S. HRG. 112–675

ALTERNATIVE ENERGY TAX INCENTIVES: THE EFFECT OF SHORT-TERM EXTENSIONS ON ALTERNATIVE TECHNOLOGY INVESTMENT, DOMESTIC MANUFACTURING, AND JOBS

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE

OF THE

COMMITTEE ON FINANCE

UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

DECEMBER 14, 2011

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PRINTING OFFICE

77–605—PDF WASHINGTON : 2011

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

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ALTERNATIVE ENERGY TAX INCENTIVES: THE EFFECT OF SHORT-TERM EXTENSIONS ON ALTERNATIVE TECHNOLOGY INVESTMENT, DOMESTIC MANUFACTURING, AND JOBS

WEDNESDAY, DECEMBER 14, 2011

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

The hearing was convened, pursuant to notice, at 9:43 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Jeff Bingaman (chairman of the subcommittee) presiding.

Present: Senators Carper, Wyden, Kerry, Grassley, Cornyn, and Thune.

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. Why don't we try to get started here? We are 2 or 3 minutes early, but we have been advised there is going to be a vote or two votes beginning at around 10:45. So we would like to get going and get as much of the hearing done as possible before those votes.

Good morning. Today's hearing examines "alternative energy tax incentives: the effect of short-term extensions on alternative technology investment, domestic manufacturing, and jobs."

Given the impending expiration of various tax provisions related to alternative energy and energy efficiency, this hearing is very timely. At least 10 important provisions expire in a little over 2 weeks. And in 2012, there will be an expiration of five other significant energy provisions. Allowing those incentives to expire will have, in my view, a negative impact on the country's ability to develop alternative energy resources.

In the past 5 years, alternative energy in the United States has gone from a halting, uncertain industry to a young but rapidly growing sector of the economy. We can attribute part of this success to several years of predictable and consistent government incentives, but, overall, incentives for alternative energy are still primarily short-term, and manufacturers and developers and investors routinely face significant uncertainty surrounding Federal policy.

One example of how inconsistent Federal policy affects the energy industry is the production tax credit. This credit supports a variety of alternative energy production, including wind, geothermal, refined coal, and nuclear. It has been allowed to lapse 3 times since originally enacted. Each time, the installation of new wind energy dropped precipitously the following year, the first time by 93 percent, the second time by 73 percent, and the third time by 77 percent.

So, fossil fuel provisions offer an excellent example of a successful Federal support structure. Predictable long-term incentives and aggressive research efforts have helped to build a global industry. More recently, they have aided in discovering and accessing vast new deposits of oil and gas, and those efforts have paid off.

Our oil import dependence peaked in 2005 and is set to continue to decline in coming decades. The natural gas production continues to expand so much that the Department of Energy is now considering at least six natural gas export permits.

Despite the success of these conventional energy resources, several reasons exist for the U.S. to maintain and expand policies to aggressively diversify its energy resources. These include price stability, energy security, economic growth, and environmental concerns.

In my view, we should be employing an all-of-the-above strategy for developing all energy resources, and we should be crafting focused and efficient tax policies that will help us get there.

So we will look today at the frequent short-term extensions and expiration of alternative energy tax incentives; second, try to understand how they have affected the alternative energy industry in the United States, the build-out of manufacturing facilities, supply chain issues, and employment; and finally, what needs to be done on energy tax provisions to continue transitioning our economy to a clean energy economy.

[The prepared statement of Senator Bingaman appears in the appendix.]

Senator BINGAMAN. Let me call on Senator Cornyn for his comments.

OPENING STATEMENT OF HON. JOHN CORNYN, A U.S. SENATOR FROM TEXAS

Senator CORNYN. Thank you, Mr. Chairman, for holding today's hearing. I want to thank the witnesses for being here today to share with us their expertise and perspectives.

I know we are going to hear today a lot about the need to provide industry with certainty and predictability when it comes to the tax code and job creation and looking at the costs and benefits of Federal policy.

Given that too many Americans remain out of work, I want to take the opportunity just to mention one subject which is energy-related, but it is not directly related, and that is the shovel-ready Keystone pipeline project, which does not need any tax incentives, but it is in need of a presidential permit.

This project means, not only additional energy security for the United States, but thousands of jobs and revenue to communities, States, and to the Federal Treasury.

In my State, in Texas, we believe in an all-of-the-above energy policy. We know that the backbone of any successful economy is a stable and secure supply of affordable energy. We are blessed with a diverse array of energy sources and industries providing solid employment in Texas, while supplying the Nation.

We are, not surprisingly perhaps, the leading crude oil producing State in the Nation. Our State's 27 refineries can process more than 4.7 million barrels of crude per day, and they account for about one-fourth of total U.S. refining capacity. We are also the Nation's leading natural gas producer and also lead the Nation in wind-powered generation capacity.

Unfortunately, when you look at the message being sent from Washington and received across the country, it is a mixed message and a confusing message when it comes to national energy policy, particularly domestic oil production, blaming the industry for high gasoline prices and accusing them of sitting on resources while, at the same time, arguing that tax incentives lead to over-production and should be discontinued, and delaying permits for new drilling, particularly in the Gulf of Mexico, while telling Brazil that the U.S. will be their best customer.

To obtain some basis and some facts necessary for an intelligent discussion of targeted tax incentives for energy, I requested a memo earlier this year from the Congressional Research Service. That memo looked at only the targeted tax incentives, and its findings are worth summarizing here, which I will do briefly.

During 2009, 77.9 percent of U.S. primary energy production can be attributed to fossil fuels, 77.9 percent, while 10.6 percent was provided by renewable resources. Of the Federal tax support to energy in 2009, an estimated 12.6 percent supported fossil fuels, while 77.4 percent supported renewables. In other words, while the majority of U.S. primary energy production came from fossil fuels, the majority of energy tax revenue losses were associated with provisions designed to support renewables.

Many today will argue for extensions of valuable tax incentives for their type of energy, and I think the time has come to evaluate tax policy based on value to the taxpayer. I am going to quote my good friend Senator Carper here, who last week said we need to ask the question, "Are we getting the best bang for our buck from all of them, and which ones should we extend, modify, or eliminate?" Who says bipartisanship is dead in Washington? I agree with Senator Carper.

I hope today's hearing continues a serious discussion and examination of the various credits and deductions in the Internal Revenue Code. It is no secret, as the President's own bipartisan fiscal commission documented in excruciating detail, our current tax code is a never-ending maze, full of twists and turns that can only confuse and befuddle even the experts. It is in dire need of reform, and nothing—nothing—should be off the table.

When examining renewable incentives, it is important to consider to what extent other policies already exist to assist alternative energy industries, such as renewable electricity mandates and fuel quotas.

Finally, what about the challenges that exist with or without the tax incentives, such as the limitation on our Nation's grid for vari-

able sources of energy, and how are incentives utilized for overcoming risk? For example, there are fundamental differences in an independent oil and gas producer purchasing a lease to explore for a resource and a company building a wind farm or solar installation for electricity use where power purchase agreements are made to sell the electricity generated.

In my view, these questions should not be separate from the discussion about extenders, because they are essential to protecting the taxpayer-funded investment in these projects.

Thank you very much, Mr. Chairman. I look forward to hearing from the witnesses.

[The prepared statement of Senator Cornyn appears in the appendix.]

Senator GRASSLEY. Mr. Chairman, could I have 1 minute?

Senator BINGAMAN. You can. Senator Kerry may want a minute, and Senator Carper may want a minute. I do not mind if each of you takes a minute.

Senator GRASSLEY. I have to go to the floor.

Senator BINGAMAN. Go right ahead.

OPENING STATEMENT OF HON. CHUCK GRASSLEY, A U.S. SENATOR FROM IOWA

Senator GRASSLEY. I would like to explain that I will not be at this meeting because of the balanced budget amendment on the floor and then because of our oversight hearing in the Judiciary Committee with the FBI.

But I want to put a long statement in the record and just simply say that both political parties believe that we ought to be doing things related to getting jobs. And one of the things that I am the author of is the wind energy tax credit of 1992, and it does not expire until next year. But effectively, it expires, as far as the jobs are concerned, March to June of this year, in my State of Iowa, for instance.

When I sponsored this bill almost 20 years ago, I did not have the slightest idea we would have companies coming from other countries to locate in Iowa to make component parts. But we would have 3,000 to 4,000 jobs in jeopardy if we do not extend the wind energy tax credit a long time before it expires next December 31.

And that is not my only interest, because you know my interest in biofuels, but I just wanted to make clear why I could not be here and emphasize the job aspect of this.

Thank you very much, Mr. Chairman.

[The prepared statement of Senator Grassley appears in the appendix.]

Senator BINGAMAN. Thank you very much.

Senator Kerry, did you want to make a very short statement, too?

Senator KERRY. Mr. Chairman, I will come back. I need to go away and come back, and then I will say a few words about it so I do not tie it up right now. But thank you very much anyway.

Senator BINGAMAN. Thank you.

Let me introduce our five excellent witnesses here. Dr. Molly Sherlock is an Analyst in Economics with the Congressional Research Service and has done a lot of analysis in this area. Will

Coleman is a partner with Mohr Davidow Ventures, which is a venture capital firm. Martha Wyrsch is the president of Vestas-American Wind Technology. Thank you for being here. Paul Soanes is the president and CEO of Renewable Biofuels, which is based in Houston, TX or near Houston, TX. Dr. Margo Thorning is the senior vice president and chief economist at the American Council for Capital Formation. Thank you for being here.

Why don't we just have you proceed in that order? And, if you could each give us about 5 minutes, making the main points you think we should understand about this set of issues, then we will have some questions.

Dr. Sherlock, go right ahead.

STATEMENT OF DR. MOLLY SHERLOCK, ANALYST IN ECONOMICS, CONGRESSIONAL RESEARCH SERVICE, WASHINGTON, DC

Dr. SHERLOCK. Thank you. Good morning. Chairman Bingaman and Ranking Member Cornyn and members of the subcommittee, on behalf of the Congressional Research Service, I thank you for the opportunity to appear before you today.

There are three main themes I will address in today's testimony. First, I will identify energy-related tax incentives scheduled to expire at the end of 2011. Second, I will discuss the negative effects temporary tax incentives may have on the renewable energy industry. Finally, I will outline characteristics of an economically efficient and effective energy tax policy.

A number of clean energy industries benefit from tax incentives scheduled to expire. Since 2009, renewable energy investors have had the option to receive a 1-time grant from the Treasury in lieu of production or investment tax credits. This incentive is available to projects that begin construction before the end of this year.

After the grant option expires, the renewable energy production and investment tax credits will remain available. The production tax credit for wind, however, is scheduled to expire at the end of 2012. Also expiring are several provisions that support renewable and alternative fuels. The $.45 per gallon tax credit for ethanol is set to expire, as is the $1 per gallon tax credit for biodiesel.

Finally, several tax provisions that support enhanced energy efficiency are scheduled to sunset this year. After 2011, taxpayers making energy efficiency improvements to their homes will no longer qualify for a tax credit. Other incentives scheduled to expire include a credit for energy-efficient appliance manufacturers and a credit for builders of energy-efficient new homes.

The second point you asked me to address today is related to the impact of temporary tax incentives on renewable energy industries. In theory, temporary tax incentives might provide economic stimulus or help new technologies achieve scale. In practice, very few temporary tax incentives, after becoming part of the Internal Revenue Code, are actually allowed to expire. Nonetheless, the frequent threat of expiration and potential for policies to lapse can have negative consequences for the industries these incentives are designed to support.

Take, for example, the production tax credit for wind. The PTC has been extended 7 times since being enacted in 1992. Prior to

three of these extensions, the credit was allowed to lapse. Lapses in the PTC have been associated with substantial declines in new wind development.

With uncertainty surrounding the fate of the PTC, some projects were stalled or put on hiatus. Project developers may be left on standby, waiting for the credit to be reinstated before moving forward. Wind development that occurs in fits and starts can create bottlenecks in the turbine manufacturing process, which might delay projects and increase overall costs.

Clean energy manufacturers may also be reluctant to make permanent investments when tax credits supporting demand for their product remain in flux. Biodiesel markets also experience declines in production following the expiration of tax incentives. Between 2005, when the tax credits for biodiesel were introduced, and 2008, biodiesel production steadily increased. Biodiesel production began to decline in 2009, and, after the tax credit for biodiesel expired at the end of that year, the decline continued into 2010.

The tax credit for biodiesel was reinstated at the end of 2010, and, in 2011, biodiesel production is up. However, it should be noted that the markets for wind and biodiesel are influenced by a number of factors, tax incentives being just one. Natural gas prices and State-level Renewable Portfolio Standards influence wind development. Biodiesel markets are affected by the price of regular diesel and mandates for renewable fuels.

Finally, I would like to note some characteristics of economically efficient energy tax policy. First, cost-effective incentives are those that encourage changes in behavior rather than those that reward current practices.

Second, incentives made available to a broad range of technologies avoid picking winners. Technological neutrality will remove a bias against newly emerging technologies.

And finally, energy tax policy does not exist in a vacuum. Tax policies may interact with or be redundant to other policies supporting energy. This issue has been raised with respect to tax incentives for renewable fuels under the renewable fuels standard.

Thank you again for inviting me to appear today. I am happy to respond to your questions.

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

Senator BINGAMAN. Thank you very much.

Mr. Coleman, go right ahead.

STATEMENT OF WILL COLEMAN, PARTNER, MOHR DAVIDOW VENTURES, MENLO PARK, CA

Mr. COLEMAN. Thank you, Chairman Bingaman, Ranking Member Cornyn, and distinguished members of the committee. I appreciate the opportunity to be here today.

I am Will Coleman, a partner at the venture capital firm Mohr Davidow. Since 1983, we have funded over 250 companies in information technology, life sciences, and energy. We were one of the earlier mainline venture funds to begin investing in energy and have since invested in a range of sectors, including biochemicals, solar, and battery materials, among others.

As early-stage investors, we invest in companies from startup to initial commercialization, and we have seen the challenges of building and scaling businesses in energy.

I am here today to focus on two topics: first, how uncertainty about the future of current tax provisions is impacting investment in the energy sector and, second, how the energy industry is facing a growing innovation gap that requires a more stable and supportive environment if our country is to remain competitive.

Tax policy has always played a significant role in the evolution of the energy industry, from the establishment of the percentage depletion allowance 80 years ago to, more recently, the establishment of a series of tax incentives for the deployment of renewable energy.

As global demand continues to strain conventional resources, most of our Nation's competitors have recognized that new technologies are becoming increasingly strategic. The current production and investment tax credits in the U.S. have been instrumental in mobilizing private capital to invest in clean energy. Over the last 5 years, wind and solar have been the fastest-growing energy sources. Over that time, the cost of solar modules has dropped 80 percent. And in just the last 3 years, wind costs have dropped 30 percent. In comparison, the cost of coal, oil, and even natural gas has risen significantly over the last decade.

Despite the growth of renewable technologies, these sectors are still in their infancy. We are rapidly approaching the point where several alternative technologies could compete on a level playing field in the absence of subsidies. However, we are not there yet.

The current situation for renewables is emblematic of the broader flaws in our approach to energy tax policy, for two reasons. First, uncertainty over extension of current clean energy provisions is undermining short- and long-term investment just as some of these technologies are beginning to reach commercial viability; and, second, the current tax code does not support ongoing innovation in substantially new technologies that would continue to drive down the costs in both emerging and conventional energy sectors.

Unlike in oil and gas, where the current credits are almost all permanent and provide investors and corporations with enough certainty to make long-term investments, almost all the credits for the renewable sector are set to expire in the next few years.

The lack of certainty is a major challenge for developers, manufacturers, and investors. The project development process can take 3 to 4 years for proven energy technology that has already been demonstrated to work in the field, but even longer for new innovative technologies. For these kinds of technologies, 3 to 5 years of development and demonstration are typically required before they even begin to develop a commercial project, and often 7 to 10 years before large-scale commercialization begins. So it takes a long time.

This is why investors need certainty and otherwise will choose to invest in areas with more permanent structures. And so the current provisions need a longer horizon.

At the same time, as a technology investor, I believe the goal should not be to prop up industries to keep them competitive indefinitely, but rather to support the innovation and scaling necessary for them to be competitive in the long term without sup-

ports. Therefore, I believe it is also time to consider some new approaches that will improve the efficiency of the current energy tax code.

Our competitiveness as a Nation depends on harnessing technology innovation, which has been credited with three-quarters of the Nation's growth since World War II. We need to focus on unlocking this innovation in both renewables and conventional energy sources. This requires new inventions and that these inventions achieve economies of scale to compete.

Our tax policy needs to better address these scaling challenges. Fortunately, there are some relatively simple ways to reform the tax code to be more efficient and flexible, while encouraging investment in new and improved technologies across all of the energy sectors.

One such approach, as I detailed in my written testimony, would be a volume-based credit for individual companies that would support early manufacturing of new technologies and then roll off as these technologies hit commercial scale. This approach would simplify the code and eliminate the long-term dependence on incentives that has plagued many energy tax provisions.

In concluding, let me end with a note of urgency. Tax credits are a central tool in the American policy framework to incentivize innovation. If we do not get them right, it is not just that we forego a better way of doing things, we may, in fact, cripple America's ability to compete.

Our economic strength over the next several decades will depend, not just on how effectively we harness existing resources, but also on how we choose to cultivate newer sources of energy. The focus must shift to accelerating the rate of innovation, continuing to reduce the cost to taxpayers, and establishing long-term regulatory certainty for investors to unlock private investment in innovative companies.

We have the talent, the capital markets, and the capacity to lead in energy technology. I hope this committee will move forward quickly on some of these important reforms, and I look forward to the opportunity to work with you in the coming months.

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

Senator BINGAMAN. Thank you very much.

Ms. Wyrsch, go right ahead.

STATEMENT OF MARTHA WYRSCH, PRESIDENT, VESTAS-AMERICAN WIND TECHNOLOGY, PORTLAND, OR

Ms. WYRSCH. Thank you, Chairman Bingaman, Ranking Member Cornyn, and members of the subcommittee. My name is Martha Wyrsch, and I am president of Vestas-American Wind Technology, the North American arm of Vestas Wind Systems. On behalf of Vestas's 3,000 employees in the United States, thank you for the opportunity to discuss tax policies to support renewable energy.

Wind energy is a success story, and it is one that Congress can be very proud of. The section 45 production tax credit, or the PTC, has been a successful tool in driving a new energy economy in America.

Wind energy now represents a manufacturing base that employs tens of thousands of workers across the U.S. in high-wage, high-skill jobs with medical and retirement benefits.

Vestas is the global leader in designing, manufacturing, and supplying wind turbines. We have been doing business in the United States for more than 30 years, supplying more than 11,000 wind turbines in 26 states. Since 2008, we have invested over $1 billion in four U.S. manufacturing plants and now employ more than 1,800 Americans in these factories.

The domestic content of wind turbines in the United States has grown from 25 percent to over 65 percent, and, in Vestas, it is even higher. Our presence is felt in nearly 40 States, with four technology facilities, more than 100 wind parks, and through our relationships with our suppliers.

If the PTC is not extended immediately, the U.S. wind industry will face very serious challenges. Without an extension, we at Vestas will have to make tough decisions on our employment and investments beyond 2012.

A report released earlier this week by Navigant Consulting, titled "Impact of the Production Tax Credit on the U.S. Market," estimates over 37,000 domestic jobs in the wind industry could be lost if the PTC is not extended.

Predictable, long-term tax and energy policies are critical to continued growth of wind energy as a low-cost, reliable, domestic source of electricity. I strongly urge the immediate extension of the PTC to ensure the continued development of wind energy and the domestic manufacture of wind turbines.

As a former natural gas and electric utility executive, I have seen firsthand how policy measures, particularly the tax code, can impact energy generation. Congress has long incentivized energy technologies, and many of those incentives are permanent in the tax code. Wind and other renewables have received tax incentives in recent years, but the policies have been short-term. This has made it difficult for companies and investors to plan and make long-term investment decisions.

Since 1999, the PTC has been set to expire 7 times. As a result, the industry has seen a boom-and-bust cycle of development, with significant drops in installations in years following the PTC expiration, and the cycle is shown in a chart on page 2 of my written testimony.

From 2008 to 2011, the U.S. experienced an enormous increase in wind energy development due to the longer-term extension of the PTC. According to the American Wind Energy Association, average investments in domestic wind energy have been between $10 billion to $15 billion per year since 2008.

But nothing is more unsettling to a business than the lack of regulatory and fiscal certainty. Although the PTC does not expire until the end of 2012, the impact is being felt now. The development cycle of a wind farm from conceptualization to operation averages about 3 years.

Suppliers require significant lead time to ensure they have produced quality parts for wind turbines. When orders are slowing down due to a looming expiration of the PTC, our business suffers.

Today there are essentially no firm plans to build wind farms in the United States past 2012, and, instead, developers are turning their wind energy investment dollars to other countries.

Thanks to the support of many on this committee, wind energy is becoming an American industry. However, our future is in jeopardy, and the impact of allowing the PTC to expire or extending it at the last hour is much greater than in previous years, because our presence today is so much larger than it has been in the past.

So, again, I ask you, please move quickly to extend the PTC, and thank you for the opportunity to provide this testimony.

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

Senator BINGAMAN. Thank you very much.

Mr. Soanes, go right ahead.

STATEMENT OF PAUL SOANES, PRESIDENT AND CEO, RENEWABLE BIOFUELS, HOUSTON, TX

Mr. SOANES. Mr. Chairman, Ranking Member Cornyn, and members of the committee, thank you for the invitation to appear today, and thank you for your leadership in securing energy independence for our Nation and your support of the biodiesel industry.

By way of introduction, my name is Paul Soanes. I am president and CEO of Renewable Biofuels. We own and operate the largest biodiesel plant in the country, a 180-million-gallons-per-year facility in Port Neches, TX.

I am here today to testify to three points. First, it is essential that Congress act and act now to extend the blenders tax credit. This tax credit provides price certainty to our industry and provides an important incentive to fuel blenders and refiners to use our product.

Secondly, as the market develops, we would ask Congress to consider alternatives to the present system that can further enhance the production of domestic biodiesel and provide energy independence for our Nation. In this regard, we refer to the production tax credit alternative that is being proposed by Senators Cantwell and Grassley, which essentially would promote the development of domestic biodiesel production and American jobs, as the production credit would only be available for biodiesel produced within the U.S.

Thirdly, we see significant value in having stable energy policy coexist with stable tax policy. In that regard, we applaud Congress for passing the renewable fuel standard in the 2007 law, which created a specific mandate for the use of biodiesel within America and provided producers with a dedicated demand and with market certainty, which is essential for the continued development of the biofuels industry.

Returning to the specific topic of today's hearing, the impact of tax incentives on production, I would draw your attention to the chart on my left-hand side. As you can see from the chart, from 2005 to 2009, when the industry enjoyed a consistent extension of the blenders tax credit, biodiesel production grew from 28 million gallons in 2004 to 678 million gallons in 2008.

In 2010, the blenders tax credit lapsed before being reinstated at the end of the year, but the impact of that was dramatic. We saw

a 40-percent reduction in production from 2009 to 2010, with over 90 percent of independent producers either mothballing or shutting down their facilities, with a massive loss of jobs and investor confidence in the sector.

This brings us full circle to 2011, where, for the first year, the industry could rely on both implementation of the renewable fuel standard through RFS–2, which provided market certainty, and the blenders tax credit, which was extended, providing price certainty.

The result was, the industry experienced unprecedented growth and is on track to produce over 1 billion gallons of biodiesel production in 2011, a 300-percent increase from the 2010 levels.

The experience of RBF during this time period mirrors that of the industry. In 2010, we produced at less than 5 percent of the plant nameplate rating, and we had to opportunistically source sales and manage through the 2009–2010 bust cycle in the biodiesel industry.

In 2011, we are on track to produce in excess of 62 million gallons of biodiesel, a 700-percent increase from our production levels in 2009. We have increased our workforce 3-fold, and we are investing additional capital to improve our production capability, quality of our product, and feedstock variability.

What this graph does not show you is what has yet to occur, which is what would happen if the blenders tax credit is not extended for 2012. In our view, history is the best predictor of the future, and we believe that, if the blenders tax credit is not extended, you will see activity similar to 2010, and you will see an erosion of market demand and investor confidence in the sector, and a significant mothballing and shutdown of domestic biodiesel or the biodiesel industry.

The looming expiration of the blenders tax credit is already having an impact. Orders for 2012 are almost nonexistent and are significantly down from our 2011 orders, and there is very little market confidence, with obligated parties preferring to take a wait-and-see approach on the expiration of the blenders tax credit before deciding to either purchase their fuel requirements or defer their RFS–2 obligations.

In closing, the biodiesel industry is young and needs continued tax support to mature and consolidate its growth over recent years and to attract additional capital for blending infrastructure and for next-generation production facilities.

The industry is like a child in the sense that it requires some nurturing before it can be self-sufficient. If Congress does not act to extend the blenders tax credit in a timely manner, it will have a significant negative impact on American production capability, which will result in a loss of jobs as production is curtailed and/or mothballed, and will put at risk the worthwhile goals of the 2007 Energy Independence and Security Act.

Thank you, Mr. Chairman and Ranking Member Cornyn, for convening today's hearing, and I would welcome an opportunity to address any questions you might have.

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

Senator BINGAMAN. Thank you very much.

Dr. Thorning, go right ahead.

STATEMENT OF DR. MARGO THORNING, SENIOR VICE PRESIDENT AND CHIEF ECONOMIST, AMERICAN COUNCIL FOR CAPITAL FORMATION, WASHINGTON, DC

Dr. THORNING. Thank you, Chairman Bingaman, Ranking Member Cornyn, members of the committee, for the chance to appear before you.

The main focus, I think, for Federal policymakers needs to be on restoring strong economic and job growth. Two and a half years after the beginning of the recovery, there are still 13.3 million people unemployed. GDP is growing at only 2 percent, which is too slow to significantly reduce unemployment. The budget deficit is still 9 percent of GDP. CBO estimates that by 2020, if we do not change the current trend, our debt will be 80 percent of GDP.

Energy is essential to U.S. economic growth. In the recent past, each 1 percent increase in GDP is accompanied by a .2 percent increase in energy use. As energy becomes more expensive, restoring economic growth will be even more difficult.

Since 2001, residential electricity prices have risen by 37 percent. Since 2006, residential electricity prices are up by about 13 percent. Renewable energy tends to be more expensive than conventional energy. States with RPS mandates have electricity prices that average 25 to almost 30 percent higher than those without an RPS mandate.

Adopting a Federal mandate for a clean energy standard will raise energy prices by 20 to 27 percent, according to a new Energy Information Administration analysis, by the year 2025 relative to the baseline forecast. GDP declines in all the cases EIA analyzed over the forecast period, and unemployment is lower. Under the CES standard, average unemployment is significantly reduced.

Renewable energy received 76 percent of all the Federal tax subsidies and credits in the year 2010, and, of course, fossil fuel got about 13 percent. The tax policy should be relatively neutral, most economists think. Tax provisions such as accelerated depreciation, the foreign tax credit, section 199, LIFO, are available to all industries and, as such, they are not considered subsidies.

In contrast to the disappointing results from the many initiatives funded in recent years by the U.S. taxpayer for renewable energy, several recent economic analyses suggest that increased access to domestic oil and gas, both offshore and onshore, including shale gas and transportation, could strongly boost U.S. economic recovery and manufacturing and job growth.

Fossil fuels, as has been noted, provide 78 percent of U.S. primary energy production, and their expansion can have a positive impact on strong economic growth.

The best use of taxpayer dollars for renewable energy is probably for R&D rather than for deployment. By subsidizing the deployment of renewable energy, Federal spending is larger, and consumers and industries are forced to spend more on energy and thus have less for other purchases or for productive investment.

So the costs, I think, tend to exceed the benefits. Greenhouse gas reduction globally is going to depend on efforts in developing countries to slow their own growth. What we do here, as I show in figure 3 in my testimony, will have a very small impact in terms of reducing global GHG growth.

Expansion of our domestic oil and gas industry is already reducing our dependence on foreign oil.

Finally, there was an article in the *Washington Post* Monday that maybe some of you saw, a very small article about the—the title was "Poor People are Bracing for Cuts in Home Heating Assistance." The Federal budget is so tight, so straitened, that funding for LIHEAP has been cut from, I think, about $4.9 billion a year to $4.4 billion a year. So low-income people who are plagued by the higher electricity bills that I mentioned earlier are going to be hurt, because our Federal budget simply is not able to provide the same level of support as before.

So my question is: What is the best use of the taxpayer dollar? Would it be better to be providing support for unemployed, poor people who are having trouble paying their heating bills or funding deployment of very expensive renewable energy?

Thank you.

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

Senator BINGAMAN. Well, thank you very much. Thank you all for your excellent testimony. Let me start out with some questions.

Dr. Sherlock, let me ask your view. One of the issues that Senator Cornyn referred to, I believe Dr. Thorning did as well, is that 77 or 76 percent of the Federal tax incentives are going to renewables, or did in 2009 and 2010.

I guess I would have two questions. First, what do those numbers look like if you take out ethanol? And second, what do they look like if you do not look at those particular years where there was substantial funding, as I recall it, for renewables as part of the stimulus package, if you look at a longer time period?

Dr. SHERLOCK. On the first point, if you remove renewable fuels, the share of tax incentives that supported renewable electricity in 2009 was 14.6 percent. So that declines from 77.4 percent to 14.6 percent.

Senator BINGAMAN. That is leaving out ethanol and other biofuels, is that right, or just ethanol?

Dr. SHERLOCK. Yes.

Senator BINGAMAN. But mainly ethanol.

Dr. SHERLOCK. But mainly ethanol. Ethanol is the big factor. And if you remove the incentive, such as the section 1603 grant that was a temporary incentive enacted under the Recovery Act, that figure would fall even further. I do not have the precise number in front of me, but it would fall again by about half.

Senator BINGAMAN. Let me ask Ms. Wyrsch: the way I am understanding your position, the wind industry's position, your top priority is extending the production tax credit rather than extending the 1603 program. Is that accurate, and, if so, could you explain that?

Ms. WYRSCH. Yes, Senator. The 1603 program has been a real benefit to the wind industry and certainly has helped spur additional growth. But extending 1603 does not get us past the end of 2012.

In other words, what we would like and need is a program that takes us beyond that 2021 deadline and moves projects along, because, as I said, the 3-year timeline for a project is a horizon that

we have to pay attention to. An order of turbines is about a 12-month horizon.

So a customer will come to us at this time of the year and say, "For 2013, we need these turbines for these new power plants that we are building," and with the extension of 1603 to, let us say, another year, we would simply be finishing out projects that are currently on the books and already being planned.

Senator BINGAMAN. So a longer-term extension of the production tax credit would be a better way to go than a short-term extension of 1603. Is that what I am hearing?

Ms. WYRSCH. Yes, Senator. It is really critical to us, because the production tax credit, of course, focuses on generation of electricity, and the tax credit is used as new electricity is generated from those wind parks. And so a longer-term extension is required for these long-term planning horizons.

Senator BINGAMAN. Mr. Coleman, let me ask you: I think some of the testimony we have heard here—I believe Dr. Thorning's testimony tries to make the point that some of these technologies are not really infant industries anymore.

Could you offer your thoughts on wind and solar as to how far they are from being mature industries that can stand on their own? What are we looking at here as far as the length of time that Federal incentives would be required?

Mr. COLEMAN. I think Ms. Wyrsch can probably speak to the wind industry better than I can in terms of the competitiveness of that industry long-term. However, I think that we have to look at these sectors not as monochromatic individual sectors, but more as collections of different technologies that are on different cost curves.

So I think the question is, are we continuing to move down that cost curve for wind as a whole and are there additional technologies in the pipeline that are starting to move through, that will move that cost base down even lower?

What we see looking at the early-stage technologies is that there are a lot of technologies in the pipeline in both solar and wind, and biochemicals and biofuels, across the board, that promise much lower cost bases. And so I think we need enough certainty to continue to move the scale in the industry up, and scale will give us a lot of those cost directions, but we also need enough long-term certainty that early-stage investors will continue to invest in those innovations.

Senator BINGAMAN. All right. Thank you.

Senator Cornyn?

Senator CORNYN. I thank each of the witnesses.

There seemed to be several themes in common with the testimony here. One is that, whatever Congress does, it should not be done in fits and starts, but on some basis that would allow for planning and predictability. You could probably say that about a lot more than just this subject, but I wholeheartedly agree. So anything we can do to provide some predictability and some opportunities for longer-term planning would strike me as a good thing.

But the other challenge that has not been directly alluded to is really the need for a national energy policy that takes into account all sources of energy and what the best deployment of scarce tax

dollars would be to encourage innovation, and to figure out, once that innovation has occurred, once an industry is sufficiently mature, I guess is the appropriate term, that it does not need any more tax subsidy, that it can operate on the good old capitalist system of risk and reward.

So I wonder if maybe I should start with you, Dr. Sherlock. At what point do you believe that the tax subsidies are no longer appropriate for an energy source, as a general rule?

Dr. SHERLOCK. As a general rule, tax subsidies can be used to support a few different instances when markets may fail to allocate economic resources efficiently. One rule is for industries that are still scaling up. So those are the so-called infant industries, and that is a difficult distinction to make as to when those industries have become mature.

A second point when tax subsidies for an industry may be needed is when there is some other form of market failure. So part of the economic justification or rationalization for supporting renewable energy through subsidies has been to offset some of the pollution generated through conventional energy sources.

So long as we are looking at the market failure from that perspective, there may be an economic justification for supporting renewable energy.

Senator CORNYN. Mr. Coleman, what, in your view, is—how should Congress approach the issue of tax incentives on new and emerging energy sectors or capacities? Is it with the idea of providing incentives with just the hope that someday, when the tax incentives are removed, that it might be able to run on its own?

What I worry about is, how does Congress avoid creating incentives that drive the production of this particular energy source which will never be viable on its own?

Mr. COLEMAN. I think that is part of the challenge of the current provisions. We get in a fairly annual debate over whether or not the industries are ready to roll off or not.

Senator CORNYN. That is on a sector or industry-by-industry basis, right?

Mr. COLEMAN. Yes. And I think part of what we are proposing in the written testimony is something that is targeted more specifically at companies. You have seen examples of this in the tax code. But effectively, what it would do is, it would encourage those companies to get to scale. It would only be provided to those companies until they reached a minimum efficient scale around their commercial deployment, and then it would roll off.

And it would not be a debate about whether or not the industry is ready. It would be based on the idea that, once you get to commercial scale, you should be competitive. And in that way, it provides investors the certainty to actually know what kind of credit they are going to get and for what duration of time, and it also means that the investors, the private investors, are the ones who are sitting there saying, this company, this technology, eventually has to compete on its own two feet. When will that be? Where is the bar, and how do we get there?

Senator CORNYN. Well, that is something that probably a venture capital firm is more nimble at and flexible at than the Federal Government.

But, Ms. Wyrsch, as you know, Texas, as you said and I said, is the number-one electricity producer from wind energy. So this is a very important industry in the State. But I would just ask you the question.

I alluded earlier that predictability and planning opportunities are really important across the businesses generally, and in this sector as well. But at what point should Congress say, or can Congress say, in the wind energy production, that these tax incentives would no longer be necessary and we should enter onto a trajectory where they would be ultimately phased out and wind energy would compete along with other renewable resources?

Ms. WYRSCH. Texas is a terrific example, actually, of a State that has built a base for strong research and development and innovation. And so, as the wind industry has grown and started to become a more mainstream source of electricity, we have looked to States like Texas to help us ensure that we are effectively getting onto the grid, for example, that we are an industry that can compete in that marketplace.

And so, as an example, the wind industry has seen dramatic cost reduction, but also significant improvement in the productivity of the wind turbine. And so, compared to 10 years ago, a wind turbine is about 15 times as productive in terms of electricity output.

We also have seen costs come down, as was said earlier, by, in the last 3 years, over 30 percent and in the last 20 years, significantly, almost 90-percent lower cost.

So I would tell you that having an industry that has long-term support and long-term focus is one that is going to then invest in research and development, invest in productivity, and ensure that we are there.

You are asking when we would get to a point where we are at a scale and a size where we would not need support, and I will tell you the wind industry is not looking for a long-term PTC, but we need something that will help us bridge now this period where we are very close to being directly head-on-head competitive, but we are not quite there. And so, to stop now and stop short, when you have a manufacturing base in the United States supporting wind energy that was not here before, you have an opportunity to create jobs and see new, better wind turbines continue to be developed, it would be a mistake for us to stop short, and I think we have to take that longer view.

Senator CORNYN. My time is up, Mr. Chairman.

Senator BINGAMAN. Senator Wyden?

Senator WYDEN. Thank you, Mr. Chairman and Senator Cornyn. I think it is a very important hearing and, obviously, especially timely given the fact that we are going to have a big debate here over the next few days about extending several of the credits.

My hope is that two would somehow make it through the gauntlet: section 45, the production tax credit, and section 25(c) for the residential incentives. But both of you have kind of highlighted a number of the tensions in this kind of debate in a very thoughtful way.

Ms. Wyrsch, welcome, great to have you, a constituent from home, and we are thrilled to have Vestas as the North American headquarters.

Picking up on what Senator Bingaman and Senator Cornyn have been talking about, I mean, at some point, we are going to have to sort through these issues to see if we can come up with something resembling a marginally coherent policy. I think that is the way I would frame it, and I certainly share Senator Cornyn's view with respect to how the government approaches these things and its ability to be nimble here.

What I have tried to look at in terms of how I have approached it on this committee, on the Energy Subcommittee chaired by Senator Bingaman, is to try to see if we can find our way at least to a level playing field, because right now we have some energy industries with permanent tax incentives while they compete against others that do not, and then we have disparities among technologies even within the renewable energy sector.

So there is sort of a policy crazy quilt in terms of how we make some of these judgments. And I think, to the extent that you all can help us think through how to find our way to a level playing field, that will be especially constructive.

I thought, because time is short, I wanted to focus on one area for you, Ms. Wyrsch, and you, Mr. Soanes. I think the staff talked to you all about this. We have been supportive of the kinds of efforts that you all are talking about, and, at the same time—and you heard my colleagues say this as well—you cannot make a case for tax credits just going on forever, to just say, through the rest of Western civilization, we will have these particular tax credits.

So the question then becomes, can we find our way to some criteria, some specific criteria, for figuring out how this committee, and working with the Energy Committee, can, in effect, wean an industry off a particular credit? And the two that come to mind for me when we are talking about this would be market share and competitive prices. Those would be two that, at least if you said an industry reached this place in market share or competitive prices, that might start to lay a bit of a direction.

But tell us, if you would—and this picks up on what Senator Cornyn just, I think, touched on—what kind of criteria should the Finance Committee use for judging when to make a break and wean an industry off a particular tax break or incentive?

Let us start, as we always should, with Oregon.

Ms. WYRSCH. Thank you very much, Senator. I think you have articulated two very important measures, certainly, market share and price competitiveness. But I think, referring back to Mr. Coleman's testimony, markets have a very clear view of how businesses are doing and whether they are successful and the extent that, as an industry, we can be put on that level playing field and have the same sorts of tools that other energy industries have. For instance, the use of a master limited partnership for investment into wind and other renewables would be a tool that would be useful.

In my past life in the natural gas industry, master limited partnerships provided the kind of market opportunities for us that other industries were enjoying and gave us that kind of feedback from the marketplace that, yes, they saw us as a long-term bet and one that they wanted to invest in. It is one example.

In the longer term, as you have said and others, having long-term stable energy policy in place that treated all forms of energy

in a more evenhanded way would be very helpful. But in the shorter term, extending the PTC will at least continue to say, this is an industry that is growing, that is providing jobs, and one that we want to continue to see stay in place as we develop those longer-term overarching energy policies.

Senator WYDEN. Mr. Soanes, I guess I have 5 seconds, and then I can yield all the time I do not have.

Mr. SOANES. I would have to endorse the comments of Ms. Wyrsch. The biodiesel industry is a young industry, and any young industry needs two components to succeed. It needs some degree of market certainty and some degree of price certainty.

The current regulations provide that. You have the RFS–2 providing market certainty, and the pricing certainty comes from the extension of the blenders tax credit.

Extension of the tax credit is needed to influence the buying behavior of customers, who need to go out and invest into blending infrastructure and into logistical infrastructure to allow biodiesel to form part of their product mix.

We do not believe the credits will be needed on a long-term basis. Biodiesel is already price-competitive with petroleum diesel, but we do need the credit to be extended for a short period of time to provide the certainty for customers to go out and invest in necessary infrastructure to make biodiesel part of their energy mix, and at that point in time biodiesel will stand on its own and be very competitive as a new domestic energy source of this Nation.

Senator WYDEN. Thank you.

Senator BINGAMAN. Senator Carper?

Senator CARPER. Thanks, panel members. Thanks for coming today. We have a markup over in our Homeland Security and Government Affairs Committee going on, and so I am bouncing back and forth. I missed your testimony, but I have a great interest in what you have had to say and appreciate the chance to ask a couple of questions.

My first question would be to Ms. Martha. It is a favorite name in our home. Martha Wyrsch. Do you pronounce your name Wyrsch?

Ms. WYRSCH. Yes.

Senator CARPER. That is a great name for a wind company, is it not? I am probably not the first person to notice that.

I want to focus for a minute or two, if I can, not on onshore wind, but on offshore wind. We have a place in Delaware we are very proud of, Rehoboth Beach, and, for a number of years, folks have been talking about hoping to deploy an offshore windmill farm about 12 miles east of Rehoboth Beach.

You know the story of Goldilocks. The soup was too hot or too cold and just right. The wind about 12 miles east of Rehoboth Beach is just right. And some folks have been anxious to deploy offshore wind, and we are interested in helping them to do that.

As I understand it, not only is Vestas a leader in onshore wind, but you are also a leader worldwide in offshore wind. That is correct, is it not?

Ms. WYRSCH. That is correct.

Senator CARPER. And, as of today, can you just give us some idea how much offshore wind production we have in this country com-

pared to offshore wind which is being harnessed to produce electricity around the world?

Ms. WYRSCH. As you said, Vestas is the world leader in offshore wind, as well as onshore. And in Europe, offshore wind has become much more highly developed than it has here in the United States.

In the United States, because we are still relatively new in the wind industry and onshore wind resources are so robust, people have been taking advantage of that resource over offshore, because offshore is a more expensive resource.

But I will tell you, in the medium to long term, here in the United States, we see great opportunity for offshore wind, and the project that you are talking about is one, as you may know, we have been working on with the developers there to help them pull that project together.

It is a challenge here, but we see opportunity in the long term.

Senator CARPER. Well, in the words of Einstein, in adversity lies opportunity.

Ms. WYRSCH. Exactly.

Senator CARPER. And we are going to pursue it. Could you talk a little bit with us today about the difference in investment and construction time of an onshore wind project as opposed to an offshore wind project?

Ms. WYRSCH. An offshore wind project actually takes about the same overall time, that 3-year horizon, if you have a willing audience and a willing regulatory regime.

And so in Europe, when you see an offshore project being built, it could take 3 to 5 years, but the actual construction itself is very readily done. We have the ships, we have the construction tools and the infrastructure to do it.

The offshore turbine is a different turbine. It is a turbine that requires more resilience in that very difficult environment. But those products are already available.

And so, having an audience and a policy environment that supports offshore wind is critical to the development.

Senator CARPER. All right. Thanks. A couple of months ago, I hosted a roundtable with major wind stakeholders. I am pretty sure that someone was there from Vestas, and I think his name was John Chase. Does that name ring a bell with you?

Ms. WYRSCH. That does. He is sitting here behind me today.

Senator CARPER. John, would you raise your hand? Thanks very much for joining us. I thought it was just an excellent dialogue, and we are grateful for your participation.

During the discussion, there really seemed to be an overwhelming agreement that, for offshore wind to be successful in this country, we are going to need a longer-term extension of the investment tax credit for offshore wind, along with an extension of the production tax credit for onshore wind.

In fact, in the conversation we had that day, the emphasis was really on the investment tax credit as even more important in the near term than the production tax credit. The reasoning was that, because offshore wind is new to us in this country, it has a long investment time. Due to permitting and other obstacles, the production tax credit would not help offshore wind investment.

Having said that, the investment tax credit was believed to encourage investors more. The production tax credit is still needed for offshore wind and we are told is vital for domestic wind turbine manufacture, and I believe that, which could start producing onshore wind and offshore wind turbines.

Does your company still support the proposal by Senator Snowe and myself? Olympia and I combined on an offshore wind tax credit that is combined with an extension of the production tax credit.

Ms. WYRSCH. Yes, Senator, we do.

Senator CARPER. And why?

Ms. WYRSCH. Because, when you look at offshore, it is a very different value proposition. You have upfront costs that are expensive and a longer time horizon. It will be important that the 1603 credit for offshore, however, go further out than currently discussed.

We had a question earlier about the 1603 tax credit, if it were to be just extended in the same time frame that we are talking about today through another year or 2 years. That would not be as helpful to offshore. It needs a longer horizon.

Senator CARPER. Good. All right. Thanks.

Mr. Chairman, I think my time has expired. But before I close, can I just say Ms. Wyrsch's name one more time? Martha Wyrsch.

Ms. WYRSCH. Yes. Thank you.

Senator CARPER. Great to see you.

Senator BINGAMAN. Senator Kerry?

Senator KERRY. Mr. Chairman, thank you very much. Thank you, both you and Senator Cornyn, for holding this timely hearing. I appreciate it very much.

I have been picking up little pieces of it back in my office, as I have had some meetings, and a lot of questions, obviously, to ask. I may submit some for the record.

But I will ask a question. I want to ask particularly about the marketplace. But I want to just highlight—since we get a very small amount of time, I think it is important to state that the 1603 program, I understand, has leveraged about $23 billion in private sector investment for some 22,000 projects in every State in the country and across a dozen clean energy industries: solar, wind, fuel cell, combined heat power, hydropower projects. And to date, I understand it has spurred the construction of sufficient new generation capacity that could power more than a million American homes, supporting over 290,000 jobs.

So allowing it to expire, as we have heard from many of the panelists here, just creates havoc in the marketplace, a tail-off in investment, uncertainty in the ability of people to be able to plan. And the same is true of the advanced energy manufacturing credit, which has also leveraged private sector investment.

But what I want to try to focus on—a couple of things. One of the things—well, there are two things I want to focus on. One is competitiveness. I particularly see this and feel this, sitting on the Foreign Relations Committee, that the United States is at risk of being left out of a $6-trillion market that others are rushing into. The fastest-growing segment of the energy market is going to be green energy, projected at about $2.3 trillion in the next 15–20 years.

Traditionally, the United States has really been in the lead on these kinds of things. A lot of the technology that is being used by China and other people was all developed here. The Bell Laboratories, 50 years ago, they were the ones who were racing to the market with them. It is just a tragedy that is exacerbated by this year-to-year big question mark hanging over this industry that cannot plan for the long term.

Also, a recent study by the National Renewable Energy Laboratory found that the financial incentives that a country provides play a far more significant role than factors like labor costs, when a company is deciding where it may go. And China, now the leading manufacturer of solar panels and wind turbines, is about to outspend the United States three to one on public clean energy projects over the next several years.

China, Germany, Italy, Australia, India are all attractive to financiers because they have national policies that create long-term certainty for investors by supporting renewable energy standards and greenhouse gas reductions, and that creates demand. We have not created demand.

So when a Solyndra or an Evergreen or one of these companies has a problem, to some large measure that is a reflection of the absence of adequate demand in our marketplace compared to what exists in other parts of the world. So I hope we are going to move on this, and we ought to be moving on it more than on a 1-year and year-to-year basis.

But let me ask you, Ms. Sherlock, whether it is or is not accurate that really one of the things we need more than anything is some market price on carbon or some kind of tax policy with respect to carbon that would then let the private sector move with a whole lot of different determinations about what is of value and what is not. And, in the absence of that, we are losing jobs to other countries and market share that we should not be losing, are we not?

Ms. SHERLOCK. From an economic perspective, placing a tax on carbon or having some other form of price on emissions would allow technological neutrality for allowing low carbon technologies to compete on a level playing field and having whichever technology is able to achieve low carbon production at the least cost become the technology that would move forward.

Senator KERRY. We do not really have a level playing field today, do we? Do we not have a lot of incentives that still exist for fuels that we do not necessarily want to encourage?

Ms. SHERLOCK. There are incentives across the board for various types of energy production incentives and consumption incentives, and it does not create a neutral playing field for energy.

Senator KERRY. Does anybody else want to comment with respect to the demand issue and how that affects the choice of where money goes?

Mr. COLEMAN. I might add onto that, which is, we look at it, obviously, as venture investors, from the earliest stages, and I think that there are two elements going on in the market here, which are, one, the provisions that we have seen over the last 10–15 years for renewables have driven this growth that we have talked about. It is important, but in large part, I think, if you dig below the covers on that, what you find is that a lot of it has been deploy-

ment of existing technologies and marginal improvements on those existing technologies.

Now, as you get more deployment, you will get this decline in the cost curve, but at some point, in order to continue to push those cost curves down, to shift those curves, you need new technology, and the only way to do that is one of two ways. You either have very long-term credits, the way you do in the oil and gas industry, where you have permanent credits and early-stage investors can plan around those things, or you focus on credits that try to push technology into the marketplace.

So I think we need to be cognizant of that in the way that we structure these tax credits.

Senator KERRY. Well, I appreciate that very much. I know I am over time. But I would just say to my colleagues that, 2 years ago China produced 5 percent of the world's solar panels. Today they produce more than 65 percent of them, and they have hurt some of our companies, obviously, in the process, and the technology they are producing was developed here in the United States.

So, I mean, you cannot tell a story more simply than that. And because of our failure to move aggressively to encourage the market incentive and the pricing and the longer-term investment decisions, we are killing ourselves on jobs, and we are hurting ourselves in the marketplace. And I hope we will get our act together.

And, Mr. Chairman and Ranking Member, I thank you for having this hearing, because this really will define our future. This is the biggest single market available to the world, a $6-trillion market, with now 7 billion potential users and growing.

The market that drove the growth of our Nation in the 1990s when every sector of our economy went up and every income level went up and we created 23 million jobs, that was a $1-trillion market with only a billion users. That is the difference, 6 to 1, and 7 to 1 in users.

But we are handicapping ourselves today because we are not making simple decisions on these kinds of credits and these kinds of incentives and this kind of competitive picture, and I hope we are going to get into the race.

Thank you, Mr. Chairman.

Senator BINGAMAN. Thank you very much.

Let me just ask—perhaps Dr. Thorning is a good person to ask on this, or any of the rest of you who have an opinion.

I recall several years ago when the push was on to retain—I believe it was called section 29 for natural gas, unconventional natural gas production, and there was a lot of opposition to that. We maintained it.

It has been a significant factor, as I understand it, in causing the discovery of all of this shale natural gas that has now changed the energy environment that we live in and kept the price of natural gas so low.

Am I right that that tax incentive was a significant factor there? Are you familiar with that, Dr. Thorning?

Dr. THORNING. I am not an expert, Senator, on section 29, but I think the development of the new technology for hydraulic fracturing for both oil and gas is the main driver for why we are seeing the expansion of our natural gas production.

Senator BINGAMAN. Do you know about this, Dr. Sherlock? Is it something you have looked at, or not?

Dr. SHERLOCK. It is not something I have looked at in the context of natural gas.

Senator BINGAMAN. Let me ask, Mr. Coleman, your proposal to have a volume-based credit, as I understand, your ideal approach on these renewable credits would be to shift to a volume-based credit and keep it in place for some period of time, but then phase it out. Is that what I understand, or does the volume-based credit have a built-in mechanism for ensuring that it is not going to be available to anyone once you get up to a certain level?

Mr. COLEMAN. It is the latter, which is, you would want to make the structure more permanent in nature so that people can actually look out 5, 10, 15 years down the road and see that that structure will be there, and accessible.

But, on the other hand, you want to make sure that users of that credit do not stay on it forever. And so the point is, there would be a built-in mechanism, and it would allow—it would force these companies to roll off of that as they hit a certain——

Senator BINGAMAN. And how would that work in connection with a developer of solar photovoltaic projects? How would that actually operate?

Mr. COLEMAN. Well, the way you would be doing it is, you would be focusing on the manufacturing of the equipment itself. So it would be on the production of the solar panels or on the wind turbines, and it is distinctly more of a supply-side solution than a demand-side solution.

And the idea would be that you would support a manufacturer through some volume of production, and then it would tail off. And so that way, that value would trickle through the system, into the projects.

Senator BINGAMAN. But would this still—as you see it, would this be an alternative to a production tax credit, or would it be something that is focused on manufacturing and you would still need a production tax credit in order to actually have projects deployed?

Mr. COLEMAN. I think, in the short term, you can see that these two things would be compatible, that one is more on the supply side, on the manufacturing side, and the other is more on the demand side and on the production of electricity side.

I think, in the long run, if you can get to the point where you are producing products that can actually compete in the marketplace without those demand-side supports, then ideally that is where you would get to.

Senator BINGAMAN. Senator Cornyn?

Senator CORNYN. Mr. Soanes, thank you for being here today. I wanted to ask about the interaction between the biodiesel tax credit in addition to the renewable fuel standard. How do those interact and affect the biofuels industry?

Mr. SOANES. They actually interact in a very positive way, and the industry needs both of those to be in place on a go-forward basis to be sustainable and to continue its growth.

The renewable fuel standard created a mandate for the use of biodiesel in the American market, and that, in effect, acts to create market certainty for biodiesel producers in America.

The blenders tax credit provides pricing certainty for our product and encourages end users to purchase the product and allows the market to mature in that way.

So really they go hand-in-fist, and they really need to coexist on a go-forward basis for the industry to continue to develop.

I heard Mr. Coleman's testimony a moment ago about having a volumetric phase-out, and I think that makes sense if you are just looking to encourage a technology. But you have to look at beyond just encouraging a technology. You have to look at behavior that will—you have to look at taxes that also influence the buying behavior of customers.

So, in the biodiesel industry, the blenders tax credit has acted to encourage capital investment in new facilities, but, on a go-forward basis, we need the blenders tax credit to be there to encourage our end users to make different decisions about how they use biodiesel within their own systems and for them to invest the necessary capital to blend the product into their fuel streams.

The two really go hand-in-hand, and it is more than a volumetric issue.

Senator CORNYN. Your biofuels industry or businesses that have regular corporate and business structure like any other business but have special concerns that we have been talking about here today, how do you view the President's debt commission, the Simpson-Bowles Commission, proposals, for example, to reform the tax code by bringing down marginal rates, particularly for domestic corporations that have businesses abroad, by eliminating a lot of tax expenditures and broadening and flattening the code?

Have you thought much about how that would relate to the subject we are talking about here today, other than probably making you very nervous?

Mr. SOANES. Senator Cornyn, I am having enough difficulty trying to manage through the boom-and-bust cycle of non-extension of the blenders tax credit and truly have not had a chance to think through that issue.

Senator CORNYN. Well, let me invite you and anyone else on the panel, as you reflect on what we have been talking about today—any additional thoughts you have about that we would certainly welcome, I personally would welcome.

Dr. Thorning, what principles should guide Congress in examining relevant renewable provisions in the context of fundamental tax reform?

Dr. THORNING. I think the use of cost-benefit analysis should be your guiding principle. What are the costs to the U.S. taxpayer of continuing the subsidies for renewable energy deployment, and what are the benefits? And we know what the costs are: $20 billion in incentives in 2010, for example, of which 76 percent was for renewable energy.

We know that, if we are trying to address the threat of global climate change, it is going to take a worldwide effort. And, as my figure in my testimony shows, growth in emissions is outside the

U.S. Therefore, what we do here is not going to make a material impact.

So the environmental benefits of deploying ever more expensive renewable energy are, in my view, not equal to the cost to the American taxpayer.

So I think we ought to look at whether spending money in terms of R&D to try to develop lower-cost renewable energy is a better use of taxpayer dollars.

I would just like to draw your attention to table 1 in my testimony, which shows the Department of Energy's estimates of the cost of solar and wind compared to conventional fossil fuels. Solar and wind tend to be 10 to 20 times more expensive per 1,000 kilowatt-hours for installing generating capacity.

So, as you look at whether these credits have really done the job and whether they are likely to in the future, I think it is pretty clear that we ought to think about phasing them out and trying to develop better ways of using renewables to bring the cost down.

Senator CORNYN. Mr. Chairman, if I can just ask one follow-up question.

Dr. Thorning, of course these credits are being used to advance other policies rather than strictly tax policy, and I would bet, based on what Senator Kerry said, he and I would have divergent views about the subject of his discussion and the need for a cap-and-trade program that would price carbon and that sort of thing.

But how would you recommend that Congress advance its clean energy policies but, at the same time, have sensible tax policies more broadly? Is it possible to reconcile those goals?

Dr. THORNING. I think all energy investment ought to be on a level playing field, and we should continue to do R&D to try to get renewables, which we hope will be a growing share of our energy mix in the future, down to where they are cost-competitive.

With the mandates that are being discussed, the clean energy standard, a Federal clean energy standard, will certainly raise energy prices, will make it harder for U.S. manufacturing and job growth to occur.

So I think you need to look at the big picture and look at trying to create a level playing field where all technologies have to stand on their own feet and compete.

Senator CORNYN. Thank you, Mr. Chairman.

Senator BINGAMAN. Senator Thune?

Senator THUNE. Thank you, Mr. Chairman. I want to thank you and Senator Cornyn for holding the hearing today at the subcommittee, and our witnesses for their willingness to testify.

Let me just make a few observations, if I might, about the importance of alternative energy tax incentives and what they have meant in a State like South Dakota.

Many of the tax incentives that we are discussing today have traditionally enjoyed broad bipartisan support. The production tax credit for wind energy, the tax credit for biodiesel, the investment tax credit for vehicle refueling property are just a few examples of provisions that I have supported in the past, because I believe that they have strengthened America's domestic energy supply.

While our Nation will remain dependent on fossil fuels in the near term, alternative sources of energy clearly should be part of

an all-of-the-above strategy and approach to achieving America's energy independence. In my State of South Dakota, for example, we have seen the positive impacts of tax incentives on the growth of the ethanol industry and the jobs associated with that.

Today, South Dakota has 15 plants which produce over a billion gallons of ethanol, about 10 percent of America's ethanol supply, and roughly 40 percent of the corn we grow goes into ethanol production.

The jobs and economic growth associated with this industry were spurred, in large part, by the blenders tax credit. I hope that, once the existing blenders credit has expired, we can continue to find ways to encourage the production and use of advanced biofuels, especially through incentives for infrastructure which will give consumers more choices at the pump.

Another example of an energy tax incentive important to my State is the wind production tax credit. It is scheduled to expire at the end of 2012. South Dakota ranks fourth in the Nation in the amount of wind power added in 2010. South Dakota's wind farms now generate enough electricity to power 240,000 homes, and the State's future potential for wind energy is enormous. According to the National Renewable Energy Lab, South Dakota wind resources could provide 310 times the State's current electricity needs if they were fully exploited.

But, as the witnesses have stated today, short-term incentives do not give businesses the certainty that they need to make long-term multiyear investments. Consider the example of Dakota Plains Energy, a business that is based in Aberdeen, SD that is currently in the fourth year of development of what will ultimately be a 300-megawatt wind farm in Campbell County in north-central South Dakota.

Because the first stage of this wind farm is unlikely to be completed until 2013, after the wind tax credit is scheduled to expire, it is becoming increasingly difficult for Dakota Plains to secure financing going forward. And this situation impacts not only wind developers, but suppliers, as well, suppliers such as Molded Fiberglas, which is a South Dakota manufacturer of wind turbine blades. It will have fewer orders as uncertainty related to the expiration of the tax credit increases.

Clearly, American businesses need greater certainty in order to be able to plan their investments, and that means that Congress has to do a better job of enacting long-term tax provisions rather than 1- or 2-year extensions. At the same time, however, we need to be realistic about our deficit situation.

As such, I hope that this committee will begin to examine how we can reform our energy tax incentives to ensure that taxpayers are getting the maximum bang for their tax dollar. This might mean phasing out some subsidies that are no longer necessary or changing the structure of certain tax incentives to make them more efficient.

I realize that this sort of major overhaul is perhaps best suited to a fundamental tax reform effort, but I do not think we can afford to wait until that time to begin this process. So I am hopeful that our discussion today, Mr. Chairman, at this subcommittee, can carry forward into next year at the full committee.

And let me just, with that observation, if I might, ask a question of the entire panel, which has to do with the need for predictability—I think many of you have testified to that today—so that businesses can plan multiyear investments.

I would be interested in knowing from each of you if you would be willing to consider reforms to the energy tax provisions that you care about the most, even if it meant a somewhat less generous incentive, in exchange for long-term permanency and predictability.

Mr. Soanes?

Mr. SOANES. Senator, thank you very much for your comments. I would be happy to try to address your question on behalf of my company, which participates in the biodiesel industry.

We see enormous value in having some degree of price certainty and market certainty, and we would certainly be supportive of a tax policy that provided predictability into the future, even if it meant it came with less support.

The key thing for our industry is that investors need to understand exactly what the pricing mechanisms are in the future and exactly what you can rely on as you invest your capital. Having a longer-term horizon on what that looks like will encourage investment.

The other issue that we face is that, in the petroleum industry, working capital needs are very, very high relative to ultimate margins. So you look at biodiesel, this year alone, our company has manufactured over a quarter of a million dollars worth of product.

You cannot raise working capital to support that amount of production activity without there being some degree of certainty as to what the pricing structure is in the market on a longer-term basis.

So we would certainly encourage a longer-term extension and certainty in tax policy.

Senator THUNE. Does anybody else care to comment on that?

Ms. WYRSCH. Senator, Martha Wyrsch, with Vestas Wind Systems. The wind industry would be very interested in working with you to look at that longer-term policy that you suggest. We do want to emphasize, however, that for us, the PTC is done today, although it does not end until the end of 2012. Business decisions are being made today.

So we would need extensions today to bridge us to that discussion and the time period it will take to complete that.

Senator THUNE. Thank you.

Mr. Coleman?

Mr. COLEMAN. I would just add that I think, from our perspective, long-term predictability is the key. What we are looking for as investors is an equitable, very clear code that allows us to figure out where to invest on a long-term basis.

And I think Dr. Thorning mentioned that technology is really what has driven this shale gas boom. What is interesting is, that technology was something that was developed over 30 years ago out of DOE.

So it has taken a long time to get that into the marketplace and for us to invest in new technologies. Whether it is in gas or whether it is in renewables, we need that kind of lead time.

I think Senator Wyden mentioned that there is this crazy quilt of incentives out there, and I think from an investment perspective,

that is the hardest thing to navigate. So what we are trying to understand is, how do you simplify it? How do you create it so that it is a little bit more technology-neutral across the board and allows us to navigate it in a way where we can actually invest with some sort of reliability in the long-term? And that requires predictability, but it also requires simplicity and transparency.

Senator THUNE. Thank you. I see my time has expired, Mr. Chairman. I think we have a vote on. So thank you all very much.

Senator BINGAMAN. Thank you all. I think it has been very useful testimony. We appreciate it. And they have started these votes that they had earlier advised us of. So we will conclude the hearing with that. Thank you.

[Whereupon, at 11:12 a.m., the hearing was concluded.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

Statement of Chairman Jeff Bingaman
Senate Finance Subcommittee on Energy, Natural Resources & Infrastructure
December 14, 2011
"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs."

Good morning. Today's hearing examines "Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs."

Given the impending expiration of various tax provisions related to alternative energy and energy efficiency, this hearing could not be timelier. At least ten important provisions expire in a little over two weeks, and 2012 brings the expiration of at least five other energy provisions. Allowing these incentives to expire will negatively impact this country's ability to develop alternative energy resources.

In the past five years, alternative energy in the United States has gone from a halting, uncertain industry to a young but rapidly growing sector of the economy.

We can attribute part of this success to several years of predictable and consistent government incentives. But overall, incentives for alternative energy are still primarily short-term, and manufacturers, developers and investors routinely face significant uncertainty surrounding federal policy.

One example of how inconsistent federal policy affects the energy industry is the Production Tax Credit. This credit supports a variety of alternative energy production, including wind, geothermal, refined coal, and nuclear, and has been allowed to lapse three times since its inception. Each time, installation of new wind energy dropped precipitously the following year: by 93 percent, 73 percent, and 77 percent.

Fossil fuel provisions offer an excellent example of a successful federal support structure. Predictable long-term incentives and aggressive research efforts helped build a global industry, and more recently have aided in discovering and accessing vast new deposits of oil and gas.

And those efforts have paid off: our oil-import dependence peaked in 2005 and is set to continue to decline in coming decades, and natural gas production continues to expand so much that the Department of Energy is now considering at least six natural gas export permits.

Despite the success of these conventional energy resources, several reasons exist for the U.S. to maintain and expand policies to aggressively diversify its energy resources. These include price stability, energy security, economic growth, and environmental concerns. We must employ an "all of the above" strategy for developing all energy resources, and craft focused and efficient tax policies that help get us there. If we fail to recognize and nourish emerging technologies and industries, we will invariably be picking winners and losers.

At today's hearing, we have a panel of expert witnesses who will help us consider three issues:

- First, to review the frequent short-term extensions and expiration of alternative energy tax incentives;
- Second, to understand how they have affected the alternative energy industry in the United States, the build out of manufacturing facilities, supply chain issues, and employment; and
- Third, if shortcomings exist, either with policy or process, how to address them in a meaningful and timely manner.

I look forward to receiving their testimony.

Testimony of Will Coleman, Mohr Davidow Ventures

Before the Senate Committee on Finance

Subcommittee on Energy, Natural Resources, and Infrastructure

Hearing on Clean Energy Tax Incentives
December 14, 2011

Thank you Chairman Bingaman, Ranking Member Cornyn, and distinguished members of the Subcommittee. I appreciate the opportunity to be here today. It is an honor and a privilege to speak with you on issues that are so critical to our nation.

I am Will Coleman, a partner at the venture capital firm Mohr Davidow. We invest in early stage companies on behalf of some of the largest endowments, foundations, and families in America. Since 1983, we have funded over 250 companies, helping entrepreneurs transform new ideas into thriving businesses in information technology, life sciences, and energy.

We were one of the first mainline funds to start investing in the energy sector, and have since invested in over 15 companies in a range of sectors including bio-chemicals, solar, energy storage, gasification, and building materials, among others. As early stage investors we invest in and help build companies from the early stages of R&D to initial commercialization and deployment. Through the experiences of our companies we have seen first-hand the challenges of developing new technologies and gaining market adoption in energy. We have also seen how public policy directly and indirectly impacts the viability of emerging companies and the private sector's willingness to invest in these important industries.

I am here today to share some perspective from our experience and talk specifically about how regulatory uncertainty impacts long term investment decisions. Additionally, the energy industry as a whole faces a growing innovation gap. I will highlight the need for a more stable and supportive environment for emerging technologies in the U.S. for our country to remain competitive.

Tax policy has always been a key driver in the energy sector. For over a century it has been used to guide energy choices and investment on the premise that energy is critical to the nation's

strategic interests. Tax policy has helped drive investment in a range of activities including R&D, exploration, infrastructure, and generation projects. Today, the tax code continues to support both renewable and conventional energy technologies. In conventional energy, the tax code has encouraged continued capacity expansions to meet our energy needs. In renewables, tax provisions such as the PTC and ITC have been instrumental in mobilizing private capital to invest in the sector and have helped drive costs down by enabling technologies to scale.

We are now seeing through our companies that pricing in the market for wind, solar, and biomass is rapidly approaching cost parity with conventional resources. However, for private investors to continue to invest in these sectors, we need confidence that the government will maintain a strong commitment to these markets as these companies continue to scale and as new technologies enter the market.

The existing tax provisions continue to be important to the ongoing growth of the sector; however, we also recognize that these provisions are imperfect. It is appropriate to consider some new approaches that will improve the efficiency of the current energy tax code. We must acknowledge where tax policy is needed and where it is not. Some energy technologies are quite capable of competing without tax breaks, others are on the cusp, and others are just beginning to emerge.

We need a tax code that provides market stability in the short term, but we also need improved structures that increase the consistency between conventional and renewable frameworks, and encourage investment in new technologies that have the greatest potential to lower our energy costs over time.

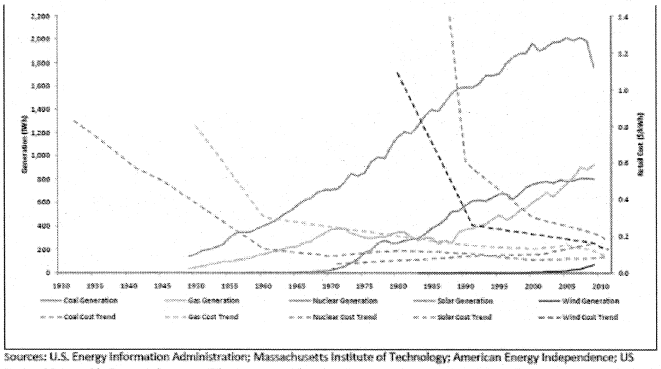
America's Diverse Energy Composition

America's economic strength over the last century has been fueled in large part by access to affordable and abundant domestic energy resources. However, the energy landscape has changed. The growth in global demand continues to strain conventional resources and drive up costs, and some of the consequences of continued dependence on conventional resources are becoming more visible. In 2010, the U.S. spent $337 billion on oil imports from foreign

countries. In other words, we transferred $337 billion of America's wealth overseas – dollars that could have been reinvested here at home.

Continuing this pattern makes little sense in the current economic environment. Many alternatives are increasingly viable. Natural gas, wind, solar, biomass and other renewables are playing increasing roles. Wind deployments grew over 400% from 2005-2010[1] and solar grew over 1000% over the same time period. The cost of solar modules has dropped 80% since 2005[2] and almost 30% to roughly $1.10/W just in the last year[3]. In comparison, the cost of coal has climbed over 50% since 2005[4], oil has climbed over 110% since 2000[5], and even natural gas is 17% higher than it was in 2000.

US Electricity Generation and Retail Cost by Energy Source (1930-2011)



Sources: U.S. Energy Information Administration; Massachusetts Institute of Technology; American Energy Independence; US National Renewable Energy Laboratory; "The Economics of Nuclear Reactors: Renaissance or Relapse," Cooper, 2009; Hudson estimates

[1] http://www.awea.org/learnabout/publications/factsheets/upload/Market-Update-Factsheet-Final_April-2011.pdf

[2] http://www.solarbuzz.com/facts-and-figures/retail-price-environment/module-prices

[3] According to Mohr Davidow research 2013 contract module prices have dropped from $1.30/W to <$1.00/W

[4] http://38.96.246.204/totalenergy/data/annual/pdf/sec7_21.pdf

[5] http://www.eia.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/current/pdf/pmatab1.pdf

Despite these gains, wind still provides only 1.4% of our electricity and solar just 0.3% as compared to 44.9% from coal and 23.8% from natural gas. Yet the solar industry already employs over 93,000 people in the U.S.[6] while the coal mining industry employs only 86,000[7]. Solar employment has more than doubled in the last 3 years alone, while coal employment has dropped over 50% in the last two decades even though total coal production has remained steady.

A great deal of attention has been focused on the rapid emergence of shale gas and the significant projected domestic reserves. It is clear that natural gas will be an important and growing piece of the energy mix going forward, but it does not negate the need for other alternatives. We also still have significant coal and oil reserves in the U.S. It is obvious that we will continue to rely on coal and oil and we need to continue to use these resources with increasing efficiency. However, it is also worth noting that the U.S. has some of the largest wind, solar, and biomass resources in the world. The US possesses over 231,000 GW[8] of potential annual capacity from untapped wind and solar resources alone. This is over 222 times our current total electricity capacity, and it is a resource that is lost if not captured.[9]

The U.S. must continue to leverage its energy assets effectively to remain economically competitive. Conventional technologies represent the vast majority of today's production; however, we should not ignore the growing opportunity that renewables represent in this country.

Still not a level playing field

Energy – particularly the global transition to next generation forms of energy – remains one of the largest growth opportunities we have seen in our time. It is important to recognize,

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[6] http://www.thesolarfoundation.org/sites/thesolarfoundation.org/files/Final%20TSF%20National%20Solar%20Jobs%20Census%202010%20Web%20Version.pdf

[7] http://www.eia.gov/coal/annual/

[8] http://www.windpoweringamerica.gov/pdfs/wind_maps/poster_2010.pdf http://www.nrel.gov/docs/fy10osti/45889.pdf http://votesolar.org/wp-content/uploads/2011/02/NREL_Solar_Tools.pdf www.nrel.gov/gis/docs/resource_maps_200905.ppt

[9] http://www.eia.gov/electricity/annual/pdf/tablees1.pdf

however, that these industries are still largely in their infancy and barriers to entry remain high. The growing market for solar in particular has fueled intense competition. This competition in combination with rapid scaling of technologies has helped drive down costs, but profit margins remain tight. While significant support has been given to the wind and solar industries over the last several years and continues to sustain them as they continue to move down their respective cost curves, the supports have been less robust than those given to their more mature competitors. According to a recent report from Nancy Pfund of DBL Investors, the average annual inflation adjusted federal spending on oil over the first 15 years of its deployment was 5 times greater than what we have spent on renewables, and nuclear was 10 times greater.[10] Yet even today, while the major oil and gas players continue to enjoy record profits, (Exxon-Mobil alone has averaged $75 billion in annual profits since 2008) fossil industries reap the lion's share of government incentives.

The Congressional Joint Committee on Taxation (JCT) estimates that from 2010-2014, the federal government will spend upwards of $74 billion on an array of **direct** subsidies to support domestic oil and gas development and production, which far outpaces support for emerging technologies.[11] These incentives include exploration credits, depletion credits, royalty relief, and several others. In addition, the O&G industry enjoys many **indirect** tax incentives that most people don't recognize as part of the energy tax equation. Tax advantaged structures such as MLPs, which are targeted at oil, gas, and natural resource projects, have grown from just $2 billion in 1994 to over $220 billion in 2010. Section 199 credits created in 2004 which provide relief for "qualifying production activities" reduce the corporate tax rate by approximately 3% according to the American Petroleum Institute.[12] Foreign Tax Credits, 40% of which are used by

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[10] Nancy Pfund & Ben Healey. *What Would Jefferson Do? The Historical Role of Federal Subsidies in Shaping America's Energy Future*. DBL Investors, Sept. 2011 (forthcoming).

[11] Joint Committee on Taxation. *Estimates of Federal Tax Expenditures for Fiscal Years 2010-2014*. Government Printing Office, 2010.

[12] American Petroleum Institute. *Repealing the 199 Manufacturing Deduction for Oil and Gas Companies Puts Jobs at Risk*. February 2011.

the petroleum industry, provided an additional $42 billion in relief in 2008 alone. [13] These are just a few of the current incentives.

My point is not to question the appropriateness of these incentives. Many of these direct and indirect supports have been essential to expansion of our domestic resource production, and were implemented at times when US oil companies were struggling to compete at $20 per barrel of oil. However, as we now strive to diversify the fuel sources that supply America's energy, we must acknowledge the role these "legacy" incentives have in the market to be able to rebalance the current energy tax code.

Challenges with the current code

The current energy tax code is an amalgam of policies woven together over several decades. As investors seeking to identify new technologies that can significantly reduce costs, increase performance, or replace existing technologies, we are acutely aware of how the tax code impacts the market and our investing options. The current production and investment tax credits have been instrumental in stimulating a market for renewable technologies, particularly in wind and solar. The existence and growth of this market has spurred tremendous new investment in capacity expansions and technology developments that have driven the cost reductions referred to earlier. Many of the long-term venture investments in new technology also would not have been made if not for the increasing confidence in the growth of the renewables markets.

However, the future of U.S. renewables markets is in question. The situation that renewables now face is emblematic of the broader flaws in the current approach to energy tax policy for two reasons:

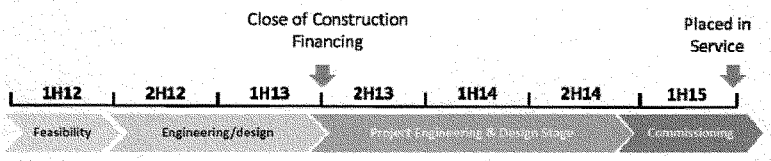
1) Uncertainty over extension of current clean energy provisions is undermining short and long term investment in the market just as some of these technologies are beginning to reach commercial viability.

[13] Internal Revenue Service. Statistics of Income Tax Stats, 2008. Corporation Complete Report Publication. Accessed May 26, 2011.

2) The current tax code does not support ongoing innovation in substantially new technologies that would continue to drive down the costs in both emerging and conventional energy sectors.

The cost of uncertainty

The need for certainty is a common refrain in the energy industry. Unlike in the oil and gas sector where the current credits are almost all "permanent" and provide investors and corporations with enough certainty to make long term investments, almost all of the credits designed for the renewables sector are temporary and set to expire in the next few years. The lack of certainty itself is a major challenge for developers, manufacturers, and investors. The easiest way to understand the implications is by looking at a typical development timeline.



In the case of an advanced biorefinery, as represented in the chart above, initial planning, siting, and permitting can commence 3-4 years in advance of commissioning. The significant capital outlays begin when the project has to secure financing, initiate engineering, and begin ordering equipment. In the case, above that is 2.0-2.5 years in advance of commissioning. The production tax credit will only provide for gallons produced before the credit expires. Investors are unlikely to support a project expected to commence near or after the credit expiration date until they have some assurance that the credits will be in place when the plant is commissioned. Therefore, each time Congress waits to renew these credits a financing gap is created in the project financing market. In the past, investors had reasonable confidence that these provisions would be renewed and often took some capital risk to compress timelines and be ready for the renewals. However, given the increasing uncertainty about renewal, developers and investors are unable to depend on the credits when making their investing decisions, negating the credit's value as an incentive.

While the project development process can take 3-4 years for a "proven" technology that has already been demonstrated to work in the field, the path to market is even longer for new "innovative" technologies. A new technology must be demonstrated at a smaller, less economic scale before being deployed in the kinds of commercial projects supported by most of these credits. Such demonstration projects can often take longer to permit, longer to finance, and longer to engineer and construct than larger commercial projects. These projects also often use novel or custom equipment that can require longer ordering lead times. These demonstration projects are the critical link for commercializing new technologies, and early stage investors must account for the 2-4 years required to demonstrate a technology before it can be fully deployed commercially.

Yet the real seeds of innovation start even earlier. Most novel technologies require significant funding and time to prototype and pilot post basic R&D. This process can take an additional 3-5 years. Therefore, early stage investors are making investment decisions in companies and sectors ideally 3-5 years before they begin the commercialization process, but often more on the order of 7-10 years before large scale commercialization begins. As a result, short term extensions of demand side credits such at the PTC and ITC do not provide the long term certainty necessary to incent early investment in innovation.

Continued innovation is critical to continued cost reductions in any sector. However, unlike in oil and gas where most credits are permanent and enable long term investment decisions, early stage investors in alternative energy sectors cannot take into account temporary demand side credits when making investment decisions. The short term visibility on credits also has a significant impact on enabling infrastructure. In Texas, the legislature saw the growing opportunity in wind and solar and voted in 2006 to support a $6 billion transmission line expansion. In addition to the political process, it will take 7-9 years to site and construct those lines. This type of infrastructure is critical to new power developers, and yet with ongoing uncertainty prevailing over the long-term future of market credits, states and cities are unlikely to invest in these long lead time projects.

We are rapidly approaching the point where alternative technologies can compete with conventional energy sources on a level playing field in the absence of subsidies. In some parts of the country, solar, wind, biomass and other alternatives are already more economically viable than conventional options. Some of my fellow panelists will likely make the case that even a temporary extension of renewable credits will have significant impacts on the long term viability of these sectors. I agree with this perspective; however I am not arguing that the current credits should be made permanent leaving taxpayers on the hook for years-to-come. As a technology investor, I believe the goal should not be to prop up industries to keep them competitive indefinitely, but rather to support the innovation and scaling necessary for them to be competitive in the long-term without supports.

Just as over the last few years we have seen the costs of alternatives drop significantly, we expect scale and continued innovation in renewables to continue to drive this trend. Eventually these industries should not need support. The challenge is that the current credits treat these industries as homogeneous technologies. Within subsectors of the industry, different companies are on different cost curves and are reducing costs at different rates. The current credits do not differentiate between technologies that need credits and those that do not, and they only indirectly encourage investment in the more innovative, longer-term solutions that drive the greatest cost reductions over time.

So while we want to be careful not to throw the baby out with the bathwater, we believe that the current approach to energy tax incentives needs significant reform to make it more consistent, more accessible, more durable, and more effective at driving innovation and long term cost reductions. A hard stop on the current incentives would send a shockwave through the industry. But ultimately, the industry needs to move to structures that acknowledge the different stages of readiness of both existing technologies and new entrants, and more efficiently drives industries to a point of market competitiveness.

The Innovation Gap

We are fortunate to have a strong, diverse natural resource base. However, much of our competitive advantage over the last two centuries has come from our ability to innovate – to develop new, lower-cost or advantaged technologies such as oil, nuclear and now renewables, ahead of our global competitors. According to a report released by the Department of Commerce, "Technological innovation is linked to Three-quarters of the Nation's post-WW II growth rate. Two innovation-linked factors – capital investment and increased efficiency – represent 2.5 percentage points of the 3.4% average annual growth rate achieved since the 1940's."[14]

Over the last 30 years the tax code has become an increasingly popular vehicle for energy incentives. However, very little of the code has been effectively targeted at jumpstarting the innovation that fuels long term economic growth. Most of the oil and gas credits such as depletion allowances, expensing of drilling costs, and domestic production credits focus merely on expanding the current resource, and even the alternative energy credits focus primarily on enhancing the economics of current technologies. Almost all the energy credits in the code are only accessible to large, mature corporations with sizable balance sheets and cash flows. This approach creates two problems: (1) it biases investment decisions toward tax advantaged primary production rather than the innovations that can significantly impact cost or performance; and (2) it makes it more difficult for new entrants to enter the market and compete.

The energy industry is already slow to adopt new technology. According to a 2007 National Petroleum Council report, "If U.S. production levels are to be maintained, new technologies will be needed." However the report states, "There is little incentive for such global supply companies to innovate or adopt step-change Technologies."[15] In 2010 the five largest oil companies spent just $3.6 billion on R&D which represents less than 2 percent of profits and

[14] U.S. Department of Commerce, *Patent Reform: Unleashing Innovation, Promoting Economic Growth & Producing High-Paying Jobs.* 2010

[15] National Petroleum Council Global Oil & Gas Study, "Topic #26: Oil & Gas Technology Development" July 18, 2007

less than 0.4 percent of total expenditures.[16] In the utility sector, the major utilities employ on average less than 5 people in R&D roles per 1000 employees. This is the lowest level of any industry.[17] These numbers are a result of many industry dynamics, but also reflect how little incentive exists for energy companies to invest in new technology. The current tax code perpetuates the status quo.

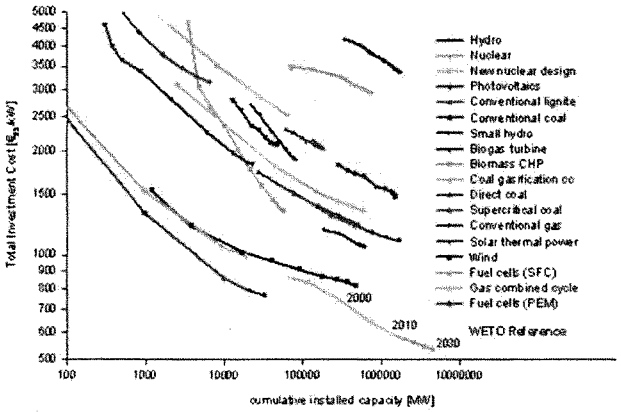
The challenge to investing in new energy technologies has not been a lack of technology solutions or the underlying economics; it has been overcoming the resistance in the market to invest in and adopt new technology. A tax code that fails to support innovation simply compounds this market failure.

One fundamental premise of technology development is that each technology reduces its costs over time through a combination of technical innovation and scaling. The result is that each technology undergoes a "learning curve" that drives costs down. Different technology solutions – even within the same vertical – can have different learning curves and development trajectories.

[16] Congressional Research Service. *Research and Development by Large Energy Production Companies.* August, 2011.

[17] National Science Foundation, Research and Development in Industry: 2006-07 (Arlington, VA: National Science Foundation, 2011), 130-131. Table 31 and 261. http://www.nsf.gov/statistics/nsf11301/pdf/nsf11301.pdf

Historical Learning Curves by Technology (over volume)



Source: European Commission. *World Energy, Technology and Climate Policy Outlook 2030*. 2003. P.71

If we as a nation want to reap the benefits of continued cycles of innovation, our focus should be on getting new technologies down their respective cost curves and to a point of maturity where they can compete on their own two feet.

All emerging technologies need a market that rewards long term performance. Almost all new technologies start out with much higher cost bases than their mature competition. Over time, with technology iterations and scale, these costs are reduced. As venture investors, we deploy our capital to unlock the rapid cost reductions that come from new invention. However, a significant portion of the cost reduction comes from scaling technology through demonstration and early commercial deployment. In the energy industry, it is the demonstration and early commercial stages when technologies are still not yet economical but start to require significant capital. Many potentially transformative innovations never overcome this transition. For tax policy to effectively drive domestic innovation, it will need to address scaling challenges and accommodate the financial constraints of smaller emerging companies.

A Complementary Incentive Structure

Continued innovation is needed in both emerging sectors and conventional energy technologies to keep the United States competitive. Ideally the tax code would be more consistent across both conventional and emerging energy categories, and enable new and improved technologies (in all sectors) to access the market and compete. The tax code would be more durable if it could more flexibly accommodate the best performing new technologies that emerge from the private sector while allowing the market to determine winners and losers. Most importantly, the tax code needs to address the scaling challenges associated with new energy technologies if we are going to unlock ongoing cost reductions and performance gains in the U.S. energy industry.

There are relatively simple ways to reform the tax code to provide more consistency, technology neutrality, and flexibility over time and to encourage investment in new and improved technologies. One approach would target early manufacturing of technologies and then roll-off as these technologies hit commercial scale. Such a volume based tax credit could be provided to individual companies as their technologies scaled and only to the point where they should achieve costs that would be competitive in the marketplace. A credit with these characteristics could be made permanent without creating dependence, and would rely on the private market to invest based on the long term viability of these companies. If such a structure were permanent it would provide certainty to investors across all stages and help to attract capital required to fill development gaps in the commercialization process. The approach would be focused on the supply side of the market much like current oil and gas incentives, and could be complementary to the existing PTC and other downstream incentives – or might ultimately replace them. Such an incentive would simplify the code and reduce the long term dependence on incentives that has plagued many energy tax provisions.

Conclusion

Let me conclude on a note of urgency. The global energy landscape is changing. New technologies are emerging, and the economic strength of our economy over the next several decades will depend not just on how effectively we use existing resources, but on how we choose to cultivate newer sources of energy. Tax credits are a central tool in the American policy framework to incentivize innovation. If we do not get them right, it is not just that we forego a better way of doing things. If we do not get them right, we may in fact cripple America's ability to compete effectively in a huge and growing international marketplace.

The current clean energy policies under discussion have been vital to the development of the clean energy market and continue to be important to sustaining the progress that has already been made. However, the energy industry as a whole must continue to innovate and adopt new technologies to provide the strong economic base that the U.S. needs to remain competitive. To do so requires a new way of thinking about tax policy that can be applied consistently across the entire energy industry and provides the long-term certainty that investors and corporations require to make rational decisions.

This committee has held many hearings on the deteriorating competitive position of the United States in new energy markets *vis a vis* China, Japan, Korea, and Germany, so I will not recount those details here. As the U.S. emerges from recession it is critical that resources should be targeted at the most effective ways to strengthen the American economy. We need to remember that the Internal Revenue Code plays a critical role in whether American new energy companies succeed in that competition, so reducing the uncertainty of our current tax credits for alternative energy technologies and exploring the creation of innovation, performance-based tax credits could not be more important or urgent.

I believe we have a rare opportunity to streamline the tax code to make it more efficiently support the development of the next generation of technologies. The focus must shift to

accelerating the rate of innovation, continuing to reduce the costs to taxpayers, and reducing the long-term dependence on government support. Such a transformation need not be complicated. The tools and approaches already exist. But we must work to rationalize these structures to better support the innovative companies that fuel our economy. We have the talent, the capital markets, and the capacity to lead in energy technology. I hope this committee will move forward quickly on some of these important reforms and I look forward to the opportunity to work with you on them in the months ahead.

Sen. John Cornyn (R-Texas)
Opening Statement
Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure
Hearing on Alternative Energy Tax Incentives
14 December 2011

Thank you, Mr. Chairman, for holding today's hearing. I want to thank the witnesses for being here today to share with us their expertise and perspective I know we're going to hear today a lot about the need to provide industry with certainty and predictability when it comes to the tax code, and job creation and looking at the cost-benefits of federal policy.

Given that too many Americans remain out of work, I want to take the opportunity just to mention one subject which is energy related, and that is the shovel-ready Keystone Pipeline project which doesn't need any tax incentives, but it is in need of a Presidential permit. This project means not only additional energy security for the United States, but thousands of jobs and revenue to communities, states and to the federal treasury.

In my state of Texas we believe in and all-of-the-above energy policy. We know that the backbone of any successful economy is a stable and secure supply of affordable energy. We are blessed with a diverse array of energy sources and industries providing solid employment in Texas while supplying the nation. We are, not surprisingly perhaps, the leading crude oil producing state in the nation. Our state's 27 refineries can process more than 4.7 million barrels of crude per day. They account for about one-fourth of total U.S. refining capacity. We're also the nation's leading natural gas producer, and also lead the nation in wind power generation capacity.

Unfortunately, when you look at the message being sent from Washington and received across the country, it's a mixed message and a confusing message when it comes to national energy policy, particularly domestic oil production. Blaming the industry for high gasoline prices and accusing them of sitting on resources, while at the same time arguing that tax incentives lead to over production and should be discontinued, delaying permits for new drilling, particularly in the Gulf of Mexico, while telling Brazil that the US will be their best customer.

To obtain some basis and some facts necessary for an intelligent discussion of targeted tax incentives for energy I requested a memo early this year from the Congressional Research Service. That memo looked at only the targeted tax incentives and its findings are worth summarizing here, which I'll do briefly.

During 2009, 77.9% of U.S. primary energy production can be attributed to fossil fuels. 77.9%. While 10.6% was provided by renewable resources. Of the federal tax support to energy in 2009 an estimated 12.6% supported fossil fuels, while 77.4% supported renewables. In other words, while the majority of U.S. energy production came from fossil fuels, the majority of the energy tax revenue losses were associated with provisions designed to support renewables. Many today will argue for extensions of valuable tax incentives for their type of energy. And I think the time

has come to evaluate tax policy based on value to the taxpayer. I'm going to quote my good friend Senator Carper here, who last week said we need to ask the question: "Are we getting the best bang for our buck from all of them, and which ones should we extend, modify, or eliminate?" Who says bi-partisanship is dead in Washington? I agree with Senator Carper.

I hope today's hearing continues a serious discussion and examination of the various credits and deductions in the Internal Revenue Code. It's no secret, as the President's own bi-partisan fiscal commission documented in excruciating detail, our current tax code is a never-ending maze full of twists and turns that can only confuse and befuddle even the experts. It's in dire need of reform and nothing should be off the table. When examining renewable incentives it's important to consider to what extent other policies already exist to assist alternative energy industries, such as renewable electricity mandates and fuel quotas.

Finally, what about the challenges that exists with or without the tax incentives, such as the limitation on our nation's grid for variable sources of energy, and how are incentives utilized for overcoming risk? For example, there are fundamental differences in an independent oil and gas producer purchasing a lease to explore for a resource and a company building a wind farm or solar installation for electricity use where power purchase agreements are made to sell the electricity generated.

In my view, these questions should not be separate from the discussion about extenders because they're essential to protecting the taxpayer funded investment in these projects. Thank you very much, Mr. Chairman, I look forward to hearing from the witnesses."

STATEMENT OF HON. CHUCK GRASSLEY
Subcommittee on Energy, Natural Resources, and Infrastructure
December 14, 2011
"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs"

The drumbeat on the tax extenders package has picked up significantly in the past few days. Press reports indicate that my friends on the other side of the aisle are considering taking up a tax extenders package before the end of this year. However, since Republicans were not consulted in drafting such a package, it does not appear that it will receive bipartisan support. While today's hearing is focused on energy tax extenders, we need to consider what energy tax incentives will provide the needed certainty to help emerging industries become strong and stable.

Clearly, in the short term, Congress should extend tax incentives for alternative energy sources. With the economy still sputtering, we cannot afford the job losses that occur from pulling the rug out from under industries like biodiesel and wind that are still developing.

In the long term, however, we need a permanent and comprehensive energy tax policy, and such a policy should be developed in the context of comprehensive tax reform.

The Finance Committee has conducted a long series of tax reform hearings this year. The Committee held one hearing this year on oil and gas tax incentives, but this is the first time this year we are discussing tax incentives for alternative energy.

As we begin to consider what comprehensive tax reform would look like, it is important to discuss what goals and objectives, other than revenue collection, the tax code should accomplish. As Ms. Sherlock notes in her written testimony, "the income tax code has long been used as a policy tool for promoting U.S. energy priorities." So, it makes sense to consider whether and how our tax code of the future should further energy priorities.

Those who want to isolate federal tax incentives for alternative energy and put them on the chopping block need to remember the oil and gas industries have received massive, permanent tax breaks for over 100 years. In contrast, tax incentives for alternative energy have existed only for a few decades and have always been temporary. These incentives first appeared in the 1970s, in direct response to the oil crisis, and they help to level the playing field for renewable resources. These incentives reduce the costs of capital investments for these fledgling industries that are not yet able to raise capital from the public. Any argument made for eliminating renewable energy tax incentives is intellectually dishonest if it doesn't include a review of all energy tax incentives.

Those opposed to incentives for alternative energy often fail to consider that a key reason to support renewable energy sources should be energy independence. Even Ms. Thorning, who in her written testimony discusses various rationales for supporting alternative energy, fails to discuss energy independence.

The United States spends more than $400 billion each year overseas for foreign oil. Now more than ever, the United States needs to ramp up domestic production of traditional energy—including oil, natural gas, and coal—and expand alternative fuels and renewable energy—including wind, solar,

hydropower, biomass, and geothermal. Congress needs to keep energy security on the front burner in Washington.

America imports an enormous amount of oil. The U.S. Treasury pays out an average $84 billion a year to defend the shipping lanes by which foreign oil reaches the United States. I do not see these costs in discussions of cost effectiveness of subsidies for oil and gas as compared to alternative energy. Ms. Thorning certainly does not address these costs in her written testimony.

Aside from energy independence, it is also important to consider the number of **domestic** jobs supported by the alternative energy sector. For example, Mr. Coleman highlights in his testimony that solar provides just 0.3% of electricity as compared to 44.9% from coal and 23.8% from natural gas. Yet the solar industry already employs over 93,000 people in the U.S. while the coal mining industry employs only 86,000. Solar employment has more than doubled in the last 3 years alone, while coal employment has dropped over 50% in the last 2 decades, even though total coal production has remained steady.

For sure, we need a tax system that is less complicated, fairer, and will make us more competitive in the global economy. However, we should be able to balance these principles with the priorities for energy independence and job creation. I thank my colleagues for holding this very important hearing today and will look forward to continued discussion of these issues as we proceed with comprehensive tax reform.

Statement of Molly Sherlock
Analyst in Economics
Congressional Research Service

Before

Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure
December 14, 2011

on

Clean Energy Tax Incentives: The Effect of Short-Term Extensions on Clean Energy Investment, Domestic Manufacturing, and Job Creation

Chairman Bingaman and Ranking Member Cornyn, and Members of the Subcommittee – on behalf of the Congressional Research Service, I thank you for the opportunity to appear before you today.

I have been invited here today to discuss expiring energy tax provisions. In this testimony, I will briefly review the history of temporarily enacted energy tax provisions, noting provisions that are scheduled to expire in 2011. I will also address some of the economic impacts of allowing targeted energy tax incentives to expire. Finally, I will outline characteristics of economically efficient and effective energy tax policy.

I. Expirations of Temporary Energy Tax Provisions

The income tax code has long been used as a policy tool for promoting U.S. energy priorities. Prior to the 1970s, energy tax incentives supported development of oil and gas resources.[1] In the late 1970s, tax incentives supporting renewable and alternative energy resources were introduced. Unlike the pre-1970s tax incentives for fossil fuels, which were permanent features of the tax code, the investment tax credit (ITC) for renewable

[1] A history of U.S. energy tax policy can be found in CRS Report R41227, *Energy Tax Policy: Historical Perspectives on and Current Status of Energy Tax Expenditures*, by Molly F. Sherlock.

energy introduced in 1978 contained a sunset provision.[2] Subsequent production and investment tax incentives for renewable energy have also, generally, been enacted on a temporary basis.[3]

Major energy legislation in the 1990s provided a number of energy-related tax incentives. One of those provisions was the renewable energy production tax credit (PTC). Since being introduced in 1992, the PTC has been the primary federal incentive supporting wind. The PTC has been extended seven times since 1992. In three of these cases, the PTC was allowed to lapse prior to being extended. Under current law, the PTC for wind will expire at the end of 2012 (the expiration date for other eligible technologies is 2013).

In lieu of the PTC or ITC, between 2009 and 2011, renewable energy investors could elect to receive a one-time grant from the U.S. Treasury.[4] This provision—commonly referred to as the "Section 1603 grant" —was included in the American Recovery and Reinvestment Act of 2009, to compensate for weak tax-equity markets.[5] Before the recession, large-scale renewable energy projects relied on tax-equity markets to convert tax credits into cash. Tax-equity markets dried up during the recession, making it harder for many market participants to realize the value of renewable energy tax benefits. The Treasury grants in lieu of tax credits program supported the renewable energy industry during the recession, when tax equity availability was limited. After 2011, the grant option will no longer be available.[6]

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[2] When first enacted in 1978, the renewable energy investment tax credit was scheduled to expire at the end of 1982. In 1980, the credit rate was increased and the duration of the credit extended, through the end of 1985. The investment tax credit for solar was allowed to lapse at the beginning of 1986, before being retroactively extended through the end of 1988. The credit was again extended in 1989 and 1991. In 1992, the 10% investment tax credit was made permanent. Legislation in 2005 temporarily increased the renewable energy investment tax credit for solar from 10% to 30%. Subsequent legislation in 2006 and 2008 extended this 30% rate through the end of 2016.

[3] A permanent 10% investment tax credit (ITC) for solar energy is currently part of the tax code. Renewable energy investments also qualify for 5-year accelerated cost recovery under MACRS, which is a permanent feature of the tax code.

[4] See CRS Report R41635, *ARRA Section 1603 Grants in Lieu of Tax Credits for Renewable Energy: Overview, Analysis, and Policy Options*, by Phillip Brown and Molly F. Sherlock.

[5] The Treasury grant option is often referred to as the "Section 1603" grant, after its section in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5).

[6] Tax credits for wind are scheduled remain available for one year, through the end of 2012. Tax credits for other technologies are scheduled to expire in 2013 or 2016.

The PTC is not the only energy-related tax incentive that has been allowed to lapse in recent years. Several other energy tax provisions were allowed to expire at the end of 2009. Among those allowed to expire were incentives supporting biodiesel, renewable diesel, and alternative fuels. Most of the energy tax provisions that were allowed to expire at the end of 2009 were retroactively extended at the end of 2010 through the end of this year. A number of energy-related tax incentives, including those supporting renewable fuels, alternative technology vehicles, as well as a number of incentives promoting energy efficiency, are also scheduled to expire at the end of 2011.[7]

Fuels-related incentives scheduled to expire this year include those supporting biodiesel, renewable diesel, ethanol, and other alternative fuels.[8] Tax incentives for ethanol were first introduced in 1978, and substantially modified in 2004. Tax incentives for biodiesel and renewable diesel first became available in 2005. Biofuels are also supported by non-tax programs, such as the Renewable Fuel Standard (RFS). The RFS, which requires a certain amount of renewable fuels be included in the nation's transportation fuels supply, was first established in 2005 and expanded in 2007.

The tax code also contains a number of incentives for alternative technology vehicles and related infrastructure, some of which are scheduled to expire at the end of 2011. The credit for electric-drive motorcycles, three-wheeled, and low-speed vehicles, as well as the credit for plug-in electric vehicle conversion kits, are scheduled to expire at the end of 2011. The tax credit for alternative-fuel vehicle refueling property is also scheduled to terminate at the end of 2011.[9]

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[7] For a full list of energy-related tax provisions scheduled to expire at the end of 2011, see CRS Report R42105, *Tax Provisions Expiring in 2011 and "Tax Extenders"*, by Molly F. Sherlock. For a list of energy-related tax provisions scheduled to expire in 2012 through 2020, see U.S. Congress, Joint Committee on Taxation, *List of Expiring Federal Tax Provisions 2010 - 2020*, committee print, 112th Cong., January 21, 2011, JCX-2-11.

[8] The tax credit for the production of cellulosic biofuel, which has been available since 2009, is scheduled to expire at the end of 2012. For a summary of federal incentives for biofuels, see CRS Report R40110, *Biofuels Incentives: A Summary of Federal Programs*, by Brent D. Yacobucci.

[9] Expenditures for property related to hydrogen may be eligible to receive the tax credit through 2014.

A number of tax incentives designed to support enhanced energy efficiency are scheduled to expire at the end of 2011. After 2011, taxpayers making certain energy-efficiency improvements to their homes will no longer be eligible for a tax credit. The tax credit for energy-efficiency improvements to existing homes was available during 2006 and 2007, but was allowed to lapse in 2008, before being reinstated for 2009.[10] As part of the Recovery Act, the credit rate was increased from 10% to 30% and the maximum credit amount increased from $500 to $1,500, for 2009 and 2010. At the end of 2010, the credit was extended for one year, at the reduced rate of 10%, subject to a lifetime cap of $500. Other energy-efficiency related incentives scheduled to expire at the end of 2011 include the credit for manufacturers of energy-efficient appliances and the credit for construction of energy-efficient new homes.

2. Economic Issues Related to Temporary Tax Incentives

There are several reasons why tax provisions might be enacted temporarily. There are also a number of reasons why temporary tax incentives may create cause for concern. In both cases, some of the reasons are economic, while others are related to federal budget policy or politics. This testimony focuses on economic considerations related to temporary tax incentives.

On a macro economic level, one motivation for temporary tax incentives might be economic stimulus. Tax incentives can be used to promote new investment and increase economic activity.[11] Ultimately, this additional economic activity could contribute to increases in economic growth and potentially job creation, but the cost effectiveness of such policies depends on the response.

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[10] Credits for residential energy efficiency were first introduced in 1978, but were allowed to expire in 1985. For more information on residential energy tax credits, see CRS Report R42089, *Residential Energy Tax Credits: Overview and Analysis*, by Margot L. Crandall-Hollick and Molly F. Sherlock.

[11] See CRS Report R41034, *Business Investment and Employment Tax Incentives to Stimulate the Economy*, by Thomas L. Hungerford and Jane G. Gravelle.

Alternatively, temporary tax incentives may be offered as support for newly developing industries. Arguably, temporary tax incentives can help new technologies "scale up." Realizing scale economies might help new technologies to compete directly with established alternatives.[12]

Another rationale for enacting tax incentives temporarily is that expiring provisions provide Congress with an opportunity to evaluate the efficacy of the expiring incentives. Under this premise, poorly designed or ineffective incentives would be modified or allowed to expire. Tax incentives achieving policy goals would be extended.

In practice, the implementation of temporary tax incentives raises a number of concerns. Very few "temporary" tax incentives, after becoming part of the Internal Revenue Code, are actually allowed to expire. Many temporary incentives, including a number that support energy, are routinely lumped together and extended as part of a "tax extender" package. The number of provisions included in tax extender packages has increased in recent years, and it is unclear how much scrutiny is given to individual provisions prior to the typical one- or two-year extension.

Temporary tax incentives can also create real economic problems. The uncertainty associated with temporary tax incentives can distort economic decision making. Taxpayers may rush to make certain investments before a possible expiration date. Longer term projects that could benefit from tax incentives in the future may stall, since it is unclear if those tax incentives will be available once investments are actually made. This uncertainty can also lead to supply-chain problems, as manufacturers may be reluctant to make permanent investments when the future of industrial incentives remains in flux.

Temporary tax incentives also contribute to tax code complexity. Taxpayers will invest time and resources in making contingency plans. If certain tax incentives expire,

[12] For example, the tax credits for hybrid vehicles that was established in 2005 terminated on January 1, 2011. Prior to termination, credits were subject to a per-manufacturer limit, such that the credit began to phase out once 60,000 units of a qualifying vehicle were sold.

investments may be made in Project A. Otherwise, Project B might get the go ahead. This type of contingency planning is unlikely to result in the most efficient allocation of resources. Retroactive extensions of temporary provisions may also require firms to file amended returns. Further, taxpayers that benefit from incentives by filing retroactive returns are not motivated by the incentive, but rather receive a benefit for actions already taken. This issue is discussed in greater detail later in this testimony.

Temporary Tax Incentives and the Energy Industry

The expiration, or threatened expiration, of renewable energy tax incentives may have real impacts on renewable energy industries. This testimony briefly examines evidence related to expiring tax incentives for the wind and biodiesel industries.

Lapses in the PTC have been associated with a so-called "boom-bust" cycle in wind development.[13] In years where the PTC was allowed to expire, new wind development substantially declined.[14] Declines in wind development have also occurred outside of PTC lapse periods. In 2010, when both the PTC and the grant option were available, new wind capacity installations were down nearly 50%.[15] While new installations of wind capacity have increased in 2011, new installed wind capacity by quarter thus far in 2011 remains below 2009 installation levels.[16] The amount of wind capacity under construction, however, has been increasing throughout 2011.

When the PTC has been allowed to lapse, some projects may have been cancelled, while others might have been put on hiatus. Uncertainty regarding PTC-status during lapse

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[13] Ryan Wiser, Mark Bolinger, and Galen Barbose, "Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States," *The Electricity Journal*, vol. 20, no. 9 (November 2007), pp. 77-88.

[14] The PTC was allowed to lapse in 1999, 2002, and 2004. Between 1999 and 2000, wind capacity installations fell 93%. Between 2001 and 2002, capacity installations declined 73%. Between 2003 and 2004, capacity installations fell 77%.

[15] The American Wind Energy Association (AWEA) reports that 10,010 megawatts (MW) of wind capacity were installed in 2009. This compares to 5,116 MW of capacity reportedly installed in 2010. See http://www.awea.org/learnabout/industry_stats/index.cfm.

[16] See data reported by the American Wind Energy Association (AWEA), available at: http://www.awea.org/learnabout/publications/reports/upload/3Q-2011-AWEA-Market-Report-for-Public-2.pdf

periods might have led project developers to stall. Some of these stalled projects would likely have moved forward even if the PTC had been allowed to terminate, but were waiting for policy clarity. The surge in wind installations following the reinstatement of the PTC, thus, likely includes some projects that were directly motivated by the PTC, as well as others that might have moved forward without the incentive.

A number of other market factors are also important to consider when thinking about the role federal incentives play in supporting wind development. First, the cost of competing energy technologies influences investment in wind. For example, low natural gas prices increase the attractiveness of natural gas power plants, making wind less attractive in comparison. Second, the price of inputs related to wind power is also important. As advances in wind turbine manufacturing and materials bring down the costs associated with wind power, investment in wind should increase. It should be noted, however, that wind development that occurs in fits and starts can create bottlenecks in the turbine manufacturing process, which might delay projects and raise overall costs.[17]

Similar to wind, biodiesel production declined following a lapse in tax incentives. From 2005, the year tax credits for biodiesel were enacted, through 2008, biodiesel production increased annually.[18] In 2009, biodiesel production declined, relative to 2008 levels. Biodiesel consumption, however, remained effectively unchanged between 2008 and 2009. Tax credits for biodiesel were allowed to lapse during 2010. In 2010, both biodiesel production and consumption declined, 39% and 28%, respectively. For the first eight months of 2011, biodiesel production and consumption is well above 2009 and 2010 levels.

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[17] See Gilbert E. Metcalf, "Tax Policies for Low-Carbon Technologies," *National Tax Journal*, vol. 62, no. 3 (September 2009), p. 526 and Mark Bolinger and Ryan Wiser, *Understanding Trends in Wind Turbine Prices Over the Past Decade*, Ernest Orlando Lawrence Berkeley National Laboratory, LBNL-5119E, October 2011, http://eetd.lbl.gov/ea/emp/reports/lbnl-5119e.pdf. For a detailed overview of the U.S. wind turbine manufacturing sector, see CRS Report R42023, *U.S. Wind Turbine Manufacturing: Federal Support for an Emerging Industry*, by Michaela D. Platzer.

[18] In 2005, biodiesel production was 2,162 thousand barrels (Mbbl). By 2008, biodiesel production had increased to 16,145 Mbbl. Biodiesel production data is available from the Energy Information Administration (EIA), at http://www.eia.gov/totalenergy/data/monthly/pdf/sec10_8.pdf.

As was the case with wind, several factors, including tax incentives, likely influence biodiesel market trends. One factor affecting biodiesel markets is the price of soybean oil, the primary feedstock for biodiesel. High soybean prices and the economic recession contributed to declines in biodiesel production, even before tax incentives were allowed to expire at the end of 2009.[19] Diesel prices also fell at the end of 2008, making it harder for biodiesel to be produced at a competitive price.

3. Characteristics of Economically Efficient and Effective Renewable Energy Tax Policy

From an economic perspective, energy prices would ideally reflect the full social cost of energy production and consumption. Having accurate cost and price signals would direct economic resources towards their most productive use. The most economically efficient way to achieve this outcome would be to tax energy resources that have negative external social costs, such as pollution. Increasing the price of energy resources would not only reduce overall demand for energy, but would also create incentives for investment in non-polluting alternatives.

The history of U.S. energy tax policy indicates a preference for subsidies, rather than direct taxes. Given this preference, this testimony provides some economic guidance related to designing efficient and effective energy tax incentives.

Cost-effective incentives are those that encourage changes in behavior, rather than simply rewarding current practices

The goal of energy tax incentives is to encourage, promote, or support production or consumption of targeted energy resources. Tax subsidies for residential energy efficiency,

[19] For more information on biodiesel markets, see CRS Report R41631, *The Market for Biomass-Based Diesel Fuel in the Renewable Fuel Standard (RFS)*, by Brent D. Yacobucci and CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*, by Randy Schnepf.

for example, are intended to promote investment in residential energy-saving property. Tax subsidies for residential energy efficiency (as well as other energy-related tax subsidies) reward two types of consumers: those who would not have installed the energy-saving property without the tax incentive, and those who would have installed the energy-saving property even if a tax incentive were not available. In practice, it is very difficult to target tax incentives such that only the first group benefits.

Economists find tax incentives are more efficient (and cost-effective) when a larger proportion of taxpayers change their behavior to become eligible for the tax incentive. If few taxpayers actually change their behavior to benefit from a tax incentive, tax incentives either 1) provide windfall gains to taxpayers already engaged in the activity the incentive was designed to promote; or 2) the incentive is ineffective.

For renewable energy projects with longer planning horizons, tax uncertainty might prevent marginal projects from moving forward. These marginal projects are those that would likely respond directly to the tax incentive, but without a tax incentive, are not viable. In the face of tax uncertainty, investments in renewable energy are still likely to take place. These investments, however, are not those that are motivated by tax incentives. If tax incentives happen to be available when these projects are placed in service, these projects will benefit. For the latter class of projects, however, tax incentives did not cause additional renewable energy investment. Instead, tax incentives provided a windfall benefit without motivating additional investment in renewable energy.

To the extent that tax uncertainty prevents marginal projects from moving forward, and allows other projects to receive windfall benefits, tax uncertainty is inefficient and diminishes the cost-effectiveness of tax policies.

Effective energy tax incentives support technologies that would be competitive if energy prices reflected the full social cost of energy consumption and production

Subsidies for low-carbon energy resources can be viewed as compensating for the fact that polluting energy resources are under-priced. In other words, in a market where pollution is not priced, subsidies for clean energy can help level the playing field. Overly generous subsidies, however, might support technologies that would otherwise not be viable (or do not have the potential to become viable at some point in the future). Supporting technologies with limited viability can create economic distortions, diverting economic resources away from more promising alternatives.

Incentives made available to a broad range of technologies avoid "picking winners"

Renewable energy tax incentives may seek to achieve varied policy goals. One goal might be reduced CO_2 emissions. Another goal might be to strengthen domestic manufacturing and promote job creation. A third goal might be to enhance energy security. Ideally, energy tax policy should be designed to allow markets to choose which technologies best meet energy policy objectives. This point is illustrated by expanding on the policy goal of reducing CO_2 emissions.

If the policy goal is to reduce carbon emissions, a tax on carbon would create market incentives for businesses and individuals to find low-cost, low-carbon alternatives. A direct tax on carbon would avoid having policymakers make explicit choices regarding which low-carbon technologies should be employed. In contrast, subsidies for low-carbon technologies require that certain technologies explicitly be identified as being eligible for the subsidy. This may create a bias against newly emerging technologies, as it takes time to update the tax code to expand the list of qualifying technologies.[20]

[20] This point was made in U.S. Congress, House Committee on Ways and Means, Subcommittee on Select Revenue Measures, *Energy Policy and Tax Reform*, Statement of Donald B. Marron, 112th Cong., 1st sess., September 22, 2011.

If the goal is renewable energy production, incentives that reward production are preferred to those that reward investment

Production incentives reward generation of electricity using renewable energy resources. When production is rewarded, investors will strive to maximize the output of qualifying energy, given the resources available. Alternatively, investment tax incentives reward capital investment, instead of directly rewarding energy production. By rewarding investment rather than production, there is a concern that investments may not translate into maximum production capacity. Further, incentives that reward investment as opposed to production may lead firms to use more capital at the expense of labor.[21]

Energy tax policy does not exist in a vacuum; tax policies may interact with or be redundant to other policies supporting energy

Tax incentives are one of many tools that can be used to support energy policy objectives. One goal for the design of energy-related tax incentives should be to avoid policy redundancy: if policy goals are being achieved through the use of another policy instrument, tax incentives may not be achieving purported policy goals.

In the case of renewable energy tax credits, one concern is that state-level Renewable Portfolio Standards (RPS) might drive up the costs associated with federal tax incentives.[22] If state-level policies mandating renewable energy use are driving renewable energy investment, then tax expenditures for renewable energy incentives may increase without an associated increase in renewable energy investment. In other words, if investment is being driven by state-level renewable energy policies, tax credits might simply be rewarding existing activity.

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[21] This point was made in U.S. Congress, House Committee on Ways and Means, Subcommittee on Select Revenue Measures, *Energy Policy and Tax Reform*, Statement of Donald B. Marron, 112th Cong., 1st sess., September 22, 2011.

[22] Gilbert E. Metcalf, "Tax Policies for Low-Carbon Technologies," *National Tax Journal*, vol. 62, no. 3 (September 2009), p. 517.

Similar concerns have been raised with respect to tax incentives for biofuels under the Renewable Fuel Standard (RFS). Consumption of biofuels is largely driven by the RFS. To the extent that biofuel consumption is driven by this mandate, tax credits do not lead to additional production. While tax incentives for biofuels may have limited effects on production under the RFS, the tax credits still provide financial support to biofuel blenders, producers, as well as purchasers of blended fuel.[23]

Thank you again for inviting me to appear today. I am happy to respond to your questions.

[23] See Congressional Budget Office, *Using Biofuel Tax Credits to Achieve Energy and Environmental Policy Goals*, Washington , DC, July 2010, p. 18 and U.S. Government Accountability Office, *Biofuels: Potential Effects and Challenges of Required Increases in Production and Use*, GAO-09-446, August 2009, pp. 99-105, http://www.gao.gov/new.items/d09446.pdf.

STATEMENT OF PAUL SOANES,

PRESIDENT AND CEO OF RENEWABLE BIOFUELS, INC.

BEFORE THE

SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES AND INFRASTUCTURE

COMMITTEE ON FINANCE

UNITED STATES SENATE

December 14, 2011

Mr. Chairman, my name is Paul Soanes, and I am the President and CEO of Renewable Biofuels, Inc., headquartered in Houston, Texas. I very much appreciate the opportunity to appear before the Committee today to discuss the impact of clean energy tax incentives on the domestic biodiesel industry.

I want to thank you, Mr. Chairman, for your ongoing leadership on renewable fuels issues. You have been instrumental in driving the federal policies designed to incentivize clean fuels and a sustainable future. I also want to thank you, Senator Cornyn, for joining with Senator Bingaman to request this hearing. Texas has more biodiesel production capacity than any other state, and I want to thank you both for your past support for the biodiesel tax credit.

RBF Port Neches LLC (RBF) operates the largest biodiesel production facility in North America. The plant is a BQ9000 accredited facility with a nameplate processing capacity of 180 million gallons per annum. We have invested over $200 million in state-of-the-art refining technology at this facility. We have and continue to process a variety of feedstocks in the production of biodiesel.

This year has seen unprecedented growth in biodiesel production in the United States, including at our facility. In 2009 and 2010, RFB produced approximately 12 million gallons and 9 million gallons of biodiesel respectively. This year, we estimate RBF's annual production will exceed 62 million gallons – a seven-fold increase in just one year.

In my view, this unprecedented growth can be attributed largely to two key federal policies. One is the Renewable Fuel Standard (RFS2), which specifies the volumetric requirements of biomass-based diesel that must be used each year by obligated parties, which are companies that have an obligation to purchase a specified amount of biodiesel for blending with traditional diesel. The other key policy decision was Congress' extension in December 2010 of the blender's tax credit for biodiesel for calendar year 2011 as well as retroactively for 2010. This credit had expired at the end of 2009.

Calendar year 2011 is the first year that both of these federal incentives have been in place concurrently, and the effects are undeniable and quantifiable. Demand for biodiesel in the U.S. is at an all time high. As a result, monthly production of biodiesel in the United States has risen from about 37 million gallons in January 2011 to almost 119 million gallons in October 2011, according to the Environmental Protection Agency (EPA). Although the year is not over, 2011 has already set a new record for annual biodiesel production in the United States with 802 million gallons produced so far.

Looking ahead, the volumetric requirement under the RFS2 for 2012 is set at 1 billion gallons of biodiesel, and the proposed volume for 2013 is 1.28 billion gallons. The industry is prepared to meet and exceed these levels of production, as there is an estimated annual production capacity in excess of 1.8 billion gallons within the domestic industry.

Although the biodiesel mandate was enacted as a provision of the Energy Independence and Security Act of 2007, the final rule for the RFS2 program was not published until March 26, 2010. Until the rule was finalized, obligated parties were not required to purchase biodiesel. Even with the 2010 mandated volumes, biodiesel demand was almost nonexistent as a result of the pricing uncertainty created by the expiration of the tax credit in December 2009. Even though the tax credit was made retroactive, the damage had been done.

The results of the uncertainty created by the lapse in the tax credit were severe. The biodiesel industry's 2011 production figures stand in stark contrast to the production levels over the past several years. In 2009, when the tax credit was in place but the RFS2 was not, biodiesel production was 506 million gallons. With the tax credit expired for most of 2010, annual production dropped to 309 million gallons, a forty percent drop from 2009 and less than half of the volume produced so far this year. According to the National Biodiesel Board, last year's steep drop in production levels resulted in the loss of nearly 8,900 jobs and a drop in household income of $485 million. This year's increased production is supporting more than 31,000 jobs, and will generate at least $3 billion in gross domestic product and $628 million in federal, state and local tax revenues, according to a study conducted by Cardno-Entrix.

At RBF, our business was also negatively affected by the lapse of the tax credit for much of 2010. Our annual production in 2010 was five percent of our nameplate capacity. This was largely because uncertainty about the tax credit disincentivized blenders from buying our product for calendar year 2010. There was too much price uncertainty for biodiesel when the tax credit lapsed. The profit margin for producers is very small, so a $1 per-gallon tax credit makes a substantial difference for both producers and blenders in the overall price of a gallon of bio-

diesel. Given the infancy of the industry, participants did not have sufficient capital to take the risk associated with the potential application of a retroactive granting of the tax credit.

Like the rest of the industry, RBF has seen a tremendous increase in demand for its product during 2011. We are running our facility harder than ever, as evidenced by the production levels I cited earlier. As a result, RBF has significantly increased its headcount, including hiring a number of veterans and has invested additional capital in our facility to further enhance our production capability.

Some policymakers have questioned the value of the tax credit given the RFS2 mandates. However, uncertainty about the tax credit decimated the domestic biodiesel industry even after the RFS2 rule was finalized. This is an unintended consequence of the operative provisions of the RFS2. As a matter of illustration, compliance under the RFS2 is done on an annual basis, with obligated parties not having to demonstrate to the EPA that they have met their obligations until February of the following year. Because compliance isn't measured until February of the following year, obligated parties may delay their purchases of biodiesel in the current year until there is certainty with regard to the tax credit and thus pricing certainty. By no means will obligated parties ignore compliance, but they will delay purchases until there is a clear direction from Congress on extension of the tax credit, which will create severe price, volume and market volatility, and will negatively impact domestic production capability. Secondly, the RFS2 program allows obligated parties to defer some of their volumetric requirements to the following calendar year, which can reduce the demand in the current year.

As you know, Mr. Chairman, a RIN is generated when an eligible gallon of biofuel is produced. Inherent in the pricing calculation of the gallon of biodiesel is the value of the RIN. Many industry participants and even third parties believe the value of the tax credit will be made

up in the pricing of the RIN, which is a liquid instrument. We don't disagree with this theory on its face; however, the market isn't deep enough nor mature enough to react to immediate fluctuations such as the loss of the tax credit or the uncertainty created by the potential retroactive application of the tax credit.

Having both the tax credit and the RFS2 program in place for all of 2011 has resulted in dramatic, recognized improvements in the current year and the future outlook for domestic biodiesel producers. This year has shown that the RFS2 program has provided market certainty, while the tax credit has provided pricing certainty for market participants. But stable, long-term federal incentives are necessary for this industry to continue to grow, and for investors to continue to provide equity and debt capital that will be needed for commercialization of the next generation of advanced biofuels. Single year extensions of the blender's tax credit will not provide the certainty needed to access both working capital and direct future investments necessary to further growth of the biofuels industry and reduce our dependence on foreign oil.

For decades, the federal government has used tax policy to achieve certain societal goals, such as home ownership, research and development, and securing the diverse sources of energy needed to maintain our economy. The tax credit to incentivize the domestic production of biodiesel is an important tax incentive designed to achieve important national goals.

Qualifying biodiesel is good for the United States: it has lower life-cycle greenhouse gas emissions and every gallon produced displaces a gallon of traditional diesel. This helps reduce our dependence on foreign sources of petroleum, many of which are national oil companies controlled by regimes whose interests do not align with U.S. national security interests.

It would be a setback to the gains our industry has made to have yet another lapse in the tax credit. Uncertainty over the extension of the tax credit and the price of biodiesel will drive

purchasers to the sidelines once again, significantly curtailing domestic market demand and production capability, availability of working capital, investor confidence and ultimately putting at risk the tremendous production and jobs gains of 2011.

I founded RBF because I believed that the 2007 Energy Independence and Security Act -- in establishing a renewable fuels mandate through at least 2022 -- signaled a long-term commitment by the federal government to incentivize the diversification of fuel sources and the development of cleaner transportation fuels for the United States. Many others made similar investments based on this perceived commitment. There is over 1.8 billion gallons of annual biodiesel production capacity in the United States, and the domestic industry currently employs over 31,000 people, often in rural areas with high rates of unemployment.

Our industry can meet and exceed the volumes mandated by the federal government, and we hope that the federal government maintains the policies that have enabled this industry to grow so rapidly. The biodiesel industry is still young, and needs the consistent support of the federal government for several more years. However, I do not anticipate that the industry will need a tax incentive indefinitely. I personally believe that the industry will be able to operate without the tax credit in three to five years, as long as the RFS2 program continues to provide market certainty.

If the Congress wants to control the overall cost of the tax credit, and to spur more domestic production, I would encourage the transition to the production tax credit that Senators Cantwell and Grassley have been championing for several years. A production tax credit would only be available to domestic producers, whereas the current blender's credit is available even when qualifying imported biodiesel is blended with traditional diesel.

In closing, Mr. Chairman and Ranking Member Cornyn, I want to thank you again for convening this hearing today to examine this important issue. While I am here in my capacity as President and CEO of Renewable Biofuels, I think I speak for most producers when I say that the seamless extension of the tax credit for biodiesel is the single highest priority for the domestic biodiesel industry. I am happy to answer any questions you may have.

Clean Energy Tax Incentives: What Role Should Government Play?

Margo Thorning, Ph.D.
Senior Vice President and Chief Economist
American Council for Capital Formation
Before the
Subcommittee on Energy, Natural Resources and Infrastructure
Committee on Finance
U.S. Senate

Executive Summary

Government Subsidies and Tax Incentives for Clean Energy: The wind, solar power, biofuel and ethanol industries do not meet the standard criteria used to justify taxpayer-funded subsidies for their deployment across the U.S. economy. They are not "infant industries," are not essential for U.S. economic and job growth and they are unlikely to provide benefits commensurate with their costs. Addressing the huge U.S. federal budget deficit requires cutbacks in programs whose costs exceed their benefits.

Renewable Energy Costs are High: Energy use is a key component in U.S. economic recovery, in recent years each 1% increase in GDP in the U.S. has been accompanied by a 0.2% increase in energy use. Data from DOE's EIA show that new electric generating capacity using wind and solar power tends to be considerably more expensive than conventional, available and secure natural gas and coal resources.

Impact of Clean Energy Standard: A national mandate requiring that electricity retailers supply a specified share of their sales from clean energy sources would have adverse economic impacts. A new EIA analysis shows that by 2035, the CES will raise electricity prices by 20% to 27 % and reduce GDP by $124 billion to $214 billion.

Renewable Energy Receives Largest Share of Tax Code Subsidies: In 2010, an estimated 76% of the $19.1 billion in federal tax incentives went to renewables, for energy efficiency, conservation and for alternative technology vehicles while only 13% went to fossil fuels according to the Congressional Research Service (CRS). Some renewable electricity enjoys negative tax rates: solar thermal's effective tax rate is -245 % and wind power's is -164%.

Tax Code Should be Neutral: Accelerated depreciation, Section 199, the foreign tax credit deduction and LIFO are examples of tax code provisions that are available to any industry and are not considered "subsidies."

Fossil Fuels Expansion: Several recent economic analyses suggest that increased access to domestic onshore and offshore oil and gas reserves , including shale gas, could strongly boost U.S. economic recovery, manufacturing and job growth as well as increasing energy security.

Conclusions: Continued high levels of federal support for the deployment of clean energy and alternative fuel vehicles in the U.S. is unlikely to have a significant impact on reducing GHG concentrations in the atmosphere since the real growth in emissions is coming from developing countries. Instead, government funded basic R&D for renewables and conservation may be a better use of taxpayer dollars than the current suite of tax incentives and direct spending programs whose renewal by policymakers is highly uncertain, especially given the critical situation of the U.S. federal budget.

Clean Energy Tax Incentives: What Role Should Government Play?

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Senior Vice President and Chief Economist
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Before the
Subcommittee on Energy, Natural Resources and Infrastructure
Committee on Finance
U.S. Senate
December 14, 2011

Introduction

Chairman Bingaman, Ranking Member Cornyn and members of the Subcommittee, my name is Margo Thorning, senior vice president and chief economist, American Council for Capital Formation (ACCF),* Washington, D.C. I am pleased to present this testimony on the impact of incentives for renewable energy on U.S. economic and job growth and the federal budget.

The American Council for Capital Formation represents a broad cross-section of the American business community, including the manufacturing and financial sectors, Fortune 500 companies and smaller firms, investors, and associations from all sectors of the economy. Our distinguished board of directors includes cabinet members of prior Democratic and Republican administrations, former members of Congress, prominent business leaders, and public finance and environmental policy experts. The ACCF is celebrating over 30 years of leadership in advocating tax, regulatory, environmental, and trade policies to increase U.S. economic growth and environmental quality.

The Subcommittee Chairman and Committee members are to be commended for their focus on how the tax incentives and subsidies provided to clean, renewable energy technologies have impacted their deployment as well as U.S. manufacturing and job growth. Given the continuing weakness of the U.S. economic recovery, stubbornly high unemployment rate, sluggish investment spending and a federal budget deficit of 8.5% of GDP, a careful examination of whether the incentives in the tax code and the direct federal expenditures on clean energy are the best and highest use of U.S. taxpayer's dollars is warranted.

Rationale for Subsidies for Industry

As explained in a report by the UN's Food and Agriculture Organization, subsidies can be defined as government policies that aid one or more industries, usually carrying a financial

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* *The mission of the American Council for Capital Formation is to promote economic growth through sound tax, environmental, and trade policies. For more information about the Council or for copies of this testimony, please contact the ACCF, 1750 K Street, N.W., Suite 400, Washington, D.C. 20006-2302; telephone: 202.293.5811; fax: 202.785.8165; e-mail: info@accf.org; website: www.accf.org*

benefit to the industry.[1] At the most conventional level, subsidies are government financial transfers to an industry, through payments to workers or to firms. Probably nobody would deny that the government is subsidizing the industry if it is paying part of the wages of workers in the industry or it is granting firms in the industry funds to make capital purchases. This is the narrowest definition of a subsidy.

But as the UN report notes, there is little difference from the standpoint of the industry between a government transferring funds to it, on one hand, and waiving transfer payments, i.e. taxes, that the firm would normally make to the government. The tax code provisions and direct federal grants made available to clean energy industries meet the criteria of subsidies described in the FAO report. The key question is: are the benefits of the taxpayer funded incentives worth the cost?

When economists justify subsidies, they usually do so in one of three ways. First, there is the "infant industry" argument. An industry, for instance, may be dominated by foreign (non-domestic) (e.g. textile manufacture by England during the early days of the United States) and for reasons of social policy, the government may want to develop an indigenous industry. Insufficient private capital may be available to permit the private sector, on its own, to accumulate sufficient capital to make the indigenous industry commercially competitive. The government then could subsidize the industry through grants, loans, equity infusions, tariff protection or tax incentives. When the industry has been built up to the point where it is self-sufficient, the subsidies would be removed.

The logic of the argument is appealing, and the approach to economic development might work, but there is a tendency once the subsidy has been implemented to continue it long after it is necessary or long after it should have been necessary, the FAO report notes. The ultimate result can be that the industry, originally stimulated by the subsidy, becomes dependent upon the subsidy and fails to improve its productivity along with the rest of the world. One is then left with an inefficient industry that cannot compete in the marketplace. The justification for subsidies then switches to the protection of employment which would fall if the government were willing to let the industry fail. Thus, subsidies which were intended to help the industry get started become "necessary" to keep an inefficient industry afloat. The subsidy then becomes permanent until the government finally decides that it can no longer maintain the industry and the industry shrinks as government subsidies shrink with all the economic and social dislocation that entails. Alternatively, the subsidy may be introduced to help the infant industry, the industry may then become self-sustaining, but it may be difficult to wean the industry off the subsidy.

The second argument in favor of subsidization is that a large, critical industry may run into serious temporary difficulties and be in danger of ceasing operations. The government, in such a situation, would have at least three options: it can play no role and let the full market effects be felt; or it can directly subsidize the endangered firms with cash or equity infusions, loans or loan guarantees; or it can let the firms go bankrupt but intervene through the monetary system to prevent the bankruptcy of the firms from affecting other, healthy, part of the economy. A third argument in favor of subsidization is tied to current interests in environmental protection.

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[1] http://www.fao.org/DOCREP/006/Y4647E/y4647e05.htm

Subsidies can be used to encourage firms and industries to behave in environmentally friendly ways.[2]

Are Continued Subsidies for Clean Energy Deployment Justified?

- **Infant industries**

Are clean, renewable energies truly "infant industries" and deserving of continued taxpayer support through provisions in the tax code or direct federal expenditures? A look back at history will help put the question in perspective. Regarding solar power, an EIA report notes that solar technology is not new, it dates from the 7th century BC when magnifying glass was used to concentrate the sun's ray to make fire and passive solar to heat rooms was used in Roman bathhouses in the 1st century AD. Almost 3000 years after the use of solar power began; it has many applications but is still not cost-competitive with conventional energy sources in many cases.[3] Similarly, wind power has a long history; the Persians constructed the earliest known windmills in the 6th century AD to grind grain.[4] By 1300 AD windmills were in wide use in Europe for a variety of industrial uses. Though some 1400 years have passed since windmill began to be used for industrial purposes, they are still only an intermittent source of power generation. Finally, batteries have been in use since the early 1800's and the first electric car was invented in Scotland in 1832 by Robert Anderson.[5] Though the plug-in electric vehicle was fairly popular in New York City in the early 1900's, it was quickly supplanted by gasoline powered vehicles with their greater driving range, quick refueling and lower cost. Thus, looking back at the length of time that renewable energy and alternative fuel vehicles have been in use, it seems questionable that these industries (which receive most federal support) meet the criteria of being "infant industries."

- **Economic impact of phasing out subsidies for renewable technology deployment**

Another key question is whether the phase out of tax incentives for clean energy deployment will have an adverse impact on U.S. economic recovery and job growth. As noted in a 2010 report by Department of Commerce, "Measuring the Green Economy," green products and services comprised only 1 to 2 percent of the total private business economy in 2007. The number of green jobs ranged from 1.8 to as many as 2.4 million when products and services that some might argue were not "green' were included in the total. These jobs constituted between 1.5 and 2.0 percent of total employment in 2007.[6] The Commerce Department report concludes that the relatively small size of the green economy suggests that the majority of jobs created during the economic recovery are likely to come from the production of products and services outside the green economy. Thus, phasing out of incentives in the tax code for clean energy is not likely to have a material impact on U.S. economic growth and such savings could help reduce the federal

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[2] Ibid.

[3] http://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf

[4] http://www.utexas.edu/gtc/assets/pdfs/windmills_world.pdf

[5] http://www.npr.org/2011/11/21/142365346/timeline-the-100-year-history-of-the-electric-car

[6] http://www.esa.doc.gov/sites/default/files/reports/documents/greeneconomyreport_0.pdf

budget deficit, especially if declining government subsidies leads to increased efficiency in the subsidized firms rather than their demise.

In addition, renewable energy industries are now globally deployed. As a result, it will be very difficult if not impossible to ensure that the benefits of U.S taxpayer funded subsidies will result in the creation of new investment, jobs, new patents, etc. here in the U.S. On the other hand, it is also true that the U.S. has benefited indirectly from the vast spending on renewables in Europe and lately in China, which have brought down costs for everyone. In this respect it might be argued that the fact that others are subsidizing such technologies is an argument for the U.S. doing less, not more.

- **Environmental impacts of renewable energy**

While fossil fuels have their share of negative environmental and social impacts such as GHG and other emissions, coal ash, mining subsidence and oil spills, for example, the use of renewable energy also carries risks. Wind and solar power have the advantage of not directly producing GHGs or other emissions but there are negative environmental impacts associated with them and as well as other renewable energy including corn-based ethanol. As policymakers decide how much taxpayer support for clean energy industries is warranted, they need to consider their overall impact on the environment and on society in addition to their impact on GHG emission and reducing oil imports.

For example, a recent article "Wildlife Slows Wind Power" notes a series of incidents, including the death of an endangered bat at a wind farm in Pennsylvania have "caught the attention of regulators and conservation minded scientists who worry that large number of bats, bald eagles and other birds are being killed by the wind turbines spinning blades." As World Bank ecologist George Ledec notes, "Low carbon does not mean low overall environmental or social impacts".[7]

Biofuels such as corn-based ethanol also have negative social and environmental impacts. A 2009 report by the Congressional Budget Office concludes that the increased use of ethanol accounted for about 10 percent to 15 percent of the rise in food prices between April 2007 and April 2008; impacting both consumer spending and government outlays for food assistance.[8] CBO also notes that if increases in the production of ethanol lead to large amounts of forests or grasslands being converted into new cropland, those changes in land use could more than offset any reduction in greenhouse-gas emissions from the use of ethanol compared to gasoline.

Large scale solar power is not without potential negative environmental impacts as well. As noted in a recent article by Ned Haluzan, "large solar power plants require large amounts of land so if we were to massively build them this could significantly shrink the habitats of many plants and animals. The current solar technologies require approximately one square kilometer for every 30-60 megawatts of generated solar energy so really large solar energy projects require lot

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[7] http://online.wsj.com/article/SB10001424052970203501304577088593307132850.html

[8] http://www.cbo.gov/ftpdocs/100xx/doc10057/04-08-Ethanol.pdf

of available land." Haluzan also points out that some solar power plants require lot of water for cooling purposes, so this could lead to water shortage problem in certain areas".[9]

The most cost-effective way to promote environmental goals is likely to come through federal research and development. As noted by Professors Nemet and Baker in a 2009 Energy Journal article on the development of low-carbon technologies, "While both subsidies and successful R&D programs reduce costs, the effect of successful R&D on cost in 2050 is an order of magnitude larger than the effect of subsidies."[10] If clean, renewable technologies that have been in development for centuries and are still not competitive with conventional energy, other approaches may be needed to maximize the benefits from the use of taxpayer dollars for clean energy. It may be time to direct more federal support on basic research and development and less support for promoting and deploying existing technology.

Cost of Renewable Energy

Energy use is a key component in U.S. economic recovery, in recent years each 1% increase in GDP in the U.S. has been accompanied by a 0.2% increase in energy use. Higher energy prices tend to slow economic growth and reduce the competitiveness of the U.S. manufacturing sector. As policymakers confront the slow U.S. economic recovery and slow job growth, they need to consider the impact of tax, budget and regulatory decisions that promote the use of renewable energy compared to the expansion of conventional fossil fuels or nuclear power electricity generation and for transportation.

Federal policies that promote the use of more expensive renewable energy to replace cheaper and already environmentally sound and compliant conventional energy sources have the effect of increasing federal spending, reducing tax receipts and raising the price of energy. According to recent EIA data, new electric generating capacity using wind and solar power tends to be considerably more expensive than conventional natural gas and coal. As shown in Table 1, the total cost of offshore wind, at $244 dollars per mega watt hour (MWH) is almost 300% higher than for advanced combined cycle natural gas–fired plants which cost only $62 per MWH. The cost of solar thermal, at $312 MWH, is over 400% higher than natural gas-fired electricity production. Similarly, advanced nuclear costs an estimated $114 per MWH and advanced coal costs only $110 MWH.[11]

A federal mandate for increased use of renewable energy has been proposed by Chairman Bingaman. The Clean Energy Standard (CES) would require that covered electricity retailers supply a specified share of their electricity sales from clean energy sources. Under a CES, electric generators would be granted credits for every megawatthour (MWh) of electricity they produce using qualifying clean energy sources. The credits could be bought and sold, companies without enough clean energy credits could buy them from other generators.

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[9] http://www.renewables-info.com/interesting_energy_articles/solar_energy_environmental_impact.html
[10] http://www.ecs.umass.edu/mie/faculty/baker/DemandSubsidies.pdf
[11] http://www.eia.gov/forecasts/aeo/electricity_generation.cfm

A new EIA analysis of the CES shows how the implementation of the CES impacts energy prices and overall U.S. economic growth.[12] By 2035, relative to the reference case, average electricity prices rise by 20% under the Bingaman base case (BCES) and by 27% under the "All Clean" and "Standards plus Codes" cases.[13] All the CES cases evaluated by EIA cause reductions in Gross Domestic Product. Relative to the base case, by 2035 GDP declines by $124 billion (in constant 2005 dollars) under the BCES case to as much as $214 billion under the Standards and Codes case (see Figure 1).

In addition, current data on electricity prices in states with renewable portfolio standards (RPS) show that they experience higher costs for electricity those without an RPS mandate. In 2011, the 29 states with an RPS mandate faced residential electricity prices that were 27% higher than those without a mandate and industrial electricity prices were 23% higher (see Figure 2).

What Role Can Energy Play in the U.S. Economic Recovery and Job Growth?

- **Renewable energy development**

As noted above, renewable energy tends to be more expensive in many cases than conventional fossil fuels and nuclear power. In addition, the Department of Commerce research cited above and recent experience with DOE- funded clean energy start-ups suggests that taxpayers will not see much job growth or productive new enterprises from approximately $90 billion allocated for clean energy in the American Recovery and Reinvestment Act of 2009. For example, a recent article on California's green jobs initiative notes that "Job training programs intended for the clean economy have also failed to generate big numbers. The Economic Development Department in California reports that $59 million in state, federal and private money dedicated to green jobs training and apprenticeship has led to only 719 job placements — the equivalent of an $82,000 subsidy for each one."[14] While the renewable energy industry has a role to play as the U.S. tries to reduce emissions of all types and become less dependent on imported oil, policymakers should evaluate the cost-effectiveness of federal tax and budget outlays subsidizing these industries.

- **Fossil fuel expansion**

In contrast to the disappointing results from many expensive green energy initiatives funded by the U.S. taxpayer, several recent economic analyses suggest that increased access to domestic onshore and offshore oil and gas reserves (including shale gas) could strongly boost U.S. economic recovery, manufacturing and job growth. Fossil fuels, which provide 78% of U.S. primary energy production, can have a positive impact in restoring strong economic growth. A new Global Insight/CERA analysis, "Restarting the Engine-Securing American Jobs, Investment and Energy Security" finds that allowing exploration and development in the Gulf of Mexico in

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[12] http://www.eia.gov/analysis/requests/ces_bingaman/pdf/ces_bingaman.pdf

[13] See table 3 and table 5 at http://www.eia.gov/analysis/requests/ces_bingaman/pdf/ces_bingaman.pdf

[14] http://www.nytimes.com/2011/08/19/us/19bcgreen.html?_r=3

2012 could create more 230,000 jobs, a $44 billion increase in GDP and $12 billion in additional tax receipts to federal and state treasuries.[15]

Another new report by Wood Mackenzie, "U.S. Supply Forecast and Potential Jobs and Economic Impacts (2012-2030)" finds that policies that encourage the development of new and existing resources could by 2015 increase production by over 1 million barrels of oil equivalent per day (mboed), create almost 670,000 jobs and provide an additional $10 billion in federal and state tax receipts compared to the base case.[16] By 2030, production would rise by over 10 mboed, employment would be over 1.4 million higher and tax receipts would be $99 billion higher.

In fact, domestic access to shale gas and development of that abundant resource has the ability to reduce operating and feedstock costs for manufacturing and chemicals industries, respectively, in ways that can be transformative for those industries and job growth. In another recent analysis, "The Economic and Employment Contributions of Shale Gas in the United States" the consulting firm Global Insight documents the significant contributions that shale gas is making to the U.S. economy.[17] The report finds that in 2010, the industry supported 600,000 jobs and contributed more than $76 billion to GDP. Capital expenditures were $33 billion in 2010 and will grow to $48 billion in 2015. The current low and stable gas prices will contribute to a 10 % reduction in electricity prices in the near term and to a 1.1% increase in the level of GDP by 2013. All sectors of manufacturing benefit, especially those that use natural gas as a feedstock or energy source. In the long run, there will be improvements in the competitiveness of domestic manufacturers due to lower natural gas and electricity costs. As a result, industrial production will be 4.7% higher in 2035, the Global Insight report concludes.

The Federal Tax Code and Incentives for Energy Investment

Most federal support for energy production and investment is for renewable energy. As CRS analyst Molly Sherlock notes in a recent report, in 2010, an estimated 76% of the $19.1 billion in federal tax incentives went to renewables, for energy efficiency, conservation and for alternative technology vehicles while only 13% went to fossil fuels (see Table 2).[18] Given that non-hydro renewables provided only 7% of primary energy production and plug–in electric vehicles like the Chevy Volt and Nissan Leaf will sell fewer than 15,000 cars in 2011, a legitimate question arises about whether the costs of these taxpayer funded subsidies to deploy these technologies exceed the benefits of these programs.

The degree of federal subsidies for alternative energy sources can also be measured by the effective tax rate. A negative tax rate indicates that the tax code is subsidizing the investment since the investor is willing to accept a before-tax rate of return that is less than the after- tax rate of return. According to the CRS report cited above, the tax code in 2007 created strong incentives for renewable energy investments. For example, a 30% investment tax credit

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[15] http://www.gulfeconomicsurvival.org/phx-content/assets/files/GoM_Restarting_the_Engine.pdf
[16] http://www.api.org/policy/americatowork/upload/API-US_Supply_Economic_Forecast.pdf
[17] http://www.ihs.com/images/Shale-Gas-Economic-Impact-Dec-2011.pdf
[18] http://www.nationalaglawcenter.org/assets/crs/R41953.pdf

combined with 5 year accelerated depreciation gave solar thermal investments an effective tax rate of -244.7%.[19] Wind power had a -168.8 % rate. Sherlock notes that overall effective tax rates for renewables and nuclear are substantially lower than the effective rates on gas, integrated oil drilling, refining and coal (see Table 3).

Another issue worth raising is the question of the effectiveness of renewable energy tax incentives and spending programs which are dependent on a financially strapped federal government and are therefore uncertain and possibly non-sustainable. The almost constant uncertainty about whether a tax code provision or direct spending program will still exist by the time the investment is deployed raises the hurdle rate and increases the cost of capital for investment. In the face of the federal government's huge budget deficits and the perceived need to close the budget gap, many potential investors in renewable energy projects may think the risks are too great. Given this uncertainty, current federal programs to significantly increase the use of renewable energy and promote energy efficiency may simply be ineffective.

How Should the Tax Code Treat Energy and other Investments?

Many public finance experts suggest that the tax code should provide the same incentives for all types of industries and activities so as to avoid advantaging one industry over another. For example, accelerated depreciation, in which the write-off period may be shorter that the actual economic life of an asset is generally provided to all taxpayers regardless of their industry or type of investment in plant or equipment. Section 199 was established to help support U.S. manufacturing of all types. The foreign tax credit deduction is designed to prevent the double taxation of income earned abroad by U.S. multinationals. Similarly, LIFO is an accounting method in use for more than 70 years to protect companies from inflation or rising prices over the course of their operations. All of the above mentioned tax code provisions are available to any industry and are not considered "subsidies."

As Gary Hufbauer, a member of the ACCF's Center for Policy Research Board of Scholars, noted in a recent article, it is important not to confuse "subsidies" with legitimate tax deductions available to all industries.[20] Dr. Hufbauer states that "The semantically accurate way to describe legislation that would eliminate the manufacturing deduction or curtail the foreign tax credit for oil and gas companies is straightforward: the imposition of tax discrimination, not the removal of federal subsidies. Because most Americans agree that tax discrimination is bad policy - Uncle Sam shouldn't be picking winners and losers through the tax code - accurate language would diminish enthusiasm for these proposals."[21]

By the same token, the current policy of providing subsidies and negative tax rates for renewable energy, energy efficiency and alternative fuel vehicles should be reexamined with an eye toward balancing costs and benefits.

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[19] http://www.nationalaglawcenter.org/assets/crs/R41953.pdf

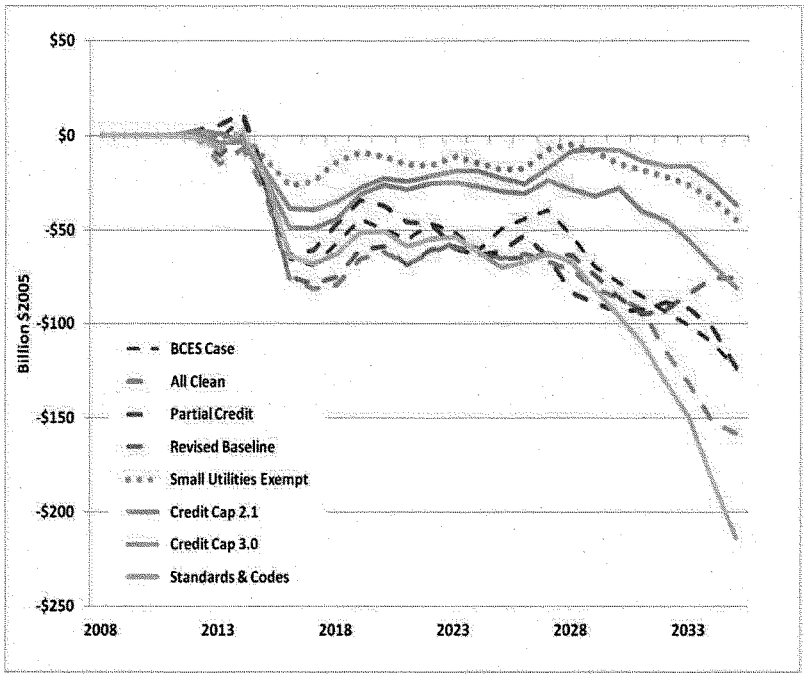
[20] http://www.washingtontimes.com/news/2011/dec/7/debunking-the-big-oil-subsidy-myth/

[21] Ibid

Conclusions

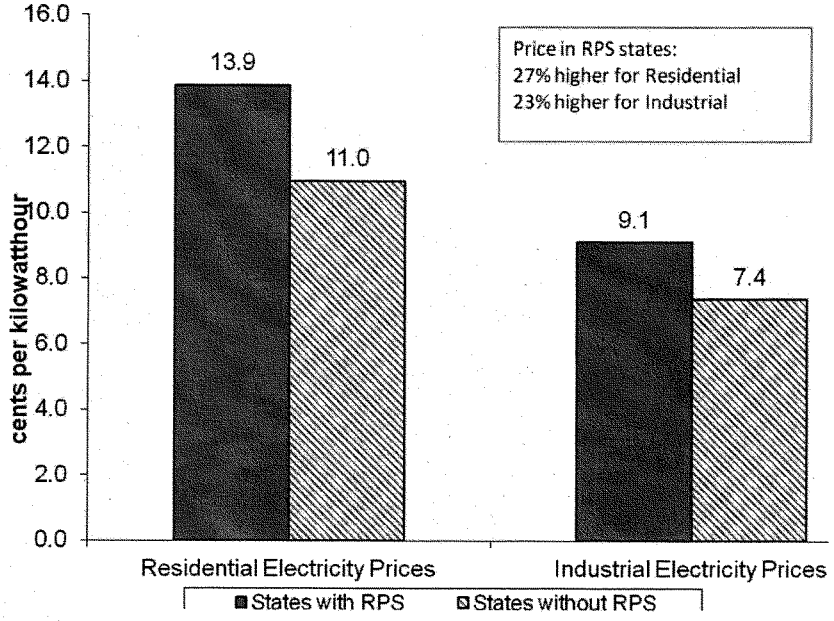
Continued high levels of federal support for the deployment of clean energy and alternative fuel vehicles in the U.S. is unlikely to have a significant impact on reducing GHG concentrations in the atmosphere since the real growth in emissions is coming from developing countries (see Figure 3). In addition, as described above, renewable energy is not without its own negative environmental and social impacts. By encouraging the deployment of energy technologies that are more expensive than conventional energy, consumers and industry are forced to spend more on energy and have less for other purchases or for productive investment. As a result, GDP and job growth will be lower than otherwise as resources are diverted from their highest and best use. If markets are allowed to select the energy technologies that are deployed rather than government officials using tax incentives, subsidies or a CES mandate, costs to consumers and the federal government's budget will be reduced. Policies that encourage the responsible development and transportation of U.S. oil and gas resources should be accelerated so as to promote a cleaner environment and stronger economic and job growth.

Figure 1. Clean Energy Standard: Impact on U.S. Gross Domestic Product
(Change in Real GDP from Reference Case (Billion $2005))



Source: "Analysis of Impacts of a Clean Energy Standard", Energy Information Administration, November 2011, http://www.eia.gov/analysis/requests/ces_bingaman/pdf/ces_bingaman.pdf

Figure 2. Electricity Prices: States with Renewable Portfolio Standards versus States without RPS



Source: Data for August 2011. Energy Information Administration, Table 5.6.A, http://www.eia.gov/electricity/data.cfm#sales

Table 1. Estimated Levelized Cost of New Generation Resources, 2016.

Plant Type	Capacity Factor (%)	U.S. Average Levelized Costs (2009 $/megawatthour) for Plants Entering Service in 2016				
		Levelized Capital Cost	Fixed O&M	Variable O&M (including fuel)	Transmission Investment	Total System Levelized Cost
Conventional Coal	85	65.5	3.9	24.5	1.2	95.1
Advanced Coal	85	74.7	7.9	25.9	1.2	109.7
Advanced Coal with CCS	85	92.9	9.2	33.3	1.2	136.5
Natural Gas-fired						
Conventional Combined Cycle	87	17.5	1.9	44.6	1.2	65.1
Advanced Combined Cycle	87	17.9	1.9	41.2	1.2	62.2
Advanced CC with CCS	87	34.7	3.9	48.6	1.2	88.4
Conventional Combustion Turbine	30	45.8	3.7	69.9	3.5	123.9
Advanced Combustion Turbine	30	31.7	5.5	61.3	3.5	102.1
Advanced Nuclear	90	90.2	11.1	11.7	1.0	114.0
Wind	34	83.3	9.5	0.0	3.4	96.1
Wind – Offshore	34	209.7	28.1	0.0	5.9	243.7
Solar PV[1]	25	194.9	12.1	0.0	4.0	211.0
Solar Thermal	18	259.8	46.6	0.0	5.8	312.2
Geothermal	91	77.4	11.9	9.5	1.0	99.8
Biomass	83	55.4	13.7	42.3	1.3	112.6
Hydro	53	78.5	4.0	6.2	1.8	90.5

[1] Costs are expressed in terms of net AC power available to the grid for the installed capacity.

Source: Energy Information Administration, Annual Energy Outlook 2011, April 2011, DOE/EIA-0383(2011)

Table 2. Estimated Revenue Cost of Energy Tax Provisions: 2009 and 2010

($ billions)

Provision	2009	2010
Fossil Fuels		
Expensing of Exploration and Development Costs for Oil and Gas	0.3	0.7
Percentage Depletion for Oil and Gas	1.3	0.5
Amortization of Geological and Geophysical Costs for Oil and Gas Exploration	(i)	0.1
15-year Depreciation for Natural Gas Distribution Lines	0.1	0.1
Election to Expense 50% of Qualified Refinery Costs	0.5	0.7
Credit for Producing Fuels from a Non-Conventional Source	0.1	(i)
Amortization of Air Pollution Control Facilities	(i)	0.1
Credits for Investments in Clean Coal Facilities	0.2	0.2
Subtotal, Fossil Fuels	2.5	2.4
Renewables		
Production Tax Credit (PTC)	1.3	1.4
Accelerated Depreciation for Renewable Energy Property	0.3	0.3
Section 1603 Grants in Lieu of Tax Credits[a]	1.1	4.2

Credit for Clean Renewable Energy Bonds (CREBs)	(i)	0.1
Residential Energy Efficient Property Credit	0.1	0.2
Credit for Investment in Advanced Energy Property	0.1	0.5
Subtotal, Renewables	2.9	6.7
Renewable Fuels		
Credits for Alcohol Fuels[b]	6.5	0.1
Excise Tax Credits for Alcohol Fuels[a]	5.2	5.7
Excise Tax Credits for Biodiesel[a]	0.8	0.5
Subtotal, Renewable Fuels	12.5	6.3
Efficiency & Conservation		
Energy Efficiency Improvements to Existing Homes	0.3	1.7
Credit for Production of Energy Efficient Appliances	0.1	0.2
Energy Efficient Commercial Building Deduction	0.1	0.2
Subtotal, Efficiency & Conservation	0.5	2.1
Alternative Technology Vehicles		
Credits for Alternative Technology Vehicles	0.5	0.8
Credit for Hybrid Vehicles	0.2	(i)
Subtotal, Alternative Technology Vehicles	0.7	0.8
Other		
Percentage Depletion for Other Fuels	0.2	0.2
15-year Depreciation for Electric Transmission Property	0.1	0.1
Exceptions for Publicly Traded Partnerships with Qualified Income from Energy-Related Activities	0.4	0.5
Exclusion of Interest on State and Local Private Activity Bonds for Energy Production Facilities	0.1	(i)
Subtotal, Other	0.8	0.8
Total	**19.9**	**19.1**

Source: See: http://www.nationalaglawcenter.org/assets/crs/R41953.pdf. Data from Joint Committee on Taxation and the Department of the Treasury.

Notes: (i) indicates a positive estimated revenue loss of less than $50 million. Provisions with a revenue score of less than $50 million during 2009 and 2010 are omitted from the table.

a. The figures reported for the Section 1603 grants in lieu of tax credits and the excise tax credits for alcohol fuels and biodiesel are outlays as reported in the President's FY2012 budget.

b. The $6.5 billion tax expenditure reported by the JCT for alcohol fuels is largely attributable to "black liquor" qualifying for a tax credit as an alternative fuel mixture. Black liquor is no longer eligible for federal tax incentives designed for alcohol fuels or biofuels (although taxpayers that were eligible during 2009 but did not claim the benefit may file an amended return).

Table 3. Effective Tax Rates for Energy-Related Capital Investments, 2007

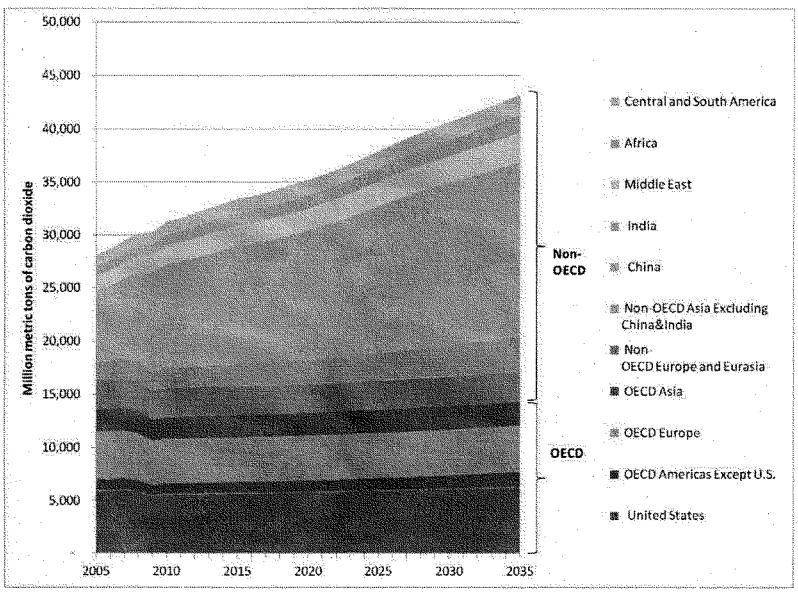
	2007 Law	No Tax Credits	Economic Depreciation
Electric Utilities: Generation			
Nuclear	-99.5	32.4	-49.4
Coal (Pulverized Coal)	38.9	38.9	39.3
Coal (IRCC)	-11.6	38.9	-10.3
Gas	34.4	34.4	39.3
Wind	-163.8	12.8	-13.7
Solar Thermal	-244.7	12.8	-26.5
Petroleum			
Oil Drilling, Non-Integrated	-13.5	-13.5	39.3
Oil Drilling, Integrated	15.2	15.2	39.3
Refining[a]	19.1	19.1	39.3
Natural Gas			
Gathering Pipelines	15.4	15.4	39.3
Other Pipelines	27.0	27.0	39.3

Source: See http://www.nationalaglawcenter.org/assets/crs/R41953.pdf. Data from Gilbert E. Metcalf, "Investment in Energy Infrastructure and the Tax Code," in *Tax Policy and the Economy*, ed. Jeffery R. Brown, 24 ed. (The University of Chicago Press, 2010), pp. 1-33.

Notes:

a. The effective tax rate on refining capital reflects the 50% expensing allowance available in 2007 for investments in additional refinery capacity.

Figure 3. World Carbon Dioxide Emissions by Region



Source: International Energy Outlook 2011, Energy Information Administration, U.S. Department of Energy.

Vestas

Testimony of Martha Wyrsch, President, Vestas-American Wind Technology, Inc.
before the
Senate Finance Subcommittee on Energy, Natural Resources & Infrastructure

December 14, 2011

Chairman Bingaman, Ranking Member Cornyn and members of the subcommittee, my name is Martha Wyrsch, and I am the President of Vestas-American Wind Technology, Inc. (Vestas), the North American arm of Vestas Wind Systems. On behalf of Vestas' 3,000 employees in the United States, thank you for the opportunity to be here today to discuss tax policies to support renewable energy.

This hearing is extremely timely in light of the serious challenges facing the domestic wind industry if the Section 45 Production Tax Credit (PTC) is not extended beyond December 31, 2012. I strongly urge an immediate extension of the PTC. This will ensure the continued development of wind energy and the domestic manufacture of wind turbines that will lead to a healthier economic and energy future for America.

Wind energy is a success story Congress can be proud of. The PTC has been a very effective tool in driving a new energy economy in America. Due largely to the PTC, the wind industry now represents a manufacturing base that employs tens of thousands of U.S. workers in high-wage, high-skill jobs across the country. Predictable, long-term tax and energy policies are critical to the continued growth of wind energy as a low-cost domestic source of electricity in the U.S.

Vestas is the second largest wind turbine manufacturer in the U.S. and the number-one global wind manufacturer, as measured by wind turbines installed. We design, manufacture and supply wind turbines for wind power plants around the world, and are very proud to be a significant part of the manufacturing renaissance which is coming about in this country. We do not develop or own wind power plants in North America.

The Vestas parent organization is based in Denmark with a 100-year history of making heavy equipment. Our U.S. headquarters are in Portland, Oregon, and our presence is felt in nearly 40 U.S. states. Our U.S. operations include:

- Four manufacturing facilities where we produce industrial scale blades, nacelles and towers
- Four technology research and development facilities
- More than 100 wind parks and 20 construction sites
- Warehouse and repair facilities
- Procurement of supplies and components
- Sales and back-office organization

We have been doing business in the U.S. for more than 30 years, supplying more than 11,000 wind turbines in 26 states. This represents nearly 9,000 MW of new, clean, secure domestic energy supply providing enough electricity to power about 2.7 million American homes.

Economic Impact of the PTC

I am relatively new to wind energy having spent most of my career in the natural gas and electric utility industries. As a former natural gas and electric utility executive, I have seen first-hand how policy measures, particularly the tax code, can impact energy generation. Congress has long incentivized energy technologies, and many of those incentives are credits that are permanent in the tax code. While wind and other renewables have had support in recent years through tax credits such as the

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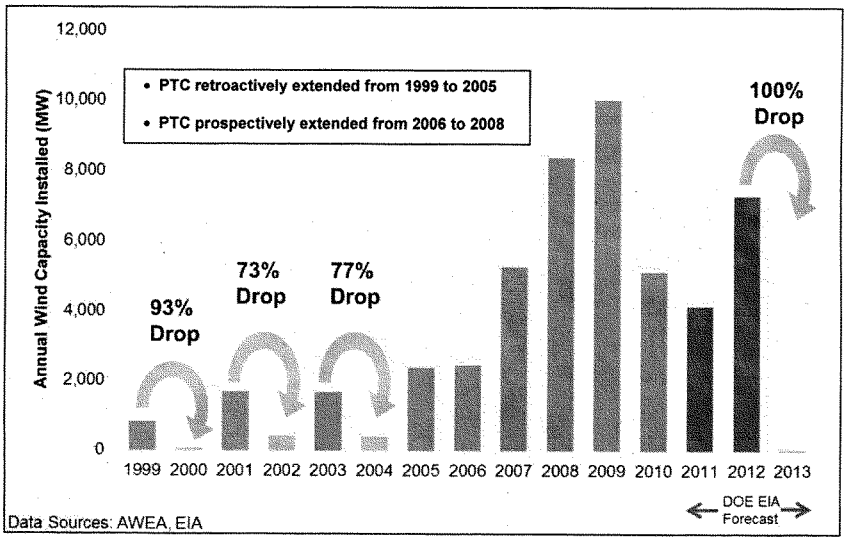
Tel: +1 503 327 2000, Fax: +1 503 327 2001, vestas-americas@vestas.com, www.vestas.com

PTC, those policies — in contrast to the support provided to the fossil-fuel and nuclear sectors — have been short-term and not provided companies or investors the long-range vision needed to plan and make investment decisions. Since 1999, the PTC has been extended seven times, and prior to 2005, this was done retroactively after expiration. In turn, the industry has seen a boom-and-bust cycle of development, with significant drops in installations in years following PTC expiration. Every one of those drops has an impact on employment and capital investment.

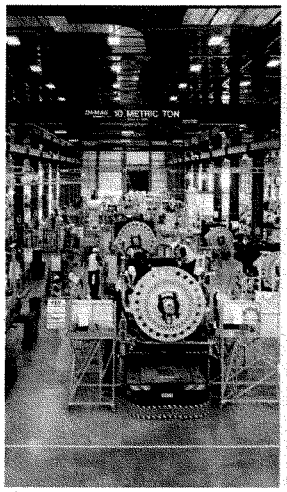


From 2008 to 2011, the U.S. experienced an enormous increase in wind energy development. This three-year window has been the longest timeframe the industry has ever had to make investment decisions. Investments in wind energy have been between $10 billion to $20 billion per year since 2008.

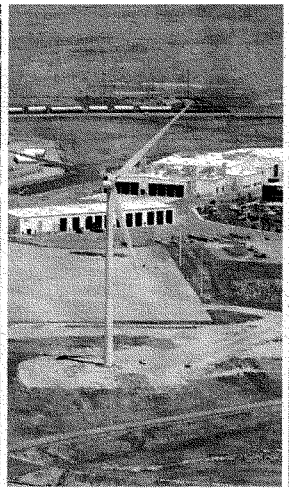
During this period, there has been a significant increase in domestic wind energy manufacturing capacity, largely due to the stability of the longer-term tax policy regime. Vestas alone constructed four manufacturing facilities and our technology and research centers, and developed our entire supply chain, investing approximately $1 billion in the U.S. economy.

Our American manufacturing base not only serves the U.S. market, but also exports products to Canada, Mexico, and Brazil, among other countries. The PTC has helped drive our American export business. With the robust U.S. wind market engendered by the PTC, we were able to size our manufacturing plants where we could support an export market, too.

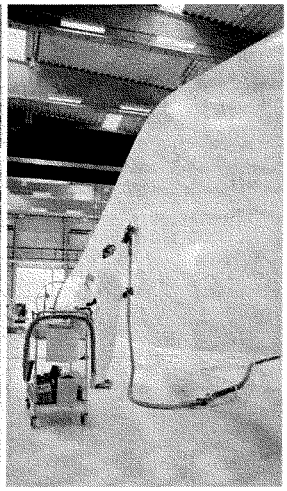
We are proud to employ more than 1,800 Americans at our Colorado facilities, almost all of whom were hired from 2008 to the present. At full operating capacity, those factories can employ more than 2,500 people. These are skilled-labor positions that pay competitive wages with generous medical and retirement benefits. Without a longer term PTC regime, Vestas will not ramp up these plants to full capacity. Unless conditions change, after completing the manufacture of turbines under order for 2012 delivery, we will have to make tough decisions on whether we can continue to employ the number of people currently working for us in these plants and in other U.S. facilities.



Nacelle factory (Brighton, CO)



Tower factory (Pueblo, CO)



Blade factories (Windsor and Brighton, CO)

Vestas also creates jobs in rural America. We have more than 800 skilled technicians who provide service for our installed turbines. Our technicians and their families live and work in rural areas where the turbines are typically installed — places that have been hit hard by the economic recession.

As the global leader in wind-power technology, we have established a large research and development division in the United States. We have a research center headquartered in Houston, and have technology and research offices in Colorado, Oregon and Massachusetts. As you know, we are not the only wind manufacturer on American soil. According to the American Wind Energy Association there are more than 36,000 utility-scale wind turbines currently operating in the United States, powering more than 10 million American homes and businesses. These turbines are supported by 80,000 Americans employed in this country's wind industry. More than 20,000 of these Americans work in direct manufacturing jobs supported indirectly by hundreds of thousands of employees working for suppliers.

Wind energy is a major American industry, maturing into a mainstream energy source. We at Vestas, just like other manufacturers, have brought new jobs and billions in new investment to America. However, our future in America is in jeopardy.

Reducing the Cost of Energy

Vestas, along with others in the industry, is working hard to drive down wind energy's cost. Electrons generated by wind are not yet competitive with the cost of electrons generated from other sources such as natural gas and coal. However, we have made significant strides toward that goal over the past several years, supported by the more predictable and stable PTC regime since 2008. According to *a Lawrence Berkeley National Laboratory study*, the cost of energy from wind has dropped 22% since 2009. Due to performance improvements since the 1990s, a turbine with a nameplate capacity seven times larger can produce 15 times more electricity. Vestas has set a goal to reduce the cost of energy of our turbines — within several years our cost of energy should be equivalent with other power generation fuel sources. Until we get there, however, a tax credit program such as the PTC is vital for continued investment and technology breakthrough.

We know wind power can compete with other forms of energy all things being equal. But that is not the world in which we live. Policy support and tax incentives have long driven the decisions the country makes on energy development. We are competing against other forms of energy that have received, and continue to receive, subsidies that often provide both a cost and market advantage. As an industry, we understand the necessity for flexibility on the size and scope of the PTC for the long term, and have a desire to stand on our own without incentives. But it is imperative that a long-term solution, which might include a PTC extension for up to 10 years, is provided. This will give businesses certainty about their investments and give the industry the ability to plan and invest accordingly to meet the needs of this growing market.

Long-term Policy Support Necessary

The development cycle of wind projects begins well before the turbines are installed. Project conceptualization to completion can take two to three years. Wind developers require months to site their projects, negotiate power-purchase agreements and obtain necessary permits. Only when these prerequisites are well in hand do they issue bids for turbines. The turbine bidding and contract negotiation process can take months. Most orders from our customers are placed at least one year in advance of project completion because manufacturers need significant lead time to schedule, acquire and assemble the thousands of component parts needed to build a wind turbine.

We build wind turbines based on orders from our customers, and each order is unique. Once a turbine is built, it must be transported to the site, constructed and tested. Like the construction of any modern power plant, the development of a wind project entails considerable site preparation and earth-moving operations, complex logistics, and heavy construction.

The timeline for project development from turbine order to a wind farm producing electricity is typically 12 to 18 months. That does not include all of the regulatory and siting approvals that developers must secure before completing an order with a turbine manufacturer such as Vestas. For example, the turbines that Vestas and other manufacturers will deliver and install by the end of 2012 were actually ordered in 2010 and 2011.

Vestas has built a supply chain stretching from coast-to-coast. There are more than 8,000 component parts in a wind turbine. Vestas works with more than 90 U.S. components suppliers in 30 states. The domestic content of one class of Vestas wind turbines has grown to 80 percent, and the industry average exceeds 60 percent. This is a huge increase in the past few years and a direct indicator of how many manufacturing jobs have been created in the United States. These companies provide the thousands of component parts needed to construct a wind turbine. For example, a significant amount of the steel in our towers and nacelles is produced in North Carolina steel mills. We purchase lubricants, electrical components, and hydraulics from Texas. Cranes and welded materials are sourced out of Iowa. We recently entered into a new agreement to purchase gearboxes from a supplier that has built a new manufacturing facility in Georgia. Each of these suppliers will be directly impacted if the PTC is not extended, and the communities in which they do business will feel the pain of the downturn in business.

Extending the PTC now will allow wind power plant developers to place orders for 2013. Currently, few, if any, 2013 orders are being placed. This impacts not only the manufacturer but the supply chain as well. We order component parts based on the market we anticipate, often before orders are placed. Suppliers require significant lead time to ensure they have produced the parts necessary to meet our customers' needs. When orders slow down due to a looming expiration of the PTC, our suppliers' businesses suffer.

Homegrown Energy
Vestas: Building the U.S. Supply Chain
Washington
Oregon
Idaho
North Dakota
Minnesota
Nebraska
Iowa
Wisconsin
Michigan
Illinois
Ohio
New York
Pennsylvania
New Hampshire
Massachusetts
Connecticut
New Jersey
Maryland
Virginia
Tennessee
North Carolina
Kentucky
Indiana
Kansas
Oklahoma
Texas
Louisiana
Florida
California
Colorado
Sales & Service HQ
Supply Chain Office
Manufacturing
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Uncertainty is Halting Investment

Nothing is more unsettling to our business than lack of regulatory and fiscal certainty. Vestas interacts with North American wind developers on a daily basis. Although the PTC does not expire until the end of 2012, the impact is being felt now. We have already heard from some of the largest wind developers that they will significantly reduce — or even stop — placing any new turbine orders until there is certainty the PTC will be extended beyond 2012. Some of these developers, including the largest in North America, NextEra, have announced their decision not to invest in wind energy in the U.S. through public filings with the Securities and Exchange Commission and in discussions with the investment community. They are turning their wind energy investment dollars to other countries around the globe.

The looming expiration of the PTC forces companies to make hard decisions today, not next December. In anticipation of fewer domestic installations, we have already seen layoffs by wind power plant developers occur this fall. Unless an extension is approved quickly, there will be more. A report released on December 12, 2011, by Navigant Consulting, a respected non-partisan consulting firm, estimates 37,000 domestic jobs could be lost if the PTC is not extended. That is a significant number, and many communities across the country would be impacted. An immediate extension of the PTC would alleviate companies from having to make difficult decisions to terminate employees, and would instead allow those companies to focus on driving new investments and creating new jobs.

We have concrete examples of wind power's economic benefits and the economic boost created by the PTC. According to an economic multiplier report by ECONorthwest, Vestas' U.S. operations in 2008 generated more than $1.1 billion in total economic activity, including more than 7,000 direct and indirect jobs for American workers and business owners. One example from that report is the Pioneer Prairie wind farm in Iowa. Property taxes for the project, when fully assessed in 2016, will be a combined $3.7 million for two counties. More than half of the property-tax revenues will go to local schools. According to a study by the Renewable Northwest Project, a typical 100 MW wind project creates more than 160 direct and indirect jobs. Once built, over the expected 20-year lifecycle of the wind farm, the project will pay direct wages of $118 million and $1.5 billion in property taxes.

The PTC has always enjoyed bipartisan support, similar to many other tax credits that have incentivized the development of energy technologies. We sometimes get caught up in political discussions about green energy versus other forms of energy. But extending the PTC is not about green, or red or blue, for that matter. It is about American manufacturing, American jobs and investing in American energy. If you truly believe in an "all of the above" energy strategy for America, then we must continue to tap wind energy, one of our most abundant domestic resources along with other renewable and traditional energy assets.

Access to Investment Capital

I believe the wind industry should have the flexibility other energy technologies have to reach a deeper pool of public investors through a public Master Limited Partnership (MLP) structure. Based on my experience in the gas industry, this is a powerful tool to raise capital from the private sector. Wind and solar infrastructure are not qualifying assets for MLP tax treatment today, which means this type of renewable energy generation is not on a level playing field when soliciting investment capital from Wall Street. We know that many active investors want the opportunity to invest in renewable energy on the same basis as hydrocarbon and ethanol MLPs. The MLP structure has been successful in the hydrocarbon infrastructure industry — it should be expanded to include renewable-energy technologies.

Offshore Wind Development

Vestas has significant experience with offshore wind development having installed turbines throughout the coast of Europe. We are active in both manufacturing and installing turbines in the North Sea off the United Kingdom coast. We believe that the potential for offshore wind generation in the United States is huge in the medium to long term and support efforts to grow that market. The regulatory regime and the cost of offshore wind is a hurdle, but one that we believe can and will be overcome with

continued support, both at the state and federal levels. We support efforts by Senator Tom Carper to provide incentives to drive offshore wind development.

We believe that the potential of the offshore market will only be realized by a strong onshore wind industry. While onshore and offshore wind development have some different technological applications, we are one industry. Many of the capabilities developed in the onshore industry are transferable to offshore. A healthy onshore manufacturing and service base will support the ongoing research and development to drive down costs of offshore wind energy.

Conclusion

The U.S. has the best wind resources and the largest energy demand in the world. Stable policy drivers will cause significantly more investment in wind energy and domestic energy production will increase. Vestas works closely with a number of manufacturing companies that are prepared to invest in the U.S. but are hesitant due to the lack of policy stability. The wind industry is part of a global economy, and the competition for investment and manufacturing is strong among different regions of the world. Other countries have made long-term commitments to secure clean energy investments, particularly Europe and Asia. The U.S. risks falling further behind other nations if we do not enact long-term policy mechanisms to drive new development and further reduce wind energy's cost. The production of electricity from wind promotes energy diversity and helps to stabilize electricity prices for consumers. Wind power provides energy security by tapping an abundant domestic resource. Wind energy gives a much-needed economic boost to rural regions of the country. Wind energy reduces carbon emissions into our air. It is a win-win for American jobs, secure American energy production and American energy ingenuity.

For this industry's continued success, it is critical that Congress immediately extend the PTC. The impact of allowing the PTC to expire — or extending it at the last hour — is much greater than in previous years. As the Navigant study shows, 37,000 American jobs could be lost. This would be a devastating blow to the nation's fragile economy.

Often we hear of government support not achieving its goal of driving new investment. This is not one of those times. Wind is driving a new energy economy in America and providing a manufacturing base that is employing thousands of U.S. workers across the country. Simply put, providing certainty through an immediate extension of the PTC will ensure continued investment, energy security and jobs.

Thank you for the opportunity to provide testimony. I look forward to answering any questions.

Martha Wyrsch

President
Vestas-American Wind Technology, Inc.
1881 SW Naito Parkway
Portland, Oregon 97201

COMMUNICATIONS

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

December 28, 2011

Chairman Jeff Bingaman
Senate Committee on Finance
Subcommittee on Energy,
Natural Resources and Infrastructure
219 Dirksen Senate Office Building
Washington, DC 20510

Ranking Member John Cornyn
Senate Committee on Finance
Subcommittee on Energy,
Natural Resources and Infrastructure
219 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Bingaman and Ranking Member Cornyn:

On behalf of the American Public Transportation Association (APTA) and its more than 1,500 member organizations, I thank you for holding the recent *"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs"* hearing. It allowed for meaningful discussion on wind, solar, and bio-fuel initiatives and I write to highlight the critical importance of also continuing to advance alternative fuels and natural gas technologies, particularly, within the public transportation industry.

A number of public transportation agencies have invested millions of dollars in, environmentally-friendly, natural gas vehicles (Compressed Natural Gas (CNG) / Liquefied Natural Gas (LNG)) and related infrastructure. Many other agencies desire to transition to modern, greener CNG/LNG fleets; however, steep upfront capital costs and increased, unique CNG/LNG operating costs often deter investments in natural gas technologies. Upfront costs can include: fueling stations; pipeline connections/extensions; building modifications; and incremental cost of CNG/LNG vehicles (revenue and non-revenue) versus diesel/gas vehicles.

It is important that we emphasize that public transportation providers can only justify and fiscally manage high upfront capital and other costs for CNG/LNG initiatives by realizing dramatic savings in fuel cost over the life of CNG/LNG vehicles -- the most efficient way to assure such savings is to continue the Alternative Fuel Tax Credit that translates into a $0.50 per gasoline gallon equivalent (GGE) tax credit for participating agencies. Maintaining the current Alternative Fuel Tax Credit is critical for our industry to continue its commitment to combating greenhouse gas emissions and moving our country toward long-term energy security.

In future hearings, you can call upon APTA members as expert witnesses as, again, many utilize modern CNG/LNG vehicles and related infrastructure to provide safe, reliable and clean public transportation services across the country. If you have

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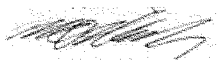
questions, please have your staff contact Brian Tynan of APTA's Government Affairs Department at (202) 496-4897 or email btynan@apta.com.

Sincerely yours,



Michael P. Melaniphy
President & CEO

MPM/bt

HEARING STATEMENT

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

"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology, Investment, Domestic Manufacturing, and Jobs"

December 14, 2011

Executive Summary

- The Biotechnology Industry Organization (BIO) represents more than 1,100 innovative biotechnology companies and institutions in all 50 states, leading companies in the production of conventional and advanced biofuels, renewable chemicals and other sustainable energy and manufacturing solutions.

- Advanced biofuels, renewable chemicals, and biobased products have tremendous potential to address the nation's economic, energy and national security challenges and are ready for commercial deployment, but simply cannot secure needed capital for first-of-a-kind biorefinery construction.

- Congress should include the following important tax provisions in any energy tax extenders package to help renewable chemical and advanced biofuels developers access critical capital to move their projects forward:

    - Extend cellulosic biofuels production tax credit and accelerated depreciation for cellulosic biofuel property for longest feasible duration and extend eligibility to algae-based biofuels;

    - Preserve current incentives for alternative alcohol fuels; and

    - Fund and clarify eligibility of renewable chemicals and biobased products for Sec. 48C Advanced Manufacturing Credit.

- Congress should consider enacting additional incentives to further help renewable chemical and advanced biofuels producers to access capital.

Biotechnology Industry Organization
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202-962-9200

Bio
BIOTECHNOLOGY
INDUSTRY ORGANIZATION

HEARING STATEMENT

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

"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology, Investment, Domestic Manufacturing, and Jobs"

December 14, 2011

Introduction

Thank you for the opportunity to provide a written statement to the U.S. Senate Committee on Finance Subcommittee on Energy, Natural Resources and Infrastructure ("the Subcommittee") on its December 14, 2011, hearing titled "Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology, Investment, Domestic Manufacturing, and Jobs."

BIO is the world's largest biotechnology organization, with more than 1,100 members worldwide, including state and regional biotech associations, service providers to the industry and academic centers. BIO's Industrial and Environmental Section represents over 85 leading companies in the production of conventional and advanced biofuels, renewable chemicals and other sustainable solutions to energy and climate change. BIO member companies apply industrial biotechnologies to help resolve important challenges in synthesizing new products, whole cell systems and other biologic processes to improve the range of manufacturing and chemical processes. BIO members include the leaders in developing new crop technologies for food, feed, fiber, and fuel.

BIO commends the Subcommittee for holding today's hearing, and for recognizing the vital role tax policy plays in driving investment in alternative energy. Sustained supportive tax policy is particularly important to emerging technologies that have not yet achieved commercial scale, and should be targeted at those technologies with the greatest potential to create the jobs, economic growth, energy security and environmental benefits we seek as a nation. Emerging technologies in advanced biofuels, renewable chemicals, and biobased products have tremendous potential to address the nation's challenges and are ready for commercial deployment, but simply cannot secure needed capital for first-of-a-kind biorefinery construction. We urge you to extend provisions supporting scale-up of these important technologies.

Background

Advanced biofuels, renewable chemicals and biobased products have great potential to significantly increase this nation's energy and national security, while creating thousands of

solid, well-paying U.S. jobs (see **Appendix A** chart on "U.S. Jobs Associated with the Production of Advanced Biofuels and Renewable Chemicals"). In fact, today, the domestic biofuels industry is already creating jobs, helping to reduce our dependence on foreign oil and providing downward pressure on gas prices at the pump. It is now contributing more than 400,000 jobs and $53 billion in new activity to the nation's economy. A recent report found that additional job creation from advanced biofuels production under the federal Renewable Fuel Standard (RFS) could reach 807,000 by 2022.[1] Advanced biofuels production under the RFS could further reduce U.S. petroleum imports by nearly $70 billion by 2022.

The domestic renewable chemicals and sustainable biobased products industries are also helping reduce U.S. dependence on foreign sources of energy, while creating significant numbers of jobs. One recent report estimates that the global sustainable chemical industry will grow to $1 trillion, which provides an important opportunity for U.S. job and export growth. Currently, the industry is estimated to be only seven percent of its future projected size. U.S. companies traditionally make-up about 19 percent of the traditional global chemical industry. If U.S. companies capture the same percentage of the sustainable chemical industry as it grows to $1 trillion, BIO anticipates 237,000 direct U.S. jobs and a trade surplus within the chemical sector. See attached **Appendix B** BIO white paper. Also please see http://www.bio.org/sites/default/files/20100310_biobased_chemicals.pdf for a report on "Biobased Chemicals and Products: A New Driver of U.S. Economic Development and Green Jobs." The report provides further explanation and context showing that, through the development of the U.S. renewable chemicals and biobased products industries, the U.S. has the opportunity to recover and reclaim significant U.S. manufacturing jobs that have been lost to other nations in recent decades.

As the 2010 Quadrennial Defense Review notes, the Navy, other branches of the military, and the nation as a whole, face a significant national security threat from U.S. dependence on foreign sources of energy. This threat can be significantly reduced with an ample supply of U.S. advanced biofuels. Innovative advanced biofuels companies have made great strides in developing new technologies to produce next generation biofuels from a variety of feedstocks, and are poised to produce billions of gallons of advanced biofuels if project financing can be secured in a timely fashion (See for example (1) the following link to an article on "Current Status of Cellulosic Biofuel Production in the United States": http://www.liebertonline.com/doi/abs/10.1089/ind.2011.7.365, and (2) **Appendix C** chart of current and planned advanced biofuel projects). Supportive, stable federal policy is essential to ensuring that advanced biofuels developers can move forward on these first-of-a-kind commercial projects, which are a critical component of plans to meet the nation's energy independence and security needs. Many federal incentives vital to U.S. advanced biofuels development and commercialization are set to expire in the near-term.

To accelerate large scale commercialization of advanced biofuels, renewable chemicals and biobased products, below please find an overview of provisions we believe are necessary to drive continued investment in the broadest possible set of emerging technologies.

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[1] *U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030*, bio-era, Feb. 2009, available at: http://www.ascension-publishing.com/BIZ/BIO-econ-impact.pdf

Tax Extensions Necessary To Drive Investment in Advanced Biofuels, Renewable Chemicals and Biobased Products

The following existing tax incentives must be extended, with recommended clarifications, so that renewable chemical and advanced biofuels producers can access critical capital to move their projects forward and help the U.S. meet its energy independence, national security, and job creation needs.

- ***Extend the Cellulosic Biofuel Production Tax Credit and Accelerated Depreciation for Cellulosic Biofuel Property*:** BIO's member companies are working hard to commercialize cellulosic technologies and these companies are dependent on private investors to help fuel the innovation that will enable this commercialization effort. The cellulosic biofuels production tax credit and the accelerated depreciation for cellulosic biofuel property have the potential to unlock vital project financing. But because commercial biorefinery projects take an average of two or more years to complete, the December 31, 2012, expiration date prevents project developers from leveraging the value of these credits. Thus, even though the incentives are nominally effective through 2012, the credits have already effectively expired with regard to current facility development. **Extend the cellulosic biofuels production tax credit (PTC) and accelerated depreciation for cellulosic biofuel property for the maximum feasible duration.**

- ***Algal Biofuels Tax Parity*:** The Internal Revenue Code effectively impedes the commercialization of algae-based biofuels by providing a production tax credit and favorable depreciation to cellulosic biofuels developers, but not for algae-based fuel facilities. Algae-based fuels provide public benefits similar to those provided by cellulosic biofuels in terms of job creation, energy security, and environmental profile. As long as the law discriminates against the algal fuels developers, it will continue to be extremely challenging for algae-based fuel start-up companies to attract the capital required to build the first commercial scale facilities. **Algae-based biofuels should be made eligible for the cellulosic biofuels PTC and accelerated depreciation.**

- ***Preserve Current Incentives for Non-Ethanol Alcohol Fuels*:** Under current law, the Internal Revenue Code provides income tax credits, or excise tax credits in lieu of income tax credits, for a number of alcohol fuels, including advanced non-ethanol alcohol fuels. It is important that these tax incentives for non-ethanol alcohol fuels be considered on their own merits. The tax credits for non-ethanol alcohol fuel are available only to biofuels that are poised to come onto the market but that need temporary policy support to help ensure their commercial viability in the short-term. Like the cellulosic biofuel production tax credit and accelerated depreciation rules, **the non-ethanol alcohol fuels credits should be extended as long as possible.** Moreover, because production levels of these alternatives will be small in the next few years, the cost of extending the provision for a term of years is expected to be modest.

- ***Fund and Clarify Eligibility of Renewable Chemicals and Biobased Products for Sec. 48C Advanced Manufacturing Credit***: S. 1764, the *Make It in America Tax Credit Act of 2011,* provides much needed additional funding to the Advanced Energy Manufacturing Tax Credit (Section 48C) and explicitly clarifies the eligibility of renewable chemicals and biobased product projects. Incentivizing investment in biorefineries provides potential to create new markets for American products and jobs. Renewable chemicals and biobased products impact everyday products such as car parts to cleaning products, soaps, insulation materials, plastics, foams, fibers, fabrics, and impacting our economy. **Incorporate S. 1764 into any energy tax extenders package.**

The following incentives should also be enacted to further help renewable chemical and advanced biofuels producers access critical capital to move their projects forward.

- ***Provide an Investment Tax Credit (ITC) for Advanced Biofuel Biorefineries***: Capital costs for construction of advanced biofuel biorefineries are a substantial barrier to commercialization. **Congress should provide an investment tax credit option (available in lieu of production tax credits) for emerging advanced biofuel project developers** to help accelerate construction of advanced biofuel biorefineries and speed deployment of emerging advanced biofuel technologies.

- **Provide a Tax Credit for Production of Qualifying Renewable Chemicals** Renewable chemicals and biobased plastics represent an important technology platform for reducing reliance on petroleum, creating green US jobs, increasing energy security, and reducing greenhouse gas emissions. By providing a federal income tax credit for domestically produced renewable chemicals, Congress can create domestic jobs and other economic activity, and can help secure America's leadership in the important arena of green chemistry. Like current law renewable electricity production credits, the credits would be general business credits available for a limited period per facility. To truly achieve energy security, the U.S. must develop biorefineries that produce alternatives to all of the products made from each barrel of oil. Industrial biotechnology enables the production of renewable chemicals and biobased products from biomass, and the total displacement of fossil fuel products can be accelerated with a production tax credit.

The provisions above are essential ingredients in any effort to accelerate the commercialization of advanced biofuels, renewable chemicals and biobased products. We ask that you include these provisions in any energy tax extenders package.

Thank you.

APPENDIX A

U.S. Jobs Associated With the Production of Advanced Biofuels and Renewable Chemicals

Source of Jobs	**Associated U.S. Jobs**
DOE/USDA	**5505** currently **see attached chart of public private biofuel projects compiled by BIO
Biomass Crop Assistance Program	**700,000** potential U.S. jobs **USDA BCAP Fact Sheet, May 2011. http://www.fsa.usda.gov/Internet/FSA_File/bcap_update_may2011.pdf
Potential Advanced Biofuels jobs in agriculture, engineering, construction and research by 2030	**800,000** **"U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030" (bio-era, 2009)
Sustainable Chemistry Sector	**237,000** direct U.S. jobs once the global sustainable chemistry industry grows to its widely projected $1 trillion size

APPENDIX B

Renewable Specialty Chemical Working Group White Paper

March 11, 2010

Sustainable chemistry produces green chemicals from renewable raw materials using environmentally friendly processes that not only conserve energy and water but also have a low carbon footprint. The primary technology-driver for sustainable chemistry is biotechnology and the main input is plant-derived raw materials. Importantly, sustainable chemistry allows U. S. companies to replace raw materials derived from foreign oil with agricultural materials produced domestically.

Why does sustainable chemistry make sense for America? We live in a competitive world. U.S. companies can create rewarding high-paying jobs for Americans, if government supports new industries in which the U.S. can maintain a leadership position. Sustainable chemistry is a sector where U.S. companies are positioned to lead because it combines three areas of U.S. strength: biotechnology, agriculture and chemicals. First, the U.S. has been and continues to be a world leader in biotechnology- its companies and research institutions excel in the core capabilities required by this industry: protein engineering, metabolic engineering and synthetic biology. Second, the American farmer has an unparalleled ability to produce the raw material needed by this industry. Finally, the U.S. has the world's largest national chemical industry. Ten cents of every U.S. export dollar is derived from chemical sales. The value of America's share of the global chemical market is $690 billion (19% of the $3.7 trillion dollar global market). The chemical industry directly employs 860,000 people in the U.S., and indirectly supports the employment of another 4,795,500 people.

Why switch from "traditional chemistry" to "sustainable chemistry"? Although the U.S. chemical industry remains successful, several forces have reshaped the global chemical industry over the past decade. Among these is growth of the industry in the Middle East and Asia. Consider, for example, Dow Chemical's decision to exit the commodity chemical business in 2007. According to Dow's CEO, Andrew Liveris: "Petrochemicals will be looked at from the point of view of low-cost feed stocks; given the likelihood that energy and feedstock costs will remain high by historical standards, there is every reason to believe that productive assets will continue to gravitate to regions that offer advantaged feed stocks, namely, the Mideast and Asia." Over the past decade, U.S. direct employment in the chemical sector has decreased from 992,000 to 860,000 employees. Regarding exports, the U.S. enjoyed a trade surplus of $13.4 billion in 1998, but by 2008 the sector suffered a trade deficit of -$2.7 billion. We believe that the U.S. can reverse these trends by capitalizing on its core strengths in biotechnology, agriculture and chemical manufacturing. While the traditional U. S. chemical industry is shrinking, several independent groups have estimated that the global sustainable chemistry industry will grow to $1 trillion dollars. This creates a significant opportunity for job growth and export growth because the current global sustainable chemistry industry is only about 7% of its projected future size. If U.S. companies can capture 19% of this new $1 trillion market, (by analogy to the traditional chemical industry) we project that the U.S. will create about 237,000 direct U.S. jobs in the sustainable chemistry sector, while shifting the balance of trade in the chemical sector to a trade surplus.

The traditional chemical industry is made up of two broad sectors: commodity chemicals and specialty chemicals. Each plays critical but different roles. Commodity chemicals are manufactured in large quantities, sell for a low price and provide the base volume for the industry. However, they are cyclic and have wide swings in prices and margins across the commodity cycle. Specialty chemicals in contrast have smaller volumes and higher margins. Their role is to provide higher margins that are consistent across the commodity cycle.

Like the traditional chemical industry, the sustainable chemistry industry of the future will have two product sectors: commodity biochemicals (also known as bioproducts) and specialty biochemicals. Both will play critical yet different roles in the integrated biorefinery. Commodity biochemicals like biofuels will

provide a base of large volume, low margin business. However, both commodity biochemicals and biofuels are subject to the volatility of commodity cycles. Specialty biochemicals will provide a base of consistent, non-cyclic higher margin products that can be depended upon across the commodity cycle and offer a stable cash-flow during biofuels and commodity chemical troughs.

What is required to accelerate the development of a strong specialty biochemical sector? Three factors are currently limiting the growth of specialty biochemical sector. The first is a lack of research funding to support early stage development of new specialty biochemical technology platforms and products. For many years, the US DOE has provided significant research support for both biofuels and commodity biochemicals which has greatly accelerated the development of these products. Over the past 15 years, the DOE and USDA have provided significant financial support for the development of cellulosic and third generation biofuels. Their support greatly accelerated the development of these new fuel alternatives. Commencing in 2004, the DOE and USDA expanded their support of biofuels to include support for the development of 12 commodity biochemicals which have had a significant impact on their advancement.

Authorizing consistent annual research funding specifically for specialty biochemicals will encourage them to expand their focus to specialty biochemicals which will greatly accelerate and expand the pipeline of new products

While biofuels and commodity biochemicals have benefited from extensive research grant support, there has been very little research support for specialty biochemicals. Thus, universities, research institutions and industry have focused on developing new biofuels and commodity chemicals. Authorizing consistent annual research funding specifically for specialty biochemicals will encourage them to expand their focus to specialty biochemicals which will greatly accelerate and expand the pipeline of new products.

Access to loan guarantees and grants will help address the lack of capital to fund the transition from pilot-scale production to full-scale manufacturing

The second factor limiting the growth of the specialty biochemical sector is the cost of investing in manufacturing capacity. It is often said that there is a "valley of death" that must be crossed in order to make the transition to full-scale manufacturing. Access to loan guarantees and grants will help address the lack of capital to fund the transition from pilot-scale production to full-scale manufacturing.

A production credit for qualifying specialty biochemicals products during the first five years will provide the incentive to accelerate market growth

The third is the initial product costs due to a lack of economy of scale during the initial years of launching a product. Initially, when a specialty biochemical is first commercialized, sales volumes are low and due to the lack of economy of scale, costs are high. After several years as the product is successfully adopted by the market, volumes increase, costs drop and the product becomes profitable. A production credit for qualifying specialty biochemicals products will provide the incentive to accelerate market growth.

APPENDIX C

Company	Location	Technology	Date	Jobs	Other participants
Abengoa Bioenergy	Hugoton, Kans.	Agricultural residues fermented to ethanol	9/2007	94 permanent, 250 construction	
Agrivida	Medford, Mass.	New crop traits that eliminate pre-treatment of cellulosic feedstock	11/2009		
Algenol*	Ft. Myers, Fla.	Algal production of ethanol		120	Dow Chemical
Alpena Biorefinery	Alpena, Mich.	Hardwood byproducts fermented to ethanol	12/2011	10 permanent	Valero Energy Corp.; American Process Inc.
Amyris	Emeryville, Calif.	Sweet sorghum fermented to diesel and related chemicals	11/2009	350	Ceres Inc., NREL
Bluefire Ethanol	Fulton, Miss.	Forest waste, MSW	12/2009	50 permanent, 250 construction	
Clear Fuels Technology	Commerce City, Colo.	Syngas from biomass, integrated with FT diesel from natural gas	12/2011		
Coskata	Boligee, Ala.	Syngas from MSW fermented to ethanol	1/2011	700 direct and indirect	
DuPont Danisco Cellulosic Ethanol	Vonore, Tenn.	Corn stover, switchgrass fermented to ethanol	12/2009	40	
Enerkem, Inc.	Pontotoc, Miss.	Syngas from wood residue catalysed to ethanol	12/2013	70 permanent	
Gevo	Englewood, Colo.	Yeast fermentation to isobutanol	11/2009		
INEOS Bio, New Planet Energy	Vero Beach, Fla.	Syngas from agriculture waste and MSW, fermentation to ethanol.	3/2010, 9/2010, 1/2011	50 permanent, 175 construction	
Lignol	Ferndale, Wash.	Fermentation of ethanol from woody biomass	9/2010	39 permanent, 200 construction	
Logos	Visalia, Calif.	Enzymatic hydrolysis of corn stover and switchgrass		43 permanent	Ceres, Novozymes
Mascoma	Kinross, Mich.	Fermentation of forestry waste to ethanol	2/2009	50 permanent and 150 construction	Oak Ridge National Laboratory
Myriant	Lake Providence, La.	Fermentation of sorghum to succinic acid	3/2010	50 permanent, 250 construction	
POET Project Liberty	Emmetsburg, Iowa	Fermentation of corn stover to ethanol	9/2008	40 permanent and 200 construction	Novozymes
Sapphire Energy	Columbus, N.M.	Algal production of green crude oil		750 direct and indirect	Sandia National Lab, and New Mexico State University
Solazyme	Riverside, Pa.	Heterotrophic algal lipid production from sugar.		388 direct and 256 indirect	Abengoa Bioenergy, BlueFire Ethanol, UOP LLC
UOP Renewables	Oahu, Hawaii	MSW and algae to gasoline, diesel and jet fuels via pyrolysis	2/2010	40 direct	Ceres, Targeted, HR BioPetroleum
ZeaChem	Boardman, Ore.	Hybrid poplar fermented to acetic acid		100 operations, 338 construction + 442 indirect jobs	Valero Energy Corporation, GreenWood Resources

*Shaded projects indicate ARRA-funded projects

Statement of Kate Offringa
President & CEO
Council of the North American Insulation Manufacturers Association
44 Canal Center Plaza, Suite 310
Alexandria, VA 22314

Before

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

On

Alternative Energy Tax Incentives: The
Effect of Short-Term Extensions on
Alternative Technology Investment,
Domestic Manufacturing, and Jobs

December 14, 2011

Mr. Chairman and Members:

Thank you, Mr. Chairman and members of the Subcommittee. My name is Kate Offringa and I am the President and CEO of the Council of the North American Insulation Manufacturers Association (Council of NAIMA). I would like to spend a few minutes describing the important role that tax incentives play for the insulation industry and advancing energy conservation.

The cleanest, least expensive, and most reliable energy comes from more efficiently using the energy we already produce. Nearly 50 million American homes are under insulated, and the insulation in many commercial buildings is woefully inadequate. Putting in proper levels of insulation would immediately lower energy bills, create jobs and decrease energy usage. If American homes were properly insulated, we could save 30 times the amount of energy lost in the 2010 Gulf oil spill.

Most importantly, we don't need to locate new reserves or develop new technologies: High quality insulation is available today and can be installed tomorrow. The challenge is incentivizing people to install and retrofit that insulation into new and existing homes and buildings.

One important way to achieve this goal is to expand and extend a tax credit that rewards homeowners for installing energy efficient products and equipment. First established in the 2005 Energy Policy Act, the provision known as "25C" - or technically known as the "nonbusiness energy tax credit" - has helped tens of thousands of homeowners across the country save substantial amounts of money on monthly energy bills. Since January, it provides

a tax credit of 10 percent—up to $500—for insulation, heating, ventilation, and air conditioning equipment, energy-smart windows and other products designed to save energy.

25C has enjoyed deep bipartisan support on Capitol Hill and has been extended several times. The credit was also expanded to triple its current size in 2009 and 2010. As a result, the number of homeowners taking advantage of 25C in these years increased substantially from previous years.

The insulation industry strongly supports extension of 25C at the highest levels the Congress can manage in light of budget constraints. In addition, 25C should be amended to allow homeowners to include the cost of labor necessary for the installation of insulation. Currently, labor costs, which can amount to half of the cost of installing insulation, are excluded without any sound public policy basis. Including labor will help put insulation on more equal footing with other products such as HVAC units, whose labor costs are already included in the credit. More importantly, it will put qualified contractors and installers—hard hit by the current economy—back to work.

In addition to 25C, there are several other important tax incentives aimed at boosting energy efficiency. The Energy Efficient New Homes Tax Credit - known as 45L -- allows homebuilders to receive a $2,000 credit for every new home they build that is 50 percent more energy efficient than code in regard to heating and cooling. Likewise, the Energy Efficient Commercial Building Tax Deduction, or 179(D), provides an incentive for retrofitting existing commercial buildings through a tax deduction of $1.80 per square foot. Unfortunately, 179D is unduly complex and, as a result, little used. We are working with the Administration and several in Congress to make 179D simpler and allow it to achieve its goals.

The construction and contractor sectors of the job market have been hit especially hard by the current economy and the continued slowdown of the housing market. Likewise, our manufacturers are hiring fewer workers and producing fewer products. Energy efficiency incentives such as 25C, 45L, and 179D can help us attain a number of goals including putting Americans back to work, saving money on our utility bills, and making America more energy independent.

We all understand that budgets are tight in the current environment. Both 25C and 45L will expire at the end of the year if Congress does not act to extend them. Competing priorities require that choices to be made. Energy efficiency and insulation are not as visually dramatic as a massive wind farm or a new oilfield, but they are cheaper, cleaner and can contribute even more significantly to creating jobs and creating a secure energy future for America.

Thank you again for the opportunity to testify today.

Statement Submitted for the Record
United States Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure
Hearing on Alternative Energy Tax Incentives
Wednesday, December 14, 2011

Submitted by:
Karl Gawell, Executive Director
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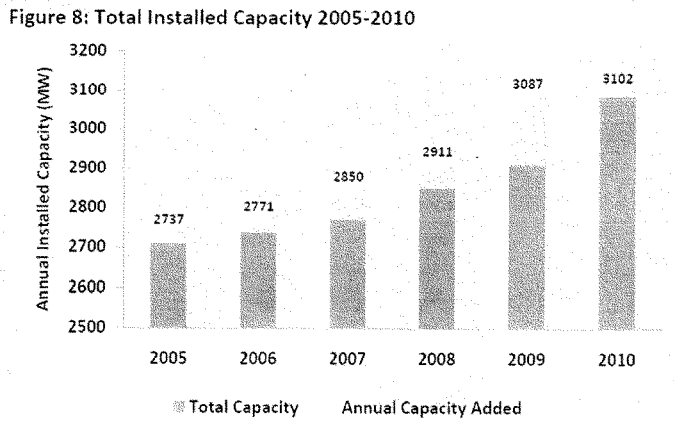
Mr. Chairman, Members of the Subcommittee, on behalf of the Geothermal Energy Association, which has over 100 US company members across the United States, I submit this statement for the record of your hearing. We thank the Subcommittee for considering our statement as part of its deliberations on Alternative Energy Tax Incentives.

The extension of the renewable energy production tax credit (PTC) to geothermal energy in the Energy Policy Act of 2005 has been a principal factor in the recent growth of geothermal energy. Prior to this change the PTC was available only to wind and closed-loop biomass power projects and geothermal energy was disadvantaged in renewable power bidding opportunities.[i] Since 2005, geothermal power has seen steady growth in the United States, as the figure below shows.

Growth in US Geothermal Capacity On-Line[ii]



Today, new geothermal power projects continue to be placed in service, and we expect that a significant number of new projects will be completed before the December 31, 2013 PTC deadline.

However the 2013 deadline presents a serious obstacle to geothermal energy growth. According to our analysis, geothermal power projects in the US typically require between four and eight years to complete. The time period from initial discovery and exploration of a geothermal resource to power emerging on-line therefore takes longer than the current tax window allows. Once projects now in later stages of development are completed, there are indications that we will see only limited if any new development as a result of the uncertainty surrounding geothermal tax incentives.[iii] This would also negatively impact the equipment and service industries which have been rebuilding to support recent market growth. Vendors of products and services in 45 states supported the development of geothermal energy in 2010.[iv]

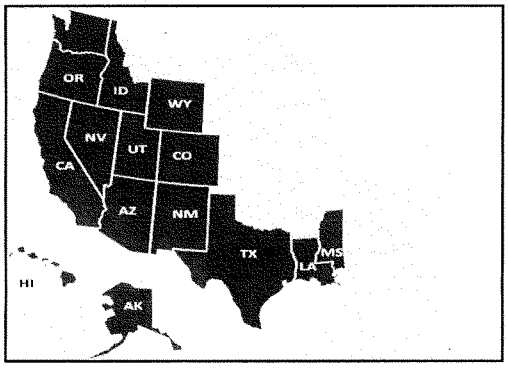
We respectfully urge that geothermal tax credits be extended to provide continued support for new project development and the deployment of new geothermal energy technology. Our nation has among the world's most promising geothermal energy resources, but without the support of long-term tax incentives, the risk vs. reward scenario is not compelling to induce the investment necessary to develop this invaluable domestic source of reliable, baseload renewable energy.

It is worth noting that the US Department of Energy has recently approved important research projects in geothermal energy, which are the first significant investments in new geothermal technology by DOE in decades.[v] A growing market for geothermal energy is important to realizing the full benefits of this investment and extension of the geothermal PTC is essential to growing the U.S. demand for geothermal energy.

The health of the US geothermal industry and its domestic market is also important to the role of US geothermal firms internationally. There is a strong and growing world market for geothermal energy, and US firms are among the leaders in these markets. According to the Department of Commerce, geothermal is one of only two renewable technology areas where US firms are exporting more than the US market is importing, and the benefits of sustaining that leadership are obvious.

Extending the deadlines under the current law would help provide the incentive needed by investors looking at new geothermal power projects. Today, there are projects under development in some 15 states, as shown below, and we hope that advances in technology will support expansion to many more states in the future.

States with Geothermal Projects Under Development in 2011[vi]



In this Congress, legislation has been introduced to address the disparity geothermal faces in the existing tax code. S. 1413 would extend the IRC Section 48 investment tax credit for geothermal power through December 31, 2016, thus putting geothermal on a par with solar energy. It has been introduced in the Senate by Sens. Ron Wyden (D-OR), Mike Crapo (R-ID) and Dean Heller (R-NV). Identical legislation, H.R. 2408, has been introduced in the House by Reps. Dave Reichert (R-WA) and Earl Blumenauer (D-OR). We understand that a principal reason for providing solar projects the 2016 deadline was the long lead-times expected for concentrated solar power projects. Certainly geothermal projects, that provide clean renewable base load power to the grid but which typically are faced with considerably longer lead times than solar projects, should also have been included for the same reason.

We believe that geothermal projects, with considerably longer lead times than currently faced by solar projects, warrant a comparable time frame.

In addition to extending the underlying tax credits, the production tax credit or investment tax credit, we believe it is important to also provide more flexibility to investors. The Section 1603 grant in lieu of the Investment Tax Credit was an important measure which made the underlying tax credit, PTC or ITC, more accessible to a range of companies and helped spur investment during an economic recession. It also helped to quickly reduce the debt load for companies building multiple plants, thus accelerating additional project development.

Other approaches being discussed would extend access to use of master limited partnerships to geothermal and other renewable projects, or provide greater latitude through transferability or refundability of tax credits. These would ensure a broader investment base for the billions of dollars of new investment which will be needed.

GEA urges the Subcommittee to include such measures as a continuation of Section 1603 grants, MLP eligibility, or other provisions to make tax credits more effective along with any extension of the current PTC and ITC deadlines. However, it needs to be stressed that extension of the credit timeframe beyond 2013 is fundamental and critically needed to sustain industry growth.

The investment of billions of dollars in new geothermal power projects will help the economy and create jobs. To give some perspective, let's look at one new project under development in California. CalEnergy, a subsidiary of Mid-American Energy, has three 65 megawatt geothermal projects permitted and under development in Southern California.[vii] These three projects will represent about $900 million in new investment in a county with one of the highest unemployment rates in the state -- over 30%. During the roughly four years of construction, CalEnergy will employ a monthly average of 323 workers. When completed, the project will employ 57 full-time employees (operations, engineering, maintenance, administration). For comparison, MidAmerican notes that a 300MW natural gas plant in operation will employ about 18 people.

Tax incentives for new geothermal investment will not only mean economic stimulus and job creation, but will produce highly reliable power. Whether as traditional baseload power, or by providing flexible capacity to support a grid utilizing more variable technologies, geothermal power can firm up the electrical power system. Geothermal power plants operate 24 hours a day, 7 days a week, 365 days a year, regardless of whether the wind blows or the sun shines. They provide much needed reliability to the power grid, an attribute which utilities value and an important reason why they find geothermal power attractive when it is available.

Expanded geothermal power production will also mean increased federal revenues from lease bids, rentals and royalties. Geothermal leases are competitively awarded and lease sales can attract millions of dollars in bonus bids. In addition, federal lessees pay significant annual rentals and royalties to the Treasury. As the federal Office of Natural Resources Revenue notes: "Increased geothermal leasing activity in several western states led to a dramatic increase in geothermal bonus payments. Once production begins on these leases, a similar increase in geothermal royalty revenues is expected."[viii]

Sustained support for geothermal industry and technology development is needed to support cost reduction and production expansion. It is not surprising that during the period that the Public Utilities Regulatory Act (PURPA) provided sustained financial support for new project development (roughly 1978-1993), over 2,500MW of geothermal power was built and the cost of power fell from roughly 8 cents/kWhr to less than 6 cents/kWhr.[ix] Since PURPA became ineffective in the early 90s, geothermal development has had neither the sustained tax incentives nor research and technology support of technologies. Only in the last few years has this changed. The enormous resource presented by the heat of the earth presents an attractive opportunity and recent tax policy and technology development support is opening the door to a new future for geothermal energy.

With continued progress in exploration, technology development, and market growth there are substantial new geothermal resources which could be made available. Geothermal resources in the US remain largely untapped, because of the high risk of finding and proving geothermal resources. Recently a meeting of leading researchers and exploration experts called for a national exploration initiative by identifying specific prospects for an additional 50,000 MW of geothermal power, which could be tapped to establish a Strategic Geothermal Reserve.[x] With continued incentives for investment in new power projects we will capitalize on new technologies which could make significant new geothermal energy production a reality in the US and sustain US leadership in the world geothermal market.

Thank you for considering our views.

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[i] From 1978 through the 1980s geothermal and other renewable power technologies received support through the Public Utilities Regulatory Policies Act, but that law became ineffective in the early 1990s. As a result, between 1993 and 2005 few geothermal power plants were built and the infrastructure needed to support development atrophied. Further, research support for geothermal was cut dramatically in the 1980s with annual program budgets incapable of supporting significant work until recent years, see note iv.

[ii] Annual U.S. Geothermal Power Production and Development Report
April 2011, Dan Jennejohn, Geothermal Energy Association, available at: http://geo-energy.org/reports.aspx

[iii] GEA has underway research examining obstacles to power plant development, and an assessment of the current project lead-time. That project examined the time-frame for new projects coming on-line since 2005 and found that the range of lead times was four to eight years. Dan Jennejohn, Geothermal Energy Association research analyst.

[iv] Annual U.S. Geothermal Power Production and Development Report, April 2011, GEA, Figure 6.

[v] While Congress has recognized the need for research support in a range of geothermal technologies areas by passing the 2007 Enhanced Geothermal Energy Research and Development Act on a strong bi-partisan basis, until recently the Department of Energy has provided scant funding for geothermal technology. Starting with ARRA 2009, DOE has announced just over $360 million in competitively awarded research contracts for geothermal technology, which have also attracted an additional $300 million in recipient cost-share, bringing the total investment to over $660 million. This represents a more balanced investment in DOEs research priorities.

[vi] Annual U.S. Geothermal Power Production and Development Report
April 2011, Dan Jennejohn, Geothermal Energy Association, available at: http://geo-energy.org/reports.aspx

[vii] From presentation of Jonathan Weisgall, Vice President, MidAmerican Energy, to Session C-4, RETECH 2011, September 22, 2011. To be available from http://www.retech2011.com/

[viii] Fiscal Year 2009 in Review, ONRR, http://www.onrr.gov/ONRRWebStats/YearInReview.aspx

[ix] See Figure 8 at http://www.rff.org/documents/RFF-DP-99-28.pdf

[x] See Report of Workshop on Exploration and Assessment of Geothermal Resources, prepared by the University of Nevada Reno Great Basin Center for Geothermal Energy, available at: http://geo-energy.org/reports.aspx

Statement on behalf of the National Association of Home Builders

Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs

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

December 14, 2011

On behalf of the 160,000 members of the National Association of Home Builders (NAHB), we respectfully submit this statement discussing the significance and impact of existing energy tax policies on housing and related industries. The energy efficiency of the built environment is a critical resource issue. Due to the enormous potential for American families to save thousands of dollars in energy costs each year, promoting an effective efficiency policy at the federal level is essential. Nearly three-quarters of the homes and buildings that consume over 20% of our nation's energy each year were built before the introduction of modern energy codes in 1991. The families that live in the 95 million oldest, least-efficient homes often cannot afford the upfront costs of energy retrofits and upgrades without meaningful incentives. Additionally, the most-efficient new homes far outpace the older stock, but at a premium that is quickly pricing out families from longer-term energy savings in new housing. A federal policy that combines effective building efficiency incentives to address these cost impacts on consumers, as well as fosters job creation in the hard-hit construction sector, is responsible and necessary for addressing two of the biggest household expenses facing today's families: housing and energy.

In 2005, Congress passed the Energy Policy Act (P.L. 109-58) and established a number of important tax incentives to promote greater energy efficiency in the built environment – single family, multifamily and commercial homes and buildings. These incentives acted as the only federal-level programs to address energy efficiency in new and existing homes and buildings with the intent of moving the market towards greater efficiency and the delivery of innovation and technology transfer in building design and practice. From the outset, the

incentives enjoyed bipartisan support and were initially proposed at much higher dollar levels before being scaled down during final negotiations. Clearly, Congress' intent was to provide incentives to push the market towards greater efficiencies rather than enact rigid mandates that distort the market.

Two of these tax credits expire at the end of 2011: Section 45L and Section 25C. Congress appears unlikely to extend these tax credits prior to their expiration. While Congress has allowed the incentives to lapse before and has extended them retroactively, for consumers and businesses this uncertainty is extremely disruptive. NAHB urges Congress to extend these critical tax credits as expeditiously as possible.

Section 45L – New Energy Efficient Home Tax Credit

The Section 45L tax credit provides a $2,000 credit to builders of new homes that exceed a minimum energy code specification (2003 International Energy Conservation Code plus the 2004 supplement) by at least 50% in both heating and cooling efficiency. The efficiency performance must be independently verified by an authorized energy rater, and the credit is subject to both a basis adjustment and may not be claimed against alternative minimum tax (AMT) liability. Eligible homes include residences, single-family and multifamily, that are sold to owner-occupants or leased for rental purposes.

Although this credit has suffered from start-and-stop issues of short-term and retroactive extensions over the last five years, and will again expire at the end of 2011, the 45L program has managed to deliver the market transformation results that Congress intended to encourage. The chart below shows that from enactment in 2005 through the end of 2009 (most recent year with available data), the Section 45L credit went from 0.6% of the market to 10% of the market for new homes.

Year	New Homes Sold	45L-Certified Homes	% of Homes Sold
2006	1,052,000	7,110	0.6%
2007	776,000	23,702	3.1%
2008	485,000	21,939	4.5%
2009	374,000	37,506	10%

Data provided by Residential Energy Services Network (www.natresnet.org), 2009.

In 2009, 10% of all the new homes sold met the energy thresholds of the Section 45L credit and were 50% or more energy efficient, with a more than 5-fold increase in total certified homes.

Section 45L is Hampered by AMT Rules and the Basis Adjustment

While claims of the Section 45L credit have grown exponentially, further adoption may be limited by two restrictions imposed under current law. NAHB recommends that Congress enact technical changes to deal with these barriers.

First, the credit cannot be claimed against alternative minimum tax (AMT) liability.[1] As the home building industry is largely comprised of small builders operating as pass-thrus (80% of NAHB builder members are organized as pass-thru entities), many home builders are trapped in AMT status year after year. Because this credit is claimed by the builder, the AMT limitation effectively deters small builders from participating in the program. NAHB believes that homebuyers and renters will be better served if Congress allows all home builders to take advantage of the Section 45L tax credit by allowing it to be claimed against the AMT.

It is also critical that any AMT fix include a retroactive element that allows "credits determined" to the beginning of the program to be claimed against AMT. For those builders who constructed 45L-eligible homes in good faith but have been unable to claim the credit, a retroactive fix is the fairest approach.

In addition to the AMT, Section 45L(e) requires a basis adjustment by the builder when claiming the tax credit. The basis adjustment poses unique challenges to a builder due to the nature of the home building businesses. Generally, builders may construct homes on a

[1] The *Creating Small Business Jobs Act of 2010* (P.L. 111-240) allowed eligible small businesses to claim general business tax credits, including Section 45L, against the AMT. This applied only to tax credits determined in 2010, so credits earned from 2005 to 2009 that are carried-forward are not eligible for this AMT exemption.

speculative or non-speculative basis. Custom built homes are generally constructed on a non-speculative basis and typically with the eventual homeowner acting as the "builder" (owning the lot and the building materials) and the home builder acting as a general contractor providing the service of construction.

The IRS has taken the position that homes built on a non-speculative basis may not qualify for the program *because the builder does not own the property and therefore cannot reduce basis.* Moreover, IRS Notice 2008-35 makes it clear that the eventual homeowner cannot claim the credit as the "builder" because the 45L credit cannot be claimed for a home in which the taxpayer will reside.

NAHB does not believe that Congress intended to exclude non-speculative homes from the tax credit. The ideal solution would be to eliminate the basis adjustment. Realizing this change would result in a revenue impact, NAHB recommends Congress look to a solution that preserves the basis adjustment while allowing all eligible homes to qualify for the credit.

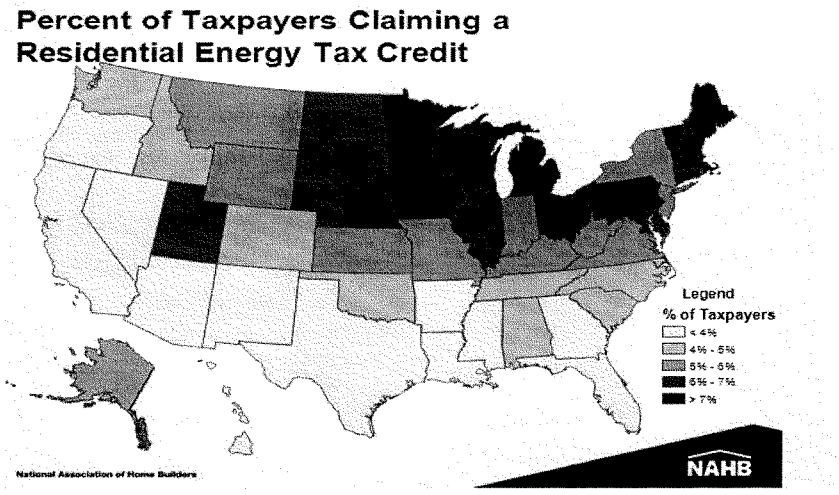
The commercial energy efficient building deduction, Section 179D also requires a basis adjustment but allows the deduction to be claimed by someone other than the building owner in certain cases. Specifically, Section 179D(d)(4) authorizes the Secretary to issue regulations to allow the deduction to be claimed by "the person primarily responsible for designing the property in lieu of the owner," for certain government-owned buildings.

45L could and should be modified to allow the tax credit to be claimed by the general contractor in custom home building, non-speculative building situations (ones in which the owner of the home and lot will be the eventual homeowners, thereby ensuring the tax credit is consistent with its operation as a general business credit under Section 38). This could be accomplished by granting the Secretary authority similar to that under 179D(d)(4). The ultimate fix could then be done via regulation and would not require modifying the existing basis rules. Custom home builders are the leaders in Green Building, and excluding them from the 45L program reduces the scope and policy effectiveness of the tax credit.

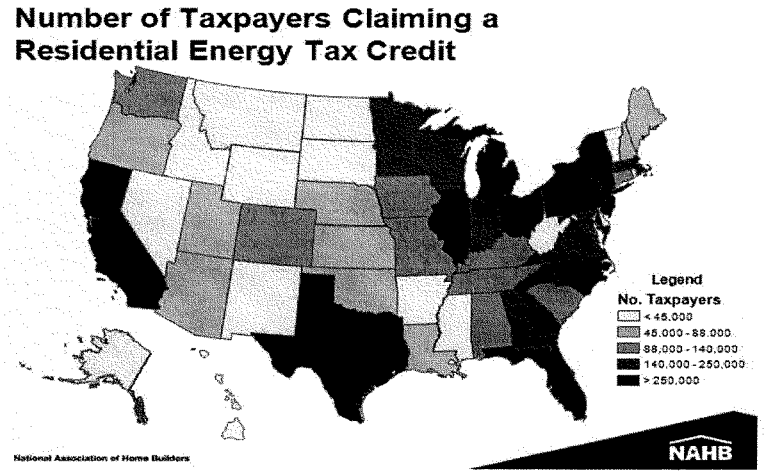
Section 25C – Qualified Energy Efficiency Improvements Tax Credit

The 25C tax credit began as a modest incentive for the purchase of qualified energy efficiency improvements for existing homes, such as windows, doors, roofs, and HVAC equipment. Originally, the 25C credit provided 10% of the cost of the product (not including installation and labor costs) not to exceed $500 but imposed various lower caps on specific energy efficient property, such as a maximum of $200 for window purchases. At the outset, the credit offered little appeal to existing homeowners because the specifications for the qualified improvements had price tags that far exceeded the tax credit. Further, the various caps caused confusion and added complexity. In 2009, the American Reinvestment and Recovery Act (ARRA) expanded the original 25C program and increased the credit to 30% with a $1,500 cap and included some labor and installation costs. All qualifying products now had the same cap, providing much needed simplicity. As a result, the appeal and popularity of this incentive soared and many retailers, manufacturers, and contractors advertised the newly-enhanced credit which encouraged business and fostered job growth in remodeling activity at the end of 2009 and 2010.

The success of the credit in those two years is unquestionable. Of note, the credit was used heavily in states with an older, less efficient housing stock, and states with more extreme weather conditions. NAHB analyzed Statistics of Income data from the Internal Revenue Service (IRS) about claims for the 25C and 25D (IRS data does not separate out these two credits) and found that in 2009, over 7% of all taxpayers in Minnesota, Iowa, Wisconsin, Michigan, Pennsylvania, Vermont, New Hampshire, and Maine claimed a residential energy tax credit.



And more than 250,000 taxpayers claimed this credit in California, Texas, Florida, Illinois, Ohio, Michigan, New York, Pennsylvania, and New Jersey.



In total, for tax year 2009, over $5 billion of 25C tax credits were claimed. NAHB estimates that these tax credits were claimed in connection with over $25 billion in remodeling expenditures. Remodelers often leverage this tax credit when working with clients. These tax credits helped support the remodeling industry (see graph below) during a period in which new home sales experienced dramatic declines. NAHB estimates that the remodeling activity generated by this tax credit in 2009 was associated with over 278,000 full-time jobs. NAHB estimates that every $100,000 creates enough work for 1.11 full-time equivalent jobs.[2] The programs supported approximately $13.2 billion in wages for these workers and $7.5 billion in net business income.

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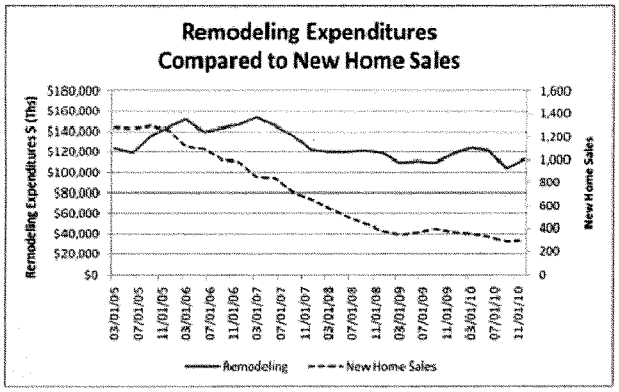
[2] THE DIRECT IMPACT OF HOME BUILDING AND REMODELING ON THE U.S. ECONOMY (HTTP://WWW.NAHB.ORG/GENERIC.ASPX?SECTIONID=734&GENERICCONTENTID=103543&CHANNELID=311), NAHB ECONOMICS PAPER.



IRS data for tax year 2009 also indicates that 25C was heavily used by middle-class homeowners. Of taxpayers claiming the credit, two-thirds had an adjusted gross income of $100,000 or less; 93% of taxpayers claiming the credit earned less than $200,000.

Unfortunately, this highly successful tax credit reverted back to its 2008 levels for the 2011 tax year. Section 25C now only provides a 10% credit with a $500 cap, plus assorted lower caps on certain energy efficient property like windows and furnaces. Reverting back to the lower credit, in addition to the complexity of the various caps, will likely discourage consumers from installing more energy efficient property when conducting home renovations. On windows alone, most homes have an average of twelve windows. For a homeowner undergoing window replacement in 2011, the $200 cap is unlikely to be an effective incentive, and homeowners are more likely to install cheaper, less efficient windows as a result.

NAHB strongly supports an extension of the Section 25C tax credit. NAHB would also urge Congress to simplify and modernize the new credit by increasing the $500 to $1,000; allow homeowners to claim installation costs for all eligible products; and remove the confusing lower caps. Adopting this 10% tax credit with a $1,000 cap will greatly simplify the current tax credit and provide an incentive that middle-class homeowners will continue to utilize to improve the efficiency of their homes.

Section 25D – Residential Energy Efficient Property

Section 25D provides a nonrefundable 30% tax credit to consumers for the purchase and installation of certain power production property for a home. Typical uses include solar, geothermal, fuel cells, and small wind energy. The credit is uncapped, meaning that all qualified expenses may be claimed. Labor costs are eligible, and unlike Section 25C and Section 45L tax credits, Section 25D credits can be claimed against the AMT.[3]

NAHB believes that the simple, straight-forward approach used in Section 25D should be a model for reforming the Section 25C tax credit. A tax credit that includes labor costs and is automatically AMT-preferred is simple, straightforward and effective. Consumers know exactly what benefit they are receiving, which makes it simpler for them to understand both the tax and energy benefits from switching to an advanced system for heating, cooling, and energy production.

Section 179D – Energy Efficient Commercial Buildings Deduction

Section 179D provides a deduction equal to energy--efficient commercial building property expenditures made by the taxpayer. This includes multifamily dwellings built under the commercial building codes (four stories or higher). If a building meets the overall building requirement of a 50% energy savings, the taxpayer may deduct $1.80 per square foot of the property on which qualifying improvements were made. For buildings that do not reach the targeted energy savings, a partial deduction of $0.60 a square foot is allowed with respect to each separate building system that meets or exceeds applicable system-specific targets. The taxpayer must obtain an independent certification before the deduction can be claimed.

The only data available about the success, or lack thereof, of this incentive is anecdotal. It is largely unused by the commercial real estate industry at the higher level because of the significant costs associated with a 50% reduction in both heating and cooling costs. Consequently, efforts to redesign this incentive to make it more effective and easier to

[3] Although the tax code does not allow taxpayers to Section 25C credits against the AMT, the annual AMT "patch" typically allows taxpayers to claim Section 25C and other personal, nonrefundable tax credits against AMT.

utilize for existing building retrofits are already underway with a large coalition of support from a diverse set of real estate and environmental interests.

Roll of the Tax Code in Energy Policy

Although some of these incentives would benefit from updates, nearly all of these tax incentives are performing exactly as Congress intended when establishing them back in 2005. Despite the unprecedented downturn in housing and the resultant recession, the increased amount of economic activity associated with retrofit incentives under 25C, coupled with the stellar market penetration of new energy-efficient homes under 45L confirm that federal policies promoting building efficiency are effective, necessary, and accomplish broad conservation goals.

Some have argued for elimination of all energy and efficiency tax incentives in an effort to let the market determine the direction of costs and savings for consumers. Unfortunately, families that do not have the economic resources to undertake a meaningful energy upgrade will be sidelined in this process—as the data shows for Section 25C, taxpayers who used the credit are overwhelmingly middle-class families. And with or without these incentives, the Department of Energy is on a mission to federalize and mandate aggressive energy code requirements for new homes and buildings that will further deteriorate housing affordability. Some of these new and proposed requirements will prove to be very expensive to the consumer and will take decades to recover the investment, a payoff few homeowners will see as the average homeowner remains in their home for about ten years while the average home remains in the housing stock for 60 years or more.

Those who suggest that Congress should eliminate incentives to offset these costs on the new construction side, plus remove incentives to upgrade older, less-efficient housing, cannot rely on the market to correct federal agency actions that are not based on a reasonable payback period and cost-benefit analysis. Further exacerbating the situation, appraisals often inappropriately or inaccurately value energy efficiency and energy-efficient features in homes, creating a regulatory disincentive for optional energy efficiency upgrades.

With an aging infrastructure and building stock, more American families are going to be relegated to living and working in less-efficient homes and buildings. New construction is at historic lows, and even when the housing market begins to return to normal levels, consumers will be facing dramatically different mortgage qualification requirements and financing issues than before the downturn. The reality is that the oldest, least-efficient homes are the most affordable to families with lower and moderate incomes. Unfortunately, these families also bear the largest burden in energy costs, as a percentage of income.

Utilization of the tax code to promote energy efficiency and consumer savings is the most effective opportunity to truly shape an efficiency policy that is not punitive to the housing market as a whole, and creates jobs as a result. The use of the tax code to incentivize energy efficiency in buildings has a long history of bipartisan support. Much like other environmental rules and regulations, efficiency requirements are expensive, and ultimately the consumer bears the brunt of those costs. New home builders cannot absorb costly new mandates, and these costs will be passed onto new homebuyers. But to really improve home energy efficiency, we must look at the over 95 million homes that were built before modern energy codes in 1991. Without effective tax incentives, those homes will continue to waste energy and cost the consumer money.

NARI®
NATIONAL ASSOCIATION OF
THE REMODELING INDUSTRY

December 14, 2011

The Honorable Jeff Bingaman, Chairman
Subcommittee on Energy, Natural Resources, and Infrastructure
Committee on Finance
United States Senate
Washington, DC 20510

The Honorable John Cornyn, Ranking Member
Subcommittee on Energy, Natural Resources, and Infrastructure
Committee on Finance
United States Senate
Washington, DC 20510

Re: Statement for the record; hearing on Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing and Jobs December 14, 2011

Chairman Bingaman and Ranking Member Cornyn,

On behalf of the 7,000 companies that belong to the National Association of the Remodeling Industry (NARI), we are writing to thank you for having this hearing on energy tax incentives and we urge support for an extension at the $1,000 level for the home energy efficiency (25C) tax credit set to expire at the end of the year.

NARI is a non-profit trade association based in Des Plaines, Illinois. We have 60 Chapters in major metro areas nationwide and our membership is comprised of remodeling contractors, local suppliers, and national suppliers. Eighty percent of NARI member companies have 20 employees or less. NARI's core purpose is to advance and promote the remodeling industry's professionalism, product and vital public purpose.

The Energy Policy Act of 2005 established a federal tax credit for energy-efficient home improvements (found in section 25C of the tax code). The 30 percent credit applies to energy efficiency improvements for existing homes and the purchase of high-efficiency heating, cooling, and water-heating equipment. Homeowners were able to take a combined credit up to $1,500 for equipment purchased during a two-year period, until 2010 when the lifetime credit cap was lowered to $500.

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Visit us on our website at www.RemodelToday.com and at http://nariremodelers.com

NARI believes that 25C tax credits deserve recognition for their success. In 2009, Internal Revenue Service data indicate Americans spent $25.1 billion on remodeling associated with the tax credit. Those expenditures supported 135,540 jobs in the construction and remodeling sectors. In addition, 25C is truly a middle-class tax credit. In 2009, over two-thirds of the households claiming the credit had adjusted gross income of $100,000 or less.

Every energy efficiency improvement offers an opportunity for trained remodeling professionals to enhance the quality of homeowners' lives. Those projects provide valuable work in the construction sector which is struggling to recover from our economic downturn. The home energy efficiency improvements also save homeowners substantial amounts of money on their monthly energy bills.

Bringing the 25C tax credit up to the $1,000 level will result in projects that save energy and will have a significant impact on job creation in the construction and manufacturing sectors. Thank you for your consideration.

Sincerely,

Mary Busey Harris

Mary Busey Harris, CAE
Executive Vice President

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Written Testimony of Anne Steckel
National Biodiesel Board Vice President of Federal Affairs
Submitted to the U.S. Senate Committee on Finance - Subcommittee on Energy, Natural Resources, and Infrastructure
Hearing on "Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs"
December 14, 2011

Executive Summary: Biodiesel is a renewable, low-carbon diesel replacement fuel. It is the only domestically produced, commercial-scale Advanced Biofuel – as defined by the Environmental Protection Agency (EPA) – that meets a strict ASTM fuel specification and is readily available and accepted in the U.S. marketplace. (Note: Biomass-based Diesel is an Advanced Biofuel under the EPA's Renewable Fuels Standard (RFS2) program, and in general, U.S. biodiesel produced from animal fats, recycled cooking oil, soybean oil, inedible corn oil derived from the ethanol production process, canola and algae qualifies as Biomass-based Diesel).

In its short history, the U.S. biodiesel tax incentive has achieved its desired goal of increasing the domestic production of a clean-burning, renewable fuel while generating jobs, reducing America's reliance on foreign oil and improving the environment.

When the incentive was enacted in 2005, the U.S. produced 75 million gallons of biodiesel. This year, the industry has set a new production record of more than 800 million gallons and will support more than 31,000 jobs across the country while generating some $628 million in federal, state and local tax revenues, according to a recent economic study[i].

This growth is to be applauded, but it should not cloud the fact that biodiesel remains a young and vulnerable industry. In fact, we know from recent history what could happen if Congress allows the tax incentive to lapse. When that occurred in 2010, the result was predictable: Plants closed and thousands of people across the country lost work. Specifically, U.S. biodiesel production plummeted by 42 percent, resulting in the loss of nearly 8,900 jobs and a drop in household income of $485 million.

Only this year, after Congress reinstated the tax incentive, did the industry regain its footing and begin ramping up production again. Through Oct. 31, 2011, the industry had already more than doubled its production from all of 2010, with more than 802 million gallons. This translates directly into thousands of jobs, millions of dollars in new equipment and feedstock purchases, and other positive economic activity.

With the ongoing economic downturn, now is not the time to allow another industry slump. Under projected expansion by 2015, biodiesel is expected to support more than 74,000 jobs, $4 billion in income, and some $7.3 billion in GDP, according to the economic study.

That growth will be severely jeopardized by the expiration of the tax incentive, and we strongly encourage Congress to provide a seamless extension of the biodiesel, renewable diesel and bio-jet tax credit.

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Chairman Bingaman and Ranking Member Cornyn, I appreciate the opportunity to submit written testimony on behalf of the National Biodiesel Board (NBB) regarding energy tax policy and tax reform. As producers of America's only commercial-scale Advanced Biofuel that's sold and produced nationwide, the U.S. biodiesel industry looks forward to working constructively with this committee to ensure that our nation's Advanced Biofuel goals are met.

NBB applauds your efforts to review alternative energy tax incentives. History has shown that well-crafted and efficient tax incentives can be powerful policy mechanisms to achieve the nation's energy objectives and leverage private sector investment to promote the deployment and utilization of new energy resources. This is certainly the case with the tax credit for biodiesel, renewable diesel and bio-jet fuel. As with every other major U.S energy resource, effective tax policy has helped create domestic manufacturing jobs as well as significant economic and energy policy benefits.

The U.S. biodiesel industry is having a record year of production and is creating good-paying jobs in nearly every state in the country. This success is in part attributed to the strong federal policies in place encouraging domestic energy production. While we understand the pressures facing Congress, we believe economic conditions are simply too weak today to pull support from a growing American industry that is a rare bright spot in this struggling economy.

Now, as much as ever, the biodiesel industry needs stability and support to continue its remarkable success story, and we encourage Congress to provide a seamless extension of the biodiesel, renewable diesel, and bio-jet tax credit. A seamless extension, before the end of this year, would provide needed certainty and protect against future disruptions and the loss of thousands of much-needed jobs.

Background and Industry Overview: Biodiesel is a renewable, low-carbon diesel replacement fuel. The EPA has determined, based on the performance requirements established by the *Energy Independence and Security Act* (EISA) (P.L. 110-140), that domestically produced biodiesel is an Advanced Biofuel under the RFS2 program. In fact, it is the only commercial-scale fuel sold and produced across the United States to achieve this designation.

Biodiesel is made from waste greases like recycled cooking oil and animal fats and secondary-use agricultural oils, and is refined to meet a specific commercial fuel definition and specification. The fuel meets the D6751 fuel specification set forth by ASTM International, the official U.S. fuel-certification organization. Biodiesel is one of the most- and best-tested alternative fuels in the country and the only alternative fuel to meet all of the testing requirements of the 1990 amendments to the Clean Air Act. There are approximately 195 domestic and foreign biodiesel plants registered with the EPA, representing a combined production capacity in excess of 2.7 billion gallons.

Biodiesel is primarily marketed as a five percent (B5) blending component with conventional diesel fuel, but can be used in concentrations up to twenty percent (B20). It is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel jobbers.

Status and Background on the Biodiesel Tax Incentive: The biodiesel tax incentive was approved in 2004 as part of the American Jobs Creation Act (P.L. 108-357) and enacted in 2005. The incentive was subsequently extended through December 31, 2008 as part of the Energy Policy Act of 2005 (P.L. 109-190). H.R. 1424, the Emergency Economic Stabilization Act of 2008 (P.L. 110-343), again extended the incentive for one year through December 31, 2009, at which time the credit expired. After a year of being expired for all of 2010, Congress extended the tax credit through Dec 31, 2011 (P.L. 111-312).

The 2010 expiration of the tax credit had a severely detrimental impact on the domestic biodiesel industry. In fact, the industry's decline resulted in the loss of nearly 8,900 jobs and a drop in household income of $485 million.

The biodiesel tax incentive is designed to encourage the production and use of biodiesel by making the fuel price-competitive with conventional diesel fuel. In general, current law allows taxpayers to claim the biodiesel tax incentive as either a $1.00 per gallon general business income tax credit or as a $1.00 per gallon blenders excise tax credit. To qualify for the biodiesel tax incentive, the fuel must by statute meet both the ASTM D6751 fuel specification and the Environmental Protection Agency's (EPA) registration requirements under Section 211 of the Clean Air Act.

The Internal Revenue Code provides a general business income tax credit to encourage the production and use of biodiesel, renewable diesel and bio-jet fuel. The credit is the sum of three credits – the biodiesel mixture credit; the biodiesel credit; and the small agri-biodiesel producer credit. The biodiesel mixture credit provides a $1.00 per gallon credit for each gallon of biodiesel that is blended with conventional diesel fuel. The biodiesel credit provides $1.00 per gallon for each gallon of pure B100 biodiesel that is used as a fuel. The small agri-biodiesel producer credit is a 10 cents per gallon credit for plants with a production capacity of less than 60 million gallons per year. The credit can be claimed on the first 15 million gallons of production.

Biodiesel Public Policy Benefits: The biodiesel tax incentive has helped achieve the worthwhile policy goal of creating jobs while increasing the production and use of biodiesel in the U.S. In 2004, when the incentive was initially enacted, the U.S. produced 25 million gallons. This year, with the tax credit reinstated we anticipate the industry will produce at least 800 million gallons. There are compelling public policy benefits associated with the enhanced production and use of biodiesel in the U.S.

Biodiesel Reduces our Dependence on Foreign Oil: Biodiesel can play a major role in expanding domestic refining capacity and reducing our reliance on foreign oil. The 2.8 billion gallons of biodiesel produced in the U.S. since 2005 have displaced an equivalent amount of diesel fuel with a clean-burning, efficient fuel that according to the EPA reduces lifecycle greenhouse gas emissions by as much as 86 percent compared to petroleum diesel fuel and creates 5.5 units of energy for every unit of energy that is required to produce the fuel.

Biodiesel is Good for the Environment: Biodiesel is an environmentally safe fuel, and is the most viable transportation fuel when measuring its carbon footprint, life cycle and energy balance. Since 2005, biodiesel has reduced lifecycle greenhouse gas emissions by 37.6 billion pounds, the equivalent of removing 3.31 million passenger vehicles from America's roadways.

Biodiesel Reduces Diesel Emissions: Tailpipe emissions from traditional diesel – primarily from trucking fleets, school buses and other vehicles – are a significant health and air quality concern. In an update to

its National-Scale Air Toxics Assessment earlier this year, EPA cited diesel exhaust as one of the nation's most dangerous pollutants, saying it is "among the substances that may pose the greatest risk to the U.S. population." Thousands of trucks and buses hit the road every day burning traditional diesel fuel. Substituting higher amounts of biodiesel for traditional diesel fuel is the simplest, most effective way to immediately improve emissions.

The Biodiesel Industry is Creating Jobs and Making a Positive Contribution to the Economy: In 2011, NBB estimates that the U.S. biodiesel industry will support 31,000 jobs in all sectors of the economy. This will add more than $3 billion to the nation's Gross Domestic Product (GDP).

Biodiesel is America's first advanced biofuel and when compared to gasoline, diesel and ethanol, it is at a fundamentally different stage of development and should be treated as a new fuel in the marketplace. The petroleum industry has received a number of tax incentives for many years; and the ethanol industry has been around for decades and has had its tax break since 1980. In contrast, the biodiesel industry has had commercial-scale production for only about six years, and has had its tax credit only since 2005. The gasoline marketplace is approximately 140 billion gallons, the diesel pool is approximately 60 billion gallons and the ethanol marketplace is producing some 14 billion gallons. By comparison, biodiesel is on pace to produce about 800 million gallons this year, up from approximately 300 million gallons last year, when the tax credit had expired. Biodiesel is an up-and-coming industry and is in a far more fragile stage of development.

Conclusion: The biodiesel tax incentive has helped achieve the desired goal of increasing the domestic production and use of biodiesel, and in turn has helped the U.S. realize the energy security, economic and environmental benefits associated with displacing petroleum with domestically produced renewable fuels. These benefits, however, will be jeopardized if Congress does not act in a timely manner to address the immediate issue facing the industry and extend the biodiesel tax incentive.

About NBB: NBB is the national trade association representing the biodiesel industry as the coordinating body for research and development in the U.S. It was founded in 1992, and since that time, NBB has developed into a comprehensive industry association which coordinates and interacts with a broad range of cooperators including industry, government and academia. NBB's membership is made up of biodiesel producers; state, national and international feedstock organizations and feedstock processor organizations; fuel marketers and distributors; and technology providers.

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Chairman Bingaman and Ranking Member Cornyn, I again appreciate having the opportunity to submit written testimony on this issue of significant importance to the U.S. biodiesel industry. We look forward to serving as a resource for the Committee on issues related to biofuels tax policy as the committee proceeds.

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[i] Cardno ENTRIX June 8, 2011, Economic Impact of Removing the Biodiesel Tax Credit for 2010 and Implementation of RFS2 Targets Through 2015.

Statement for the Record

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

Hearing on Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs

12/14/2011

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Statement for the Record of the National Hydropower Association on Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing and Jobs

The National Hydropower Association[1] (NHA) appreciates this opportunity to comment on the effects of short-term energy tax incentive extensions on alternative technology investment, domestic manufacturing and jobs.

Summary
Today, hydropower is the country's largest renewable electricity technology, generating approximately 7 percent of total electricity in the United States in 2009. This represents about two-thirds of total U.S. renewable electricity generation. Successful federal tax incentive programs have helped developers bring new facilities online, and with these incentives the industry is poised for ongoing growth.

However, hydropower has the longest development time frame of all the renewable technologies due in part to the scale of the facilities, but also do to the extensive multi-year federal and state licensing process. For federal tax incentives to motivate developers and investors to place these capital-intensive facilities in service, Congress should provide certainty and stability by enacting multi-year extensions of the incentives for hydropower facilities.

Comments
NHA strongly supports federal policy that provides a predictable market signal in support of renewable energy project development, which in turn leverages significant private investment and stimulates job creation and local economic benefits across the country.

We urge the Congress to continue its bipartisan support for renewable energy incentives, such as the production tax credit (PTC) and clean renewable energy bonds (CREBs) program, and provide the hydropower industry the certainty needed to compete for investment, complete project construction and begin operation over the next several years.

The inclusion of hydropower resources under the various federal tax incentive programs has kicked off a resurgence in growth of responsible, sustainable projects – growth the industry has not seen in nearly two decades, with tens of thousands of megawatts under consideration before the Federal Energy Regulatory Commission (FERC) today. Long-term extension of these growth policies, along with additional improvements to the provisions, will ensure that these projects move from proposals to actual deployment.

Hydropower's Contribution and Impact of Tax Incentives
Increased renewable electricity generation supports a variety of important short and long-term national energy goals including: energy independence; diversity of the nation's generation mix; and the environmental benefits associated with the greater use of clean energy resources. However, to meet

[1] NHA is the non-profit national association dedicated exclusively to advancing the interests of the U.S. hydropower industry, including conventional, pumped storage and marine and hydrokinetic technologies. NHA's 180 members includes public utilities, investor owned utilities, independent power producers, project developers, equipment manufacturers, environmental and engineering consultants and attorneys.

these goals and reap the benefits, federal policy support, particularly in the form of extended and expanded tax incentives, is needed.

Today, hydropower is the country's largest renewable electricity provider, generating approximately 7 percent of total electricity in the United States in 2009.[2] This represents about two-thirds of U.S. renewable electricity generation.

The U.S. hydropower industry currently employs up to 300,000 workers from project development to equipment manufacturing to facilities' operations and maintenance. With the right tax policies in place, hydropower can expand its American workforce.

NHA estimates that 1.4 million cumulative direct, indirect and induced jobs could be created by the hydropower industry by 2025 through capacity additions and efficiency improvements at existing hydropower facilities, the deployment of projects to convert non-powered dams to electricity generating assets[3], pumped storage projects, and marine and hydrokinetic technologies.[4]

However, throughout the 1990s and 2000s, the hydropower industry experienced a period of minimal growth. This has changed dramatically with the inclusion of hydropower technologies under the production tax credit (PTC) and clean renewable energy bonds program (CREBs) in 2005, and other incentives, such as the investment tax credit (ITC) and Section 1603 program, in 2009.
From the enactment of the Energy Policy Act of 2005 through July 2011, FERC has certified approximately 83 hydropower projects in 23 states for the PTC.[5] These projects, involving capacity additions and technology or efficiency improvements at existing hydropower facilities, have resulted in an average increase in generation of close to 11 percent for a total generation increase of 954,312 megawatt hours. This is enough energy to power 87,583 homes.[6]

Looking to the public power sector, hydropower developers received 24 percent of the $2.2 billion in bonds allocated under the Clean Renewable Energy Bonds program in 2009. This amounted to approximately $531 million in funding for hydropower projects, several of which have already begun construction and will be brought online in the next couple of years.
In fact, there is over 85,000 MW of proposed conventional hydropower, pumped storage and marine and hydrokinetic projects under consideration before FERC today.[7] And a recent study by Navigant Consulting determined that up to 60,000 MW of capacity by 2025 is possible.[8]

With the proper support, including continued economic incentives, NHA believes the U.S. hydropower industry is primed for responsible growth and can play a significant role in the effort to increase renewable electricity generation. Numerous opportunities are available to expand this country's

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[2] http://www.eia.gov/cneaf/electricity/epa/epa_sum.html
[3] Approximately three percent of the nation's 80,000 dams currently produce power.
[4] See http://hydro.org/why-hydro/job-creation/navigant-study/ where a cumulative job is a job-year, defined as one person working full-time for 12 months.
[5] The 22 states in which hydropower projects have received PTC certification are: Arkansas, California, Georgia, Idaho, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Montana, New Hampshire, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Vermont, Virginia, Washington, West Virginia and Wisconsin.
[6] See http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3 for EIA data on average residential annual electricity consumption.
[7] See http://ferc.gov/industries/hydropower/gen-info/licensing.asp
[8] See http://hydro.org/why-hydro/job-creation/navigant-study/

hydropower base while at the same time provide responsible environmental stewardship of the nation's waters.

Need for Certainty

To realize the substantial new capacity highlighted above, the hydropower industry requires stable and predictable support policies. Extension of existing tax policies is needed, as well as several substantive improvements, along with new policies for technologies, such as hydropower pumped storage, that are not currently covered under the existing programs.

Of all renewable technologies, hydropower has the longest development time frames due, in part, to the extensive multi-year federal and state licensing process.[9] In addition, these projects are capital-intensive, with significant up-front costs. Without the long-term certainty and predictability provided by consistent federal support policies, developers will be unable to attract the financing needed to support this considerable investment and utilities will be driven by default to other resources with shorter development timelines, such as wind and natural gas, resulting in a less diverse generation mix.

Specific NHA Tax Agenda Items

- ***Extension of the PTC and ITC.*** Congress has extended the renewable energy PTC and ITC through 2013 for hydropower and marine and hydrokinetic technologies. As stated above, this multi-year extension has been critical for the hydropower industry to utilize the credits as the deployment timeline of larger, more capital-intensive hydropower projects is longer than that of other renewables.

  NHA strongly supports further extension of the PTC and ITC through 2018. The conventional hydropower industry faces significant challenges to development, challenges at least on par with those experienced by other renewable industries that have been the focus of legislative efforts to extend these programs.

- ***Additional Funding of CREBs.*** For the public power community, which represents a substantial portion of hydropower facility ownership in the United States, the CREBs program is an important corollary to the PTC for this industry sector. Even with the allocations already made, the CREBs program is oversubscribed. Demand continues to outpace the size of the allocations awarded and is again in need of significant additional funding.

- ***New Pumped Storage Investment Tax Credit and CREBs Eligibility.*** Pumped storage of electricity is a proven, viable, large-scale method of storing energy and is an ideal option for firming the variability of other renewable energy resources, such as wind and solar. Pumped storage also provides several grid reliability benefits, including energy storage, load balancing, frequency control, and others.

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[9] The integrated licensing process (ILP), the default federal process for hydropower development takes 5-5.5 years. While FERC is the lead agency, the process can also involve federal hydropower project owners, such as the Bureau of Reclamation and the Army Corps of Engineers, federal resource agencies, state resource agencies, tribes, and interested stakeholders and the public. This complex, comprehensive process is intensive, multi-layered and can take up to 26 steps as outlined at: http://ferc.gov/industries/hydropower/gen-info/licensing/ilp/flowchart.pdf.

There are a number of new pumped storage projects under consideration across the country. Of these, several may be brought online in the next 5-8 years, totaling about 3400 MW of capacity. These proposed facilities are situated in key areas where new development of variable resources is occurring at a rate that will challenge the capabilities of the transmission system and existing flexible generation resources to manage. Without the stability and reliability services new pumped storage can provide, the grid system will be more vulnerable to increased disruptions in the future and the negative economic impacts and losses that result.

Currently, there is no federal incentive that supports the development of energy storage resources, including pumped storage. Pumped storage projects are large capacity projects ranging in size from several hundred MW to 1500 MW, which can cost billions of dollars to build and take much longer to construct. NHA supports enactment of a new energy storage ITC and CREBs eligibility for pumped storage, as proposed in several pieces of recent legislation.

- ***Additional Funding of the Section 48C Advanced Manufacturing Credit.*** The manufacturers' ITC has been a valuable program that supported investment for the U.S. hydropower manufacturing sector. In fact, three hydropower equipment manufacturers received awards to support new facilities or facility upgrades located in Pennsylvania, Tennessee, Ohio, and Washington.

  Funding for the 48C program was completely allocated in the first round of awards announced in January 2010. Additional funding is needed to meet the pent-up demand from renewable energy equipment and component manufacturers as evidenced by the fact that the program was significantly oversubscribed.[10]

- ***Extension of Direct Payment in lieu of Tax Credits.*** NHA supports extension of the direct payment in lieu of tax credit program that was created by Section 1603 of the *American Recovery and Reinvestment Act of* 2009 (ARRA) for renewable energy facilities, including hydropower. NHA has seen the Section 1603 grant program provide access to financing for qualified energy facilities during the nation's economic downturn, extension of the grant program would ensure the creation of additional facilities to expand production of renewable energy and create thousands of new jobs in the renewable energy sector.

  As an example, one NHA member company has moved forward with a 125 MW expansion of their existing hydropower facility because of the availability of the Section 1603/ITC programs. This $450 million project, with its 200 construction jobs, was temporarily shelved at the end of 2008 and only moved forward after the passage of the ARRA. In addition to the extension, NHA also recommends adoption of a mechanism that allows public power to utilize this program.

- ***Parity for Hydropower and Marine and Hydrokinetic Resources under the PTC.*** Internal Revenue Code Section 45 provides for a PTC for electricity produced from renewable resources. Under current law, the PTC prescribes different tax credit rates, discriminating between technologies and picking winners and losers. Certain renewable facilities, such as wind and

[10] The Department of Energy confirmed the need for additional funding in testimony before the Senate Finance Committee on May 20, 2010 stating that the Section 48C program was "oversubscribed 3:1 with qualifying projects" and that "extending and expanding the 48C program would allow the U.S. to accelerate this manufacturing expansion."

geothermal power, are eligible to receive the full PTC, while other qualified facilities, including qualified hydropower, small irrigation power and marine and hydrokinetic power receive only 50 percent of the full PTC rate. Congress has never articulated a rationale for this disparate treatment.

All of the technologies that qualify possess unique energy attributes and generation benefits that play an important role in expanding the nation's use of renewable electricity and addressing climate change. In an environment where utilities require competitive bids for renewables, a higher PTC for some technologies results in unequal playing field and affects competition. The disparity distorts market dynamics and makes it difficult for facilities that receive only a 50 percent credit to compete with those that receive the full amount of the credit. Congress should provide technology-neutral tax incentives to promote the growth of all clean electricity resources.

In ARRA, Congress unambiguously endorsed the doctrine of tax parity for renewables by allowing all qualifying facilities to receive the 30 percent ITC. NHA applauds this recognition and encourages Congress extend the same treatment to the PTC, which would harmonize the policies and ensure there is no slanting of investment in favor of any one technology over another.

As the largest trade association that exclusively represents all sectors of the waterpower industry, NHA appreciates the opportunity to submit these comments on the importance of renewable energy tax incentives to support project development.

We believe tremendous opportunities exist to accelerate deployment of hydropower resources to realize our national clean energy, jobs, and environmental goals by utilizing the benefits hydropower provides. NHA would be pleased to meet with Committee staff to discuss the comments and recommendations contained in this statement in more detail.

Sincerely,

Linda Church Ciocci

Linda Church Ciocci
Executive Director

Testimony of the Honorable Glenn English
Chief Executive Officer (CEO)
National Rural Electric Cooperative Association

Submitted for the Record to the
United States Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure
Hearing: Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing, and Jobs

December 14, 2011

Thank you for the opportunity to offer testimony about how electric cooperatives have utilized renewable electricity tax incentives to develop projects that help keep electricity reliable and affordable for their consumers.

Electric cooperatives and their consumers have, since 2005, utilized the Clean Renewable Energy Bond program (CREBs) to finance renewable projects. Recently, some cooperatives that could not use CREBs have indirectly benefited from the 1603 Treasury Grant Program (TGP). In addition, electric cooperatives have purchased renewable power on contract from private developers claiming the Production Tax Credit (PTC), since the mid-1990s. Co-op experiences with all three of these programs can guide this Committee as it decides the future of renewable incentive policy.

A key principle that should be considered in the context of energy tax reform is this: if Congress uses the tax code to direct energy policy, not-for-profit electric cooperatives should be included in any available incentives. Otherwise, the tax code will create a disparity. Co-op consumers in rural America will be unable to enjoy the diverse mix of generation resources available in areas co-ops serve, while consumers of investor-owned utilities will benefit from incentives. Moreover, without incentives, meeting state and federal renewable and environmental mandates will be more costly for members of tax exempt rural electric cooperatives than for consumers of investor-owned utilities (IOUs).

Background on Electric Cooperatives

The National Rural Electric Cooperative Association (NRECA) is the national service organization representing the interests of cooperative electric utilities and their consumers. Electric cooperatives are not-for-profit, private businesses governed by their consumers. These consumers are unique in the electric industry in that they are members of their cooperative and therefore own their utility ("member-consumers"). Today, over 900 electric cooperatives serve 42 million consumers in 47 states. Cooperatives are a

unique sector of the electric utility industry, serving an average of only 7 consumers per mile compared with the 35 customers per mile served by investor-owned utilities (IOUs) and 47 customers per mile served by municipal utilities.

To put this in perspective, electric cooperatives serve 12% of the nation's electricity customers -- but maintain 42% of the nation's electricity distribution lines. Annual cooperative revenue per mile averages only $10,565, while it is more than six times higher for investor-owned utilities, at $62,665 and higher still for municipal utilities, at $86,302 per mile. In summary, cooperatives have far less revenue than the other electricity sectors to support a greater share of the distribution infrastructure.

These numbers illustrate why bringing power to rural areas is a challenging and costly endeavor. The not-for-profit, cooperative business model has been the key to delivering reliable and affordable power to these low density areas. Consistent with Internal Revenue Service requirements, electric cooperatives are democratically governed by locally elected boards of directors, and operate at cost. Any revenue collected above what is needed for the cooperative is returned to all consumer-members on an equitable basis. Benefits received from the federal government, therefore, also flow to the cooperative's members. Given this, electric cooperatives are generally exempt from federal income tax. All electric cooperatives, however, pay state and local property taxes, sales tax and payroll and excise taxes.

Does Renewable Electricity Require Incentives?

Electric cooperatives have a mission to provide reliable, affordable electricity to their consumer-members. Co-ops must balance that mission with compliance with state renewable portfolio mandates and state and federal clean air law. As such, co-ops must consider all available electricity sources to meet new electricity demand. Cooperatives are planning to build 12,800 MW of new electric generation over the next decade, and will have to buy additional generation in the market to meet an annual population growth rate exceeding 1 percent per year in their service territories. These figures do not take into account additional power needed to replace older coal plants that will soon be retired given recent and prospective Environmental Protection Agency (EPA) regulations.

According to the Energy Information Agency (EIA), renewable electricity (excluding renewable hydropower) accounts for 4% of the nation's fuel mix – about double the percentage of renewable energy in the mix prior to the expansion of tax incentives under the Energy Policy Act of 2005. Renewable electricity is generally thought of as distributed generation and is much smaller in scale than a new coal or gas plant. In the case of solar and wind, it is only intermittently available. For these reasons, it cannot replace retired coal plants. Nonetheless, renewable resources are an important part of the "mix" for building the generation necessary to meet future electricity demand while mitigating global greenhouse gas emissions and traditional pollutants that result from fossil fuel generation. This is increasingly important as the Environmental Protection Agency develops more strict standards for power plants.

Given its importance to balancing environmental goals within our nation's fuel mix, some ask why renewable electricity should require a tax incentive or incentive of any kind. For cooperatives, the answer is that renewable electricity will only be developed if it can be done so affordably for consumers. Today, without incentives, renewable electricity is unaffordable compared to natural gas-fired generation. In November 2010, U.S. Energy Information Administration estimated that the overnight capital cost of an advanced natural gas combined cycle plant is $1,003 per kW of capacity. Not counting current tax subsidies, by way of comparison, an onshore wind project is the most affordable renewable resources at overnight capital costs of $2438 per kW. For other renewables, the cost is even greater. For example, a large solar photovoltaic is $4755 per kW; and a combined cycle biomass plant is $7894 per kW. Although existing tax credits have driven improvements in renewable resources, the mission of making the cost of renewable technology comparable to the cost of conventional resources has not yet been completed.

Despite its value in providing a balanced generation profile for utilities, absent incentives, the pace of placing renewable energy in service is likely to slow to a trickle. Yet putting future generation into one basket – likely, natural gas – is risky due to volatile prices. For example, in May of 2008, natural gas prices were $12.41 per thousand cubic feet (TCF). Today, prices are hovering around $5 TCF. The new, lower prices are a result of both the recession and newly discovered domestic gas reserves. However, past experience teaches us that gas is a volatile price input for fuel as home heating, transportation and electricity sectors all may rely on gas. Moreover, utilizing natural gas does not avoid greenhouse gas emissions.

Some argue that mandates are sufficient to drive renewable energy. Thirty-seven states currently have renewable mandates or goals, and 20 of those include cooperatives in these programs. Without tax or other incentives, there will be no tools available to help co-ops meet those goals affordably. The cost of renewable resources will exceed the cost of paying a penalty to the State for failing to build them. Exacerbating this result, many state mandates ultimately require resource development that simply is not achievable given transmission constraints and the quality or availability of renewable resources. These mandates quickly convert to a pure tax on consumers when penalty payments are paid in lieu of actual resource development. For those reasons, NRECA has opposed one-size-fits-all federal renewable portfolio standard and has consistently advocated that the best way to push the envelope on technology remains incentives – whether those incentives are in the tax code, in the form of grants, or through low-cost loan programs.

Experience with the CREB Program

The Clean Renewable Energy Bond (CREB) program was enacted in the 2005 Energy Policy Act with strong bipartisan support. It helped cooperatives and other not-for-profits to finance renewable generation projects that would have been eligible for the Production Tax Credit if developed by a for-profit. The bond started as, essentially, a zero interest, term-limited loan. A cooperative would issue a bond; the bondholder would receive principal repayment from the cooperative; and the Federal Treasury would

provide a tax credit to the bondholder in lieu of interest the cooperative would otherwise have paid.

A volume cap of $800 million in bonding authority was initially provided with $300 million set aside for electric cooperatives. The volume cap posed a problem for the program. Treasury received $2.5 billion in applications overall in the first year. While an additional $400 million (with $150 million set aside for electric cooperatives) was provided under the Tax Relief and Health Care Act of 2006, applications still exceeded available funding authorizations.

By contrast, there is no volume cap for the Production Tax Credit, the Investment Tax Credit or the tax grant provided under the American Recovery and Reinvestment Act of 2009 ("stimulus bill"). Attempting to address this disparity through meaningful program funding, the stimulus bill, combined with the Emergency Economic Stabilization Act of 2008 ("economic rescue bill"), added $2.4 billion in bonding authority to the CREBs program, divided equally between electric cooperatives, municipal utilities and non-utility government bodies. These bills also made a series of improvements to the program to make the bonds more marketable, such as the ability to strip the bond from the tax credit and sell them separately, and provided for a 70%/30% shared interest cost between the issuer and the Treasury.

In 2009 and 2010, electric cooperatives received over $600 million in CREBs awards through bond authorizations that were set asides in the two bills. Despite the promise of significant new funding, the program hit a major snag -- the economic downturn. The market for tax credits nearly collapsed. Potential CREBs buyers were demanding significant additional interest from issuers on top of the face value of the bond – an effective interest rate of 8.5%! So, CREBs had already been allocated to projects that were ready to move forward. But the bonds could not be issued, and the projects – and related jobs – were at a standstill.

To rescue these projects, the Committee made a critical improvement to the program in H.R. 2847, the "Hiring Incentives to Restore Employment Act." This new law established a "direct payment" option that allows CREB issuers, such as cooperatives, to receive a direct payment from Treasury designed to reimburse the co-op for 70% of the projected interest cost on these bonds. This option rescued the program from the negative impact of the recession on the market for tax credits, and assured that renewable projects could move forward. Under the conditions that continue to suppress tax appetite in the bond markets, the "direct pay" feature remains an important aspect of the program.

To sum up cooperatives' success with the program, 210 MW of cooperative renewable power is currently in service financed through CREBs, with another 250 MW poised to come on line under the program. The projects are distributed across 18 states and include solar, wind, geothermal, hydropower, biomass and landfill gas technologies. The map labeled "Attachment A" provides more detail on the projects. Each CREB project merits mention as a success story. The projects are the result of balancing clean energy objectives with the conservative approach imposed by local cooperative Boards of

Directors. The Boards emphasize long-term planning, continued affordable rates and prudent use of utility resources. Electric cooperative projects are not built to impress stockholders or follow a trend, but instead, provide affordable, clean, renewable power benefits to local consumers.

Experience with the Production Tax Credit and 1603 Treasury Grant Program

The CREB program is a story of coop ownership of renewable projects. Direct project ownership is the best way for cooperatives to reserve environmental and compliance benefits for their own consumers. But cooperatives also buy a substantial quantity of renewable energy from the market. Overall, cooperatives access over 3900 MW of renewable capacity (not counting hydropower). Twenty percent of this is owned by the cooperative, while eighty percent of this capacity is generated by taxpaying entities and then contractually purchased by cooperatives. These sellers are themselves the recipients of the Production Tax Credit (PTC) or, in the case of solar, the Investment Tax Credit (ITC). Cooperatives do not have federal tax liability and therefore cannot use the PTC – but nonetheless, their consumers can benefit indirectly from entities that do. The PTC has never been a complete solution for cooperatives, as the entire value of the PTC is only partially flowed through to the cooperative on contract. So, the PTC does not provide cooperatives with cost-certainty and more importantly, does not enable electric cooperatives to own and develop their own resources. It has been a valuable underpinning in the marketplace for renewable energy for the past decade, although it has suffered some of the same impacts from the recession that hit the CREBs program – a lack of tax appetite for tax credits.

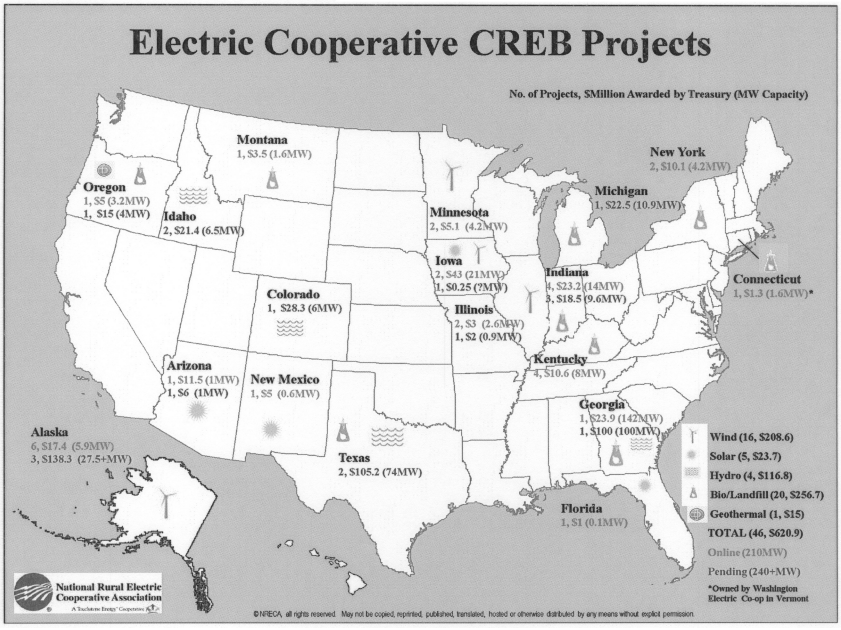
The PTC expansion under the "stimulus bill" created an option to take an Investment Tax Credit -- and then convert the ITC to a tax grant under the "1603 Treasury Grant Program." This mechanism was designed to address the tax appetite barrier affecting the PTC. Under the 1603 Treasury Grant Program (TGP), a renewable developer can receive a grant from Treasury covering 30% of the project's capital costs once it is placed in service. Cooperatives were not included in this program directly, but it has brought cooperatives an opportunity that is proving to be more useful than the PTC. Some cooperatives have formed structures that enable them to indirectly utilize the TGP and own and develop renewable projects. It has been the driver for several significant cooperative renewable projects currently underway.

Conclusion

Whether indirectly through the PTC and 1603 Treasury Grant Program - or directly through CREBs - nearly 100% of the renewable projects that benefit electric cooperative consumers are attributable to tax code incentive programs. Without incentives, development of such renewable projects will grind to a halt. The Committee has important considerations to weigh as they carefully review reform of the tax code. Renewable energy development will not "make or break" electric cooperatives as entities,

but will shape the extent to which cooperatives rely upon natural gas or other resources in their generation mix, their ability to optimize local resources, and the extent to which cooperative consumers are exposed to environmental compliance costs. Should Congress choose to extend tax incentives like the PTC to drive down the cost of renewable technologies, we urge Congress to also extend programs -- such as Clean Renewable Energy Bonds or the Treasury Grant Program -- that benefit not-for-profit cooperative consumers.

Attachment A



December 14, 2011

Adam Monroe, President, Novozymes North America
Senate Committee on Finance
Subcommittee on Energy, Natural Resources, and Infrastructure
Alternative Energy Tax Incentives:
The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing and Jobs
215 Dirksen Senate Office Building
Wednesday, December 14, 2011

Chairman Bingaman, Ranking Member Cornyn, Senator Burr and Members of the Subcommittee,

On behalf of Novozymes and its 829 employees across America – from North Carolina and Iowa to California and Massachusetts– we thank you for the opportunity to submit testimony for the record.

Novozymes is a technology and science company; we respect and encourage both. We have more than 5,000 patents and 700 products at work in 130 countries: enzymes that remove trans-fats in food, lower the temperature needed to wash a consumer's clothes – and convert biomass, from switch grass or corn stover, into biofuels. Our technology saves consumers money and protects the environment for our children. Our North American headquarters is located in Franklinton, North Carolina and we are proud to help Senator Burr bring jobs and economic activity there.

Today, we are nearing completion of a new state-of-the-art enzyme manufacturing facility in Blair, Nebraska, a $200 million investment in America's future. Our enzyme facility has already created 140 construction jobs and will bring 100 permanent jobs when it opens in 2012. In fact, 45 full-time employees are already at work. These are good-paying, sustainable jobs for families helping to create sustainable, domestic energy for our country.

We appreciate this subcommittee's inquiry into the types of tax incentives necessary to increase domestic alternative energy production and spur our economy. The impact of short term extensions for these incentives should not be underestimated.

First, I'd like to highlight: As our Blair investment demonstrates, we believe private industry drives America's economy and must provide the innovation and lion's share of capital to develop it. However, we also believe a strong partnership is vital to the success of any emerging industry, where the public sector provides consistent policy support to grow it.

Novozymes North America Inc.
PO BOX 576
77 Perry Chapel Church Road
Franklinton NC 27525 United States

American biofuels are a growing success story rooted in such a partnership. Today the American biofuels industry provides more transportation fuel to the U.S. market than we import from Saudi Arabia – or roughly 445 million barrels of imported oil a year.

The industry also built more than 200 biorefineries during a 20 year period in which much of the U.S. manufacturing base was being exported to foreign countries like China, Brazil and India – and that means jobs: construction, permanent and indirect jobs. In fact, biofuels has created an estimated 400,000 direct and indirect jobs in the United States, with 70,000 added in 2010 alone, according to the Renewable Fuels Association.

The Committee can continue to play a vital role in helping these technologies, and America's economy and energy policy, grow into the future by continuing to support the types of policies and incentives in place to incentivize the advanced biofuels and biobased products industries.

For example, immediate and long term extension of the Cellulosic Biofuels Producer Tax Credit (PTC) and the Special Depreciation Allowance for Cellulosic Biofuel Plant Property. Both of these provisions are, in addition to production incentives, cues to the private investment community of continued support of the advanced biofuels industry and bioeconomy. To enable the domestic development of this industry, its jobs and economic growth in the United States, Congress should provide long-term extensions of these provisions, ideally 5+ years. The cellulosic biofuels industry is just on the verge of commercial production, the impact of the production credit and depreciation allowance will be more significant going forward than ever before.

Another important provision for expanding the bioeconomy in the United States would be enactment of Senator Stabenow's bill, S. 1764, which explicitly includes biobased product manufacturing projects to the extension of the Section 48C tax credit for qualifying advanced energy manufacturing. US manufacturing of biobased products will provide the same economic, energy and national security and job growth benefits as advanced biofuels.

You are likely aware of a recent opinion piece in the *Wall Street Journal.* We know concerns persist as they would with any new industry. But smart policies like the Renewable Fuel Standard – and tax incentives like we are discussing today – provide Americans the best prices and choices at the pump. The *Journal's* piece fails to account for new technology which will improve efficiency, drive down costs and, therefore, favorably impact our ability to produce and deliver biofuels to market.

Despite a level of uncertainty for alternative energy policy, and an oil and gas industry that is able to count on their tax incentives and policies, the biofuels industry has accomplished significant advancements and innovations. If we have been able to achieve so much in so short a time with current uncertainties, imagine what we could do with more stability. We look forward to working with the Committee to find that stable ground.

As you know, Americans are looking for less expensive, domestically-produced and cleaner ways to fuel their cars and trucks. In a new University of Texas poll, Americans say their top two concerns are U.S. consumption of foreign oil and the country's progress in developing renewable energy. Innovation through science offers a way to do both. The technology is here and with continued public support, we can continue to provide viable, innovative solutions.

We appreciate the committee's focus on domestic energy production and hope your efforts will continue to help our industry save Americans money at the pump.

Thank you for the opportunity to submit testimony. We are happy to provide answers to any questions the Committee may have.

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Statement of the Residential Energy Efficient Tax Credit Industry Coalition

before the

Subcommittee on Energy, Natural Resources and Infrastructure

Committee on Finance
United States Senate

on

"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing and Jobs"

December 14, 2011

2025 M St, NW, Suite 800 | Washington, DC 20036 | Phone: 202-367-1280

Residential Energy Efficient Tax Credit Industry Coalition

December 8, 2011

The Honorable Harry Reid
Senate Majority Leader
S-221, United States Capitol
Washington, D.C. 20510

The Honorable Mitch McConnell
Senate Minority Leader
S-230, United States Capitol
Washington, D.C. 20510

The Honorable Max Baucus
Chairman, Committee on Finance
219 Dirksen Senate Office Building
Washington, D.C. 20510

The Honorable Orrin Hatch
Ranking Member, Committee on Finance
219 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Majority Leader Reid, Minority Leader McConnell, Chairman Baucus and Ranking Member Hatch:

As companies and associations representing manufacturers, retailers, builders and contractors in the housing and residential energy retrofit industry, we are writing to urge your support for an extension at the $1,000 level for the residential energy efficiency (25C) tax credit set to expire at the end of the year. The 25C tax credit creates and preserves American jobs and promotes energy efficiency by helping owners of existing homes afford higher efficiency windows, doors, HVAC systems, hot water heaters, roofing and insulation. We are deeply concerned that the loss of this incentive before the housing market recovers would lead to substantial job losses.

Residential remodeling activity spurred by the 25C tax credit in 2009 and 2010 was critical to maintaining our economic vitality. In 2009, Internal Revenue Service data indicates American taxpayers reported spending $25.1 billion on remodeling costs associated with the tax credit. Moreover, the program supported 278,610 jobs (135,540 of which were in the construction and remodeling sectors), approximately $13.2 billion in wages and $7.5 billion in net business income according to analysis by the National Association of Home Builders. In addition, 25C is truly a middle-class tax credit. In 2009, over two-thirds of the households claiming the credit had adjusted gross income of $100,000 or less.

Further, private residential investment as a percent of gross domestic product set another record low of 2.4 percent in the third quarter of 2011—in comparison to its historic average of approximately 5 percent. The 25C tax credit has provided a needed floor on remodeling activity, declining 32% since its peak compared to 76% for new home sales. It creates jobs and benefits homeowners by reducing their energy use, lowering their energy bills and improving their homes.

Again, we urge your support for a robust extension of the 25C tax credit, knowing the $1,000 level would effectively leverage consumer activity and job preservation. We believe that the

program has had a powerful and positive impact on employment and extending the incentives until the housing market further stabilizes will protect American jobs.

Thank you for your consideration. We look forward to working with you to include an extension of the residential energy efficiency credit in tax legislation before the end of the year.

Sincerely,

Air Conditioning Contractors of America
Air-Conditioning, Heating and Refrigeration Institute
Andersen Corporation
A.O. Smith
Asphalt Roofing Manufacturers Association
Champion Window Manufacturing Company
Council of North American Insulation Manufacturers Association
Fortune Home and Security
Guardian Industries
Heating, Air Conditioning & Refrigeration Distributors International
The Home Depot, Inc.
Ingersoll Rand
Insulation Contractors Association of America
JELD-WEN, inc.
Lennox International, Inc.
Lowe's Companies, Inc.
National Association of Home Builders
National Association of Manufacturers
National Association of the Remodeling Industry
National Electrical Manufacturers Association
National Lumber and Building Material Dealers Association
National Roofing Contractors Association
New England Fuel Institute
Pella Corporation
Petroleum Marketers Association of America
Plumbing-Heating-Cooling Contractors—National Association
Regal Beloit
Retail Industry Leaders Association
Rheem Manufacturing Company
Roof Coatings Manufacturers Association
Spray Polyurethane Foam Alliance
Tile Roofing Institute
United Technologies Corporation
Window and Door Manufacturers Association

cc: Senate Committee on Finance members

STATEMENT OF

RHONE RESCH, PRESIDENT & CEO
SOLAR ENERGY INDUSTRIES ASSOCIATION

SUBMITTED TO THE

UNITED STATES SENATE COMMITTEE ON FINANCE
SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES, AND INFRASTRUCTURE

HEARING ON

ALTERNATIVE ENERGY TAX INCENTIVES:
THE EFFECT OF SHORT-TERM EXTENSIONS ON ALTERNATIVE TECHNOLOGY INVESTMENT, DOMESTIC MANUFACTURING, AND JOBS

DECEMBER 14, 2011

Solar Energy Industries Association
575 7th Street NW, Suite 400
Washington, DC 20004
(202) 682-0556
www.seia.org

The Solar Energy Industries Association (SEIA) is the national trade association for the U.S. solar energy industry. On behalf of our 1,100 member companies and the 100,000 American taxpayers employed by the solar industry, I appreciate having the opportunity to submit a written statement for the record on this hearing regarding the effect of short-term extensions of energy tax incentives on alternative technology investment, domestic manufacturing and jobs.

History has shown that well-crafted and efficient tax incentives can be powerful policy mechanisms to promote the nation's energy objectives and leverage private sector investment to promote the deployment and utilization of new energy resources. As with every other major U.S. energy resource, effective tax policy has helped yield significant economic and energy policy benefits in the solar industry. Accordingly, it is appropriate for the Senate Finance Committee to review existing energy tax incentives, and in particular focus on the impact short-term extensions of energy tax incentives have on a host of energy industries and technologies.

When evaluating the efficacy of specific energy tax incentives, there are several fundamental considerations for policymakers. For example, an incentive's rate of return for taxpayers and whether or not a tax preference is effective in meeting the nation's short, medium and long term energy policy objectives should be carefully considered by Congress. By any objective measure, in the case of the U.S. solar industry, tax policy has proven to be an efficient and cost-effective way of promoting an activity that is fully consistent with the nation's energy policy goals. Retention of stable, reliable tax policy that maintains tax incentives provided under current law and improves the liquidity and efficiency of existing incentives will allow the U.S. to reap the significant economic and energy security benefits associated with a vibrant U.S. solar industry.

It is important to note that in 18 days, the Section 1603 Treasury Program will expire. Tax equity is utilized to finance a broad array of energy projects, and the Section 1603 Treasury Program addresses an existing shortage of tax equity in the marketplace. There remains a need for this effective initiative. However, uncertainty regarding the program's future is having a detrimental impact in the marketplace and could negatively impact the financing of promising domestic energy projects. To remove this uncertainty, Congress should extend the 1603 Treasury Program.

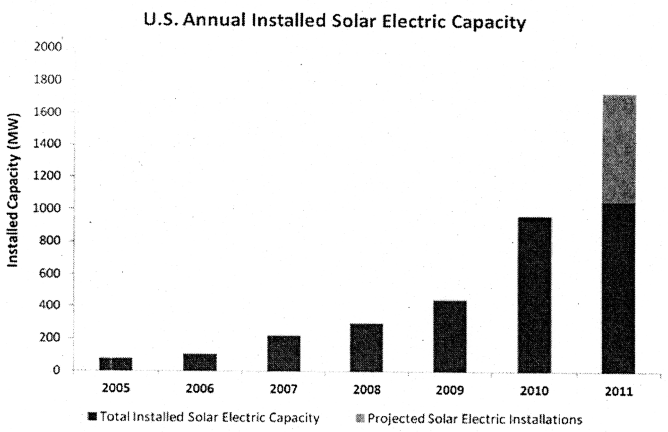
Background on Solar Tax Incentives

The *Energy Policy Act of 2005* (P.L. 109-58) created tax incentives for solar energy – a new 30% investment tax credit (ITC) for commercial and residential solar energy systems that applied from January 1, 2006 through December 31, 2007. These credits were extended for one additional year in December 2006 by the *Tax Relief and Health Care Act of 2006* (P.L. 109-432). In 2007, global investment in clean energy topped $100 billion, with solar energy as the leading clean energy technology for venture capital and private equity investment. The solar tax credits helped to create unprecedented growth in the U.S. solar industry from 2006-2007. The amount of solar electric capacity installed in 2007 was double that installed in 2006.

In response to the dramatic downturn in the economy in 2008, Congress enacted the *Emergency Economic Stabilization Act of 2008* (P.L. 110-343). Among other provisions, this legislation included an eight-year extension of the commercial and residential solar ITC, elimination of the monetary cap for residential solar electric installations, and permitted utilities and alternative minimum tax (AMT) filers to utilize the credits.

Solar ITC a Resounding Policy Success

The market certainty provided by a multiple year extension of the residential and commercial solar ITC has helped the rate of solar power installations grow by 800% since the ITCs were implemented in 2006 - a compound annual growth rate of 74%. Cumulative solar capacity in the U.S. now exceeds 3,650 megawatts (MW), enough to power more than 730,000 homes. In Q3 2011, the U.S. installed an additional 449 MW, a 140% year-over-year increase from Q3 2010.



Growing U.S. Solar Manufacturing Capacity

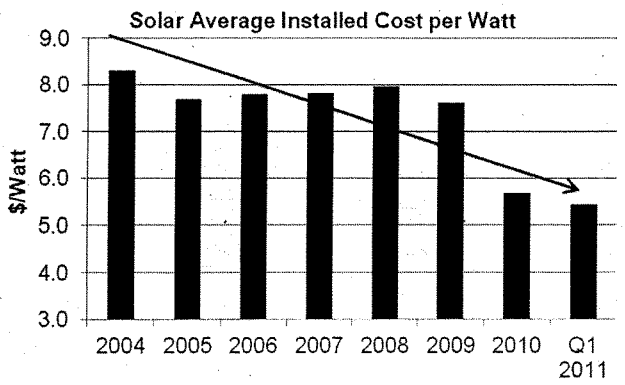
The sharp growth in project installations after passage of the ITC jump-started domestic U.S. solar manufacturing. Between enactment of the ITC through the end of 2010, U.S. solar manufacturing capacity quadrupled from 726 MW in 2007 to 2,887 MW.

Today, there are at least 51 domestic facilities in 21 states manufacturing the primary components of solar PV systems, including solar-grade polysilicon, wafers, cells, solar modules, and inverters. The U.S. was a $2 billion net exporter of solar products in 2010.

The Falling Cost of Solar for Consumers

Since the beginning of 2010, the price of solar panels has dropped by 40%, and costs continue to fall, making solar even more affordable for residential and business consumers. This is part of an ongoing trend that has shown consistent declines in solar pricing in the marketplace.

The existence of the ITC through 2016 provides market certainty for companies to develop long-term investments in manufacturing capacity that drives competition, technological innovation, and ultimately lowers costs for consumers.



Source: LBNL Tracking the Sun III; SEIA/GTM Research Solar Market

An Engine for U.S. Job Creation

Due in large part to the availability of the multi-year ITC, the solar industry grew by 140% in the last year, making it one of the fastest growing industry sectors in the U.S. economy – in contrast to the 2.8% GDP growth of the U.S. economy overall in 2010.

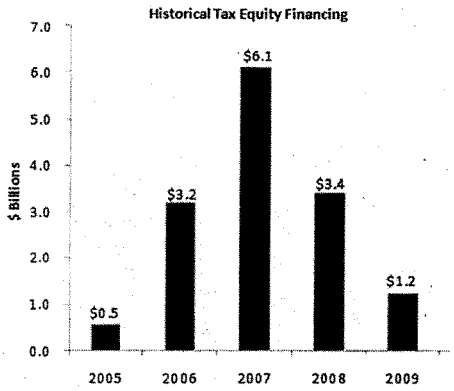
Today, the solar industry employs more than 100,000 Americans, more than double the number from 2009. They work at more than 5,000 companies, the vast majority being small businesses, in all 50 states. Additional job growth is expected as the industry continues to grow in the future.

Importance of Tax Equity Financing and Credit Liquidity

The 2008 economic crisis rendered solar and other renewable energy tax incentives of little immediate value. Prior to the financial crisis, many large-scale renewable energy projects relied

upon third-party tax equity investors to monetize the value of federal renewable energy incentives. The economic downturn drastically reduced the availability of tax equity, severely limiting the financing available for renewable energy projects.

Tax equity is the term used to describe the passive financing of an asset or project by large tax-paying entities that can utilize tax incentives to offset future tax liabilities. Tax equity investors in renewable energy projects receive a return on investment based not only on the income from the asset or project, but also on federal income tax incentives (through the utilization of tax credits). Renewable energy developers themselves typically do not have sufficient taxable income to benefit directly from these tax credits and must partner with tax equity investors in order to finance projects. For example, they participate in a partnership structure in which ownership of the project is transferred from the tax equity investor to the developer-owner once the tax benefits are realized. Leasing structures akin to those commonly found in many sectors of the economy are also utilized.



Sources: U.S. Department of The Treasury, US Partnership for Renewable Energy Finance, and Leading Tax Equity Market Participants

The pool of tax equity investors is typically limited to the largest and most sophisticated financial firms and utilities, and the 2008 economic crisis significantly reduced the market demand among these entities for tax equity. A report released by the Bipartisan Policy Center on March 22, 2011, noted that the number of tax equity investors in renewable energy projects declined from approximately 20 in 2007 to 13 in 2008 and only 11 in 2009. The associated decline in overall tax equity financing provided to renewable energy projects was equally dramatic, falling from $6.1 billion in 2007 to $3.4 billion in 2008 and $1.2 billion in 2009.

Section 1603 Treasury Program

In response to the dramatic decline in capital available for renewable energy projects, the *American Recovery and Reinvestment Act* (ARRA)(P.L. 111-5) included important modifications to the ITC and other renewable energy tax incentives to address the lack of available tax equity financing, including the Section 1603 Treasury Program. This program allows solar and other renewable energy developers to receive a direct federal grant in lieu of taking the ITC that they are otherwise entitled to receive. The goals of this modification were to simplify financing for renewable energy projects and to provide access to capital during a time when project developers' tax burdens were inadequate to capitalize on tax incentives and tax equity

financing was both scarce and expensive. The program has been very successful in achieving these goals.

It is important to note that the Section 1603 Treasury Program does not significantly increase the overall cost to the federal government of tax incentives for solar energy projects. Instead, the program primarily affects the timing of when ITCs for solar projects can be utilized.

Section 1603 Treasury Program has been a Proven Success

Due in large part to the liquidity provided by this important incentive, the solar industry grew by 69% in the last year, making it one of the fastest growing industry sectors in the U.S. economy. The solar industry employs more than 100,000 American workers in all 50 states.

In its preliminary evaluation of the Section 1603 Treasury Program, conducted at the request of the House Ways and Means Committee, DOE's Lawrence Berkley National Laboratory, noted:

> *[T]he Section 1603 program provides significant economic value to many renewable power projects, relative to the PTC or even ITC. Specifically, the grant program reduces the market's dependence on scarce and/or costly third-party tax equity, and also in many cases provides more direct or face value to renewable power projects than does the PTC. In addition, a number of indirect or ancillary benefits favor the grant from a renewable project developer's perspective, potentially helping to drive additional renewable capacity additions.*

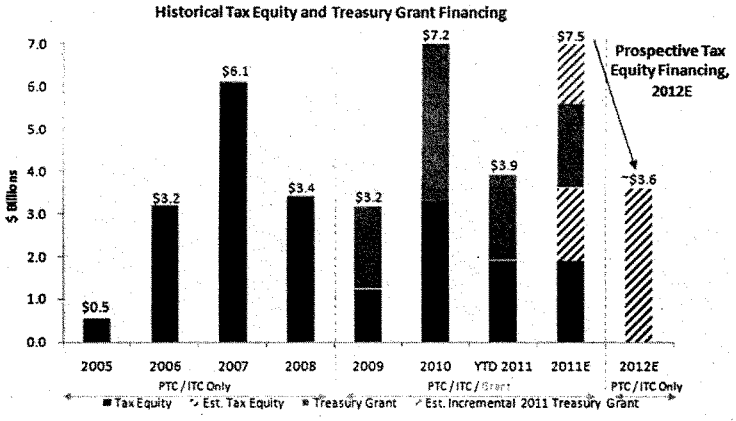
The 1603 Program revived the renewable energy industry in 2009 after the lack of tax equity financing in late 2008 brought many projects to a halt. As of November 2011, the program has awarded grants for more than 22,000 solar projects totaling $1.5 billion and driving over $3.5 billion in private sector investment in the solar industry across 47 states. Since enactment, the program has leveraged more than $22.8 billion in private sector investment for a wide range of energy technologies in all 50 states.

Congress Should Extend the Section 1603 Program

Tax equity financing has still not recovered to the levels available prior to the recession and the rates of return that are being demanded in today's marketplace by investors remain prohibitively high. In December 2010, tax equity investors in solar projects required returns from 9% to as high as 20% compared to pre-recession levels of 6% to the low teens.

Due to global economic conditions, a large gap persists between the total amount of financing renewable energy developers need to build a thriving U.S.-based clean-tech industry and what money is available. Expiration of the 1603 Treasury Program this year is projected to reduce the availability of financing from an estimated $7.5 billion in 2011 to approximately $3.6 billion in 2012 – a reduction of more than 50%. Therefore, to continue this successful, job-creating

program, SEIA encourages Congress to extend the 1603 Treasury Program and explore ways to improve the liquidity and efficiency of the solar ITC.



Sources: U.S. Department of The Treasury, US Partnership for Renewable Energy Finance, Leading Tax Equity Market Participants

Global Competitiveness and the U.S. Solar Industry

The U.S. is a $2 billion net exporter of products in the solar value chain, and has the potential to be the world leader in solar energy. But for this to occur, policymakers should support smart policy that supports the global competitiveness of the U.S. solar industry while allowing market forces and global trade to spur growth and innovation. For example, other significant global players in the solar industry, such as China, Germany and Malaysia employ a variety of initiatives including but not limited to federal and local tax abatements; low cost access to capital; and aggressive policies to attract foreign direct investment and promote growth and stability in their domestic solar industries.

It is in the nation's best interests, from both an economic and energy policy perspective, to remain competitive in the global solar marketplace. This is particularly the case with domestic solar manufacturing. Section 48C of the Internal Revenue Code previously provided for a 30 percent ITC that could be claimed on the cost of re-equipping, expanding or building a factory to make clean energy products. The incentive could be claimed by a wide variety of renewable energy technologies. The Section 48C credit was capped at $2.3 billion in 2010. While the incentive was in place, solar manufacturing facilities in 21 states received support to promote production activities across the broad spectrum of solar energy technology.

Expiration of the Section 48C manufacturing incentive at the end of 2010 removed a viable incentive to help U.S. solar manufacturers remain competitive in both the global and domestic marketplace. Moving forward, lawmakers should carefully consider the important role tax

policy can play to bolster the nation's solar energy industry in an increasingly competitive global marketplace.

Conclusion

As the brief duration of federal solar tax incentives demonstrates, effective federal tax policy can yield significant energy and economic policy benefits. SEIA and the U.S. solar industry looks forward to working constructively with the Finance Committee to extend the 1603 Treasury Program and craft effective tax policy that is consistent with the nation's energy and economic policy objectives.

Statement of the Window & Door Manufacturers Association

before the

Subcommittee on Energy, Natural Resources and Infrastructure

Committee on Finance
United States Senate

on

"Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology Investment, Domestic Manufacturing and Jobs"

December 14, 2011

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Washington Office: 2025 M St, NW, Suite 800 | Washington, DC 20036 | Phone: 202-367-1280 | Fax: 202-367-2280 | www.wdma.com

The Window and Door Manufacturers Association (WDMA) would like to thank Chairman Bingaman, Ranking Member Cornyn and the members of the Subcommittee for the opportunity to provide this statement regarding our nation's energy tax policy and the vital role it plays increasing energy efficiency and job creation.

Founded in 1927, WDMA is the premier trade association representing the leading manufacturers of residential and commercial window, door and skylight products for the domestic and export markets. WDMA members are focused on Total Product Performance™ products that are designed and built to performance-based standards. WDMA members are leading America's efforts to develop and utilize energy efficient windows, doors and skylights for both new and replacement construction.

We are particularly appreciative of the Subcommittee's interest in examining the goals and implementation of energy tax incentives. Our testimony will comment in general on the goals of energy efficiency in buildings and specifically on the importance of the 25C tax credit to attaining dual objectives of saving energy and spurring investment in U.S. job creation.

Meeting Our Nation's Energy Goals Through Window, Door and Skylight Replacement

While much has been said and written about reducing our nation's reliance on foreign oil and investing in renewable energy technologies—both important goals—not as much attention has been paid to the dramatic impact that improving the energy efficiency of existing buildings could have on reducing energy consumption, and, as a result, reducing our dependence on foreign oil and other fossil fuels.

40 percent of all energy consumed in the U.S. is consumed by residential and commercial buildings, while U.S. buildings alone accounted for 8 percent of global energy consumption in 2008.[1] Significantly contributing to that energy consumption is the stock of nearly a billion single-pane windows still in use in residential buildings alone. As the California Energy Commission notes, the amount of energy lost each year through inefficient windows and doors is equivalent to the amount of oil the nation receives from the Alaska pipeline.[2]

Any national energy tax policy needs to make replacing these inefficient windows and doors a major component if we are to make a dent in the overall efficiency of our nation's residential and commercial building stock.

The 25C Residential Energy Efficient Tax Credit

Enacted as part of the Energy Policy Act of 2005, the original purpose of the Residential Energy Efficient Tax Credit (IRC 25C) was to save energy. However, in recent years, the 25C incentives have achieved two compelling national goals:

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[1] 2010 Building Energy Data Book, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy,
[2] "Today's Windows," California Energy Commission, Consumer Energy Center, www.consumerenergycenter.org

- Saving energy by making energy efficient home improvements more affordable for a wide spectrum of the American public; and
- Saving thousands of U.S. manufacturing and construction jobs.

We believe that a properly focused residential tax credit can efficiently and effectively spur significant private investment in energy saving measures. While niche populations utilize other tax credits, the 25C tax credit is broad-based. By all accounts, it has been hugely popular with the American homeowner, particularly the middle class, in 2009 and 2010. Internal Revenue Service (IRS) preliminary data for 2009 shows that taxpayers with adjusted gross income of under $100,000 claimed two-thirds of the credit.[3]

Also known as the Nonbusiness Energy Property Credit, 25C provides a credit to homeowners who make qualified energy efficiency improvements, including windows, doors and skylights, to their homes. In 2009, the credit was increased to 30 percent of the cost of the improvements up to $1,500 for the 2009 and 2010 tax years. For 2011, the 25C credit was reduced to 10 percent of the cost up to $200 for windows and skylights and $500 for exterior doors and is due to expire altogether at the end of 2011. Many of the products that qualify for the 25C tax credit, including windows, doors and skylights, are manufactured in America, unlike alternative energy sources that have benefited from other federal incentives.

As most are aware, the nation's housing industry is mired in recession, which has had a profound impact on the window, door and skylight industry. Residential window sales for new construction dropped 66 percent from 34.1 million units in 2005 to just 11.4 million units in 2009.[4] This has resulted in over a one-third decline in employment in our industry since 2005.[5] Further, private residential investment as a percent of gross domestic product set a record low of 2.4 percent in the third quarter of 2011—in comparison to its historic average of approximately 5 percent.[6]

As a result, there has been a demonstrable shift in the last few years to the remodeling and retrofit market for the window, door and skylight industry, spurred in part by the 25C tax credit. The 25C tax credit in effect for 2009-2010 was tremendously successful in supporting this industry and its workers during the worst housing downturn since World War II. The tax credit can be directly tied in our industry to the preservation and creation of American jobs and keeping plants and production lines open.

This shift to the remodeling and retrofit market is evident in the comparison to new home sales over the past five years. While total remodeling activity declined somewhat, it certainly has weathered the economic downturn much better than new home construction, in large part due to the 25C energy tax incentives Congress enacted in 2009.

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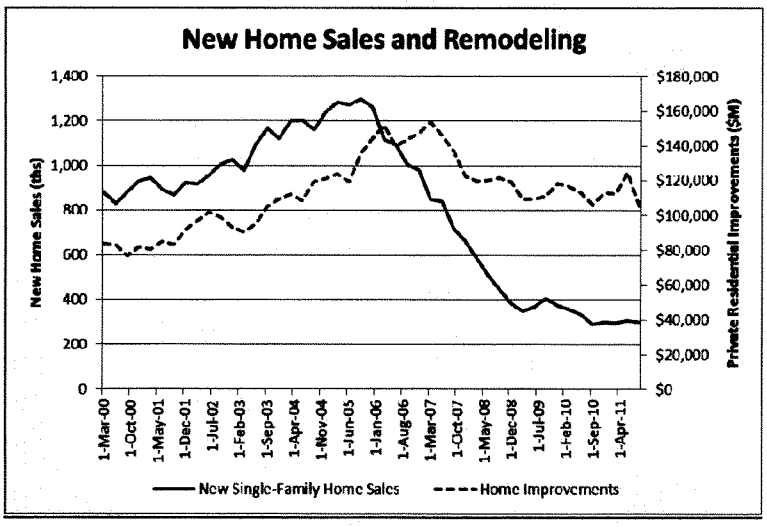
[3] Individual Tax Returns Preliminary Data, 2009, Statistics of Income Bulletin, Winter 2011. Michael Parrisi
[4] AAMA/WDMA U.S. Industry Statistical Review and Forecast, 2010
[5] U.S. Bureau of Labor Statistics data
[6] U.S. Bureau of Economic Analysis data

The following chart courtesy of the National Association of Home Builders (NAHB) plots new home sales (left axis) and total remodeling expenditures (right axis). The data indicate that remodeling expenditures fared better over the 2008 through 2011 period than new home sales. The tax credit program provided a floor on remodeling activity, which has declined only 32% since its peak compared to 76% for new home sales.



Economic Impact of the Residential Energy Efficient Tax Credit

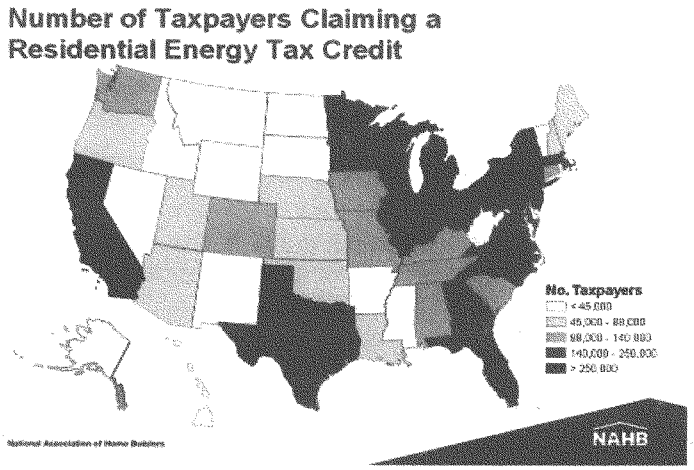
Using the 2009 IRS tax data, the net economic impacts of the 25C tax credit programs from a remodeling perspective are significant (setting aside the long-run energy efficiency benefits for homeowners).

- For tax year 2009, IRS data indicates $25.1 billion of remodeling expenses in connection with the section 25C tax credit
- NAHB estimates that this level of remodeling activity was associated with 278,610 full-time jobs
  - 135,540 of these jobs were in the construction and remodeling sectors
- Homeowners received a tax benefit of $5.17 billion from the 25C credit
- 93% of taxpayers claiming the energy credit had adjusted gross income of $200,000 or less

The 25C credit is claimed on the same tax form (5695) as a similar remodeling credit, the section 25D credit, which provides a nonrefundable 30% tax credit to consumers for the purchase and installation of certain power production property for a home. Typical uses include

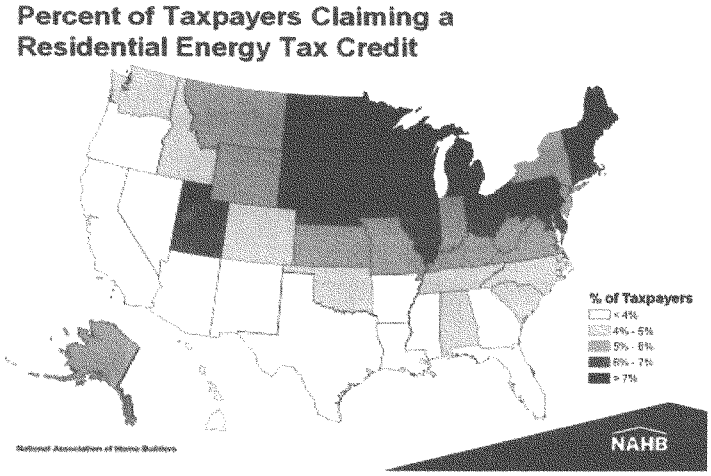
solar, geothermal, fuel cells, and small wind energy. The credit is uncapped, meaning that all qualified expenses may be claimed. Labor costs are eligible, and unlike section 25C, section 25D credit can be claimed against the AMT.[7]

The map below tracks the number of taxpayers in each state that claimed either or both the 25C and 25D tax credit, although NAHB estimates that nearly 90% of claims were 25C related. Intuitively, larger states in terms of population had larger numbers of taxpayers claiming the credits.

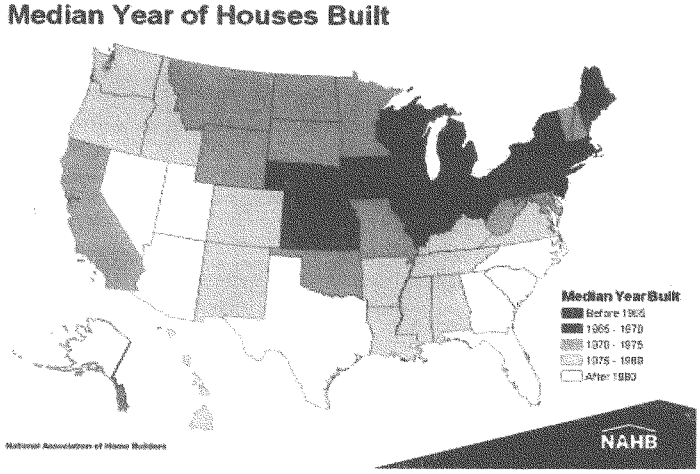


In the next map, a slightly different picture emerges. This map presents the percentage of taxpayers in each state who claimed either or both the 25C and 25D tax credits in 2009. A clear concentration of tax credit use can be seen for states in the Northeast and upper Midwest. Why? There are two leading explanations. First, homeowners in states in cold weather climates have more to gain from energy-efficient improvements in terms of reduced utility bills. However, there is no reason to believe that warm weather homes could not also benefit from energy-efficient improvements.

[7] Although the tax code does not allow taxpayers to claim section the 25C credit against the AMT, the annual AMT "patch" typically allows taxpayers to claim section 25C and other personal, nonrefundable tax credits against AMT. The simple, straight-forward approach used in section 25D offers a model for improving the section 25C tax credit. A 30% tax credit that includes labor costs and is automatically AMT-preferred is simple, straightforward and effective.

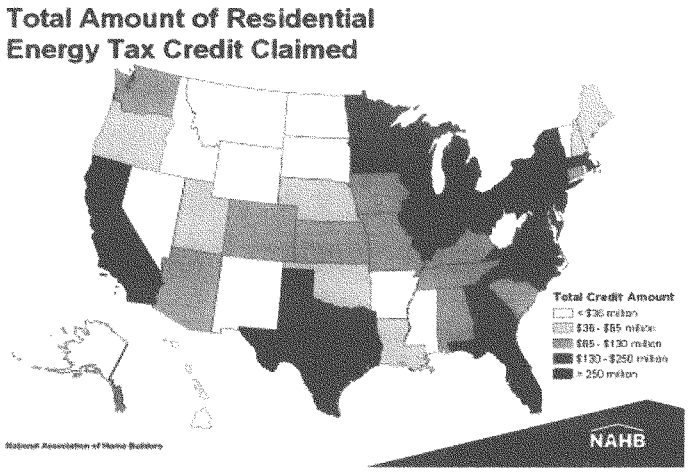


Thus, the second explanation, and the stronger one, is that the states with relatively more common use of the energy tax credits also contain older homes. The following map details the median year of construction for housing units in each state, and there is indeed a rough correlation between tax credit use and older housing with concentrations of both in many northern states.



A homeowner with a 50-year-old home is much more likely to improve their residence than a homeowner who has purchased a newly constructed home, with new construction more common in the southern part of the nation.

The last map tracks the total amount of the tax credits claimed. Overall, in 2009 taxpayers claimed nearly $5.9 billion in 25C and 25D tax credits. For the two tax credits combined, ***93% of tax credit claims were made by taxpayers who have an adjusted gross income of no more than $200,000***, which is indicative of a middle class tax program.



With respect to the 25C credit for energy-efficient remodeling of existing homes, the IRS data indicate a total of $25.1 billion of qualified expenditures in 2009.

Because the tax credit in 2009 was limited to $1,500 per taxpayer, not all of this activity was generated by the tax credit. In fact, according to the IRS data, just a little more than 71% of these costs ($5.404 billion versus potential $7.539 billion) were allowed in the 25C calculation due to the $1,500 limit. Moreover, due to other tax rules, only $5.172 billion of the $5.404 billion were allowed as realized 25C tax credits.

The first portion of the 25C credit is due to energy-efficient building envelope improvements, with 13% of the 25C claims associated with insulation, 34% with windows and skylights, 9% with doors and another 9% with qualified roofing materials. The second part of the credit dealt with energy-saving appliance installation, with 16% of the total 25C claims connected to heat pumps, air conditioners, water heaters and stoves; 17% with hot water boilers; 3% with air circulating fans used with a natural gas, propane or oil furnace.

An economic impact model has been developed by NAHB that enables estimating total employment and economic income impacts from home building and remodeling.[8] The model uses Bureau of Economic Analysis (BEA) data and BEA input-output tables to generate

[8] http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=103543&channelID=311

economic impacts by sector. The following table presents the impacts that result from $100,000 of remodeling activity.

Income and Employment Impacts of Remodeling on the U.S. Economy

	Number of Full-time Jobs	Wages and Salaries	Proprietors' Income	Corporate Profits	Total Income
$100,000 Spent on Remodeling					
All industries	**1.11**	**$52,709**	**$13,810**	**$16,147**	**$82,667**
Construction	0.54	$25,573	$6,601	$4,232	$36,406
Manufacturing	0.18	$8,136	$824	$4,529	$13,489
Wholesale and retail, Transportation and warehousing	0.16	$6,432	$849	$2,307	$9,588
Finance and insurance	0.02	$1,487	$71	$1,459	$3,017
Real estate and rental and leasing	0.01	$315	$1,652	$758	$2,725
Professional, Management, administrative services	0.12	$6,970	$2,191	$764	$9,924
Other services	0.09	$3,797	$1,623	$2,098	$7,518

Source: NAHB estimates, based primarily on data from the U.S. Bureau of Economic Analysis.

The jobs are measured on a full-time equivalent (FTE) basis. Thus, NAHB estimates that every $100,000 of remodeling activity creates 1.11 jobs on an FTE basis. 48.6% of those jobs are in the construction and remodeling sector.[9]

Putting all the data together, the IRS data and the NAHB economic impact model indicate that for 2009, a total of 278,610 full-time jobs were in connection with the25C credit—135,540 of these jobs were in the construction and remodeling sectors. The program supported approximately $13.2 billion in wages for these workers and $7.5 billion in net business income.

Treasury Inspector General Report on Residential Energy Credits

On April 19, 2011, the Treasury Inspector General for Tax Administration issued a report on the residential energy efficient tax credits (IRC 25C and 25d) and came to the conclusion that inadequate processes were in place to verify eligibility for the credits. Specifically, the report stated that:

> *The IRS **cannot verify** [emphasis added] whether individuals claiming Residential Energy Credits are entitled to them at the time their tax returns are processed. The IRS does not require individuals to provide any third-party documentation supporting the purchase of qualifying home improvement products and/or costs associated with making energy*

[9] The Direct Impact of Home Building and Remodeling on the U.S. Economy. NAHB Economics.

efficiency improvements and whether these qualified purchases and/or improvements were made to their principal residences.[10]

While the report did note a number of deficiencies with the IRS process for establishing verification of eligibility for the credit, some of the credits claimed are legitimate despite the inability to establish eligibility for the credit. In addition, the IRS notes that it can improve its processes to add additional safeguards and improve its ability to verify eligibility. WDMA stands ready to assist the government in making sure that the credit is only going to those who truly deserve the benefit.

To that end, WDMA has recommended consumer-friendly verification techniques to the IRS with the goal of improving the system for assuring that the tax credit claimed on returns are actually for qualifying energy efficient windows, doors and skylights. Currently, no documentation is provided on tax returns about the qualifying product. Taxpayers must maintain documentation in the event of an audit.

There are a variety of methods that should be explored to provide an identifying number or code that could be included on tax returns to help the IRS establish the eligibility of a product for the tax credit, which could be implemented for use with electronic filing. WDMA will continue to work with Congress and the IRS to improve the system of product verification.

Conclusion

Without question, the nation is facing the twin challenges of reducing energy consumption while spurring job creation. The 25C residential energy efficient tax credit encourages middle-class homeowners to undertake important and beneficial energy saving upgrades, which in turn supports American jobs preservation and creation across the housing industry supply chain—from manufacturing to distribution to sales to installation. The 25C credit has been popular because it works.

As we move toward the end of 2011, WDMA would like to work with the Finance Committee to extend the 25C tax credit to 2012 and beyond at a level that will continue to support the nation's energy goals while continuing to create and preserve American jobs.

WDMA would like to thank the Subcommittee for this opportunity to provide this statement and looks forward to working with them on this important issue.

For More Information Contact:

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[10] "Processes Were Not Established to Verify Eligibility for Residential Energy Credits," Treasury Inspector General for Tax Administration, Reference Number 2011-41-038, April 19, 2011