on hold while -- because of the budget constraints of the NSA, we have to look at all the other projects, and we could not simply -- we felt we could not simply start CMRR and UPF, the uranium processing facility at Oak Ridge, and we felt there were more compelling reasons to begin that.

The -- we're looking at, ultimately, the plans we can consolidate. There's -- the footprint is there. There could be other parts of this. We are looking at -- as we look towards New START and beyond New START, whether -- you know, and working with the Defense Department as to what our requirements to fill our duties to the Defense Department the nucleus here will be.

And so as that gets worked out, that will be folded into it. So that -- so we'll essentially begin to complete the engineering design and then try to figure out how we can reposition, again because of the -- and what is different, as you all know, is that we have severe budget constraints and we do have a deficit.

BINGAMAN: But you -- but you are not real clear as to what -- what additional actions the administration would expect to take to meet its needs, the needs it was expecting to meet through the construction of this CMRR.

CHU: There -- yes, we're looking at some of the things that the CMRR building would have done -- would have done. We are looking perhaps to offload some of that to other -- for example, the -- I'm forgetting what the name of it was called. It used to be called the Nevada Test Ground. I'm -- they have a new name for that. Also, some issues in weapons.

So we are looking very closely at how we can best fulfill our obligations and needs for our nuclear security. We believe that -- so -- and our overall plutonium strategy. But there will be some CMRR in Los Alamos, we feel. But again, we don't know whether there are other options.

BINGAMAN: Let me ask Senator Hoeven, is -- are you ready for your questions before I ask others if they have a second round of questions?

HOEVEN: I am, Mr. Chairman. Thank you very much.

BINGAMAN: Why don't you go ahead.

HOEVEN: Appreciate it.

Mr. Secretary, good to see you again. Thank you for being here. I'd like to ask you a little bit about gasoline prices. I'm sure you're well aware that the average price for gasoline in the country right now is over \$3.50, according to both AAA and the Lundberg survey. That's up 90 percent since the current administration took office.

And so my question relates to, why aren't we advancing projects like the Keystone XL pipeline to provide more supply and help bring gasoline prices down? You were asked to review that project, or the Department of Energy was asked to review that project by the State Department.

And your expert, Dr. Carmine -- I'm going to probably miss on the last name. You might have to help me -- DiFiglio? Does that -- Dr. Carmine DiFiglio -- does that sound about right?

CHU: Sounds about right.

HOEVEN: All right. Anyway, he was asked to review the Keystone XL pipeline project and comment on it as to whether it would help reduce gas prices in the United States.

And I'll quote from his report. "Gasoline prices in all markets served by PADD I, the East Coast, and III, the Gulf Coast refiners, would decrease." "Gasoline prices in all markets served by PAD I on the East Coast, and III, the Gulf Coast, would decrease, including the Midwest." And that was by your expert, Dr. DiFiglio, Department of Energy, June 22nd, 2011.

So my question to you is, here we have rising gas prices putting a strain on our consumers, on businesses, on the economy, and yet the administration turns down a project that would help us reduce gasoline prices. Why is that?

CHU: First, let me say I'm not aware of this report, so I can get back to you on that. But it is my understanding that -- as I tried to explain, that the gasoline prices in the United States are affected by refined capacities and by access to those refiners.

The biggest bottleneck was the bottleneck from Cushing, Oklahoma, to Houston. That -- and there was a very large price differential of crude in Houston -- in Cushing versus in Houston. And so it -- that bottleneck is being taken care of by the pipeline -- the people who invest in pipelines.

And as that is being taken care of as we speak, there are numerous pipeline plans for enlarging that pipeline, and one pipeline is being reversed so that refined products from Houston and Louisiana can be then ported to the Midwest.

Another pipeline from Chicago to Cushing also in the -- is being built, as far as I know. So much of the pipelines in the United States that would bring oil from Wyoming, North Dakota, and to get the oil to the refineries that have the capacity so they (ph) don't (ph) back up, are being done in the private sector.

And so we think that this is on a path that is creating jobs, that is going to be helping. In the end, the gasoline prices, we are very concerned about, and the administration has taken, in addition to -- I mean, this pipeline

activity occurs because once you see big price differentials, the industry steps in and says, "Hey, we can fix that."

In addition to that, we are doing a lot -- for example, the -- twice we've changed the mileage standards of automobiles. This directly affects the American public. By 2025, the estimate is the fleet average would be saving on average Americans over the lifetime of that -- ownership of that car by \$8,000 in gasoline bills.

HOEVEN: Mr. Secretary, so you're saying that while you've been part of this administration, gasoline prices have gone up 90 percent. We're looking at \$4 gasoline by Memorial Day, maybe \$5 gasoline this summer.

You're saying you're willing to build all kinds of pipelines, but you're unwilling to build a pipeline that will bring 830,000 barrels in day into this country from our closest friend and trading partner, Canada, and will help alleviate a bottleneck in my state of North Dakota, where we now produce more than 500,000 barrels a day.

But our oil is now discounted \$27 a barrel, light sweet black and crude, off West Texas Intermediate -- \$27 a barrel we're discounted because we don't have the pipeline capacity to bring it down to the refineries. And we will put more 100,000 barrels a day in that pipeline.

Instead, we have to run trucks over the road. We have traffic fatalities. We have wear and tear on our roads. You just got done saying you're willing to build all these pipelines. Why not the Keystone?

CHU: The pipelines from Wyoming and North Dakota can be built. The administration actually has no -- there's not a decision the administration need make on that. These are -- this is all in American territory.

The only part of the pipeline the administration was -- the State Department was asked to weigh in on was the part that went from Canada to the United States. So specifically -- and the pipelines that I was talking about are actually helping bring the oil from your state down to those refineries. Those things are things where...

HOEVEN: That's not the case. I just explained to you the pipeline that would help us bring the oil from my state down to the refineries.

CHU: Well, my understanding is, if you look at the pipelines that exist today, and you look at the major, quote, "bottom lines (ph)" to the pipelines, those pipelines -- and we're talking now specifically about the part of the pipeline that goes from Canada into the United States. Those -- that is not the -- my people tell me that for the next decade or so, with the anticipated increase in production of Canadian oil, that that will not be the bottleneck.

Where we have a bottleneck now is in this Cushing to Houston. There's another bottleneck from Chicago. And there's also pipelines that go from that go your state to Chicago. And that pipeline goes from Chicago to Cushing. So those things are being built. So those are taken care of as we speak.

HOEVEN: I see I'm over my time, Mr. Chairman. I will defer for a second round, if that's the wishes of the chair.

BINGAMAN: All right. Why don't we go ahead with the second round.

Senator Murkowski, did you have questions?

MURKOWSKI: I do, Mr. Chairman. Thank you.

And thank you for your patience, Secretary. Several weeks ago, we had a presentation, EIA presented kind of the global picture. And I had an opportunity to ask Mr. Gruenspect his opinion on where Alaska natural gas fit into the bigger picture, as we talk about domestic natural gas.

Senator Wyden has on many occasions before this committee asked questions about the export of domestic product here. And you, as the secretary, have the authority to sign off on whether or not export is in the national interest.

The question that I had asked Mr. Gruenspect was whether or not, in his opinion, Alaska was viewed separately from the rest of the lower 48 market -- different type of gas, different processes, and clearly, a different market. Alaska is -- is much closer to the Asian market than we are -- most of the lower 48. It was good to get Mr. Gruenspect's opinion on it, but you're the guy that -- that ultimately signs off on export licenses.

How do you view Alaska's natural gas and whether or not this is something that would be viewed differently than the domestic -- the lower 48 natural gas domestic production?

CHU: Well, I -- given the charge of the act (ph) and the decisions we would have to make on allowing the export of natural gas, it would again have to be folded into what would be in the best interests of the United States.

MURKOWSKI: Certainly.

CHU: And so -- and you correctly pointed out that Alaska is in a different location. But we would have to fold all that in.

I actually don't know what Howard said, but it is very clear that before we license anybody as we deal with these applications, we also -- we just have to be very conscious of the fact that we -- we don't want to have a significant impact on the gas prices, again considering the benefit of the United States in its totality.

And so I really -- I can't comment on what is going to be the economics in Alaska. Yes, having said that, you know, we are -- you know, Alaska does have natural gas and...

MURKOWSKI: Lots of it.

CHU: Yes.

MURKOWSKI: Lots of it.

CHU: Right.

MURKOWSKI: And you know, we're still trying to figure out how we access that, and that's our challenge in the state right now.

But one of the things that we are looking at is the prospect of rather than sending it through Canada through an extraordinary transportation system, to move it through the state, liquefy it and move towards export.

It's not a decision that has been made yet. We've got a long way to go. But it is an issue where for us in the state, it is a very different market. It is a very different gas. And I look forward to the opportunity to speak with you more about that.

Just segueing here, we've also had the chance to talk about Arctic methane hydrates and the great potential that we have. I understand that methane hydrates are going to continue to be a part of the natural gas technologies R&D budget, which is good. We're not the only country, of course, that is working on this. We've got a good partnership going with Japan.

I guess the question to you on this is, right now, there is a -- they're scheduled to conduct major test up in the arctic in Alaska, in partnership with Japan on hydrate flows and pressures. I know DOE had hoped to follow up on this test.

So I'm wondering if you can tell me what the level of commitment is from DOE to continue this public-private -- the progress that has been made to advance the research in an area that I think we recognize holds great potential.

It may be further out in the distance than some of the technologies that are in front of us, but exciting if we can get there. So can you give me any updates?

CHU: Sure.

MURKOWSKI: And specifically the commitment that the DOE has to this.

CHU: Sure. We're going ahead with this test. It's -- it's (inaudible) Conoco Phillips Japan is very interested because they -- they have methane hydrate reserves off the coast. And as you noted, it can -- if -- if we -- if one could figure out how to extract it without plugging gas lines and all those other things, it would be -- it could be as significant or even far more significant than the technology that was developed for shale gas.

So -- so we are -- we're looking forward to the test. But the test is one part of a program going forward before -- quite candidly, before industry actually would want to begin to invest in it on their own. So again, it's this balance.

Right now, industry is not -- you know, they view methane hydrates more as something that plugs up their lines, rather than a potential source. And just like with shale gas, if it looks like it can be developed and industry gets invested in it, that's part of all our (ph) (inaudible) strategy, then they can take it over.

Right now, the program being done in Alaska is actually being directed by a DOE scientist, and so it is a research project. But it's just one part of that research project. After this stage, we see it continuing.

MURKOWSKI: Well, I think that's important because we recognize that, apparently, there's \$12 million now that's proposed in this budget for all methane hydrate research next year. It's my understanding that this test is going to -- is going to be more expensive. So the commitment then from DOE to continue that, I think, is going to be important. Again, we'll follow up on this -- this conversation. Thank you, Mr. Chairman.

BINGAMAN: Senator Wyden?

WYDEN: Thank you, Mr. Chairman.

And Secretary Chu, you've been a patient soul. You have sat in that seat for two-and-a-half hours. And as you can tell, up on this side of the dais, there are pretty diverse views with respect to energy, folks who care about wind and solar and folks who care about coal and nuclear. And so there is a wide variety of opinion.

And I wanted to ask you about an area that I think would be unifying and something that I think you, in particular, could champion, and that is energy storage. When you look at energy storage -- this is something that makes wind and solar, for example, more economic.

But it also is hugely beneficial to baseload technologies like coal and nuclear because it can help them meet their peak electric demand and it also helps the transmission system operate more efficiently.

So you've got something that is cross-cutting in terms of technology, literally benefits every corner of the country. In other words, I can't find a corner of the country that wouldn't benefit from it. And yet we haven't been able to get in place a clear strategy to tap the potential of energy storage.

A couple years ago, Dr. Kunin (ph), your science adviser, a very distinguished individual -- I asked him about energy storage. He said, "Well, we're going to wait and see what happens." And basically, we've gone through a variety of debates. I'm concerned, for example, that in the Office of Electricity in this budget, it looks like energy storage is cut.

But I want to set that aside and ask you what would it take to get you and the department to lay out for us a significant strategy to tap the potential of energy storage? I mean, it has the real potential for production and distribution. It's not consumption. It's almost the other side of the coin of energy efficiency.

And it could be something that would be backed by Democrats and Republicans. It would be cross-cutting in terms of technology, and yet, so little has been done to lay out an opportunity for real strategy here.

Could we persuade you to do that?

CHU: You don't have to persuade me. We are doing that. We -- this is one of the reasons why one of our hubs is an energy storage hub not only for automobiles but for utility. We made it very specific. And it's not only batteries, it's -- it's compressed air. It's thermal storage.

I just talked about how can you use nighttime energy to -- or process heat. Sometimes, when the wind is blowing, there's nowhere to take that electricity. You can put that into lots of kinds of storage, either -- you know, hydrostorage is something I've been pushing very hard to BPA (ph) to start doing, pump from one dam to another dam, so it is a minimal -- essentially, no environmental impact, but it's a form of storage.

And we have a target. You know, we know that energy storage at the megawatt and megawatt -- megawatt-hour scale would have incredible applications in the electricity distribution system.

It would make our electricity distribution system much more efficient because all the little ripples that -- you know, you have some -- a few major generating stations (inaudible) distribute out here, you purposely overfill today to -- to -- and if you had little batteries of, you know, kind of that size scale popped here and there, it would have a profound difference.

Right now, the energy storage is \$300, \$350 a kilowatt hour. At \$100, \$150 a kilowatt hour, it goes viral. And so energy storage for renewables, energy storage for making a more efficient distribution system, energy storages for a sounder, more robust grid are all part of that.

So we have a hub for that. We are trying to coordinate. We -- and we're not only looking at battery, we're looking at compressed air. We're looking at thermal storage.

WYDEN: Dr. Chu, if you could send me the document that reflects this strategy, that's what I'm really asking for because I follow this -- all I can see in terms of documents is the proposed cut in storage at the Office of Electricity. And I wasn't interested in debating that. What I wanted to see was something that would lay out a strategy.

As I said, I've gone back several years with Dr. Kunin and others, and we haven't seen such a thing. If can you get that to me, we'll discuss it back and forth. But what I really want to see here, that I think would be unifying in this committee, is an actual strategy so that everybody would understand what the potential is and where we want to go.

Thank you, Mr. Chairman.

CHU: Here -- just 10 seconds. Yes, the office of energy -- OE was cut because what we decided was it was much more appropriate -- it's increasing in RPE dramatically, in Office of Science and in ERE. And so we were trying to consolidate where -- where -- where we could think it would do the most good in terms of the level of program management. And so overall, if we gathered up all the pieces in energy storage, it's actually going up.

BINGAMAN: Senator Portman?

PORTMAN: Thank you, Mr. Chairman.

And to the question as to whether energy storage is part of efficiency, yes, it is, and part of using our system more efficiently.

Earlier, we talked about your commitment to a new enrichment technology that gives the United States the ability to get back on the cutting edge in terms of our technology, create great advance (ph) in manufacturing jobs but also be able to supply our energy needs, and from the national security point of view, to deal with our need for tritium for the nuclear arsenal, which comes from enriched uranium.

That tritium comes from domestic sources of enriched uranium, is that correct?

CHU: Correct.

PORTMAN: And is that the policy of this administration that we should have a U.S. source of low enriched uranium for tritium production at TVA?

CHU: It's not the policy. By treaty, we're obligated to have U.S. sources to create our tritium.

PORTMAN: So this is a requirement that we have a domestic source. With regard to other activities at Piketon, which you know has a huge campus -- and by the way, we'd once again extend an invitation to you to come out. I think you'd really enjoy seeing what's going on there and see the incredible work that's been done over the years at that plant.

But there is also a cleanup of the existing technology, which is a gaseous diffusion technology still being used at Paducah, but now at Piketon, through an effort that administrations through the years have supported, decontamination and decommissioning is going on. There are actually 1,950 workers involved with that. And I notice in the budget, and am very concerned about it, that there's a 33 percent cut there, from \$190 million to \$127 million. Will this reduction in funding allow the department to maintain the commitment that the department has made to accelerate a cleanup that was made, I think, back in 2009?

CHU: Well, we are looking very hard at this. And yes, there's a decrease in the budget. We are looking, again, at all our options, whether we can do some bartering, things of that nature. But again, we have to be very careful about whether that bartering will affect the markets.

And so we're trying to figure out, with the tools we have, how we can move that forward.

PORTMAN: Well, in the past, as you know, you have both bartered and sold some of your own stockpile of uranium to provide the additional funding and maintain that accelerated cleanup schedule. It seems to me that that would be the right way forward. When you say you need to analyze it more, what do you need to do?

CHU: Well, right now, we've already analyzed that if we introduced into the market something at 10 percent or below, that we feel safe that won't have a material impact on the markets. And we have not done -- we don't know what will happen beyond that. So...

PORTMAN: It sounds like you have done the analysis. You did it in 2011, and it went through the third quarter of calendar year 2013 and -- and that thing (ph) you found, as you say, no adverse impact for the level you were talking about.

CHU: Yes, the 10 percent market, yes.

PORTMAN: So I would hope that, having done that analysis, that we could move forward to give the folks at the plant some certainty and also just to maintain the cleanup schedule on an accelerated basis.

As I think you and I have talked about, I worked a lot when I was in the House of Representatives on the cleanup at Fernald, and in the end, we accomplished something great working with the Department of Energy on an accelerated cleanup.

It was initially opposed by some people, including folks who had jobs at the plant to maintain the status quo. But in the end, it saved the taxpayer somewhere between \$3 billion and \$4 billion by accelerated cleanup.

And so I know there is a temptation in these budgets to try to find savings, but I think this is a place where it would penny wise and pound foolish. In other words, I think for the taxpayer, it's definitely going to cost the taxpayer more over time if we get away from the accelerated cleanup.

So I strongly encourage you, Mr. Secretary, to look at that analysis again and provide the funding through the barter or sales to keep your commitment because I think it's the right commitment. I think it's good for taxpayers and good for the site and good for the high-tech jobs that are there.

CHU: Yes. Senator, we did do the analysis for barter and sales at the 10 percent level or below. Right now, we see (ph) us (ph) bumping up hard against that. If you want to ask us to do an analysis higher than 10 percent, we would be receptive, but I think Senator Barrasso's not here, but he might represent an alternate point of view because...

PORTMAN: That's why I'm asking you when he's not here.

(LAUGHTER)

PORTMAN: No, I think, seriously, the analysis done last year was, as I understand it, conclusive as to not having a market impact.

CHU: At the 10 percent level. But again, because (ph) of (ph) all our obligations, we're bumping up against that. So we would have to do another analysis to go higher.

PORTMAN: Well, are you committed to the accelerated cleanup?

CHU: We're committed to, with every (ph) means we have and the constraints we have, to do the best we can. And if you want to ask us to do another analysis, we'd be delighted to.

PORTMAN: Well, we certainly would appreciate that analysis, if that's what it takes to be able to keep the commitment, because I do think it's the right thing to do for the taxpayer.

And it's also the right thing to do, certainly, to keep on site a lot of highly skilled people who are otherwise going to be found without a job or moving on, and more difficult to bring them back to continue the good work they're doing.

The other issue, of course, is we're very interested in being able to take some of the materials out of the decontamination and cleanup effort and be able to recycle those materials, and we appreciate your continued cooperation with that effort.

I know there's a concern with some of the other agencies looking at the safety of that. But we think that that is an enormous benefit, again, to the taxpayer, and also through the processing, provides good economic opportunities for our region.

Thank you, Mr. Chairman.

BINGAMAN: Senator Franken?

FRANKEN: Thank, Mr. Chairman.

Thank you, Mr. Secretary, for your patience. I want to follow up on what Senator Sanders is talking about in terms of -- I call it retrofitting. And I've started a retrofitting initiative in my state called Back to Work Minnesota. And I really believe that this is low-hanging fruit, that we -- what I'm trying to do is innovate -- find innovative financing mechanisms to get that up-front money to retrofit commercial buildings, MUSH -- you know, municipals, universities, schools and hospitals, et cetera -- and residential buildings, knowing that it pays for itself and it puts people back to work.

It puts people in the building trades to work who are in depression or a recession right now. They need the work. It helps our manufacturers in Minnesota, and would do this all around the country. So I -- and it's sort of part of the president's better building initiatives, as well.

I'd like to just bring up a few little areas in this. You talked about utility companies can provide the financing for this. In Minnesota, we have a mandate for utility companies that they have to increase the efficiency of their users by 1.5 percent a year. This is a mandate that actually encourages the utilities to find retrofits or energy-efficient projects that they can help finance.

I was wondering if that -- do you think there could be -- if we legislated that as a national part of maybe the clean energy standard, if that would be helpful.

CHU: I'm not sure. I think -- obviously -- I don't know whether that has a chance of passing, quite frankly. But let me -- let me just say that...

FRANKEN: Let's say it did.

CHU: That would be helpful. Here's another...

(LAUGHTER)

CHU: Here's another thing that would be helpful. It happens now in New York and Massachusetts and California, maybe a couple of other states, if the regulatory agencies who set the rates say that the utility company gets an equal return on investment if they help a customer, a business, a home owner, and they loan them money to retrofit, that that is seen as an investment of the utility company, which they're entitled to a return on their investment.

Utility companies -- a highly rated utility company has access to fairly inexpensive capital.

FRANKEN: Yes. Yes.

CHU: And so they can -- so they're -- they're -- they became a bank for the business, for the home owner. So a moderate interest rate and -- but you -- you're entitled to recover for your investment in energy efficiency. So instead of building another power plant...

FRANKEN: Oh, exactly. I mean, that's the whole -- that's the whole -- that's why Minnesota put this in.

CHU: Right. Right. FRANKEN: Let me talk -- I have limited time -- PACE, Property Assessed Clean Energy financing. This is basically done for commercial buildings. We say a state or a county can lend money to a commercial building to do a retrofit. And sometime an ESCo gets involved in this.

And -- but some part of the financing can be this PACE, which puts a property tax on -- that even if the building gets sold, that property tax continues. And it's a great model.

And again, what I'm trying to do is just find financing models for this. On residential PACE, putting a property tax on doing a retrofit, to finance a retrofit, the FHFA will not give mortgages to a resident -- residential -- to a home with PACE because PACE would get paid back before the mortgage.

Do you think that's a wise policy by FHFA? and is there anything you could do, like, give -- I've written them a letter. Would you join my letter or would you...

CHU: Well, I've been talking to Shaun Donovan a lot about this, and he and I are trying to be as supportive as possible. I think the issue was that even -- the lenders don't want to even be *pari passu* -- take -- you know, let's say you loan \$200,000 to buy a home and the home owner wants another \$10,000 for home energy improvements and to be -- have equal footing in the payback.

The lenders are fighting back. And they say, No, we don't want to do that. You'll have to be high. That has to be -- the PACE is viewed as essentially a mortgage, and it has to be behind the initial mortgage. Even to get it even would be of great help.

And so we're trying to work this thing through. But the lenders really feel that nothing should stand in the way of them and the first mortgage.

FRANKEN: Well, very often, the lender would be the city or the county. And this is when someone's buying the house, but it may be when they're -- they've been in the house for a while. And it's just about making that home more efficient, and again, putting people to work, putting people to work who are in the building trades, people who are in the manufacturing, and making that home more energy- efficient and bringing down the cost of energy in the community.

CHU: I'd love to talk to you. The time is up.

FRANKEN: Yes.

CHU: And if the chair would indulge me a minute? There are a couple of other ideas we think are worth thinking about. On the commercial sector, there are real estate investment trusts.

FRANKEN: REITs.

CHU: REITs. And we feel that all we need is perhaps even just a clarification from Treasury to say (ph) if this Real Estate investment trust of a commercial building wants to invest in a new HVAC system or in more energy-efficient windows -- let's just say an HVAC system.

FRANKEN: OK.

CHU: Would you -- would you allow that to be written off, depreciated as a capital expenditure cost, as differentiated from a -- the depreciation rate for the building? And just a clarification of that I think would spur a lot of investment because these REITs quite often own office buildings, and they pay the energy bill because, you know, occupants come and go and they don't want to separately meter all the time. And it goes into the rent.

And so a very simple clarification could spur a lot of investment because it will make sense to them. It won't cost the government any money. But that would be good.

There are a couple of other things. I think if -- sometimes, retrofits, actually, there's a community, a block, that wants to do -- you know, a couple home owners get together and say -- you know, one has -- home owner has a good experience to say, you know, I'm saving a lot of money.

But now you can capitalize on that, have the block party, talk about it and make it a group (inaudible) thing. So if you get five people, eight people, to say, We will do this, but you demand a discount rate, a 30 percent discount on the energy audit and the installation and everything else -- because to the contractor, it's great.

They send a truck out and go, Bang, bang, bang down the -- so it's -- so that can greatly reduce the price of retrofitting and drive it up and actually get some social awareness in this, as well. But it's all about saving money by saving energy.

The finance part of that -- you know, if you lower the price by 20, 30 or 40 percent, the finance decreases. And I go back to utility companies -- companies that have access to low-cost financing -- moderate interest rate is a no-brainer.

You don't -- you're (ph) not out of pocket expenses. You're saving more in paying back the debt. You're saving -- you're saving -- the monies to pay back the debt is less than the money for your energy bill. And it is immediate jobs. And this is immediate jobs that could be for decades, right? It's going to -- we have 140 million homes.

FRANKEN: Right.

CHU: I think probably 80 million could use an energy uplift -- facelift, or whatever you want to call it. And -- and so there are many things that we are mulling about and trying to get programs. And we have a number of programs to -- those are some of the ideas we're talking about, also to stimulate state and local governments to think of better ideas.

Again, a lot of this can be driven by the private sector because... FRANKEN: Absolutely. Absolutely.

CHU: ... energy efficiency does save money.

FRANKEN: Absolutely. It doesn't need government money, just needs...

(CROSSTALK)

FRANKEN: Can my office work with your office? Because right now, I've written down REITs and house parties.

CHU: Yes. Block parties.

FRANKEN: Block parties. That's what I meant. Block parties. I'm glad you corrected me. Thank you.

(LAUGHTER)

FRANKEN: Thank you, Mr. Chairman.

BINGAMAN: Thank you.

Senator Hoeven, you have the final questions.

HOEVEN: Thank you...

BINGAMAN: Assuming nobody else wanders in here, which I very much hope...

FRANKEN: I'd like a third round on block parties.

(LAUGHTER)

BINGAMAN: We'll schedule that for the week after Christmas. Go ahead, Senator. Hoeven.

HOEVEN: Thank you, Mr. Chairman.

And again, Mr. Secretary, thank you for being here. You've been out to our state I think several times. We appreciate it. We'd like to have you back.

But I really am looking for help on this vitally important issue of energy infrastructure. In your -- in our last question and answer period here, we went through pipelines. And you said, Well, we're trying to build all these pipelines.

CHU: Well...

HOEVEN: And you talked -- if I could finish? You talked about all these pipelines we're trying to build around the United States. So my question to you is if we're -- and you'll acknowledge that there's thousands of pipelines under the entire country.

So why are we unwilling to build a pipeline that will bring crude in from Canada and will help us move our crude in the country? Why is that?

CHU: Well, first, we're not unwilling. The president's position and the State Department's position, not the DOE's -- we're not in the decision-making loop. We were asked to give technical advice on certain things, but -- is that they wanted an evaluation of the environmental impact.

The pipelines that are being built in the country are investments of the private sector. And I see a lot of healthy movement in the pipeline construction within the United States in large part because of the ability to get oil from shale-like rock.

This is a big boom in your state, and you got to get that oil to the refineries. And this is also wealth creation and it's decreased oil dependency, all good things.

The private sector is the one that's investing (inaudible) pipelines. And that's what (inaudible) The only time the government actually steps in is -- is -- well, there's FERC issues, but -- but in terms of the one you're worried -- concerned about is the one that goes across the border, and then again, that's the State Department issue.

HOEVEN: Right. If I may, Mr. Secretary, you've brought up two great points. Your technical advice -- again, Department of Energy, this administration's Department of Energy -- the report I cited says that the Keystone XL pipeline will lower gas prices -- not may, will lower gas prices, East Coast, Gulf Coast, even in the Midwest.

In addition, in that report also says that -- it concludes that the PADD III refiners, the Gulf Coast refineries, will likely consume additional Canadian oil sands well in excess of what would be provided by Keystone XL pipeline -- again, your experts.

The reason I cite this is because some have said, Well, we'll bring it in from Canada and then export it somewhere else. But your own experts have said that it will be used here, and we're going to need more, not less. So it won't be exported.

So again, on your technical advice, you've said -- the Department of Energy -- that it'll reduce prices and it'll be used here, not exported -- your experts.

So I appreciate your technical advice. I think it's very good. And I compliment you for it and I thank you for it.

Second, private sector investment -- this is a \$7 billion private sector investment, the Keystone XL pipeline, not one penny of government spending. So again, I go back and say, given that it would bring us more crude, which we otherwise have to get from the Middle East or Venezuela -- and you know what's going on in the Middle East -- and it helps us with the bottlenecks.

We have a \$27 a barrel crude in my state, unbelievable traffic up there which -- because of truck traffic and so forth, oil trucks, that we'd like to use a pipeline for. So not only do we have discounts for our producers, not only do we have infrastructure problems, we have the consumer and businesses paying \$3.52 -- I think it's \$3.52 a day (sic), the highest it's ever been this time of the year in our country, which hurts our economy.

Why would we conceivably allow this? I don't understand it, when you said we're willing to build pipelines. It -- it -- I don't understand.

CHU: Well, Senator, I don't know the particulars. I mean, usually, when you have trucks -- trucks are a short-term interim solution to a region if you expect the same oil production. They're very expensive, as you well know, as well as being very disruptive. And...

HOEVEN: I agree.

CHU: And so -- Which is why we need the pipelines.

HOEVEN: And so again, if we're talking about the trucks in North Dakota and Wyoming, the private sector -- I don't know the particulars about this, but I think once you see a lot of truck traffic, that's almost the last resort. You know, it goes pipeline, then it goes rail, and the last is truck.

HOEVEN: Mr. Secretary, I'm looking for help here. Frankly, your experts have been helpful. And they've been right on the money -- literally. They have. They've reported this thing straight up, and I appreciate it.

Maybe we conclude with -- as you know, in our state, when we talk about all of the above energy development, we don't just talk about it, we do it. If you go to our state, you'll see wind. You'll see biofuels. You'll see ethanol. You'll see biodiesel. You'll see shale gas. You'll see oil, the Bakken. You'll see hydro, biomass, all of these. In other words, we're really doing it.

But the reality is, to get to that, all of the above, that means we have to try to develop all of them, not pick winners and losers. So I'm looking for help in this endeavor.

Let's touch for just a minute on in situ. And Mr. Chairman, I may go over my time just a minute. I hope you'll indulge me. With the development of the Canadian oil sands oil, 80 percent of the new development is in situ, where instead of excavating, as is the traditional practice, you actually drill like you'd drill for conventional oil. You put steam down a hole, and so forth. And so your greenhouse gas emission is the same as for conventional drilling, right?

So talk to me in terms of what -- with Canada, the United States and some help from Mexico, we produce about 70 percent of our crude. We add Keystone, we immediately go to 75 percent. Plus, and we have the opportunity for much more. We then don't have to rely on the Middle East and Venezuela. Eighty percent of the new development is in situ, which is the same footprint as conventional. Why wouldn't we be trying to do all of that that we can?

From an energy standpoint, from the concept of North American energy independence, isn't this a plan that gives us the opportunity to truly get to all of the above? And why aren't we doing it? How can you help us get this done?

CHU: Well, again, first, in -- I agree that in situ is environmentally much preferred than the open pit mining that started with the oil sands...

HOEVEN: Right.

CHU: ... because it leaves a lot of the really gunky stuff that we don't want down in the ground...

HOEVEN: But 80 percent of new development is in situ.

CHU: I understand this. It's still a little bit more carbon- intensive because you're using fossil fuel to heat up the steam. But having said that, it is much preferred than open pit mining.

Again, it's not a question of "Why don't we." This is where industry's going because as they develop those sands, they're finding that they're going to have to go deeper, and it doesn't make sense economically (inaudible) open pit mining.

There's also the environmental cleanup issues that they have to face when you have that open pit mining. And so the in situ recovery is much more desirable. It's...

HOEVEN: And you address that problem, too, with in situ, correct?

CHU: Again, because you're using natural gas to heat up the steam, that is going to cause more carbon. But the refining issues are much easier. All sorts of issues are easier.

HOEVEN: Thank you, Mr. Chairman. I appreciate it. I appreciate you being here.

BINGAMAN: Secretary Chu...

(CROSSTALK)

HOEVEN: Secretary. Excuse me.

CHU: Yes.

BINGAMAN: Yes, you've been very generous with your time. And we appreciate you being here. So that will conclude our hearing.

CHU: All right. Thank you.

UNKNOWN: Thank you, Mr. Chairman.

END