S. HRG. 111–1046

CLEAN TECHNOLOGY MANUFACTURING COMPETITIVENESS: THE ROLE OF TAX INCENTIVES

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE

OF THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

MAY 20, 2010

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PRINTING OFFICE

67–346—PDF WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON FINANCE

MAX BAUCUS, Montana, *Chairman*

JOHN D. ROCKEFELLER IV, West Virginia
KENT CONRAD, North Dakota
JEFF BINGAMAN, New Mexico
JOHN F. KERRY, Massachusetts
BLANCHE L. LINCOLN, Arkansas
RON WYDEN, Oregon
CHARLES E. SCHUMER, New York
DEBBIE STABENOW, Michigan
MARIA CANTWELL, Washington
BILL NELSON, Florida
ROBERT MENENDEZ, New Jersey
THOMAS R. CARPER, Delaware

CHUCK GRASSLEY, Iowa
ORRIN G. HATCH, Utah
OLYMPIA J. SNOWE, Maine
JON KYL, Arizona
JIM BUNNING, Kentucky
MIKE CRAPO, Idaho
PAT ROBERTS, Kansas
JOHN ENSIGN, Nevada
MICHAEL B. ENZI, Wyoming
JOHN CORNYN, Texas

RUSSELL SULLIVAN, *Staff Director*
KOLAN DAVIS, *Republican Staff Director and Chief Counsel*

SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE

JEFF BINGAMAN, New Mexico, *Chairman*

KENT CONRAD, North Dakota
JOHN F. KERRY, Massachusetts
BLANCHE L. LINCOLN, Arkansas
DEBBIE STABENOW, Michigan
MARIA CANTWELL, Washington
BILL NELSON, Florida
THOMAS R. CARPER, Delaware

JIM BUNNING, Kentucky
MIKE CRAPO, Idaho
JOHN CORNYN, Texas
ORRIN G. HATCH, Utah
MICHAEL B. ENZI, Wyoming

CONTENTS

OPENING STATEMENTS

WITNESSES

ALPHABETICAL LISTING AND APPENDIX MATERIAL

COMMUNICATIONS

CLEAN TECHNOLOGY MANUFACTURING COMPETITIVENESS: THE ROLE OF TAX INCENTIVES

THURSDAY, MAY 20, 2010

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

The hearing was convened, pursuant to notice, at 2:45 p.m., in room SD–215, Dirksen Senate Office Building, Hon. Jeff Bingaman (chairman of the subcommittee) presiding.

Present: Senators Wyden, Stabenow, Cantwell, Carper, and Bunning.

Also present: Derek Dorn, Staff Director for Senator Bingaman; and Karin Hope, Staff Director for Senator Bunning.

OPENING STATEMENT OF HON. JEFF BINGAMAN, A U.S. SENATOR FROM NEW MEXICO, CHAIRMAN, SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE, COMMITTEE ON FINANCE

Senator BINGAMAN. All right. Why don't we get started? This afternoon, the hearing examines "Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives." This term "clean technology" refers to technologies that harness zero-emission energy sources—such as wind turbines, solar panels, fuel cells—or enhance energy efficiency.

If we had held this hearing in 2000, 10 years ago, we might have framed the key question as: how do we maintain and expand U.S. leadership in clean tech manufacturing? Unfortunately, over the past decade the U.S. has fallen behind a number of countries. For instance, as recently as 1999, the U.S. commanded a 30-percent share of the global solar manufacturing market. As the global market grew, domestic production declined, and by 2008 our share had slipped to 6 percent. A similar story can be told for the wind turbine industry: today, only one of the world's top 10 wind turbine manufacturers is American.

Using OECD data, the New America Foundation found that America's green trade balance had moved from a surplus of $14.4 billion in 1997 to a deficit of $8.9 billion in 2008. This is a troubling trend. We see at least three reasons for trying to ensure that U.S. leadership in clean tech manufacturing returns.

First is economic. Building a clean energy technology industrial base offers an opportunity to reverse the decline in our manufacturing sector, which has lost more than 6 million jobs in the past decade. A national renewable electricity standard, like the one that we reported out of our Energy Committee, which my colleagues here, Senator Bunning and Senator Wyden, serve on with me, could stimulate enough demand for wind turbines, solar panels, and other clean energy technologies to create a great many manufacturing jobs, but we must ensure that those jobs are created here in the U.S. and not in other countries.

Second is national security. If we do not grow a domestic clean tech manufacturing base, we could be trading our imported oil dependency for an imported clean energy component dependency. Shortages in energy and renewable energy components and systems have already slowed domestic renewable energy production.

Finally is innovation. We have begun to see offshoring of manufacturing being followed by the offshoring of research and development capacity. Failure to lead in clean technology manufacturing could undermine our lead in the research, development, and innovation that is related to it.

For years, other countries have utilized tax incentives to attract clean tech manufacturers. In the Recovery Act that Congress passed last year, we began to level the playing field. We created the Advanced Energy Project, or section 48(c) credit, that allows qualifying companies to claim a credit for 30 percent of the cost of creating, expanding, or re-equipping facilities to manufacture clean energy technologies.

Under the provisions enacted into law, the Departments of Energy and Treasury were authorized to award $2.3 billion in tax credits. In January, the departments fully allocated that $2.3 billion among 183 different projects, representing the solar, wind, vehicles, nuclear energy storage, smart grid, energy efficiency, and bio-fuel sectors.

Awards were made to projects in 43 States, and this includes three projects in my home State of New Mexico, four in the State of Kentucky. The credit's vast over-subscription is a powerful demonstration of the potential for clean energy manufacturing in the United States.

To that end, I joined, in December, with Senators Hatch, Stabenow, and Lugar in filing the American Clean Technology Manufacturing Leadership Act, which would add another $2.5 billion in tax credit allocation authority. I am glad to see that earlier this year the President endorsed this expansion, but called for $5 billion in credits rather than the $2.5 billion.

At today's hearing, we have a panel of expert witnesses who will help us consider three issues: first, how have the U.S. and other countries attracted advanced energy manufacturing facilities through tax and other incentives; second, what is the experience of the recently enacted section 48(c) tax credit; and third, should Congress provide additional tax credit authority under this section 48(c) program? I look forward to receiving this testimony.

Senator Bunning, go right ahead.

OPENING STATEMENT OF HON. JIM BUNNING, A U.S. SENATOR FROM KENTUCKY

Senator BUNNING. Thank you, Mr. Chairman. I thank the witnesses for appearing today, and I thank you for holding this hearing.

I think we all can agree that we need to allow American manufacturers to compete fairly and create jobs, including jobs in clean energy. Today, we are looking at whether the tax credit in section 48(c) of the tax code is succeeding, whether it should be extended or changed, and in general, what keeps U.S. manufacturers from being competitive in clean energy?

First, I think it is important to put the tax credit in context. Section 48(c) was created in last year's stimulus package, a bill that added over $1 trillion to our national debt if you include the interest costs. We simply cannot continue spending money that we do not have. If we follow the path outlined by the administration, America will be on a track to double our national debt in 5 years and triple it in 10. Unless we want the situation in Greece to happen here in a few years, we have to stop spending money like drunken sailors.

So let us agree that, if extended, section 48(c) will have to be paid for. On the rare occasion that Congress actually pays for anything, the favorite method is to raise taxes, not to cut spending and reduce the bloated size of the Federal Government. The Obama administration has proposed paying for clean energy incentives by raising taxes on the most abundant source of American energy. Since manufacturers have a harder time succeeding when their energy costs are high, it is hard to see how this is going to create jobs or make American businesses more competitive.

Or to put it another way, how many jobs are we willing to destroy in order to create one green energy job? We know that America is second to none in innovation and our high-quality workforce, but we should not be surprised that other countries are outpacing America in clean energy manufacturing.

The policy of the Chinese government is to massively subsidize their exporting industries. China does this through huge direct subsidies and by manipulating currency to make its exports cheaper. One of the most obvious and cost-effective ways to address this problem is for the United States to actually enforce our trade laws, but our government refuses to take any meaningful action.

Then there is the problem of environmental and other regulatory roadblocks that are thrown up to prevent American energy projects from going forward. These roadblocks affect many renewable energy projects, and we would not have to spend a lot of money to fix them. Some people suggested that if we impose a cap-and-trade system we would not need tax incentives to promote cleaner sources of energy and green jobs, but many of our witnesses will point out that this will not succeed in creating green jobs. In fact, it is likely to push even more manufacturing jobs offshore to countries without emissions limits.

So, we have a lot of important questions to explore today: (1) can we afford to spend another $5 billion on a tax subsidy, and will it really help; (2) are we willing to destroy jobs in order to create one

green job; and (3) are there more cost-effective ways of addressing the competitiveness of the United States' manufacturers?

Thank you again, Mr. Chairman, for holding this hearing.

Senator BINGAMAN. Since we have two other colleagues here who are vitally interested, let me just ask if each of them would like to make a short statement. We do want to get to the witnesses. But Senator Wyden, why don't you make a short statement, if you would like, and then Senator Carper?

OPENING STATEMENT OF HON. RON WYDEN, A U.S. SENATOR FROM OREGON

Senator WYDEN. Mr. Chairman, I will be brief, because I am going off to chair another panel on clean energy that you and I have a big interest in.

I look forward to working very closely with you, Mr. Chairman, on this topic. As you know, I chair the Trade Subcommittee of the Finance Committee. You and I have a mutual interest in looking carefully at 48(c), the Advanced Energy Manufacturing Tax Credit, because I think we have really reached a fork in the road with respect to how we advance these credits. The two standards essentially for the original credit were: (1) did the proposal create jobs; and (2) would that be a commercially viable kind of effort?

What you and I have talked about is a third area that I think is absolutely essential, and that is the ability to take those two standards, job creation and commercial viability, and apply them to the export area. It is very obvious now that, particularly, China is in a crash program to develop these clean energy technologies. They have the potential to out-invest us in this area by a factor of 3:1 in the next 5 years. It just strikes me as a no-brainer to say that one of the criteria for the future should be the ability to export. That way, when we produce these wind turbines and solar panels—I think Senator Bunning made a good point with respect to his concern about spending.

Let us just say, if we are going to make an investment, let us give it the potential to be a two-fer: one to be used in our country, these green products here, but second, to have it as something that we would export around the world so that our workers could get additional good-paying jobs. This also fits with the President's promise, of course, to double exports in the next 5 years.

The last point I would make, Mr. Chairman, is something else you and I have talked about. The structuring of the incentives in this area as it relates to manufacturing needs to be done carefully to not run afoul of U.S. obligations under the World Trade Organization. But I think it would be possible, by adding exports as a third criteria, in effect, to the other two major criteria, to get the best of both worlds, an additional opportunity, a major opportunity for our country in the export markets, and do it in a way that does not run afoul of our obligations under the World Trade Organization.

Mr. Chairman, I really look forward to working closely with you on it. Our staffs have been working together on it, and I think this is an extraordinarily important initiative for the future of the American economy, and I commend you for your leadership.

Senator BINGAMAN. Thank you for your statement.
Senator Carper?

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

Senator CARPER. Thanks very much. Witnesses, we welcome you today.

Maybe three quick points, if I could. Four. First of all, thanks for pulling this together. This is great stuff. When we did the stimulus package, voted and worked on that measure in the Finance Committee, I was strongly interested—I think every one of us was strongly interested—in making sure, if we are going to move toward clean energy, and I hope we do, that we build those components to support those initiatives in this country.

Three points. Delaware hopes to be the first State off of whose shores will be deployed the first windmill farm. Twelve miles off of Rehoboth Beach, hopefully in 2 years we will have a windmill farm. They already have a contract with the utility to buy the electricity, and we are very much encouraged that that will happen.

Across the river from us in Delaware, just across the Delaware River in New Jersey, there is a place called Salem, and they have two nuclear power plants there, Salem and Hope Creek, owned by PSEG. PSEG, the utility, wants to build another one on the vacant site. There is a plot there that is available to build another one.

Finally, down in Dover, our State capitol in the middle of the State, we have a farm with several hundred acres. The town of Dover has decided they are going to help build and deploy a solar energy farm there to provide and meet much of the electricity needs for the community.

Now, I love offshore wind and I am a supporter of nuclear, as I know my two compadres here are, and I think we are all supportive of solar. It would be great to have all three of those projects, I think, happen to put people to work and so forth. But would it not be even better if the components that were actually going to be used to manufacture and assemble the windmill farms and the nuclear power plant and the solar energy farm could be made here in America as well? Whatever we could do to incentivize that, that is a great thing for our country. So, thanks.

Senator BINGAMAN. Well, thank you. Thanks for being here at our hearing.

Let me introduce our first panel. Dr. Mark Mazur is the Deputy Assistant Secretary for Tax Analysis in the Treasury Department. Thank you for being here. And Dr. Henry Kelly is the Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy at the Department of Energy. Thank you very much for being here.

Why don't you each go ahead? As you are probably aware, the practice here on the committee is to try to have folks summarize their testimony in about 5 or 6 minutes each, and then we will include your full statement in the record.

So, Dr. Mazur, why don't you go ahead?

STATEMENT OF DR. MARK MAZUR, DEPUTY ASSISTANT SECRETARY FOR TAX ANALYSIS, DEPARTMENT OF THE TREASURY, WASHINGTON, DC

Dr. MAZUR. Thank you. Good afternoon, Chairman Bingaman, Ranking Member Bunning, and members of the subcommittee. Thanks for inviting me here to testify before the subcommittee today. I appreciate the opportunity to discuss the role of tax incentives in helping to improve clean energy technology manufacturing competitiveness for the United States.

Now, the Obama administration believes that our Nation must build a clean energy economy, curb our dependence on fossil fuels, limit greenhouse gas emissions, and make America less dependent on foreign sources of energy. It is not sufficient to address our energy needs solely by finding more fossil fuels. Instead, we must take dramatic steps toward becoming a clean energy economy. These include encouraging investment in clean energy infrastructure and energy efficient technologies.

The Recovery Act took an important step in that direction by providing more than $90 billion for various investments in clean energy technologies, including $2.3 billion in tax credits for investments in advanced energy manufacturing facilities, section 48(c) of the tax code.

This section 48(c) program is one of two major Recovery Act programs promoting clean energy technologies that are administered by the Department of the Treasury in consultation with the Department of Energy. The other one provides payments for specific energy property in lieu of tax credits, the section 1603 program, but the 48(c) program, the subject of today's hearing, has provided $2.3 billion in tax credits to support American businesses in the clean energy manufacturing marketplace, funding 183 projects in 43 different States.

This tax credit supports investments in advanced energy manufacturing facilities and was designed to help America take the lead in the manufacture of wind turbines, solar panels, electric vehicles, and other clean energy and energy conservation products.

Under section 48(c), a 30-percent tax credit is provided for investments in eligible property used in a qualifying advanced energy project. A qualifying advanced energy project is a project that reequips, expands, or establishes a manufacturing facility for the production of property designed to produce energy from renewable sources, fuel cells, or microturbines; property that supports the transmission of intermittent sources of renewable energy; property to capture and sequester carbon dioxide emissions; property to refine or blend renewable fuels; electric drive motor vehicles; and advanced energy property designed to reduce greenhouse gas emissions.

Ineligible property for this credit is tangible personal property or other tangible property, but not including a building or its structural components for which depreciation is allowable.

The 48(c) credit represents a new approach for the United States. Previous tax incentives were aimed at increasing clean energy production, and while these incentives increased demand for clean energy equipment, much of this equipment and property was manufactured overseas.

The 48(c) credit provides a powerful incentive to invest in advanced energy facilities that will produce clean energy equipment here in this country. The $2.3-billion cap on the credit resulted in the funding of less than one-third of the technically acceptable project applications that were received.

Now, other countries have a variety of programs to encourage the clean energy sector. Some countries have adopted systems that require you to purchase a specified amount of energy from renewable or clean sources at a set price. The creation of a stable market for clean energy increases demand for, and encourages investment in, manufacturing capacity to meet that demand. Other programs include direct public investments in clean energy technology, often at levels far exceeding what the United States has in their programs.

China, for example, is expected to direct nearly $400 billion of public investments in clean energy technology over the period 2009 to 2013. That compares to about half, or less than half, of that amount for the United States over the same period.

Some jurisdictions offer significant tax incentives for clean energy manufacturers. Just one example is Malaysia, that offers photovoltaic manufacturers a 15-year income tax holiday.

The Obama administration will monitor other countries' programs that promote clean energy manufacturing and will work to establish a level playing field for U.S. clean energy product manufacturers, including vigorous enforcement of our rights under international trading rules and our ongoing efforts in the World Trade Organization to eliminate tariff and non-tariff barriers in this area.

With this as background, I want to turn to the tax proposals in the fiscal year 2011 budget that relate to clean energy. These really fall into two buckets. One, a proposal to provide additional tax credits for advanced manufacturing facilities. The President's fiscal year 2011 budget proposed an additional $5 billion in credits for the 48(c) program. We estimate that will support at least $15 billion of total capital investment and create tens of thousands of new construction and manufacturing jobs.

Given the experience with the existing section 48(c) program, we believe there will be a sufficient number of high-quality projects and substantial interest from a variety of sources. Accordingly, we believe that this can be an effective program to further promote advanced energy technologies.

The second bucket is extending a number of expiring provisions. The fiscal year 2011 budget proposes to extend through 2011 a number of tax provisions that have either expired or are scheduled to expire before the end of 2011.

The following clean and renewable energy efficiency incentives are included in the budget proposal. Incentives for biodiesel and renewable diesel, incentives for alternative fuels, incentives for alcohol fuels, tax credits for alternative fuel refueling property, tax credits for hybrid automobiles and other alternative motor vehicles, tax credits for energy-efficient new homes, and tax credits for energy efficiency improvement to existing homes.

Mr. Chairman, this concludes my prepared testimony. I would be happy to answer any questions you or other members of the committee may have.

Thank you.

Senator BINGAMAN. Thank you.

[The prepared statement of Dr. Mazur appears in the appendix.]

Senator BINGAMAN. Dr. Kelly, go right ahead.

STATEMENT OF DR. HENRY KELLY, PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY, WASHINGTON, DC

Dr. KELLY. Chairman Bingaman, Ranking Member Bunning, other members of the committee, it is a pleasure to be here today to talk about what we think is a crucial part of America's Recovery and Reinvestment Act, which is the 48(c) tax credit program. I have a longer statement, which I will submit for the record.

[The prepared statement of Dr. Kelly appears in the appendix.]

Dr. KELLY. First of all, let me say that it has been a pleasure working with our colleagues at Treasury and the IRS in undertaking this complex, but important, program. A lot of the credit goes to this committee for designing a program that allowed us to work smoothly together, and we think that it has been a very productive relationship.

The 48(c) program, as you know, is an integral part of a multipronged effort to encourage clean energy technology innovation and investment in the American economy. Taken together, we have about $90 billion worth of public investment, which we think will leverage a total of over $150 billion of investment in clean manufacturing.

The 148 projects funded by the 48(c) program cover a wide range of technologies in 43 States. The hunger for this kind of program and these kinds of investments was revealed by the enthusiastic participation. As Dr. Mazur said, we were over-subscribed by a large factor, and there is latent demand from places that did not adequately understand the opportunity presented by this program.

In combination with other investments and policies, the 48(c) program is providing the incentives to invest in major clean energy programs and their supply chains, as with wind energy, for example. Five years ago, only about a quarter of the value-added parts in a wind turbine placed into service in the United States were actually sourced from the United States. It is now, thanks to these programs, up to 50 percent, and we think we can probably get up to the range that the U.S. automobile industry is, which is above 70 percent, in the near future. We are on a pace to double U.S. renewable manufacturing capacity by 2012, again thanks in part to these programs.

Of course, equally importantly, these investments translate into job creation. While the recipients are not required to report jobs created to our *federalreporting.gov,* the 48(c) program applications estimated Federal dollars would support about 17,000 of the roughly 50,000 jobs generated in the selected clean energy manufacturing projects. As a result, we can see concrete cases of where this program is putting America's workers back to work in jobs that are productive, rewarding, and point towards the future.

As you know, the President has called on Congress to fund an additional $5 billion for the section 48(c) tax credit program, and we look forward to working with this committee. And my col-

leagues in the Treasury and I were asked to keep the work that we have so productively started this year going, through this additional funding.

Now, the 48(c) program lays a foundation for a very broad and ambitious expansion of high technology clean energy production in the United States, and there is wide agreement among economists that these kinds of innovative high productivity investments are precisely the things that will keep America competitive, drive exports, and create long-term, stable, high-paying jobs.

Of course, it has to be coupled with a program to make sure that the incentive to buy the output of these products both at home domestically and internationally exists, but the combination of ensuring stable demand and finding the funds to ensure the manufacturing to meet the demand can be highly productive. So we thank the committee for your leadership in creating this program. We think it is key to maintaining U.S. leadership in a crucial and expanding industry. It is an important policy tool, and I look forward to discussing the path to the future with you.

Senator BINGAMAN. Thank you both.

Let me start with a couple of questions. As you are aware, in enacting section 48(c), Congress outlined broad selection criteria that the two departments, Energy and Treasury, have implemented. One criterion is for products that "have the lowest levelized cost of generated or stored energy or a measured reduction in energy consumption supply chain."

I think we included the reference to the full supply chain so as not to disadvantage manufacturers of components rather than completed products, but some have suggested that this criterion, the way we now have it, creates an implicit bias in favor of manufacturers that import components from overseas. I would be interested in knowing whether either of you think that is the case, and is that something we need to fix? Dr. Mazur, did you have a view on that?

Dr. MAZUR. At first blush, it seems that the current requirement does not have a bias in it at all. Basically, it just says "lowest levelized cost." As you start thinking about it a little more, if it turns out that there are significant cost differences between imported components and U.S.-generated components, perhaps there could be some advantage there.

I think part of the intent of the 48(c) program is to, in a sense, jump-start the American manufacturing capability so that we can compete on price across the board on this. So there may be a transition issue getting to that point. That is something we would be willing to work with you all about in trying to make sure that that can be done in the context of meeting our trade obligations.

Senator BINGAMAN. Dr. Kelly, did you have a view on this?

Dr. KELLY. Well, we had actually thought about this quite considerably during the selection process. We did not find any restrictions on our ability to select, and found no evidence that the people who were importing parts had any greater access to these funds than anyone else. On the contrary, what we have been able to do, through these programs, is increase the domestic content, as I mentioned earlier regarding the statistics about wind domestic content.

By encouraging the investment in wind manufacturing here, you then build a local domestic supply chain, and the wind domestic content has been growing very sharply as a result. There is no evidence that this bias exists. Of course, we have to be vigilant that our reviewers understand this, but so far our track record is good.

Senator BINGAMAN. One of the other suggestions has been that we make this credit refundable. In fact, I believe there is a bill that has been filed to that effect here in the Congress. Given the fact that the application volume substantially outstrips the credits availability, do you believe we have a need to make this credit refundable, or does the high demand suggest that the credit already can be utilized by more than enough taxpayers?

Dr. KELLY. The evidence of over-demand for the available funds speaks for itself. We feel that we have a portfolio of options for people who want to receive funding for projects that are in various stages of maturity. We have, of course, the loan programs. We have the 1603 payment in lieu of tax credit programs, which provides payment for projects that are not in a position to be paying taxes. There are, of course, the existing investment tax credits and production tax credits. So we think that the 48(c) actually fills a very crucial niche within this portfolio of opportunities.

Senator BINGAMAN. By establishing an allocated tax credit, which is what 48(c) is, Congress asked the administration to play a role that is not dissimilar from the role that a venture capitalist plays, that is, take a limited pool of capital and invest that. Congress established broad selection criteria that the Department then implemented. Do either of you have recommendations for ways that we should modify the statutory selection criteria?

Dr. KELLY. We were actually very satisfied with the way the original bill was written. We felt that it gave us the flexibility to attract exactly the kinds of investments you were looking for.

If I were going to fault the process, it is not in the design of the legislation itself, it is that we probably were not as active in marketing this to certain parts of the community as we should have been. We were sort of surprised that, in areas like nuclear components and some efficiency areas, we did not receive as many applications as we had originally expected. With additional funding, we can be very active in making sure all the potential recipients are aware of this opportunity. All of that can be done within the existing statute.

Dr. MAZUR. Actually, one improvement that could be made would be to allow applicants to apply for a portion of the cost of their project rather than the entire amount, and that would allow them to say they needed a smaller amount of money to make the project go. That would allow, then, more projects to be funded and perhaps to leverage the funds a little bit more highly, more effectively.

Senator BINGAMAN. All right.

Senator Bunning?

Senator BUNNING. Thank you, Mr. Chairman.

Dr. Kelly, what percentage of the U.S. energy supply is currently from renewable sources?

Dr. KELLY. If you count hydroelectric, I believe hydro is around——

Senator BUNNING. No, all.

Dr. KELLY. It is around 10 percent.

Senator BUNNING. Ten?

Dr. KELLY. Yes. I would like to correct that for the record, but I think that that is roughly correct.

Senator BUNNING. All right. That is fine.

Would it be fair to say that most U.S. manufacturers currently get their energy from traditional fossil fuel sources?

Dr. KELLY. With a total only being 10 percent, obviously that is roughly the fraction manufacturers are getting from the renewables.

Senator BUNNING. All right.

So, if we raise taxes on the most abundant form of energy in order to pay for clean energy incentives, what assurances can you give us that we will not be losing more jobs than we will gain?

Dr. KELLY. Well, we are trying very hard to get renewables and investments in efficiency, including industrial efficiency, to come in at a price that is fully competitive with the price of traditional fuels. So, in effect, it will not be affected.

Senator BUNNING. In other words, so it will not cost more than traditional fossil fuels?

Dr. KELLY. That is certainly our research goal. Also, the fact is that there are environmental costs associated with using some of these fuels that are not captured in the current market price. That is a decision we have made. But there is a price, in pollution and in other areas, that is not being captured in the real economics of energy.

Senator BUNNING. Just so I can get this straight, Dr. Mazur, you said that 48(c) funded 148 projects. But Dr. Kelly, I believe you said that 183 projects were funded.

Dr. KELLY. I think we both said 183.

Dr. MAZUR. I thought I said 183. I may have misspoken.

Senator BUNNING. All right. I just wondered why the numbers disagreed. So they are both 148?

Dr. MAZUR. No. It's 183 projects.

Senator BUNNING. One hundred and eighty-three?

Dr. MAZUR. And 43 States.

Senator BUNNING. Forty-three States, 183. Thank you.

Dr. MAZUR. You are welcome.

Senator BUNNING. Dr. Mazur, are there any small businesses that receive the 48(c) tax credit?

Dr. MAZUR. I believe, yes.

Senator BUNNING. Would any of those small businesses be likely to earn more than $200,000 or $250,000 a year?

Dr. MAZUR. I do not know for sure, but that is possible, yes.

Senator BUNNING. Well, if they do not earn more than that, then they probably would be able to create a whole lot of new jobs. The President is planning to raise taxes on successful small businesses that earn more than $250,000. Even if the 48(c) credit is extended, will you not just be giving with one hand and taking away with another?

Dr. MAZUR. What the President proposes in the 2011 budget is to allow the tax cuts from 2001 and 2003 to expire as scheduled for high-income households, those with $250,000 or more, both wage earners and business earners.

Senator BUNNING. Well, we are talking about businesses, not individuals.

Dr. MAZUR. Well, generally it is on the individual income taxes.

Senator BUNNING. Are you talking about the small business that does not file the corporate tax?

Dr. MAZUR. Right. They either file Schedule C as a sole proprietor——

Senator BUNNING. All right.

Dr. MAZUR [continuing]. Or schedule F as a farmer, or just another part of their 1040 form.

Senator BUNNING. All right. It is my understanding that the tax credit was sometimes given to businesses in which there was a foreign parent company that manufactured most of the products offshore and that was just assembled here. These products might have been assembled here anyway for logistical reasons, even without the tax credit. Is this really encouraging innovation? What assurances can you give us that this tax credit is going to projects that create U.S. jobs, not just subsidizing jobs that would have occurred here anyway?

Dr. KELLY. Well, you get the credit only by investing in the United States and creating U.S. jobs, so an assembler would have to be matching that.

Senator BUNNING. I understand that. But what if the parts were manufactured other places and, as a convenience, they were put together here in the United States by a corporation that was formed to do just that?

Dr. KELLY. All businesses import some parts. What we want to do is make sure the highest fraction of the parts in renewables, as in other things, are in fact manufactured here.

Senator BUNNING. You brought in wind as something that we are up now to 50 percent.

Dr. KELLY. To get this credit, the wind assemblies have to invest roughly 2 or 3 times as much as we are giving them in credit of their own money in the U.S. to get the credit. They do not get the credit unless they do that. Wind now imports roughly half the parts, but because of the local manufacturing, the supply chain is growing very rapidly here, so domestic production is driving associated part production here in the U.S. very rapidly. We lost a lot of this over the last 5 years. In the last few years, we have been getting it back quickly.

Senator BUNNING. Well, is that because the Federal Government has not subsidized, or what was it?

Dr. KELLY. As Dr. Mazur said, there are huge subsidies for wind and other renewables overseas, and that is why a lot of the production went over there. We think we are well on track to get a lot of production back here, and this tax credit has given people a very strong incentive to decide that they are going to assemble here in the United States and put a robust supply chain in place here.

Senator BUNNING. Thank you.

Senator BINGAMAN. Thank you.

Senator Carper, go right ahead with your questions.

Senator CARPER. Thanks. Thanks, Mr. Chairman.

Dr. Kelly, Dr. Mazur, again, welcome. We have heard complaints from some manufacturers that with 48(c) it has taken too long for

the money to be received. Let me just ask two questions, really. First is, how can we improve that process? How can we expedite it? Second, can we make it easier for manufacturers? Those are my two questions: how can we improve the process and, second, can we make it any easier for manufacturers? Please.

Dr. KELLY. I think we actually got it done ahead of time, a week ahead of the deadline, and we put together a very effective team and moved quite rapidly. The second time we do this, it will obviously be somewhat more efficient.

We thought hard about ways to make this easy for the applicants to participate, and one of the innovations was to get them to submit a 2-page pre-proposal which was necessary, but not sufficient, to get the grant. That allowed us, among other things, to understand what kind of projects we were going to get and assemble a peer review team rapidly so that, when the applications came in, we would immediately be able to start reviewing them.

Second, it allowed us to immediately weed out applicants that were just not going to qualify for one reason or another. So we actually are proud of the track record here. The next time around, we can obviously do it somewhat more productively, but from our point of view we would not recommend any statutory changes to the process. It worked well.

Senator CARPER. What kind of lessons did you learn or take away from this process for the last year or so?

Dr. KELLY. There were parts of industry that should have been much more active than they were.

Senator CARPER. Including?

Dr. KELLY. Well, a lot of energy efficiency product manufacturers; nuclear was not well-represented, et cetera. It seems that some industries, like the solar industry, were just much better at using their network and getting the word out. We are going to have to tap into a new set of networks, and we think we know how to do that, but we would love to work with the committee to find more effective ways to do that, particularly if many States have local innovation networks and ways of communication with production people in the States. I want to make sure that we are making full use of those.

Senator CARPER. All right.

Dr. Mazur, I have a follow-up question. If you have something you want to say at this point, go ahead. All right.

I think you mentioned—one of you mentioned—$70 million of manufacturing tax credits were awarded to a couple of companies to manufacture nuclear reactor components, I think. Was that correct, $70 million? All right.

Dr. KELLY. Yes.

Dr. MAZUR. Yes.

Senator CARPER. Is that $70 million out of $2.5 billion in projects? Is that correct?

Dr. KELLY. Let me see. There were two projects. It is $73.8 million, yes, out of the $2.3 billion.

Senator CARPER. Again, you may have said this. Let us just go back, though. How do we make sure that in the next step, the next leg as we are pursuing this, that the nuclear industry is not just coming in for, in this case, I will not call it chump change, but rea-

sonably modest amounts of money? Any lessons that we learned as to how to change that, or how they can change that?

Dr. KELLY. Well, the reason the number of awards was low is, we had comparatively few applicants in this area. So, as I said——

Senator CARPER. Again, why do you think that was the case?

Dr. KELLY. Our understanding is that a lot of people who could have qualified simply did not know about the opportunity, and we need to be much more aggressive in working with the industry associations——

Senator CARPER. Good.

Dr. KELLY [continuing]. As I said, State organizations, utilities, and other people to make sure that the entire nuclear supply chain that qualifies knows about this next time around.

Senator CARPER. All right.

Let me just ask one last question on this point. Again, if you would respond, Dr. Kelly. Do you believe we are going to build new nuclear power plants in this country in the next 15 years? Do you think we will? There are applications to build a couple dozen. What do you think?

Dr. KELLY. We are determined to get them built. We have certainly gotten our loan guarantee program up and running, and for the first time real applications are being actively considered. So, I am actually quite optimistic that we have the sites, we have the financing, and we have the applicants.

Senator CARPER. All right.

And I presume from what you said, you believe that the manufacturing energy tax credit will help increase our manufacturing base for new nuclear. Is that a fair statement?

Dr. KELLY. The manufacturing tax credit helps across a very diverse supply chain, because the components of nuclear plants qualify under this.

Senator CARPER. Last question. Dr. Kelly, you mentioned the need to also provide incentives for clean energy use, to build new clean energy manufacturing. Several of my colleagues and I have introduced legislation to build our offshore wind industry in this country, and one such bill was introduced by Senator Snowe and a number of us, a bipartisan bill. It separates offshore wind from onshore wind in the tax code and extends the production tax credit and the investment tax credit for offshore wind until 2020.

I would just like to ask you to maybe comment on that. Do you agree that offshore wind has a longer start-up time than onshore wind, and could an extended tax incentive for offshore wind help our Nation to develop an offshore wind industry, including a manufacturing base for making offshore wind technology?

Dr. KELLY. We have a very ambitious program to try to move forward. The Recovery Act actually allowed us to get a very exciting jump-start on offshore wind, including the project partly run out of Maine. In terms of the specifics of the bill, I would defer to my colleague from Treasury on that.

Senator CARPER. All right.

Dr. MAZUR. I think generally, in terms of tax incentives, you try not to make distinctions between similarly situated taxpayers. So, you would have to have a very good story for why offshore wind should be treated differently than onshore wind.

Senator CARPER. I think the reason why is because a lot of people believe it has a significantly longer start-up time than onshore wind. It is simply because of the difficulties we have seen in the Gulf, the difficulty in uprigging, and the water depths of those magnitudes.

Dr. MAZUR. Also, partly because of the maturity of the industry. I think that you have seen way more onshore projects than offshore projects.

Senator CARPER. Yes, we have.

Dr. MAZUR. Exactly.

Senator CARPER. All right. Mr. Chairman, you have been generous with your time. Thanks so much.

And gentlemen, thanks so much for really good work.

Senator BINGAMAN. Thank you.

Senator Stabenow?

Senator STABENOW. Well, thank you, Mr. Chairman, very much. First, thank you to you for your leadership. It was my pleasure to partner with you during the Recovery Act, in the Finance Committee, to be able to place the advanced energy manufacturing tax credit in the Recovery Act.

I know, certainly from Michigan's standpoint, this has made a real difference and is creating jobs. I would emphasize again, and you may have already said this, but jobs have actually been created in 48 different States, and I think that is a pretty good track record for this particular policy. I know that we can, in fact, do more.

I am pleased to be a co-sponsor of your bipartisan legislation, and also to have authored a provision in the Budget Resolution, if in fact we have a budget resolution this year, that would in fact place the full $5 billion into the budget—it is in the Budget Resolution in the Senate coming out of Committee—to expand this very important tax policy.

We, I think, have made a very important statement about the fact that we need to make things in this country. It is not enough just to have clean energy R&D, we actually want to create the jobs and the manufacturing here in the United States. So, I think that is very important.

Mr. Kelly, a couple of questions for you. We know that we have had many more applicants—I know you have spoken about that—technically, acceptable applicants than we had dollars for. That is our job, to do our best to be able to expand this very important tax credit.

But I am often asked by those who applied and did not receive funding the first time how a second round would work in terms of those who have already applied. Are you assuming that people would reapply, or would you begin with those whom you did not give a credit to this time? How do you see that working?

Dr. KELLY. I would be happy to try to take a stab at this, but the rules governing reapplication are really IRS's rules. Dr. Mazur would——

Senator STABENOW. I am sorry. Dr. Mazur, I should be maybe directing that to you. But if you would both like to say something about that.

Dr. MAZUR. Basically, it would depend on the statute, the way the statute read. You could imagine the statute reading just to ex-

tend the current rules for another round and say $5 billion for the next round. That would require reapplication.

You could imagine statutory language that had some different language in there that would allow the taxpayers that have already applied to just sort of roll their applications over. It would probably be fairer to have a new round of applications so those who did not get the awards could update their applications and perhaps make a stronger case. That may put them in a better position than just using the application that is already in place.

Dr. KELLY. We certainly have a large number of highly qualified applicants who did not get the funding. We would hope that, no matter what happens, we would make the reapplication process very simple so that they could basically do a modest update and not have to do a lot of paperwork to reapply.

Senator STABENOW. Well, to add to that, though, let me ask then, what is being done in terms of debriefing companies to give them feedback, those that did not receive the tax credit, so that they would be in a better, stronger position to reapply?

Dr. KELLY. We were under some constraints given the tax treatment rules of application data as outlined in the Notice. However, we do engage applicants as best we can.

Senator STABENOW. Well, I think that is very important. I would encourage you to do more of that. We have many manufacturers. As you know, in Michigan, they are moving from autos into alternative energy: wind, solar, other applications. It is important, for those that did not receive a credit, that they do have the opportunity to get feedback and to work with you on how to strengthen their proposals.

Thank you, Mr. Chairman.

Senator BINGAMAN. Thank you.

Senator Cantwell, did you have questions for this first panel?

Senator CANTWELL. Yes, I did.

Senator BINGAMAN. Go right ahead.

Senator CANTWELL. Thank you, Mr. Chairman. Thanks for holding this important hearing. Like many of my colleagues, I do think that 48(c), and going in and making sure that we make improvements there or expanding the program, is very important. But I also wanted to talk about 1603, the Treasury grant program. I know that many people in the renewable energy industry feel like that has been a very successful program for them as far as incentives. According to Lawrence Berkeley Lab, by the end of 2010, we will have created 143,000 new jobs from this program.

So do you think that this has been a successful program, and given where the equity markets are and still the challenges with clean energy, should we expand this program, or continue it, I should say? Either of you.

Dr. KELLY. As you know, we have asked for an additional $5 billion for the 48(c) credits. We think that has been an enormously successful program and we think nicely matches the capabilities of 1603, so people have two different places that they can turn depending on what state of maturity they are in. We strongly support both programs and think that they have worked well.

Together, they have had a really dramatic impact on domestic manufacturing investment in the United States and in many parts of the country, including places that badly need it.

Senator CANTWELL. Yes. Thank you.

Dr. Mazur, any comments on the Treasury grant program?

Dr. MAZUR. No.

Senator CANTWELL. That is a "yes, we support it," "no, we do not support it," or——

Dr. MAZUR. We support the program as it exists, yes.

Senator CANTWELL. Do you support continuing it?

Dr. MAZUR. I think it has a substantial amount of lead time still before it runs out, so it is not something that is in the budget to be extended.

Senator CANTWELL. Well, there are clearly people who are going to, by the end of the year, have a curtailment of jobs. If we are looking here at where we have created jobs and where we can create jobs moving forward, it has been one of the most effective programs. That was a yes? Is someone or something holding you back?

Dr. MAZUR. Yes. They can place these projects in service for several more years, so they have to have started construction by the end of this year and then have been placed in service by, I believe, 2017.

Senator CANTWELL. This committee is full of experts on what happens when you do not have certainty by the end of the year. What happens about this time of year, maybe in another month, is that people start looking at their time period and start saying, oh my gosh, we are never going to meet that deadline, and we are going to start canceling projects.

We do not want that; we want people to have predictability and certainty so they will invest for the future. If somebody can come up with another area where we have had so much job growth and creation, we would be certainly interested, so I would hope that Treasury would help us and get this legislation through.

So, thank you, Mr. Chairman.

Senator BINGAMAN. Thank you both very much for your testimony. I think it has been useful. We will continue to work with you and see if we can move ahead with expansion of this program.

Let me call the second panel forward. The second panel is Dr. Robert Atkinson, president of Information Technology and Innovation Foundation here in Washington; Jon Sakoda, who is a partner with New Enterprise Associates in Chevy Chase; and Dr. Douglas Parks, who is senior vice president for Business Development and Attraction with the Michigan Economic Development Corporation. I believe Senator Stabenow wished to make a comment before we get to your testimony. And Mr. Kevin Book, who is managing director of ClearView Energy Partners in Washington; Ms. Karen Alderman Harbert, who is president and CEO of the Institute for 21st Century Energy at the U.S. Chamber of Commerce; and Dr. J.D. Foster, who is the Norman B. Ture senior fellow in the Economics of Fiscal Policy with The Heritage Foundation.

So, we are glad you are all here. Why don't we just start with Dr. Atkinson? If each of you could take 5 minutes and summarize your testimony, we will include your full statements in the record. Go right ahead.

STATEMENT OF DR. ROBERT D. ATKINSON, PRESIDENT, INFORMATION TECHNOLOGY AND INNOVATION FOUNDATION, WASHINGTON, DC

Dr. ATKINSON. Thank you, Mr. Chairman, Senator Bunning, and other members of the committee. It is a pleasure and an honor to be here today.

I want to talk about two things: one, why I believe we need to continue the 48(c) credit; and second, some suggested modifications that might be made to the credit to make it more effective.

I am going to start by responding to some concerns about the generalized program, on why do we need a program like that, and does such a program lead to distorting the market. I think fundamentally we have to "distort the market" if we want to achieve and solve climate change.

We have to get, by 2050, an 85-percent improvement in energy and carbon efficiency globally because, to meet a 50-percent goal, we have to match that with population growth and per capita growth. So, we have to radically transform and decarbonize our energy system. Frankly, the market will not do that, even with pricing, so we have to take steps that get us to that goal. One of the important steps is a program like this that supports clean energy production.

I would also argue that demand-side policies are not enough. Demand-side policies such as carbon trading or carbon tax are a necessary, but insufficient, condition to do what we want. First of all, they, by themselves, will not lead to the fundamental innovations we need in decarbonizing the global economy, but second, even if they were to be effective in getting us where we need to go alone, they will create demand for these clean energy products and services, but they will not necessarily create supply.

As we wrote in a report with the Breakthrough Institute called "Rising Tigers, Sleeping Giant," Korea, Japan, and China are outinvesting us by a factor of three, so other countries are focusing on the production side to create low-cost clean energy, but also to create a clean energy industry. We need to do the same.

The second component, I would argue, is with regard to jobs. If this program were to simply just create some low-wage jobs with no export opportunities, then I would say there is no reason for it. We do not need jobs that badly. The market does create jobs eventually, but clean energy jobs are: (A) higher wage jobs, and therefore the industry ends up creating more wealth in the U.S. economy than other types of market activities; and (B) they have the potential to create exports.

I know there is a lot of focus on the debt and the budget deficit, and rightly so. That is an important issue for the U.S. to face. But we have to recognize we face two debts in this country for our future generation: we face the budget debt, and we also face the trade debt. That has to be paid off at some time in the future, which means we have to start running a trade surplus at some point. Focusing on the production side of the clean energy equation makes it easier to do that.

So let me suggest a few possible changes in the program. One, I think we can tighten up, and should tighten up, some of the criteria in the program, if for no other reason than the program was

over-subscribed, so one could do that and still have very good projects. I think one change I would suggest would be—and I think, Senator Bingaman, you alluded to this—to make the program easier for companies to qualify for it if they do not have tax liabilities presently, whether that is because they are too small or because of their current tax situation, and that could be done through a grant program or refundability. I would favor that.

Second, I think, and rightly so, when this bill was drafted there was clearly a significant economic crisis. That crisis has moderated somewhat; I believe we are on the road to recovery fairly strongly now. So I think some of the criteria for the program, such as funding projects that have already been initiated, having the shortest project time from certification to completion, and greatest domestic job generation, I would actually take those out or diminish them in terms of their importance. I think they were critical for the last time this was done, but I do not think they are as important this time.

So what is important? I think the most important thing is to be focusing on the kinds of technologies that we are going to need to be able to meet that 85-percent carbon reduction goal by 2050. That means not just focusing on current net impact, but, as the bill says, "a levelized cost of energy." One could imagine that there are certain projects today that could do that, such as projects on building insulation. Those would be projects that could maybe get us there, maybe better than, say, solar energy projects, in the short run.

The problem, I would argue, is that we are not going to be able to meet an 85-percent global energy carbon reduction goal with efficiency. Efficiency is useful, it is important, but it is not going to get us to where we need to go. So, to the extent there is greater demand and supply of money here, I would be focusing on a narrower set of technologies that is going to be critical in reaching that goal, and I would not put efficiency there.

The last point I would make—and again, I think Senator Wyden alluded to this point—I would add a criterion that rewards projects that are going to lead to greater exports. It is critical for us not just to be producing here domestically, but to leading global export markets.

Related to that, I think that we really should be focusing on prioritizing projects that are not just assembly projects.

Some of those projects, I think as Senator Bunning alluded to, frankly, would be done here anyway. Since we have a limited supply of funds for this program, I would be targeting projects that are going to produce more value added here. So perhaps having a criteria of value added produced in the U.S. as a key component of criteria, I think, would make the program a little bit more effective. Overall, ITIF supports the program, it supports expanding the program in the future. So, thank you.

Senator BINGAMAN. Thank you very much.

[The prepared statement of Dr. Atkinson appears in the appendix.]

Senator BINGAMAN. Mr. Sakoda?

STATEMENT OF JON SAKODA, PARTNER, NEW ENTERPRISE ASSOCIATES, CHEVY CHASE, MD

Mr. SAKODA. Chairman Bingaman, Ranking Member Bunning, members of the committee, thank you for inviting me to the hearing. It is an honor to be here today.

I am a partner of New Enterprise Associates and a member of the Clean Tech Advisory Council for the National Venture Capital Association. NEA is, by assets under management, the largest U.S. venture capital firm, with $11 billion under management. Through our 30 years of history, we have funded over 650 companies and have had over 160 of them go public. Our 50 largest companies have created over $65 billion in revenues and have created hundreds of thousands of jobs in this country.

Today, the energy technology industry represents one of the most compelling investment opportunities in the history of venture capital. We are one of the most active investors in the sector, and today have more than 30 portfolio companies creating new technologies in solar, wind, nuclear, advanced batteries, smart grids, electric vehicles, and energy-efficient building materials.

Energy technology is a complex industry, but the goals of our entrepreneurs are simple: create companies that enable us to make or save energy better, faster, cheaper, and cleaner than anyone else in the world.

The U.S. has long been the home of great clean energy innovation, but over the past decade the U.S. has lost its leadership in clean energy manufacturing to China, Japan, and Germany. As one example, the U.S.'s market share for solar manufacturing has fallen from 45 percent in the mid-1990s to roughly 5 percent today. In the past decade alone, the two best U.S. solar technology companies in the world, First Solar and SunPower, the equivalent of Intel and Cisco for solar, were recruited overseas to Germany, Malaysia, and the Philippines. These companies have developed the majority of their manufacturing overseas, creating jobs and economic growth primarily in other nations.

Prior to the Recovery Act, this paradigm of developing innovative technology in the U.S. and exporting manufacturing to foreign nations has been driven primarily by a significant imbalance between U.S. and foreign tax policies and incentives.

As is shown in the table in my submitted testimony, low labor cost was not the most important variable in the equation. Up-front manufacturers' incentives and long-term tax holidays were frequently as important, if not more important, variables influencing U.S. companies as to where they should establish their manufacturing facilities.

The result of this imbalance has been the loss of direct and indirect jobs, a loss of intellectual property, and a loss of economic growth here in the U.S. for one of the fastest-growing global industries of the 21st century.

In describing this trend, I must remind the committee that venture capitalists and entrepreneurs are, by definition, optimists. I believe the U.S. can be a leader in clean energy manufacturing and have witnessed this firsthand in my portfolio companies. We are not giving up on the American entrepreneur, and I hope you will not either.

With the help of the tax policies and incentives put forth in the Recovery Act, this Nation's best energy technology companies are expanding their domestic capacity, reopening closed factories, retraining new workers, and rebuilding local economies depressed by the Great Recession.

One of the most important policies in restoring American competitiveness is the section 48(c) advanced manufacturing tax credit. This program awarded $2.3 billion in tax credits to over 100 companies in 43 States and was over-subscribed with requests for over $8 billion in projects.

One section 48(c) recipient, a company in our portfolio named Suniva, was able to expand its solar manufacturing from 33 megawatts to 170 megawatts in Norcross, GA and hire an additional 60 workers, creating more than 100 construction jobs in an economically depressed suburb of Atlanta.

Many of Suniva's full-time employees were either veterans or laid-off auto workers who have now subsequently been retrained in solar manufacturing. This company was recently named the "Renewable Energy Exporter of the Year" by the Export-Import Bank, and today exports greater than 90 percent of its industry-leading high-efficiency solar cells overseas to Europe, China, and India.

Suniva has plans to expand to 400 megawatts in Saginaw, MI, a project which would create over 400 direct, and over 1,000 indirect, jobs over the life of the project. This is one of just many section 48(c) success stories.

Recovery Act programs such as section 48(c), competitive market incentives such as the investment and production tax credits for wind and solar development, and compelling State incentives are making the U.S. a more competitive and compelling Nation for manufacturers. Already this year, you have seen one of China's larger solar manufacturers and one of Japan's larger solar manufacturers announce plans to open or expand facilities here in the U.S. These are encouraging signs that the U.S. has started to regain momentum lost over the past decade.

To continue to restore American competitiveness in this industry, we need to maintain consistency and support for these important incentives over the long term. I believe time is of the essence to reopen the section 48(c) program through its expansion of an additional $5 billion, as called for by the administration. Many of the most promising 48(c) applicants have qualified to build facilities here in the U.S. They want to stay in the U.S., but ultimately may have to move their plans overseas. Expanding 48(c) gives these companies the choice and the chance to stay in the U.S.

In closing, I feel compelled to dispel the myth that I hear all too frequently, that the U.S. will never be competitive in energy manufacturing. I hear that our labor costs are too high, I hear that we lack innovation, and I hear that our workers are not skilled enough to compete. These are all myths, and they need to be dispelled. We are home to some of the best energy technologies in the world, we are home to some of the most skilled workers in the world, and we are taking the right steps to level the playing field and restore American competitiveness in this very important sector.

Thank you very much for inviting me to be here today. I look forward to your questions.

Senator BINGAMAN. Thank you very much for your testimony.

[The prepared statement of Mr. Sakoda appears in the appendix.]

Senator BINGAMAN. Senator Stabenow, did you wish to introduce our next witness?

Senator STABENOW. Well, thank you very much, Mr. Chairman. I am very pleased that Doug Parks is with us, senior vice president of the Business Development and Attraction unit of the Michigan Economic Development Corporation.

Mr. Chairman and Ranking Member, he is where the rubber meets the road. I have to tell you that Doug has done a fantastic job. When I hear a previous witness talk about folks coming to Saginaw, MI, Doug Parks is right in the middle of that. Clean energy technology manufacturing is very much what he is focused on.

So, welcome, Doug. Good to have you here.

Mr. PARKS. Thank you, Senator.

STATEMENT OF DOUGLAS PARKS, SENIOR VICE PRESIDENT FOR BUSINESS DEVELOPMENT AND ATTRACTION, MICHIGAN ECONOMIC DEVELOPMENT CORPORATION, LANSING, MI

Mr. PARKS. Good afternoon, Chairman Bingaman, Ranking Member Bunning, and members of the subcommittee. My name is Doug Parks, and I am the senior vice president of Business Development and Attraction at the Michigan Economic Development Corporation, or MEDC. I am pleased to be here today to present testimony on behalf of the MEDC and the administration of Governor Jennifer M. Granholm regarding the critical role tax incentives play in attracting and retaining advanced energy manufacturing facilities and jobs.

I would also like to express my sincere gratitude to Senator Stabenow, whose leadership on energy issues and attention to manufacturing have been extremely important for the State as we seek to diversify our economy. Her leadership on the advanced energy manufacturing tax credit, the advanced technology vehicles manufacturing loan program, and worker training for green jobs has been a vital part of our diversification strategy, so thank you.

Clean energy tax policies play a crucial role in creating new high-wage American jobs, spurring economic growth, and improving the environment. The Senate Finance Committee is well-positioned to accelerate these innovations by creating and expanding tax and other policy incentives that support State and local economic development by reducing the risk to innovators and entrepreneurs.

Establishing a strong domestic manufacturing base for clean energy technologies is critical. True energy independence requires a domestic manufacturing base, as well as domestic R&D. Since 2000, Michigan has lost almost 1 million jobs. However, we are one of a handful of States that has been able to add green jobs, 109,000 in total, in spite of overall negative job numbers.

In 2006, the MEDC began to focus economic development efforts on diversification opportunities with the potential for significant growth by leveraging the State's competitive advantages, including our natural resources, workforce, rich engineering, and deep manufacturing heritage.

The MEDC's intense review of best practices across the globe has led us to focus on four targeted clean energy sectors: advanced energy storage, solar energy manufacturing, wind energy manufacturing, and bio-energy.

Teams were developed around these targeted sectors, composed of Ph.D.-level technology experts, industry experts, engineers, MBAs, and economic developers to guide State strategy in these areas. We also forged partnerships with national laboratories, including Oak Ridge National Laboratory and the U.S. Army Tank Automotive Research, Development, and Engineering Center, or TARDEC, to assist us in vetting projects.

We developed a unique toolbox of State incentives to help grow these industries and attract these industries, including $1 billion in refundable tax credits for advanced energy storage projects, batteries—or as we like to say in Michigan, the new power train—$75 million in refundable tax credits for photovoltaic manufacturing opportunities, and $75 million in grants for Centers of Energy Excellence programs, which promote clean energy commercialization partnerships between industry, government, and academia.

Federal incentives have played a vital role in our State's diversification strategy, and most of the incentives that I have just described were created specifically to complement Federal funding opportunities. For example, the advanced energy storage sector, the same companies that received $1 billion in refundable tax credits from Michigan, subsequently received over $1.3 billion in competitive grants from the electric drive and component manufacturing initiative of the Recovery Act.

This has influenced the entire supply chain, which was our goal, for vehicle batteries to locate in Michigan, resulting in $5.8 billion in total investment to date. The 48(c) advanced manufacturing tax credit has been an effective tool, and a complementary tool, in spurring economic development in Michigan. Earlier this year, 12 Michigan projects received $242 million worth of these credits.

As an example, the MEDC has worked closely with many of these 48(c) recipients. One of them is Energetx, a spin-out company from composites manufacturer and boat builder S–2 Yachts, located in Holland, MI. Its business was significantly impacted by the economic downturn, and, while many in the marine industry were forced out of business, S–2 Yachts is weathering the storm, in part by applying its composites expertise to the production of wind turbine blades.

For its clean energy manufacturing efforts, Energetx received a 48(c) credit of almost $2 million, and subsequently—and this is important—received $7 million in grants from two additional Michigan State programs. In addition, Energetx forged partnerships with key supply chain partners, is working with two national laboratories, and is hiring interns from two Michigan universities.

Michigan appreciates your leadership, Mr. Chairman, together with Senator Stabenow and Senator Hatch, in first proposing to extend and expand the advanced energy manufacturing tax credit. We also support the President's call to commit $5 billion more for the 48(c) program, as included in the Security and Energy Manufacturing Act. This bill would extend the tax credit by 2 years, provide $5 billion more in 48(c) credits, place more emphasis on manu-

facturing than on the assembly of goods, and allow for direct grant payments.

As a State that is working aggressively—as hopefully you can see—with our manufacturing partners to leverage Federal clean energy incentives, the MEDC believes Congress should give strong consideration to expanding the statutory review criteria to benefit projects that can demonstrate strong financial capacity through the commitment of State financial incentives and investments. We believe the early success of the 48(c) program, coupled with an abundance of worthy unfunded proposals, justifies swift enactment of additional authority to stimulate more American manufacturing ingenuity.

Thank you, Mr. Chairman, for the opportunity to present Michigan's views. I would be pleased to take any questions from you or other members of the subcommittee.

Senator BINGAMAN. Thank you very much.

[The prepared statement of Mr. Parks appears in the appendix.]

Senator BINGAMAN. Mr. Book, go right ahead.

STATEMENT OF KEVIN BOOK, MANAGING DIRECTOR, CLEARVIEW ENERGY PARTNERS, WASHINGTON, DC

Mr. BOOK. Thank you, Chairman Bingaman, Ranking Member Bunning, and distinguished members of this committee, for the privilege of being here this afternoon.

My name is Kevin Book, and I lead the research team at ClearView Energy Partners, LLC, a research and consulting firm that serves institutional and corporate strategic investors in energy.

My testimony considers the 48(c) credit through the lens of three basic types of demand for clean and green power: fundamental demand for energy, legislative demand—in other words, from renewable energy mandates or carbon surcharges—and financial demand, which is from government programs that pay premiums to financial sponsors.

Before the economic crisis, U.S. fundamental demand for clean and green sources was mixed, stronger for wind than for solar. Legislative demand was growing with State-level portfolio standards. Most demand, however, came from investors who paid developers for tax equity, the stream of income-shielding tax credits generated by the projects.

Back then, some of my clients thought that investors would want $7 to $9 billion in clean energy tax equity in 2009. Of course, back then, conventional fuel prices were still rising, after all, and many investors thought the daunting spike in subprime mortgage defaults would remain contained.

One year later, Investment Tax Credits (ITCs) and Production Tax Credits (PTCs) were extended within the bill that created TARP, but clean technology investors had little to cheer about. Financial demand had dried up. The once-profitable banks that held once-untroubled assets that TARP was designed to relieve had been a big part of the tax equity market. Troubled assets meant losses, not money to spend on tax credits or profit to shelter.

Fundamental energy demand weakened also. In 2008 and 2009, U.S. power consumption fell by almost 5 percent. Retailers sold off

inventories, layoffs decreased fuels demand, and foreclosures diminished building energy needs. Weak demand hurts alternative power twice, not just intrinsically, but also because conventional fuels get cheaper.

Which brings us to the American Recovery and Reinvestment Act green stimulus monies, especially 1603, now more than $3.5 billion in spending, and the over-subscribed 48(c) credit, for which $2.3 billion was obligated.

The credits are very different: 1603 grants are demand-side subsidies; 48(c) credits work on the supply side. The 1603 credit has mostly paid for wind projects and, according to independent studies, much of this technology came from leading manufacturers overseas. Almost half of the 48(c) credit has gone to solar power, and about one-third of the money has encouraged leading clean tech companies to invest in capacity here in the U.S. Both credits are likely to have preserved employment, and DOE projects impressive job creation numbers from the 48(c) program.

Even so, both programs present areas for discussion. Demand-side subsidies get expensive fast because investors always like free money. Many governments, especially Spain and Germany, have begun to experience what we call equity subsidy fatigue as their fiscal fortunes weaken.

Debt subsidies, like loan guarantees such as those proposed by you, Mr. Chairman, and Ranking Member Murkowski on the Energy Committee, could encourage clean and green demand while minimizing equity subsidy fatigue. My written testimony provides a hypothetical example of a wind project under different scenarios. A 10-year PTC would give developers only about 47 percent of the buying power of every taxpayer dollar spent.

ITCs and grants would do better, achieving gains of 51 and 71 percent return per taxpayer dollar, respectively. Assuming a 10-percent default rate, loan guarantees would deliver 337 percent developer benefit per taxpayer dollar. No matter what, green protectionism could be risky. U.S. clean technologies will not win market share at home or abroad until they can compete on a price basis with technologies produced overseas.

On the supply side, it is also not clear the U.S. can win in every corner of clean tech. The U.S. manufactured about 5 percent of global solar equipment in 2009, making the 47.5-percent allocation of 48(c) credits to solar power a very ambitious statement. The U.S. is unlikely ever to enjoy lower factory costs than China, and the point is well-taken that there are other things that the U.S. does very well, and I certainly do not want to discount that.

But it is also not clear that domestic demand will prove sufficient to create an internationally competitive solar sector comparable to those driven by energy security and power price pressures in Japan and Germany. We have very cheap power, and we currently have extra. Fundamentally, Americans, in 2009 and 2010, have demanded about one-third of the incremental energy per job recovered that they demanded in 2001 and 2002. Legislatively, it remains unclear whether efforts putting a price on carbon or a national RPS will succeed, and financially the potential lapse of the 1603 credit at year-end could bring a demand cliff.

It may not make sense to expand 48(c) funding without corresponding expansions in domestic demand. The good news is, there may be many eligible sources, technologies that capture, sequester, or reduce energy sector greenhouse gas emissions, for example. Last week, EPA released its final tailoring rule that will regulate greenhouse gas emissions from stationary sources. Currently, it will begin on January 2 of next year. Forty-four percent of our power came from coal-fired plants last year. Perhaps future 48(c) allocations could establish the U.S. as a global leader in post-combustion retrofit technologies for capture and storage.

Retroactively allocating money to original applicants for 48(c) projects may not represent the best investment strategy. New dollars might best be directed at new applications, and new award considerations informed by new energy use patterns and new commodity price expectations.

Rescinding fossil energy tax benefits to pay for 48(c) outlays may not improve competitiveness either. We are 85 percent fossil-fueled. Taxing fossil energy means higher prices, increasing the cost of all manufacturing. Even though higher prices could make clean tech seem more attractive here, they are unlikely to augment demand for our products overseas.

In short, extending and expanding the 48(c) program seems reasonable if fundamental legislative or financial demand exists to absorb the new supply, and particularly if the next round of funding unlocks innovative investments for which significant domestic demand may soon exist.

This concludes my prepared testimony. I look forward to any questions at the appropriate time.

Senator BINGAMAN. Thank you very much.

[The prepared statement of Mr. Book appears in the appendix.]

Senator BINGAMAN. Ms. Harbert, go right ahead.

STATEMENT OF KAREN ALDERMAN HARBERT, PRESIDENT AND CEO, INSTITUTE FOR 21st CENTURY ENERGY, U.S. CHAMBER OF COMMERCE, WASHINGTON, DC

Ms. HARBERT. Thank you, Chairman Bingaman, Ranking Member Bunning, and members of the subcommittee. I am Karen Harbert, president and CEO of the Institute for 21st Century Energy, which is an affiliate of the U.S. Chamber of Commerce.

Last month, Doug Elmendorf, Director of the Congressional Budget Office, highlighted the results of a CBO report that forecast an increase in the public debt to $20.3 trillion by the end of 2020, if President Obama's fiscal year 2011 budget were to be implemented, with debt accounting for 90 percent of GDP.

So, as we examine energy policy, it is more important than ever that we look to options that do not further burden the taxpayer and provide the affordable energy we need to restore the jobs lost to the recession and the millions of new jobs we need to recover over the next decade.

We also have to recognize that U.S. energy demand is projected to increase by as much as 33 percent between now and 2035, so we need a realistic plan that transitions us to a low-carbon future, while keeping our Nation strong and competitive.

Renewable sources of energy, such as wind, solar, energy from waste, and biomass, will certainly play an increasingly important role in our Nation's energy supply, yet today wind and solar comprise less than 2 percent of our electricity, so we must be realistic about their achievable rate of expansion. Even under the Energy Information Administration's modeling of the Waxman-Markey bill, the climate bill's aggressive carbon regulation, wind and solar will only comprise 6 percent of the country's portfolio by 2030.

The recent history of fiscal incentives for clean energy technologies is checkered, with boom-and-bust intervals that have inhibited the formation of private capital. Investors in businesses and manufacturers need predictability to make capital decisions, but that does not mean that subsidies should exist forever. Once a technology has realized the milestone of commercial deployment, the government should step back and let the efficiency of the market determine its eventual success or failure.

The advanced energy project credit, 48(c), was included in the American Recovery and Reinvestment Act as an investment tax credit for the expansion or retrofitting of manufacturing facilities geared towards advanced clean energy sources. As the original allocation has now been committed, there are several issues this committee should consider before expanding the credit by another $5 billion. Some of them are as follows.

Is the number of jobs created sufficient to justify its continuation, and are those jobs sustainable? Are there other more cost-effective ways to stimulate these investments and these jobs? In light of our ballooning deficit, what is the return on investment from those credits?

There are other carbon-abatement technologies that were excluded from consideration in the initial round, and, since government should not be picking winners and losers, should all these technologies not be considered eligible and be judged on their merits? Lastly, what would be offered as the pay-for for these new credits, and how do their benefits stack up against the credits benefits?

The Chamber supported 48(c) at the outset and has supported many other incentives for renewable technologies. For example, we support extending the various renewable production tax credits for 8 years, followed by a 4-year phase-out, providing the long-term certainty investors need, but also the definitive sunset which will ensure tax dollars do not continue to support technologies that are not commercially viable.

Also, policymakers need to be mindful of the counterproductive effects of singling out industries at the expense of others. Germany has done that. Twenty years ago, they implemented the most aggressive renewable policy on the planet. In 2008, Germany was home to the largest installed solar capacity and wind capacity in the world, yet in 2009, the electricity generated from wind and solar accounted for only 7 percent of the electricity supply, even with an estimated direct subsidy of $100 billion over 10 years.

In Spain, Italy, and Denmark, 2009 studies show that the green jobs that were created were offset by those policies with losses in other areas. In other words, we need to be really focused on job dislocation and also the sustainability of the subsidized jobs.

It is also important to recognize that there are other things that we could do to stimulate manufacturing and clean energy in our country that do not break the back of the taxpayer. For example, we support the creation of an independent clean energy bank, which is captured, Senator Bingaman, in your Clean Energy Development Authority Administration, and we applaud you for that leadership. This would not be a further burden on the taxpayer because those loans, the financial instruments, would be paid and therefore would not have long-term impact on the deficit.

Also, every new energy project that would be the market for the beneficiaries of the 48(c) program struggles with regulatory and siting burdens that either increase the project's cost or result in its cancellation. Can you imagine that getting the approval to site a transmission line in our country across State lines can take upward of 10 years? Congress can solve this problem by granting the Federal Energy Regulatory Commission preemptive siting authority, much like it already has for natural gas pipelines.

Jobs. Finally, we must remember that we still have a strong economic foundation of our existing energy industry. Nuclear power, for example, accounts for more than 70 percent of our emissions-free electricity. Each plant contributes $430 million to its local economy. If the 26 reactors that are currently in the queue at the Nuclear Regulatory Commission were built, we estimate that that would create an additional 240,000 jobs for our country.

Let us not forget the oil and natural gas industry that currently employs 9.2 million people. So in short, if we are going to lay a groundwork for a clean energy economy to secure our Nation and install environmental protection, we have to pursue policies that put more options on the table, yet do not artificially explode our Nation's debt. Thank you.

Senator BINGAMAN. Thank you very much.

[The prepared statement of Ms. Harbert appears in the appendix.]

Senator BINGAMAN. Dr. Foster?

STATEMENT OF DR. J.D. FOSTER, NORMAN B. TURE SENIOR FELLOW IN THE ECONOMICS OF FISCAL POLICY, THE HERITAGE FOUNDATION, WASHINGTON, DC

Dr. FOSTER. Thank you, Mr. Chairman, members of the committee. My name is J.D. Foster. I am the Norman B. Ture senior fellow in the economics of fiscal policy at The Heritage Foundation. The views I express are my own and should not be construed as representing The Heritage Foundation's position.

In its "Reasons for Change" discussion in the Treasury's general explanation of the administration's fiscal year 2011 revenue proposals, Treasury writes, "The credit the administration proposes to repeal distorts markets by encouraging more investment in the industry than would occur under a neutral system. To the extent the credit encourages over-production, it is detrimental to long-term energy security." I would hasten to add that this paraphrased language on page 75 refers to the administration's proposals relating to the oil and gas industry and their proposal to eliminate a credit in other fuel preferences, proposals with which I fully agree.

But what is bad for goose is also bad for the gander. Just as oil and gas subsidies distort economic decisions, so, too, does the 48(c) credit and similar subsidies. They are detrimental to long-term energy security and to the economy, as Treasury rightly observed.

In my view, and following Treasury's logic, the 48(c) credit is bad energy policy, bad tax policy, and bad economic policy. My concern, to be clear, is not with clean energy manufacturing, per se. Rather, it is the government's bad habit of attempting to pick successful technologies of any sort to favor and others to disfavor.

There is nothing wrong with hoping one sort of energy or one sort of technology will succeed in the marketplace. If we believe so firmly in a company or industry, we have capital markets that allow us to encourage and participate in its success or failure.

Tax provisions like 48(c) do something else entirely: they involve the power of the Federal purse to influence artificially the development of these markets and technologies. Is this taxpayer investment based on any information superior to what the market already has and has processed? No, it is not.

In the case of 48(c), for all the professionalism, is there any reason to believe the employees at the Internal Revenue Service and Department of Energy are more adept at picking technologically promising and economically sustainable technologies than market participants investing their own time and money? No.

If they were, they would already be doing so, working for venture capital firms, making large amounts of money. They are working at the agencies because this is not their strength. Market participants investing their own time and money are vastly better at sifting information and rendering judgments regarding economic viability. No doubt, there are some excellent players in fantasy football at the IRS and DOE, but that does not mean they are qualified to run an NFL franchise.

Markets are not perfect. Markets make mistakes, and government has a modest, but clear, role to play in the process. But over time and on balance, market participants facing price signals undistorted by government policies make fewer mistakes, less costly mistakes, and more quickly correct those mistakes.

One argument raised to defend provisions like 48(c) is that the industry is somewhat at an infant stage and the credit is needed temporarily to get the industry moving forward. The obvious first problem with this temporary tax credit argument is that the word "temporary" is redefined over time to cover decades. Temporary can take on near-cosmological proportions.

Another problem is the industry, protected by the credit from the pressures to become more efficient, typically fails to advance, to become internationally competitive. The infant industry argument would be better labeled the "Peter Pan" argument because it means the industry never needs to grow up. Further, this Peter Pan industry is then likely condemned to second-class status on the world stage. Members hoping for good things out of advanced energy manufacturing should beware: good intentions are no substitute for bad outcomes.

A second argument that we have heard this afternoon is that the U.S. has fallen behind already on the world stage. Interpreting this situation requires a couple facts, the first of which is that tech-

nology is inherently mobile, so the U.S. position does not have to do with our innate inability to get our hands on technology. Second, the United States generally offers the best economic environment in the world to incubate a high-tech industry. On this point, I would align myself with Mr. Sakoda's remarks.

Given the mobility of capital and America's advantages, if the U.S. lags, then one of two circumstances is almost certainly at work: either we have employed our own counterproductive policies restraining this activity, in which case the remedy is to reverse those policies; or other countries may have borne heavy costs in creating subsidies to distort their own markets and gain a temporary advantage, such as perhaps China, as Senator Bunning alluded to earlier.

While it is tempting to match these countries foolishness for foolishness, this is not a gap we should seek to close. Their advantage will fade as market distortions accrete, while their industries become ever-more dependent on these subsidies to survive in the global marketplace and ours gain steadily an advantage.

In conclusion, the 48(c) credit, like so many provisions that litter the tax code, is bad economic policy, distorting the allocation of our resources. It is bad energy policy for precisely the reasons Treasury lays out in the context of oil and gas credits, because it encourages over-production and it is detrimental to long-term energy security. Of course, the credit is bad tax policy, adding to the litter of special provisions that constitute the sum total of past efforts to micromanage our economy through an already inherently complex income tax system.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Foster appears in the appendix.]

Senator BINGAMAN. Well, thank you all very much for your testimony. I will start with a few questions.

Mr. Sakoda, let me start with you. I was glad to hear that you see a promising future for U.S. manufacturing. Could you just explain how the receipt of a tax credit for manufacturing such as 48(c) would impact the attractiveness of a company for venture capital investing? I mean, is this something that you folks would look at closely to see which companies are, in fact, being chosen for these kinds of tax credits?

Mr. SAKODA. Senator, is the question whether our investment decisions are driven by whether or not the companies have received tax credits?

Senator BINGAMAN. Well, as to whether that is a factor, or whether you think that there is any correlation between a company's ability to obtain a tax credit and the attractiveness of the company for venture capital investment.

Mr. SAKODA. It is helpful, probably, to go back a few years in history. Actually, the growth of the clean tech industry in the U.S. has been primary venture-backed, and that trend really started about 7 or 8 years ago. Actually, the height of venture capital investment in clean tech was in 2008. Many of these companies were commercializing some of the most innovative technologies, which had been developed primarily within national labs and universities here in the U.S., in many cases through decades of Federal funding provided by DOE.

It has been, within the past 3 or 4 years, that many of those companies have been approached to scale up their manufacturing overseas, so the examples that I gave of First Solar and SunPower, again being U.S.-based technologies, innovations created here in the U.S. but manufacturing being exported overseas, was happening again in this most recent venture capital-backed industry. Some of our best companies, the future First Solars and SunPowers, were being attracted overseas.

So I believe the answer to your question is that many of our best companies have already been venture-backed. They are U.S.-based companies, U.S.-based entrepreneurs, U.S. technologies. They just have a choice as to where they can scale up their manufacturing.

The U.S. is not the number-one end-market for renewable energy technology. We can debate all day long whether solar and wind is the right portfolio mix inside the U.S., but the second, third, and fourth largest economies have already spoken. So, our companies need to scale up their manufacturing somewhere. The question is really, where are they best set up to compete long-term when they expand their manufacturing? That is why the 48(c) tax credit is so important.

Senator BINGAMAN. Thank you.

Mr. Parks, you, undoubtedly, have had a lot of experience trying to attract companies to Michigan that might choose, on the contrary, to locate in foreign countries. I have had a frustration over the years in seeing our Economic Development Department in New Mexico, for example, or the Albuquerque economic development entity, try to compete for foreign companies to locate in our State. I would be interested in your perspective on the importance of this kind of a section 48(c) at the Federal level to complement what you are able to do at the State level in actually getting these firms to come to Michigan.

Mr. PARKS. Well, Mr. Chairman, let me start by saying it is definitely a contact sport, and it is a very aggressive environment. Early on in Michigan, we did a couple of things that I think caused us to be successful. First, we understood what we were good at or what we thought, if all things were equal, would compete, and went in. The second thing we did was we understood that, if we were going to create these tools, where would our investment be best placed? So in batteries, for example, we identified that it was not assembly, it was not the material side, it was cell manufacturing, a critical national need that had been lost to Asia back in the 1980s.

All the suppliers had arrayed around the consumer electronics industry, and it was firmly entrenched. So we identified our programs early and we identified our targets, and we spent a great deal of time working with the national labs and the Defense Department, identifying who the worldwide best players were. Then we were very aggressive in developing what I mentioned earlier were a billion dollars in refundable tax credits. We are a State that has to balance the budget, and I had to discern or identify to our legislature, both sides, that the return on investment was such that, if we did this, we would be competitive.

But early on we also realized that we could not do it alone, and that, not only was it important for us to develop these credits, but

it was important that we would be part of a comprehensive plan that included competitive grants, that included 48(c) programs, so that, when we worked to attract these companies, we could represent to the companies that we: (A) did our homework; (B) were working aggressively to invest in the right parts of the supply chain so the remainder of the supply chain would then be recruited—and that is happening, which will make them more cost-competitive; and that (C) we had a Federal Government that we could work with these companies with that might have funds available to help them accelerate and expand, and I think 48(c) is a part of that plan for us.

Senator BINGAMAN. Thank you very much. My time is up.

Senator Bunning?

Senator BUNNING. Thank you.

If you all could just shorten your answers a little bit, it would really help, because we are limited to 5 minutes.

Dr. Atkinson, you support having a trade policy that challenges clean technology protectionist policies in other Nations. Would it not be highly cost-effective to simply enforce our own trade laws?

Dr. ATKINSON. It would be highly effective, but I think it would be insufficient. I agree with you 100 percent, we do not enforce our trade laws, and we let countries get away with murder, but I do not think enforcement is enough. There are many things other countries do that are not protectionist, but are promoting innovation or production, which I would not call protectionism. There are other things that the Chinese in particular do that are clearly protectionist, so I think for us to win we would have to do both.

Senator BUNNING. All right.

Dr. Foster, you have heard some witnesses say today we should subsidize clean energy manufacturing because other countries are doing so. What are the problems with making U.S. subsidies match the subsidies of other countries?

Dr. FOSTER. Well, first of all, we are in effect engaging in the same bad behavior that they are. They are distorting their economy. They are misallocating resources, and we are following suit in self-protection. I think, to the extent one could address this through the trade side, that would be far preferable, as per your previous question.

The other point, though, is that the simple fact of history that we have learned from the trade area is that, when you create tax provisions or tariff provisions that protect an industry, you also prevent that industry from properly growing up. That is why I referred to it as a Peter Pan process. These industries become protected, and they refuse to grow up. They operate in a protected environment, so you are almost condemning them to second-class citizens in the global economy.

Senator BUNNING. Thank you.

Ms. Harbert, can you elaborate on some of the studies that show that subsidizing green jobs can actually destroy more jobs than it creates?

Ms. HARBERT. Certainly, and I will be brief. Certainly there is a much more detailed explanation in my written testimony. But a study in Spain, for example, showed that the creation of one green job destroyed 2.2 jobs in other parts of the economy. There was a

similar study just done in Italy, and that was double the number of jobs that were destroyed in the industrial sector, mainly because Italy imports most of its technologies.

In Germany, a detailed study of 20 years of its subsidizing of renewable energy shows that actually the cost of energy did not go down, in fact it went up, and actually, the usage of renewable energy stayed the same. They are still 45-percent dependent on coal. So we have to think about it very hard and look at real-time examples right now of what other countries have done. We are guessing, for the future; we have examples right here today.

Senator BUNNING. All right. Thank you.

Mr. Book, I see that carbon capture and storage received 0.21 percent of the 48(c) credit, and coal makes up about 50 percent of our electric generation. On the other hand, wind and solar projects received 60 percent of the 48(c) credit, and they make up less than 2 percent of the electric generation. Are we being cost-effective in the way we allocate our resources?

Mr. BOOK. Senator, I think it is a good question. The first panel did make, I thought, a laudable attempt to try to broaden the franchise to reach into some of the other fuels. But the scope of the challenge of decarbonizing the U.S. economy is not going to be met by adding new high-cost green capacity. We are still going to have almost 600 electric generating units that need to be retrofitted for carbon capture and storage. If we get good at doing this through a Federal subsidy, maybe we will be like Germany is in solar today. Maybe we will be the global leader. My suggestion is not so much that it should be proportional to the fuel mix you have, but proportional to the result you want.

Senator BUNNING. Thank you.

Ms. Harbert, what are some of the most cost-effective ways to promote clean energy projects?

Ms. HARBERT. We have just studied, the last 3 years, the amount of energy projects that have been proposed in the United States, and we have found that over 380 projects have been stopped through abuse of the siting process. Surprisingly, 40 percent are in the renewable area. If we really want to get some generation capacity built in this country, whether it is wind, solar, nuclear, or clean coal, we have to get beyond the BANANA syndrome, Build Absolutely Nothing Anywhere Near Anyone, and clear the way for capacity to get built. That would cost nothing. It would create jobs. It would create revenue. It would create investment, and it costs nothing. But it does demand action by Congress, and that would be something that would be tax-free, and it would certainly generate revenue and jobs.

Senator BUNNING. Thank you, Mr. Chairman.

Senator BINGAMAN. Thank you.

Senator Stabenow?

Senator STABENOW. Well, thank you again, Mr. Chairman. Thank you to all the panelists for your input.

Mr. Parks, I really want to indicate again the great work that you are doing is very much appreciated at MEDC. We really appreciate your great work in getting out the word about the Federal partnership opportunities that we have been working on together and how businesses can be a part of that.

It is also a great sense of pride for me that we are, in fact, becoming a clean energy manufacturing leader in Michigan, and there has been a tremendous amount of hard work that has gone into that. I know you have been very much a part of it, and I have been pleased to do my part on this end as well.

With the 48(c) and the Recovery Act, can you again tell us how many companies in Michigan have been successful in receiving the credit, and also talk a little bit about what these companies are doing?

Mr. PARKS. I think we had 12 companies, $242 million awarded, approximately 10 percent of the award. Most of our awards were in solar and wind, ranging from monosilane, which is a material in the thin-film photovoltaic sector that was a Dow-Corning award, to a tool and die shop in, I think, Battle Creek, Great Lakes Technology, that diversified into gear box manufacturing for the wind industry.

So we also know that we had a number of projects that were teed up then and are teed up now. We closed, in 2009, about $9 billion in business in the alternative energy arena, and we are actively working to pursue the supply chains, many of which we are recruiting from Asia right now to support our battery industry, for example, and we think we have a significant pent-up demand, potentially, for 48(c)s, if they are reauthorized.

Senator STABENOW. I wanted to ask a little bit more about that because, as I indicated earlier, I was successful in the Budget Committee in being able to get the inclusion of an additional $5 billion that would expand 48(c). Of course, the chairman has been leading our efforts legislatively, and I am pleased to work with the chairman on this. But it is important to look at the kinds of companies that could take advantage of this in Michigan, or any other State, but specifically in Michigan. Are there companies? What do you see in terms of the specifics if we were to expand this very important manufacturing credit?

Mr. PARKS. So what we did early on, for us it was about jobs. It was about diversifying the auto manufacturing industry or the suppliers to the auto space. We spent a lot of time identifying what the value chain was and put diversification programs together for auto suppliers.

We have over 400 companies, for example, that are teed up that have been, and still are, auto suppliers that are looking to diversify into wind component manufacturing, for example, which we think is an easy transition for our folks, many of whom we think would be applicants in this process.

We have a number of folks—I do not know if people know, but 80 percent of the R&D in the auto industry happens 50 miles from the Renaissance Zone (RenZone) in downtown Detroit. A number of the folks that have been all auto R&D are looking to diversify within the auto sector—that is a key point we like to make—on the energy storage side, on batteries. We have a number of defense companies that are looking, or people who want to support defense, who are looking at diversifying into clean tech to support some of the renewable portfolio standards in the defense sector.

So we believe we have about a billion-dollar pipeline in applicants. I do not want to necessarily foreshadow what we have, but

we have a large number of applicants that I think, if successful, would help us accelerate our plans in Michigan. Again, I am here talking about jobs in Michigan.

Senator STABENOW. Right. Which I think for the two of us in the room, at least, that is absolutely a top priority, certainly.

Talk a little bit more about the race with China. We have talked today about what is happening in other countries. We know that the latest numbers I saw, China was spending about $280 million every day to beat us on clean energy technology, and we certainly do not want to go from a dependence on foreign oil to a dependence on foreign technology. So could you talk about 48(c) in terms of closing that gap with China?

Mr. PARKS. Well, again, 48(c) is part of a comprehensive plan we put in place. On the battery side, for example, we were recruiting companies, even U.S.-based companies, that were going to manufacture exclusively in China. So we put our refundable tax credits together to recruit those folks and were successful in recruiting a Korean battery manufacturer, and two battery manufacturers in the U.S. that were manufacturing solely in China, to manufacture in Michigan. They, as well as their suppliers, are going to be applicants as they expand into the supply chain and into their activities in Michigan. But 48(c), again, for us, is part of the puzzle.

One of the recommendations that we had early on is, I think we all need to have shared skin in the game as we go forward. We would hope that you would look for States that are aggressive, that have done their homework, and see how they are creating jobs, ecosystems, and supply chains that will be sustainable, and how 48(c) is a very important part of that as we locate these manufacturers and then grow the supply chain.

Senator STABENOW. Thank you.

I see my time is up, Mr. Chairman. Thank you.

Senator BINGAMAN. Well, thank you very much.

I would intend to go ahead and end the hearing at this point. Did you have any burning question you needed to continue with here? I know Senator Bunning and I have other questions, but we feel we have proceeded long enough.

Senator STABENOW. Mr. Chairman, I have one, actually.

Senator BINGAMAN. Why don't you ask that question, and then we will terminate.

Senator STABENOW. Just in general. Just out of curiosity, I guess. Ms. Harbert, you said something I thought was interesting, and I just wondered your position, or the Chamber's position, talking about our national debt, which of course is a serious issue that we all care very deeply about and have to address.

But you were talking about being concerned about continuing these particular tax cuts, given the national debt. Would that apply to all tax cuts? Do you think we should not be doing tax cuts until we address the national debt?

Ms. HARBERT. No. We are looking at such a ballooning deficit that we have to look through a new lens when we look at new appropriations, as we are in the appropriations process now. We have to have an additional level of scrutiny, I think, and make value judgements, cost/benefit analyses, as we are looking at the outlays of billions and billions of dollars. We have long supported the pro-

duction tax credit for renewable energy, for example, and extending it so investors have certainty. But on the other hand, can we afford some of these new outlays that we are considering today that did not exist a couple of years ago? We need to really take those under consideration, in light of our deficit.

Senator STABENOW. We have a difference of opinion on that in terms of what it does to create jobs, but I did want to ask that question. Thank you.

Senator BINGAMAN. Well, thank you all very much for being here. I think it has been useful testimony.

We will conclude the hearing.

[Whereupon, at 4:35 p.m., the hearing was concluded.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

Dr. Robert D. Atkinson
President
Information Technology and Innovation Foundation

Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives
before the
Senate Finance Committee
Subcommittee on Energy, Natural Resources, and Infrastructure
U.S. Senate
May 20, 2010

Senator Bingaman, Senator Bunning, and members of the Committee, I appreciate the opportunity to appear before you today to discuss the issue of U.S. competitiveness in the clean energy industry and the role of tax credits in enhancing that competitiveness.

I am the president of the Information Technology and Innovation Foundation. ITIF is a nonpartisan research and educational institute whose mission is to formulate and promote public policies to advance technological innovation and productivity. Recognizing the vital role of technology in ensuring American prosperity, ITIF focuses on innovation, productivity, and digital economy issues.

Global private investment in renewable energy and energy efficient technologies is estimated to reach $450 billion annually by 2012 and $600 billion by 2020, and much larger if recent market opportunity estimates are realized.[1] As such, the industry presents an important market opportunity for the United States, one that could lead to significant job creation and export markets. However, for the United States to regain economic leadership in the global clean energy industry, U.S. energy policy must include more significant and coordinated investments in clean technology R&D, manufacturing, deployment, and infrastructure. One key component of this includes support for clean energy manufacturing in general, and the Section 48c clean technology production tax credits, in particular. ITIF supports renewed funding for this program and, as described below, some modifications in the structure and function of the program.

Why Demand Side Policies Alone Are Not Enough To Address the Challenge of Global Climate Change

Addressing the challenge of global climate change will require a transformation of the global production system, with significant reductions in greenhouse gas emissions. Because of population and per-capita income growth, achieving a 50 percent reduction in global greenhouse gas emissions by 2050 (the minimal reduction advocated for by most climate scientists) will require that each unit of economic activity produce 85 percent less green gas emissions than today. Achieving that level of greenhouse gas efficiency will require the development and deployment of new clean energy technologies.

The principal focus of climate change policy to date has been on boosting demand for clean energy technologies (and thereby reducing demand for "dirty" energy technologies), either by requiring reductions in carbon emissions (carbon caps or other regulations limiting energy use) or by increasing the price of carbon (carbon taxes or cap and trade). While such a demand side strategy is a key component of addressing climate change, it alone is insufficient to produce the kinds of changes needed.

This is true for several reasons. First, for many clean energy technologies to be competitive with fossil fuels, governments would have to set very high prices for carbon pollution, and as we are seeing, mustering the political will to impose even low prices on greenhouse gas emissions is difficult. Thus, political considerations mean that even if a carbon price is established it will likely be relatively low, as in the House's version of climate and energy legislation, which would establish a price averaging roughly $15 per ton of CO2-equivalent for the first decade of the program (2012-2021) – the equivalent of roughly a 15 cent increase in the price of a gallon of gasoline.[2]

Second, an economy-wide carbon price would not overcome specific barriers to the adoption of particular technologies. While a modest carbon price may help some lower-cost and more mature clean energy technologies (e.g., wind power) become more competitive with fossil fuels, it will not be enough to make mature and currently more expensive technologies such as solar energy or carbon capture and storage competitive. Only innovation and continued price declines in these technologies will allow them to be competitive with fossil fuels.

Third, the scale and long time horizon of many clean energy projects, combined with considerable market and technology uncertainty, makes it extremely difficult for firms to assess expected rates of return on investments. This large level of uncertainty discourages high-risk, high-reward research in favor of short-term research and incremental product development, while also inhibiting the commercialization and adoption of technologies that require capital-intensive projects to demonstrate technological and financial performance at commercial scale.[3]

But there is an additional problem with relying principally on a price or regulation-induced demand side strategy for clean energy. One key factor in convincing the American public that climate change legislation is worth the (modest) short and moderate-term cost is to demonstrate the promise of good jobs in the clean energy industry. If climate change legislation raises costs, but at least results in the creation of significant numbers of good paying clean tech jobs, then it will likely generate more public support. Yet, without a policy focused on the supply side (e.g., developing a robust clean tech industry in the United States), there is a very real chance that any policies to spur demand for clean energy will simply result in that demand being filled by foreign supply. If that is the case and the United States continues to run trade deficits in clean energy, the United States will be a net loser of jobs in this growth industry.

This suggests that supporting clean technology research and production is a necessary component of any clean energy policy. Such subsidies need not distort what economists term "allocation efficiency." Economists from a wide array of political orientations have long argued that "bads" (activities with negative externalities) carbon should be taxed, since the consumption of carbon creates costs to society that are not borne by the consumer (e.g., an organization or

individual), and thus will be higher than what is optimal for society. Raising the price of carbon is one way to address this market failure, but as we have seen doing so has proven politically unpopular. The alternative is to subsidize non- or low-carbon alternatives in order to reduce their price. A principal advantage of the latter approach is that it addresses two issues at once: lowering the relative price of clean technology while at the same time increasing the likelihood that the demand for clean technology will be met in the United States, thereby creating jobs and reducing the trade deficit.

The U.S. Risks Losing out on the Global Clean Energy Revolution

The U.S. should not assume that the clean energy industry is ours for the taking. Nations like China, Japan, South Korea, Spain and Germany are already outcompeting U.S. manufacturers, not through some inherent comparative advantage, but through direct public investment in clean energy research and development, manufacturing, and market creation. As ITIF and The Breakthrough Institute documented in "Rising Tigers, Sleeping Giant,", Asia's "clean tech tigers" are already on the cusp of establishing a first-mover advantage over the United States in the global clean tech industry.[4] The United States already relies on foreign-owned companies to manufacture the majority of its wind turbines, produces less than 10 percent of the world's solar cells, and is losing ground on hybrid and electric vehicle technology and manufacturing.[5] That's why China will export the first wind turbines destined for use in an American wind farm, in a project valued at $1.5 billion.[6] China now produces two times as many wind turbines as the United States, and both China and Japan are ahead of the United States in the production of solar PV cells. Overall, the report found the United States lagging far behind its economic competitors in the production of virtually all clean energy technologies. According to the New America Foundation, the U.S. balance of trade in renewable energy has moved from a trade deficit of nearly $300 million in 1997 to a deficit of $6.4 billion in 2008.[7] Should this gap continue to grow, the United States risks importing the majority of the clean energy technologies necessary to meet growing domestic demand.

While the United States has traditionally attracted the bulk of available private investment in clean energy, capital flows are increasingly being directed to Asia's clean tech tigers, and these nations' greater public investments are likely to capture much of the future private investment in clean energy technologies. For the first time in 2008, China attracted more private investment[8] in clean energy than the United States and has since widened its lead. In 2009, China attracted $41 billion – and China's share of global clean tech investment is rising each year.[9] (China also attracts more private capital than any other country in the world, with $34.6 billion in private capital going into in China in 2009, nearly twice as much as went into the second-placed United States,$18.6 billion).[10]

One reason we are lagging behind is that other nations have put in place aggressive clean tech investment strategies. According to a recent study by Deutsche Bank, "generous and well-targeted [clean energy] incentives" in China and Japan will create a low-risk environment for investors and stimulate high levels of private investment in clean energy. These nations rely on a "comprehensive and integrated government plan, supported by strong incentives."[11] In contrast, the investment firm notes, the United States is a "moderate-risk" country since it relies on "a

more volatile market incentive approach and has suffered from a start-stop approach in some areas." In "Rising Tigers," we estimated that China, South Korea and Japan governments will invest a total of $509 billion in clean technology over the next five years (2009-2013) while the U.S. government will invest $172 billion, a sum that assumes the passage of the proposed American Clean Energy and Security Act (ACESA) and includes current budget appropriations and recently enacted economic stimulus measures (both figures include investments in clean energy generation and advanced vehicle technologies, as well as rail, grid, and efficiency investments.)[12]

South Korea recently announced it will invest $46 billion over five years in clean technology sectors – over one percent of the nation's Gross Domestic Product (GDP) – with the explicit goal of increasing Korean firms' share of the global clean tech export market by eight percentage points. This "Green New Deal" investment program will focus in particular on solar, LED lighting, nuclear, and hybrid car technologies.[13] Japan will provide $33 billion in targeted deployment incentives for a number of clean energy technologies, including solar, hybrid-electric vehicles, and energy efficiency technologies, and plans to invest an additional $30 billion over the next five years to implement technological roadmaps that focus on achieving price and performance improvements in a suite of low-carbon technologies.[14]

Beyond their greater size, the direct and coordinated nature of these Asian nations' public investments will confer significant advantages by developing each of the areas necessary to achieve a competitive economic advantage in the clean energy industry: research and innovation, manufacturing, and domestic market demand, as well as supportive infrastructure.

China is poised to replicate many of the same successful strategies that Japanese and South Korean governments used to establish a technological lead in electronics and automobiles. Those governments supported nascent companies with low-interest loans, industry-wide R&D, government procurement, and subsidies for private firms to drive the purchase of advanced technologies. China is now employing similar tactics in emerging clean technology industries such as electric cars and low-carbon power generation.[15]

Indeed, the largest investments are being made by China, which is planning new investments totaling at least $440 billion,[16] and up to $660[17] billion, over ten years. These investments are expected to focus primarily on low-carbon power, and are in addition to the $177 billion in stimulus funds China has already invested in clean technology, including rail and public transit.[18] In addition, local and provincial governments in China are establishing clean energy clusters—low-carbon development zones that offer clean energy companies generous subsidies to establish operations in their localities, including free land, low-cost financing, tax incentives, and money for R&D. One particular cluster is located in a city called Baoding, which is referred to as "Electricity Valley," and is composed of nearly 200 renewable energy companies focusing on wind power, solar PV, solar thermal, and biomass technologies. Baoding is the center of clean energy development in China, and operates as a platform that links China's clean energy manufacturing industry with policy support, research institutions, and a skilled labor force.

Many of these investments are directed at growing domestic clean technology industries in order to meet aggressive technology deployment targets. By 2012, China, Japan, and South Korea plan

to produce 1.6 million hybrid gas-electric or electric vehicles annually compared to North America, which is projected to produce 267,000, less than a fifth as many, according to industry forecasts.[19] Japan has unveiled a plan to generate 20 percent of its electricity from renewable sources by 2020. Both targets are backed up by targeted R&D investments, technology-specific deployment incentives, and government procurement programs. China plans to deploy 86 GW of new nuclear capacity by 2020, and is rapidly deploying wind and solar power spurred by guaranteed preferential tariff prices and, in many cases, low-interest financing. The country expects to generate from 15 to 18 percent of its electricity from renewable sources by 2020; Chinese officials have recently indicated this amount could reach 20 percent.

As Asia's clean tech tigers solidify their lead, they will capture economies of scale, learning-by-doing experience, supply chain efficiencies, and greater market power advantages. These "first-mover" advantages are likely to create significant challenges for late-to-market entrants. National investments in the deployment and procurement of new technologies will be used to help emerging domestic industries solve technology problems, improve manufacturing efficiency and product performance, and reduce price, providing a lasting competitive advantage over other firms and nations. Japan, for example, is using government procurement and other incentives to buy down the price of solar power and is engaging in targeted R&D efforts to drive price and performance improvements that could help it retain its status as a leading global producer of solar technology.[20]

Nations that establish an early lead in key industries can more easily retain that advantage at a lower cost over the long-term. Direct government investments by Asia's clean tech tigers will help them form industry clusters, like Silicon Valley in the United States, where investors, manufacturers, suppliers and others can establish dense networks of relationships that can provide cost and innovation advantages for participating firms, and for the nation as a whole.[21]

The Role of Supply-Side Clean Energy Policies

Current U.S. energy and climate policies focus on stimulating domestic demand primarily through indirect, demand-side incentives and regulations, with inadequate attention to supply. If these policies succeed in creating demand without providing robust support for U.S. clean energy manufacturing and innovation, the United States will rely on foreign manufactured clean energy products. This dependency is already occurring in many manufacturing sectors. Indeed, as the manufacturing goods trade deficit has increased over the last decade, U.S. manufacturing value added as a share of GDP has declined significantly.[22]

In order to avoid ceding first-mover advantage to Asia's clean tech tigers, U.S. support for the nation's already lagging domestic clean energy industries must be robust. Unfortunately, according to the Environmental Protection Agency, the climate and energy bill passed by the House of Representatives in June 2009 is not sufficiently aggressive to significantly increase the deployment of renewable and other low-carbon energy generation technologies or advanced vehicle technologies, particularly in the near-term.[23] When compared to investments made by Asian competitors, ACESA directs relatively little public funding to directly support research and development, commercialization and production of clean energy technologies within the

United States. Furthermore, the legislation is unlikely to trigger significant private investments in clean energy development and deployment before 2020, if not much later, largely because carbon prices established by the bill's cap and trade program are projected to remain relatively low over this period and firms are expected to rely significantly on offsets for compliance with the legislation.[24]

While the United States is facing challenges in the global race for clean energy competitiveness, we are still in the game and can thrive provided the right policies are put in place. Indeed, there are historic examples of the United States catching up to competitors who have surged ahead. The United States raced past Europe in aerospace through sustained federal military-related support for aviation technology development and deployment, and was able to become a world leader in civil and military aviation, after trailing Europe for years.[25] During the space race, the United States quickly met and then surpassed the Soviet Union after it launched the Sputnik satellite, putting a man on the moon twelve years later after a sustained program of direct investment in innovation and technology. The United States has consistently been a leader in inventing new technologies and creating new industries and economic opportunities. It remains one of the most innovative economies in the world, and is home to the world's best research institutions and most entrepreneurial workforce. The challenge will be for the United States to aggressively build on these strengths with robust public policy and government investment capable of establishing leadership in clean technology development, manufacturing, and deployment, and to do so before countries like China, Germany, Japan and South Korea fully establish and cement their emerging competitive advantages.

Why Foreign Clean Tech Policies Can Hurt the U.S. Economy

One rationale for not intervening on the supply side of the clean tech industry is that if these other nations want to subsidize their clean energy industry exports to us (or any industry exports, for that matter) that we should let them. After all, aren't their subsidies just lowering prices for American industry and consumers? What's wrong with this?

The fallacy of this logic is that it ignores the fact that most American consumers are also workers. In other words, foreign clean tech policies may help American consumers by lowering the price of clean energy, but they hurt American workers, at least in the short term and possibly in the moderate term. Consumers don't benefit much from lower clean energy prices if they are out of a job. These foreign policies clearly hurt American workers in the short term. For example, the wind turbines installed in Texas and manufactured by Chinese government subsidized producers clearly substituted for American produced wind turbines and either resulted in direct job losses or limited expansion of jobs in the U.S. wind energy industry.

Even if defenders of unilateral disarmament by the United States in the face of foreign clean technology subsidies acknowledge short-term harm to U.S. workers, they will argue that in the moderate term U.S. workers benefit. Their logic is that if workers are not employed in the clean tech industry because of foreign clean tech industrial policies, they will simply be employed in other U.S. industries. In the moderate and long-term this is true. But there are at least two problems with this analysis. First, they may not be employed in jobs with the same or higher

levels of productivity and wages. In fact, average wages in the clean energy industry are higher than overall U.S. wages for industries associated with household consumption.[26] This suggests that the average worker not employed in the clean tech industry will make less, not more, money and U.S. GDP will be less, not more.

A second flaw in this logic is that it ignores the problem of the trade deficit. While there is disagreement among economists over whether the persistent and large U.S. trade deficit is a problem (ITIF believes that it is), there is much less disagreement of what the trade deficit represents: a debt owed by future generations of Americans. Currently Americans consume approximately 5 percent more than they produce (with the rest being made up of imports greater than exports). This is clearly unsustainable, if for no other reason that eventually other nations will tire of sending us their products and getting nothing in return for them. When that happens it means that Americans will have to consume approximately 5 percent *less* than they produce, for at least several decades, and this will likely happen when the baby boomers are retired. ITIF believes that for this reason alone, coming to grips with the trade deficit now is good public policy. Supporting clean energy production, as Section 48c does, is one way to do this.

The Role of Clean Energy Tax Credits

Public investment helps bridge the initial price differential between clean energy technologies and their incumbent competitors. Unlike economy-wide carbon prices or market mechanisms, these public investments and incentives can be targeted to address the varying price differentials for a full suite of clean technologies at various stages of maturity and development. These investments in turn accelerate reductions in the real, unsubsidized cost of emerging clean technologies over time. New technologies routinely become less expensive with increasing experience and scale, as supply chain and production efficiencies are captured and economy of scale effects are realized. This "learning-by-doing" effect, brought about through operational market experience, also feeds back into the research process to guide future research and improvements in product performance and price.[27]

It is in this context that the Section 48c program plays an important role. The American Reinvestment and Recovery Act of 2009 (ARRA) authorized the Department of Treasury to award $2.3 billion in tax credits for qualified investments in advanced energy projects, to support new, expanded, or re-equipped domestic manufacturing facilities. The Section 48C program has so far provided a 30 percent tax credit for investments in 183 manufacturing facilities for clean energy products in 43 states. This program helps support U.S. manufacturing capacity to supply clean energy projects with U.S. made parts and equipment. These manufacturing facilities should also support significant growth in exports of U.S. manufactured clean energy products. After implementation, the program was oversubscribed by a ratio of more than 3 to 1. Over 500 applications were received with tax credit requests totaling over $8 billion. This clearly suggests that there is a significant capability to produce clean energy technology in the United States. It also suggests that DOE could tighten the criteria by which they make awards to increase the overall effectiveness of the program.

ITIF believes that Congress should extend this program. However, if Congress does this, we would recommend several changes in the program.

- Congress should consider expanding the program to provide some grants, as well as tax incentives. Under the current program newer firms with limited tax liability find the program of less use (they can presumably carry forward their tax credits for future years when they may have federal tax liability, but this is of less use than being able to receive the support sooner).

- In order to extend the scope of the program, Congress may want to consider lowering the credit from 30 percent to 25 percent (or even 20 percent) and encouraging state governments to provide matching funds. States and local governments should be in a position to help support these investments since these projects will clearly have strong state and local economic development benefits.

- The program should fund only projects that have not yet been initiated. While it may have made some sense to fund projects that had already been initiated because the U.S. economy was in the midst of a severe economic downturn when the program was established, going forward only new projects should be supported.

- Eliminate (or at least significantly downgrade) the criteria for awards of the "Shortest project time from certification to completion." One factor in determining winning projects was speed of completion. While this criteria made sense during the downturn when it was critical to stimulate economic activity quickly, it makes less sense now with recovery under way. We would recommend eliminating this criteria as speed of completion as a selection criteria.

- Eliminate (or at least significantly downgrade) the criteria for "greatest domestic job creation (direct and indirect)." Again, this factor made sense during the downturn. But giving this criteria significant weight can disadvantage projects that are more capital intensive, more innovative, and more export focused.

- Eliminate (or at least significantly downgrade) the criteria for "greatest net impact in avoiding or reducing air pollutants or emissions of greenhouse gases; lowest levelized cost of energy." This goal is obviously a critical one. But the real issue in how it is applied is the time horizon for the generation of these benefits. Strict application of this criteria could result in some projects with higher short-term energy benefits (such as factory producing insulation) winning out over other projects with slightly lower short-term benefits (such as solar panel production).. But a potential advantage of funding the solar panel project is that economies of scale and learning are achieved, plus more revenue is gained for reinvestment in solar energy R&D. Achieving the 85 percent greenhouse gas efficiency improvement requires more than energy efficiency measures. It will require new technology measures, such as new lighting technology, new renewable energy technology, new energy storage technology, more efficient carbon capture, etc. These are the kinds of projects that should be prioritized in the 48c program.

- Give more weight to "greatest potential for technological innovation and commercial deployment." As noted above, this is an important factor that deserves to be weighted more heavily in DOE project selection.

- Add a criteria that rewards projects that are likely to lead to greater exports (or reduced imports). It is the product areas that are most exposed to robust international competition that are in most need of federal government support, if for no other reason than to offset the competitive advantage that foreign competitors get from help from their domestic governments.

- Related to this, the program should prioritize projects that produce components or products domestically, as opposed to just assembling components produced overseas. Assembly plants are more likely to have to be located in the United States regardless of whether there is a tax credit given to them or not. Moreover, the job creation benefits from component production are usually much larger than from assembly plants, as the former usually either get exported or assembled domestically.

A More Integrated Clean Energy Technology Strategy is Needed

While the 48c program is an important tool towards both increasing clean energy jobs in the United States and addressing global climate change, it is not enough. Ultimately, developing a globally competitive clean energy industry will require not only support for clean energy manufacturers, including but not limited to incentive programs like 48c, but also a comprehensive efforts to spur innovation and collaboration throughout the clean energy sector, from research to technology commercialization and production.

Therefore, tax credits for advanced clean energy manufacturing are one piece of what must be a larger public strategy to build a robust clean energy economy. The federal government must also ensure adequate investment in clean energy research and development to advance next-generation energy technologies to improve their performance and make them cheaper,[28] and accelerate the opportunities to manufacture and commercialize new technologies by providing stable and long-term demand. In this regard, ITIF believes that any climate change legislation considered by Congress should invest much more in research, innovation and advanced production, even if it has to reduce the tax on greenhouse gases emissions (for example, by a less aggressive carbon cap).

New institutional models are also needed to coordinate investments in R&D, manufacturing, and technology commercialization and spur public-private collaboration to accelerate the pace of innovation throughout the technology value chain. A large body of scholarship has identified regions as the most effective delivery mechanisms for such coordination, and we have proposed that the federal government offer grants to create regional clean energy innovation clusters to link federal and non-federal investment in clean energy and maximize the economic impact of our federal dollars.[29]

Finally, we need to supplement domestic clean energy policies with a trade policy that challenges clean technology protectionist policies in other nations. As the National Foreign Trade Council recently documented in a report on Chinese policies to support their renewable energy industry, many Chinese practices are clearly protectionist.[30] ITIF believes that it is important to differentiate between polices that are generally positive sum (such as subsidies for clean energy research and production) and those that are designed to limit imports and spur exports in clearly protectionist ways. In the case of China, the government is aggressively using both kinds of policies, but among the latter include VAT rebates; procurement preferences for Chinese-owned and controlled companies; and local content preferences (not to mention their manipulated currency as an overall export subsidy). For example, China enacted a rule that provided that no wind farm could be constructed in China that did not meet a 70 percent local content requirement. They also released the Provisional Measures for the Accreditation of National Indigenous Innovation Products which provides for a process under which products made with "indigenous" (e.g., Chinese) intellectual property could qualify for "priority" in government procurement and "national key projects that will spend Treasury funds." In other words, China's "Indigenous Innovation" program is simply a protectionist regime applied to technology-related industries, including clean tech, and one that has the potential to severely hurt U.S. technology companies. As such, it is time for the U.S. government to stop sitting on the sidelines and begin to seriously challenge other governments' clean-tech protectionism.

Conclusion

U.S. manufacturing output (as a share of GDP) and jobs have declined in the last decade. One way to help revive both is for the United States to gain a larger share of the expanding global clean energy industry. Doing so will not only produce jobs in the United States, it will help address the challenge of global warming. However, absent supply-side policies to support clean energy innovation and production this revival is unlikely to occur. Ultimately, creating a robust clean energy economy in the United States will require a more integrated investment strategy to support clean energy research, commercialization and production. Toward that end, reauthorizing and refining Section 48c support for clean energy production is critical.

Notes

---

[1] World Economic Forum, "Green Investing: Toward a Clean Energy Infrastructure," World Economic Forum, January 2009, http://www.weforum.org/pdf/climate/Green.pdf. For example, a recent opportunity estimate for China alone estimated a maximum market opportunity of $500 billion to $1 trillion by 2013. See:"The China Greentech Report 2009." *China Green Tech Initiative*, September 10, 2009,16, http://www.china-greentech.com/reportweforum.org/pdf/climate/Green.pdf.

[2] A number of independent estimates have projected that the carbon price established under the American Clean Energy and Security Act (ACESA) would remain around $15/ton until as late as 2020. See: Larry Parker and Brent Yacobucci. "Climate Change: Costs and Benefits of the Cap-and-Trade Provisions of H.R. 2454." *Congressional Research Service*, September 14, 2009.

[3] Karsten Neuhoff, "Large-Scale Deployment of Renewables for Electricity Generation." *Oxford Review of Economic Policy*, Vol 21, (1) (2005).

[4] Robert Atkinson et al., "Rising Tigers, Sleeping Giant," Breakthrough Institute and Information Technology and Innovation Foundation, November 2009, http://www.itif.org/files/2009-rising-tigers.pdf.

[5] Wind: Through the 3rd quarter of 2009, 55 percent of installed turbines were manufactured from foreign companies, as well as 67 percent of the turbines slated for projects currently under construction. See, Choma, Russ. "Overseas Firms Collecting Most Green Energy Money," *Investigative Reporting Workshop*, http://investigativereportingworkshop.org/investigations/wind-energy-funds-going-overseas/; Solar: "Marketbuzz 2009 Annual World Photo Voltaic Market Review." Solarbuzz LLC (March 2009), 130, http://www.solarbuzz.com/Marketbuzz2009-intro.htm;
Vehicles: "China Vies to be World Leader in Electric Cars," *New York Times*, April 1, 2009, http://www.nytimes.com/2009/04/02/business/global/02electric.html?_r=2&hp=&pagewanted=print.

[6] John Collins Rudolf, "China-U.S. Group Plans to Build Texas Wind Farm," *The New York Times,* October 29, 2009, http://www.nytimes.com/2009/10/30/business/energy-environment/30wind.html?scp=2&sq=China%20texas%20wind&st=Search

[7] Samuel Sherraden, "Green Trade Balance," New America Foundation, June 2009, http://www.newamerica.net/publications/policy/green_trade_balance.

[8] Deutsche Bank Group. Global Climate Change Tracker: An Investor's Assessment. October 2009.

[9] Ibid. See also: United Nations Environmental Program, *Global Trends in Sustainable Energy Investment 2009*, 2009.

[10] Pew Charitable Trusts, "Who's Winning the Clean Energy Race?" March 2010, http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Global_warming/G-20%20Report.pdf

[11] Deutsche Bank Group. Global Climate Change Tracker: An Investor's Assessment.

[12] Robert Atkinson et al., "Rising Tigers, Sleeping Giant."

[13] A number of reports have put South Korea's investment figure at around $84 billion, but this includes a number of investments that are unrelated to clean energy technology. While details of South Korea's investment package have not been completely specified, a preliminary accounting of the investment package puts the clean energy total at $46 billion. This figure excludes investments in water and waste management. See Robins, Nick; Clover, Robert and Charanjit Singh, "A Global Green Recovery? Yes, but in 2010." HSBC Global Research, August 6, 2009, p.2.
See also: "Gov't Unveils Plan to be Among the Top Green Nations." Government of South Korea. July 7, 2009, http://www.korea.net/news/issues/issueDetailView.asp?board_no=20963.

[14] "Low Carbon Technology Plan," Government of Japan, Council of Science and Technology Policy (May 19 2008). Available at: http://www8.cao.go.jp/cstp/english/doc/low_carbon_tec_plan/low_carbon_tech_plan.pdf

[15] "China Vies to be World Leader in Electric Cars." New York Times (April 1, 2009). Available at: http://www.nytimes.com/2009/04/02/business/global/02electric.html?_r=2&hp=&pagewanted=print .

[16] "China Plans 440-bln dlr stimulus for Green Energy." *Agence France Press,* May 24, 2009, http://www.google.com/hostednews/afp/article/ALeqM5i7wWkoCABy_Y7poh8ym0TI7CiJjA

[17] "The scale of the total investment planed for new energy may reach 4.5 Wan Yi," translated by Gang Lin, http://money.163.com/09/0526/16/5A8JM34S00252G50.html.

[18] Nick Robins, Robert Clover, and Charanjit Singh, "A Climate for Recovery: The Colour of Stimulus Goes Green".

[19] Ibid.

[20] See "Asia's First-Mover Advantage" in Atkinson et al., "Rising Tigers, Sleeping Giant."

[21] Ibid.

[22] Leaving out NAICS 334 (Computer and Electronics Manufacturing), U.S. manufacturing value added has fallen from around 13 percent of GDP in the late 1990s to less than 10 percent today. It appears that the Bureau of Economic Analysis considerably overstates the growth of value added in NAICS 334, thereby masking U.S. manufacturing decline. See: Robert Atkinson, "Comment on Gregory Tassey's Rationales and Mechanisms for Revitalizing U.S. Manufacturing," *Journal of Technology Transfer*, March 19, 2010, (http://www.itif.org/files/2010-Atkinson-JTT.pdf).

[23] U.S. Environmental Protection Agency, "Analysis of H.R. 2454 in the 111th Congress, the American Clean Energy and Security Act of 2009," June, 2009, http://www.epa.gov/climatechange/economics/economicanalyses.html.

[24] The U.S. Environmental Protection Agency projects carbon prices under the House-passed American Clean Energy and Security Act (ACESA) would rise to just $13 per ton of CO2-equivalent (CO2-e) by 2015, while the Congressional Budget Office projects a price of $16 per ton CO2-e in 2012, rising to $17 per ton in 2013 and $19 per ton in 2015. See: "EPA Analysis of the American Clean Energy and Security Act of 2009." U.S. Environmental Protection Agency, June 23, 2009), http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf; And: "H.R. 2454, American Clean Energy and Security Act of 2009," U.S. Congressional Budget Office (June 5, 2009) http://www.cbo.gov/doc.cfm?index=10262.

In contrast, CO2 permit prices in the European Union's Emissions Trading Scheme (ETS) have regularly traded at above $30 per ton CO2-e during the current compliance phase (Phase II) and preferential production incentives for solar power, for example, offered in China, Japan, the EU and elsewhere routinely top the CO2 price equivalent of $200-500 per ton (roughly equivalent to production incentives or tariff prices of $0.20-0.50 per kilowatt-hour).

Furthermore, both of the EPA and CBO forecasts were published prior to revised emissions projections for 2009 taking into account the impacts of the global economic recession and resulting significant drop in U.S. CO2 emissions. Analysts now project a potential over-allocation of emissions permits in the early years of the ACESA cap and trade program, which may collapse carbon prices down to the $10 per ton CO2-e floor price for primary auction markets established by the legislation, with secondary markets potentially trading below this nominal floor. See "Over-Allocation of Pollution Permits Would Result in No Emissions Reduction Requirement during Early Years of Climate Program," Breakthrough Institute, September 23, 2009, http://thebreakthrough.org/blog/2009/09/climate_bill_analysis_part_20.shtml

[25] John Alic et al., "U.S. Technology and Innovation Policies." *Pew Center on Global Climate Change*, 2003. http://www.cleanenergystates.org/library/Reports/Pew_US-Technology_and_Innovation_Policies.pdf. See also: Zach Arnold et al. "Case Studies in American Innovation" Breakthrough Institute, http://thebreakthrough.org/blog/2009/04/breakthrough_report_case_studi.shtml.

[26] Robert Pollin et al. found that the average pay of the green investment program is about 14 percent higher than that for the industries associated with household consumption. See: Robert Pollin, Heid Garrettd-Peltier, James Heintz, and Helen Scharber, "Green Recovery: Programs to Create Good Jobs and Start Building a Low-Carbon Economy," Center for the American Progress, September 2008, http://www.americanprogress.org/issues/2008/09/pdf/green_recovery.pdf.

[27] Karsten Neuhoff, "Large-Scale Deployment of Renewables for Electricity Generation," *Oxford Review of Economic Policy*. Vol 21. (No 1.) (2005).

[28] There is strong expert consensus for the need for greater investment in clean energy R&D, on the order of an additional $15 billion per year. This scale of investment has been endorsed by 34 Nobel-prize winning scientists, the nation's top research universities, and leading think tanks and private sector technology companies like Google, See:

Jesse Jenkins, "The Innovation Consensus: $15 Billion for Clean Energy R&D," *TheEnergyCollective.com,* October 29, 2009, http://theenergycollective.com/TheEnergyCollective/50750.

[29] Reference forthcoming in an ITIF-Breakthrough Institute report.

[30] Thomas Howell et al., "China's Promotion of the Renewable Electric Power Equipment Industry," Dewey and LeBoeuf LLP for the National Foreign Trade Council, March 15, 2010, http://www.nftc.org/newsflash/newsflash.asp?Mode=View&id=236&articleid=3015&category=All.

TESTIMONY OF KEVIN BOOK
MANAGING DIRECTOR, RESEARCH
CLEARVIEW ENERGY PARTNERS, LLC
BEFORE THE
U.S. SENATE COMMITTEE ON FINANCE
SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES AND INFRASTRUCTURE

MAY 20, 2010

Thank you, Chairman Bingaman, Ranking Member Bunning and distinguished members of this Committee for the privilege of contributing to your discussion this afternoon. My name is Kevin Book and I lead the research team at ClearView Energy Partners, LLC, a research and consulting firm that serves institutional and corporate strategic investors in energy and natural resources.

A CHALLENGING ENVIRONMENT FOR CLEAN TECHNOLOGY AND GREEN ENERGY FINANCING

In December 2007, as the U.S. economy was collapsing into the downturn that has come to be known as the "Great Recession", clean technology and renewable electricity investments were surging ahead. At the time, I covered alternative energy as a research analyst at an investment bank, and I can distinctly recall the strong, negative reactions I received from financial investors when a colleague and I published an ambivalent assessment of solar power market potential. Our concern at the time seems almost trivial today, given the massive dislocations that subsequently confronted global manufacturers of every kind. We believed that rapidly expanding manufacturing capacity, much of it in China, was likely to outstrip demand in the primary markets for solar power. Even this humble assertion seemed overly pessimistic to many investors, and they had plenty of reasons for optimism: many industrialized countries appeared to offer at least one of three basic types of "clean" and "green" power demand:

- **Fundamental demand** that reflected high power prices due to resource scarcity, population growth, industrialization or limited electric generating potential;
- **Legislative demand** that derived from renewable energy mandates and/or carbon surcharges;
- **Financial demand** generated by government programs in many OECD nations – especially Germany, Spain and Japan – that paid generous "feed-in tariffs", or per-kilowatt-hour premiums, to the financial sponsors of alternative power projects.

Here in the U.S., fundamental demand was mixed. Solar demand was weak, because "grid parity", or the cost of power generation at which a solar power investment would deliver electricity at the same price as the electrical grid – appeared to be about 4-6 years away, outside of a few isolated markets. By contrast, many wind power projects were in the money thanks to manufacturing efficiencies that had lowered equipment costs, technology improvements that had improved generation yields and high natural gas prices that had made wind projects more competitive.

U.S. legislative demand was a growing factor in clean and green prospects. A carbon surcharge that could close the generation cost gap between clean and conventional sources appeared to be several years away, but state-level renewable portfolio standards (RPS) contributed to a growing alternative power demand, primarily for wind projects, but also for solar installations within states where RPS created solar "set-asides".

The biggest driver of U.S. clean and green demand, however, came from financial investors who funded wind, solar and geothermal projects by paying project developers for "tax equity", the stream of income-shielding state and federal tax credits generated by the projects. At the end of 2007, some of my clients anticipated that investor appetite for clean energy tax equity might be as large as $7-9 billion in 2009. Investor confidence probably reflected the still-rising prices of

conventional fuels and many investors' optimism that the daunting 3Q 2007 spike in subprime mortgage defaults would remain "contained" as the global economy continued to prosper. My clients' primary concern regarding green and clean sources was that Congress might fail to reauthorize the production tax credits (PTCs) and investment tax credits (ITCs) due to expire at the end of 2008.

They would soon have much bigger worries.

As this Committee well knows, the PTCs and ITCs were expanded and extended on October 3, 2008 within the Emergency Economic Stabilization Act of 2008, the same legislation that created the Troubled Asset Relief Program (TARP). This was cold comfort to clean technology manufacturers and their investors, however, because the once-profitable financial institutions that held the once-untroubled assets that TARP was designed to "relieve" also represented a large portion of alternative power tax equity demand. Troubled assets meant losses, and losses meant that financial sponsors had neither the working capital with which to sponsor projects, nor profits that required tax shelters.

Not only had financial demand dried up, but fundamental energy demand had also weakened substantially: U.S. electric power consumption declined by about 1.15% in 2008 and fell by another 3.76% in 2009, a two-year contraction without precedent since the beginning of EIA recordkeeping in 1949. A speculator-led sell-off in energy commodities during late 2008 gave way to an even starker reality at the beginning of 2009: manufacturers and shippers were using less and less energy as retailers sold off their inventories, layoffs decreased transportation fuels demand and residential and commercial foreclosures diminished building energy needs.

Weak demand fundamentals hurt alternative power producers in two ways. First, less demand for a commodity means less demand for all producers of that commodity, clean and conventional alike. Second, the combination of prolific, low-cost shale gas discoveries and collapsing end-user demand led to bargain-basement generation costs for natural gas-fired power plants, undermining the economic case for many clean and green sources.

GREEN CONSUMERS, GREEN PRODUCERS AND GREEN PROTECTIONISM

The February 13, 2009 American Recovery and Reinvestment Act (ARRA) created two mechanisms intended to preserve clean tech investment: the "Section 1603" Program, which makes payments for specified energy property in lieu of ITCs and PTCs; and the Advanced Energy Manufacturing Tax Credit (or "48C" program), which pays 30% tax credits to new, expanded, or re-equipped domestic manufacturing facilities of clean energy infrastructure, and for which Congress authorized and appropriated $2.3 billion.

The two credits differ markedly in nature and structure:

- Whereas the Section 1603 grants allow clean energy project developers to fund their projects in the absence of financial-sector demand for tax equity, 48C credits provide credits to clean technology manufacturers.

- Section 1603 grants continue the U.S. policy of subsidizing clean and green consumption that dates back to the PTC created by the Energy Policy Act of 1992 (and even further, to the energy ITC that preceded it), while 48C credits encourage U.S. manufacturers to build, expand or retrofit for clean and green production capacity.

- Section 1603 grant recipients can source technology without country-of-origin restrictions, but the 48C credit is awarded exclusively for manufacturing facilities located within the U.S.

The 48C credit includes several innovative features that distinguish it from the Section 1603 program:

- A broad universe of potentially-qualifying projects: in addition to facilities that manufacture renewable energy technologies, the 48C credit applies to energy storage; transmission projects to support renewable energy

infrastructure; renewable fuel refining/blending; energy conservation; plug-in vehicles; carbon capture and storage and "other property designed to reduce greenhouse gas (GHG) emissions".

- Spending limits defined by the Congressional authorization and appropriation process, rather than a "blank check".
- A "use it or lose it" provision that requires funds to be spent within four years.

Figure 1 presents summary data regarding the Section 1603 program outlays through March 15, 2010.

Figure 1 – Section 1603 Grants in Lieu of Tax Credit, As of March 15, 2010, by Technology Type

Technology	Amount	%
Biomass	$63,394,826	1.80%
Combined Heat and Power	$2,960,227	0.08%
Fuel Cell	$2,770,235	0.08%
Geothermal	$154,693,463	4.40%
Hydropower	$2,678,644	0.08%
Landfill	$15,592,966	0.44%
Open Loop Biomass	$30,836,200	0.88%
Small Wind	$723,272	0.02%
Solar (All Types)	$182,001,522	5.18%
Wind	$3,057,159,898	87.03%
Total	**$3,512,811,253**	

Source: ClearView Energy Partners, LLC, using data from U.S. Treasury

Figure 2 presents summary data regarding tax credits approved under the 48C program.

Figure 2 – Section 48C Credit Requests, by Technology Type (to the Extent Specified by Requestors' Voluntary Responses to DOE Survey)

Technology	Amount	%
Battery	$29,360,400	1.28%
Biomass	$29,304,480	1.27%
Buildings	$147,339,742	6.41%
CCS	$4,842,438	0.21%
Fuel Cell	$5,510,100	0.24%
Geothermal	$9,054,126	0.39%
Hydropower	$4,053,733	0.18%
Industrial	$168,655,585	7.33%
Smart Grid	$73,800,000	3.21%
Solar (all)	$1,092,546,921	47.50%
Vehicles	$196,790,145	8.56%
Wind (all)	$289,609,000	12.59%
Not Specified in DOE Survey	$249,133,331	10.83%
Total	**$2,300,000,001**	

Source: ClearView Energy Partners, LLC, using data from U.S. Department of Energy

The ambitious premise of the 48C program – to help the United States re-tool to become a competitive manufacturer, and perhaps a competitive exporter, of clean energy technologies – offers an appealing prospect during the current employment slump. Building capacity to satisfy either internal or export demand for clean technology would represent an impressive expansion of U.S. manufacturing capabilities. Moreover, it is easy to understand why a policy intended to create jobs would require manufacturing capacity to be built within U.S. borders. Practically speaking, the fastest way to bring U.S. capabilities up to the level of foreign competitors may be to bring those companies, their business practices and their technologies here to the U.S. in the hope of promoting knowledge capital diffusion into the U.S. workforce. Figure 3 suggests that the 48C program could contribute to such a result: 33% of the 48C projects approved for credits are subsidiaries or affiliates of foreign-domiciled corporate parents, many of them global leaders in clean tech manufacturing.

Figure 3 – 33% of Surveyed Projects, or $761.5 MM in 48C Tax Credits, Went to U.S. Affiliates or Subsidiaries of Foreign Corporations (Showing Top 25)

Rank	Company	$ Requested, by Company	% of Total	Parent or Affiliate Corporate HQ
1	REC Silicon	$154,896,429	6.73%	Norway
2	Volkswagen Group of America Chattanooga Operations LLC	$150,000,000	6.52%	Germany
3	Hemlock Semiconductor Corp.	$141,870,000	6.17%	USA
4	Wacker Polysilicon North America LLC	$128,482,287	5.59%	Germany
5	UTC Power Corp.	$115,700,100	5.03%	USA
6	Miasole	$101,800,200	4.43%	USA
7	General Electric Company	$89,849,798	3.91%	USA
8	SolarWorld Industries America Inc	$82,200,000	3.57%	Germany
9	Alstom Inc.and Subsidiaries	$65,725,800	2.86%	France
10	E.I. du Pont de Nemours and Co.	$65,265,000	2.84%	USA
11	Vestas	$51,769,800	2.25%	Denmark
12	CaliSolar, Inc.	$51,563,980	2.24%	USA
13	Texas Instruments Incorporated	$51,450,000	2.24%	USA
14	AE Polysilicon	$44,850,000	1.95%	USA
15	Nanosolar	$43,453,309	1.89%	USA
16	Cree Inc.	$39,087,000	1.70%	USA
17	Stion Corporation	$37,500,000	1.63%	USA
18	Siemens Industry, Inc.	$36,110,979	1.57%	Germany
19	Xunlight Corporation	$34,500,000	1.50%	USA
20	SCHOTT Solar, Inc.	$33,000,000	1.43%	Germany
21	SAGE Electrochromics, Inc.	$31,500,000	1.37%	USA
22	Gamesa	$30,946,582	1.35%	Spain
23	ZF Steering Systems, LLC	$28,560,000	1.24%	USA
24	Novozymes Blair, Inc.	$28,401,000	1.23%	Denmark
25	Dow Corning - Solar Silane	$27,300,000	1.19%	USA

Source: ClearView Energy Partners, LLC, using DOE and corporate data

It is less clear, however, that abandoning origin-agnostic, consumption-oriented policies for some measure of "green protectionism" will achieve the broader goal of sustained economic growth. U.S. clean technologies will not win market share at home or abroad until they can compete on a price basis with technologies produced overseas. Nor is it clear that the U.S. is naturally well-positioned to compete in every corner of the international clean tech market. According to DOE data, solar technologies accounted for approximately 47.5% of 48C credits approved, a surprising statistic for a country responsible for less than 5% of global photovoltaic production in 2009, as presented in Figure 4.

Figure 4 – 2009 Global PV Manufacturing Share, Major Manufacturers

Country	Share of 2009 PV Manufacturing
China	31.68%
Germany	17.37%
Japan	16.02%
Taiwan	13.27%
Malaysia	8.87%
USA	4.87%
Philippines	4.49%
Netherlands	0.90%
Spain	0.79%
Belgium	0.61%
India	0.57%
France	0.55%

Source: ClearView Energy Partners, LLC, using Photon Magazine *data*

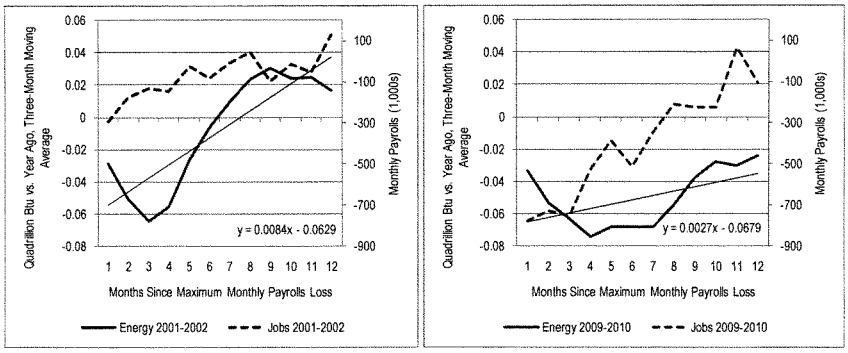
Michael E. Porter, head of Harvard Business School's Institute for Strategy and Competitiveness, in his seminal 1990 work *The Competitive Advantage of Nations,* highlighted four key factors that contribute to an industry's international

competitiveness. Loosely paraphrased, these are: innate and acquired factor cost advantages; the presence of "related and supporting" industries; competition between firms; and robust domestic demand.

The U.S. is unlikely ever to enjoy lower factor costs than China. Nor is it clear that domestic demand will prove sufficient to create an internationally competitive solar sector comparable to those driven by energy security and power price pressures in Japan and Germany. Even more vexingly, on a fundamental basis, U.S. energy demand remains weak, even as growing employment rolls reinforce early indications of economic recovery.

Figure 5 compares the energy intensity of the 2001-2002 U.S. jobs recovery to the 2009-2010 jobs recovery. Over comparable periods, the slope of the current recovery is considerably flatter than the last one (243 billion Btu vs. year-ago per 1,000 jobs recovered then, compared to 68 B Btu/1,000 jobs now).

Figure 5 – Year-on-Year Change in Monthly Demand, 3-Month Moving Average, vs. Nonfarm Payrolls Changes, 2001-2 and 2009-10



Source: ClearView Energy Partners, LLC using data from EIA and BLS

On a legislative demand basis, it remains unclear whether efforts aimed at putting a price on carbon or establishing a national renewable electricity standard will succeed this year. Similarly, the possible lapse of the Section 1603 program at year-end could substantially diminish U.S. clean energy demand from financial investors. Absent fundamental, legislative or financial demand, clean technology producers spurred by stimulus monies to increase domestic manufacturing capacity could face the unpleasant prospect of a 2011 supply glut. It may not make sense to expand 48C funding without corresponding expansions in domestic demand.

That said, there may be other sources of domestic demand, especially technologies that capture, sequester or reduce energy-sector GHG emissions. Last week, the U.S. Environmental Protection Agency released its final "Tailoring Rule", establishing a phased-in regulation of GHG emissions from stationary sources that will begin on January 2, 2011. Future 48C allocations could play a significant role in establishing the U.S., a nation where 44% of electric power came from coal-fired plants in 2009, as a global leader in post-combustion retrofit technologies.

How to Combat Equity Subsidy Fatigue: Give Debt Subsidies to Developers

The downside of demand subsidies for clean tech generally boils down to government discomfort with the cost of funding them, a phenomenon our firm refers to as "equity subsidy fatigue". Although extraordinary economic events like the Great Recession may temporarily blunt public opposition to extraordinary stimulus programs, cash or cash-equivalent payments to project sponsors typically must come either from ratepayers' pockets or government treasuries. Several of the OECD governments that encouraged clean tech demand through generous subsidies (Spain and Germany especially) discovered that feed-in-tariffs for renewable power worked too well and imposed unanticipated costs. Ultimately, financial investors weren't buying solar or wind capacity; they were generating rates of return in excess of those available through investment-grade corporate bonds and other low-risk fixed-income instruments, and the clean power was a just a byproduct of their investments.

Debt subsidies like loan guarantees may encourage clean and green demand while minimizing equity subsidy fatigue. Figure 6 applies different subsidy mechanisms to a hypothetical 1 kilowatt (kW) wind project. At $2,000 per kW of installed capacity, a 33% capacity factor, a 12% cost of debt, ten-year financing life, 80:20 debt-to-equity split and 20-year useful life, the project would incur "levelized" (amortized) fixed generation costs of approximately 5.93 cents per kilowatt-hour (kWh).

Figure 6 – Theoretical Subsidy Impacts on Generation Cost Impacts and Project Benefits per Taxpayer Outlay, at 100% of Tax Equity Value

Scenario	Base Case	PTC over ten years	30% ITC paid in Year 1	30% Grant in Year 0	Loan Guarantee 10% default rate
Present Value (PV) or Value		($350.68)	($532.86)	($600.00)	($699.36)
How Modeled		Subtract PV from Capital Cost	Subtract PV from Capital Cost	Subtract PV from Capital Cost	Lower Interest Rate
Effective Capital Cost	$2,000 per kW	$1,649 per kW	$1,467 per kW	$1,400 per kW	$2,000 per kW
Capacity Factor	33%	33%	33%	33%	33%
Useful Life	20 years	20 years	20 years	20 years	20 years
Financing Life	10 years	10 years	10 years	10 years	10 years
Debt	80.00% of project	80.00% of project	80.00% of project	80.00% of project	80.00% of project
Cost of Debt	12.00% APR, monthly	12.00% APR, monthly	12.00% APR, monthly	12.00% APR, monthly	5.00% APR, monthly
Interest Costs	$1,127 nominal	$930 nominal	$827 nominal	$789 nominal	$428 nominal
Equity	20.00% of project	20.00% of project	20.00% of project	20.00% of project	20.00% of project
Cost of Equity	15.00% hurdle rate	15.00% hurdle rate	15.00% hurdle rate	15.00% hurdle rate	15.00% hurdle rate
Equity Costs	$300 levelized	$247 levelized	$220 levelized	$210 levelized	$300 levelized
Discount rate (WACC)	12.600%	12.600%	12.600%	12.600%	7.000%
Total Cost	$3,427 per kW	$2,826 per kW	$2,514 per kW	$2,399 per kW	$2,728 per kW
Total Hours	57,816 hours	57,816 hours	57,816 hours	57,816 hours	57,816 hours
Levelized Fixed Cost	$0.0593 per kWh	$0.0489 per kWh	$0.0435 per kWh	$0.0415 per kWh	$0.0472 per kWh
Savings		$0.0104 per kWh	$0.0158 per kWh	$0.0178 per kWh	$0.0121 per kWh
Taxpayer Cost		$0.0220 per kWh	$0.0104 per kWh	$0.0104 per kWh	$0.0028 per kWh
Fixed Cost Benefit per Taxpayer Cost		– 53%	52%	71%	337%

Source: ClearView Energy Partners, LLC

If our theoretical wind project developer did not have any tax liability, but he could sell 100% of his 10-year stream of Section 45 PTCs of 2.20 cents per kWh, Figure 6 suggests that the present value of that sale (excluding transaction costs) would reduce his levelized generation costs by about 1.04 cents per kWh. Taking a 30% ITC, paid at the end of Year 1, would reduce generation cost by 1.58 cents per kWh. A 30% cash grant, paid immediately, would reduce generation costs by 1.78 cents per kWh. Alternatively, a loan guarantee that lowered the developer's borrowing costs from 12% to 5% would reduce generation costs by 1.21 cents per kWh, a modest improvement relative to reductions achieved through equity subsidies, but an approximate savings of about 26.6% from the theoretical base case, nonetheless.

But what must taxpayers give up in return? In the case of our theoretical PTC, taxpayers would give up 2.2 cents for every 1.04 cents the developer would save, a loss of 53%. The 30% ITC and 30% grant would return 51% and 71% respectively in developer benefit per taxpayer dollar spent. Assuming a 10% loan default rate, the loan guarantee would theoretically return 337% in developer benefit per taxpayer dollar spent.

Debt subsidies may be a more appropriate mechanism for encouraging long-term clean and green demand for another reason: equity payments like investment tax credits have a tendency to flow directly through to sellers, but lower debt costs tend to give market power to project developers. In a world where manufacturers receive 48C credits, it makes sense to balance incentives on the demand side with incentives on the supply side, rather than paying the supply side twice.

Figure 7 highlights the capital intensity of renewable generation. Capital costs account for only about 27-39% of natural gas power generation costs, but they account for about 80-95% of nuclear, wind and solar power generation cost. In other words, green and clean project valuations are likely to be highly interest-rate dependent, making debt subsidies a powerful lever to encourage demand.

Figure 7 – EIA AEO2010 Projections of 2016 Levelized Generation Cost and Capital Cost as a Percentage of Total, by Fuel and Technology

Plant Type	Capacity Factor	Levelized Capital Cost	Fixed O&M	Variable O&M including Fuel	Transmission Investment	Total System Levelized Cost	Capital Cost as % of Total Levelized Cost
Conventional Coal	85%	$0.0692	$0.0038	$0.0239	$0.0036	$0.1004	68.9%
Advanced Coal	85%	$0.0812	$0.0053	$0.0204	$0.0036	$0.1105	73.5%
Advanced Coal with CCS	85%	$0.0926	$0.0063	$0.0264	$0.0039	$0.1293	71.6%
Natural Gas: Conventional Combined Cycle	87%	$0.0229	$0.0017	$0.0549	$0.0036	$0.0831	27.6%
Natural Gas: Advanced Combined Cycle	87%	$0.0224	$0.0016	$0.0517	$0.0036	$0.0793	28.2%
Natural Gas: Advanced CC with CCS	87%	$0.0438	$0.0027	$0.0630	$0.0038	$0.1133	38.7%
Conventional Combustion Turbine	30%	$0.0411	$0.0047	$0.0829	$0.0108	$0.1395	29.5%
Natural Gas: Advanced Combustion Turbine	30%	$0.0385	$0.0041	$0.0700	$0.0108	$0.1235	31.2%
Advanced Nuclear	90%	$0.0949	$0.0117	$0.0094	$0.0030	$0.1190	79.7%
Wind	34%	$0.1305	$0.0104	$0.0000	$0.0084	$0.1493	87.4%
Wind – Offshore	39%	$0.1599	$0.0238	$0.0000	$0.0074	$0.1911	83.7%
Solar PV	22%	$0.3768	$0.0064	$0.0000	$0.0130	$0.3961	95.1%
Solar Thermal	31%	$0.2244	$0.0218	$0.0000	$0.0104	$0.2566	87.5%
Geothermal	90%	$0.0880	$0.0229	$0.0000	$0.0048	$0.1157	76.1%
Biomass	83%	$0.0733	$0.0091	$0.0249	$0.0038	$0.1110	66.0%
Hydro	51%	$0.1037	$0.0035	$0.0071	$0.0057	$0.1199	86.5%

Source: ClearView Energy Partners, LLC using EIA projections

CONCLUSION

Extending and expanding the 48C program seems reasonable as long as fundamental, legislative or financial demand exists to absorb the new supply, and particularly if the next round of funding unlocks innovative investments for which significant domestic demand may soon exist, like technologies that improve the GHG efficiency of fossil energy sources.

Proposals to retroactively allocate an additional $1.5 billion of new money to fund original applicants for 48C projects may not represent the best investment strategy, however. The sluggish nature of the 2009-2010 energy demand recovery suggests that new dollars might best be directed at new applications and new award considerations informed by new energy-use patterns and new commodity price expectations.

Similarly, it is not clear that any proposals to rescind existing benefits for fossil energy as a means of financing new 48C outlays will be consistent with the goals of creating jobs or improving global competitiveness. The U.S. remains 85% fossil-fueled, which means that taxing fossil energy will result in higher energy prices, potentially increasing the cost of clean technology manufacturing along with every other industrial sector. And even though higher U.S. fossil energy prices could make clean tech investments seem more attractive here at home, they are unlikely to augment the U.S. share of the global clean tech export market.

Mr. Chairman, this concludes my prepared testimony. I will look forward to any questions at the appropriate time.

Statement of Sen. Jim Bunning
Finance Subcommittee on Energy, Natural Resources and Infrastructure
May 20, 2010

Thank you, Mr. Chairman, for holding this hearing.

I think we can all agree that we need to allow American manufacturers to compete fairly and create jobs, including jobs in clean energy.

Today we are looking at whether the tax credit in section 48C of the tax code is succeeding, whether it should be extended or changed, and in general, what keeps U.S. manufacturers from being competitive in clean energy.

First, I think it's important to put the tax credit in context. Section 48C was created in last year's stimulus package, a bill that added over one trillion dollars to our national debt, if you include interest costs.

We simply cannot keep spending money that we don't have. If we follow the path outlined by the Administration, America will be on track to double our national debt in five years and triple it in ten.

Unless we want the situation in Greece to happen here in a few years, we have to stop spending money like drunken sailors.

So let's agree that if we extend 48C, we will have to pay for it. On the rare occasions that Congress actually pays for anything, the favorite method is always to raise taxes, not to cut spending and reduce the bloated size of government.

The Obama Administration has proposed paying for clean energy incentives by raising taxes on the most abundant sources of American energy. Since manufacturers have a harder time succeeding when their energy costs are high, it is hard to see how this is going to create jobs or make American businesses more competitive.

Or to put it another way, how many jobs are we willing to destroy in order to create one "green energy" job?

We know that America is second to none in innovation and our high-quality workforce. But we shouldn't be surprised that other countries are outpacing America in clean energy manufacturing.

The policy of the Chinese government is to massively subsidize their exporting industries. China does this through huge direct subsidies and by manipulating currency to make its exports cheaper.

One of the most obvious and cost-effective ways to address this problem is for the United States to actually enforce our trade laws. But our government refuses to take any meaningful action.

And then there is the problem of environmental and other regulatory roadblocks that are thrown up to prevent American energy projects from going forward. These roadblocks affect many renewable energy projects, and we wouldn't have to spend a lot of money to fix them.

Some people have suggested that if we if impose a "cap and trade" system, we wouldn't need tax incentives to promote cleaner sources of energy and "green" jobs. But many of our witnesses will point out that this won't succeed in creating "green" jobs. In fact, it is likely to push even more manufacturing jobs offshore to countries without emission limits.

So we have a lot of important questions to explore today:

- Can we afford to spend another five billion dollars on a tax subsidy, and will it really help?
- Are we willing to destroy jobs in order to create one "green" job?
- And are there more cost-effective ways of addressing the competitiveness of U.S. manufacturers?

Thanks again for holding this hearing, Mr. Chairman.

The Heritage Foundation
LEADERSHIP FOR AMERICA
214 Massachusetts Avenue, NE • Washington DC 20002 • (202) 546-4400 • heritage.org

CONGRESSIONAL TESTIMONY

Clean Technology: Manufacturing Competitiveness The Role of Tax Incentives

Testimony before Senate Finance Committee Subcommittee on Energy, Natural Resources, and Infrastructure

May 20, 2010

J. D. Foster, Ph.D.
Norman B. Ture Senior Fellow in the Economics of Fiscal Policy

The Heritage Foundation

Mr. Chairman, members of the Committee, my name is J.D. Foster and I am the Norman B. Ture Senior Fellow in the Economics of Fiscal Policy at the Heritage Foundation. I am pleased to testify before the Committee on some of the issues surrounding the use of tax incentives with respect to advanced energy manufacturing, most especially the tax credit allocation authority provided in the I.R.C. Section 48 C program. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

The advanced energy manufacturing tax credit (MTC) was created as part of the American Reinvestment and Recovery Act of 2009. The MTC provides a 30 percent credit for investments in new, expanded, or re-equipped advanced energy projects. Up to $2.3 billion of MTCs were to be allocated through a joint process of the Department of Energy and the Internal Revenue Service. A qualifying energy project involves the production of:

(1) property designed to produce energy from renewable sources;
(2) fuel cells, microturbines, or an energy storage system for use with electric or hybrid-electric vehicles;
(3) electric grids to support the transmission, including storage, or intermittent sources of renewable energy;
(4) property designed to capture and sequester carbon dioxide emissions;
(5) property designed to refine or blend renewable fuels or to produce energy conservation technologies;
(6) electric drive motor vehicles that qualify for tax credits or components designed for use with such vehicles; and
(7) other advanced energy property designed to reduce greenhouse gas emissions.

In his annual budget submission, President Obama has called for increasing the cap on the available credit by $5 billion, from $2.3 billion to $7.3 billion.

One Perspective on Tax Subsidies

In its "Reasons for Change" discussion, the Treasury Green Book describing the President's Fiscal Year 2010 tax proposals explains with respect to one credit, like other preferences the Administration proposes to repeal, distorts markets by encouraging more investment in the industry than would occur under a neutral tax system. To the extent the credit encourages overproduction, it is detrimental to long-term energy security.

This slightly paraphrased language appears on page 75. To be clear, the reference in the Green Book is to the oil and gas industry and the President's proposals to eliminate fossil fuel preferences, proposals with which I agree fully. However, what is bad for the goose is bad for the gander. Just as these oil and gas subsidies distort economic decisions, so too does the MTC and similar subsidies, and so while the recipient of the subsidy differs, the essential outcome remains the same – it is detrimental to long-term energy security and to the economy – as Treasury rightly observed.

From this introduction one can quickly surmise my views with respect to the MTC. It is bad energy policy, bad tax policy, and bad economic policy. I do not in the least question the intentions of the credit's supporters, but to adapt a popular aphorism, the road to bad policy is paved with good intentions.

The issue I raise is not the relative advantages of clean energy manufacturing. The issue is the government's bad habit of attempting to pick successful technologies of any sort to favor, and others to disfavor. There is nothing wrong with hoping or expecting that one sort of energy or one sort of technology will ultimately prevail in the marketplace. For example, I have long expected that America would overcome its misplaced phobia over nuclear energy, and I am pleased to see that this is coming to pass as the President's recent comments and the solid nuclear title in the otherwise misguided Kerry-Lieberman climate bill demonstrate.

Moreover, if one believes so firmly in the advantages of one energy or technology over another, we have capital markets that allow one to encourage and participate in its success, or failure. If confidence so merits, one can even take a more proactive approach and become directly involved in some way in the industry.

Tax provisions like the MTC do something else entirely. They involve the power of the federal purse to influence artificially the development of these markets and technologies. Is this taxpayer investment based on any information superior to what the market already has and has processed? No.

Specifically in the case of the MTC, for all their professionalism and due diligence is there any reason to believe the employees at the Internal Revenue Service and the Department of Energy are more adept at picking technologically promising and economically sustainable technologies than the market? On the contrary, the market is vastly superior than even the most sagacious government employee at sifting information and rendering judgments regarding economic viability. No doubt there are some excellent players in fantasy football at both DoE and the IRS, but that does not mean they're qualified to run an NFL franchise.

The approach to public policy evidenced by the MTC is commonplace, unfortunately. A now largely discarded practice is to erect trade barriers to succor and advantage domestic industries, often "infant" industries, hoping they will someday compete effectively. The tax code is replete with subsidies for businesses and individuals to encourage some activities and discourage others. We have a multitude of federal welfare programs garbed as subsidies, price supports, regulatory inhibitions, and marketing compacts such as the various forms of welfare for farmers that goes under the more politically correct label of a farm program. And along with carrots we have sticks, such as the punitive federal excises on so-called "sin" products. The MTC is not in the least unique, but that makes it no less meddlesome and no less harmful to the long-run economic strength of the nation.

The Private Sector Advantage

Markets are not perfect. Markets make mistakes. And government has a modest but clear role to play in the process. But on balance and over time market participants facing price signals undistorted by government policies make fewer mistakes, less costly mistakes, and more quickly correct mistakes. Consequently, private market participants will generally allocate our nation's resources so as to produce the most value at the least cost. Every instance in which government decides it knows best is another instance in which policymakers have decided they know better. Our economy would be stronger if Washington's humility ran deeper.

The process of putting Uncles Sam's big thumb on the market's scales through taxation, through spending, or through regulation is coupled with the process of creating new classes of political supplicants and corporate welfare recipients with their hands out for Washington's goodies. One can hardly blame the companies for participating in this game, but it makes it no less unseemly. If government intends to play Lotto based on political winds using taxpayer dollars, who can blame those who want a ticket?

Further, for those who decry the amount of money spent to influence Washington, they should recognize that the monies spent to influence policy are closely proportional to the monies Washington seeks to influence. The surest way to limit the amount of money seeking to influence decisions over national policy in Washington is to limit the amount of influence Washington has over the nation's money.

Infant Industries and International Markets

Two of the arguments that may be raised to defend the MTC are that the credit is needed temporarily to get the industry moving forward and that the credit is needed for the United States to catch up to other countries in the use and development of advanced energy manufacturing technology. Both arguments miss the mark badly.

The obvious and traditional problem with the temporary tax credit/infant industry argument is that the word temporary is typically redefined over time to include periods that can last for decades. "Temporary" can take on near cosmological dimensions. The "temporary" ethanol tax credit comes to mind.

Another problem is that the industry, protected from the pressures to improve economic efficiency by the subsidy value of the credit typically fails to advance to become internationally competitive. The infant industry argument would be better labeled the "Peter Pan" argument because it means the industry never needs to grow up.

Perhaps the greater danger than simply distorting the marketplace is that the tax credit may condemn the coddled industry to second class status on the world stage. Members looking favorably on the advanced energy manufacturing industry in all its hopes and facets should think carefully upon this very real possibility.

However, if there is a concern about more rapid advances in foreign countries, then the industry is not in a particularly early or "infant" stage, but rather the U.S. industry appears to be in an early stage. Perhaps under the financial encouragements of their own tax subsidies, direct payments, loan guarantees, and the like similar industries in other countries have advanced beyond their U.S. counterparts. If so, interpreting the situation requires a couple facts. First, note that the technology is inherently mobile. As China and India demonstrate powerfully, neither the development nor the application of technologies to the manufacture of goods or the goods manufactured is limited by national boundaries. So the U.S. position likely has little to do with access to technology.

Second, the United States generally offers perhaps the best economic environment in the world to incubate a high-tech industry. We have an enormous market with a solid institutional framework, highly mature capital markets, highly skilled labor, and the best university system in the world. Given the mobility of capital and the advantages of the U.S. economy, if the U.S. lags in this area as some suggest then one of two factors is almost certainly at work. The first is that perhaps the United States has adopted some especially counterproductive policies that restrain this activity, in which case the proper remedy is to correct those policies rather than to offset a bad policy with another bad policy.

The alternative is that these other countries have borne heavy costs in creating subsidies to distort their markets badly so as to gain a temporary advantage. While it is tempting to match these countries foolishness for foolishness, that is not a gap we should seek to close. Their advantage will prove temporary as market distortions accrete while their industries become ever-more dependent on these subsidies to survive in the global marketplace.

Conclusion

The MTC, like so many provisions that litter the tax code, is bad economic policy because it distorts the allocation of the nation's resources – its capital, its labor, its talent, its technological advancements – pushing more resources into these activities than the economics of the market dictate.

The credit is bad energy policy for precisely the reasons the Treasury Department laid out in the context of the oil and gas credits: to the extent the credit encourages overproduction, it is detrimental to long-term energy security.

And of course, the credit is bad tax policy, adding to the litter of special exemptions, deductions, credit, exceptions, and exceptions to exceptions that constitute the sum total of past efforts to micromanage our economy through an already inherently complex income tax system. While calls for examining tax expenditures for review and possible repeal in pursuit of revenues are problematic for a number of reasons, it is abundantly clear that the MTC credit would certainly be captured in any such effort.

Finance Committee
Subcommittee on Energy, Natural Resources, and Infrastructure
United States Senate

Testimony of Karen A. Harbert
President & Chief Executive Officer
Institute for 21st Century Energy
U.S. Chamber of Commerce

Thursday, May 20, 2010

Thank you, Chairman Bingaman, Ranking Member Bunning, and members of the Subcommittee. I am Karen Harbert, President and CEO of the Institute for 21st Century Energy (Institute), an affiliate of the U.S. Chamber of Commerce. The U.S. Chamber of Commerce is the world's largest business federation, representing the interests of more than three million businesses and organizations of every size, sector and region.

The mission of the Energy Institute is to unify policymakers, regulators, business leaders, and the American public behind a common sense energy strategy to help keep America secure, prosperous, and clean. In that regard we hope to be of service to this Committee, this Congress as a whole, and the administration.

As this committee well appreciates, the energy policy decisions we make in the next few years will largely determine who we are as a nation for decades to come. We need to approach this thoughtfully and be crystal clear about the tradeoffs, timelines and costs to the American economy. We certainly don't want to find our economy in a worse situation than it is today.

Last month Doug Elmendorf, Director of the Congressional Budget Office highlighted the results of a CBO report that forecasts an increase in the public debt from $7.5 trillion at the end of 2009 to $20.3 trillion at the end of 2020 if President Obama's Fiscal Year 2011 budget were to be implemented.. CBO also found that over the same period, the debt would rise from 53% to 90% of gross domestic product. The last time the percentage was that high was right after World War II.

So as we examine energy policy, it is more important than ever that we look to options that don't further burden the taxpayer and offer the greatest return on investment to our economy.

The greatest challenge we now face as a nation is reviving our economy, restoring the 8.2 million jobs lost to the current recession, and creating the 11.8 million new jobs our growing nation will need over the next decade. Only a vibrant American free enterprise system can accomplish this goal.

I. Scale & Scope of the Challenge: A Reality Check

Underpinning America's national security, economic prosperity and quality of life is an available, affordable, and reliable supply of energy. Three recent events—the Washington state refinery explosion, the West Virginia coal mine explosion, and the Gulf of Mexico oil spill—have put the value of energy into stark relief. We must address our nation's serious energy challenges urgently, thoughtfully, and realistically. We must pursue a smooth and realistic transition to a lower carbon future that includes a diverse portfolio of energy sources and accelerated development and deployment of the necessary technologies.

However, I think it is critical to take stock of our current energy disposition before crafting new policies. The Energy Information Administration's (EIA) most recent forecast estimates U.S. energy demand will increase by 15% between now and 2030, and electricity demand will increase by 24% and perhaps as high as 33%. According to The Brattle Group, an investment on the order of $1.5 to 2 trillion is needed by 2030 to maintain a reliable electricity sector. Both the electricity and transportation sectors are dominated by the least cost fuel sources: fossil fuels. In the electricity sector, wind and solar power comprise less than 2% of our electricity generation. Even under EIA's modeling of H.R. 2454's ("Waxman-Markey") aggressive carbon regulations, wind and solar will only comprise 6% of the country's electricity generation in 2030, requiring us to rely on other sources for the remaining 94%..

In the transportation sector 94% of the energy we consume comes from oil. Despite the valuable progress being made in the development of new alternative fuels and automotive technologies, there is still no viable substitute for oil in this sector. Fossil fuels will remain the backbone of our national and global economy for the foreseeable future. In light of the tragic situation in the Gulf of Mexico, there will be some who call for the United States to forego the tremendous economic and energy security benefits of tapping America's vast oil and gas reserves. Americans remain deeply concerned by the Gulf of Mexico oil spill and we must work together to get to its root cause. But, banning the production of up to 90 billion barrels of recoverable oil in the United States, more than four times proven reserves, will jeopardize our long-term economic recovery and competiveness and threaten our energy security.

There is a growing and valid concern about our nations' dependence on foreign oil, yet turning our back on vast domestic oil and gas resources or increasing costs and taxes on the energy industry, as the Administration has proposed, will only serve to increase two things: energy costs and oil imports. To decrease our reliance on foreign sources of energy, we must increase the use of domestic energy, of all types, conventional and renewable. Improving the prospects for the production of all types of American energy increases investment and spawns new industries, manufacturing, and, most importantly, new and sustainable American jobs.

II. A Comprehensive Deployment Policy: Regulatory Burdens Frequently Trump Fiscal Incentives

Renewable sources of energy such as wind, solar, energy-from-waste, hydropower, geothermal, and biomass will play an increasingly important role in our nation's energy supply as they continue to become more cost competitive with traditional energy sources. This is especially true for sources that can provide reliable baseload electricity. It is critical that policies are put in place to promote the development and deployment of all clean energy technologies, including renewables. This does not, however, mean that we should create a sector of the energy market that cannot be sustainable over the long-term without substantial government subsidies.

While renewable electricity is enjoying robust growth, we must be realistic about the achievable scale of its expansion. With wind and solar accounting for 1.8% and 0.02%, respectively, of our overall electricity production, it remains a very small component. Conventional hydropower provided about 6.9% of generation in 2009, biomass 1.4%, and geothermal 0.4%.

Investing in research, development, and especially deployment of new technologies will ultimately pay major dividends. However, government should not be in the business of picking technology winners and losers, and we have to recognize that research and development—while critically important—takes time. It is also essential to find the appropriate roles for government and the private sector. The role of the private sector in our future energy security is paramount, and we should not seek to crowd out its participation, capital, innovations, or expertise.

Ultimately, we should be focusing on a comprehensive approach to the deployment of clean energy technologies that will help us transition to a cleaner and more secure energy future without further adding to our growing deficit or burdening taxpayers. These policies should be clearly limited in time and scope, but for long enough a period of time that they achieve their goal. It is also important to realize that tax incentives are only one avenue to foster the deployment of clean technologies; there are other instruments that, in some situations, have greater impact and are less expensive.

Subsidies and Tax Credits

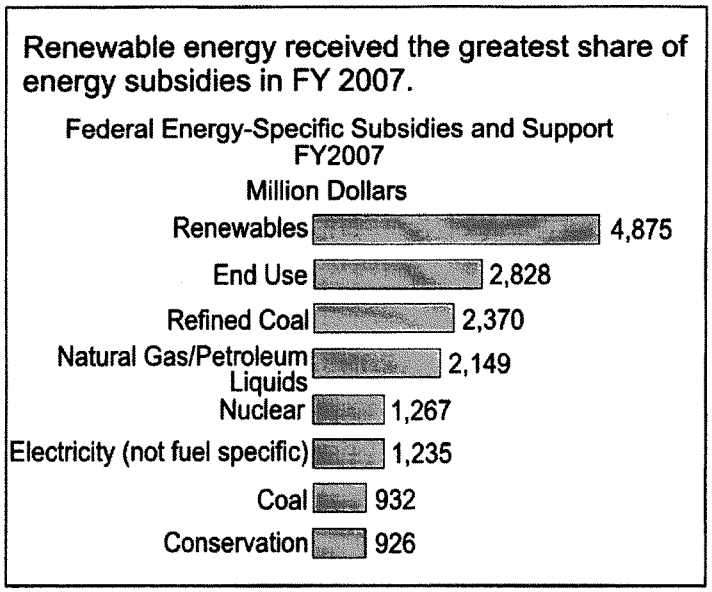
The recent history of fiscal incentives for clean energy technologies is checkered with "boom-bust" intervals. The habit of Congress renewing tax credits only at the 11th hour each year creates uncertainty that inhibits private capital from being invested. Investors and manufacturers need predictability to make capital decisions, but that does not imply that subsidies need to be extended in perpetuity. Once a technology has realized the milestone of commercial deployment, the government should step back and let the efficiency of consumer choice through the marketplace determine the eventual success or failure of such technology. Subsidizing any technology in perpetuity is a wasteful use of tax dollars that does little to further the country's energy security or provide sustainable jobs.

The Advanced Energy Project Credit (48C) was included in the American Recovery and Reinvestment Act of 2009 as an investment tax credit for the expansion or retrofitting of manufacturing facilities geared toward advanced clean energy sources. As the original $2.3 billion has now been committed, there are several issues this Committee should explore before expanding the credit by another $5 billion. Some outstanding issues include:

- Is the number of jobs created sufficient to justify its continuation and are these jobs sustainable?
- Are there other, more cost-effective ways to stimulate these investments and jobs?
- In light of a ballooning deficit, what is the return on investment from these credits?
- What would be offered as the "pay-for" for these new credits and how do their benefits stack up against the credit's benefits?

The Chamber supported 48C at the outset and has supported many other incentives for renewable technologies. For example, we support extending the various renewable production tax credits for renewable energy for eight years, followed by a scaled phase-out over four years. Providing long-term certainty for investors will ensure greater capital availability for clean energy technology deployment, while the definitive sunset will ensure tax dollars do not continue to support technologies that are not commercially viable and that the technologies continue to improve and evolve.

In the U.S., when subsidies across the electricity sector are compared, renewable sources have received the largest percentage of federal dollars and are the most expensive sources receiving subsidies except refined coal. Energy-specific subsidies have more than doubled since 1999.



Source: Energy Information Administration, *Federal Financial Interventions and Subsidies in Energy Markets 2007* (April 2008).

Fiscal policy has been, and will continue to be, an important tool in the federal government's toolbox of technology deployment policy options. Tax incentives can be powerful drivers of capital to specific markets, but there are also other mechanisms that can facilitate private investment *without* further burdening the American taxpayer.

Regulatory Streamlining

Nearly every new energy project, whether traditional or alternative, struggles with regulatory and siting burdens that at best increase the cost of production, and all too often result in the project being canceled. Nearly everyone is familiar with the term, "NIMBY" and how it applies to building new energy facilities, but it has evolved to an even greater threat to our energy security; "BANANA," or Build Absolutely Nothing Anywhere Near Anything. This would be humorous if it were not an accurate depiction of the situation energy developers face across the country.

A little over a year ago, the U.S. Chamber began an initiative called "Project, No Project," an effort to catalogue any energy project that has been delayed or scuttled. We have recorded over

380 projects representing roughly 250,000 direct jobs and $560 billion of capital investment. With unemployment hovering near 10% and nearly every state scrambling to cover budget shortfalls, getting these projects built should be a top priority for everyone.

While many of the stalled projects are traditional energy sources, most would find it astonishing that over 40% of them are renewable energy projects. Neither wind, nor solar, nor biomass is spared by the various obstacles routinely erected to block any new energy project. So while a company may decide to catch the green wave and build a renewable facility and then obtain capital commitments from private investors seeking the federal income tax credit, it is still more likely than not that the project will encounter obstacles in the permitting and siting process that increase the expense by drawing the process out, many times ultimately leading to scrapping of the project altogether. Congress can eliminate many of these obstacles by streamlining the approval process.

One clear example where Congressional action is absolutely necessary is interstate transmission. If the country is going to realize President Obama's goal of producing 25% of our electricity from renewable sources by 2025, it will require a significant build-out of solar in the southwest desert and wind in the upper mid-west because that is where those sources are most intense and most efficient. But, the fact is many people do not live in these areas. So developers will only build the renewable facilities if they can be assured that they can get their electricity to the major load pockets hundreds and thousands of miles away. Getting approval to site and build a transmission line across state lines is difficult to achieve, averaging upwards of 10 years. And most transmission developers quit long before the 10-year average because they cannot afford to have capital tied up in a risky project for a decade. Congress can solve this problem by granting the Federal Energy Regulatory Commission preemptive siting authority, much like it already has for pipelines. This one change, while not an easy political lift, will help facilitate significant build out of renewable power and without a cost to the American taxpayer.

Concessionary Financing

Beyond regulatory changes, there are additional steps the federal government can take to foster the necessary private sector investment needed to meet our future energy requirements that do not necessitate fiscal incentives. In fact, for new and emerging technologies, tax credits are not enough to encourage investors to take a risk on an unproven technology. Through the Export-Import Bank and the Overseas Private Investment Corporation, the federal government regularly provides a range of financing tools to U.S. companies to build clean energy facilities in other countries. Yet, no similar entity exists for deploying clean energy technologies domestically.

Indeed, securing our energy future is in large part tied to the degree we are able to accelerate the commercial adoption of new technologies, and that will necessitate an accelerated rate of capital formation. Federal and state governments can help leverage private capital to attain this goal by reducing investment risk and lowering the cost of capital. The Department of Energy's loan

guarantee program created in the Energy Policy Act of 2005 is a good start, but it is not independent and is not authorized to offer assistance beyond loan guarantees. We strongly support the creation of an independent Clean Energy Bank that is authorized to provide concessionary financing like loan guarantees, direct loans, and risk insurance to projects deploying new technologies that conventional capital markets avoid. Because the loans would be paid back, it would have no long-term impact on the deficit. This concept is effectively captured by the creation of the Clean Energy Development Administration (CEDA) in S. 1462, the American Clean Energy Leadership Act, sponsored by you, Chairman Bingaman as well as Ranking Member Murkowski, and we thank you for your leadership.

A federal approach to clean energy deployment that focuses on addressing market inefficiencies rather than competing with existing market players and investors is the appropriate role for government. Public-private cooperation is essential and should be encouraged, but injecting federal dollars into private markets too often creates distortions that ultimately increase prices for consumers.

Using Energy More Wisely

There is no question that the next best source of new energy is the energy we can save every day. The United States has improved its energy intensity—that is, energy use per unit of gross domestic product—at a steady rate. In 1970, it took roughly 18,000 btu to produce one dollar of GDP. Today, it takes a little less than half of that. At the same time, the United States can and should make further improvements. Putting into practice more robust energy efficiency programs is a crucial component of our nation's energy security. Immediate benefits can be realized by increasing building efficiency and appliance standards, two areas with high energy savings potential. These actions would reap immediate economic and environmental benefits by better harnessing the energy we unintentionally waste every day. Initial groundwork has been laid in this area following enactment of the Energy Policy Act of 2005, the Energy Independence and Security Act, and the American Recovery and Reinvestment Act of 2009, but substantial benefits are still in the offing.

Scaling up the Market

The price of commercially viable advanced and renewable technologies will continue to go down as the size of the market expands. Ironically, many countries' trade policies currently inhibit the natural expansion of advanced technologies by placing heavy tariff and non-tariff barriers on clean energy goods and services. The U.S. should lead the charge in removing these costly barriers thereby creating larger markets and export and job opportunities.

Diversity and Jobs in Nuclear Energy

We need a diverse portfolio that includes all of our domestic resources to increase our economic and energy security. One needs to recognize the tremendous benefits of and opportunities for the

largest source of clean energy we have--nuclear energy. Accounting for more than 70% of our emissions-free electricity, nuclear power will be a major driver in our transition to a clean energy economy. Nuclear power is also an economic engine, with each plant contributing more than $430 million to the local economies and employing up to 700 workers at wage rates 36% above the local average. We estimate that if the 26 reactors that have been proposed to the Nuclear Regulatory Commission are built, approximately 240,000 jobs will be created. The nuclear industry has already invested more than $4 billion and created more than 15,000 jobs in support of nuclear expansion and construction hasn't even started yet.

III. Cautionary Notes on an Over-Reliance on Subsidies to Expand Renewable Energy

Policymakers need to be mindful of not singularly supporting some industries at the expense of others. A study released in March 2009 by researchers at Spain's King Juan Carlos University examined the economic impact of Europe and Spain's support for green jobs. The study concluded that for every green job created, 2.2 jobs were destroyed and cautioned that if a similar agenda is pursued in the U.S, we could lose 6.6 to 11 million jobs in order to create 3 to 5 million green jobs, resulting in a net loss of jobs. In addition to the devastating impact on job creation, the study also cautions that the bubble created by Spain's push to create green jobs through government intervention instead of market incentives was ultimately paid for by the consumer. To pay for the enormous subsidies given to renewables, consumers faced both increases in electricity rates and also in taxes.. (A recent study in Italy reported similar results, with one green job costing on average as much 4.8 jobs in the entire economy and 6.9 jobs in the industrial sector.[1])

A study of Denmark's wind industry conducted by the Danish Center for Political Studies (CEPOS) released in September 2009 concluded that "creating additional employment in one sector through subsidies will detract labor from other sectors, resulting in no increase in net employment, but only a shift from the non-subsidized sectors to the subsidized sector." This also means that in many cases, jobs are being shifted from more productive sectors to less productive sectors, negatively impacting GDP. Proponents of unrestrained renewable energy subsidies continue to attack studies critical of that approach, but the findings are consistent: government policies that drive capital to investments the market otherwise avoids results in economic inefficiencies. In other words, there is no free lunches. When such policies are targeted and limited in their length and scope the catalytic effect outweighs economic consequences. But European style energy subsidies are neither targeted nor limited and economic consequences have been pronounced.

Many proponents of renewable energy cite Germany as a model for expanding the renewable power sector. However, after close examination it appears to be more of a cautionary tale.

---

[1] Carlo Stagnaro and Luciano La Vecchia, "Clean Jobs, Expensive Jobs: Why Italy can't afford a 'green economy,'" *Wall Street Journal Europe*, May 11, 2010.

Nearly 20 years ago, Germany implemented the world's most aggressive renewable power deployment policy consisting of progressively greater subsidies. The goal was to provide significant federal support to push the technologies to reach greater scales of efficiency and to make them competitive in the power market much sooner. Bringing down the marginal cost of clean technologies is a laudable goal and should ultimately be the aim of fiscal policy for energy technologies. However, the German case demonstrates how perennial direct subsidies actually disincentivize technology evolution and have created a market that is hardly more sustainable today than it was 20 years ago.

In 2008, Germany was home to the largest installed photovoltaic *capacity* in the world and the second largest wind *capacity*. However *capacity* and *generation* are not the same thing, and while German renewable facilities had the capacity to produce more than 26% of its total electricity demand, they generated only 17%. Coal accounted for more than 45% of the electricity generated while wind and solar accounted for only 7% in spite of an estimated direct subsidy of $100 billion from 2000-2010.[2] In 2009, on-shore wind required a subsidy of three times the per-kilowatt cost of the market price to make it competitive and solar required a subsidy of more than eight times the market price. To pay for this, German consumers saw their utility bills jump by 8%. The German government proposal to reduce the current subsidy structure by 15% was met with protests by workers from renewable manufacturing facilities. With reduced subsidies in the offing, Germany's solar industry faces an uncertain future because even after 20 years of aggressive subsidies, the technology is still too expensive to compete with other sources, even with European Union climate regulations adding to the cost of conventional sources.

CONCLUSION

Our nation faces some extraordinary energy challenges in the years ahead, but these challenges are also an opportunity. When it comes to energy, we need all options on the table. New technology is the cornerstone of any sensible energy policy. Today, these innovations can only be successfully brought to market if an appropriate and stable legal, regulatory, and fiscal environment is maintained over the long term. But ultimately, such ideas must stand on their own and meet the demanding tests of both consumers and the free marketplace.

We must also recognize the strong economic foundation of our existing energy industry. The economic benefits of putting our homegrown resources to work for us are undeniable. The oil and natural gas industry supports 9.2 million jobs across the country and has the potential to employ hundreds of thousands more if policies that increase access to our domestic resources are implemented. In 2008 alone, natural gas production supported nearly 3 million jobs and contributed $385 billion to our nation's economy. If oil and natural gas companies reduce

[2] Economic Impacts from the Promotion of Renewable Energies: The German Experience. Rheinisch-Westfalisches Institut. October, 2009.

domestic production as a result of increased taxes or other costs, much-needed jobs will disappear, and imports from some unstable areas of the world will no doubt increase to fill the void.

If we embrace a comprehensive approach and enact smart policies that do not further the growth of our nation's exploding deficit, we can lay the groundwork for energy security, environmental protection and economic prosperity and create the 20 million sustainable jobs our country needs. The private sector has been—and will continue to be—the engine that drives America's economic recovery, but it must have the tools to create the path forward.

Statement of Henry Kelly
Principal Deputy Assistant Secretary
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Before the Subcommittee on Energy, Natural Resources, and Infrastructure
Committee on Finance
United States Senate
May 20, 2010

Re-establishing U.S. leadership in Clean Energy, High Technology Manufacturing.

Chairman Bingaman, Ranking Member Bunning, and Members of the Subcommittee, thank you for the opportunity to appear before you today to report on the progress of "The American Recovery and Reinvestment Act's"(Recovery Act) clean energy tax credit program. The members of this Subcommittee and the Finance Committee as a whole were critical in including clean energy tax provisions in the Recovery Act, and I am happy to be here today to report on how the Department of Energy is working with our colleagues at Treasury and the IRS to implement these provisions.

President Obama made it clear in his first State of the Union address: "The nation that leads the clean energy economy will be the nation that leads the global economy." And with the investments we made in advanced energy manufacturing, we have started to stake our claim in the global manufacturing marketplace.

The Recovery Act has helped us meet this goal by ensuring that creative, productive manufacturing stays and prospers in the U.S. instead of going abroad. The Advanced Energy Manufacturing Tax Credit ("48C") program has made a decisive difference in ensuring that U.S. producers see the U.S. as a good place to invest in production, and in the innovation that is closely tied to manufacturing. I am pleased to report that, coupled with other deployment programs in the Recovery Act, the 48C program has already begun to yield results maintaining and reinforcing U.S. leadership in high technology, clean energy manufacturing. It is playing a key role in our national effort to build new businesses, and new rewarding, long-term jobs around clean energy manufacturing.

The 48C program selected 183 projects in 43 states for a total of $2.3 billion in tax credits. We were oversubscribed 3:1 with qualifying projects, allowing us to select a portfolio of highly-qualified projects. In combination with other investments and policies, the 48C program is providing the incentives to expand domestic manufacturing allowing the U.S. wind industry for example to move domestic content from 25% just five years ago to more than 50% today to over

70% once this round of manufacturing expansion is complete. The U.S. is now on pace to double U.S. renewable manufacturing capacity (excluding conventional hydropower) by 2012.[1]

The DOE nuclear loan guarantees are expanding demand for manufactured nuclear equipment. (The 48C program created the tax incentives to expand nuclear equipment manufacturing in the United States to meet the demand with goods manufactured here.)

The 48C program also helped move advanced building technologies, developed in part with DOE support, to move rapidly to production in U.S.-based facilities. Products include energy efficient lighting, windows, appliances, water heaters, and HVAC equipment as well as fuel cells, batteries and advanced vehicle manufacturing.

The program was particularly effective in getting money out the door quickly to put people back to work on great projects that would otherwise have been idled in the face of the Great Recession. These incentive programs are laying the foundation for a broad expansion in high technology clean energy manufacturing. They are positioning the United States to regain global leadership in these high growth markets and remain an important policy tool for the future. That is why the Administration has called on Congress to provide an additional $5 billion in tax credits for clean energy manufacturing projects.

The 48C program is an integral part of the Recovery Act's multi-faceted strategy to encourage investment in domestic manufacturing. Taken together, Recovery Act investments will total $90 billion. Together with matching private investments, we estimate that the programs will result in as much as $150 billion in clean energy projects.[2] Existing investment programs could produce up to $90 billion in additional clean energy projects.[3]

In addition to the 48C program:

- To date the Department of the Treasury awarded $3.5 billion in payments in lieu of tax credits to 934 renewable energy generation projects in 44 states. DOE provided technical support for these selections.
- The Smart Grid investment grant program created incentives for upgrading our power infrastructure to 21st century technology, within the greater Office of Electricity's portfolio of $4.5 billion for smart grid and efficient electrical transmission. In parallel, the 48C program provided tax incentives for companies to expand manufacturing to meet the demand created by other federal investment.
- The Office of Energy Efficiency and Renewable Energy is investing nearly $16.8 billion in projects across its portfolio, from advanced battery manufacturing and advanced biorefinery projects to weatherization assistance and building retrofits.

---

[1] "Status Report on Goal of Doubling Renewable Energy in 3 Years" National Renewable Energy Laboratory; Logan and James, Strategic Energy Analysis Center, September 23, 2009.

[2] This includes Recovery Act appropriations across all government agencies. http://www.whitehouse.gov/sites/default/files/administration-official/vice_president_memo_on_clean_energy_economy.pdf

[3] This figure represents the estimated project value if all the existing authority for the DOE loan guarantee program is used. The estimate includes Title 17 loan guarantee authority for energy efficiency, renewable energy ($18.5 billion), fossil energy ($8 billion) and nuclear ($20.5 billion for both reactors and front-end), and Section 136 Advanced Vehicle Technology Manufacturing loans ($25 billion). Typically, projects require a minimum 20% equity share.

- The Department's Environmental Management office is investing nearly $6 billion in clean up of Cold War nuclear sites.
- The Department's Loan Guarantee Program has approximately $4 billion in appropriated credit subsidy to support an estimated $32 to $35 billion in loans for renewable energy, transmission, and leading edge biofuels projects.
- The Office of Fossil Energy is investing $3.4 billion in carbon capture and storage projects.
- $1.6 billion is being used to support scientific research through the Department's Office of Science.
- The Advanced Research Projects Agency-Energy (ARPA-E) is funding $400 million in highly innovative energy research projects.

I would like to take a moment to highlight two stories made possible by the clean energy manufacturing tax credit. With additional funding we can make sure that stories like these are heard more often.

James Morris is a native of Oconee County, South Carolina. He worked for a fabric manufacturer for 28 years. When the plant he worked at closed, he got a new job in manufacturing, but was laid off after just one year. After being unemployed for a year and a half, he was hired as a setup/repair operator for a manufacturer of smart meters that help businesses and consumers monitor in real-time how they use electricity. The company won a $5 million 48c tax credit to expand manufacturing lines in its factories in South Carolina and Minnesota. James is one of 120 people at the South Carolina plant that was hired because the tax credit helped the company expand. $3.4 billion in smart grid investment grants to other companies are also increasing demand for smart meters, creating more work opportunities for people like James.

A wind energy manufacturing company operating in western Pennsylvania is putting 79 laid-off employees back on the job and will be able to hire 50 additional workers at its other Pennsylvania locations. Eric Sheesley of Nanty Glo, Pennsylvania is one of these workers. Eric is a quality inspector who was laid off just before the holidays and a father of two young children. Because of the stimulus funds and the wind projects across the country being helped by ARRA 1603 program for which the company is now providing turbines, he's back on the job. After living off of his unemployment compensation and the extra hours his wife was able to pick up at her receptionist job, Eric's happy to be back in this exciting industry that is now a priority across the country.[4]

****

The next six months will see an accelerating rate of job creation, specifically in clean energy, high technology manufacturing. We look forward to working with all of the recipients as they receive their credits, construct new projects, and expand and build new manufacturing facilities, all while hiring more workers to grow a strong, clean energy economy.

---

[4] http://www.energyempowers.gov/post/Wind-projects-providing-hope-for-Pennsylvania-workers.aspx

As proposed in the FY 2011 Budget, extending and expanding the 48C program would allow the U.S. to accelerate this manufacturing expansion. There is widespread agreement in the economic community that innovation is a primary driver of long-term economic growth and prosperity. Innovation drives job creation—long-term, high-quality jobs stay in industries where there is a high degree of innovative content and where innovation, manufacturing, and end-user demand are tightly integrated. This interface between innovation and manufacturing in the U.S. market is essential, allowing companies to move new products to market faster, enabling more rapid cost reduction in manufacturing processes, and creating, high quality, high productivity jobs.

Again, I want to thank this Committee for the opportunity to testify today. The 48C program and related energy programs have been critical to the increase in clean energy manufacturing we have seen over the past year. I strongly believe that these programs have been a success, and the Department looks forward to continuing that success in the future.

Background:

Creating a sustainable clean energy manufacturing sector and growing our supply chains

For too long, the U.S. has not been competitive in the global market for clean energy manufacturing and our domestic demand incentives were weak as well. As a result, the U.S. held a relatively small share of worldwide manufacturing capacity for clean energy-related industries, such as wind, solar, and batteries. In 2008, the U.S. had 16% of global wind manufacturing capacity (5.4 gigawatts (GW)[5] in the U.S. out of 33 GW worldwide), 6% of global solar manufacturing capacity (0.5 GW out of 9 GW worldwide), and less than 1% of global battery manufacturing capacity.[6]

This is largely because, until recently, a combination of factors including greater incentives for clean energy development and manufacturing overseas than in the U.S. have enabled clean energy manufacturing to grow more rapidly in Europe and Asia. Recently, however, the grant and tax provisions under the Recovery Act have made the U.S. a more attractive market for investment in clean energy development and manufacturing. As a result, we are seeing rapid growth of U.S. clean energy markets, and billions of dollars invested in expanding clean energy manufacturing in the U.S.

There is an opportunity for the U.S. to lead the world in high-technology, clean energy manufacturing. In these industries, the U.S. can leverage the R&D and innovations being pursued by companies, universities, and the Department of Energy's national labs into competitively advantaged manufacturing positions.

The U.S. clean energy manufacturing base is starting to expand rapidly. Section 1302 of the American Recovery & Reinvestment Act of 2009 Division B[7] amended the Internal Revenue Code by adding a new Advanced Energy Manufacturing Tax Credit ("48C").[8] As a tax credit, the program falls under the jurisdiction of Department of Treasury; it is being administered in cooperation with the Department of Energy, which led the review and selection of qualified advanced energy manufacturing projects[9] that would receive the 48C tax credits.[10]

ARRA authorized the IRS and Treasury in consultation with DOE to competitively award $2.3 billion in 30% tax credits for qualifying advanced energy projects in new, expanded, or re-equipped domestic manufacturing facilities.

---

[5] Finished wind turbine capacity.
[6] The U.S. supplied less than 1% of global nickel metal hydride manufacturing and a negligible portion of the 3 billion cells per year worth of global lithium ion manufacturing.
[7] Pub. L. No. 111-5 (2009).
[8] 26 USC. 48C
[9] The term 'qualifying advanced energy project' means a project—which re-equips, expands, or establishes a manufacturing facility for the production of: property designed to be used to produce energy from the sun, wind, geothermal deposits or other renewable resources; fuel cells, microturbines, or an energy storage system for use with electric or hybrid electric motor vehicles; electric grids to support the transmission of intermittent sources of renewable energy, including storage of such energy; property designed to capture and sequester carbon dioxide emissions; property designed to refine or blend renewable fuels or to produce energy conservation technologies (including energy-conserving lighting technologies and smart grid technologies); new qualified plug-in electric drive motor vehicles (as defined by section 30D), qualified plug-in electric vehicles (as defined by section 30(d)), or components which are designed specifically for use with such vehicles, including electric motors, generators, and power control units, or other advanced energy property designed to reduce greenhouse gas emissions as may be determined by the Secretary.
[10] *See* IRS Notice 2009-72 §5.01. "The Service will consider a project under the qualifying advanced energy project program only if the U.S. Department of Energy provides a recommendation and ranking of the project."

In January, President Obama announced the award of the entire $2.3 billion of 48C tax credits to 183 projects in 43 states. We received 594 applications overall requesting over $10.9 billion in credits to support over $30 billion in total project value. After initial review 418 projects were deemed eligible requesting over $8.1 billion in credits (representing over $27 billion in total project value). DOE recommended, and IRS awarded, $2.3 billion to 183 companies, leaving $5.8 billion and 235 companies with unfunded eligible applications. [11]

The 48C tax credits are allowed for projects that are placed in service on or after February 17, 2009, when the Recovery Act was signed. Projects must be placed in service before 2014 (with the exact date depending on when the IRS issues the certification for the project). The statute favors the selection of projects that are in service early. As a result, some of the selected projects already have been completed and begun operation.

Projects were assessed based on the following statutorily specified review criteria including: domestic job creation (direct and indirect), net impact in avoiding or reducing air pollutants or emissions of greenhouse gases; lowest levelized cost of energy, potential for technological innovation and commercial deployment, and shortest project time from certification to completion. Applicants estimate that the advanced energy manufacturing facilities helped by this program may generate more than 17,000 jobs. This investment could be matched by as much as $5.4 billion in private sector funding likely supporting up to 41,000 additional jobs.

This tax credit program is already building a robust high technology, U.S. manufacturing capacity to supply clean energy projects with U.S.-made parts and equipment. These manufacturing facilities should also support significant growth in U.S. exports of U.S. manufactured clean energy products.

A strong supply chain means a nationwide network of clean energy companies, which means a well trained, robust workforce throughout the country. The geographic breadth of this network shows these initiatives are creating clean energy jobs all over the country and rebuilding the U.S. manufacturing base. The geographic concentration of some supply chains shows the value of clusters, creating synergies between manufacturers, suppliers, universities, and labs linked into a pocket of regional expertise. The mix of new and old industries shows the expansive impact of the clean energy supply chain. High-tech startups like Amonix and Calstar are constructing large factories to build cutting-edge products and contracting with traditional U.S. manufacturing companies to provide the steel, bolts, and glass necessary to make the most advanced solar panels, wind turbines, and vehicles in the world.

[11] The final application breakdown is as follows: 594 projects applied requesting a total of $10,902,251,709; 176 were ineligible (did not meet the specified requirements) for $2,783,932,005;; 183 projects were selected for $2.3 billion; 235 were eligible but not selected totaling $5,818,319,703

Clean energy innovation leads to long term, sustainable job growth

The global clean energy industry is expected to be worth trillions of dollars over the coming decades. In Durham, NC, we have helped fund the Nation's foremost producer of LED lighting, Cree Inc.. It's a tale of many important economic advances coming together: cutting- edge energy-saving technology, export-led growth, and good manufacturing jobs here in the U.S. And at the center of the story is a Recovery Act tax credit that helped to pull a lot of this together.

Cree was chosen for a $39 million tax credit through this Recovery Act program, which is called the Advanced Energy Manufacturing Tax Credit. So far, the investments they're using the credit to make, along with the private capital they're putting into those investments, have led to 375 new factory jobs in the last year, and they're planning to add 300 more next year.

The 48C credit has a unique characteristic that makes it especially important in today's economic landscape. For years, the tax code has been used to subsidize the generation and use of clean, renewable energy. That approach is consistent with President Obama's environmental vision. But another part of that vision calls for the growth of new, clean energy industries, providing American workers with the opportunities to build the equipment of the renewable revolution here in the U.S. The 48C tax credit incentivizes exactly that: it's a 30% credit going to domestic companies building domestic capacity to meet this new and growing source of demand.

The Recovery Act included $2.3 billion for the 48C program, but we were flooded with more applications than we were able to fund. Given the high volume of quality applications we would like to support and the impact this program has on growing new jobs today and new industries tomorrow, the President has called for a $5 billion expansion of the program.

STATEMENT OF MARK MAZUR
DEPUTY ASSISTANT SECRETARY (TAX ANALYSIS)
DEPARTMENT OF THE TREASURY
BEFORE
SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE
COMMITTEE ON FINANCE
May 20, 2010

Good afternoon Chairman Bingaman, Ranking Member Bunning, and members of the Subcommittee. Thank you for inviting me to testify before your Subcommittee today. I appreciate the opportunity to discuss the role of tax incentives in helping improve clean technology manufacturing competitiveness for the United States.

Overview of the Administration's Environmental and Energy Policy

First, I will briefly discuss the Administration's environmental and energy policy to provide some context for President Obama's budget proposal relating to supporting clean technology manufacturing through the tax code.

The Obama Administration believes that our nation must build a clean energy economy, curb our dependence on fossil fuels, limit the emissions of greenhouse gases (GHGs), and make America more energy independent. It is not sufficient to address our nation's energy needs solely by finding more fossil fuels. Instead we must take dramatic steps towards becoming a clean energy economy. These include encouraging investment in clean energy infrastructure and energy efficient technologies.

The American Recovery and Reinvestment Act of 2009 (Recovery Act) took an important step in that direction by providing more than $90 billion for various investments in clean energy technologies, including $2.3 billion in tax credits for investments in advanced energy manufacturing facilities (section 48C of the tax code). In addition, the Administration recently finalized a joint rule establishing new fuel economy and greenhouse standards that will require new vehicles to meet an estimated average emissions level of 250 grams of carbon dioxide (CO2) per mile in model year 2016, equivalent to 35.5 miles per gallon if the automotive industry were to meet this CO2 level entirely through fuel economy improvements. These new standards are expected to save 1.8 billion barrels of oil over the life of cars and trucks sold in the 2012-2016 model years and reduce carbon dioxide emissions by about 960 million metric tons over the lifetime of those vehicles.

The Administration's proposed FY 2011 Budget further promotes these objectives by investing in a variety of renewable sources of electricity generation, by investing to accelerate deployment of energy conservation measures, by providing support for the construction of new nuclear power plants, by advancing the development of carbon capture and storage technologies, and by

providing Federal assistance for state-level programs related to clean energy and energy conservation. The President has recently established an Interagency Task Force on Carbon Capture and Storage (CCS). The Task Force will develop a plan to overcome the barriers to the widespread, cost-effective deployment of CCS within 10 years, with a goal of bringing 5 to 10 commercial demonstration projects online by 2016. The Task Force also will explore incentives for commercial CCS adoption and address financial, economic, technological, legal, institutional, social, and other barriers to deployment. The President has also called on Congress to invest in a new HomeStar program of rebates for consumers who make energy efficiency retrofits. Such a program will harness the power of the private sector to help consumers make effective cost-saving and energy-saving investments in their homes.

In addition to direct investments in clean energy, the Administration's Budget proposes a comprehensive market-based policy that will reduce GHG emissions in the range of 17 percent below 2005 levels by 2020 and more than 80 percent by 2050. The policy will address the looming challenge of climate change, help reduce our dependence on oil, promote advanced industries and technology in the U.S., all while providing businesses the right incentives and the necessary flexibility to find the least costly and most efficient ways of achieving GHG emission reductions.

Recovery Act Clean Energy Programs Administered by Treasury

The Department of the Treasury, in consultation with the Department of Energy, administers two major Recovery Act programs promoting clean energy technologies and leveraging billions of dollars of investment into domestic clean energy manufacturing: The program providing payments for specified energy property in lieu of tax credits established under section 1603 of the Recovery Act's Division B (the Section 1603 program) and the advanced energy manufacturing tax credit (the 48C program). The 48C program, which is the subject of today's hearing, has provided $2.3 billion in tax credits to support American businesses in the clean energy manufacturing marketplace, funding 183 projects in 43 states. The Section 1603 and 48C programs together are responsible for supporting tens of thousands of American jobs.

Other Countries' Programs

Other countries have a variety of programs to encourage the clean energy sector. Some countries have adopted systems that require utilities to purchase specified amounts of clean or renewable energy at a set price. The creation of a stable market for clean energy increases demand for it and encourages investment in the manufacturing capacity to meet that demand.

Other programs include direct public investments in clean energy technology, often at levels exceeding similar U.S. programs. China, for example, is expected to direct nearly $400 billion in public investments in clean energy technology over the period 2009-13, compared to less than half that amount of public investments in clean energy by the United States over the same period. In other cases, direct public investment, while not greater than U.S. investment in absolute terms, nevertheless exceeds U.S. public investment as a percentage of gross domestic product.

Some jurisdictions offer significant tax incentives to clean energy manufacturers. In one example, Malaysia offers solar photovoltaic manufacturers a 15-year income tax holiday.

The Obama Administration will monitor other countries' programs to promote clean energy manufacturing and will work to establish a level playing field for U.S. clean energy product manufacturers, including through vigorous enforcement of our rights under international trading rules and our ongoing efforts in the World Trade Organization to eliminate tariffs and non-tariff barriers to trade in goods and services linked to addressing climate change.

Budget Tax Proposals Relating to Clean Energy

With this as background, let me turn to the tax proposals in the FY 2011 Budget relating to clean energy. Additional information on the proposals can be found in the appendix.

1. *Provide additional tax credits for advanced energy manufacturing facilities.*

As noted above, the Recovery Act provided $2.3 billion in tax credits for investments in advanced energy manufacturing facilities. This section 48C credit was designed to help America take the lead in the manufacture of wind turbines, solar panels, electric vehicles, and other clean energy and energy conservation products. Eligible manufacturers receive a 30-percent tax credit for their investments in facilities to manufacture these products.

The 48C credit represents a new approach for the United States. Previous tax incentives were aimed at increasing clean energy production. While these incentives increased demand for clean energy equipment, much of this equipment was manufactured overseas. The 48C credit provides a powerful incentive to invest in advanced energy facilities that will produce clean energy equipment here in this country.

The $2.3 billion cap on the credit resulted in the funding of less than one-third of the technically acceptable applications that have been received. The President's FY 2011 Budget proposes an additional $5 billion in credits that would support at least $15 billion in total capital investment, creating tens of thousands of new construction and manufacturing jobs. Because there is already an existing pipeline of high-priority projects and substantial interest from a variety of sources, the additional tax credits could be deployed quickly to create jobs and support economic activity.

2. *Extend expiring provisions.*

The FY 2011 Budget proposes to extend through 2011 a number of tax provisions that have either expired or are scheduled to expire before the end of 2011. The following clean and renewable energy and energy efficiency incentives are included in the budget proposal:

- *Incentives for biodiesel and renewable diesel.* A $1.00-per-gallon incentive for biodiesel and renewable diesel is provided as an income tax credit, an excise tax credit, or a

refundable payment. In addition, an extra $0.10-per-gallon income tax credit is available for small producers. The incentives expired at the end of 2009.

- *Incentives for alternative fuels.* A $0.50-per-gallon (or gasoline gallon equivalent) excise tax credit or refundable payment is provided for alternative fuels such as liquefied hydrogen, natural gas fuels, liquefied petroleum gas, liquid fuels derived from coal, and liquid fuels derived from biomass. The incentives expired at the end of 2009 for fuels other than liquefied hydrogen. The proposed extension would not apply to black liquor.
- *Incentives for alcohol fuels.* A $0.45-per-gallon income tax credit, excise tax credit, or refundable payment is available for alcohol fuels. The incentive is increased to $0.60 per gallon for alcohol other than ethanol and an extra $0.10-per-gallon credit is available for small producers. The incentives are scheduled to expire at the end of 2010.
- *Tax credits for alternative fuel refueling property.* A 50-percent income tax credit is provided for alternative fuel (including electricity) refueling property, subject to a $50,000 cap for depreciable property and a $2,000 cap for nonbusiness property. The credit rate falls to 30 percent and the caps are reduced to $30,000 and $1,000 after 2010. The proposal would delay these reductions for one year.
- *Tax credits for hybrid automobiles and other alternative motor vehicles.* Income tax credits are provided for hybrid vehicles, advanced lean burn technology automobiles, alternative fuel motor vehicles, and fuel cell vehicles. Credits of up to $4,000 are available for passenger automobiles ($12,000 for fuel cell vehicles) and of up to $40,000 for heavy motor vehicles. At the end of 2009, the credit for heavy hybrid vehicles expired and the maximum credit for fuel cell vehicles fell to $8,000. The credits expire for other hybrid vehicles, advanced lean burn technology vehicles, and alternative fuel vehicles at the end of 2010.
- *Tax credits for energy efficient new homes.* A $2,000 dollar income tax credit is allowed for the construction of an energy efficient home ($1,000 in the case of a manufactured home). The credit expired at the end of 2009.
- *Tax credits for energy efficiency improvements to existing homes.* A 30-percent income tax credit is allowed for various energy-efficient home improvements (improvements to the building envelope and the installation of energy-efficient heating and cooling equipment). The aggregate credit is limited to $1,500. The credit expires at the end of 2010.

Conclusion

Mr. Chairman, this concludes my prepared testimony. I will be pleased to answer any questions you or other members of the Committee may have.

APPENDIX: GENERAL EXPLANATIONS OF THE ADMINISTRATION'S FISCAL YEAR 2011 REVENUE PROPOSALS RELATED TO CLEAN ENERGY

PROVIDE ADDITIONAL TAX CREDITS FOR INVESTMENT IN QUALIFIED PROPERTY USED IN A QUALIFYING ADVANCED ENERGY MANUFACTURING PROJECT

Current Law

A 30-percent tax credit is provided for investments in eligible property used in a qualifying advanced energy project. A qualifying advanced energy project is a project that re-equips, expands, or establishes a manufacturing facility for the production of: (1) property designed to produce energy from renewable resources; (2) fuel cells, microturbines, or an energy storage system for use with electric or hybrid-electric vehicles; (3) electric grids to support the transmission, including storage, of intermittent sources of renewable energy; (4) property designed to capture and sequester carbon dioxide emissions; (5) property designed to refine or blend renewable fuels or to produce energy conservation technologies; (6) electric drive motor vehicles that qualify for tax credits or components designed for use with such vehicles; and (7) other advanced energy property designed to reduce greenhouse gas emissions.

Eligible property is property: (1) that is necessary for the production of the property listed above; (2) that is tangible personal property or other tangible property (not including a building and its structural components) that is used as an integral part of a qualifying facility; and (3) with respect to which depreciation (or amortization in lieu of depreciation) is allowable.

Total credits are limited to $2.3 billion, and the Treasury Department, in consultation with the Department of Energy, was required to establish a program to consider and award certifications for qualified investments eligible for credits within 180 days of the date of enactment of the American Recovery and Reinvestment Act of 2009. Credits may be allocated only to projects where there is a reasonable expectation of commercial viability. In addition, consideration must be given to which projects: (1) will provide the greatest domestic job creation; (2) will have the greatest net impact in avoiding or reducing air pollutants or greenhouse gas emissions; (3) have the greatest potential for technological innovation and commercial deployment; (4) have the lowest levelized cost of generated or stored energy, or of measured reduction in energy consumption or greenhouse gas emission; and (5) have the shortest completion time. Guidance under current law requires taxpayers to apply for the credit with respect to their entire qualified investment in a project.

Applications for certification under the program may be made only during the two-year period beginning on the date the program is established. An applicant that is allocated credits must provide evidence that the requirements of the certification have been met within one year of the date of acceptance of the application and must place the property in service within three years from the date of the issuance of the certification.

Reasons for Change

The $2.3 billion cap on the credit has resulted in the funding of less than one-third of the technically acceptable applications that have been received. Instead of turning down worthy applicants who are willing to invest private resources to build and equip factories that manufacture clean energy products in America, the program should be expanded. An additional $5 billion in credits would support at least $15 billion in total capital investment, creating tens of thousands of new construction and manufacturing jobs. Because there is already an existing pipeline of worthy projects and substantial interest in this area, the additional credit can be deployed quickly to create jobs and support economic activity.

Proposal

The proposal would authorize an additional $5 billion of credits for investments in eligible property used in a qualifying advanced energy project. The guidance that requires taxpayers to apply for the credit with respect to their entire qualified investment will be modified so that taxpayers can apply for a credit with respect to only part of their qualified investment. If a taxpayer applies for a credit with respect to only part of the qualified investment in the project, the taxpayer's increased cost sharing and the project's reduced revenue cost to the government will be taken into account in determining whether to allocate credits to the project.

Applications for the additional credits would be made during the two-year period beginning on the date on which the additional authorization is enacted. As under current law, applicants that are allocated the additional credits must provide evidence that the requirements of the certification have been met within one year of the date of acceptance of the application and must place the property in service within three years from the date of the issuance of the certification.

The change would be effective on the date of enactment.

CONTINUE CERTAIN EXPIRING PROVISIONS THROUGH CALENDAR YEAR 2011

A number of temporary tax provisions are scheduled to expire before December 31, 2011. The Administration proposes to extend a number of these provisions through December 31, 2011. These provisions include the optional deduction for State and local general sales taxes, the Subpart F "active financing" and "look-through" exceptions, the exclusion from unrelated business income of certain payments to controlling exempt organizations, the modified recovery period for qualified leasehold improvements and qualified restaurant property, incentives for empowerment and community renewal zones, and several trade agreements, including the Generalized System of Preferences and the Caribbean Basin Initiative. In accordance with the President's agreement at the G-20 Summit in Pittsburgh to phase out subsidies for fossil fuels, temporary incentives provided for the production of fossil fuels would be allowed to expire as scheduled under current law.

Testimony of Douglas Parks
Senior Vice President Business Development & Attraction
Michigan Economic Development Corporation

Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure

May 20, 2010

Good afternoon Chairman Bingaman, Ranking Member Bunning, and members of the Subcommittee. My name is Doug Parks, and I am the Senior Vice President of Business Development and Attraction at the Michigan Economic Development Corporation (MEDC). On behalf of a cabinet-level agency of the State of Michigan, I am pleased to present testimony on behalf of the MEDC and the administration of Governor Jennifer M. Granholm regarding the critical role tax incentives play in attracting and retaining advanced energy manufacturing facilities and jobs.

I would also like to express my gratitude to Senator Stabenow, whose leadership on energy issues and attention to manufacturing have been extremely important for the State as we seek to diversify our economy. Her leadership on the Advanced Manufacturing Tax Credit, the Advanced Technology Vehicles Manufacturing Incentive Program (ATVM), and worker training for green jobs has been a vital part of our diversification strategy. These, along with other tax credits she has championed, help manufacturers, researchers and consumers adapt and innovate through clean energy technologies.

Clean energy tax policies play a crucial role in creating new high-wage American jobs, spurring economic growth, promoting consumer purchases of energy efficient products, lowering energy bills for consumers and businesses, and improving the environment. These tax policies can also help the U.S. recover lost ground against other countries in the development and deployment of clean energy technologies.

As one of the most influential committees in Congress, the Senate Finance Committee is well positioned to accelerate these innovations by creating and expanding tax and other policy incentives that support state and local economic development, particularly by reducing the risk to innovators and entrepreneurs working to unlock the full potential of emerging clean energy technologies. My role at the MEDC is to help companies unlock their intellectual property and put it to work to create jobs and develop manufacturing supply chains in every renewable energy sector where Michigan can effectively compete.

It is vital that Congress continues creating incentives for American clean energy investments. Michigan and the rest of the United States are clearly engaged in a global clean energy competition, and the future of our industrial base will be greatly shaped by how the United States competes – state by state and region by region – in both the private and public sectors. A recent Pew Charitable Trusts report[1] noted that China outspent the United States in clean energy investments by almost two to one in 2009, $34.6 billion to $18.6 billion, and other nations in Europe and Asia are rapidly developing and deploying advanced clean energy technologies and markets. Fortunately, as evidenced last week by the introduction of major climate and energy legislation in the Senate, it is clear that our leaders in government and industry understand the fundamental challenges and opportunities of clean energy technology, and are pledging further actions and investments to strengthen American competitiveness.

In the midst of one of the worst global economic downturns in history, Michigan's decade-long economic struggle, much of it tied to our automotive sector, is well known to this committee. The immense level of job loss, almost 1 million jobs since 2000 in a state with approximately 10 million people, was severe not only in its immediate impact but also in the reality that many of those lost jobs are not coming back.

A clear path for Michigan's economic recovery lies in our historic manufacturing strength. A key question that our State's leadership has faced is how to best leverage our existing assets for future job growth. Clean manufacturing presents a clear opportunity to redeploy those assets.

Michigan's investments to leverage new and expanded federal clean energy programs are designed to accelerate this job growth. According to the Pew report, Michigan ranked in the top 10 of all states in the number of clean energy jobs, businesses and patents in 2007. And while the State suffered significant overall job loss between 1998 and 2007, it was one of only seven states with total negative jobs numbers that actually gained clean energy jobs during that period.

In 2006, Governor Granholm directed the MEDC to focus our economic development efforts on opportunities for diversification by leveraging the state's competitive advantages – natural resources, workforce, rich engineering and manufacturing heritage – into new industries with the potential for significant economic growth. Our intense review of research and best practices across the globe led us to focus on four targeted clean energy sectors: advanced energy storage, solar energy manufacturing, wind energy manufacturing, and bio-energy.

We developed teams around these targeted sectors – comprised of Ph.D.-level technology experts, industry experts, engineers, MBAs, and economic developers – to guide state strategy in these areas. We also forged partnerships with national laboratories, including Oak Ridge National Laboratory and the US Army Tank-Automotive Research Development and Engineering Center (TARDEC), to assist us in vetting projects.

---

[1] Who's Winning the Clean Energy Race?," Pew Charitable Trust, March 25, 2010

Finally, we developed a unique toolbox of state incentives to help grow these industries, including:

- $1 billion in refundable tax credits for advanced energy storage projects;
- $75 million in refundable tax credits for photovoltaic manufacturing opportunities; and
- $75 million in grants for the Centers of Energy Excellence program, which matches federal funds to promote clean energy technology commercialization partnerships between industry, government and academia.

As of this year, Michigan has become the home of more than 109,000 green jobs. The State's efforts in the past few years to diversify Michigan's clean energy economy into four specific sectors are projected to create another 80,000 additional jobs in coming years, in large part through our concerted efforts to work with the private sector using well-crafted state incentives.

Federal incentives have played a vital role in our state's diversification strategy. Michigan's premier example is our successful strategy to leverage federal funds to build a new domestic industry within the State, an effort that required extensive ingenuity and collaboration among many leaders. We relied upon Senator Levin and Senator Stabenow to advance the $2.4 billion Electric Drive Battery and Component Manufacturing Initiative as part of the Recovery Act. Our leadership in Michigan worked closely with our Senators and Congressional Delegation to ensure that state resources were ready to match federal efforts.

Passed with overwhelming bipartisan support, the Michigan Advanced Battery Credit Program, successfully secured total investment commitments in excess of $5 billion in battery-related projects. Our battery credits provided aggressive, industry-targeted state incentives to leverage advanced vehicle research, development, engineering and manufacturing. After comprehensive technical reviews, the MEDC awarded $600 million in refundable tax credits for cell manufacturers, plus another $400 million in related refundable tax credits. These grant awards provided a critical competitive advantage to our private sector partners, who subsequently won more than $1.3 billion in federal recovery grants, making the birth of this new industry possible.

The 48C Advanced Clean Energy Manufacturing Tax Credit has been an effective tool in spurring economic development in Michigan. As you know, the President announced the award of $2.3 billion in 48C credits for 183 clean energy manufacturing projects earlier this year. Twelve Michigan companies received $242 million worth (over 10 percent) of these credits for a variety of projects, including the production of poly-crystalline silicon as a component of solar panels, the manufacture of a component for lithium-ion battery thermal management systems, and the production of blades for wind turbines.

The MEDC has worked closely with many of the 48C recipients to leverage federal funds in other parts of the clean energy arena. In addition to financial incentives, we have helped these companies develop relationships and partnerships throughout the supply chain to strengthen their commercialization efforts.

For example, the MEDC assisted Energetx, a spin-out company of composites manufacturer and boat builder, S2 Yachts, in applying its composites expertise to the production of wind turbine blades.

S2 Yachts is a third generation, family-owned business located in Holland, Michigan. Four years ago, its business was around $150 million in annual sales, building 400 boats per year and employing 800 people. Its business was adversely impacted by the economic downturn, resulting in significantly lower boat production and layoffs that impacted over one-half of its work force. While many in the marine industry were forced out of business, S2 Yachts is weathering the storm, in part by manufacturing fiberglass composite products for use in renewable energy markets. As a result, Energetx received a 48C credit of almost $2 million.

Owing to its 48C award, Energetx received an additional $7 million in grants from two Michigan programs. They forged partnerships with companies that include Aeroblade and The Dow Chemical Company, are working with national laboratories including Oak Ridge National Laboratory and the National Renewable Energy Laboratory, and are hiring engineering interns from the University of Michigan and Kettering University.

Michigan appreciates your leadership, Mr. Chairman, together with Senator Stabenow, Senator Lugar and Senator Hatch, in first proposing to extend and expand the Manufacturing Tax Credit through the introduction of S. 2857, the American Clean Technology Manufacturing Leadership Act. We also support the President's call to commit $5 billion more for the 48C program, as included in S. 3324, the Security in Energy and Manufacturing (SEAM) Act of 2010. This bill, which was introduced earlier this month and referred to this Committee, would extend the manufacturing tax credit by two years, provide $5 billion in 48C credits, place more emphasis on manufacturing than on the assembly of goods, and would also allow for direct grant payments in lieu of qualifying advanced energy project credits.

As a state that is working aggressively with our manufacturing partners to leverage federal clean energy incentives, the MEDC believes Congress should give strong consideration to expanding the statutory review criteria to benefit projects that can demonstrate strong financial capacity through the commitment of state financial incentives.

As this Subcommittee knows, the 48C program was oversubscribed by a ratio of three to one. Providing more investment will keep the manufacture of these critical technologies, the research and development, and the hundreds of thousands of jobs at home. As this Committee has discussed in the past, government incentives and tax credits for renewable energy technologies prior to the 48C program were concentrated at the commercial and individual consumer level, failing to create sustained industry growth. We believe the early success of the 48C program, coupled with the abundance of worthy unfunded proposals, justifies swift enactment of additional authority to stimulate more American manufacturing ingenuity.

Thank you, Mr. Chairman, for the opportunity to present Michigan's views. I would be pleased to take any questions from you or other members of the Subcommittee.

Testimony of Jon Sakoda
Partner
New Enterprise Associates

Clean Technology Manufacturing Competitiveness:
The Role of Tax Incentives

Senate Finance Committee
Subcommittee on Energy, Natural Resources, and Infrastructure

Thursday, May 20, 2010

Introduction

Chairman Bingaman, Ranking Member Bunning, and Members of the Committee -- thank you very much for inviting me to be here today. It is truly an honor.

I appear before you here today as a partner of New Enterprise Associates and as a member of the Cleantech Advisory Council for the National Venture Capital Association (NVCA). NEA is by assets under management, the largest US venture capital firm with ~$11 billion under management. Through our 30 years of history we've funded over 650 companies and have had over 160 of them go public. Our 50 largest companies have created over $65 billion in revenues and have created hundreds of thousands of jobs in this country. Today we have a global footprint, with offices in India and China and roughly 20% of our committed capital targeted at emerging markets.

In the past, the venture capital industry has played a pivotal role in inspiring industries such as biotechnology, computing, medical devices, semiconductors, telecommunications, and the Internet. According to the NVCA, US VC-backed company revenue has equated to more than 22 percent of US GDP and over the past 3 years alone VC-backed companies have accounted for 3 times the growth rate in job creation than the private sector taken as a whole.

Today, the energy technology industry represents one of the most compelling investment opportunities in the history of venture capital. We are one of the most active investors in the sector, and today we have more than 30 portfolio companies here in the US that have raised a total of $2 billion in capital. Our enthusiasm for this emerging sector is shared by the vast majority of VC firms, with more than half of the NVCA's over 400 members expected to increase their allocation to the sector this year.

Our portfolio includes investments in sectors such as Solar, Wind, Nuclear, Advanced Batteries, Smart Grids, Electric Vehicles, and Energy Efficient Building Material. Many of our entrepreneurs are commercializing technologies developed in universities and national laboratories leveraging the historic investment of federal funds, and have created companies with innovation from great institutions such as Stanford, MIT, the University of Texas, NREL, NASA, and the Los Alamos National Laboratory. Energy technology is a complex industry, but the goals of our entrepreneurs are simple: create companies that enable us to make or save energy -- better, faster, cheaper, and cleaner, than anyone else in the world.

The Loss of US Clean Energy Manufacturing: A Solar Case Study

The US has long been the home of great innovation, and in spite of increasing global competition, is still the world leader in fundamental breakthrough energy technology. But over the past decade, the US has lost its leadership to China, Japan, and Germany in clean energy manufacturing, and is challenged and threatened by emerging economies such as India, South Korea, Malaysia, and the Philippines. These nations have outpaced the US in recruiting, incenting, and developing domestic manufacturing of solar, wind, and battery technology. We are not the market leader in producing and supplying this high growth industry, and have ceded our historic leadership in manufacturing of these key technologies to other nations.

As one example, the US's market share for solar manufacturing has fallen from 45 percent in the mid 1990's to roughly 5 percent today. In the past decade alone, the two best US solar technology companies in the world, First Solar and Sunpower, were recruited overseas to Germany, Malaysia, and the Philippines. Today these companies have developed the majority of their manufacturing overseas, creating jobs and economic growth primarily in other nations.

Prior to the Recovery Act, this paradigm of developing innovative technology in the US, and exporting manufacturing to foreign nations has been driven primarily by a significant imbalance between US and foreign tax policies and incentives. As is shown in the attached table, low labor cost has not been the most important variable in the equation -- upfront manufacturer's incentives, long term tax holidays, and end market incentives have been frequently as important, if not more important variables influencing US companies as to where they should establish their manufacturing facilities. Incentives from foreign nations have often totaled as much as 40 or 50% of the cost of a new manufacturing project. Without competitive incentives for companies to stay in the US, this nation's best manufacturers have had no choice but to look overseas to remain competitive in their industries. The result has been a loss of both direct and indirect jobs, a loss of intellectual property, and a loss of economic growth here in the US for one of the fastest growing global industries of the 21st century.

In describing this trend, I must remind the Committee that venture capitalists and entrepreneurs are by definition optimists. I believe the US can be a leader in clean energy manufacturing, and have witnessed this first hand. We are not giving up on the American entrepreneur, and I hope you won't either.

Restoring US Clean Energy Competitiveness: Section 48C Success

I am grateful to this Committee and the current Administration for recognizing the need to level the playing field for US clean energy manufacturers. With the help of the tax policies and incentives put forth in the Recovery Act, this nation's best energy technology companies are expanding their domestic capacity, re-opening and retro-fitting closed factories, re-hiring and re-training new workers, and rebuilding local economies depressed by the "Great Recession".

One of the most important policies in restoring American competitiveness in clean energy manufacturing is the Section 48C Advanced Manufacturing Tax Credit, providing a 30% tax credit for investments in facilities that manufacture clean energy products such as solar panels and wind turbines. This program awarded $2.3 billion in tax credits to over 100 companies in 43 states, and was oversubscribed with requests for over $8 billion in projects. Four of our most

promising companies were awarded the credit and were able to expand manufacturing here in the US, creating jobs thanks to your efforts in the Recovery Act.

One Section 48C recipient, Suniva, was able to expand its solar manufacturing from 33 MW to 170 MW in Norcross, Georgia, hiring an additional 60 workers, and creating more than 100 construction jobs in an economically depressed suburb of Atlanta. Many of Suniva's full time employees were either veterans or laid-off auto workers who have now subsequently been retrained in solar manufacturing. This company, whose technology originated at the first DOE Center for Excellence in PV at Georgia Tech, was recently named the Renewable Energy Exporter of the Year by the Export-Import bank, was recognized by President Obama and Secretary Chu, and today exports greater than 90% of its industry leading high efficiency solar cells overseas to Europe, China, and India. Their products power the first utility grid connected solar farm in India, a market which many speculate will be as large as 20 GW by 2020. Suniva has plans to expand to 400 MW in Saginaw, Michigan, a project which would create over 400 direct and over 1450 indirect and construction jobs over the life of the project. This is just one of many Section 48C success stories.

Supporting the Key Pillars of a Domestic Clean Energy Manufacturing Industry

Growing a strong domestic clean energy manufacturing industry requires competitive supply and demand side incentives and policies. Recovery Act programs such as Section 48C and the DOE Loan Guarantee Program, competitive end market incentives such as the investment and production tax credits for wind and solar development, and compelling state incentives such as those put forward by Michigan and New Mexico, are making the US a more competitive and compelling nation for manufacturers. These pillars are the foundation of a growing US clean energy manufacturing industry. Already this year, you've seen one of China's largest solar manufacturers, Suntech, and one of Japan's largest solar manufacturers, Kyocera, announce plans to open or expand facilities here in the US. These are encouraging signs that the US has started to regain momentum lost over the past decade.

To continue to restore American competitiveness in this industry, we need to maintain consistency and support for these important incentives over the long term. I believe time is of the essence to re-open the Section 48C program through its expansion of an additional $5 billion as called for by the Administration. Many promising companies have qualified applications to build facilities here in the US, and are patiently waiting for guidance on whether 48C will be expanded. Their plans currently call for expansion in the US, but these plans will ultimately be shifted abroad if the program is not re-opened this year. These companies want to stay in the US, but may not have a choice if 48C is not re-opened.

In closing, I feel compelled to dispel the myths that I hear all too frequently: that the US will never be competitive in manufacturing. I hear that our labor costs are too high. I hear that we lack innovation. I hear that our workers aren't skilled enough to compete. These are all myths, and they need to be dispelled. We are home to some of the best energy technologies in the world, we are home to some of the most skilled workers in the world, and we are taking the right steps to level the playing field and restore American competitiveness in this very important sector. We can compete. We must compete.

Thank you very much for inviting me to be here today. I look forward to your questions.

Table A: Factors Influencing Choice of Solar Manufacturing Location

	Germany	Japan	China	India	Malaysia	Philippines	USA
Subsidized Manufacturing Incentives	High	Medium	High	High	High	High	Low
Subsidized End Markets	High	High	High	High	Low	Low	Medium
Labor Costs	High	High	Low	Low	Low	Low	Medium
Quality / Stability of Workforce	High	High	Medium	Medium	Medium	Medium	High
Transportation Infrastructure	High	High	High	Poor	Medium	Medium	High
Accessibility (supply, partners)	High	High	High	Low	High	Low	High

COMMUNICATIONS

Written Statement for the Record
Submitted by
The American Forest & Paper Association
To
United States Senate Committee on Finance
Subcommittee on Energy, Natural Resources and Infrastructure
Hearing on
"Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives"
May 20, 2010

The American Forest & Paper Association (AF&PA), on behalf of its member companies, is pleased to submit this written statement for the record of the Committee on Finance's Subcommittee on Energy, Natural Resources and Infrastructure Hearing on "Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives" that was held on Mary 20, 2010.

AF&PA is the national trade association of the forest products industry, representing pulp, paper, packaging and wood products manufacturers, and forest landowners. Our companies make products essential for everyday life from renewable and recyclable resources that sustain the environment. The forest products industry accounts for approximately 5.6 percent of the total U.S. manufacturing GDP. Forest products companies produce $200 billion in products annually and employ approximately 1 million people earning some $50 billion in annual payroll.

AF&PA applauds the Committee on Finance for focusing on energy tax incentives as an important way to expand business activity, create and maintain jobs, reduce dependence on fossil fuel and non-renewable energy sources, promote energy efficiency, and sustain the environment for future generations of Americans. As the leading producer and user of carbon-neutral renewable biomass energy, AF&PA and its member companies welcome the opportunity to discuss the important role of energy tax policy in achieving these goals.

In recent years, federal energy tax legislation has sought to encourage renewable energy sources and alternative fuels by expanding production tax credits, providing energy investment credits, enhancing depreciation deductions, and creating new tax-favored financing mechanisms. The growth and importance of these energy tax incentives makes it imperative that such incentives be delivered in a neutral manner that does not favor some energy producers over others or some energy uses over others. Government policies to encourage additional renewable energy should not create winners and losers between existing renewable industries and new power generation. In addition, incentives should be carefully designed to avoid imposing barriers to future innovation.

The forest products industry produces and uses renewable energy for manufacturing operations and is a significant contributor to our country's existing base of renewable

1111 Nineteenth Street, NW, Suite 800 • Washington, DC 20036 • 202 463-2700 Fax: 202 463-2785 • www.afandpa.org

manufacturing process to dry paper, for example. We also generate 28.5 million MWH annually of biomass-based electricity, which we use to power our facilities, and sometimes to sell to third parties. Through increased efficiencies in the manufacturing and production process, AF&PA members' overall total energy use per ton of production at pulp and paper mills has decreased by 26.6 percent since 1972, and by 11 percent between 1990 and 2006.

Our increasing efficiency and greater reliance on biomass energy also has enabled AF&PA members to significantly reduce the use of fossil fuel and purchased energy, much of which also is generated from fossil fuel. From 1972 to 2006, the fossil fuel component of the AF&PA member mill energy mix decreased by over 55 percent, and the use of both fossil fuel and purchased energy has decreased by 56 percent. From 2004 to 2006, AF&PA members reduced their use of fossil fuels and purchased energy per ton of production by 9 percent.

The forest products industry generates more energy from renewable sources than wind, solar, and geothermal combined. The industry has had limited success in qualifying for renewable biomass energy incentives but has a substantial amount of additional renewable energy capability. As policymakers seek to encourage rapid expansion of renewable energy sources, the forest products industry can and should continue to play an important role in furthering these goals.

We believe a level playing field between new and existing uses of biomass for renewable energy production is critical for manufacturers of paper and wood products to remain competitive in the markets for our products and in our procurement of wood as a raw material. As the demand for biomass-based power increases, AF&PA member facilities must compete with new market entrants for that biomass—the raw material for their products, as well as the source of their own renewable, carbon-neutral power. The ability of new market entrants to qualify for potential new renewable energy tax credits, while existing facilities' biomass-based energy may not, often puts existing forest products facilities at a serious competitive disadvantage.

As discussed below, we believe the Section 45 renewable energy production tax credit should apply to existing facilities for the full 10-year production period and should be expanded to energy produced and used onsite in manufacturing operations. In addition, we believe the Section 48 credit for combined heat and power facilities should be expanded and enhanced, new improvements to existing biomass facilities should qualify for the Section 48 elective credit without applying the 80-20 rule in IRS Notice 2008-60, and ARRA Section 1603 grant in lieu of tax credit program should be extended.

Section 45 Renewable Energy Production Credit

Section 45 of the federal tax code provides a credit of 1.1 cents per kilowatt hour of electricity generated from open loop biomass that is sold to a third party. Since 2004, forest products companies have been eligible for this similar renewable energy tax credit as wind, solar, and geothermal producers when they sell electricity generated by renewable biomass to third parties. However, those other industries are eligible for a higher credit of 2.1 cents per kilowatt hour. This credit applied to existing biomass

facilities for only five years – 2005 through 2009 – compared to 10 years for all other facilities. It is important to note, however, that many facilities were not able to use the existing facility credit because of confusion created by an IRS ruling shortly after the 2004 existing facility credit was put in place. In 2008 the IRS rescinded the limitation, leaving companies with only one year of eligibility; four years fewer than Congress originally intended.

A major component of the electricity generated by forest products companies is used onsite in their manufacturing and processing operations, which has significantly reduced their fossil fuel use. The generation of electricity for onsite use is highly efficient because it avoids transmission and distribution losses compared to electricity that moves across the electricity grid. However, the industry's electricity generated from renewable biomass and used onsite is not currently eligible for the Section 45 tax credit.

AF&PA member companies appreciate the Committee's inclusion of a one-year extension of the time for existing facilities to benefit from Section 45 in recent tax extender legislation. We look forward to continuing to work with the Committee on a full 10-year credit period for existing facilities and to strengthen Section 45 to include renewable biomass electricity used onsite, as proposed in S. 870, H.R. 622 and H.R. 2528.

AF&PA member companies strongly believe that all generators and users of renewable energy should be treated the same. There are unintended consequences for the forest products industry from government mandates and incentives for new renewable energy production. Government policies to encourage additional renewable energy should not create winners and losers between existing renewable industries and new power generation.

It's not about getting incentives for doing business as usual – it's about treating desired behavior the same across all industries and taxpayers. For example, even though electricity utilities and forest products facilities produce the same kind of renewable energy, utilities get a tax credit for their electricity but forest products facilities do not unless they sell it to someone else. Renewable energy displaces fossil fuel whether it's sold or used onsite, so both uses should be treated the same. So as new renewable energy generators come online and are able to claim additional tax incentives, existing biomass electricity generators such as those in the forest products industry become disadvantaged by the tax code. This stifles investment and creates disincentives for the industry to continue to increase its already substantial generation and use of biomass. All of this threatens domestic jobs and slows the full realization of domestic energy policy goals. Congress has sent a clear signal that maintaining existing jobs and creating new jobs, particularly in the field of renewable energy, is a priority. It should reaffirm a commitment to net job growth by maintaining a level playing field on tax policy.

Extension and expansion of Section 45 – as proposed in S. 870, H.R. 622, and H.R. 2528 – will:

1. Encourage more renewable energy projects at traditional manufacturing facilities, thereby supporting existing jobs.
2. Increase energy efficiency since on-site use avoids transmission and distribution losses on the grid.
3. Sustain more than 360,000 jobs: 50,000 pulp and paper mill jobs, 150,000 related jobs associated with other products in the value chain (such as envelopes, shipping containers, or cartons), and 160,000 indirect jobs in supplier industries and local communities....plus an estimated 115,000 jobs (35,000 direct and 80,000 indirect) in the wood products sector.

Section 48 Energy Investment Credit for Combined Heat and Power

One of the most efficient means of utilizing energy is combined heat and power (CHP) or "co-generation." CHP is more efficient because it generates both thermal energy and electricity from the same fuel rather than generating thermal energy onsite and electricity at utility generators remotely. In general, CHP is about twice as efficient at using fuel as is utility technology, emits only half as much greenhouse gas as non-CHP electricity, and reduces transmission and distribution inefficiencies compared to electricity from the grid.

Section 48 of the federal tax code provides a 10 percent investment credit for new CHP facilities with electrical capacity of 50 megawatts or less. To further encourage investment in CHP facilities, we believe the Section 48 credit should be modified to increase the credit amount to 30 percent of the CHP investment and remove the 50 megawatt limitation.

Section 48 Energy Investment Credit for Existing Facility Expansion

Section 48 of the federal code provides an elective energy investment credit for qualified closed-loop and open-loop biomass facilities placed in service in 2009 through 2013. IRS Notice 2008-60 applies an 80-20 rule in determining whether a modification or improvement to an existing facility qualifies for the credit. Under this rule, if more than 20 percent of a facility's total value is attributable to property placed into service prior to 2009, then the new modification or improvement to the facility will not be eligible for the credit. This has proved to be an overly restrictive rule and one that is contrary to the intended purpose of encouraging investments in renewable energy. The 80-20 rule should be eliminated to allow expansion and reinvestment in existing facilities to encourage greater, cleaner energy production.

Section 1603 Grant In Lieu of Tax Credit

The American Recovery and Reinvestment Act of 2009 (ARRA) created a new federal government grant program under which a taxpayer can apply to the Secretary of the Treasury for a cash grant of 30 percent of the investment in qualified energy property (10 percent for small CHP, microturbine, small irrigation, certain geothermal) in lieu of

the Section 45 credit. Property must be originally placed in service in 2009 or 2010, or construction of property must begin in 2009 or 2010 and be placed in service before 2014 for biomass facilities and 2017 for certain CHP facilities.

This program is an effective means of encouraging new investment in renewable energy facilities and should be extended beyond 2010. In addition, further clarification of the standards for determining when construction begins is needed.

One method for making the program more efficient would be to align the period of eligibility with existing placed in service dates. That is, the section 1603 program should provide that an eligible property is any qualified property placed in service before the expiration of the particular energy incentive's current placed in service expiration date. Thus, the option to elect the grant in lieu of the credits would be available for biomass facilities placed in service through 2013. This would eliminate the need for the current complex rules for determining when construction begins. Aligning the grant election with existing placed in service dates would both simplify the program and provide a more effective incentive.

****

The forest products industry's commitment to sustainable forest management for the wood fiber used in manufacturing, and to renewable energy sources for the generation of electricity from the portion of trees not used in manufacturing demonstrates that a critical balance between maintaining our environment and business activity that creates and sustains jobs can be achieved.

Increasing renewable energy is a laudable and achievable goal, but it should not be at the expense of existing renewable energy production in the forest products industry. The expansion of Section 45, Section 48 and ARRA Section 1603 will encourage more renewable energy projects at our manufacturing facilities, resulting in increased energy efficiency since on-site use avoids transmission and distribution losses on the grid. This will translate into jobs preserved and jobs created across America.

AF&PA and its member companies look forward to working with the Committee to help preserve jobs and expand renewable energy production.

For more information please contact:
Elizabeth VanDersarl
Vice President, Government Affairs
American Forest & Paper Association
202-463-2700
elizabeth_vandersarl@afandpa.org

BTEC
Biomass Thermal Energy Council

1211 Connecticut Ave NW, Suite 600 • Washington, DC 20036-2701
202-596-3974 tel • 202-223-5537 fax • www.biomassthermal.org

Senate Committee in Finance
Hearing on
"Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives"
May 20, 2010

Statement for the Record

Prepared by the
Biomass Thermal Energy Council
1211 Connecticut Ave, NW
Washington, DC 20036

Introduction

The Biomass Thermal Energy Council (BTEC) appreciates the opportunity to submit a statement to the Senate Finance Subcommittee on Energy, Natural Resources, and Infrastructure regarding the continuation of the Advanced Energy Manufacturing Tax Credit. BTEC believes that energy incentive programs such as the Advanced Energy Manufacturing Tax Credit (AEMTC) outlined in §48C are indispensible in growing domestic sources of clean energy, whether they originate in the wind, solar, hydroelectric, nuclear, hydrogen, or biomass sectors.

Biomass thermal technologies can play a key role in domestic energy production and job growth if programs like the AEMTC recognize their impact. Dr. Henry Kelly of the Office of Energy Efficiency and Renewable Energy credited the program's $2.3 billion funding with creating an estimated 17,000 direct jobs as well as spurring $5.4 billion in private investment.[1] Right now, biomass thermal technologies employ thousands of Americans and provide useful heat for over 1 million diverse users nation-wide; this industry decreases reliance on foreign oil, strengthens local economies, lowers fuel costs, and decreases greenhouse gas emissions. The potential exists to greatly strengthen this industry through extension of the AEMTC to biomass thermal technologies.

The overwhelming pool of AEMTC applicants demonstrates that demand for these finite incentives is real. Should the Congress and administration move forward on allocating additional funding for the AEMTC beyond its original $2.3 billion, certain issues surrounding the administration of the program ought to be addressed and revised.

---

[1] U.S. Cong, Senate, Committee on Finance: Subcommittee on Energy, Natural Resources, and Infrastructure, Re-establishing U.S. leadership in Clean Energy, High Technology Manufacturing, By Henry Kelly, 111 Cong., 2nd sess. S. Doc, 20 May 2010, Office of Energy Efficiency and Renewable Energy, 24 May 2010 <http://finance.senate.gov/imo/media/doc/052010HKtest.pdf>, pp. 6

Namely, these concerns pertain to initial consultations of project eligibility and industry stakeholder involvement. Should both items be addressed to the level outlined below, future AEMTC funding would surely find its way to vastly underrepresented—but certainly no less worthy—energy technologies like that of biomass thermal.

Improved Project Eligibility Consultation
The AEMTC's requirements for qualifying advanced energy manufacturing projects are broad in scope; this breadth allows the incentive to reach promising technologies across the energy spectrum without favoring certain sectors over others. Additional informational materials on the Department of Energy's AEMTC webpage confirm this intentional range of eligible projects by describing its own qualifying list of technologies as, "non-exclusive [and] non-exhaustive."[2] Certain biomass thermal technologies like biomass densification/solid fuel refining and high efficiency combustion thermal applications fall within the spirit of the AEMTC, yet it is unclear whether they are indeed eligible.

The program's capacity for offering meaningful consultation and guidance is hampered by its requirement to respond only to active applicants. Prospective applicants are left with two difficult—and financially hazardous—choices. Either they can devote hours of staff time and resources to complete the comprehensive application only to later discover the ineligibility of their technology, or they can forego the funding opportunity altogether by deciding (possibly incorrectly) that their technology is ineligible. Both options are wasteful and undermine the AEMTC's prime principle, to encourage the growth of domestic alternative energy manufacturing.

BTEC recommends that a reauthorization of the AEMTC provide a means for prospective applicants to inquire and have a consultation with a program authority to determine if their technology and application are consistent with the intent of the program and worthy of consideration. Doing so would avoid arbitrarily limiting the program's eligible technologies and assist potential applicants in expending precious resources for the application's preparation and submission.

Increased Industry Communication and Involvement
The coordination of government and private industry often increases the effectiveness of incentive programs like the AEMTC. However, a lack of communication between the administering agency and eligible industries certainly resulted in the underrepresentation of eligible and competitive technologies.

Dr. Henry Kelly's hearing testimony highlighted this deficit when he commented that the administrating agency failed to adequately inform industry stakeholders during the

---

[2] U.S. Department of Energy, Tax Credit 48C – Credit for Investment in Advanced Energy Facilities. Department of Energy, 24 May 2010, <http://www.energy.gov/recovery/documents/Types_of_48C_Projects.pdf>.

program's application period.[3] This lack of communication likely explains the major absence of energy technologies outside that of wind, solar, and nuclear. Biomass-related projects numbered only 2 of the 183 projects awarded,[4] despite biomass providing 53% of the nation's renewable energy supply.[5] More pointedly, there was only one biomass thermal specific award in the initial round of funding. It is uncertain whether this near absence was due to a lack of qualified applicants, lack of program awareness, or both. Yet, when thermal energy needs occupy roughly one-third of the nation's energy demand, all renewable players—especially biomass thermal—must be at the table to address the path forward.

It is astonishing how little attention thermal energy has been given in the U.S, this particular program notwithstanding. To date, nearly all of the government policies and incentives for renewable energy support the electricity and transportation sectors. Renewable sources of thermal energy, such as biomass, have largely been forgotten. Engaging biomass stakeholders during the rollout of programs like the AEMTC would begin to reverse this policy disparity.

Significant job creation is possible through the increased deployment of biomass thermal technologies, pending programs that support the industry's development and continued growth. In the American Northeast alone, significant displacement of traditional heating fuels with sustainably produced biomass fuel is estimated to create over 142,000 jobs and infuse billions of dollars into local communities by the year 2025.[6] Investments in domestic manufacturing of feedstock refining technologies and combustion appliances (among others) would spur new and re-tooled facilities nationwide, further displacing foreign fossil fuels and imported heating equipment.

A reauthorization of the AEMTC ought to acknowledge the positive employment and economic benefits from biomass thermal through open and clear communication with its stakeholders. This could resemble active relationships with biomass trade associations and related media, with all working to educate eligible businesses on the program's funding requirements. Innovation will surely flourish when these parties are involved.

---

[3] *Clean Technology Manufacturing Competitiveness: The Role of Tax Incentives*, 111th Cong, (2010) (testimony of Dr. Kelly Mazur). Mr. Mazur's comments were in response to a question on the disproportionate awards to wind and solar in over that of nuclear.

[4] The White House, Office of the Press Secretary, "Fact Sheet: $2.3 Billion in New Clean Energy Manufacturing Tax Credits," Press release, Briefing Room: Statements & Releases, 8 Jan. 2010, 25 May 2010, <http://www.whitehouse.gov/sites/default/files/100108-48c-Selection-Final-With%20Projects.xls>. These figures reference known awards; the fact sheet discloses 137 of the 183 award amounts, corresponding businesses, and technologies. While it is possible that the remaining 46 awards are biomass related, it is highly unlikely.

[5] U.S. Department of Energy, Energy Information Administration, Renewable Energy Consumption and Electricity Preliminary Statistics 2008, July 2009, 25 May 2010, <http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/rea_prereport.html>.

[6] Biomass Thermal Energy Council, et al, Heating the Northeast with Renewable Biomass: A Vision for 2025, Rep, 28 Apr. 2010, 5 May 2010, <http://biomassthermal.com/resource/pdfs/heatne_vision_full.pdf>, pp. 15. The figure details the potential for job creation in the seven-state collection of CT, MA, ME, NH, NY, RI, and VT.

Concluding Remarks

Domestic manufacturing of biomass heating appliances, fuels, and components must become a priority as the nation pursues a platform of diverse clean energy options. In Europe, these technologies are viewed as advanced energy technologies.

U.S. progress on clean energy was underscored in a Department of Energy memo published shortly after the AEMTC hearing that exempted certain advanced biomass thermal technologies from 'Buy American' ARRA requirements *due to non-existent domestic manufacturing capacity.*[7] This is discouraging. The U.S. cannot seriously move forward on clean energy implementation and energy independence without addressing domestic renewable energy manufacturing, biomass thermal included.

BTEC recommends that a revised AEMTC involve increased communication with trade associations across the energy industry spectrum and develop better processes for determining initial project eligibility. BTEC understands that projects with the greatest commercial viability and technical merit should win funding, no matter their industry. Tax and incentive programs that level the playing field by recognizing the most efficient technologies will guide the U.S. towards energy independence more quickly, cleanly, and affordably.

---

[7] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Memorandum of Decision, By Cathy Zoi, 24 May 2010, 1 June 2010 <http://www1.eere.energy.gov/recovery/pdfs/eere_buy_american_nonavailability_waiver.pdf>. The memo lists products that are exempt from the Buy American provision of the American Recovery and Reinvestment Act of 2009 due to one of three factors: domestic availability, costs considerations, and public interest concerns.

HEARING: CLEAN TECHNOLOGY MANUFACTURING COMPETITIVENESS: THE ROLE OF TAX INCENTIVES

STATEMENT FOR THE RECORD OF JOHN W. DIAMOND
RICE UNIVERSITY
6100 MAIN STREET,
HOUSTON, TX 77005-1827

ON

FUEL REFORMULATION TAX CREDIT TO REDUCE EXCISE TAX FRAUD, CONSERVE NATURAL RESOURCES, AND PROTECT THE ENVIRONMENT

BEFORE

THE SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES AND INFRASTRUCTURE OF THE SENATE FINANCE COMMITTEE

MAY 20, 2010

Green Fuel Reformulation Tax Credit: Creating Economic Incentives to Reduce Excise Tax Fraud, Conserve Natural Resources, and Protect the Environment

Blendstock gasoline and other petrochemicals are commonly transported by barge on inland waterways. After transportation maritime barge companies must remove excess fuel sludge—a mix of valuable and toxic petrochemicals—that remains in the waste compartments of the barge. Fuel sludge can yield significant quantities of several important petrochemicals (often over 5,000 gallons); however, improper disposal wastes valuable resources, causes environmental damage, and reduces government tax revenue. Fuel sludge can be burned off, down holed, re-refined, reformulated, illegally sold to retailers, or disposed of improperly. This type of activity is almost impossible to control by regulation.

The most efficient and environmentally safe method of dealing with fuel sludge is reformulation. This process produces the largest amount of re-usable petrochemicals (blendstock gasoline and other valuable chemicals such styrene, toluene, xylene etc…) and avoids environmental damage associated with disposal, re-refining, or other illegal activities. Under current law, the illegal disposal or sale of fuel sludge harms the environment and reduces government tax collections because of widespread excise tax fraud. Firms that abide by the existing laws and regulations are forced to compete against wildcat firms that reduce their costs by disposing of harmful chemicals improperly, such as dumping waste in waterways or delivering fuel sludge directly to retail gas stations. In addition, fraudulent firms do not remit excise payments and thus have a built in price advantage over law abiding firms.

There is ample evidence to suggest that committing such fraud is easily accomplished in an industry that can be operated in a fly by night fashion. For example, in Larry West, Sr. v. The State of Texas, Larry West was found guilty of engaging in a motor fuel tax fraud scheme, evading or attempting to evade a motor fuel tax, and failing to remit motor fuel tax. He was sentenced to a 20 year prison term based on this conviction and previous convictions of the same offence. More recently, a Travis County Grand Jury indicted fourteen individuals and companies on June 21st, 2007 for their participation in a motor fuel tax fraud scheme that was carried out in Texas between March 2002 and October 2004.

The purpose of this tax credit is to encourage reformulation and improve government oversight of fuel sludge after maritime barge transportation. The proposal would create economic incentives that encourage reformulation and conservation of valuable petrochemicals. It is important to keep in mind that reformulation is a very costly method of disposing of fuel sludge even when compared to other legal methods such as re-refining the sludge. The purpose of the tax credit is to give more companies the incentive to invest in the equipment to reformulate fuel sludge into its useful components.

To accomplish this we propose draft legislation that would allow for a $0.50 excise tax credit for blendstock gasoline that is reformulated from fuel sludge after maritime barge transportation. It might be useful to include an average limit per barge cleaned to limit any possible tax schemes aimed at taking advantage of such a credit. The credit should not be allowed for other types of disposal of fuel sludge such as re-refining. In addition, the credit should be restricted to fuel sludge from inland waterway barge transportation. The credit should also be restricted to firms that have completed form 637 (Excise Tax Registration) and registered with the Internal Revenue Service. This would insure oversight of registered firms and would greatly reduce the cost of this legislation as increased fuel excise taxes that result from decreased evasion would offset some or all of the costs of the tax credit, since non-637 firms generally do not pay federal excise taxes. Companies that reformulate fuel sludge into blendstock gasoline and other petrochemicals should collect and submit excise tax payments to the IRS.