

# CURRENT ENERGY BILLS

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HEARING  
BEFORE THE  
SUBCOMMITTEE ON ENERGY  
OF THE  
COMMITTEE ON  
ENERGY AND NATURAL RESOURCES  
UNITED STATES SENATE  
ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

ON

<b>S. 679</b>	<b>S. 3251</b>
<b>S. 2900</b>	<b>S. 3396</b>
<b>S. 3233</b>	<b>S. 3460</b>

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JUNE 15, 2010



Printed for the use of the  
Committee on Energy and Natural Resources

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U.S. GOVERNMENT PRINTING OFFICE

62-133 PDF

WASHINGTON : 2010

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## CURRENT ENERGY BILLS

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TUESDAY, JUNE 15, 2010

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, DC.*

The subcommittee met, pursuant to notice, at 2:30 p.m. in room SD-366, Dirksen Senate Office Building, Hon. Maria Cantwell presiding.

### OPENING STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. The hearing will come to order.

This is a U.S. Senate Committee on Energy and Natural Resources Subcommittee on Energy hearing. I appreciate our witnesses being here today.

This is a legislative hearing by the subcommittee to consider 6 bills that are on the committee's legislative calendar, and these bills cover a range of energy-related topics under the purview of the Department of Energy that include S. 3460, the 10 Million Solar Roofs Act, introduced by Senator Sanders. The bill would require the Secretary of Energy to provide the funds to States for rebates, loans, and other incentives to eligible individuals and entities for the purchase of installation of solar energy systems.

S. 3396, the Supply Star Act, introduced by Senators Bingaman and Lincoln. The bill would establish a program within the Department of Energy to identify and promote practices, companies, and products that use energy efficiently—highly efficient supply chains to conserve energy, water, and other resources.

S. 3251, introduced by Senator Carper, who is with us today. This bill would improve energy efficiency and the use of renewable energy by Federal agencies.

S. 679, introduced by Senator Collins, who is also with us today. This bill would establish a research and development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles.

S. 2900, the Gas Turbine Efficiency Act, introduced by Senator Gillibrand. This bill would establish a research and development technology demonstration program to improve the energy efficiency of gas turbines.

Finally, S. 3233, the Surplus Uranium Disposition Act, introduced by Senator Barrasso. The bill would amend the Atomic Energy Act of 1954 to authorize the Secretary of Energy to barter,

transfer, or sell surplus uranium from the inventory of the Department of Energy.

The purpose of this hearing is obviously to collect testimony from the Department of Energy and others, but we are fortunate to have 2 of our colleagues here, Senator Collins and Senator Carper. They are here today to talk about the bills they have introduced and are sponsoring. So, we welcome them to the committee.

I will turn to my colleague, the ranking member Senator Risch, when he shows up, for an opening statement. But now I would like to turn to 2 of our colleagues and start with you, Senator Collins. Thank you for being here and to give testimony on your bill.

**STATEMENT OF HON. SUSAN M. COLLINS, U.S. SENATOR  
FROM MAINE**

Senator COLLINS. Thank you very much, Madam Chairman.

Madam Chairman, members of the committee—particularly my neighbor from New Hampshire, Senator Shaheen—I want to thank you very much for holding this hearing today to consider a number of bills that have been introduced, including one that I have introduced with my colleagues Senator Feinstein and Kohl. It is called the Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act.

Our bill would accelerate the research for plug-in hybrid technologies for heavy duty trucks. In 2008, truck operators in Maine and around the country were hit hard by increases in the price of diesel fuel. While, fortunately, there has been some relief, it is likely that as our Nation recovers from the recession, the demand for and prices of diesel fuel will once again increase.

Given that our Nation relies so heavily upon the trucking industry to keep our economy running by providing timely delivery of everything from food, manufactured goods, raw materials, and other products, we must develop alternatives that make the industry less susceptible to dramatic changes in oil prices. That is also obviously important for the overall well-being of our economy, and of course, since the transportation sector uses up so much imported oil, it is important that we explore technology to reduce our dependence on foreign oil.

Hybrid power technologies offer the tremendous promise of reducing this critical industry's dependence on oil. Trucks consume large amounts of our imported fuels. Successfully transitioning trucks to hybrid power technology would reduce our Nation's oil consumption and thereby improve our energy security.

The bill that I have introduced directs the Department of Energy to expand its research and advance the energy storage technologies to include hybrid trucks, as well as passenger vehicles. Current hybrid technology works well for cars that can be made with lightweight materials and travel for short distances.

But trucks need to be constructed with heavy materials commensurate with the heavy loads that they carry. If they are going to be successful as hybrid plug-in vehicles, then they must be able to travel relatively long distances between charges. Thus, advances in battery technology are needed to make plug-in trucks commercially viable, and that requires more advanced technology than is required for passenger cars.

Under our bill, grant recipients would be required to complete 2 phases. In phase one, the recipients of Federal funds must build a plug-in hybrid truck, collect the data, and then make performance comparisons with traditional trucks. Recipients who show promise in phase one would be invited to enter into a phase 2 competition, where they must produce 50 plug-in hybrid trucks and report on the technological and market obstacles to widespread production.

The bill would also establish 2 smaller programs to deal with drive-train issues and the impact of the wider use of plug-in hybrid technology on the electrical grid. In total, the bill would authorize the expenditure of \$16 million for each of the next 3 fiscal years.

Madam Chairman, as you well realize, we need a comprehensive approach to modernize commercial transportation in the 21st century. To date, a lot of that effort has focused on smaller cars, on passenger vehicles, and not on heavy trucks. The purpose of my bill is to advance the research and the technology to focus on that sector of transportation, heavy trucks.

I believe that the bill that we have introduced, our bipartisan approach, is one vital piece of the puzzle as we move forward to secure our Nation and to reduce our dependence on imported oil. So, again, I thank you for your tremendous leadership in this area and for holding today's hearing to look at a variety of bills, including the one that I have introduced with my 2 colleagues.

I urge the committee to proceed and get the advice from the Department of Energy, and I hope you will report the bill soon.

Thank you.

Senator CANTWELL. Thank you, Senator Collins. Thank you for being here. This is a very important issue. We have had testimony before the full committee before that our dependence on Middle East oil could be reduced in half if we just did 2 things—focus on renewables and on lightweight materials.

So, I really appreciate that, and I think our national laboratory in the Northwest, the Pacific Northwest Lab, has done a lot of work on this lightweight material for heavy duty trucks. So we will look forward to the outcome of this demonstration.

Senator COLLINS. Thank you.

Senator CANTWELL. Thank you for being here.

I am going to call on my colleague Senator Carper next, but we have been joined by 2 of our other colleagues who also have bills before the committee today. So once we are done with that, I will turn to you if you want to make a statement about your legislation.

So, Senator Carper, welcome. Thank you for being here.

**STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR  
FROM DELAWARE**

Senator CARPER. Thank you, Madam Chair.

Senator Barrasso, Senator Shaheen, Senator Sanders, thank you for this opportunity you provided for us and for the good work that you are doing on these issues and related issues across the board.

Today, I want to chat for just a few minutes with you, if I could, about some important opportunities to help our Federal Government to cut our energy bill, save taxpayers some money, and benefit the environment at the same time.

Over the past several months, the Homeland Security and Government Affairs Subcommittee, which I am privileged to chair, held hearings to examine how the Federal Government can lead by example in being more energy efficient.

Now we learned, among other things, that the Federal Government is the single largest user of energy in our Nation. For example, in fiscal year 2008, the total energy consumption of Federal Government buildings and operations was roughly 1.5 percent of all energy consumed in the U.S., 1.5 percent.

The energy bill for the U.S. Government that year was almost \$25 billion. With a price tag that large, our subcommittee believes there has got to be some significant opportunities for savings.

That is why I introduced legislation. We call it the Improving Energy Efficiency and Renewable Energy Use by Federal Agencies Act of 2010.

Senator SANDERS. How do you abbreviate that?

Senator CARPER. The acronym is—we have no acronym, but we are looking for one, I am sure.

[Laughter.]

Senator CARPER. My legislation, our legislation consists of really a series of proposals that I believe will allow the Federal Government to take greater advantage of clean energy and energy efficiency opportunities that exist today.

Already, many Federal agencies are pursuing some of these ideas and technologies to reduce the amount of energy that they consume and reduce their air pollution footprint. Many of the provisions in the bill adopt those good, common-sense ideas.

For example, some agencies are entering into what we call “power purchasing agreements” with private sector energy production companies. As you may know, these agreements allow a company to build and to operate and produce privately funded renewable energy on Government land, like an unused portion of a military base, in exchange for cheaper electricity for their Federal agency.

This means an agency can reduce the cost of its energy use and help clean up our air by promoting renewable energy, all without spending a single taxpayer dollar. As far as I am concerned, that is not a bad way to do business.

Currently, only the Department of Defense can enter into long-term power purchase agreements. Civilian agencies are restricted to only 10-year agreements. Long agreements usually mean cheaper energy costs for the agency. That is why our bill allows longer-term agreements not just for DoD, but for all Federal agencies.

The bill also requires Federal agencies to consider and to adopt new computer and software operations that use less energy. Recently, we learned that the Department of Veteran Affairs did this, and the agency plans to save about \$32 million over the next 5 years as a result.

Our bill also establishes a \$500 million revolving fund to provide financial support for Federal agency energy efficiency and renewable projects. This fund would increase the number of agency energy efficiency projects, such as new heating and cooling systems, which save on operations costs. Money from energy savings from



the projects would be paid back into the fund over time and eventually fund additional projects.

I am also interested in adopting some common-sense ideas from the private sector. There is an old saying you may have heard. “You can’t manage what you can’t measure.” It can easily be applied to energy use. During our subcommittee hearings, we learned that with digital technology, we can save energy and money by monitoring the energy used in buildings—even machinery in the buildings—in real-time.

For example, Walmart already uses this technology because of the financial savings that it brings. So from their headquarters in Bentonville, Arkansas, Walmart knows—literally knows—if a freezer door has been left open at their store in Middletown, Delaware.

The Federal Government, I think, can and should do the same kind of thing. The best part about deploying advanced metering is the fact that those investments can pay for themselves literally in less than a year.

These are, I think, some excellent ideas. They are not really original ideas. In some cases, they are being practiced by one agency or another, and frankly, we just think that not just the Department of Defense should have the opportunity to do these longer-term agreements for the power purchases. Not just the VA should be finding ways in saving \$30 million some a year and changing the way they power down their computers when they are not being used.

We would like to see a lot of agencies do this sort of things. We think these are good ideas and can reduce our Government’s energy consumption and reduce, at the same time, our Federal budget deficit.

I look forward to working with this subcommittee and this committee as you examines our legislation. I believe that it will help the Federal Government, our Federal Government to lead by example and demonstrate to the American people that energy efficiency efforts can pay real dividends, both in saving money and in preserving our environment.

Thank you.

[The prepared statement of Senator Carper follows:]

PREPARED STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM DELAWARE

Let me begin this morning, Mr. Chairman, by thanking you and Senator Burr for holding this hearing on S, 1801, the First State National Historical Park Act. I particularly want to thank you, Mr. Chairman, for cosponsoring this legislation and for allowing me to appear before you today to discuss it with you.

As you know, this legislation, if adopted, would establish the first national park in the State of Delaware, the only state in the Union which is home to neither a national park or even to a unit of the national park system.

Some of you may recall, the story of “America’s Best Idea”—the National Park System—that was told last year to a national television audience by the renowned documentary film maker Ken Burns, who coincidentally grew up in Delaware as a youth.

Along with Ken Burns and many of the millions of people who viewed that documentary, I share the belief that national parks are, indeed, one of our nation’s very best ideas.

National parks are an invaluable resource for understanding our nation’s historic and cultural heritage, as well as its natural environment. Every year, millions of Americans plan their vacations around our nation’s national park system.

I remember fondly my own family’s trip several summers ago to Denali National Park in Alaska. And, our two sons will never forget their cross-country road trip

along the northern route from Boston to San Francisco last summer, an adventure that took them to places like Mt. Rushmore, Yellowstone and Yosemite.

In planning our family's summer vacation several years ago, we logged onto the National Park Service web site and searched state by state for ideas. When we came to our own state—Delaware—our search turned up empty.

That's right. The first state to ratify the Constitution, the first state in the Union, the first state in which Swedes and Finns came ashore in what was to become America, and the place where the Dutch built an ill-fated settlement over 400 years ago—Delaware—remains the only state to have no national park.

For almost a decade, hundreds of Delawareans have joined me in working to change that.

After four years of research and planning that involved Delaware state officials, community leaders and citizen activists, we unveiled a proposal for a Delaware National Park in 2004.

In 2006, thanks in part to the work of this Committee, Congress authorized the National Park Service to study the need for a park in Delaware. The National Park Service used our 2004 proposal as the starting point for their study.

In January 2009, the National Park Service finalized its study and agreed that—at long last—a park should be created in Delaware.

In its study, the National Park Service recommended a national park that celebrated Delaware's early Dutch, Swedish and English Settlements and the events leading up to the state's role in the founding of our nation.

This brings us to today's hearing and to the First State National Historical Park Act which I'm pleased to report has been cosponsored by each member of our state's tiny congressional delegation.

The First State National Historical Park Act uses a majority of suggestions from the 2009 National Park Study to authorize a national park to be created within Delaware.

If approved, our state's national park will be comprised of sites associated with early settlement and with the people and events leading up to Delaware's role as the first state to ratify the U.S. Constitution on December 7, 1787.

The Park will tell the story of the birth of our nation in a unique way not found in any other National Park.

The park's central headquarters will be located along the Delaware River in the historic Town of New Castle, just a stone's throw from a statue of William Penn who deeded the land to the inhabitants of the town of New Castle in 1701."

Once a national park unit is established in Delaware, families from throughout America—and all over the world—will have the opportunity to learn from the National Park Service's website of the rich, historical heritage of the First State.

And, who knows? They just might decide to pay us a visit; much like my own family did when we chose to spend an unforgettable week or two visiting Denali and other parts of Alaska.

In closing, I would note that the word "Denali" translates loosely to mean "the Great One." That enormous park is several times the size of my state.

While visitors to Delaware are not likely to remember us as "the Great One," they may well end up returning to their own homes with lasting memories—fond memories—of the "Small Wonder" along the Eastern Seaboard of our nation that helped to launch the most enduring experiment in democracy that the world has ever known—the United States of America.

Senator CANTWELL. Thank you, Senator Carper.

We have had much discussion about Federal agencies leading the way and a specific goal to be met. So we appreciate your legislation today and your leadership on it.

Thank you for being here.

Senator CARPER. Yes. Thank you so much.

Senator CANTWELL. Senator Sanders, would you like to make a statement about S. 3460?

**STATEMENT OF HON. BERNARD SANDERS, U.S. SENATOR  
FROM VERMONT**

Senator SANDERS. I would, and thank you very much, Madam Chair. Thank you for allowing me to bring forth our amendment and say a few words on it.

The amendment is called the 10 Million Solar Roofs Act, S. 3460. It is being cosponsored by Senators Specter, Whitehouse, Cardin, Gillibrand, Boxer, Leahy, Lautenberg, Stabenow, Casey, Merkley, Harkin, Menendez, Kaufman, and Kerry. The bill is supported by the Solar Energy Industries Association, the National Association of State Energy Officials, the Sierra Club, Environment America, and other groups.

Madam Chair, Thomas Edison said in 1931, "I put my money on the sun and solar energy, what a source of power. I hope we don't have to wait until oil and coal run out before we tackle that." 1931, no wonder that guy invented so many things. He was a pretty smart guy.

Later, the solar cell was invented in the United States. Since then, however, Germany, Japan, and Spain have installed more solar than we have. India and China have each announced plans to develop 20,000 megawatts of new solar by 2020. In other words, solar is exploding all over the world.

Every megawatt of solar means at least 24 jobs and passing the 10 Million Solar Roofs legislation would send a clear signal that the United States is serious about winning the race for solar jobs by creating the largest market for solar energy right here in the United States of America.

The bill would create 30,000 megawatts of new solar energy and hundreds of thousands of new jobs while reducing greenhouse gas emissions by the equivalent of taking 6 million automobiles off the road. The legislation sets a goal of 10 million solar properties in the United States in 10 years. If you think this is ambitious, consider that in 1952, 1952, a commission formed by President Harry Truman predicted that we could have 13 million solar roofs by the 1970s. That was way back then. But today, we just have about 250,000.

This bill achieves the 10 million solar goal in part by providing funds through States to help consumers, businesses, schools, and other entities with the purchase and installation of solar. This flexible approach allows States to decide the best strategy for deploying more solar by utilizing Federal funds along with their own State and local incentives and loan programs.

This builds on California's Million Solar Roofs program, which set a goal of 3,000 megawatts of solar over 10 years and offers rebates for solar purchases and installations. California is on track to meet its goals. In fact, there is a whole lot of demand for assistance from the State to achieve these goals.

For example, as part of that program, investor-owned utilities had a target of 1,750 megawatts of new solar by 2016, and to date, they have more than 700 megawatts installed or pending. It is clear that we have huge potential for solar in this country, and 92 percent of the American people want our country to develop more solar. I think every day that we look at TV and we see what is going on in the Gulf Coast, that number goes up and up.

A report by the New Rules Project found that every single State in this country could produce at least 11 percent of their electricity from rooftop solar panels using existing roof space. The National Renewable Energy Lab has found the cost, discounting any incentives, of photovoltaic panels decreased 30 percent, went down 30

percent between 1998 and 2008, but also found the costs to install solar are even lower in other countries like Germany and Japan that have more megawatts of solar.

We need to do more, as Secretary Steven Chu has said, to drive down the upfront cost so consumers can purchase affordable solar energy and lower their energy bills. The 10 Million Solar Roofs bill helps to do exactly that by providing incentives to ramp up solar production and installation, further driving down costs as we achieve a greater scale.

I look forward to working with my colleagues on the committee to add this bill to a comprehensive energy legislation.

Thank you very much, Madam Chair.

Senator CANTWELL. Thank you, Senator Sanders.

As I was preparing for the hearing today, I found out more about your legislation. So I would like to add my voice to it and ask that you add me as a sponsor to the legislation.

Senator SANDERS. Thank you very much.

Senator CANTWELL. Thank you.

Senator Barrasso, would you like to give a statement about S. 3233?

**STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR  
FROM WYOMING**

Senator BARRASSO. Thank you very much, Madam Chairman. I would.

Madam Chairman, the Department of Energy controls roughly 150 million pounds of uranium. The uranium is a valuable resource, and it is owned by the American people.

In 2008, the department approved a plan to manage its excess uranium. The plan provided a roadmap for the efficient management and responsible disposition of excess uranium. The plan was intended to maximize the return on this valuable asset. It was also intended to ensure that Department of Energy sales do not undercut the domestic nuclear fuel industry.

Last year, the department announced a proposal to transfer between \$150 million and \$200 million worth of excess uranium in fiscal year 2010. Additional transfers valued at \$450 million were planned over the next 3 years. The proposal ignored the department's own management plan.

Forcing too much uranium onto the market puts jobs in the entire uranium industry in jeopardy. It also undercuts the department's ability to get fair market value for the uranium that they are trying to sell. Members of Congress and Congress as an institution recognized the problem.

The 2010 energy appropriations bill directed the Government Accountability Office "to undertake a review of the department's oversight and implementation strategy of the proposal, including an evaluation of the department's overall uranium management plan." Fortunately, the department has now backed off its plan.

In testimony earlier this year before this committee, Secretary Chu acknowledged that the proposed uranium transfers did create significant problems for domestic uranium producers. This admission is evidence that the department continues to struggle with responsible management of its uranium stockpile.

Now this is not the first time that the Department of Energy has struggled with managing its uranium stockpile. In 2006, the Government Accountability Office concluded that the Department of Energy had actually broken the law, bartering Government-owned uranium for services.

This is why I have introduced this bipartisan bill with Senator Ben Nelson. Companion bipartisan legislation has been introduced by a number of members of the House of Representatives. The goal of this bipartisan bill is simple—to codify the uranium management plan that was issued in 2008.

We need to improve the Government's management of its uranium stockpile. This bill is important for jobs, jobs in Wyoming and jobs across the country. It will also improve certainty and transparency for the department's uranium stockpile. Finally, it will ensure the American taxpayer gets fair market value for this important asset.

So I look forward to hearing the department's testimony. I look forward to moving this bipartisan bill through Congress.

Thank you, Madam Chairman.

Senator CANTWELL. Thank you, Senator Barrasso. Thank you for being here to discuss this legislation.

Now we are going to proceed to the members of the administration who are here to give testimony.

I would like to welcome Mr. Steve Chalk, who is the chief operating officer and Acting Deputy Assistant Secretary for Renewable Energy at the Office of Energy Efficiency and Renewable Energy at the Department of Energy, and Mr. Shane Johnson, who is the chief operating officer of the Office of Nuclear Energy at DOE.

So if you would both like to come up to the witness stand, and I think you are both going to give us some remarks about the department's views on these various pieces of legislation.

**STATEMENT OF STEVEN G. CHALK, CHIEF OPERATING OFFICER, ACTING DEPUTY ASSISTANT SECRETARY FOR RENEWABLE ENERGY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY**

Mr. CHALK. Thank you, Madam Chairman and other members of the subcommittee.

Thank you for the opportunity to appear before you today to discuss the proposed clean energy legislation. We at the Department of Energy share the subcommittee's goals of strengthening our economy, enhancing our energy security, and protecting our environment.

The department and the subcommittee have had a long, productive relationship. In addition to my appearance here today to discuss these pieces of legislation, I also commit to working with the subcommittee further as you continue to consider clean energy legislation on the way to the floor.

The 5 bills related to energy efficiency and renewable energy on the agenda cover a range of topics and technologies, and it is clear that even where there are some particular differences, the department shares the intentions and the spirit of virtually all of them.

While there are detailed remarks on each bill in my written testimony, I would like to comment briefly on a few key points. First

of all, the department shares the goal of 10 Million Solar Roofs Act. Like the bill's sponsor, we are committed to the widespread deployment of solar energy systems on homes and businesses. The DOE would like to work with this subcommittee to ensure that, if passed, this legislation provides us with the flexibility to achieve this goal.

In particular, we suggest that the DOE be given the flexibility to adjust the cost share requirements in order to leverage Federal funding. We also are open to innovative programs to promote photovoltaic installations throughout the country.

Second, the DOE welcomes the Supply Star Act of 2010 as a next step to our existing supply chain initiatives. While we do have concerns regarding the term "Star," as we want to maintain a clear distinction between the Energy Star brand, we commend Chairman Bingaman for introducing this bill to maximize supply chain energy reductions.

Supply chain energy reductions can make an important contribution to the overall industrial efficiency and competitive position of domestic suppliers. Analysis suggests that a large part of the carbon footprint for many consumer products can be attributed to the supply chain, from raw material extraction to processing, transport, packaging, all the way to the consumer, including recycling of the product.

Presently, DOE encourages manufacturing companies to engage their supply chains in energy and carbon management. We look forward to providing companies with further tools to make production as efficient and clean as possible.

So, in the interest of time, I will conclude my oral statement with these remarks, but I am happy to answer questions on any of the 5 bills related to energy efficiency and renewable energy.

I especially want to recognize Senator Collins's testimony on the heavy duty RD&D bill and Senator Carper for trying to help us expand the toolkit that we have available in the Federal Government to expand renewable energy and to reduce our energy use.

Once again, we support the intent of all of these bills, and we look forward to working with the subcommittee on these and other issues. I thank you for your time and look forward to your questions.

[The prepared statement of Mr. Chalk follows:]

PREPARED STATEMENT OF STEVEN G. CHALK, CHIEF OPERATING OFFICER, ACTING DEPUTY ASSISTANT SECRETARY FOR RENEWABLE ENERGY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Madam Chairman, Ranking Member Risch, and Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss proposed clean energy legislation.

The Department and the Subcommittee share common goals of strengthening our economy, enhancing our national security, and protecting our environment. As part of the Recovery Act, the Office of Energy Efficiency and Renewable Energy (EERE), oversees a total of \$16.8 billion in investments. To date, EERE has obligated 96 percent, or \$16.07 billion, of its Recovery Act funds. The funds are putting America to work laying the foundation for our clean energy future. The Department also appreciates the authorities you have provided in recent years in the Energy Policy Act of 2005 (EPAAct) (P.L. 109-58) and the Energy Independence and Security Act of 2007 (EISA) (P.L. 110-140). This year, the Committee has proposed further investment and we thank you for all your hard work in reporting the American Clean Energy Leadership Act (S. 1462).

Today, I am pleased to offer the Department's perspective on five pending pieces of legislation related to energy efficiency and renewable energy. Note that many of the authorities outlined in the bills would simply reinforce existing authorities, and may not be necessary for the Department to carry out the activities in question. I will discuss them in the order listed in the hearing invitation letter I received from the Subcommittee. These include the 10 Million Solar Roofs Act of 2010 (S. 3460), the Supply Star Act of 2010 (S. 3396), the Improving Energy Efficiency and Renewable Energy Use By Federal Agencies Act of 2010 (S. 3251), the Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act (S. 679), the Gas Turbine Efficiency Act of 2009 (S. 2900).

#### S. 3460: 10 MILLION SOLAR ROOFS ACT OF 2010

We thank the subcommittee and the sponsor of this legislation for your strong leadership on solar technologies over the years. The Department's goals for solar electric technologies are to be cost competitive in their respective markets by 2015 and to reach a high penetration of solar installations. The Department is investing \$232 million in 2010 to support solar research across the development pipeline, from basic photovoltaic (PV) cell technologies to manufacturing scaleup to total system development. Within the \$232 million, DOE is investing up to \$50 million in concentrated solar power technology development and deployment related activities and \$23 million to understand how solar technologies can be better integrated within existing electricity generation and transmission systems. In solar hot water heating, DOE is investing approximately an additional \$6.5 million in 2010.

The proposed legislation incorporates several significant features. We believe that rebates, loan programs, and performance based incentives are all effective means of stimulating demand. Allowing states to choose between these incentives will enable the Act to expand existing state programs that have been effective in promoting solar installations. In addition, the states' matching funds requirements will leverage available federal appropriations and increase the resulting deployment of solar technologies, both of which are high priorities for the Department.

To maximize the effectiveness of the proposed legislation, we would recommend two changes. First, while we support the state match requirement, we propose that the cost share be set at 50 percent to increase the potential leverage of federal funds. Second, the Secretary should be given the ability to reduce this as necessary to increase the overall effectiveness of the program. We also believe the program could be designed in a creative way such as working with municipalities to promote photovoltaic installations through innovative local programs.

We note that by our estimates, the \$250 million authorized for FY 2012 would yield roughly 100,000 rooftop solar systems, and may not be sufficient to put us on a trajectory to meet the goal of 10 million solar roofs. With these changes, the legislation could be an effective tool in increasing deployment of solar electricity technologies Nationwide. We note that existing authorities, such as the competitive portion of the state energy program, would allow DOE to undertake such a program already.

#### S. 3396: SUPPLY STAR ACT OF 2010

Supply chain energy efforts can make an important contribution to overall industrial efficiency and the competitive position of domestic suppliers. Analysis suggests that a large part of the carbon footprint for many consumer products can be attributed to the supply chain—from raw materials, transport, and packaging to the energy consumed in manufacturing processes—on the order of 40 to 60 percent<sup>1</sup>.

The Supply Star legislation seeks to build upon existing best practices in the industrial community by establishing a voluntary recognition program that supports and promotes products and companies with highly energy- and resource-efficient supply chains.

DOE and the Environmental Protection Agency (EPA) both have existing initiatives that address supply chain efficiency, such as Save Energy Now® at DOE and the Smart Way Transport™ program at EPA. The legislation should coordinate with and leverage these programs as a structure through which Supply Star activities could be conducted. For example, through its national Save Energy Now® initiative, DOE encourages manufacturing companies to engage their supply chains in energy and carbon management. Specifically, DOE develops processes and resources to assist companies in promoting energy management to their industrial suppliers and customers. Save Energy Now® LEADER Companies make a voluntary commit-

<sup>1</sup> Source: Climate Change and Supply Chain Management, McKinsey Quarterly, McKinsey & Company, July 2008.

ment to reduce their energy intensity by 25 percent in 10 years. Many of these companies are interested in improving the efficiency of their supply chains as well.

The Supply Star bill also builds upon Superior Energy Performance (SEP), a voluntary certification program working to provide industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. A central element of SEP is implementation of the forthcoming International Organization for Standardization (ISO) 50001 energy management standard, with additional requirements to achieve and document energy intensity improvements. DOE is working through SEP to bring ISO 50001 to the U.S. Upon its expected publication in 2011 this American National Standards Institute-accredited program will provide companies with a framework for fostering energy efficiency at the plant level and a consistent methodology for measuring and validating energy efficiency and intensity improvements. This new framework will be an important tool to integrate into supply chain efforts.

S. 3251: IMPROVING ENERGY EFFICIENCY AND RENEWABLE ENERGY USE BY FEDERAL AGENCIES ACT OF 2010

On October 5th, President Obama signed Executive Order 13514 requiring Federal agencies to set GHG emission reduction targets, increase energy efficiency, reduce fleet petroleum use, conserve water, reduce waste and promote environmentally-responsible produce purchases by federal agencies. With this action, the President directed agencies to demonstrate the Federal government's commitment, over and above what is already being done, to reducing emissions and saving money.

As a whole, the Federal government has made significant progress in meeting the energy requirements of EISA 2007 and EPAct 2005. Further progress on these efforts would be bolstered by S. 3251. The Department is particularly supportive of provisions clarifying the definition of allowable "renewable" energy sources, and authorizing the creation of a revolving fund for Federal facility energy efficiency and renewable energy projects.

The Department looks forward to working with the Subcommittee on legislation that would provide agencies with the flexibility to purchase renewable energy for appropriate time periods, that do not exceed asset life, create appropriate risk sharing between project developers and taxpayers, and that recognize the importance of fiscal responsibility and Congressional Budget Office scoring of contracts. This authority would provide opportunities for more on-site renewable power at Federal agencies and would provide strong support for growing our domestic clean energy economy.

The Department's recommended definition of renewable energy follows the definition in section 203 of EPAct 2005, with an additional recommendation to allow for both electric energy and thermal energy from renewable sources. It is very important to allow thermal energy to count as renewable energy, particularly because renewable thermal energy sources such as ground source heat pumps are often the lowest-cost option for displacing purchased energy and are already widely deployed. This approach contrasts with the current definition which is limited only to "renewable electricity," a definition that reduces incentives for this valuable and cost-effective form of renewable power.

The Department fully supports the creation of a revolving loan fund based on best practices and subject to appropriate interest rates for Federal facility energy efficiency and renewable energy projects. There is considerable experience and success at the state and local level with using revolving loan funds to assist innovative projects to improve energy efficiency. In addition, there is Federal experience with a similar concept within the General Services Administration (GSA) that funds agency relocations, and agencies reimburse the fund at slightly above costs to gradually increase the amount of funds available for lending.

Federal agencies are already responding to the requirements of EISA Section 432 to survey their facilities for potential energy efficiency and renewable energy upgrades, as well as to complete energy audits and to report on measures taken. The Department recommends that the renewable energy facility surveys called for in S. 3251 Section 5 should be included as a modification of EISA Section 432.

DOE's Federal Energy Management Program is already at work implementing provisions similar to the Federal energy management and data collection standard called for in S. 3251 Section 7. As required under EISA Section 432, DOE will publish overarching guidance for implementation of all Section 432 requirements in 2010. The Department is also developing a web-based tracking system for facility-level energy data and identified or implemented energy conservation measures per EISA. Tasking the GSA to deploy a similar publicly-available resource with facility-



level energy data would create redundancy as the Department's compliance tracking system will be deployed for use by all agencies in July 2010.

S. 679: HEAVY DUTY HYBRID VEHICLE RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT

The program authorized by S. 679 would complement several of the Department's current activities focused on increasing vehicle energy efficiency. One of those programs is the SuperTruck Program, in which DOE is seeking to improve the freight hauling efficiency of Class 8 trucks by 50 percent. Other complementary efforts underway include: (1) the development of hybrid school bus technology; (2) research, development, and demonstration of medium-duty utility bucket trucks and passenger shuttles using a plug-in hybrid electric system; and (3) other medium and heavy duty truck deployment activities supported by our Clean Cities program. S. 679 has the potential to increase the fuel economy attainable by vehicles in this sector.

There are several technical definitions and reporting requirements about which we would like to seek clarification, and the Department looks forward to working with the subcommittee on those provisions.

S. 2900: GAS TURBINE EFFICIENCY ACT OF 2009

The Gas Turbine Efficiency Act would establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems.

The Department believes that industry has economic incentives to invest in research, development and demonstration to increase the efficiency of gas turbines. To the extent that the private sector underinvests in basic research, DOE has sufficient authority and existing programs to improve high temperature materials applicable to a range of energy technologies.

The bill is similar to an existing successful program within DOE. The Advanced Turbine Systems Program, a research, development and demonstration collaborative between the Department's Offices of Energy Efficiency and Renewable Energy and Fossil Energy, successfully developed and deployed advanced turbine material and coating leading to today's turbine efficiencies.

The legislation outlines activities DOE already performs. For example, through its Industries of the Future (crosscutting) investments, DOE's Industrial Technology Program (ITP) aids the development of advanced manufacturing processes for the expanded use of lightweight materials such as titanium. Those breakthroughs help to drive production cost down and market impact up. In other efforts, ITP promoted advanced alloys of steel to support many of the new clean energy products being developed today. Nanocoating technologies are still another group of innovations developed with the assistance of ITP that now extend the life of tooling systems and provide wear resistance to reduce the cost of manufacture and extend the useful life of products. All of these efforts support the overarching objective of reducing the energy intensity of Industry to help advance the Administration's energy security and environmental performance goals.

The Department is committed to continuing research of high temperature materials which will help industry develop more efficient energy technologies. Meanwhile, the private sector has economic incentive to invest in the development and demonstration of efficient gas turbines. Therefore, private sector work on later stages of efficient natural gas turbine development and demonstration will likely be conducted without the need for additional funding authorizations beyond that already in place.

In conclusion, the Department of Energy thanks the Subcommittee for the opportunity to comment on these proposed initiatives. We look forward to working with Congress to develop strong, effective clean energy policy to ensure U.S. leadership on these global issues and in the clean energy economy.

Senator CANTWELL. Thank you, Mr. Chalk.  
Mr. Johnson.

**STATEMENT OF R. SHANE JOHNSON, CHIEF OPERATING OFFICER, OFFICE OF NUCLEAR ENERGY, DEPARTMENT OF ENERGY**

Mr. JOHNSON. Thank you.

Madam Chairman, members of the subcommittee, I appreciate the opportunity to appear before you and comment on legislation under consideration by the committee and to provide the information on the Department of Energy's management and disposition of its excess uranium inventory.

The administration views nuclear power as an important element in its strategy to increase energy security and combat climate change. A strong domestic nuclear industry supports the expansion of clean, carbon-free nuclear energy in the United States.

To date, the Department of Energy has awarded conditional commitments for loan guarantees for the construction of both a new nuclear power plant and a new uranium enrichment facility, and the department is considering additional loan guarantee applications in both of these areas.

In my written testimony, I have provided details on the department's excess uranium inventory and how the department manages that inventory. The department is committed to managing its excess uranium inventory in a manner that complies with all applicable legal requirements, maintains sufficient uranium inventory to meet current and reasonably foreseeable mission needs, undertakes transactions with nongovernment entities in a transparent and competitive manner unless the Secretary of Energy determines in writing that an overriding DOE mission need dictates otherwise, and supports pursuit of our climate and energy goals while at the same time supporting departmental missions and objectives.

With my remaining time, I would like to offer a few comments on the Surplus Uranium Disposition Act of 2010. The department understands that S. 3233 seeks to facilitate an orderly management and disposition of the department's excess uranium in support of a strong domestic nuclear industry. We believe certain provisions of the bill, while well-intentioned, may work against meeting that objective and would complicate the department's ability to meet its own missions.

We are especially concerned that the technical amendment at the end of the bill would revise the definition of "commission" in Section 11(f) of the Atomic Energy Act to mean Nuclear Regulatory Commission rather than Atomic Energy Commission. This provision would result in a major change, which we believe was unintended, in how the Government deals with nuclear energy matters.

This provision would effectively strip the department of its authorities under the Atomic Energy Act and transfer them to the Nuclear Regulatory Commission. This change would, in effect, undo the Energy Reorganization Act of 1974 and go back to the situation that existed when the Atomic Energy Commission was responsible for implementing all of the authority under the Atomic Energy Act.

Other provisions of the bill are inconsistent with the concept of competition in sales or transfers, and some provisions potentially conflict with existing contractual commitments currently held by the department's National Nuclear Security Administration and the Office of Environmental Management. In considering the management and disposition of the department's excess uranium inventory, a variety of factors need to be assessed, including the mission needs of the department, energy security, and the flexibility to be responsive to a changing uranium market.

The department is committed to managing its excess uranium inventory in a manner that is consistent with and supportive of a strong domestic nuclear industry, while at the same time supporting departmental missions and objectives.

Thank you again for the opportunity to testify today. I look forward to answering your questions.

[The prepared statement of Mr. Johnson follows:]

PREPARED STATEMENT OF R. SHANE JOHNSON, CHIEF OPERATING OFFICER, OFFICE OF NUCLEAR ENERGY, DEPARTMENT OF ENERGY

#### INTRODUCTION

Thank you, Madam Chairman, Ranking Member Risch, and Members of the Subcommittee. I appreciate this opportunity to appear before you and comment on legislation under consideration by the Committee, as well as to provide information on the Department of Energy's management and disposition of its excess uranium.

The Administration continues to view nuclear power as an important element in its strategy to increase energy security and combat climate change. A strong domestic nuclear industry supports the expansion of clean, carbon-free nuclear energy in the United States. To date, the Department of Energy has awarded conditional commitments for loan guarantees for the construction of both a new nuclear power plant and a new uranium enrichment facility, and the Department is considering additional loan guarantee applications in both of these areas. The Department also sees the necessity of managing its excess uranium inventory in a manner that is consistent with and supportive of the maintenance of a strong domestic nuclear industry achieving our climate and energy goals while at the same time supporting Departmental missions and objectives.

#### EXCESS URANIUM INVENTORY

To start, I would like to provide the Subcommittee with an overview of the Department's excess uranium inventory. The Department of Energy holds a significant inventory of uranium that exceeds government needs. This inventory contains uranium in various forms and includes highly enriched uranium ("HEU"), low enriched uranium ("LEU"), natural uranium, and depleted uranium hexafluoride, all of which must be actively managed. The natural uranium equivalent contained in this inventory corresponds to about three years of supply for current U.S. nuclear power plants. The uranium held in this inventory is a valuable asset both in terms of its monetary value and in the role it could play in achieving vital Departmental missions and maintaining a healthy domestic nuclear fuel infrastructure. However, a significant amount of this inventory requires further processing before it is considered marketable. The long lead times anticipated for processing some of our uranium materials would reduce the annual amount of uranium that could enter the market.

For non-proliferation reasons, the Department already has an active program for downblending much of its excess HEU into LEU. The Department will continue to downblend HEU to promote non-proliferation objectives.

The Department's current excess uranium inventory also contains a considerable amount of natural uranium in the form of uranium hexafluoride. This uranium meets commercial-grade specifications and does not require further processing to be marketable. Some of this is domestic natural uranium that was declared excess to U.S. defense needs while other quantities were purchased from Russia to support the U.S.-Russia HEU Purchase Agreement.

The excess uranium in the Department's inventory also includes depleted uranium hexafluoride that was generated from the government's prior uranium enrichment activities. Making this depleted uranium hexafluoride useable could require considerable processing, depending on the uranium's form, assay level, and degree of contamination. Some of this material—especially that with higher assay levels or about 10 percent of DOE's total inventory of depleted uranium hexafluoride—is potentially marketable subject to the market price of uranium.

#### MANAGEMENT OF EXCESS URANIUM

Next, I will describe how the Department manages its excess uranium inventory. DOE's Office of Nuclear Energy (NE), Office of Environmental Management (EM), and the National Nuclear Security Administration (NNSA) are the organizations within DOE responsible for the Department's excess uranium inventories. These of-

ices coordinate the identification of transactions that are planned or under consideration, or that may be considered by DOE in the future, for disposition of DOE's excess uranium consistent with the following principles.

First, the Department has broad authority under the Atomic Energy Act (AEA), as amended, to loan, sell, transfer or otherwise utilize its inventories of depleted, natural and enriched uranium. In exercising this authority, the Department must act consistently with other relevant statutory provisions, including the National Environmental Policy Act and section 3112 of the USEC Privatization Act. Section 3112 imposes limitations on certain specified transactions, including the sale and transfer of natural or enriched uranium to certain domestic end users of material from the Department's inventory. Under this section, the Secretary must determine that a proposed sale or transfer of natural or LEU, with the exception of certain sales to select non-commercial entities or for national security purposes, "will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industry." We often refer to this procedure as a "Secretarial Determination."

Second, the Department should maintain sufficient uranium inventories at all times to meet the current and reasonably foreseeable needs of Departmental missions.

Third, the Department undertakes transactions involving non-U.S. Government entities in a transparent and competitive manner, unless the Secretary of Energy determines in writing that overriding Departmental needs dictate otherwise.

Fourth, the Department believes, as a general guideline, that the introduction into the domestic market of uranium from Departmental inventories in amounts that do not exceed 10 percent of average annual domestic demand (approximately 2,000 metric tons of uranium or 5 million pounds of U3O8) in any one year period should not have an adverse material impact on the domestic uranium industry. In fact, the 10 percent guideline was one of industry's recommendations regarding the Department's management of its excess uranium.

The disposition of excess uranium is anticipated to take at least 25 years, consistent with the time envisioned for completing the decommissioning and decontamination of the gaseous diffusion plant sites where much of the excess uranium inventory is stored and for dismantlement of nuclear weapons removed from the national security stockpile. The Department anticipates that in any given year it may introduce less than that amount into the domestic market and that in some years it may introduce more, particularly for national needs.

While the 10 percent guideline appears to be a reasonable rule of thumb, the Department is not exempted from conducting analyses of the impacts of specific sales or transfers on the market prior to entering into these sales or transfers. It is important to note that the Department will assess each and every proposed uranium transaction in the context of all current and other planned DOE transactions.

In July of 2009, the Department announced that it would transfer uranium to USEC Inc. in exchange for accelerated cleanup services to be performed at the Portsmouth Gaseous Diffusion Plant. The subsequent Secretarial Determination placed a limit on this transfer of no more than 300 metric tons of uranium per quarter for a total of 1,125 metric tons of uranium over the combined calendar years 2009 and 2010. In light of this transfer, the Department decided not to conduct additional sales or transfers of uranium it had planned to carry out during calendar years 2009 and 2010 and limited its transactions to the 1,125 metric tons for the accelerated cleanup at Portsmouth and the amount of NNSA's committed transfers related to the blend down of HEU. As a result of coordination among EM, NNSA, and NE, the Department's total actual transfers for 2009 were 3.1 percent of average U.S. reactor demand in 2009 ramping up to 6.6 percent in 2010, significantly less than the 10 percent guideline.

The Administration is seeking an increase of \$184 million in Congressional appropriations for FY 2011 in lieu of bartering uranium for environmental cleanup at the Portsmouth site. Secretary Chu, in testimony at the Senate Energy and Natural Resources Committee's hearing on DOE's FY 2011 budget in February, stated that the Department favors a budgetary approach over bartering uranium to fund environmental cleanup at the Portsmouth site.

#### COMMENTS ON S. 3233

It should be clear from the preceding comments that the Department is committed to managing its excess uranium inventories in a manner that: (1) complies with all applicable legal requirements; (2) maintains sufficient uranium inventories at all times to meet the current and reasonably foreseeable needs of DOE missions; (3) undertakes transactions involving non-U.S. Government entities in a transparent

and competitive manner, unless the Secretary of Energy determines in writing that overriding DOE mission needs dictate otherwise; and (4) supports achieving our climate and energy goals while at the same time supporting Departmental missions and objectives.

The Department understands that the Surplus Uranium Disposition Act of 2010, S.3233, also seeks to facilitate an orderly management and disposition of DOE's excess uranium to support a strong domestic nuclear industry. We believe certain provisions of the bill, while well intentioned, may work against meeting that objective and would complicate the Department's ability to meet its own missions. We are especially concerned that the "technical amendment" at the end of the bill would revise the definition of "Commission" in section 11f of the AEA to mean "Nuclear Regulatory Commission" rather than "Atomic Energy Commission." This provision would result in a major change, which we believe was unintended, in how the government deals with nuclear matters and effectively strip DOE of its authorities under the AEA and transfer them to the Nuclear Regulatory Commission. This change would, in effect, undo the Energy Reorganization Act of 1974 and go back to the situation that existed when the Atomic Energy Commission was responsible for implementing all of the authority under the AEA.

Other provisions of the bill are inconsistent with the concept of competition in sales or transfers, and potentially conflict with NNSA and EM commitments.

#### CONCLUSION

In considering the management and disposition of the Department's excess uranium inventory, a variety of factors need to be assessed, including DOE's mission needs, energy security, and the flexibility to be responsive to a changing uranium market.

Thank you for this opportunity to testify before you. I look forward to answering your questions and working with the Committee to achieve the Administration's goals of utilizing our valuable uranium assets in a manner that meets energy security needs, reduces the nation's carbon emissions, and supports skilled jobs for American workers.

Senator CANTWELL. Thank you, Mr. Johnson. Again, thank you, Mr. Chalk, for being here.

I wanted to start with S. 3460. Mr. Chalk, the 10 Million Solar Roofs Act proposes to distribute funds to States to incent solar energy systems using the State Energy Program allocation formula. I know that the DOE inspector general released a report finding that the SEP program and ARRA funds were meant to go toward additional solar in Florida and were used instead.

So is it your view that this report raises questions about whether that is the most appropriate mechanism for this?

Mr. CHALK. First of all, let me explain what happened in Florida. Florida had approved State energy programs in place for the solar rebate program back to 2008 and 2007. It was so successful that it was oversubscribed, and the State did not have enough money to pay the rest of the rebates.

When it was offered as an activity in the Recovery Act funding, Florida first chose to complete the rebates to the people that had already subscribed. The DOE did approve that, and measures have been put in place so that does not happen again, so we do not use Recovery Act dollars for something that has been done in the past and essentially does not create jobs.

Hopefully, when those people got their rebate, that they put that money back into the economy and created jobs somewhere along the way. But it was a very successful program, oversubscribed.

I think the State Energy Program is one route. There are some issues possibly with the formula, where it is partly based on previous funding. We may want to look at that. There are other opportunities to use the Energy Efficiency Conservation Block Grant formula (EECBG), which is much more based on population, overall

population and daytime population, I think the intent of the overall legislation is to scale this as much as possible, get it out into many communities as possible.

So I would prefer the EECBG mechanism. I would definitely prefer SEP or EECBG over competitive solicitation. Competitive solicitation is good, but I think it provides unfair advantage to the States that are already ahead in solar energy. I think, again, the intent of the legislation is to scale this as much as possible and to have deployment nationwide, not just in some of the leading States.

Senator CANTWELL. One of the barriers, obviously, to the deployment of great distributed generation is our process of interconnecting to the utility grid. Would you consider something where States would be required to streamline their interconnection procedures for small distributed solar before they could access the funds?

Mr. CHALK. Yes. In fact, I think we ought to have standards so there are ways of doing solar right in terms of working with utilities—for instance, net metering. You mentioned interconnection standards, but net metering is something else that should be a condition of the funding, any other best practices that come into play. Obviously, we want folks to leverage this money as much as possible.

Senator CANTWELL. OK. Changing to S. 3396, on the Supply Star program, I am aware that the Department of Energy made some good progress in tracking some of the supply chain efficiency issues. Can you give us an idea how that we might grow this for the future, how this bill might complement those efforts that DOE has already been undertaking?

Mr. CHALK. Right now, we have Save Energy Now program, where we have folks volunteer to sign up for 2.5 percent improvement or reduction, if you will, in energy intensity per year. So over 10 years, that could be as much as 25 percent and really help industry on their bottom line. We help them do energy audits. We help them baseline their energy use.

As Senator Carper said, if you can't measure it, then you really don't know how much you are using. So we spend a lot of time working with the American standards associations and, in fact, international standards associations so we know we are measuring the energy for various processes in the right fashion.

So I think we would use our existing programs to complement this effort, which I think is more expansive. Again, it is more cradle to grave, if you will, looking at the whole process, beginning with extraction all the way to recycling, where our current efforts are mainly dependent, we are looking at process efficiencies in the plant itself, not looking at where the materials are coming from or the packaging thereafter or how consumers use the product.

So this legislation we support because it is more expansive of our current programs, but we could use a lot of the tools developed in our current program to help industry decrease their energy use.

Senator CANTWELL. Thank you.

Senator SANDERS, did you have questions?

Senator SANDERS. Thank you, Madam Chair.

Mr. Chalk, my impression is if we look at California, if you look at New Jersey, if you look at Florida, I could tell you even begin-

ning to look at Vermont, there is a lot of pent-up demand for solar, that given the opportunity, people and building owners want to move in that direction. Would you agree with that?

Mr. CHALK. Absolutely. I think those demand-side programs—and this is a demand-side program—have definitely worked. We have the excess supply capacity to produce these solar cells and modules so these types of programs will really help multiply the number of installations throughout the U.S.

Senator SANDERS. Right. As I understand it, Secretary Chu has said that he wants to see the cost of solar come down significantly within the next 10 years. Would I be right in assuming that if we create all kinds of demand all over this country that you are going to see efficiencies of scale and installation in terms of driving down prices for solar? Is that a fair statement, do you think?

Mr. CHALK. It is. I think with these subsidies, if you will, rebates, we can be competitive in a lot of markets, at least on the retail side. If you also have a robust R&D program, which we do—we have an investment of over \$200 million in solar—we will continue to do the R&D to bring the cost curve so that hopefully in the near future we do not need these subsidies.

Senator SANDERS. Right. As you know, because we have worked with DOE on technical feedback for this legislation, our bill authorizes \$250 million for the first year as a down payment of sorts toward fully funding this program over 10 years. In our text, we provide this funding to the States to complement existing State and center programs.

In your judgment, are there other approaches we can consider in terms of getting maximum leverage for the \$250 million while maintaining a flexible approach that works with States and localities to deploy more solar power?

Mr. CHALK. Yes, there are. As I mentioned, one route is the State Energy Program. There is another formula program, the block grants. But the real key is leveraging this can be combined with revolving funds and other types of financial instruments where we can bring in private sector money and make the Government money go even further.

Senator SANDERS. OK. Give us some case histories, if you would, about what approaches have been most successful up to now at the State level or in other Nations to help consumers purchase and install solar.

Mr. CHALK. The actual cash rebates has probably been the most successful. When you look at renewable energy under the Recovery Act programs known as 1603, you see that even developers who are putting in wind turbines or wind farms, solar farms are preferring the cash in lieu of the tax credit in that program. So I think the cash rebate has been the most effective.

The key, though, and I think we will get into this when we talk about the Federal energy use, is renewable energy in general, higher first cost, but of course, the fuel is free. So you can amortize that first cost over many years through different financial mechanisms, and you can do that on solar through purchase power agreements—a lot of Government installations have done that, a lot of businesses have done that—then it can be very affordable.

Senator SANDERS. The price of photovoltaics are going way down. I think there is an argument right now that in terms of concentrated solar, large utility-size solar projects, in terms of producing energy, they are competitive or cheaper, I should say, than nuclear right now. In terms of photovoltaics, when do you see them becoming competitive with other, more mature forms of energy?

Mr. CHALK. I believe that we still need about a factor of 2 for photovoltaics in order to start being competitive with more conventional means. Right now, with subsidy programs, we can compete with retail rates, but not generation of power at the source. It is still going to take another factor of 2, possibly 3, to come down.

Senator SANDERS. But we are making some progress in that area?

Mr. CHALK. We are making tremendous progress. In the last decade, I would say that we cut the cost essentially in half.

Senator SANDERS. OK.

OK, Madam Chair, thank you very much.

Thank you, Mr. Chalk.

Senator CANTWELL. Thank you, Senator Sanders.

Senator BARRASSO.

Senator BARRASSO. Thank you, Madam Chairman.

Mr. JOHNSON, if I could, I want to talk a little bit about the proposed uranium transfers. You know, in February, the Secretary testified during the Fiscal Year 2011 budget hearing that the department is not going to move forward with the proposed uranium transfers in 1911 and 1912 and 1913, and that was good news.

Then I got a letter from the Secretary that raised some questions. That was in April 2010. I can get you the letter. He said a separate secretarial determination would be required later regarding possible transfers of uranium to fund decontamination and decommissioning activities at the Portsmouth plant after Calendar Year 2010, and I know you are familiar with the situation there.

That statement to me appeared to leave the door open a little bit to moving forward with the previous plans. Are you still considering the proposed uranium transfers in 1911 and 1912 and 1913 relating to that, do you know?

Mr. JOHNSON. No, sir. I do not believe we are. I believe, as Secretary Chu testified on the department's appropriations request, that the department is seeking about \$180 million in appropriation for funding the cleanup at the Portsmouth plant. He would prefer the direct appropriation as opposed to any type of material barter.

Senator BARRASSO. I think I would agree completely with preferring that approach. If that appropriation doesn't come through, though, would you fall back on additional uranium sales?

Mr. JOHNSON. I believe we will just have to look at it when that time arises. I cannot speak to it one way or the other.

Senator BARRASSO. They wanted to go with the ramp-up, the original plan for the ramp-up, the Department of Energy's excess uranium management plan included that for future sales and transfers gradually increasing the amount of uranium put into the market. Made sense to me and 2013 reaches I think 5 million pounds, which is 10 percent of the market.

The gradual ramp-up was included to ensure that the department's sales didn't really have a negative impact then on the Amer-



ican uranium industry or on the cost, the value of that Government-owned uranium. But looking at that 4-year Portsmouth plan, I just have concerns that that initially was going to ignore the ramp-up as well, now that we have drawn back from those 3 years.

So I just want to make sure that the department recognizes that that ramp-up idea shouldn't be discarded with this sort of an increase.

Mr. JOHNSON. Yes, sir. The department is very aware of the sensitivity of the impact that we could have in the commercial marketplace. The guideline limit of 10 percent that the department has been using as its benchmark was actually a recommendation from the industry themselves that the department has embraced and is using.

I believe in 2009, the transfers, including the barter for the Portsmouth material, worked out—that, NNSA worked out to be about 3.1 percent, and I believe those transfers here in calendar year 2010 amount to about 6.6 percent. So we are working to maintain our impact at below that 10 percent guideline.

Senator BARRASSO. Good. Right now, the United States currently imports about 90 percent of the uranium that we use in American nuclear power plants. So we do have vast American uranium reserves. We continue to be somewhat dependent on foreign countries for the feedstock for our nuclear energy.

So my question is does the department consider domestic uranium production important for America's energy security?

Mr. JOHNSON. Yes, sir. We do.

Senator BARRASSO. So it would make sense then that the department wouldn't want to force too much uranium on the market, which would perhaps push the envelope to the point that it impacts American jobs and American energy?

Mr. JOHNSON. Yes, sir.

Senator BARRASSO. OK. Thank you.

Thank you, Madam Chairman.

Senator CANTWELL. Thank you, Senator Barrasso.

Can I go back to S. 3251, which is Senator Carper's bill, and I understand that power purchase agreements are used, the Department of Defense is allowed to enter into long-term contracts, up to 30 years, while other agencies are just 10. So, Mr. Chalk, do you know how many power purchase agreements are in place within the Federal Government, and does the administration support extending the length of time beyond 10 years?

Mr. CHALK. Yes. Right now, for renewable energy, there are about eight purchase power agreements in place, four of those eight are out at the National Renewable Energy Laboratory. A few others are in the Defense Department, like the Nellis Air Force Base.

We do support the bill, and again, I want to make sure the subcommittee understands this is a good tool. Again, the first cost is really what we are trying to overcome with renewable energy. Since the fuel is free, it becomes very predictable to say with relatively low risk what the cost of electricity is going to be over a 20- or a 30-year period.

Now, having said that, on mature technologies, wind turbines, for instance, we feel very comfortable. While on other technologies, where we are still bringing down the cost curve, we would not want

the Federal Government to enter into a long-term agreement and then have the solar R&D be successful and pay higher prices over time, paying higher electricity rates than what the market might bear. That would be one concern we would like to address with the subcommittee, as well as between DOE and the subcommittee and the Office of Management and Budget.

The other issue with the PPAs, of course, is how they are scored by the Congressional Budget Office. Even though it may be over a 20- or 30-year period, it is all scored in year one. Of course, that can be a lot—in the billions of dollars. So another issue that we would like to work with the subcommittee on is how the PPAs are actually scored.

We do think it is a better tool than current energy saving performance contracts, which you can enter in for renewable energy. We believe that there is much lower finance costs associated with PPA's. So, essentially, it is a much lower risk instrument than some of the tools that are available to us now for renewable energy.

Senator CANTWELL. I wonder what BPA says about purchasing contracts? I mean, being an entity, I would be curious to see. So you are basically saying there are some issues here with the length of time. You would generally like to increase it beyond 10 years, but there are issues here? Is that a fair characterization?

Mr. CHALK. Beyond 10 years, but there are a few issues that we would like to work with the subcommittee on so that the deals we enter into, we establish pretty hard, rigorous criteria so that we are purchasing electricity at the market rate or lower through these long-term instruments.

Senator CANTWELL. OK. If I could go to the heavy duty vehicle research legislation? Now I know we have a couple of different programs, or Senator Stabenow has introduced 2843, which would provide a new structure for medium and heavy duty trucks. The department, as I mentioned before, I know conducts research with regards to heavy duty truck fuel and efficiency.

So can you give us a sense of how the current authority and this bill and other proposals would fit together?

Mr. CHALK. We start with Senator Collins's bill, which is more narrowly focused than Senator Stabenow's. But Senator Collins's bill is focused on an area of our portfolio that is a little underwhelming. We do not have a lot of investment in Class 4 through 7 trucks. In fact, the R&D investment is only about \$1 million a year.

Of course, a lot of the investments we make on hybrid technology, whether they be on light duty or for the Class 8 trucks, is still going to apply in these middle classes, if you will. But we support that bill. We support the program that is in that bill.

One adjustment that could be made is the first phase, the R&D phase be 2 years instead of 1 year, and that will allow more designs to be looked at. The ultimate deliverable of that first phase is a heavy duty hybrid truck that will allow for a little better shakeout of the design and operations and the integration of all the hybrid components. You could almost flip-flop the timeframe for one and 2, or just make phase one 2 years. So we support that very much.

In fact, this class of trucks is probably going to benefit from hybridization more than any other class of trucks, especially the heavy class, because of the drive cycle, a lot of start and stopping through the urban drive cycles. You can picture delivery vans or box-type trucks, things like that.

It is also a little easier on the infrastructure. These trucks basically go back to the same place every night, and they can refuel through electric charging stations and things like that. So we support this bill very much. It could improve fuel economy by a factor of 2.

We also support the broader bill, Senator Stabenow, because that would authorize essentially our whole vehicles program. So, actually, the first bill is almost a subset of the broader bill, and we support both of those bills very much.

Senator CANTWELL. Do you think that there is enough potential applications for the minimum number of grants here?

Mr. CHALK. We think there are enough companies that would be interested to meet the minimum requirements, and there are enough different types of applications. There are buses, delivery vans, box trucks, and refuse trucks. So we would have enough platforms that we could really come up with some optimal designs for each situation under this program.

Senator CANTWELL. OK. I know we didn't hear a statement from Senator Gillibrand. But if we could talk about S. 2900, does the Office of Energy Efficiency and Renewable Energy conduct research on these turbines, or is it primarily within the Office of Fossil Energy?

Mr. CHALK. Over the last 20 years, both offices have conducted R&D. In the Energy Efficiency and Renewable Energy, our gas turbine investments have decreased. It is on the order of \$5 million today, but mostly in support of combined heat and power applications. We actually made a lot of awards under the Recovery Act in combined heat and power with gas turbines.

The Office of Fossil Energy is mainly focused on utility-scale, hundreds of megawatt type of turbines. So that has been their role. They have been doing the larger turbines. We have been doing the smaller turbines. We do support this bill. Gas turbines are a very mature technology. So what is in the bill is almost a step increase in efficiency.

So while there are lots of investment in gas turbine R&D by industry, we think there is a Government role here to improve the efficiency from about 50 percent combined cycle to 65 percent. We would like to work with the subcommittee on this balance of what is funded by the Government, the higher risk enabling R&D, versus what industry can do by itself because this is a mature technology. Roughly, 7 gigawatts of gas turbines went in last year. If you look at capacity, gas turbine capacity is even greater than coal. It is not for generation, but there is lots of capacity.

Gas turbines are very, very cost effective by themselves. If you look at a single combustion regime, you are talking on the order of \$700 per kilowatt. The combined cycle is only \$1,000 per kilowatt. So these are the most cost-effective power generation units that essentially you can buy, and they are very, very modular.

While we support the intent of the bill, we want to carefully look at what the Government investment should be, which is the higher risk R&D.

Senator CANTWELL. This uses, I believe, the Energy Policy Act of 2005, that 999(e) section. So it limits the participation to U.S. companies. Is that—does that cause any potential—

Mr. CHALK. We would concur with that. We could also work with the committee offline on if it is not a U.S.-owned company, as long as they have operations and research in the United States, we would concur with that because taxpayer dollars would stay within the United States. But I can get back to the committee on a formal position on that issue.

[The information referred to follows:]

While DOE has no issue with this language as written, the Department would like to respond to a question raised by Sen. Maria Cantwell (D-WA) related to this sub-section. The question concerned whether inclusion of the limitation on participation to the U.S. companies found in section 999E of the EAct of 2005 would cause any problem for the Department.

In response, the Department wishes to first make a clarification. According to our understanding, the language of 999E allows certain companies that are organized under U.S. law, but that have a foreign parent company, to be eligible as long as the laws of the country where the parent company is based meet certain criteria. This domestic situs criteria is intended to ensure compliance with certain World Trade Organization (WTO) obligations.

The Department has no problem with keeping EAct 999E in the bill, nor does it see a problem with application of the domestic situs criteria to S. 2900. The companies most actively engaged in the research and development called for in the bill should fall safely within the eligibility criteria as set forth here.

Senator CANTWELL. I think most of my colleagues want to see the investment here. So it is a question of just understanding how that 2005 act section would apply.

On the uranium legislation that my colleague Senator Barrasso has recommended, does the department perform an economic analysis before selling and bartering, transforming uranium from stockpiles? Do they do that now?

Mr. JOHNSON. Yes, ma'am, we do. We actually contract with an industry organization that conducts these analyses on behalf of the department, and then those analyses are then reviewed by the department, concurred and used as the basis for making the decision.

Senator CANTWELL. So is that information, is that analysis made public?

Mr. JOHNSON. Yes, it is.

Senator CANTWELL. So, does the department have existing authority to sell and barter and transfer? Do you have that now?

Mr. JOHNSON. Yes, ma'am. The department does.

Senator CANTWELL. OK. But this appears to fix it in statute. Is that—

Mr. JOHNSON. Madam Chairman, I am an engineer, not a lawyer. But I have it from our counsel who says that—

Senator CANTWELL. We need more engineers at DOE, not more lawyers. So that is—

[Laughter.]

Senator CANTWELL. That is the good news.

Mr. JOHNSON [continuing]. That the department has the authority and that one of the department's concerns on this legislation is the implication that it—by the language in the bill that we don't

have that authority, and that authority already exists in existing legislation.

Senator CANTWELL. So you don't see anything here that provides more flexibility?

Mr. JOHNSON. No, ma'am.

Senator CANTWELL. OK. But why, if you have that authority, would you be worried about specifying it?

Mr. JOHNSON. Again—

Senator CANTWELL. You are not the lawyer, OK. All right, well, maybe we will get an answer from somebody over there on that point.

Mr. JOHNSON. I can get an answer back for you.

[The information referred to follows:]

The legislation, in a section entitled "Authority of Secretary," states that "as soon as practicable after the date of enactment of this section, the Secretary may barter . . . uranium in accordance with this section." The Department has existing authority to barter pursuant to the Atomic Energy Act. The Department would not be in favor of any language that implies that this authority does not currently exist. Likewise, the Department, as discussed at the hearing, does not believe that the constraints that this legislation puts on the Department's barter authority are necessary or advisable.

Senator CANTWELL. OK. I think that is all the questions that I have, and I know I am sure we will keep the record open on these various pieces of legislation, or people who want to ask questions to the department.

We appreciate you being here and being so forthcoming on the details of where the agency supports these various bills and how they coordinate with various projects already underway by DOE. I think that is very important.

There is so much work for us to continue to do. So we are glad to have our colleagues working with DOE on these programs and looking at getting these bills passed.

So the hearing is adjourned.

Mr. CHALK. Thank you, Madam Chairman.

[Whereupon, at 3:28 p.m., the hearing was adjourned.]



## APPENDIXES

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### APPENDIX I

#### Responses to Additional Questions

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##### RESPONSES OF STEVEN G. CHALK TO QUESTIONS FROM SENATOR BINGAMAN

S. 3251

*Question 1.* Mr. Chalk, Section 3 of 5.3251 authorizes a \$500 million revolving fund to finance energy efficiency or renewable energy projects at federal facilities. Will the federal government continue to use Energy Savings Performance Contracts if the revolving loan program is established?

Answer. Yes, Energy Savings Performance Contracts (ESPCs) and other financing tools such as Utility Energy Services contracts, would still be used because federal agencies need to invest significantly more than \$500 million dollars annually to meet their various energy efficiency, renewable energy, and related sustainability goals. The revolving fund will provide an important additional tool to finance projects that do not fit well under current mechanisms, such as medium size projects or those which include major renewable power generation capacities.

*Question 2.* Who will administer the revolving loan program and how will the administrator choose the energy efficiency and renewable energy projects to receive loans?

Answer. The revolving loan fund would likely be created within an existing government agency in cooperation with the Department of the Treasury. Projects would be selected on a competitive basis based on return on investment, contribution to sustainability goals, and social benefit.

##### RESPONSES OF STEVEN G. CHALK TO QUESTIONS FROM SENATOR MURKOWSKI

*Question 1.* It appears that S.3251 is largely duplicative of ongoing requirements to improve energy efficiency and the use of renewable energy by federal agencies that are set forth in the Energy Policy Act of 2005, the Energy Independence Act of 2007, various Executive Orders, and S. 1462, the American Clean Energy Leadership Act of 2009, as reported by this Committee. Please describe the Administration's current energy efficiency/renewable energy efforts for Federal agencies. Does the Administration require additional authority in those areas?

Answer. The Administration supports the intent of S. 3251 and will work to ensure that it does not lead to duplications or redundancies of any ongoing efforts.

Currently DOE's Office of Energy Efficiency and Renewable Energy, with the support of its Federal Energy Management Program, undertakes a wide range of activities on behalf of the Federal Government including technical assistance to support energy efficiency and renewable energy projects; assistance in executing alternative funding through Energy Saving Performance Contracts or Utility Energy Service Contracts projects; training, testing and deployment of new and emerging technologies; guidance and assistance in meeting statutory facility energy management, auditing, benchmarking, and reporting requirements; coordination of knowledge exchange; chairmanship of interagency working groups; assistance in fleet management activities; and technical support for greenhouse gas accounting.

*Question 2.* Currently, energy efficiency and renewable energy projects in federal buildings are funded through such methods as federal appropriations, Energy Savings Performance Contracts, and Utility Savings Contracts. Does the Administration require additional funding sources for these activities? What is the Department's position on establishing a revolving fund to finance these energy efficiency/renewable energy activities, as S. 3251 seeks to do?

Answer. The Department supports the creation of a revolving fund to support sustainability projects, since funds in addition to ESPCs and UESCs will be required to meet Federal sustainability goals, particularly in areas not well addressed by ESPCs. Currently, ESPCs and most UESCs are financed through third party private financiers obtained by the energy service contractors of each project.

*Question 3.* Please describe the process for creating a revolving loan fund based on best practices and subject to appropriate interest rates for Federal facility energy efficiency/renewable energy projects. How would OMB address this type of loan fund, if authorized?

Answer. The revolving loan fund would likely be created within an existing government agency and funded by the Treasury up front, incrementally, or periodically as projects are selected. The fund would charge an interest rate on projects that accurately reflects the true borrowing cost to the government plus the cost associated with administering the fund. This would likely result in agencies being able to finance projects for 25 to 50 basis points above Treasury rates compared to the current private sector rates which average 270 basis points above Treasury for similar projects. Assuming \$500 million of projects were financed at current private sector interest rates (270bps), the government would pay roughly \$1.03 billion over the life of the projects. If financed using the revolving loan fund at 37.5bps above Treasury rates, the government would pay \$742 million, for a total savings of \$287 million. These estimated savings are only for the initial allocation of the revolving loan funds, additional savings will occur with each subsequent reallocation from the loan fund.

Several states have successfully created revolving loan funds, and would serve as guides for the creation of this Federal fund. The Office of Management and Budget would address this type of loan fund according to existing procedures for revolving loan funds.

*Question 4.* Please describe how DOE has monitored, and tracked energy use within the Government. What other agencies are involved in developing standards, or data regarding energy use in the Federal Government?

Answer. The Department of Energy has collected from Federal agencies energy use, costs, and facility square footage data going back to 1975. Currently, these data are reported under three end-use sectors:

- 1) Goal-Subject Buildings
- 2) Excluded Facilities and Processes
- 3) Vehicles and Equipment (including covered fleet consumption and tactical mobility fuels.)

The Annual Reports compiling this data and describing agency progress toward energy goals can be accessed through: [http://www1.eere.energy.gov/temp/regulations/facility\\_reports.html](http://www1.eere.energy.gov/temp/regulations/facility_reports.html).

The database of Federal energy consumption maintained by the Federal Energy Management Program (FEMP) within DOE's Office of Energy Efficiency and Renewable Energy contains annual data back to Fiscal Year 1975. Annual aggregated data is maintained for approximately 25 major Federal agencies. This database is currently being migrated from its legacy system to a Web-based platform and is being enhanced to address additional reporting requirements and functionality to support calculation of greenhouse gas emissions reporting required under Executive Order 13514.

#### FACILITY ENERGY REPORTING

Federal agencies that own or control buildings are required to report the energy consumption in these buildings to FEMP by January 1 after the end of each Fiscal Year. The General Services Administration (GSA) reports the energy consumption of buildings it owns and operates, including usage by other Federal agency occupants. Agencies which have been delegated authority by GSA to enter into contracts for energy and utility services are responsible for reporting their energy consumption and square footage. Not included in this data set is energy used in leased buildings where the energy costs are a part of the rent and the Federal agency has no control over the building's energy management. The latest reporting guidance and data template for agencies to use in reporting energy use to FEMP can be accessed through: [http://www1.eere.energy.gov/femp/regulations/facility\\_requirements.html](http://www1.eere.energy.gov/femp/regulations/facility_requirements.html).

These reporting requirements are coordinated with the major agencies through the Interagency Energy Management Task Force. The agency members of the Task Force are listed at: [http://www1.eere.energy.gov/femp/about/iatf\\_members.html](http://www1.eere.energy.gov/femp/about/iatf_members.html)



## VEHICLES AND EQUIPMENT

Federal agencies operating motor vehicle fleets are required to report the fuel consumption of their fleet vehicles as one portion of their annual submission through the Federal Automotive Statistical Tool (FAST) managed by DOE and GSA. These agency fleet submissions are required to be complete on or before December 15 for the prior fiscal year. Reporting guidance to agencies specific to fleet vehicles and FAST can be accessed through: <https://fastweb.inel.gov/>.

Fleet vehicle Annual Reports can be accessed through: [http://www.eere.energy.gov/femp/regulations/fleet\\_reporting.html#ar](http://www.eere.energy.gov/femp/regulations/fleet_reporting.html#ar).

*Question 5.* Please describe all your interagency agreements with other federal agencies as it relates to energy use.

Answer. The Department of Energy (DOE), Golden Field Office (GFO), in support of the Federal Energy Management Program (FEMP), processes several Interagency Agreements (IAAs) each year with multiple federal agencies. GFO processes both “funds-in” IAAs, where DOE receives funds from other agencies and “funds-out” IAAs, where DOE sends funds to other agencies.

Funds-in IAAs (approximately \$1.5 million for project facilitation support and between \$400,000-\$1.5 million annually for SAVEnergy and Technical Assistance):

- Authorized by the Economy Act or the Skaggs amendment to the Omnibus Consolidated Appropriations Act of 1998: IAAs authorized by the Skaggs amendment are for Project Facilitation (PF) support for Energy Savings Performance Contracts (ESPCs) which are designed to assist agencies in achieving greater energy efficiency, water conservation or use of renewable energy by means of privately financed mechanisms.
- IAAs authorized by the Economy Act are for SAVEnergy and FEMP Technical Assistance. DOE receives these IAAs to pay for the use of DOE’s existing contract vehicles and/or readily available expertise that some other agencies do not possess. Examples include energy audits of federal facilities to identify energy conservation measures, feasibility studies on efficient building design, or use of wind or photovoltaic technology at Federal sites.

Funds-Out IAAs (\$0 for the last two years and up to \$500,000 in prior years)

- Authorized by the Economy Act
- DOE entered into a 5-year Funds-Out Interagency Agreement with the National Institute of Standards and Technology (NIST) on March 14, 2007 (DEAI01-07EE11247). As called for by legislation (Energy Policy and Conservation Act, P.L.94-163, 195, 92 Stat 3206, 42 USC 8252 et seq), NIST provides technical assistance to DOE in the development and implementation of life-cycle costing methods and procedures for evaluating potential energy and water conservation and renewable energy investments in existing and new federally owned and leased buildings. DOE does not possess life-cycle costing expertise and it is readily available at NIST in its Building and Fire Research Laboratory’s Office of Applied Economics. Under the IAA, \$830,000 has been obligated by DOE to date as follows:
  - FY 07: \$55,000
  - FY08: \$200,000
  - FY09: \$75,000
  - FY10: \$500,000
- IAAs sending funds to other agencies to utilize existing contract vehicles and/or expertise readily available that DOE does not possess. Examples include assisting agencies with the costs of installing energy efficient lighting by a contractor already selected by the other agency.

The Department of Energy has interagency agreements with Architect of the Capital, Bureau of Land Management, Central Intelligence Agency, Department of Homeland Security, Department of Homeland Security / U.S. Coast Guard, Department of Defense, DOD Army National Guard, DOD Navy, DOD U.S. Air Force, DOD U.S. Army, Department of the Interior U.S Geological Survey, Department of Justice Bureau of Prisons, Department of State, Environmental Protection Agency, National Institutes of Health, Federal Aviation Administration, Federal Bureau of Investigation, Food and Drug Administration, General Services Administration, Department of Housing and Development, National Archives and Records Administration, National Aeronautics and Space Administration, National Institute of Standards and Technology, National Park Services, Smithsonian Institute, U.S. Department of Agriculture Beltsville Agricultural Research Center, United States Forest Service, and Veterans Affairs.

*Question 6.* Within ARRA, how much money has been spent on developing data to better understand how buildings use energy? Has the Department developed any models to better understand energy use with the building sector? If so, please describe the funding, and the types of data being developed?

Answer. To better understand how residential buildings use energy, \$8 million in Recovery Act funding was directed to the Energy Information Administration's Residential Energy Consumption Survey (RECS), which is designed to collect energy characteristics, usage, and expenditures in U.S. households. The Recovery Act funding will allow for a more detailed geographic representation of the RECS data, including detailed energy use data for up to 15 States (currently only 4 States are represented). The funding will also increase the level of precision of all data for all geographic regions of the U.S.

S. 2900

*Question 1.* In your written testimony, the Department seemed to oppose this legislation. However, there seems to be a disconnect between your written and oral testimony because the Department appeared to support the bill at the subcommittee hearing. Please clarify the Administration's position on this legislative proposal?

Answer. The Department believes that industry has sufficient economic incentive to invest in research, development and demonstration to increase the efficiency of gas turbines. To the extent that the private sector under invests in basic research, DOE has sufficient authority and existing programs to improve high temperature materials applicable to a range of energy technologies.

*Question 2.* General Electric estimates that just a one percentage point improvement in efficiency for its gas turbines would result in greenhouse gas emissions reductions of 4.4 million tons per year while providing savings of more than \$1 billion in fuel costs. Does the Administration agree with GE's assessment?

Answer. Without seeing GE's methodology, it is difficult to comment on their specific estimates. As illustrated by GE's estimate, gas turbine manufacturers should have a strong incentive to improve the efficiency of their gas turbine products. The Department is committed to continuing basic research of high temperature materials which will help industry develop more efficient energy technologies. The private sector has sufficient economic incentive to invest in the development and demonstration of efficient gas turbines. Therefore, government funding for the later stages of efficient natural gas turbine development and demonstration would inefficiently subsidize activities likely to be conducted by the private sector absent any government funding.

*Question 3.* Does the Administration agree with the targets set forth in S.2900—a Phase I portion to achieve at least 62 percent combined cycle efficiency or 47 percent simple cycle efficiency; with Phase II designed to achieve at least 65 percent combined cycle efficiency or 50 percent simple cycle efficiency?

Answer. These goals are aggressive but achievable. The Department is committed to continuing basic research of high temperature materials which will help industry develop more efficient energy technologies. The private sector has sufficient economic incentive to invest in the development and demonstration of efficient gas turbines. Therefore, government funding for the later stages of efficient natural gas turbine development and demonstration of specific efficiency targets as set forth in S.2900 would inefficiently subsidize activities likely to be conducted by the private sector absent any government funding.

*Question 4.* Does the Administration have existing authority to undertake this type of research and development? Is the private sector already undertaking this type of research?

Answer. To the extent that the private sector under invests in basic research, DOE has sufficient authority and existing programs to improve high temperature materials applicable to a range of energy technologies.

The bill is similar to an existing successful program within DOE. The Advanced Turbine Systems Program, a research, development and demonstration collaborative between the Department's Offices of Energy Efficiency and Renewable Energy and Fossil Energy, successfully developed and deployed advanced turbine material and coating leading to today's turbine efficiencies.

The legislation outlines activities ITP already performs. For example, through its Industries of the Future (crosscutting) investments, ITP aids the development of advanced manufacturing processes for the expanded use of lightweight materials such as titanium. Those breakthroughs help to drive production cost down and market impact up. In other efforts, ITP promoted advanced alloys of steel to support many of the new clean energy products being developed today. Nanocoating technologies are still other innovations developed with the assistance of ITP that now extend the

life of tooling systems and provide wear resistance to reduce the cost of manufacture and extend the useful life of products. All of these efforts support the overarching objective of reducing the energy intensity of Industry to help advance the Administration's energy security and environmental performance goals.

The Department is committed to continuing basic research of high temperature materials which will help industry develop more efficient energy technologies. The private sector has sufficient economic incentive to invest in the development and demonstration of efficient gas turbines. Therefore, government funding for the later stages of efficient natural gas turbine development and demonstration would inefficiently subsidize activities likely to be conducted by the private sector absent any government funding.

*Question 5.* What economic incentives exist for the industry to increase R&D for gas turbine efficiency to reach the levels proposed in this bill?

Answer. In a previous question, reference was made to an estimate by General Electric that "just a one percentage point improvement in efficiency for its gas turbines would result in greenhouse gas emissions reductions of 4.4 million tons per year while providing savings of more than \$1 billion in fuel costs." As illustrated by that estimate, gas turbine manufacturers should have a strong incentive to improve the efficiency of their gas turbine products. The major manufacturers sell a broad range of gas turbine systems to meet the needs of different customers, duty cycles and service requirements. One of the most important gas turbine markets is for power generation, which includes baseloaded generators, cycling units that operate 10% to 50% of the time and peaking units that may operate only 100 hours per year.

Fuel costs dominate the total cost of operations for the baseloaded generators and manufacturers promote the efficiency of their most efficient combined cycle units. Even simple cycle turbines are marketed for their high efficiency; GE's LMS 100 can achieve 45% efficiency (lower heating value).

The market for simple cycle gas turbines that operate as peaking units may not be directly affected by the proposed legislation. Low capital cost and rapid startup are more important than fuel costs (efficiency) for this market segment, although it should be noted that these units account for only a small portion of generation.

*Question 6.* In your testimony, you make the point that S.2900 outlines activities that the Department already performs. We are unaware that the Department is funding R&D on gas turbine efficiency. Titanium is not used in heavy duty gas turbines and nanocoating has little to do with turbine efficiency. Please explain.

Answer. Work in the areas of titanium and nanocoating were intended as examples of the Department's cutting-edge research activities that parallel those described in Section 2(b)(1)(A) of the bill (i.e., "high temperature materials, including superalloys, coatings, and ceramics;"), and that support the goal of reducing the energy intensity of industry similar to, and consistent with, the objectives stated in the legislation. The National Energy Technology Laboratory (NETL) recently won an award for its work on a coating that can extend the lifetime of metal components, thus enabling greater efficiency for gas turbines. Other work related to titanium and nanocoating being conducted by the Department could have applicability to gas turbine efficiency down the road.

S. 3396

*Question 1.* What is being done already to comply with provisions in the Energy Independence and Security Act of 2007 and the Energy Policy Act of 2005 regarding energy savings in government and federal programs?

Answer. Extensive efforts are underway across all Federal agencies to comply with the provisions of EAct and EISA. DOE's Office of Energy Efficiency and Renewable Energy, with the support of its Federal Energy Management Program (FEMP), which serves as the Federal Government's lead coordinator of energy management and provides technical assistance to agencies as they work to meet these provisions.

A summary of agency performance in key indicators based on preliminary data from the Fiscal Year 2009 Annual Report on Federal Government Energy Management and Conservation Programs are as follows:

**Energy Intensity.**—Federal agencies reported that buildings subject to energy reduction goals collectively decreased energy use per gross square foot by 13.1 percent in FY 2009 relative to FY 2003.

**Renewable Power.**—Federal agencies reported purchasing or producing 2,330.6 Gigawatt-hours of renewable electric energy in FY 2009, equivalent to 4.2 percent of the Federal Government's FY 2008 electricity use.

**Petroleum Reduction.**—Federal agencies reduced petroleum-based fuels in buildings by 76.8 percent in FY 2009 compared to FY 1985, from 118.8 trillion Btu to 27.6 trillion Btu. Compared to FY 2003, use of these fuels fell by 36.1 percent.

**Metering.**—Overall, agencies identified 107,250 buildings for which separate electricity meters are appropriate. Of these buildings, 95,821 had standard electricity meters installed and 10,723 had advanced meters installed. Although there may be a few instances of counting both the advanced and standard meters in a single building, overall compliance with the metering goal exceeds 99 percent.

**Performance Standards for New Buildings.**—Four agencies did not achieve full compliance with the requirement that all new buildings designed since FY 2007 must be 30 percent more efficient than relevant code, if life-cycle cost effective. These four agencies, the Departments of Defense, Homeland Security, Health and Human Services, and the Social Security Administration, have an opportunity to revisit designs to bring them into compliance. However, SSA does not own or operate any Federal Buildings for which designs were started since the beginning of FY 2007. Some agencies are also assessing performance of designs underway to determine compliance and will report these findings in their future annual reports. Of the 1,132 new building designs since FY 2007, 1,071 or almost 95 percent are in compliance.

*Question 2.* Are additional measures such as the Supply Star bill necessary, or are they duplicative? Is further Congressional authority really needed to promote highly efficient supply chains? Or does the authority already exist?

*Answer.* The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehensive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change.

While the Supply Star bill would provide a new lens through which one can consider energy efficiency, the potential exists for this new initiative to overlap with or duplicate existing Federal Government efforts to address supply chain efficiencies. For example, the ENERGY STAR program already has developed tools and resources that provide an industry sector benchmarking approach for energy performance, promote the procurement of energy efficient products and services, and engage industrial partners in mapping value chain energy use. Also, the Green Suppliers Network, led by the Department of Commerce and EPA works with large manufacturers to engage their small and medium-sized suppliers in low-cost technical reviews that employ Lean and Clean methodologies (e.g., eliminating energy and water waste and toxic emissions) to increase productivity, reduce waste, and boost profitability.

While the Department of Energy (DOE) and other federal agencies already have authorities and programs in place to address supply chain energy efficiency, the authority proposed in the Supply Star Act of 2010 could provide a means for expanding those efforts to address efficiency in the use of water and other resources as well. Under existing authorities, the Department's Industrial Technologies Program promotes energy efficiency in industrial production/operations by working with a broad spectrum of industries from mining and material processing to manufacturers of finished products for consumers. The Supply Star Act of 2010 would expand DOE's supply chain efficiency initiatives by providing specific authority to implement strategies to improve the efficiency of energy, water, and other resources throughout the entire lifecycle of a product, including production, transport, packaging, use, and disposal. However, this expansion could lead to potential overlap with or duplication of efforts underway at the EPA and other federal agencies. The focus on resources beyond energy and the stages of a product's lifecycle beyond manufacturing constitute important additional elements in the effort to address overall supply chain efficiency.

*Question 3.* Please describe how the Department of Energy could incorporate the intent of Supply Star within their Save Energy Now Program. Furthermore, please provide a listing of programs, or authorities that you have to address supply chain efficiencies—from raw materials, transport, and packaging to the energy consumed in manufacturing processes.

*Answer.* The Save Energy Now initiative in DOE's Industrial Technologies Program (ITP) currently works in partnership with industry to develop and disseminate tools, training, assessments, and other resources to target energy savings in industrial production/operations throughout the supply chain. ITP is currently developing

resources to help Save Energy Now LEADER Companies who volunteer to launch an outreach program with their suppliers and customers focused on energy and carbon management.

The Save Energy Now program could, in coordination and consultation with other government agencies and programs, expand its focus beyond energy to include water and other resource use efficiency across the entire lifecycle of manufactured products. New resources targeting supply chain efficiency could be developed in partnership with industry and other stakeholders both domestically and internationally. These activities would build on DOE's successful partnership leveraging strategies. The resulting guidelines, benchmarking and analysis tools, databases, training, and other resources could be distributed using ITP's existing infrastructure and outreach mechanisms. Achievements in supply chain efficiency could be recognized as part of the Save Energy Now recognition program. The program would coordinate with other federal initiatives such as Smart Way and Green Suppliers Network as appropriate.

DOE programs that address supply chain energy efficiency include:

- ITP's R&D program partners with U.S. industry to develop new technologies that improve the energy efficiency and environmental performance of the most energy intensive industrial processes. ITP R&D activities target industry-specific efficiency improvements in the processing of raw materials as well as the development of crosscutting technologies and materials that benefit multiple processes across the industrial sector and throughout the supply chain.
- ITP's Save Energy Now initiative aims to drive a reduction of 25% or more in industrial energy intensity in 10 years. The program distributes resources, tools, and training to help companies in diverse industries increase their awareness of energy savings opportunities and their implementation of energy efficiency projects.
- Superior Energy Performance is a market-based, ANSI-accredited manufacturing plant certification program that will provide companies with a framework for implementing the forthcoming ISO 50001 energy management system (standard) and validating energy intensity reductions. ITP is participating in the development of the standard and is a member of U.S. Council for Energy-Efficient Manufacturing (U.S. CEEM) which is guiding the development of the certification program.

Public Law Authorizations:

- P.L. 94-163, "Energy Policy and Conservation Act" (EPCA) (1975)
- P.L. 94-385, "Energy Supply and Production Act" (ECP A) (1976)
- P.L. 95-91, "Department of Energy Organization Act" (1977)
- P.L. 95-619, "National Energy Supply Policy Act" (NECPA) (1978)
- P.L. 95-620, "Powerplants and Industrial Fuel Use Act" (1978)
- P.L. 96-294, "Energy Security Act" (1980)
- P.L. 101-218, "Renewable Energy and Energy Efficiency Technology Competitiveness Act" (1989)
- P.L. 102-486, "Energy Policy Act of 1992"
- P.L. 109-58, "Energy Policy Act of 2005"
- P.L. 110-140, "Energy Independence and Security Act of 2007"

*Question 4.* Please describe how the Superior Energy Performance certification program works. How do you intend to incorporate and integrate supply chain efforts into validating energy efficiency and intensity improvements?

Answer. Superior Energy Performance is a voluntary certification program that provides industrial facilities with a road map for achieving continual improvement in energy efficiency while maintaining competitiveness. A central element of Superior Energy Performance is implementation of the forthcoming global ISO 50001 energy management standard along with additional requirements to achieve and document energy intensity improvements. A non-governmental organization will manage and administer the Superior Energy Performance program and will be self-sustained through the collection of certification fees. Industrial facilities pursuing certification will implement the ISO 50001 energy management standard and take steps to reduce energy use. The certification of the plant is retrospective; plants must demonstrate that requirements have been met upon applying for certification. Third-party verification by an ANSI-accredited organization is required to receive certification.

Companies can use Superior Energy Performance as a framework to demand a high level of quality in how their suppliers manage energy and achieve energy cost reductions. It can provide a way for large companies to assist their suppliers and thereby reduce their overall costs. ITP's Save Energy Now program has a portfolio

of energy management tools and resources which will help facilities, including suppliers, prepare for certification. In addition, ITP is developing a series of complementary professional certification programs on industrial energy management, efficiency, and auditing expertise that will assist plants to become certified by the Superior Energy Performance program.

S. 679

*Question 1.* Please summarize the Department's current authorities and activities, if any, related to the development and deployment of heavy-duty plug-in hybrid vehicles.

Answer. The Department of Energy (DOE) supports a number of projects related to the development, demonstration, and deployment of heavy-duty plug-in hybrid vehicles, with funds from the American Recovery and Reinvestment Act (ARRA) as well as annual appropriations.

DOE awarded ARRA funds for Transportation Electrification projects that will result in the deployment of more than 1,800 electric and plug-in hybrid electric medium- and heavy-duty vehicles and charging infrastructure. These vehicles will include 378 plug-in hybrid electric bucket trucks and shuttle buses deployed nationwide in partnership with 50 electric utilities and partner fleets. DOE will conduct data collection and analysis activities as part of these projects to evaluate vehicle performance and fuel economy benefits in a variety of user environments and vocations.

DOE has also partnered with several major vehicle manufacturers to develop and deploy advanced plug-in hybrid electric vehicles through the five-year Plug-in Hybrid Electric Vehicle Technology Acceleration and Demonstration Activity (PHEV TADA). One project within this program targets medium- and heavy-duty vehicles, focusing on the development of a plug-in hybrid school bus that will provide 30 miles of all-electric propulsion. This project is intended to accelerate the commercialization of PHEV school buses that meet the requirements of the majority of customers with regards to performance, affordability, reliability, and fuel economy.

In addition, DOE supports in-use evaluations of medium- and heavy-duty electric-drive trucks, as well as modeling and simulation studies to predict the effectiveness of various powertrain configurations—including plug-in hybrid architectures—and evaluation of idle-reduction technologies enabled through heavy-duty truck electrification. This work is conducted primarily at national laboratories using annual appropriations.

With ARRA funds, DOE also awarded 14 geographically-dispersed, cost-shared projects to deploy a total of 910 medium/heavy-duty hybrid trucks and buses. These projects are being implemented by local community partnerships that comprise DOE's Clean Cities Program and will help inform DOE's work on plug-in hybrids.

Department authorizations related to the development and deployment of heavy-duty plug-in hybrid vehicles include EPA Act 2005, Sections 706, 712, and 721, and EISA 2007, Section 131.

*Question 2.* Please discuss the potential value of developing hybrid technologies for heavy-duty vehicles, in terms of cost-effectiveness and emission reductions, as compared to other technologies and other fuels (such as natural gas) that are also capable of improving efficiency.

Answer. Hybrid technologies achieve significant fuel economy benefits when applied to heavy duty vehicles that experience duty cycles involving frequent starts and stops, because much of the energy typically lost during braking can be recaptured through regenerative braking systems and subsequently reused during acceleration. Because of their ability to capture and reuse otherwise wasted energy, regenerative braking and other hybrid technologies provide fuel economy benefits that cannot be obtained through efficiency improvements in the engine or fueling system alone. Refuse haulers, delivery trucks, and school buses, for example, could increase their fuel economy by 18 to 40% using hybrid technologies. The benefits of vehicle hybridization are not fuel dependent and they help improve fuel economy no matter what fuel is chosen.

*Question 3.* According to various news reports, there are already a number of companies who supply heavy-duty hybrid systems and a number of companies who demand those systems. For example, Coca-Cola Enterprises reportedly ordered 130 hybrid trucks from Eaton Corporation in February 2008. Given the small but growing market for heavy-duty hybrid systems, does the Department believe that the type of grants program created by S.679 is most appropriate to encourage their continued deployment?

Answer. The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehen-

sive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change.

The Department of Energy believes that the reported acquisitions of hybrid trucks indicate early adopter interest in this advanced technology, but may not necessarily mark the beginning of a broad introduction to the nation's medium-and heavy-duty fleet. While some companies have initiated procurement of medium-and heavy-duty hybrid vehicles, most of these purchases are for demonstration purposes to assess the business case and familiarize company personnel with hybrid technology.

The grant program proposed by S.679 is consistent with activities currently authorized and being undertaken by the Department as part of its vehicle technologies research, development, demonstration, and deployment efforts. The program would provide a demonstration and deployment opportunity for companies that would not otherwise be able to invest in advanced hybrid vehicles and enable the collection of useful data and accumulation of field experience that can lead to broad acceptance of hybrids in the commercial vehicle market.

S.679 also includes an important mandatory research effort in Phase I of each project. Such work is expected to improve heavy-duty hybrid performance and efficiency while lowering costs and removing other barriers to broad market acceptance.

#### RESPONSES OF STEVEN G. CHALK TO QUESTIONS FROM SENATOR BINGAMAN

S. 3460

*Question 1.* Mr. Chalk, the 10 Million Solar Roofs Act allows states to use Federal funds to provide rebates, loans, and other incentives to consumers to purchase solar energy systems.

Between federal and state tax incentives, "PACE" financing programs, state and local rebates, net-metering, and other incentives, there are a variety of mechanisms available to support the deployment of solar PV. Does the Department have any insight into the comparative effectiveness of these different deployment incentives?

Answer. The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehensive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change. The incentive programs listed in the 10 Million Solar Roofs Act, rebates, loans, and performance-based incentives, have been implemented at various levels of government in the U.S. and in international markets such as Germany to stimulate solar demand. Each of these incentives has particular advantages. For instance, rebates reduce the upfront costs of solar systems, loan programs increase the availability and reduce the cost of financing of solar systems, and performance-based incentives are directly tied to generation of solar energy.

Generally, a cash incentive, whether in the form of a rebate or performance-based incentive, is a simpler and more efficient incentive than a tax credit incentive of the same amount, whose benefits, in some instances, may only be realized by the taxpayer with the use of tax equity financing.

Other state and local financing programs have limited operating history and the ultimate effectiveness of such incentives can depend on specific local considerations.

*Question 2.* The 10 Million Solar Roofs Program would rely on state-level programs to disburse its funds to consumers. Should the program take into account the varying degrees of effectiveness and cost-efficiency of these different incentive mechanisms?

Answer. The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehensive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change. In that context, DOE would consider taking into account the varying degrees of efficiency and cost-effectiveness of different mechanisms as well as 1) a State's ability to execute a given program, 2) its existing solar incentive infrastructure, 3) solar activities of utilities in the State, as well as other physical, economic, policy and regulatory considerations, and 4) ability of states to leverage the Federal money of state and private capital. Additionally, the Department would welcome the flexibility to work with cities and counties as well should they be well-positioned to administer these funds.

## RESPONSES OF STEVEN G. CHALK TO QUESTIONS FROM SENATOR MURKOWSKI

*Question 1.* A recent Inspector General's report found that there have been some problems with the distribution of funds to state energy programs. For example, the American Recovery and Reinvestment Act authorized \$3.1 billion in grants to state energy programs, and the Energy Department allocated \$126 million for Florida—a state that previously had received about \$1.4 million. The Inspector General found that Florida had used the federal stimulus money to pay for its own state solar rebate program, so no new jobs were created. Apparently, Florida's rebate program ran out of money in 2008 and it had a backlog of people waiting to collect so the stimulus funds were used to address the existing state backlog.

S. 3460 allows this new federal program to be used to expand existing state solar programs, including rebate programs. Is it correct then, that this legislation could be used to fund the backlog of state solar rebates, as the ARRA was in Florida? Does the Department believe this is a wise use of limited federal resources?

Answer. Utilizing an existing state rebate program would allow federal resources to leverage existing program infrastructure for rebate marketing and fulfillment, as well as saving on program development startup costs. State funding should be supplemented, not supplanted. We have taken steps to work with the state of Florida, and they are now using their regular budget to cover the pre-existing solar rebate program and are steering their SEP funds to other energy activities.

*Question 2.* In response to that Inspector General's report, the Energy Department noted that many of the problems with the ARRA funding resulted because no state energy program had ever encountered the "scale of funding" provided under the Recovery Act. If that is the case, is this new federal program to subsidize residential solar energy necessary?

Answer. Electricity from solar energy sources is still two to three times more expensive than electricity from other generating sources in wholesale markets, in the absence of subsidies. Deployment of solar may be accelerated by incentives such as those contemplated in this bill. DOE is emphasizing robust R&D programs to lower the cost of solar energy, therefore allowing it to compete in the long term unsubsidized. The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehensive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change.

*Question 3.* What is the Administration's position on other financial models for residential solar energy like the third-party ownership model adopted by Solar City? These types of residential third-party ownership models allow a tax equity investor to benefit from the tax incentives of ownership and provide the host site with a renewable energy system with little or no upfront cash required—payments are made through either Power Purchase Agreements in which payments vary based on a customer's electricity usage or via leases that incorporate a fixed rate payment schedule independent of electricity usage. In this way, customers get the benefit, without having to pay up-front costs or even maintain the system.

Answer. Innovative financing methods for residential solar energy can accelerate solar installations. For the reasons stated above, third party Power Purchase Agreements or leases can overcome upfront cost issues or other obstacles related to affordability of residential solar.

Essential to the success of the third-party ownership model is the overall economic viability of solar for a given state. This viability is primarily determined by examining the amount of solar radiation a state receives, current utility and retail electric rates, and available incentives. To date, the presence of an adequate state incentive program has been an essential prerequisite for SolarCity and other third-party ownership providers to expand their operations into a given state.

Additionally, the Power Purchase Agreement model for solar has faced some legal challenges at the state level that has hindered its proliferation into some states or market sectors. In some cases, new regulatory proceedings or state legislation may be required to ensure that a potential provider has legal authorization to proceed.

*Question 4.* You testified that by the Department's estimates, "the \$250 million authorized for FY 2012 would yield roughly 100,000 rooftop solar systems, and may not be sufficient to put us on a trajectory to meet the goal of 10 million solar roofs." Under the Department's estimates then, it appears that \$2.5 billion in federal funding would be needed to reach the 10 million solar roofs goal—correct?

Answer. No, PV panel and system prices have declined by over 50% and 20%, respectively, over the past two years. With the continuing price declines that the Department expects from technological improvements and market development, lower



incentive levels will be possible in the coming years to make solar-generated electricity competitive with electricity from the grid. The amount of federal funding needed to deploy a certain number of rooftop installations is thus expected to decline over time.

For reference, the estimate cited in your question is based on a 20% state cost share and a potential rebate of \$0.75/Watt to make rooftop PV systems competitive at present along with other federal incentives, \$250 million in federal funding for one year would result in the deployment of 400 MW of solar. If all of the funding went towards residential PV systems, which average roughly 4,000W in size, approximately 100,000 solar systems would be installed in the first year. With the expected cost declines, it is possible that lower subsidies per installation could enable larger deployments in future years with the same funding level, but a detailed analysis of a specific program would need to be undertaken to determine the level of subsidy required to achieve 10 million installations over 10 years.

In a simple scenario with an average potential incentive of \$0.50/W over 10 years and a state cost share of 20%, \$16 billion in cumulative federal funding would support deployment of 40 GW of solar over 10 years. If all of the funding went towards residential PV systems, which average roughly 4,000W in size, 10 million solar systems would be installed.

*Question 5.* S. 3460 proposed to allocate funds based on the State Energy Program formula. How are funds now distributed under the State Energy Program and how does the recovery mechanism work?

*Answer.* For annually appropriated SEP funding, the initial \$25.5M is allocated to States according to the base allocation table listed in 10 CFR 420.11. Any appropriations above the \$25.5M base are allocated according to the following formula:

- 1/3 equally among all states and territories
- 1/3 according to population of the participating States as contained in the most recent reliable census data available from the Bureau of the Census, Department of Commerce, for all participating States at the time DOE needs to compute State formula shares
- 1/3 according to energy consumption of the participating States as contained in the most recent State Energy Data Report available from DOE's Energy Information Administration.

All ARRA SEP funds were allocated based on the above formula.

*Question 6.* In your written testimony, you propose that the Secretary should have the authority to reduce the cost share percentage in order to increase the overall effectiveness of the program. Please explain. How do you envision this to work?

*Answer.* The Energy Policy Act of 2005 grants the Secretary the authority to reduce or waive cost share. The Secretary utilized this authority for awards made under the American Recovery and Reinvestment Act of 2009. In areas where the target organizations are already challenged by economic conditions, this can be critical in enabling the department to extend its reach to identify a larger pool of worthy ideas for support.

*Question 7.* In your written testimony, you state that the "program could be designed in a creative way such as working with municipalities to promote photovoltaic installations through innovate local programs." How does the Department envision this coordinated effort to work?

*Answer.* The Administration looks forward to working with Congress to consider the efficacy and efficiency of these and other measures in the context of comprehensive energy and climate legislation to protect our nation from the serious economic and strategic risks associated with our reliance on oil, to create jobs, and to cut down on the carbon pollution that contributes to the destabilizing effects of climate change. In that context, Similar to the Energy Efficiency and Conservation Block Grant program, DOE would work with local governments towards the creation or expansion of innovative solar financing models and to leverage private sector capital. Examples that can be drawn from the Solar America Cities Program, include Community Solar models, such as the Solar Shares program administered by the Sacramento Municipal Utility District; volume purchasing programs, such as Solarize Portland created by the City of Portland, OR; or public-private partnerships such as the SolarCity-City of Phoenix partnership under which SolarCity offers Phoenix residents a solar lease with no down payment. In addition, DOE would work with local governments on best practices for solar installation. These include net metering, standardized grid interconnection protocols, and best practices for developing utility rate structures. However, the current S. 3460 does not provide DOE the authority to provide funds directly to local governments.

*Question 8.* In your written testimony, you suggest that the funding available in this act would not be sufficient to meet the goal of 10 million solar roofs. What percentage increase would be necessary to meet this projected target?

*Answer.* The federal funding for the Act to reach the goal of 10 million solar roofs is hard to predict because it will depend on 1) the continued cost declines of solar systems, 2) the mix of smaller residential and larger commercial systems funded by the Act, 3) a supportive policy and regulatory framework, including such areas as interconnection standards, net metering and utility rate structures, and 4) the existence of other federal and state solar incentives, notably the investment tax credit (ITC) and 1603 grants in lieu of tax credits.

In a simple scenario with an average potential incentive of \$0.50/W over 10 years and a state cost share of 20%, \$16 billion in cumulative federal funding would support deployment of 40 GW of solar over 10 years. If all of the funding went towards residential PV systems, which average roughly 4,000W in size, 10 million solar systems would be installed. DOE emphasizes the importance of a robust R&D program to continue to lower PV costs so that it can be compete with alternatives on an unsubsidized basis.

*Question 9.* What is the current amount of installed solar rooftop capacity? If the U.S. reached the 10 million solar roof goal set forth in this legislation, how much of a percentage increase would that represent?

*Answer.* At the end of 2009, there was a total of nearly 95,000 residential PV systems installed in the U.S., so the 10 Million Solar Roofs Act, presently funded with \$250 million in FY 2012, could double the current number of installations. The full goal of 10 million cumulative solar installations by 2020 would equal 100 times the current number of residential systems.

While this increase is very large, it is consistent with the rapid growth of the U.S. PV market. Over the past four years, the number of annual residential installations has grown at a compound annual growth rate of 57%. Maintaining this growth rate through 2020 would result in over 13 million cumulative solar installations. Historically, PV costs have decreased by 20% every time cumulative production doubles. Therefore, subsidies can decrease over time.

*Question 10.* Please describe the durability and longevity of these types of solar rooftop panels. What is the impact of the installation on the roofs? Will roofs need to be retrofitted (both shingles and framing) to accommodate these panels?

*Answer.* Solar panels have proven to be both reliable and durable products. There are panels installed in the U.S. that have been in operation for over 25 years that continue to achieve their expected performance. Solar panel manufacturers typically warranty their product to produce at least 80% of the rated output for 25 years. Solar panels are designed to pass a number of industry standard tests including tests that mimic the ability to withstand golf ball size hail, snow loads, high humidity, and high wind events. Properly designed and maintained rooftop solar photovoltaic systems can last as long as the underlying roof itself.

The total weight of solar panels, racking, and mounting hardware is between 4 to 6 pounds per square foot. Residential and commercial rooftops that are built and maintained in conformance with the published building codes can accommodate the additional weight of a rooftop solar system—no retrofitting of the framing is generally required. The roof surface (whether it be asphalt shingle, tile, tar and gravel, metal, or wood shake) generally does not need to be retrofitted to accommodate the panels. There are a wide range of commercially available products that allow the solar installer to complete a fully weatherproofed installation without the building owner needing to make any modifications to the roof surface.

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RESPONSES OF R. SHANE JOHNSON TO QUESTIONS FROM SENATOR MURKOWSKI

*Question 1.* When the DOE transfers uranium to its contractors does the DOE have control over when (immediately or with some delay) or how (through the spot market or long-term contracts) the uranium enters into the commercial market?

*Answer.* No, the Department does not control a contractor's use of the material once it has been transferred to the contractor in compliance with applicable law.

*Question 2.* What are the issues with establishing a strategic reserve of 20 million pounds of U<sub>3</sub>O<sub>8</sub> equivalent? Would the DOE need authority to promulgate rules for the management and release of materials from the strategic reserve? Could the unallocated U.S. highly-enriched uranium, which is equivalent to approximately 32 million pounds of natural U<sub>3</sub>O<sub>8</sub>, be utilized as strategic reserve? If so, should it be down blended to low-enriched uranium?

*Answer.* DOE already has sufficient authority and capability to manage its excess uranium inventories effectively without establishment of a formal strategic reserve.

DOE believes it is in the best interest of both DOE and the uranium industry to retain this flexibility regarding access to its excess uranium inventory. While it is possible that the Department could use the unallocated highly enriched uranium (HEU) among other inventories to create a strategic reserve, the HEU would need to be down blended. The National Nuclear Security Administration is already creating a reliable fuel supply of low enriched uranium (LEU) by down-blending from HEU. This supply would be available to both domestic and international recipients in the event of a market disruption.

*Question 3.* The DOE's actions to increase the rate at which it releases excess uranium into the market along with the actions of the Department of the Interior to withdraw Federal lands from exploration and mining taken together may have significant impact on domestic uranium mining in the U.S. Is it the Administration's intent to bring a halt to domestic uranium production?

Answer. No, the Administration certainly does not intend to halt domestic uranium production, and the Department does not believe its release of limited amounts of excess uranium into the market has resulted in a material adverse impact on the domestic uranium mining industry. As a result of close coordination among the offices within DOE responsible for the disposition of excess uranium inventories, the Department's total actual transfers for 2009, including transfers for accelerated cleanup services and for NNSA's pre-existing commitments, were 3.1 percent of average U.S. reactor demand in 2009, with an anticipated ramp up to 6.7 percent in 2010. This is significantly less material actually transferred than the 10 percent guideline articulated in the Department's 2008 Excess Uranium Inventory Management Plan (the Plan), and less material actually transferred than the amounts anticipated to be transferred for these years under the Plan.

*Question 4.* About 90 percent of the uranium that is used in U.S. reactors is from foreign sources. Given this large dependence on foreign sources for clean nuclear energy, is it advisable for the DOE to be taking steps that could create a greater dependence on foreign sources in the future?

Answer. DOE does not believe its releases of uranium relative to the total uranium market have resulted in a greater dependence on foreign sources of uranium. However, to increase domestic uranium enrichment capacity, a critical element of the fuel cycle for nuclear power reactors, the Department has made available \$4 billion in loan guarantees for the deployment of advanced enrichment technology in the United States.

*Question 5.* In 2008, DOE's total excess uranium inventory was the equivalent of 150 million pounds of  $U_3O_8$ . What is the amount of excess uranium inventory held by the department today?

Answer. The amount of DOE's excess uranium inventory at the conclusion of calendar year 2010 will be the equivalent of around 128 million pounds of  $U_3O_8$ , or the equivalent of 49,300 metric tons uranium (MTU). The decline of DOE's excess uranium inventory from about 153 million pounds of  $U_3O_8$  (the equivalent of 58,900 MTU) presented in the December 2008 DOE Excess Uranium Inventory Management Plan results largely from the National Nuclear Security Administration's (NNSA) shift of previously unallocated U.S. HEU into allocated programs, including a program to provide replacement LEU fuel for research reactors which had previously used HEU (which does not impact the commercial industry) and from the Office of Environmental Management's choice of a non-market disposition path for the off-spec non- $UF_6$  inventory. A small part of the overall decline does result from DOE's excess uranium entering the commercial market in calendar years 2009 and 2010 as actual and anticipated transfers to USEC for accelerated cleanup services and NNSA's pre-existing commitments. These various reductions in DOE's inventory total 1,954 MTU, equivalent to 5.1 million pounds  $U_3O_8$ .

*Question 5a.* How much of this material is U.S.-origin natural uranium in the form of  $UF_6$ ?

Answer. The DOE's current inventory of U.S.-origin natural uranium in the form of  $UF_6$  amounts to about 5,156 MTU.

*Question 5b.* How much of this material is Russian-origin natural uranium in the form of  $UF_6$ ?

Answer. At the conclusion of transfers related to the accelerated cleanup at the Portsmouth Gaseous Diffusion Plant, DOE's inventory of Russian-origin natural uranium in the form of  $UF_6$  at the end of calendar year 2010 will be about 11,315 MTU.

*Question 5c.* How much of this material is off-spec non- $UF_6$  uranium?

Answer. As of the end of calendar year 2008, DOE identified 4,462 metric tons of uranium as off-spec non- $UF_6$ . DOE has made several attempts to sell or reuse this material to avoid or mitigate disposal costs and responsibilities. Of the 4,462 metric tons, approximately 1,515 metric tons have been disposed of as of June 30,

2010, and approximately 1,076 metric tons remain to be disposed in fiscal year 2010 with funding provided by the American Recovery and Reinvestment Act of 2009. Additionally, 1,278 metric tons of the off-spec non-UF<sub>6</sub> are scheduled for sale to a private entity which will extract only the fluorine content. The remaining approximately 578 metric tons are budgeted for disposal in fiscal year 2011.

*Question 5d.* How much of this material is depleted uranium in the form of UF<sub>6</sub>?

Answer. Approximately 75,300 MT of depleted uranium as UF<sub>6</sub> (equivalent to 25,950 MTU) is identified as higher assay 235U.

*Question 5e.* How much of this material is unallocated U.S. highly enriched uranium?

Answer. Of a total of 209 metric tons of U.S. HEU designated to be down-blended, 34.3 metric tons of HEU are not allocated to any project at this time. The 34.3 metric tons of HEU contain the equivalent of approximately 18 million pounds of U<sub>3</sub>O<sub>8</sub>, or approximately 6,900 MTU.

*Question 6.* More than 40 percent of DOE's excess uranium is in the form of depleted uranium. While it is possible that this material could be enriched at a gaseous diffusion plant, what would the uranium price need to be to make this a viable option? Would this price be lower if it were enriched using the laser enrichment process being developed by General Electric? What is the long range plan for the use of this depleted uranium?

Answer. DOE is evaluating its options for potential future use of the highest-assay depleted uranium in its inventory. Any future policy decision, however, will depend upon current and forecast prices for both uranium and enrichment services. Because depleted uranium must be re-enriched (for example from a tails assay of 0.35% <sup>235</sup>U to an assay of 0.7% <sup>235</sup>U, the same assay as in natural uranium) before it is usable in commercial nuclear fuel, the cost of the enrichment process, whether by older gaseous diffusion technology or by modern laser technology, will be a critical factor.

*Question 7a.* Much of DOE's excess uranium is in the form of uranium hexafluoride (UF<sub>6</sub>) which does not have to be converted prior to being enriched into reactor fuel. Is this material more attractive to a buyer since the buyer would not have to pay for the cost of conversion?

Answer. The price a buyer pays for UF<sub>6</sub> includes the cost for both U<sub>3</sub>O<sub>8</sub> and conversion services. Some consumers may prefer purchasing UF<sub>6</sub> rather than U<sub>3</sub>O<sub>8</sub> and conversion services but utilities generally meet most of their fuel requirements by contracting for both U<sub>3</sub>O<sub>8</sub> and conversion services.

*Question 7b.* Would this have a negative impact on the conversion services in the U.S. especially in regard to the fact that the U.S. only has one conversion facility?

Answer. In its transfers of excess UF<sub>6</sub> into the market thus far, DOE has determined there to be no adverse material impact on the conversion industry. Pursuant to Section 3112 of the USEC Privatization Act, the Secretary of Energy must determine that certain sales or transfers of excess natural or enriched uranium "will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industry." Any future transfers by DOE of UF<sub>6</sub> will also comply with this requirement as applicable.

*Question 8.* When analyzing the potential impact of uranium auctions or transfers did the DOE examine the historical trends in the uranium spot market price with employment in the domestic mining industry? (Note: historically, employment tracks well the average spot market price for a given year. As the price increases so does employment.)

Answer. DOE examined recent historical trends for spot market price both in advance of and after transferring excess uranium to USEC for accelerated cleanup at the Portsmouth Gaseous Plant. DOE contracted Energy Resources International (ERI), a nuclear fuel consulting company, to conduct a market impact analysis to form the basis for its section 3112(d) Secretarial Determination authorizing the transfer of excess uranium to USEC in exchange for services. ERI observed that the short-term volatility in spot market price over the last several years corresponded to a variety of market events, including the flooding of mines and temporary closures of production facilities due to regulatory compliance issues. DOE believes that short-term fluctuations in price do not form a sound basis for making long-term investment decisions in uranium mining projects. DOE has carried out its announced quarterly transfers of uranium to USEC, and the current spot market price for U<sub>3</sub>O<sub>8</sub> falls within the range of prices prior to the DOE's July 2009 announcement of the anticipated transfers to USEC.

## RESPONSES OF R. SHANE JOHNSON TO QUESTIONS FROM SENATOR BARRASSO

*Question 1.* Do all funds generated by the Department of Energy sales, barter, or transfers of excess uranium go to the U.S. Treasury?

Answer. For transactions in which uranium or other nuclear materials would be sold for cash, those proceeds would go to the United States Treasury. For transactions in which the Department has received goods or services in exchange for transfers of excess uranium, no funds were generated to go to the U.S. Treasury.

*Question 2.* Did the proposed transfers generate revenue for the U.S. Treasury? What processes did the Department use to evaluate the value of the transferred uranium scheduled for 2009 and 2010?

Answer. The revenue from the transactions with USEC was in the form of services provided to cleanup the Portsmouth Gaseous Diffusion Plant under the Cold Shutdown Contract with USEC. DOE required the contractor to provide a quotation for the value of services to be provided in exchange for the proposed quantity of uranium to be transferred in that quarterly transaction. The Department then evaluates the contractor's proposed value to determine that the value represents "fair market value." Once that determination is made, DOE's contracting officer modifies the contract to include the additional services at that value.

*Question 3a.* Does the Department play a role in the disposition of excess uranium once it transferred to USEC Inc.?

Answer. No, the Department does not control a contractor's use of the material once it has been transferred to the contractor in compliance with applicable law.

*Question 3b.* How does the Department ensure that the uranium transferred for cleanup services does not impact the market?

Answer. In the case of the recent USEC transfers, the Department contracted with Energy Resources International, a nuclear fuel consulting company, to conduct a market impact analysis which included a number of sensitivity analysis cases to determine, based upon the government's specifications, how much uranium could be transferred, and on what schedule, so as not to have an adverse material impact on the market. Ultimately, based upon internal analysis and consideration of industry interests, the Secretary of Energy determined that a maximum of 300 MTU per quarter and no more than 1,125 MTU for the entire period could be transferred to the contractor without creating an adverse material impact on the market. In 2009 and 2010, DOE's total uranium sales and transfers (including those sales and transfers to which DOE was already committed) remained within the guideline of DOE transfers not exceeding 10 percent of the annual domestic reactor demand.

*Question 4.* The Environmental Assessment for disposition of federal uranium inventories and the analysis done for the Department concerning the recent Secretarial Determination both recognized that long term uranium sales would have much less impact than spot market sales of this material. Does the Department have plans to enter into long-term contracts in order to dispose of its excess uranium?

Answer. The Department intends to include long term uranium contract sales or transfers among its preferred options when its excess inventories permit such a decision.

*Question 5.* Is the Department committed to pursuing long-term contracts for disposition of a portion of its uranium, given the greater certainty long-term contracts provide for uranium markets?

Answer. The Department intends to include long term uranium contract sales or transfers among its preferred options when its excess inventories permit such disposition.

*Question 6.* Increasing transparency for the disposition of Department of Energy uranium will help ensure Department actions do not negatively impact domestic uranium mining and conversion industries. S. 3233 includes a requirement that the Secretary publish the Secretarial Determination in the Federal Register 14 day before the Secretary barter, transfers, or sells any of the Department's excess uranium. Does the Department agree that notifying the public in advance will improve transparency?

Answer. The Department believes that the process laid out in the December 2008 DOE Excess Uranium Inventory Management Plan (Plan) is already transparent. Since the Plan was released, the Department has transferred uranium to support accelerated cleanup of the Portsmouth Gaseous Diffusion Plant. The Department intends to publicly release an update of the Plan to reflect this activity and other changing program objectives. In the past, DOE has made Secretarial Determinations under section 3112(d) of the USEC Privatization Act publicly available and has also released the underlying market impact analyses that supported these Determinations. The Department notes that imposing a 14-day delay on a transfer or sale

supported by a Secretarial Determination hinders the Department's discretion and may adversely affect the Department's ability to enter into transactions that are more advantageous to the government.

*Question 7.* Does the Department believe there is currently a market for initial cores for new reactors and if so what steps has the Department taken to make sales of initial cores for new reactors?

Answer. A market does exist for initial cores in new reactors but DOE would be competing with other suppliers worldwide to supply a relatively small number of anticipated new U.S. reactors. DOE is evaluating various options, including sales for initial cores, but has not made a decision as to the disposition of its excess uranium in this market.

#### RESPONSES OF R. SHANE JOHNSON TO QUESTIONS FROM SENATOR BUNNING

*Question 1.* Would an eligible entity under 2 (e) of S. 3233 include a foreign entity?

Answer. Under proposed section 2(a), new Sec. 170J subpart (e) permits DOE to barter, transfer, or sell to eligible entities certain amounts of uranium in addition to transfers for initial cores. New Sec. 170J subpart (c) defines eligible entities for non-initial core transfers as possessing a license from the Nuclear Regulatory Commission (NRC), without specifying what type of license would be needed to qualify. If a foreign entity were able to acquire the requisite NRC license, it does not appear that the pending legislation would preclude that entity from being an "eligible entity."

*Question 2.* If 2 (e) does not include the sale to foreign entities under the 10 percent limitation, is there any limitation on the sale of DOE uranium inventory to foreign entities?

Answer. As noted in response to question 1, foreign entities may be eligible entities under new Sec. 170J subpart (e). Aside from new Sec. 170J subpart (e), the Department conducts its sales of excess uranium in compliance with existing law, including applicable provisions of the USEC Privatization Act, and with entities appropriately licensed or approved to engage in the transaction.

*Question 3.* Would you agree that the market for uranium is global in nature, and thus that sale of DOE uranium inventory should not be limited by a 10 percent cap on only the domestic demand, but rather on a 10 percent cap on worldwide demand?

Answer. DOE does not agree that the general 10 percent guideline for limiting the sale of excess DOE uranium inventory should be based on worldwide demand instead of the current approach of domestic demand. While DOE recognizes the global nature of the uranium market, a 10 percent limit based on world uranium demand could roughly triple the amount of DOE excess uranium entering the market in a given year. This additional quantity of uranium could cause an adverse material impact on the domestic industry.

*Question 4.* Under the provisions of S. 3233, would DOE be able to apply the proceeds from the sale of uranium derived from the re-enrichment of the tails at Paducah and Portsmouth to the DOE D&D program so long as the sales were consistent with the limitations proposed under 2 (e)?

Answer. As we understand the bill, unless Congress specifically provided that the sale proceeds were to be deposited in the Uranium Enrichment Decontamination and Decommissioning Fund, DOE must return the proceeds to the United States Treasury.

## APPENDIX II

### Additional Material Submitted for the Record

June 29, 2010.

Hon. JEFF BINGAMAN,  
*Chairman, Senate Energy and Natural Resources Committee, SD-304, Washington, DC.*

Hon. LISA MURKOWSKI,  
*Ranking Member, Senate Energy and Natural Resources Committee, SD-304, Washington, DC.*

DEAR SENATOR BINGAMAN AND SENATOR MURKOWSKI: We, the undersigned organizations, urge you to support S.2900, the Gas Turbine Efficiency Act of 2009, introduced by Senator Kirsten Gillibrand (D-NY) and cosponsored by Senators Susan Collins (R-ME), Kay Hagan (D-NC), and Bill Nelson (D-FL).

S.2900 would authorize a four-year program at the Department of Energy to establish a public-private research, development and technology demonstration program to improve the efficiency of turbines used in natural gas-fired electric power generation systems. The goals established under the bill would result in efficiency improvements in turbines used in simple and combined cycle systems to bring them to levels of 50 percent and 65 percent respectively.

We believe the program would produce technologies that would dramatically reduce the carbon footprint of existing natural gas-fired electric generating units and improve the next generation of power plants. To offer one example of the impact of turbine efficiency, if technologies developed under the proposed program resulting in a 1 percentage point efficiency improvement were deployed across the existing gas turbine fleet, it would result in CO<sub>2</sub> reductions of approximately 10 million metric tons per year. A reduction of 10 million metric tons would be the equivalent of taking nearly 2 million passenger cars off the road permanently.

The significance of this is twofold. First, gas turbines currently generate approximately 20 percent of the nation's electricity. Secondly, given the preference of electric utilities for the reduced carbon footprint of natural gas turbines, as well as the competitive cost of America's abundant natural gas supplies, this figure is expected to grow in the next decade.

Finally, S.2900 would have substantial economic and employment impacts in the United States, helping to create or maintain thousands of jobs across the country in engineering, construction, services and suppliers. The bill would help to preserve America's traditional leadership role in gas turbine innovation and bolster our exports to overseas markets.

As such, we would urge the Committee's timely and favorable consideration of S.2900.

Sincerely,

International District Energy Association; Gas Turbine Association; National Electrical Manufacturers Association; Interstate Natural Gas Association of America; American Society of Mechanical Engineers International Gas Turbine Institute; Natural Gas Supply Association; United States Clean Heat and Power Association; National Association of Manufacturers.

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#### STATEMENT OF THE GAS TURBINE ASSOCIATION, ON S. 2900

The Gas Turbine Association (GTA) appreciates the opportunity to provide written testimony in support of S 2900, "The Gas Turbine Efficiency Act of 2009", introduced by Senator Kirsten Gillibrand (D-NY). The GTA commends Senator Gillibrand for introducing the bill, and applauds the Committee for holding this Com-

mittee hearing. We believe these actions highlight the importance of increasing dramatically the efficiency of both future natural gas fired gas turbine products and the existing gas turbine fleet which is currently generating almost 20% of the nation's electricity.

The GTA member companies include virtually all of the US based turbine manufacturers as well as small businesses which provide support services and supplies to the industry. These members include United Technologies/Pratt and Whitney Power Systems, Alstom Power, GE Energy, Siemens Energy, Solar Turbines, Strategic Power Systems, Florida Turbine Technologies, Meggitt VibroMeter and Rolls-Royce. Under S 2900 all turbine manufacturers, both large and small, would be eligible to compete for DOE funding. This is a major reason the GTA is in unanimous support of the legislation.

It is clear that dramatic reductions in greenhouse gas emissions are in the national interest and it is also clear that the economy will need more electric generation capacity in the years ahead. Without the more efficient gas turbine technologies envisioned in S 2900, the power generation industry will be hard pressed to produce the needed additional electric capacity while at the same time meeting the strict greenhouse gas emissions set by states and the federal government.

Gas turbines already play a significant role in reducing greenhouse gas emissions because they are already the cleanest form of the fossil-based generation technologies. Gas turbines can be sited and built quickly and can also burn a wide range of fuels. However, without the public private partnership proposed in S 2900, the higher efficiencies that will be required in the near future are simply not likely to be available when needed. In short, higher efficiency gas turbines along with the use of lower carbon fuels (e.g. natural gas) will lead to lower CO<sub>2</sub> emission. But reduced emissions of CO<sub>2</sub> are not the only environmental benefits provided by gas turbines. Emissions of nitrogen oxide (NOX), sulfur dioxide (SO<sub>2</sub>) carbon monoxide (CO) and particulate matter (PM) from gas turbines are also at fractional levels compared to other combustion-based power generation and mechanical drive applications. In addition to these significant environmental advantages, the GTA believes that the development of the new turbine technologies envisioned under S 2900 is likely to result in the creation at several thousand high-paying, high-technology jobs and increased volumes of US exports. For the past several years Federal R&D funding support for the development of higher efficiency gas turbines has lagged significantly behind what the nation requires. The scope and authorizing levels of S.2900 match very closely the support levels and technology goals that the GTA has been recommending now for several years.

GTA would like to make one additional point. GTA members have heard suggestions that the program envisioned in S 2900 should include carbon capture and sequestration (CCS) research directed at natural gas fired gas turbines (as distinguished from coal based syngas fired gas turbines). CCS on natural gas fired gas turbines is a longer term question and can't truly be addressed given the timing and funding limitations contemplated by this bill. Expanding the scope to natural gas fired gas turbines could dilute the substantial benefits that otherwise would be achieved through this legislation, divert attention from the nearer term and more important work that needs to be done in order to promote CCS on coal fired plants (the much lower hanging fruit), and send confusing signals into the marketplace. There is certainly a time and place for the Senate to address whether adequate information exists to assess the need and potential path forward on CCS for natural gas fired power plants, but that ought not come at the expense of the initial intent of this legislation.

In closing, the GTA reiterates its strong support for S 2900 and commends the Committee for recognizing the national need incorporated in the legislation. We encourage the Committee membership to report the bill as quickly as possible.

NATURAL GAS SUPPLY ASSOCIATION,  
*June 15, 2010.*

Hon. JEFF BINGAMAN,  
*Chairman.*

Hon. LISA MURKOWSKI,  
*Ranking Member, Senate Energy and Natural Resources Committee.*

DEAR CHAIRMAN BINGAMAN & RANKING MEMBER MURKOWSKI: The Natural Gas Supply Association asks that you support S.2900, the Gas Turbine Efficiency Act of 2009, introduced late last year by Senator Kirsten Gillibrand (D-NY).

As you know, S.2900 would authorize a four year program at the Department of Energy to establish a research, development and technology demonstration program



to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems. The legislation contains a cost-sharing provision which NGSAs members view as highly important to the potential success of such research.

Gas turbines generate approximately 20 percent of the nation's cleaner electricity now and this percentage is expected to grow in coming years, in large part because America's domestic natural gas is so abundant, reliable and competitively priced.

NGSA believes that raising the efficiency of gas turbines from the present 60 percent efficiency to the 65 percent efficiency required in the legislation, will significantly reduce the emissions of CO<sub>2</sub> and provide an expanded export market for U.S. manufactured products.

Sincerely,

R. SKIP HORVATH,  
*Chairman and CEO.*

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STATEMENT OF HOLLY GORDON, VP, LEGISLATIVE & REGULATORY AFFAIRS, SUNRUN INC., ON S. 3460

Senator Sanders and other members of the Committee—

Thank you for the opportunity to submit written testimony on the issue of reaching 10 million new solar rooftop installations by 2020. As a growing company in the residential solar industry, we at SunRun would first like to applaud the bill's aim to reach 10 million new roofs in the next ten years. And second, we would like to express our earnest confidence in reaching the goal and beyond—with the appropriate allocation of public support, we can eclipse the 10 million roof mark and make distributed solar a truly significant contributor to creating new American jobs, reducing our dependence on foreign oil, and combating climate change.

From the advent of solar photovoltaic technology up until recently, purchasing and installing solar systems on residential roofs has required high upfront costs. Even with existing federal and state incentive programs, the cost for residential solar systems can range from \$15,000 to upwards of \$60,000. In addition to the prohibitive upfront costs, consumers are faced with understanding a complex technology, daunting permitting requirements, uncertain maintenance costs, and puzzling federal and state incentive programs. To date, this marketplace has yielded a total of only 80,000 solar homes. Dramatically increasing residential solar installations to one day exceed 10 million homes requires addressing these pressure points on consumers and offering innovative solutions to address them.

SunRun was formed in 2007 with a simple mission: to provide every homeowner with access to hassle-free, clean, and affordable solar. With SunRun's third-party financing model, homeowners get solar on their roofs through a Power Purchase Agreement (PPA) or lease, allowing them to get solar for as little as \$0 down and simply pay monthly for solar power. SunRun customers fix their electricity rates for 18-20 years, allowing them to save immediately on their bills and even more over time as utility rates increase. In addition to the low up-front costs and providing monthly savings on customers' bills, SunRun provides complete monitoring, maintenance, repairs, insurance and a money-back performance guarantee for all customers—eliminating all complexity and risk for home solar. With the SunRun model, the homeowner gains all the benefits of having solar on their roof and eliminates all the barriers of high-up front costs, maintenance, permitting, and navigating complex incentive payments.

Third-party ownership is accelerating solar adoption faster than ever. Based on the California Public Utility Commission's California Solar Initiative (CSI) database, in Q2 of 2009, the market share<sup>1</sup> for PPAs (Purchase Power Agreements) and leases in the California residential solar market was 9%. By Q1 of 2010—just nine months later—the market share for PPAs and leases in California residential solar skyrocketed to over 25% and continues to rise. Having launched only just over two years ago, SunRun—along with a growing small group of competitors utilizing third-party financing—is dramatically accelerating residential solar adoption by offering homeowners affordable and hassle-free solar systems on their roofs.

The SunRun third-party ownership model works by leveraging the purchasing power of a larger developer and offering the cost savings directly to homeowners. SunRun purchases all the solar and installation equipment and hires local installers to do installations, maintenance and monitoring—creating local, well-paying green jobs. SunRun also passes on the federal, state and local incentives to the homeowner. For example, SunRun currently operates in five states with existing rebate programs. Since solar costs are still coming down, SunRun is only able to thrive in

<sup>1</sup> CSI includes the territory of the three investor owned utilities in California.

marketplaces and deliver this value where strong and consistent rebate programs exist. As SunRun's success is directly attributable to these programs SunRun's near term growth is dependent on the expansion of existing and creation of new rebate and incentive programs.

If the ultimate goal of this legislation is to accelerate solar rooftop installations in America, we at SunRun strongly recommend that the funds allocated through the 10 Million Solar Roofs Act go to support all business models capable of deploying solar, rather than favoring one business model over another. An earlier version of the bill (S. 2993, Feb 7, 2010) provided for traditional rebates that would benefit all business models. Under S. 2993, a homeowner could choose to get a solar system on their home through either third-party ownership, a solar loan (such as through a PACE program), a home equity loan, or a straight cash purchase and use the rebates provided for in the bill—equally for each product offering and allowing for appropriate consumer choice and fair competition. However, most “solar loan program[s]” (sec. 3(d)(1)(B) of the current draft bill) (e.g. PACE loans) exclude third-party owned systems. So if a state made a choice to allocate all funding toward a solar loan program, it would exclude SunRun's business model, even though that business model—using third-party financing—is deploying solar on roofs faster than any other model.

Third-party financing models have already revolutionized the residential solar market by dramatically reducing barriers to entry for consumers. Giving more states the incentive to ensure strong and consistent rebate programs for solar installations will encourage solar developers like SunRun to enter new markets and accelerate solar adoption across the country.

Third-party financing works and is proven to be the fastest in deploying solar rooftop installations. SunRun's business alone has grown over 500% YOY, and we believe this can be attributed to reaching a new customer base. Our customers are choosing solar not just because of its environmental attributes, they are choosing solar because it saves them money. Never before in this industry was this true. If reaching 10 million solar roofs is dependent on convincing 10 million homeowners to take on prohibitive costs in the name of clean energy, it is unlikely that we will reach our goal. Alternatively, if we can offer homeowners emission-free, cost-saving solar technology for their roofs, we can meet and far exceed the goal of 10 million roofs by 2020. By prioritizing the funds allocated through S. 3460 to rebates or other such programs that support all business models, including third-party ownership, SunRun—along with a growing group of competitors—will deliver the up-front cost savings homeowners want, and will create local jobs and dramatically accelerate the deployment of affordable, hassle and emission free solar installations on roofs across America.

We would again like to applaud Senator Sander's leadership and welcome the opportunity to comment further on this issue.

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STATEMENT OF JON J. INDALL, COUNSEL, URANIUM PRODUCERS OF AMERICA,  
ON S. 3233

The Uranium Producers of America (“UPA”) is a group of domestic uranium mining and conversion companies whose mission is to promote the viability of the front end of the nation's nuclear fuel industry. UPA members are conducting uranium exploration, development and mining operations in Arizona, Colorado, Nebraska, New Mexico, South Dakota, Texas, Utah and Wyoming. The sole domestic conversion company operates in Illinois. Several UPA member companies are very close to permitting new uranium production facilities and could be contributing to domestic fuel security in the near term. UPA members operate valuable, high grade uranium deposits that provide good high paying jobs and tax revenues and produce clean energy for the citizens of the United States. Growth in domestic uranium mining and conversion will be required to support the U.S. government's plans to increase use of nuclear power and foster new domestic uranium enrichment plants as evidenced by multi-billion dollar loan guarantee programs underway. The UPA appreciates the opportunity to provide its comments on the proposed legislation which its members strongly support.

I. BACKGROUND OF DEPARTMENT OF ENERGY URANIUM INVENTORY DISPOSITIONS

The Department of Energy controls approximately 153 million pounds of excess uranium inventories in various forms.<sup>1</sup> The possible disposition of these inventories is not certain and this has created a significant impediment to the stability of the

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<sup>1</sup>See Exhibits 1 and 2 attached.

price of nuclear fuel and to the ability to obtain investment to create new domestic uranium production in the United States or re-invest in the sole ageing conversion plant. Past Department transfers of federal uranium reserves have had drastic impacts on the price of uranium and conversion, diluting the value of the government's uranium assets and forcing the price of uranium below its cost of production. Congress has long recognized the importance of carefully managing the Department's program for sales and transfer of excess uranium inventories and took a positive step by enacting Section 3112 of the Enrichment Privatization Act in 1996. The provisions of Section 3112 placed restrictions on inventory sales to assure that such sales would not create adverse impacts on the front end of the domestic nuclear fuel supply industry:

§ 3112(a)

"The Secretary (of Energy) shall not . . . transfer or sell any uranium including natural uranium concentrates, natural uranium hexafluoride, or enriched uranium in any form to any person except as consistent with this section."

§3112(d)

Sales Must Meet Three Criteria:

(A) The President determines that the material is not necessary for national security needs;

(B) The Secretary determines that the sale of the material will not have an adverse impact on the domestic uranium mining, conversion or enrichment industry, taking into account the sales of uranium under the Russian HEU Agreement and the Suspension Agreement; and

(C) The price paid to the Secretary will not be less than the fair market value of the material.<sup>2</sup>

Despite these restrictions, the Department transferred approximately 70 million pounds of uranium, with the associated conversion component, to USEC in 1998. While the Secretary of Energy determined that this transfer would have no adverse impact on the domestic producers, this uranium transfer devastated the spot uranium price and essentially destroyed domestic uranium production.<sup>3</sup> For example the spot conversion price declined by 50% from \$5.10/kgU in Jan 98 to \$2.55/kgU in Dec 99 while the longterm market price dropped 35% from \$5.00/kgU in Jan 98 to \$3.25/kgU in Dec 99. Similarly the uranium prices fell from \$11.80 per pound in 1998 to \$9.60 per pound in 1999, and approximately 50% from 1997 to 2002. Clearly, these were material adverse impacts.

## II. DEVELOPMENT OF THE DEPARTMENT OF ENERGY MANAGEMENT PLAN FOR THE DISPOSITION OF EXCESS FEDERAL URANIUM INVENTORIES

With this historic record in mind, as the commercial uranium market rallied, uranium producers seeking investment for new projects were faced with the outstanding question as to how the Department of Energy would dispose of the government's excess uranium inventories. The industry met with Department officials to discuss the burden imposed by the lack of market predictability created by the unknown and unpredictable disposition of the government's inventories. In January 2006, the Department announced its intention to be a good steward of federal uranium inventories, recognizing the vast importance that responsible management of this material held for the domestic fuel cycle industry. The Department also stated that it was aware of the importance of managing its uranium assets in a manner that not only achieved a higher return on investment to the United States Government, but avoided an adverse material impact to the domestic nuclear fuel industry. The Department stated it understood the importance of limiting the quantity of government uranium entering the market and that it recognized the vital importance of new investment in developing and expanding new uranium production and processing centers and the risks the financial community would evaluate in making necessary funding decisions. Finally, the Department stated that there was a need to balance national and energy security objectives with the realities of the complex mining, conversion and enrichment markets. The importance of the Department's treatment of surplus uranium was underscored by the fact that, at the time of this announcement, the nuclear utilities producing electricity in the nation's 104 nuclear

<sup>2</sup>See 42 U.S.C. 2297h-10(a) and (d).

<sup>3</sup>The impacts of federal involvement on the frontend of the domestic nuclear fuel cycle are well documented. Government programs and inventories have historically created a heavy burden on domestic fuel suppliers. See generally Jon J. Indall, "A New Dawn for Uranium," Rocky Mountain Mineral Law Digest, Vol. 52, p. a-1 (2006).

power generating plants were importing over 85% of the uranium required to fuel these plants. Since that time the U.S. nuclear generators dependence on imports has grown to more than 90+% of their uranium needs: far more than oil imports.

In August 2006, the Department unveiled a proposal to sell or transfer 10% of U.S. reactor uranium requirements annually over a 30-year period. This would produce sales of approximately 5 million pounds per year. The UPA responded to the Department's suggested plan with a study done by a leading market analyst, Ux Consulting.<sup>4</sup> The Ux study observed that the Department could readily mitigate the impact to domestic fuel suppliers from its proposed inventory sales if (1) it made longterm sales,<sup>5</sup> (2) some of the Department's excess material were sold for initial cores for new reactors, and (3) the Department's sales be gradually ramped up over time to the Department's desired 5 million pounds per year annual sales. The ramp-up recognized the long lead time required to get new uranium production facilities on line and the need to reduce the market price impacts of government material on an emerging uranium industry and a struggling converter.

Industry and the Department continued to debate the merits of government uranium sales and in July 2007, the Department urged the domestic fuel cycle companies and nuclear utilities to achieve a consensus agreement whose parameters, if adhered to, would allow government sales without adversely impacting the nuclear fuel suppliers. The industry achieved a Consensus Agreement in December 2008.<sup>6</sup> The Agreement included (1) a gradual ramp-up of sales, (2) established a strategic reserve for emergency reactor fuel needs, and (3) provided for initial core sales of up to 20 million pounds. The consensus met industry and Department needs and provided much needed predictability to the commercial uranium and conversion markets.

In December 2008, the Department unveiled its Excess Uranium Inventory Management Plan. The Management Plan adopted many of the aspects of the Industry consensus and was welcomed by the nuclear utilities and suppliers. DOE met with industry to describe its Plan in early 2009 and stated that "[u]ranium market fundamentals dictate a gradual ramp-up of material entering the market."<sup>7</sup>

In conjunction with its Management Plan, the Department prepared a draft Environmental Assessment ("EA") in December 2008. The EA defined the term "sale" as including direct sales, transfers or other transactions the Department of Energy may undertake in the disposition of its excess uranium inventory. This definition would include barter transactions favored by the Department in order to direct receipts from the asset transfers to Departmental Programs. The EA contained a section describing the uranium market. According to the EA, over the last few years, about 15 percent of the western world's uranium requirements have been procured in the spot market, that is, for delivery within 12 months of contract award. A report dated April 11, 2008 by Energy Resources International, Inc. ("ERI") on behalf of the Department of Energy was produced in conjunction with the EA's assessment of the impacts on the domestic uranium industry from the Department's surplus uranium sales. ERI attempted to quantify the potential impact on commercial fuel markets by the sale of government surplus uranium. ERI found that impacts would be greatly reduced by the sales of excess uranium inventories through long-term contracts. The report also stated that there was very limited spot market capacity for excess uranium sales by the Department. ERI concluded that potential price effect of additional uranium introduced by disposition of the Department of Energy's excess uranium inventory on the spot or short-term uranium market is very difficult, if not impossible, to forecast due to the spot market's volatility. ERI also concluded that the relative effect of disposition of the Department of Energy's excess uranium inventory by sales or transfers appears to be highly dependant on the underlying direction in which the market price may be moving at the time of the sale or transfer.

<sup>4</sup>The Summary of the October 2006 Ux Consulting Report is attached as Exhibit 3.

<sup>5</sup>Long-term sales are defined in the commercial uranium market as sales that occur over at least a period of three years.

<sup>6</sup>A copy of the Industry Position on Disposition of DOE's Nuclear Fuel Inventory is attached as Exhibit 4.

<sup>7</sup>See Department of Energy PowerPoint slide from Excess Uranium Inventory Plan, Summary and Status, Presented by William Szymanski at the Nuclear Regulatory Commission Fuel Cycle Information Exchange, June 24, 2009, attached as Exhibit 5. This slide clearly demonstrates the fact that DOE sales into a limited spot (near term) market would have much greater impact on the uranium market than longer term contract sales that would provide for future deliveries into a market with unfilled orders and the ability to absorb government sales.

## III. THE DEPARTMENT OF ENERGY ABANDONS THE DECEMBER 2008 MANAGEMENT PLAN

In July 2009 the Department of Energy abandoned the December 2008 Management Plan, particularly the ramp-up schedule that the Department had previously described as a necessary component “dictated by uranium market fundamentals”. Specifically, on July 28, 2009, the Department rejected USEC’s application for a government loan guarantee to assist USEC’s research and development of USEC’s American Centrifuge Project in Piketon, Ohio. In response to the Department’s decision to deny its loan guarantee application, USEC announced it would begin laying off employees and contractors. In response to this announcement, the Department announced a four year commitment of an annual \$150 million to \$200 million investment in accelerated environmental clean up at the Portsmouth site in Piketon, Ohio funded by providing excess uranium from the Department’s existing stockpiles in exchange for services.<sup>8</sup> According to the Department’s announcement, new jobs to be created at the Portsmouth site would offset any job losses at USEC’s American Centrifuge Project.

The receipts from any direct sales of government surplus uranium inventories by the Department of Energy must be deposited in the United States Treasury unless Congress specifically authorizes the use of such receipts for a particular Department program. The Department has been avoiding the payment of the receipts of excess uranium inventory sales or transfers by bartering such excess uranium with third parties in return for the Department’s programmatic needs. Thus, the Department of Energy’s plan was designed to circumvent the need to ask Congress to appropriate funds needed for additional cleanup activities at Portsmouth by transferring uranium to environmental cleanup contractors in a barter transaction.

Furthermore, the Department of Energy’s announcement to sell or transfer excess uranium inventories in exchange for services to accelerate the Portsmouth cleanup was made before any Secretarial Determination of the potential impacts of such sales or transfers on the domestic uranium producing and conversion industries was made. On August 13, 2009, the Department of Energy announced its intent to enter into a noncompetitive contract with USEC for the first year of the work and to fund the noncompetitive contract by the transfer of uranium to USEC with a value at \$150 million to \$200 million.<sup>9</sup> On August 28, 2009, the Department of Energy issued a Request for Proposal (“RFP”) stating that the Department would transfer in a barter arrangement the uranium equivalent necessary to fund the accelerated Portsmouth cleanup between 2011 and 2014. The Department of Energy did not state the exact amount of uranium equivalent to be sold or transferred in the RFP because the amount of uranium equivalent would be determined by the price bid. Because the successful contractor would “have to” sell the transferred uranium immediately, this material would become a “distress sale” in a weak market and therefore have a dramatic impact on uranium and conversion prices.

On September 17, 2009, USEC sent a letter to the Department of Energy expressing concern about the Department’s announced plan. USEC stated that the proposed amount of uranium material to be introduced under the plan and the proposed rate of introduction of that material would significantly depress current and future uranium market prices, which would discourage investment in existing and new uranium production and conversion. The USEC letter further stated that the volume, sequence and timeframe of the Department of Energy’s planned introduction of surplus uranium of this quantity would overwhelm the normal market dynamics in coming years, with long adverse consequences for the U.S. nuclear industry.<sup>10</sup>

The Nuclear Energy Institute (“NEI”), a trade association representing the front end of the nuclear fuel cycle and the domestic nuclear utilities also sent a letter to the Assistant Secretary of Energy, Department of Energy expressing concern regarding the announced Department plan to release uranium into the commercial market. NEI stated that the Department’s announcement alone already had contributed to a depression of uranium prices, and would ultimately be self-defeating as ongoing releases into a saturated market trigger a continued downward price spiral impacting new uranium projects and jobs in the U.S as well as the continued viability of U.S conversion. The NEI letter stated the announced Department’s plan created a difficult scenario to justify the viability criteria that requires the Secretary

<sup>8</sup> See the DOE announcement dated July 28, 2009, attached as Exhibit 6.

<sup>9</sup> See August 13, 2009 letter from Secretary Steven Chu to Vice President Joseph Biden dated August 13, 2009, attached as Exhibit 7.

<sup>10</sup> See the USEC September 17, 2009 letter to the Department of Energy attached as Exhibit 8.

to certify that surplus uranium transfers or sales will not have an adverse impact on the mining and conversion sector.<sup>11</sup>

In response to the Department's proposed uranium transfers, the House and Senate Energy and Water Development Committees of the Appropriations Committee entered into a conference agreement that provided \$232,404,000 for funding the Portsmouth enrichment facility. This was an increase in funding from the President's budget request by the Committee in response to the Department of Energy's decision to expand ongoing cleanup activities at Portsmouth. The Energy and Water Development Committees also noted in their report language that the Department of Energy had limited experience with off-budget excess federal uranium barter strategies and that the Congressional Budget Office estimated the Department would achieve only 55 percent of its deficit reduction targets from excess uranium sales in fiscal year 2010. The conferees expressed serious concerns regarding the Department's ability to successfully implement its excess uranium transfer proposal. The conferees directed the Government Accountability Office to undertake a review of the Department of Energy's oversight and implementation strategy to ensure that the Department executed the excess federal uranium sales or transfers program consistent with the statutory requirements of 42 U.S.C. 2297h-10.<sup>12</sup>

#### IV. THE DEPARTMENT OF ENERGY WITHDRAWS ITS PLAN TO FUND ACCELERATED PORTSMOUTH CLEANUP WITH TRANSFERS OF EXCESS URANIUM INVENTORIES

In response to congressional and industry concerns and declining market conditions brought about by the Department's proposal to barter uranium inventories for accelerated remediation at Portsmouth, Secretary Chu re-examined the impacts of the proposed 2011-2014 transfers. He told this Committee in February 2010 that the Department could not continue to propose uranium transfers to pay for departmental programs such as the accelerated remediation at the Portsmouth facility due to the adverse impacts on the domestic uranium and conversion industries. UPA applauded the Secretary's decision because, unlike the Department's initial determination of no impact from these transfers, the industry's study of the Department's proposal determined the likelihood of much greater price declines for uranium and conversion than forecasted by the Department's determination analysis. Industry consultants found that the proposed Department transfers could represent 20 to 25 percent of annually traded spot market volume, and when considering only end-users' volume (as opposed to material traded for financial gain), Department transfers would represent an even greater percentage of traded volumes.

In a study done by Trade Tech, an industry consultant, it was pointed out that the Department's analysis failed to recognize that near-term price movements can affect long-range price forecasts and investment decisions. Trade Tech conservatively identified over 100 million pounds of annual uranium production that could be negatively impacted from a weakening market resulting from the proposed Department of Energy transfers.

While Secretary Chu has rescinded the Department's decision to use bartered surplus uranium to fund the 2011-2014 accelerated reclamation at Portsmouth, serious impacts occurred to the spot uranium and conversion price in response to the Department's initial inventory transfer announcement. The substantial market impacts occasioned by the decision to barter uranium and then the rescission of this decision demonstrates the vital need to codify the Department's Management Plan in order to bring predictability to the commercial uranium market. New and expanded uranium / conversion operations must have significant investment to develop. The uncertainty associated with the Department's ability to abandon its stated policy is crippling industry's ability to achieve the market stability necessary for investment to expand or bring new domestic production and the jobs associated therewith on line. Further, the Department's misadventures with these federal uranium assets reduces the value of uranium contrary to the requirements of § 3112(d). Putting the Department's Surplus Uranium Disposition Management Plan into law will prevent market disruption and provide predictability greatly needed by the commercial market. It will allow both producers and nuclear fuel consumers to have some certainty of how the surplus inventories will impact the market.

#### V. THE SURPLUS URANIUM DISPOSITION ACT OF 2010 SHOULD BE ENACTED

Enactment of the proposed language set out in the Surplus Uranium Disposition Act of 2010 would bring predictability to the commercial uranium market. It would

<sup>11</sup> See the NEI September 22, 2009 letter attached as Exhibit 9.

<sup>12</sup> See Energy and Water Committee Report FY 2010, p.194, September 30, 2009, attached as Exhibit 10.

allow domestic uranium producers to obtain the investment required to renew current facilities and promote new domestic production to assure security of fuel supply to our nation's reactor fleet. It would promote the creation of numerous high paying jobs associated with this vital industry. A strong domestic uranium mining and conversion sector will provide substantial direct and indirect economic benefits and tax revenues to promote economic recovery in addition to enhancing national energy security.

The proposed legislation provides the ramp up of government sales that will allow new and expanded domestic production operations to get established so that they can coexist with government uranium inventories. The provision for new reactor initial core sales will provide the Department with the ability in the ramp-up years to meet its stated goal of selling 5 million pounds on an annual basis. The proposed legislation creates an incentive for the Department to sell a portion of the federal inventories by long-term contracts, which all analysts acknowledge would have less adverse impacts on private industry. The current Department practice of disposing of its uranium inventories through spot barter transaction cannot be accomplished with long-term contracts. Also, the Department's practice of using receipts from prior sales to fund its programs without the benefit of the appropriations process will stop. While the UPA recognizes that the Department's programs have merit, the proposed legislation would place all receipts into the Treasury so that Congress could direct how these federal asset receipts should be allocated. This would create an incentive for the Department to sell into the long-term market, make initial core sales and greatly mitigate adverse commercial impacts. UPA believes long-term sales would enhance the value of the surplus federal uranium inventory and passage of the proposed legislation would cause the commercial market to be more reflective of actual production costs for primary producers instead of temporary supply demand imbalances created by surplus government inventories.

#### VI. CONCLUSION

Fast-growing countries competing for global resources of fuel and raw materials like China and India, are building up stockpiles of uranium and investing heavily in overseas uranium properties while the U.S is disposing of its stockpile and creating a very difficult environment for investment in new uranium facilities within the U.S.

The Uranium Producers of America believe that the Surplus Uranium Disposition Act of 2010 deserves strong consideration by this Committee. This Act will bring stability to the commercial uranium and conversion market while providing the basic conditions for growth of all facets of the domestic fuel cycle industry. The Act enjoys the support of all players in the nuclear industry.

*[Note: All exhibits have been retained in subcommittee files.]*

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#### STATEMENT OF SHIRLEY BROSTMAYER, CHIEF EXECUTIVE OFFICER, FLORIDA TURBINE TECHNOLOGIES, INC., JUPITER, FL, ON S. 2900

Florida Turbine Technologies (FTT) thanks the subcommittee for the opportunity to submit testimony in support of S. 2900, the "Gas Turbine Efficiency Act".

Florida Turbine Technologies has established itself as a leader in the development of next generation gas turbine technologies and existing gas turbine improvements. FTT continues to be at the forefront of gas turbine technology by (1) recognizing the value of an experienced American gas turbine workforce, (2) hiring and retaining the best graduates that American universities have to offer, and (3) developing innovations that help to achieve the Department of Energy's long range goals for energy independence.

FTT employs over 200 engineers, technicians, and support personnel, and has an eleven year history of providing innovative and proven efficiency and durability improvements to gas turbines for power generation. Furthermore, FTT develops advanced turbomachinery for aircraft, missile, and rocket applications, and currently ranks among the leading turbomachinery companies worldwide in the number and quality of patent awards involving clean energy innovations. FTT's contribution to our nation's environment is proven every day since turbine efficiency improvements designed by FTT are saving millions of tons of CO<sub>2</sub> per year.

Gas turbines generate 20% of our nation's electricity and are a versatile component of America's clean energy portfolio. They are economic to operate as very efficient base load generators or as peak power generators. Their ability to quickly and economically come on-line to provide power makes gas turbine power the natural complement to sometimes intermittent renewable energy sources. And above all

they are fueled by plentiful and clean domestic natural gas. Currently, investments by Asian countries in their own gas turbine technologies are threatening the US's technological leadership in this important industry, which supports tens of thousands of American export-producing jobs.

The efforts authorized under S. 2900 will help the US preserve its technical leadership in the Natural Gas Turbine Industry and will leverage American small businesses and universities to create lasting jobs for generations to come. Americans must continue to perform the detailed design, manufacture and test of efficiency innovations in order for the US to retain the depth of understanding that is necessary to be the innovative leader in this technology-intensive field.

Florida Turbine Technologies again thanks the Senate Subcommittee on Energy for the opportunity to submit this testimony, and we urge you to support S. 2900, the "Gas Turbine Efficiency Act".

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NATIONAL ASSOCIATION OF STATE ENERGY OFFICIALS,  
*Alexandria, VA, June 14, 2010.*

Hon. BERNIE SANDERS,  
*U.S. Senate—SD-332, Dirksen Senate Office Building, Washington, DC.*

Re: S. 3460—10 Million Solar Roofs Act of 2010

DEAR SENATOR SANDERS: On behalf of the National Association of State Energy Officials (NASEO), I wanted to take this opportunity to endorse your innovative legislation: The 10 Million Solar Roofs Act of 2010 (S. 3460). NASEO represents the energy offices from the states, territories and the District of Columbia, and we support a balanced national energy policy, that includes strong promotion of renewable energy.

This solar legislation would facilitate the use of solar energy for homeowners, businesses, schools and other types of facilities utilizing solar installations of less than 1 megawatt. Funds are provided under your bill through the State Energy Program (SEP), operated by the 56 State and Territory Energy Offices utilizing the formula for SEP. This is a proven vehicle, which is being operated successfully in distributing ARRA funds as well. The types of programs which can be implemented include rebates, loans, performance-based incentives and other financing options. These programs are being operated at the state level now, and these funds will greatly expand and focus their use on solar economic development opportunities.

Your continuing efforts leading support for the State Energy Program, the Weatherization Assistance Program, the Energy Efficiency and Conservation Block Grant and the Low-Income Home Energy Assistance Program, are seen by state and local governments as a powerful model for how a legislator can impact energy policy and programs for the better. These programs help real people every day, and you deserve credit for leading the charge in support of these critical activities.

Thank you again for your support for innovative approaches to solving our nation's energy problems.

Sincerely,

PHILIP GIUDICE,  
*Chair.*

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ALLIANCE TO SAVE ENERGY,  
*June 11, 2010.*

Hon. JEFF BINGAMAN,  
*Chairman, Senate Energy and Natural Resources Committee, 304 Dirksen Senate Office Building, Washington, DC.*

DEAR CHAIRMAN BINGAMAN: We write today to congratulate you for introducing the Supply Star Act (S. 3396). Your legislation would create within the Department of Energy a program known as "Supply Star," whose sole purpose would be improving the efficiency with which enterprises related to each other through manufacturing supply chains use energy, water and other natural resources. We believe this bill has the potential to significantly improve the energy efficiency of almost all energy sectors, and the Alliance to Save Energy is pleased to endorse S. 3396.

Improving the energy efficiency with which products are manufactured, packaged, transported, stored, sold, used, and recycled or disposed of has a great potential for companies to save money and resources. For instance, through Wal-Mart's Supplier Energy Efficiency Program, industrial facility retrofits saved manufacturers \$200,000 in energy costs in its first year, and eliminated more than 3,300 metric tons of greenhouse gases. By improving its freight logistics planning and the meth-



ods by which it loads merchandise in trucks, Wal-Mart also reduced the number of miles driven by its trucks by over 87 million miles, saving 15 million gallons of diesel fuel—all while transporting more goods than before.

But most companies don't have the capacity or the expertise to attain these savings. The Supply Star Program would fill that role, collecting best practices by which companies can maximize the efficiency of their supply chains, and sharing its findings with industry—including, importantly, small businesses. It would develop and standardize metrics, processes and tools for measuring supply chain efficiency, and collect and disseminate data on energy consumption in supply chains. It would provide entities with opportunities to benchmark their supply chain efficiency, and promote the practices, companies and products that conserve energy water and other resources through highly efficient supply chains.

While there are significant opportunities to improve supply chain energy efficiency in the private sector, the federal government is in a unique position to lead by example in this field. Through its direct energy consumption, the federal government is not only the largest single energy user in the nation but the largest buyer in the world of many types of products and services. The energy use of federal government suppliers is equally substantial, particularly in the military sector. We recommend that the Supply Star program capitalize on this fact by requiring federal government agencies to improve the efficiency of their supply chains.

This would have a host of benefits. Reduced energy consumption of federal suppliers will not only strengthen their own bottom line, but improve air quality and reduce the emission of greenhouse gases while improving American energy security. And as agencies implement innovative strategies to reduce the resource consumption of their supply chains, they will serve as a proving ground to test the Supply Star information and software tools and to demonstrate and document best practices in this field.

Initiatives to involve the federal government in the Supply Star program could take a number of forms. Agencies could work with their suppliers to encourage the purchase of Energy-Star-qualified appliances; improve facility energy management by calling on their suppliers to join DOE's Save Energy Now program and to benchmark and "commission" their major facilities; challenge their suppliers to join the Environmental Protection Agency's SmartWay program for shipping their products; and much more.

We would also propose that the federal government enlist advice from the private sector in designing and implementing a federal supply chain initiative.

The Supply Star Act creates a unique opportunity to tackle energy use across a variety of sectors, while reducing costs for industry in these difficult economic times. The Alliance is pleased to endorse this bill and we look forward to assisting you in moving it forward through the legislative process this year.

Sincerely,

KATERI CALLAHAN,  
*President.*

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UPS,  
CORPORATE PUBLIC AFFAIRS,  
*Washington, DC, July 14, 2010.*

ALICIA JACKSON, PH.D.,  
*Professional Staff Member, Senate Committee on Energy and Natural Resources, SD-304, U.S. Senate, Washington, DC.*

DEAR DR. JACKSON, Given the technical changes that you have made to the bill S. 3396, the Supply Star Act of 2010, sponsored by Chairman Bingaman, UPS is pleased to indicate its support for the bill. I thank you for your cooperation.

Sincerely,

JAMES T. BRUCE,  
*Special Counsel.*

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STATEMENT OF JOHN REINKER, GENERAL MANGER, HEAVY DUTY GAS TURBINE  
COMBINED CYCLE PRODUCTS, GE ENERGY, ON S. 2900

OVERVIEW

GE Energy (GE) appreciates this opportunity to submit testimony in support of S. 2900, the "Gas Turbine Efficiency Act."

GE serves the energy sector by developing and deploying technology that helps make efficient use of natural resources. With nearly 85,000 global employees and 2009 revenues of \$37 billion, GE Energy ([www.ge.com/energy](http://www.ge.com/energy)) is one of the world's leading suppliers of power generation and energy delivery technologies. The businesses that comprise GE Energy—GE Power & Water, GE Energy Services and GE Oil & Gas—work together to provide integrated product and service solutions in all areas of the energy industry including coal, oil, natural gas and nuclear energy; renewable resources such as water, wind, solar and biogas; and other alternative fuels.

S. 2900 authorizes a cost-shared program at the Department of Energy to research, develop and demonstrate technologies to improve dramatically the efficiency of gas turbines used in simple cycle and combined cycle power generation systems. This program would serve significant U.S. national interests by promoting environmental protection through reductions of CO<sub>2</sub> and other emissions, strengthening the economy through job creation and retention, and preserving U.S. technology leadership. GE commends Senator Gillibrand and her cosponsors for introducing this bill, applauds the Committee for moving it forward, and encourages the Senate to enact it as quickly as possible.

#### BENEFITS

This program will achieve important objectives in a variety of critical areas. These include:

**Environmental benefits.**—Natural gas is considered by many to be the cleanest burning fossil fuel. Highly efficient gas turbine technology offers a reliable, economical, power generation option, providing significant savings for consumers while producing substantial reductions in emissions of CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub> compared to other sources of fossil fired generation. The technologies developed pursuant to this new program can be an essential part of the response to climate change, both in this country and around the world.

For example, a one percentage-point improvement in efficiency potentially achieved through technology developed under this program and applied to GE's existing F Class fleet in the U.S. would result in CO<sub>2</sub> emissions reductions of 4.4 million tons per year. Such an improvement could also result in savings of more than a billion dollars per year in fuel costs for consumers. Assuming adoption of some form of climate change legislation, deployment of a 65% efficient combined cycle gas turbine throughout the country could result in significant reductions in fuel use, leading to savings in electricity costs of \$180 billion through the year 2040.

**Jobs created and retained through U.S. technology leadership.**—The program will promote U.S. technology leadership, which could put the U.S. in a position to serve a greater share of the world's energy needs and create and retain high value domestic jobs in turbine manufacturing. If GE were to qualify for an award under this program, we estimate that it would lead to the creation or retention of 180 jobs per year for the design, manufacturing, and testing of the technology. That technology could lead to the subsequent creation or retention of more than 3,700 jobs over the following 5 years for potential plant retrofits, and the creation of roughly 1 million hours in labor for each new plant constructed.

**Takes advantage of abundant U.S. natural gas supplies.**—Recent developments in drilling technology are allowing the United States to tap huge supplies of shale and other non-conventional domestic gas resources. Recent estimates suggest the U.S. has 100-years or more of natural gas supply. These developments could have an important impact on the role that natural gas plays in our nation's energy mix, which would be complemented by the introduction of more efficient technology.

**Need for a public-private partnership.**—A government-industry partnership will greatly assist in addressing the inherent technological challenges in moving the efficiency benchmarks to the levels contemplated by this legislation, particularly in the areas of the development of high temperature materials, and enhancements in combustion technology, advanced controls, and high performance compressor technology.

GE again thanks the Committee for the opportunity to share its views on S. 2900, and urges the Committee to support its passage by the full Senate as quickly as possible.

SOLAR ENERGY INDUSTRIES ASSOCIATION,  
*Washington, DC, June 15, 2010.*

Hon. BERNIE SANDERS,  
*U.S. Senate, 332 Dirksen Senate Office Building, Washington, DC.*

DEAR SENATOR SANDERS: On behalf of more than 1,000 companies and over 30,000 employees that make up the U.S. solar energy industry, the Solar Energy Industries Association thanks you for your leadership on the 10 Million Solar Roofs Act (S. 3460). This bill would create a mechanism to fund comprehensive solar rebate and incentive programs in all fifty states and create for the first time a national market for solar in the United States.

The 10 Million Solar Roofs Act would have significant economic, energy, and environmental benefits if enacted and implemented. With its focus on spurring the growth of small-scale, distributed solar systems, this bill would bring the benefits of solar energy to millions of new consumers and organizations. State-level solar incentives created through the American Recovery and Reinvestment Act of 2009 have proven extremely successful, and this bill would provide a way to sustain and expand these programs notwithstanding the current shortfall in many state budgets.

We applaud your determination and dedication to expanding the use of solar energy in the U.S. Your willingness to take the lead in supporting and encouraging the growing solar industry, and the vision you have shown in crafting this legislation, serve as models for other legislators in Congress. This type of forward-thinking policy is critical to ensuring America's technological and environmental leadership in the twenty-first century.

Passing this important legislation will help America begin to diversify our energy portfolio and further expand our already-growing clean energy industry. By investing in solar, the U.S. will create thousands of new jobs in manufacturing and installation, save Consumers money on their electricity bills, and reduce the amount of harmful and dangerous pollutants in our atmosphere.

Once again, we strongly support the 10 Million Solar Roofs Act, and we commend you for leading the way to a clean energy future for our country. We look forward to working with you to pass and implement this important legislation.

Sincerely,

RHONE RESCH,  
*President.*

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